



**中國建築 - 利達聯營**  
CHINA STATE - LEADER JOINT VENTURE

**Wan Chai Development Phase II –  
Central – Wan Chai Bypass at Wan Chai West  
Contract No. HK/2012/08**

**Silt Curtain Deployment Plan  
for FEP-06/356/2009**

Revision	Date of Issue	Remarks	Prepared by	Checked by
0	22 Apr 2013	First Issue	James MA	George CHEUNG
1	8 May 2013	Revised as per ET's and IEC's comments	James MA	George CHEUNG
2	23 Jul 2013	Revised as per EPD's comments and ET's comments	James MA	George CHEUNG
3	25 Nov 2015	Revised to reflect final stage of works arrangement	James MA	Keith TSE
4	13 Jan 2016	Revised as per EPD's comments	James MA	Keith TSE

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## 1 Introduction

Wan Chai Development Phase II – Central - Wan Chai Bypass at Wan Chai West (Contract No. HK/2012/08) is part of the permanent reclamation works including associated dredging works in Wan Chai Development Phase II (WDII) and Central - Wan Chai Bypass covered under the Environmental Permit No. EP-356/2009.

China State – Leader Joint Venture was granted on 5 March 2013 a Further Environmental Permit (No. FEP-06/356/2009) for the Contract No. HK/2012/08 under the master Environmental Permit.

Under Condition 2.8 of Part C of the FEP-06/356/2009, a silt curtain deployment plan has to be prepared and deposited by the permit holder to the EPD at least two weeks prior to the commencement of the marine works.

In the first three stages of the works, mainly dredging and seawall trench filling will be carried out. Both frame type and general type silt curtains will be deployed to prevent sediment plume dispersion arising from the works.

In the final stage of works (i.e. both the dredging and seawall trench filling stages are completed), only the silt curtain for culvert channel is deployed which serves as a general type silt curtain to prevent any potential discharge from the upstream outside the site boundary of the project.

The purpose of this Silt Curtain Deployment Plan is to show the implementation of deploying silt curtain in areas, in particular, around seawall dredging and seawall trench filling in reclamation shoreline zones during construction phase of the project (Contract No. HK/2012/08) which is undertaken by China State – Leader Joint Venture (CSLJV). CSLJV is responsible for the installation, maintenance, repairing (in case of damage) and removal of the silt curtain during the course of marine works until completion.

## 2 Area of Application

Silt curtain shall be provided during dredging and seawall trench filling works which may affect the water quality around the site. To restrict the dispersion of sediment plume during the dredging and seawall trench filling works, woven geotextile shall be used as the silt curtain system that is sustained by floating

foam and operated in such a way that tidal rise and fall can be accommodated.

Two types of silt curtain will be deployed:

- (A) Frame type silt curtain to closely enclose the dredging areas during closed grab dredging;
- (B) General type silt curtain to surround the dredging areas and the seawall trench filling areas.

In dredging stage, one frame type silt curtain will be deployed to closely enclose the dredging areas for prevention of sediment plume dispersion during the closed grab dredging.

One general type silt curtain will be deployed to enclose the dredging areas for prevention of sediment plume dispersion arising from the transfer of dredged materials between the grab frame and pontoon. The pontoon with bunker will be moored along the dredger and the silt curtains. Dredged materials in the bunker will be transferred to the hopper barge via the crane of a derrick lighter. Tarpaulin sheeting will be installed when necessary among the hopper barge, derrick barge and pontoon to prevent marine deposit from dropping into the sea.

In seawall trench filling stage, one general type silt curtain will be deployed to enclose the works areas for prevention of sediment plume dispersion arising from the transfer of rockfill from the grab to the seawall trench.

In the final stage of works (i.e. both the dredging and seawall trench filling stages are completed), only the silt curtain for culvert channel will be deployed which serves as a general type silt curtain to prevent any potential discharge from the upstream outside the site boundary of the project. (refers to drawing for final stage of works and photo for silt curtain for culvert channel in Appendix I). There will be no marine traffic entering/leaving the culvert channel. To suit the site condition with reference to the tidal range, the silt curtain would be extended as closely as practicable to the seabed level. The inspection and rectification for this silt curtain will generally follow the procedures in Section 7.

The layout plan and the details for deployment of silt curtains during different

stages of works and its general arrangement is shown in Appendix I. The programme for major marine works is shown in Appendix III. To suit the site condition with reference to the tidal range, the silt curtain would be extended as closely as practicable to the seabed level. The condition of ballast steel chain would be checked regularly to maintain the extension of silt curtain as closely as practicable to the seabed level.

### **3 Current Situation**

Both the dredging and seawall trench filling are completed as of November 2015. No marine plant for dredging and seawall trench filling is necessary for the project and there is no chance of any source of pollution arising from the works as used to be contained by both the frame type and general type silt curtains. Please refer to the site photos in Appendix V.

In the final stage of works (i.e. both the dredging and seawall trench filling stages are completed), only the silt curtain for culvert channel is deployed which serves as a general type silt curtain to prevent any potential discharge from the upstream outside the site boundary of the project. There will be no significant impact on the water quality despite minor remaining marine works including installation of berm stones, seawall blocks and coping being carried out.

### **4 Use of Material**

“Bonar SG110/110” woven geotextile, manufactured by BONTEC, is proposed as the silt curtain system for this Project. Catalogue of the material is shown in Appendix II. BONTEC is operated in accordance with an ISO 9001:2000 quality assurance system and ISO 14001 environmental management system to provide a good quality product. The Bonar geotextile is widely used in recent port works construction projects such as CV/2003/06 — Stanley Waterfront Improvement Project, CV/2004/02 — Reconstruction of Wong Shek and Ko Lau Wan Public Piers, CV/2002/04 — Penny’s Bay Reclamation Stage 2 and HK12/02 — CED Central Reclamation Phase III, Engineering Works (Please refer to Appendix II). The properties of Bonar geotextile are satisfactory and fulfill the requirements as stipulated in the particular specification. Visual inspection of the silt curtain shall be carried out on a daily basis.

According to the “Assessment and Remediation of Contaminated Sediments Program” of United States Environmental Protection Agency, silt curtain has

been used at many locations with varying degrees of success. Moreover, the successful experiences in the deployment of the material “Bonar SG110/110” woven geotextile as silt curtain have been demonstrated in many projects as listed above. According to the Environmental Monitoring and Audit Manual, regular monitoring of water quality shall be carried out by the Environmental Team for complying with the statutory regulation and maintaining the quality of marine water during the course of construction.

## **5 Silt Curtain Installation Methodology**

### **5.1 General Type Silt Curtain**

- a. Link up 300mm buoys together by a net
- b. Tie the top end of the geotextile to the buoys net and the bottom end with steel chain ballast before transportation
- c. Transport the silt curtain to the location for fixing via a marine pontoon.
- d. Workers tie the buoy to nearby existing structures with nylon ropes.
- e. Put the buoys to the water and then slowly put the geotextile with the steel chain ballast into sea.
- f. In order to maintain the position of the silt curtain especially at the locations with strong current, place concrete sinkers to the seabed if required and tie the silt curtain to the sinkers with nylon strings by divers.

### **5.2 Frame Type Silt Curtain**

- a. Prefabricate a 15m x 12m rectangular shape floating steel frame using 400mm diameter x 8mm thick steel circular hollow sections.
- b. Tie the top end of the geotextile to the steel frame by nylon strings / steel wires.
- c. Tie the bottom end of the geotextile with ballast steel chain. This arrangement shall maintain the geotextile in vertical position during the course of the dredging.
- d. Place and unfold the silt curtain to the sea by grab dredger. Fix the floating steel frame alongside the grab dredger with a movement joint. Slowly put the geotextile together with the ballast steel chain to the sea.
- e. The frame shall enclose the dredged area to ensure water quality impact is minimized.
- f. Prepare different length of the geotextile for replacement in order to suit

the various existing seabed levels.

## **6 Silt Curtain Removal**

After completion of the marine works, the silt curtain shall be removed as follows:

- a. Prior to decommission of silt curtain, make sure all marine works or works affecting the seawall shall be completed, and also the water quality shall be checked to ensure no dispersion of muddy water outside the works areas.
- b. Loosen the fixing wire of the silt curtain from the concrete block and remove the silt curtain by motor boat for general type silt curtain or by crane for frame type silt curtain.
- c. Lifting the concrete block slightly by diver team and crane boat in order to minimize the disturbance of seabed causing mud wave.

