俊和 - 利達聯營
CHUN WO - LEADER JOINT VENTURE

Contract No. HK/2009/01

Wan Chai Development Phase II – Central -Wan Chai Bypass at Hong Kong Convention and Exhibition Centre

Silt Curtain Deployment Plan

Revision	Date of Issue	Remarks	Author	Approved
0	24 Feb 10	Initial issue	DW	WTII
1	30 Mar 10	Incorporating comments from Engineer, ET & IEC	DW	WTII
2	11 May 12	Updated Appendix F & G	AM	PY
3	30 May 12	Revised Section 1.1	AM	PY
4	4 Jul 12	Revised Section 3.2	AM	PY
5	6 Aug 12	Appendix F	AM	PY

Table of Content

1. GENERAL

1.1 Introduction

Prior to the commencement of any dredging and backfilling works under Contract No. HK/2009/01, Chun Wo – Leader Joint Venture (CWLJV) will be responsible for the installation, operation and maintenance of the silt curtain against water impact during the works. The silt curtain act as a double measure to the silt screens installed to protect the existing seawater intakes in the vicinity of the marine works. CWLJV will also be responsible to remove the aforementioned silt curtain after the completion of the works.

This deployment plan describes in details the design, method of installation, operation and maintenance of the proposed silt curtain.

1.2 Reference Specification and Drawings

a) General Specification Section 21 & 25
b) Particular Specification Section 21 & 25

1.3 Construction Plants

The following plants shall be deployed:

i) Derrick Barge	1 no.
ii) Grab Dredger	1 no.
iii) Motor Sampan	1 no.

Adequate resources shall be employed to suit the construction programme.

1.4 Safety

The works shall be carried out in accordance with the Project Safety Plan and shall comply with the requirements of the Marine Department and Labour Department. Specific risk assessment shall be prepared and submitted separately.

2. Construction Programme

2.1 Major marine works in this project which involves the installation of silt curtain consist of:

i) Trail bored pile for MTR Tsuen Wan Line Protection works

ii) Dredging and backfilling for the reprovision of 2 X 1000mm dia. Cross Harbour Water Mains from Wan Chai North (north of HKCEC) to Tsim Sha Tsui (near Avenue of Stars)

iii) Reclamation of water