## **7 Inspection and Rectification Works**

Inspection and rectification works will be carried out for the silt curtain as follows and recorded in the silt curtain daily inspection checklist as shown in Appendix IV:

- a. Diver inspection shall be carried out to inspect the installation and decommission of silt curtain to ensure proper installation and functioning of the silt curtain according to the design drawings.
- b. During the entire construction period, visual inspection and regular diver inspection shall be carried out to ensure no muddy water passing through the silt curtain system and to maintain proper functioning of the silt curtain. Visual inspection for the silt curtain shall be carried out daily. When damaging is suspected during daily inspection, diver inspection would be undertaken in order to ensure the performance of the silt curtain is effective and efficient. If the silt curtain is damaged and repairing works are necessary, all dredging work should stop at once until the damaged silt curtain is fixed. The silt curtain will then be lifted up by grab dredger / derrick barge. A new piece of geotextile with sufficient overlapping length (1m) will be attached to the existing silt curtain. If the extent of the damaged is large and silt curtain cannot be lifted up without causing further damage, a new layer of silt curtain will be installed from sea level to seabed

and the damaged location on two sides will be covered for a minimum of 5m. The dredging works will resume after repairing of the damaged silt curtains.

c. The site foreman shall supervise the entire installation and decommissioning processes. He shall also closely monitor the effectiveness of the silt curtain and report any irregularities which may affect its proper functioning so as to trigger early rectification by the Contractor.

d. In case of any malfunction of the silt curtain, diver inspection shall be carried out to check whether there is any damage or defect of the silt curtain and the situation will be immediately reported to the Environmental Team. Once the damage or defect is found, the rectification works shall be carried out to maintain well-functioning of the silt curtain under the supervision of the site foreman.

e. 20 linear meters of additional geotextile will be made ready for use and be kept on site for emergency replacement in case of damage or defect of the silt curtain is observed.



## Appendix I

### Layout Plan and Details of Silt Curtain



- LEGEND:**
- PROPOSED COPE LINE
  - - - DREDGING & EXCAVATION SLOPE
  - ▨ SILT SCREEN
  - PROPOSED SILT CURTAIN (GENERAL TYPE)
  - PROPOSED SILT CURTAIN (FRAME TYPE)
  - ▩ RANGE OF DEPLOYMENT OF FRAME TYPE SILT CURTAIN (DREDGING AREA)
  - SITE BOUNDARY

- Relocated cooling water intakes:**
- P1 Hong Kong Convention and Exhibition Centre Phase I
  - P3 Hong Kong Academy for Performing Arts
  - P4 Shui On Centre
  - P5 Wan Chai Tower, Revenue Tower, Immigration Tower

CONTRACT NO. HK/2012/08  
 WAN CHAI DEVELOPMENT PHASE II –  
 CENTRAL – WAN CHAI BYPASS AT  
 WAN CHAI WEST

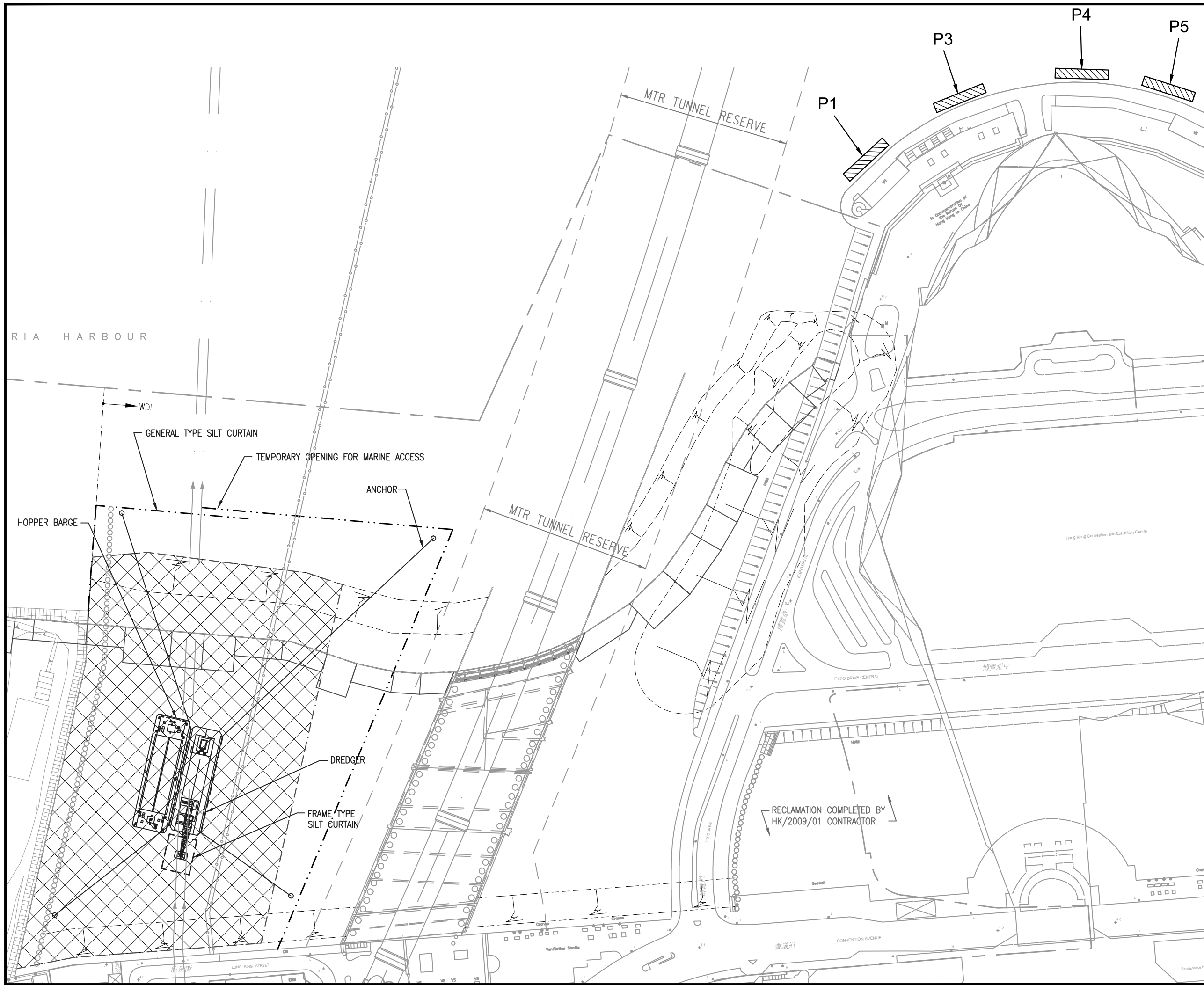
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LOCATION PLAN FOR DEPLOYMENT OF  
 SILT CURTAIN AND SILT SCREEN FOR  
 DREDGING WORKS (STAGE 1)

DRG. NO. HK\_2012\_08/CDB/SK/00030A1

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 DATE OF DRAWING ISSUE: 23-JUL-2013  
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 CHINA STATE - LEADER JOINT VENTURE



- LEGEND:**
- PROPOSED COPE LINE
  - - - DREDGING & EXCAVATION SLOPE
  - ▨ SILT SCREEN
  - · - · - PROPOSED SILT CURTAIN (GENERAL TYPE)
  - PROPOSED SILT CURTAIN (FRAME TYPE)
  - ▩ RANGE OF DEPLOYMENT OF FRAME TYPE SILT CURTAIN (DREDGING AREA)
  - SITE BOUNDARY

- Relocated cooling water intakes:**
- P1 Hong Kong Convention and Exhibition Centre Phase I
  - P3 Hong Kong Academy for Performing Arts
  - P4 Shui On Centre
  - P5 Wan Chai Tower, Revenue Tower, Immigration Tower

RIA HARBOUR

GENERAL TYPE SILT CURTAIN

TEMPORARY OPENING FOR MARINE ACCESS

ANCHOR

HOPPER BARGE

MTR TUNNEL RESERVE

DREDGER

FRAME TYPE SILT CURTAIN

RECLAMATION COMPLETED BY HK/2009/01 CONTRACTOR

CONTRACT NO. HK/2012/08  
WAN CHAI DEVELOPMENT PHASE II –  
CENTRAL – WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE  
LOCATION PLAN FOR DEPLOYMENT OF  
SILT CURTAIN AND SILT SCREEN FOR  
DREDGING WORKS (STAGE 2)

中國建築—利達聯營  
CHINA STATE - LEADER JOINT VENTURE

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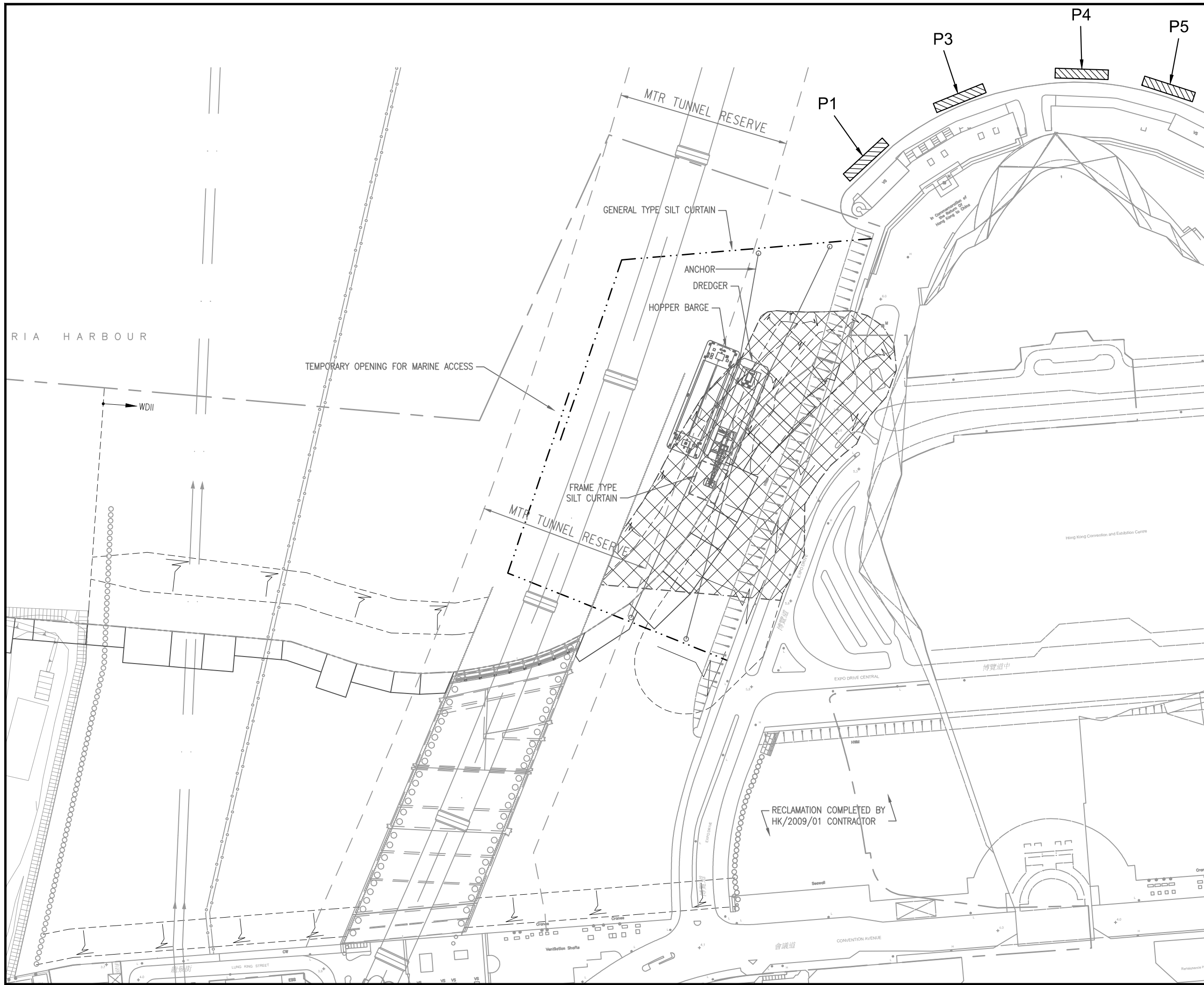
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- LEGEND:**
- PROPOSED COPE LINE
  - DREDGING & EXCAVATION SLOPE
  - ▨ SILT SCREEN
  - PROPOSED SILT CURTAIN (GENERAL TYPE)
  - PROPOSED SILT CURTAIN (FRAME TYPE)
  - ▩ RANGE OF DEPLOYMENT OF FRAME TYPE SILT CURTAIN (DREDGING AREA)
  - SITE BOUNDARY

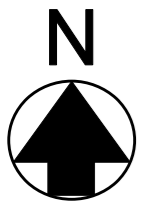
- Relocated cooling water intakes:**
- P1 Hong Kong Convention and Exhibition Centre Phase I
  - P3 Hong Kong Academy for Performing Arts
  - P4 Shui On Centre
  - P5 Wan Chai Tower, Revenue Tower, Immigration Tower

CONTRACT NO. HK/2012/08  
 WAN CHAI DEVELOPMENT PHASE II –  
 CENTRAL – WAN CHAI BYPASS AT  
 WAN CHAI WEST

TITLE  
 LOCATION PLAN FOR DEPLOYMENT OF  
 SILT CURTAIN AND SILT SCREEN FOR  
 DREDGING WORKS (STAGE 3)

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LEGEND :

--- SITE BOUNDARY

— SILT CURTAIN FOR CULVERT CHANNEL

維多利亞港  
VICTORIA HARBOUR

INSTALLED SILT CURTAIN  
FOR CULVERT CHANNEL

CONTRACT NO. HK/2012/08  
WAN CHAI DEVELOPMENT PHASE II -  
CENTRAL - WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE  
LOCATION PLAN FOR  
DEPLOYMENT OF SILT CURTAIN  
FOR FINAL STAGE OF WORKS  
(STAGE 4)

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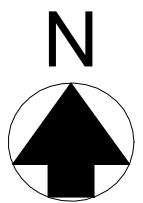
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Photo of Silt Curtain for Culvert Channel for Final Stage of Works



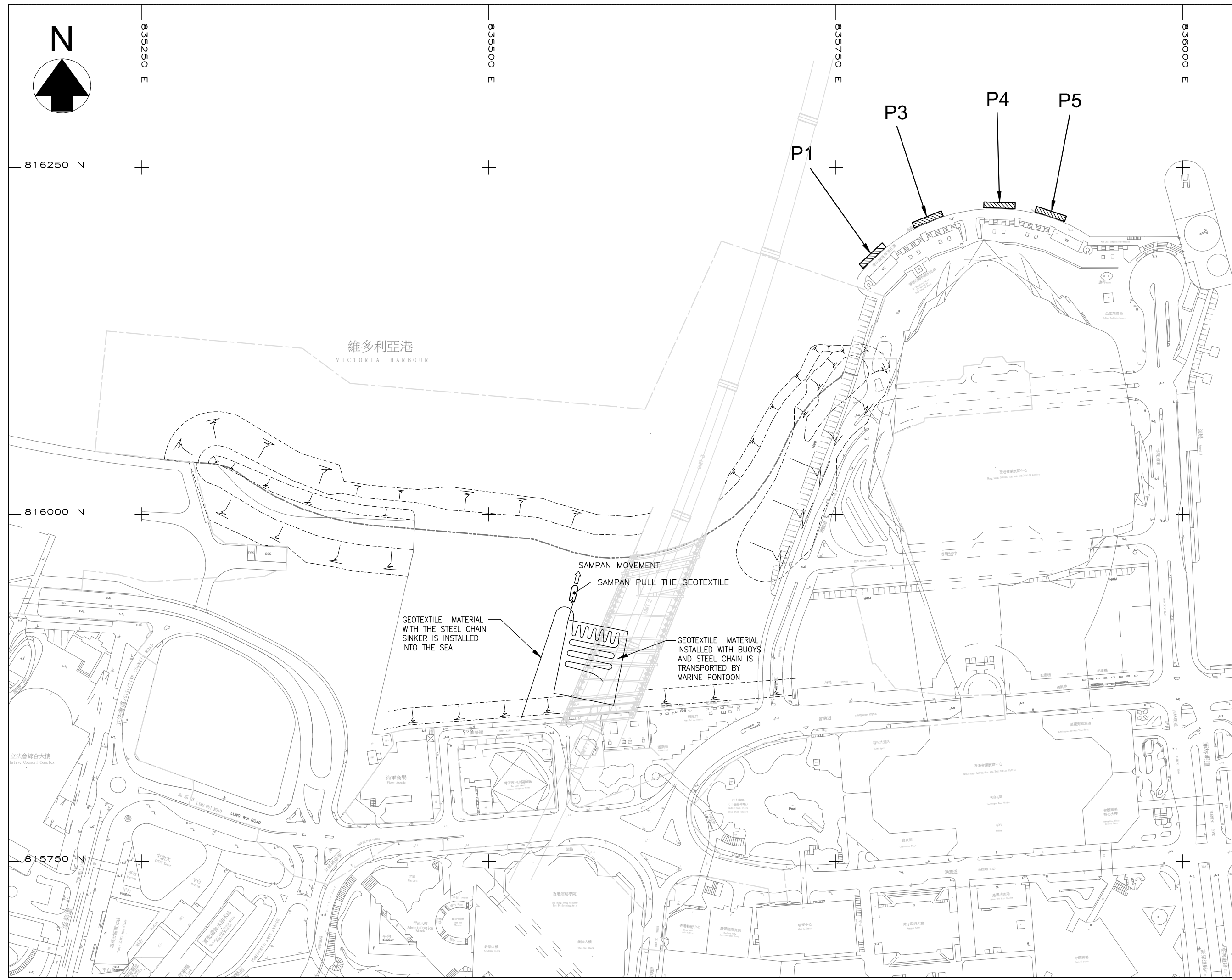


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- LEGEND :**
- SILT SCREEN
  - Relocated cooling water intakes:
  - P1 Hong Kong Convention and Exhibition Centre Phase I
  - P3 Hong Kong Academy for Performing Arts
  - P4 Shui On Centre
  - P5 Wan Chai Tower, Revenue Tower, Immigration Tower
  - SITE BOUNDARY
  - - - PROPOSED COPE LINE
  - - - SUB-ZONE
  - ↑ ↑ DREDGING & EXCAVATION SLOPE
  - - - ZONING-MARINE WORKS

維多利亞港  
VICTORIA HARBOUR

SAMPAN MOVEMENT  
SAMPAN PULL THE GEOTEXTILE

GEOTEXTILE MATERIAL WITH THE STEEL CHAIN SINKER IS INSTALLED INTO THE SEA

GEOTEXTILE MATERIAL INSTALLED WITH BUOYS AND STEEL CHAIN IS TRANSPORTED BY MARINE PONTOON

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CENTRAL – WAN CHAI BYPASS AT  
WAN CHAI WEST

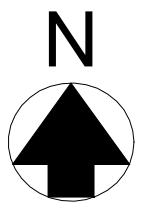
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TYPICAL ARRANGEMENT FOR  
INSTALLATION AND REMOVAL  
OF SILT CURTAIN (1 OF 4)

中國建築—利達聯營  
CHINA STATE-LEADER JOINT VENTURE

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LEGEND :

 SILT SCREEN


Relocated cooling water intakes:


P1 Hong Kong Convention and Exhibition Centre Phase I


P3 Hong Kong Academy for Performing Arts


P4 Shui On Centre

P5 Wan Chai Tower, Revenue Tower, Immigration Tower

 SITE BOUNDARY

 PROPOSED COPE LINE

 SUB-ZONE

 DREDGING & EXCAVATION SLOPE

 ZONING-MARINE WORKS

維多利亞港  
VICTORIA HARBOUR

CONCRETE SINKERS ARE INSTALLED IF NECESSARY AT LOCATION OF STRONG CURRENT AND TURNING POINTS

SAMPAN TO PULL OUT THE GEOTEXTILE

SILT CURTAIN IS MOUNTED

GEOTEXTILE MATERIAL WITH THE STEEL CHAIN SINKER IS INSTALLED INTO THE SEA

GEOTEXTILE MATERIAL INSTALLED WITH BUOYS AND STEEL CHAIN IS TRANSPORTED BY MARINE PONTOON

P3

P4

P5

P1

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WAN CHAI DEVELOPMENT PHASE II –  
CENTRAL – WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE  
TYPICAL ARRANGEMENT FOR  
INSTALLATION AND REMOVAL  
OF SILT CURTAIN (2 OF 4)

 中國建築—利達聯營  
CHINA STATE-LEADER JOINT VENTURE

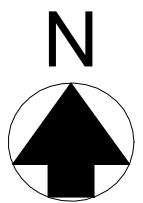
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LEGEND :

SILT SCREEN

Relocated cooling water intakes:

P1 Hong Kong Convention and Exhibition Centre Phase I

P3 Hong Kong Academy for Performing Arts

P4 Shui On Centre

P5 Wan Chai Tower, Revenue Tower, Immigration Tower

SITE BOUNDARY

PROPOSED COPE LINE

SUB-ZONE

DREDGING & EXCAVATION SLOPE

ZONING-MARINE WORKS

維多利亞港  
VICTORIA HARBOUR

PRIOR TO DECOMMISSION OF SILT CURTAIN OR CHANGING OF SILT CURTAIN TO ANOTHER STAGES, ALL WORKS AFFECTING THE WATER QUALITY SUCH AS DREDGING SHALL BE COMPLETED OR SUSPENDED

PONTOON MOVEMENT

SILT CURTAIN IS LIFTED UP TO THE PONTOON BY CRANE ON PONTOON

SAMPAN

P3

P4

P5

P1

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WAN CHAI DEVELOPMENT PHASE II -  
CENTRAL - WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE  
TYPICAL ARRANGEMENT FOR  
INSTALLATION AND REMOVAL  
OF SILT CURTAIN (3 OF 4)

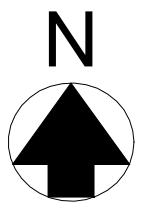
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LEGEND :

 SILT SCREEN


Relocated cooling water intakes:


P1 Hong Kong Convention and Exhibition Centre Phase I


P3 Hong Kong Academy for Performing Arts


P4 Shui On Centre

P5 Wan Chai Tower, Revenue Tower, Immigration Tower

 SITE BOUNDARY

 PROPOSED COPE LINE

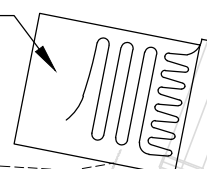
 SUB-ZONE

 DREDGING & EXCAVATION SLOPE

 ZONING-MARINE WORKS

維多利亞港  
VICTORIA HARBOUR

SILT CURTAIN IS LIFTED UP TO THE PONTOON BY CRANE ON PONTOON



PONTOON MOVEMENT

NO DREDGING WORK AFTER DECOMMISSIONING OF SILT CURTAIN

P3 P4 P5

P1

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CENTRAL - WAN CHAI BYPASS AT  
WAN CHAI WEST

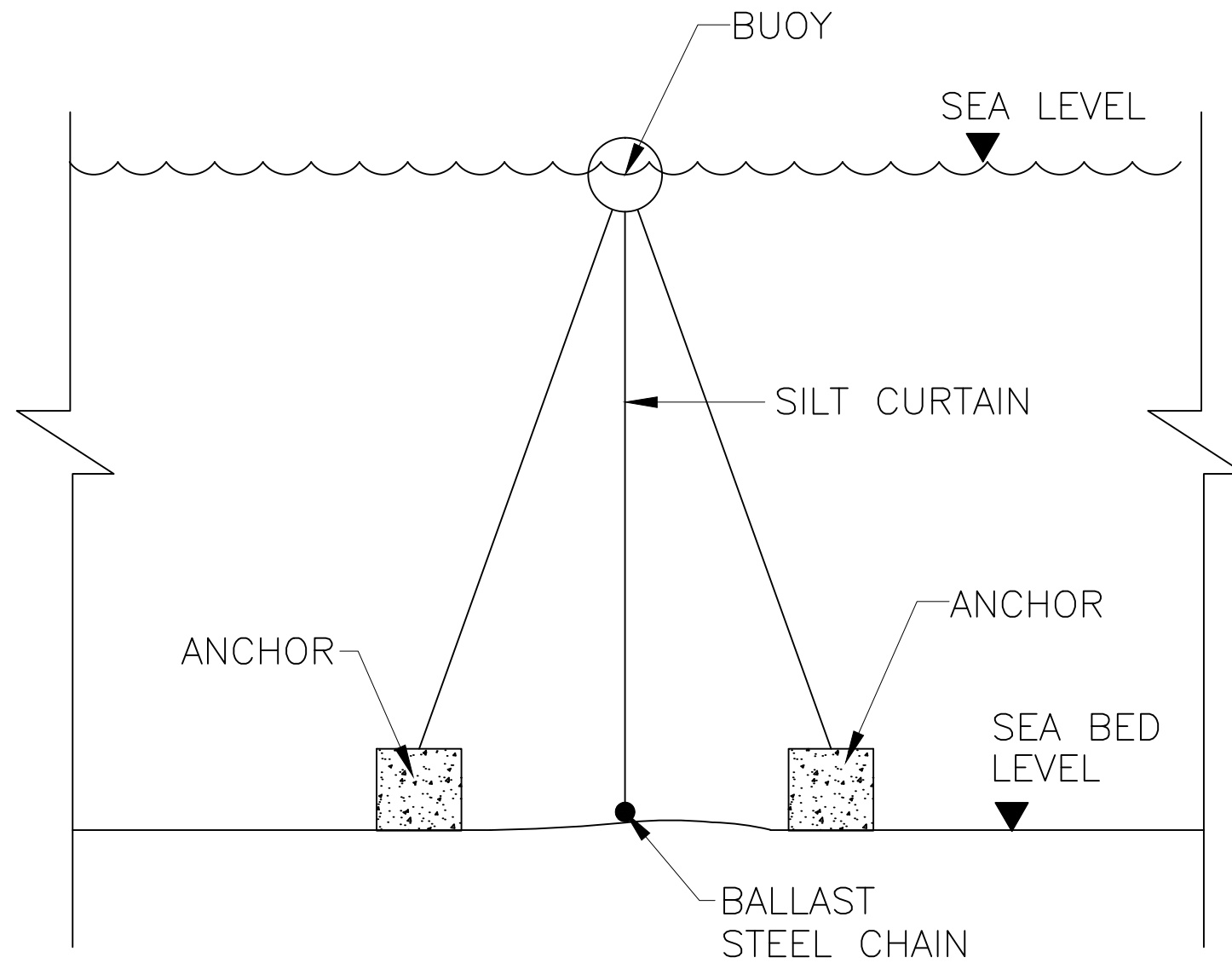
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TYPICAL ARRANGEMENT FOR  
INSTALLATION AND REMOVAL  
OF SILT CURTAIN (4 OF 4)

 中國建築-利達聯營  
CHINA STATE-LEADER JOINT VENTURE

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TYPICAL DETAILS FOR SILT CURTAIN  
DEPLOYMENT

CONTRACT NO. HK/2012/08  
WAN CHAI DEVELOPMENT PHASE II –  
CENTRAL – WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE

DETAILS OF SILT CURTAIN  
(GENERAL TYPE)

中國建築－利達聯營  
CHINA STATE - LEADER JOINT VENTURE

DRG. NO.

HK\_2012\_08/CDB/SK/00034

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## Appendix II

### Material Catalogue of Silt Curtain

## SG 110/110

Woven polypropylene geotextile made of slit film tapes

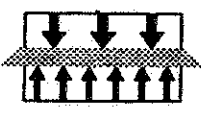
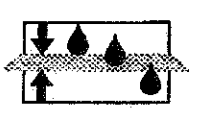
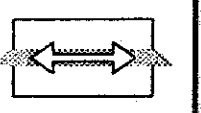
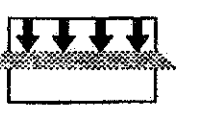

Technical data sheet according to internal specifications Bonar TF: version 06 dd. 05/01/10

Accompanying documents CE marking: version 04 dd. 05/01/10






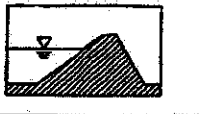






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10

				
separation	filtration	reinforcement	protection	drainage

	test method	value	tolerance
<b>Mechanical properties</b>			
Tensile strength MD	EN ISO 10319	110,0 kN/m	-9,9 kN/m
Tensile strength CD		110,0 kN/m	-9,9 kN/m
Elongation MD	EN ISO 10319	12,0 %	+/-2,8 %
Elongation CD		8,0 %	+/-1,8 %
Static puncture resistance – CBR	EN ISO 12236	12,50 kN	-2,50 kN
Dynamic perforation resistance – cone drop	EN ISO 13433	10,0 mm	+2,0 mm
<b>Hydraulic properties</b>			
Water permeability normal to the plane	EN ISO 11058	25x10 <sup>-3</sup> m/s	-8x10 <sup>-3</sup> m/s
Water flow normal to the plane (*)		25 l/m <sup>2</sup> .s	-8 l/m <sup>2</sup> .s
Characteristic opening size (AOS)	EN ISO 12956	230,0 µm	+/-69,0 µm
<b>Physical properties</b>			
Thickness under 2 kPa (*)	EN ISO 9863-1	1,53 mm	+/-0,31 mm
Weight (*)	EN ISO 9864	464,0 g/m <sup>2</sup>	+/-46,4 g/m <sup>2</sup>
Composition	100 % polypropylene woven geotextile		
Durability	predicted to be durable for a minimum of 25 years in natural soil with 4 < pH < 9 and soil temperatures < 25° C		

				
roads	railways	foundations & retaining walls	drainage systems	erosion control systems
EN 13249:2000	EN 13250:2000	EN 13251:2000	EN 13252:2000	EN 13253:2000
				
reservoirs & dams	canals	Tunnels & underground structures	solid waste	liquid waste
EN 13254:2000	EN 13255:2000	EN 13256:2000	EN 13257:2000	EN 13265:2000

1. This geotextile is intended for use in both functions & applications highlighted with a bold border.
2. It is the responsibility of all users to satisfy themselves that the above data is current.
3. Roll dimensions are 5,25 m x 100 m. Other dimensions on demand.
4. Bonar Technical Fabrics reserves the right to alter product specifications without prior notice.
5. Although not guaranteed, these results do to the best of our knowledge offer a true and accurate record of the product's performance.
6. Bonar Technical Fabrics cannot accept responsibility for the performance of these products as the conditions of use are beyond our control.
7. Geotextile has to be covered within 2 weeks after installation

(\*) Not mandated characteristics for CE marking.



## **G AND E COMPANY LIMITED**

Room B, 13/F Cheung Lee Industrial Bldg.  
9 Cheung Lee Street  
Chai Wan, Hong Kong  
Tel: 2508 0058

Fax: 2570 0089

website: [www.g-and-e.com](http://www.g-and-e.com)

July 9, 2010

### **OFFICIAL ANNOUNCEMENT**

I would like to inform you that geotextile Bontec SG100/100 is upgraded to SG110/110 effective immediately, and that SG100/100 has become obsolete. The performance of SG110/110 is superior to that of SG100/100.

No adjustment and adaptation are necessary to the current application, installation method, packaging and quality control assurance program with the improved properties of SG110/110.

Bonar Technical Fabrics is Europe's premier manufacturer of woven and non-woven geotextile products, with continuous commitment to quality, product development and production improvement. One of Bonar's many advantages is that they are vertically integrated. This means they have their own fiber production which helps ensure consistent product performance. Bonar also has a high production capacity with the facility located in close proximity to the Antwerp port. These translate into more efficient supply.

I have attached the manufacturer's letter here about the change for your reference. We would be happy to answer any questions that you may have.

Thank you for your kind attention.

Best regards

*Gary Ng*

Gary Ng  
General Manager

# bontec

a bonar technical fabrics product

---

<b>Date: 5-Jul-10</b>	
<b>To: G and E – Hong Kong Gary</b>	<b>From: Isabelle Ruyffelaere – 0032 52 457 487 Philippe Grimmelpez – 0032 52 457 486</b>
<b>E mail: nannette@g-and-e.com</b>	<b>Pages: 1 +</b>
<b>Your reference: Bontec® SG 110/110</b>	
<b>Our reference: G&amp;E07052010.doc</b>	

---

Dear Gary,

We are pleased to confirm that the old name of the Bontec® SG100/100 has been replaced with the Bontec® SG 110/110.

Bonar constantly strives to increase the performance of the products over time. Thanks to improved polymers, extrusion and weaving techniques we managed to produce stronger geotextiles with the same unit weight. Hydraulic characteristics were not affected either.

Bonar uses very strict -in house- and ISO 9001:2000 quality and ISO 14001 environmental standards (in annex) and is using electricity generated from 100 % renewable sources.

We send hereby the newest datasheet as well for your information.

Should you require any further information, please do not hesitate to contact us.  
Best regards

Philippe Grimmelpez  
Global Sales & Marketing Manager



BONAR Technical Fabrics nv/sa  
Industriestraat 39 • B-9240 Zete • Belgium  
Tel: +32 (0)52 457 411 • Fax: +32 (0)52 457 495  
E-mail: geotextiles@bonar.com

BONAR Yarns & Fabrics Ltd  
Mt. Saleader Street • Dundee DD2 7FU • United Kingdom  
Tel: +44 (0)1382 346102 • Fax: +44 (0)1382 202376  
E-mail: sales@bonaryarns.com





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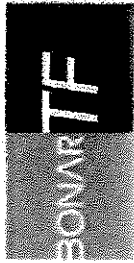
**Bontec SG110/110**  
**Woven Polypropylene Geotextile**

**Certification**

# QUALITY MANAGEMENT SYSTEM CERTIFICATE

## ISO 9001 : 2000

*The BQA, sa hereby declares that the quality management system of  
Bonar Technical Fabrics NV – Site in Zele en Lokeren*



*located at Industriestraat 39 - 9240 Zele - Belgium, has been examined on 05-05-2008  
and found in conformity with the ISO 9001, edition 2000, standard for the following application field:*

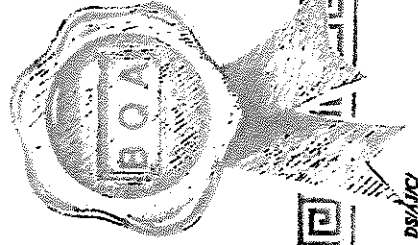
***Development, manufacture and sales of a standard range of fibres and textiles such as agrotexiles, building textiles and geosynthetics, as well as similar products especially designed to customer specifications***

*This certificate has been issued by the BQA, sa according to its quality manual concerning the certification of quality systems, and after concluding the contract of certification N° DS/AJ/CER/ 05-05-2008/301, under which the company accepts a regular control of its quality management system.*

Certificate N° BQA\_QMS019\_C\_2004301  
Valid until 04-05-2011



BQA N° 019-QMS



*D. SIMOENS  
Directeur*

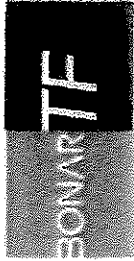
*Any person aware of infirmity of this certificate may inform himself to the BQA, sa. This certificate may only be disclosed in its entirety.  
BQA, sa - rue Montoyer 24 (09) - 1000 Brussels.*

DS/AJC

# CERTIFICATE OF ENVIRONMENTAL MANAGEMENT SYSTEM

## ISO 14001 : 2004

The BQA, nv hereby declares that the environmental management system of the company  
Bonar Technical Fabrics NV - Site in Zele en Lokeren



located at Industriestraat 39 - 9240 Zele - Belgium, has been examined on 05-05-2008  
and found in conformity with the ISO 14001, edition 2004, standard for the following application field:

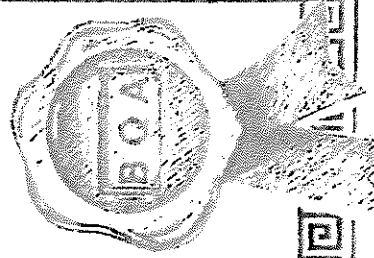
**Development, manufacture and sales of a standard range of fibres and textiles such as agrotexiles, building  
textiles and geosynthetics, as well as similar products especially designed to customer specifications.**

This certificate has been issued by BQA, nv according to its quality manual EMS concerning the certification of environmental  
management systems, and after the contract of certification N° DSAJ/CER-EMS/05-05-2008/84  
under which the company accepts a regular control of its environmental management system.

Certificate N° BQA\_EMS019\_C\_200484  
Valid until 04-05-2011



BQA N° 019-EMS



D. SIMOENS  
Directeur

Any person owning or holding this certificate may address himself to the BQA, nv. This certificate may only be disclosed in its entirety.

BQA, nv - rue Montoyer 24 (08) - 1000 Brussels

DSAJ/CERT/07-2004

# bontec

a bonar technical fabrics product

woven and non woven geotextiles

Zek,05.10.09

## CERTIFICATION OF CONFORMANCE

The undersigned supplier BONAR TECHNICAL FABRICS, hereby states under his responsibility that the following product complies with the indicated technical properties :

Invoice F0918342

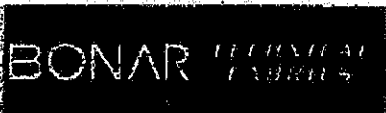
Type	NW 9 525 : 10500 m <sup>2</sup>
Type	NW 10 525 : 18375 m <sup>2</sup>
Type	NW 20 5250 : 10500 m <sup>2</sup>
Type	SG 100/100 : 5250 m <sup>2</sup>
Delivery docs :	Packing list N. T0908524 and T0908557

Manufacturer : Bonar Technical Fabrics N.V.

BONAR TECHNICAL FABRICS N.V.



**BONAR TECHNICAL FABRICS N.V.**  
p/a Industriestraat 39  
B-9240 Zek



*invisible good*

BONAR TECHNICAL FABRICS nv/sa  
Industriestraat 39 • B-9240 Zek • Belgium  
Tel +32 (0) 52 457 493 • Fax +32 (0) 52 457 495  
E-mail geotextiles@bonarfi.com

BONAR Yarns & Fabrics Ltd  
St. Salvador Street • Dundee DD3 7EU • United Kingdom  
Tel +44 (0) 1382 346402 • Fax +44 (0) 1382 202378  
E-mail geotextiles@bonaryarns.com



# bontec

A Bonar technical fabrics product.

## Fax

<b>Date:</b> 11-Aug-04	
<b>To:</b> G and E - Hong Kong Mr. Gary NG	<b>From:</b> Isabelle Ruyffelaere - 0032 52 457 457 Philippe Grimmelpré - 0032 52 457 486
<b>Fax:</b>	<b>Pages:</b> 1 +
<b>Your reference:</b> Bonar TF acquisition of Uco Technical Fabrics	
<b>Our reference:</b>	G&E11082004.fax

### To Whom it may concern

We hereby confirm that Bonar acquired the company UCO Technical Fabrics in October 1996 and all activities of the manufacturing and sales of Woven and Non woven geotextiles.

The Company changed name to **BONAR TECHNICAL FABRICS**.

Its headquarters are moved to Industriestraat 39, 9240 Zele, Belgium. At the same location is a new manufacturing plant of non woven geotextiles based.

The plant where woven geotextiles are produced is based on the old UCO location: weverslaan 15, Lokeren, Belgium.

Should you require any further information, please do not hesitate to contact us.

Best regards



Philippe Grimmelpré  
Sales & Marketing Manager geotextiles.



**BONAR Technical Fabrics nv/sa**  
Industriestraat 39 • 9240 Zele • Belgium  
Tel: +32 (0)52 457 471 • Fax: +32 (0)52 457 495  
E-mail: geotextiles@bonar.com

**BONAR Yarns & Fabrics Ltd.**  
St. Lawrence Street • Dunfermline DD1 7EL • United Kingdom  
Tel: +44 (0)1382 749100 • Fax: +44 (0)1382 261078  
E-mail: yarns@bonaryarns.com



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**Bontec SG110/110**  
**Woven Polypropylene Geotextile**

**Installation Guideline**

**BONTEC:** Woven and Non Woven Geotextiles manufactured by Bonar Technical Fabrics - Belgium.



### **RECOMMENDATION FOR THE INSTALLATION OF GEOTEXTILES**

- The **BONTEC** geotextiles shall be kept in its original packaging in order to protect it from damaging UV-rays and high temperatures.
- The **BONTEC** geotextiles shall be stored protected from wind, rain, excess moisture or sunlight.
- The **BONTEC** geotextiles shall only be unpacked just before use. The material shall be covered within 1 week
- The **BONTEC** geotextiles shall be labelled and show the following data :
  - roll number
  - quality
  - name of the manufacturer
  - roll length & width
  - roll weight
- The **BONTEC** geotextiles shall be laid with the longitudinal ascis down slopes
- A minimum overlap of 500 mm between the different sheets shall be respected. Sewing of the different fabrics shall be done with a double prayer stitching technique with non deteriorating thread.
- Wherever visibility or installation of the **BONTEC** geotextile is poor an extra safety overlap of +/- 1 m shall be respected
- The surfaces to be covered with **BONTEC** geotextiles shall be smooth and free of sticks, roots, sharp objects, and all debris that may damage the fabric. The surface to be covered shall be firm and unyielding, with no sudden changes or brakes in grade.
- The compacted sub-base shall be maintained in a smooth, uniform and compacted condition during installation of the fabric.
- In area's where wind is prevalent, fabric installation shall be started at the upwind side of the project and proceed downwind. The leading edge of the fabric shall be secured at all times with sandbags or other means sufficient to hold it down during high winds. Sandbags or rubber tires may be used as required to hold the fabric in position during installation. Tires shall not have exposed steel cords or other sharp edges which may snag or cut the fabric. Materials, equipment or other items shall not be dragged across the fabric or be allowed to slide down slopes on the fabric.
- Should the fabric be damaged during any step of the installation, the damaged section shall be repaired by covering it with a piece of fabric which extends at least 0,6 meter in all directions beyond the damaged area. The fabric shall be secured as directed by the engineer.
- Smoking shall not be permitted by personnel working on the fabric.

P.geodiversen/installationgeot.doc



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**Bontec SG110/110**  
**Woven Polypropylene Geotextile**

**List of Project Reference**



## Bonar

Date	Project	Client	Consultant	Style
Feb-05	CV/2003/06 Stanley Waterfront Improvement Project - Construction Pier and Boardwalk	Sun Fook Kong (Civil) Ltd	Civil Engineering and Development Department	SG100/100 NW10
Feb-05	99/9028 Lamma Power Station	Wai Kee (Zens) Construction & Transportation Co Ltd	Maunsell Geotechnical Services Ltd	SG100/100
Feb-05	CV/2004/02 Reconst. of Wong Shek & Ko Lau Wan Public Piers	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	SG100/100
Apr-05	CV/2002/04 Penny's Bay Reclamation Stage 2	Gammon Skanska Ltd Shun Tat Construction Engineering Ltd	Scott Wilson Ltd	SG100/100 SG100/100
Apr-05	HK/12/02 CED, Central Reclamation Phase III, Engineering Works	Best Leader Engineering Ltd Leighton - China State - Van Oord Joint Venture	Atkins China Ltd	SG100/100 SG100/100
May-05	03/8013 Lamma Island to Cyberport	Leader Marine Contractors Ltd Honwin Engineering Ltd	Maunsell Geotechnical Services Ltd	SG100/100 SG100/100
Jul-05	Shenzhen to Tai Po Twin Submarine Gas Pipeline Project	Honwin Engineering Ltd		SG100/100
Sep-05	TP37/03 Remaining Engineering Infrastructure Works for Pak Shek Kok Development Package 2A	Leader - Wai Kee (C&T) Joint Venture	Hyder Consulting Ltd	SG100/100
Nov-05	HY/2002/26 Stone Cutter's Bridge	Hong Kong River Engineering Co Ltd	Ove Arup & Partners HK Ltd	SG100/100
Feb-06	CV/2005/12 Fill Reception Facilities at Tseung Kwan O Area 137 Quarry Bay and Mui Wo	Penta-Ocean Construction Co Ltd	Civil Engineering and Development Department	SG100/100
Mar-06	Maintenance Dredging at Castle Peak Power Station (CPPS) Jetty	New Concepts Engineering Development Ltd	Civil Engineering and Development Department	SG100/100
Mar-06	CV/2004/04 Maintenance and Repairs to Government / Public Piers and Immersed Tubes of Hung Hom Cross-Harbor Tunnel	China Harbour Engineering Co (Group)	Civil Engineering and Development Department	SG100/100
Mar-06	HY/2005/06 Castle Peak Road Improvement West of Tsing Lung Tau	Shun Tat Construction Engineering Limited Chun Wo Construction & Engineering Co Ltd	Mouchel Halcrow JV	SG100/100 SG100/100

May-06	212 Main Works for the Proposed Third Golf Course Development at Kau Sai Chau, Sai Kung	China Harbour Engineering Co (Group)	Ove Arup & Partners HK Ltd	SG100/100
Jun-06	Hong Kong Convention and Exhibition Centre Project - Silt Screening for Intake Pipe	Wai Kee (Zens) Construction & Transportation Co Ltd Kaden - Wai Kee (C&T) Joint Venture	NA	SG100/100 SG100/100
Aug-06	EP/SP/52/06 Development of EcoPark in Tuen Mun Area 38	Kaden Construction Limited	Scott Wilson Ltd	SG100/100
Sep-06	CV/2004/06 Management and Capping of Contaminated Mud Pit IV at East of Sha Chau - Phase III	Kaden - Wai Kee (C&T) Joint Venture	Civil Engineering and Development Department	SG100/100
Oct-06	Lamma Island Cable Landing	United Marine Co Ltd	Hong Kong Electric Co Ltd	SG100/100
Nov-06	CV/2004/01 Maintenance and Repairs to Seawalls, Piers and Other Port Works	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	SG100/100
Dec-06	Private project	Friendly Benefit Engineering Ltd		SG100/100
Feb-07	Prebored Socketted H-Piles at Hong Kong Convention & Exhibition Centre	Yee Hop Engineering Co Ltd	NA	SG100/100
May-07	HY/2005/06 Castle Peak Road Improvement - West of Tsing Lung Tau	Chun Wo Construction & Engineering Co Ltd	Mouchel Halcrow JV	SG100/100
May-07	CV/2004/05 Dredging Maintenance	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG100/100
Aug-07	Dredging Project in Lai Chi Kok Shipyard	Maritime Mechanic Ltd	NA	SG100/100
Aug-07	6/WSD/06 Construction of Salt Water Supply System for Penny's Bay	Univic Engineering Ltd	Water Supplies Department	SG100/100
Nov-07	Permanent Aviation Fuel Facility Hong Kong International Airport (Contract No. H2104)	UDL Dredging Ltd	Babtie Asia Ltd	SG100/100
Dec-07	Seawall Modify, Tuen Mun Area 38	Cheer Engineering Ltd	Scott Wilson Ltd	SG100/100
May-08	DC/2007/10 Design and Construction of HK West Drainage Tunnel	Tapbo Civil Engineering Co Ltd	Ove Arup & Partners HK Ltd	SG100/100
Sep-08	CV/2006/05 Maintenance of Seawalls and Navigation Channels	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG100/100

Sep-08	Marine Works at Maldives	Kwan Sing Engineering & Construction Co Ltd		SG100/100
Nov-08	DC/2007/06 River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River	Kwan Lee Construction Co Ltd	Maunsell Consultants Asia Ltd	SG100/100
Mar-09	DC/2007/01 Drainage Improvement Works in Ki Lun Tsuen, Kwu Tung, Ma Tso Lung and Sha Ling	Shanghai Urban Construction Group Corp	Mott Connell Ltd	SG100/100 SG40/40
Jun-09	CHEC247 Lamma Power Station - Navigation Channel Improvement	China Harbour Engineering Co Ltd		SG100/100

Updated November 26, 2009



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**Bontec SG110/110**  
**Woven Polypropylene Geotextile**

**Photo References**



**G AND E COMPANY LIMITED**  
Room B, 13/F Cheung Lee Industrial Building  
9 Cheung Lee Street,  
Chai Wan, Hong Kong  
Tel: 852-2508 0058 Fax: 852-2570 0089  
website: [www.g-and-e.com](http://www.g-and-e.com)



<b>Date</b>	Feb-10
<b>Project</b>	Contract No. HY/2009/11 Central - Wanchai Bypass - North Point Reclamation
<b>Client</b>	Highways Department
<b>Consultant</b>	AECOM
<b>Main Contractor</b>	China Harbour Engineering Company
<b>Works</b>	Silt Curtain
<b>Materials</b>	Woven Geotextile SG100/100
<b>Size</b>	3,675 sqm



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**Bontec SG110/110  
Woven Polypropylene Geotextile**

**Approval Letters**

土木工程拓展署  
**CEDD Civil Engineering and Development Department**

RECEIVED  
 27 JAN 2005

土木工程處  
 Civil Engineering Office

Web site 網址 : http://www.cedd.gov.hk  
 E-mail 電子郵件 :  
 Telephone 電話 : (852) 2760 5737  
 Facsimile 傳真 : (852) 2714 2054  
 Our reference 本署檔號 : ( ) in PW WC/CV/0402/R20/340 PL1  
 Your reference 來函編號 : KS330/2005

香港九龍公主道101號  
 土木工程拓展署大樓四樓  
 4/F, Civil Engineering and Development Building,  
 101 Princess Margaret Road,  
 Kowloon, Hong Kong

Kin Shing Construction Company Limited  
 1/F,  
 27 Yin Chong Street,  
 Mong Kok  
 Kowloon  
 (Attn.: Mr. Patrick P K Chan - Site Agent)

24 January 2005

**BY MAIL & FAX No. 2780 2085**

Dear Sirs,

Contract No. CV/2004/02  
Reconstruction of Wong Shek and Ko Lau Wan Public Fiers

Material Submission - Geotextile for Silt Curtain


I refer to your letter of 14.1.2005 enclosing the particulars of the geotextile for fabrication of silt curtain.

In accordance with PS Clause 26.08(2), the proposed "SG 100/100" woven geotextile manufactured by Bonar Technical Fabrics is approved to be used under the captioned Contract.

Pursuant to PS Clause 26.08(1), you are required to submit details of the silt curtains 3 weeks before their deployment.

Contract No.	Item	Quantity	Copy	Remarks
CV/2004/02	CM	1		
	DM	1		
	EM	1		
	FM	1		
	GM	1		
	HM	1		
	IM	1		
	JM	1		
	KM	1		
	LM	1		
	MM	1		
	Material	1		
Stamp	1			

Yours faithfully,



(W. H. LEE)

Engineer's Representative  
 Port Works Division  
 Civil Engineering and Development Department

c.c.  
 S10W/P2B - Site Copy

etc

土木工程拓展署  
**CEDD Civil Engineering and  
 Development Department**

Web site 網址 : <http://www.cedd.gov.hk>  
 E-mail 電子郵件 :  
 Telephone 電話 : (852) 2762 5055  
 Facsimile 傳真 : (852) 2714 2054  
 Our reference 本署編號 : (15) in PW WC/CV0306/R20046 P.01  
 Your reference 來函編號 : CV0306/1.2/1W/SY/CC/mc(S0067),  
 CV-000001/1.2/1W/SY/CC/mc(S0118)

土木工程處  
 Civil Engineering Office

112

香港九龍公主道 101 號  
 土木工程拓展署大樓 4 樓  
 4/F, Civil Engineering and  
 Development Building,  
 101 Princess Margaret Road,  
 Kowloon, Hong Kong

18 February 2005

Sun Fook Kong (Civil) Limited  
 Rms. 3207-10,  
 Great Eagle Centre,  
 23 Harbour Road,  
 Wan Chai,  
 Hong Kong  
 (Attn: Mr. Howard KONG - Fax No.2827 6275)

Dear Sirs,

Contract No. CV/2003/06  
Stanley Waterfront Improvement Project -  
Construction of Pier and Boardwalk

Fabric for Silt Curtain

I refer to your above letters dated 21.1.2005 and 15.2.2005 proposing the SG100/100 fabric supplied by "Bonar Technical Fabrics" for silt curtain.

I have no objection to your proposed material for silt curtain.

Yours faithfully,

*Paul Y K Ma*  
 (Paul Y K MA)

Engineer's Representative  
 Port Works Division  
 Civil Engineering and Development Department

c.c.  
 Site Office (Attn: SIOW/PIA)  
 CEG/PIA

File PW WC/CV0306/M10/00

YK044/m

Post-Net Fax Note	7671	Date	24/2/05
To	MR. STANLEY WAN	From	CHANG SZE-TAO
On/By	GSE	On	SFK
Phone #	2508 0028	Phone #	6841 702
Fax #	2570 0089	Fax #	



# Mott MacDonald Hong Kong Limited

Consulting Engineers

Chief Resident Engineer's Office  
North Lantau Development - Tung Chung  
for Territories Development Department

Our Ref : S287/NL1/25.7/283/JY

30 June 1992

China Harbour Engineering Company  
19/F, China Harbour Building  
370-374 King's Road  
North Point  
Hong Kong.

Attn : Mr. S. Y. Yu

T.D.D. CONTRACT NO. NL 1/91		
C. E. Dept.		
DATE	ADVIS	INFORM
SA		11/2
DBA		
GE		
BMS		
SUR		
FOREMAN		
FILE		11/2

Dear Sirs,

North Lantau Development  
Contract No. NL1/91  
Tung Chung Development Phase I - Site Formation  
Materials for Subsoil Drains

I refer to your letter ref. NL1/C/0097/008/MM/145 of 10/6/92 submitting materials for subsoil drains for our approval.

I have the following comments :

- 1) The proposed subsoil drain material - i.e. 300mm diameter ADS corrugated polyethylene subsoil drain pipes from Benpak Waterwise company is acceptable.
- 2) The proposed Geotextile SG17/15 from UCO (2 layers) as protection for subsoil drainage is acceptable in principal. Please submit further technical specification such as lapping and site storage requirements recommended by the manufacturer.
- 3) The proposed Greenfix Eromat Special type 5 from CCL is still under review. You will be notified of the outcome if a decision is made.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED

Luke Chi  
Engineer's Representative

LC/TY/ak

Handwritten notes: 11/2, 2/17, 11/2, 3/16

**Maunsell Consultants Asia Ltd**  
 8/F Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road Shatin, N.T., Hong Kong  
 茂盛(亞洲)工程顧問有限公司  
 香港新界沙田鄉事會路 138 號新城市中央廣場第 2 座 8 樓  
 T +852 2605 8262 F +852 2691 2642 www.maunsell.aecm.com  
 SRE's Office T +852 2669 0708 F +852 2631 2889 E sre@triv.com.hk

Your Ref. : DC0706/M1.2/1512 & 1529  
 Our Ref. : (DC/2007/06)/R20/106(0023)

**RECEIVED**  
 13 NOV 2008

Chiu Hing Construction & Transportation Co. Ltd.  
 Room 201, 2/F Fuk Shing Commercial Building  
 28 On Lok Mun Street  
 On Lok Tsuen, Fanling  
 New Territories, Hong Kong

BY: .....

Attn: Mr. Roger Lau (Site Agent)

13 November 2008

Dear Sir,

**Contract No. DC/2007/06**  
**River Improvement Works in Upper Lam Tsuen River,**  
**She Shan River and Upper Tai Po River**

**Proposed Geotextile at Gabion Wall in She Shan River and Upper Tai Po River**

I refer to your letter dated 7 November 2008 and 12 November 2008 respectively.

Please be advised that since the water flow rate of the proposed geotextile model Bontec SG100/100 meets the requirements in accordance with P.S. Clause 7.150, I have no further objections to your proposed use of woven geotextile model Bontec SG100/100, supplied by "G and E Company Ltd." at gabion wall in She Shan River and Tai Po River, subject to its satisfactory performance on site.

Yours faithfully,

  
 Adrian Ng  
 Resident Engineer

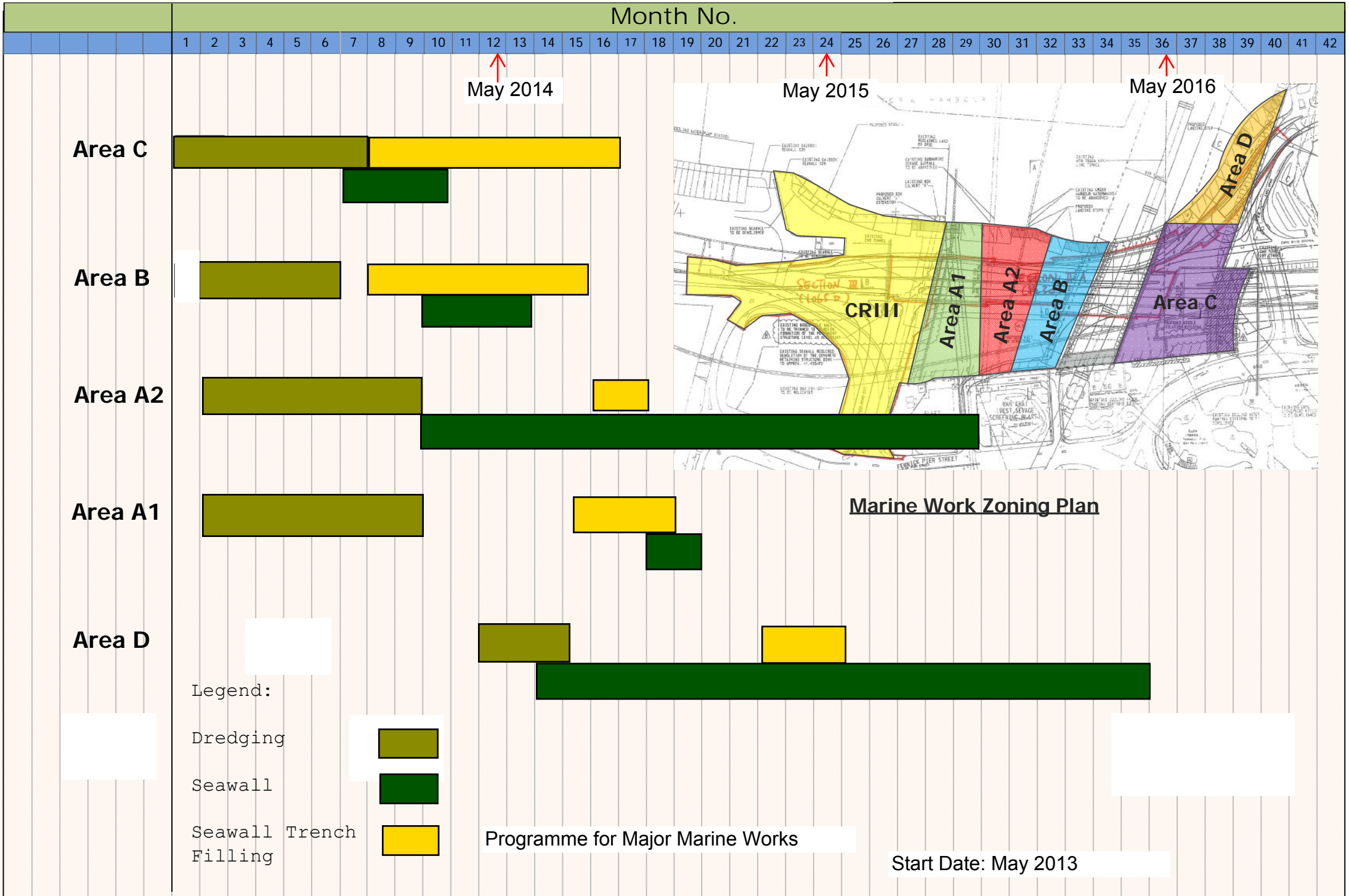
cc MCAL - Attn : Mr. Conder Yan  
 Chiu Hing H.O.

AN/CRok



## Appendix III

### Programme for Major Marine Works



## Appendix IV

### Silt Curtain Daily Inspection Checklist



## 隔泥幕每日檢查表 Silt Curtain Daily Inspection Checklist

隔泥幕名稱： \_\_\_\_\_

地點： \_\_\_\_\_

檢查日期及時間： \_\_\_\_\_

項目	描述	情況		需要立即採取行動?*		預計修補日期	備註
		是	否	要	不要		
1.	No any floating debris / refuse within silt curtain? 隔泥幕內沒有任何垃圾?						
2.	Buoys in good condition? 浮泡情況良好?						
3.	Tying rope in good condition? 繫上的繩索情況良好?						
4.	Geotextile intact and in good condition? 土工布完整無缺?						
5.	Sinkers in good condition? 下墜物情況良好?						
6.	No any obstruction to water flow between geotextile? 土工布之間沒有任何阻礙水的流動?						
7.	Silt curtain frame in good condition? 隔泥幕鐵架狀況良好?						

檢查人： \_\_\_\_\_

中國建築 – 利達

\*Note: For silt curtain with defects which need to be rectified immediately, related marine work has to be stopped until rectification work completed to the satisfaction of the Engineer.

\* 指引：對於已損壞的隔泥幕，需要立刻給予修補，而相關的海事工作必須停止，直到工程師認可修補工作完成。

## Appendix V

### Site Photos





Site towards the West on 19 Dec 2015



Site towards the East on 19 Dec 2015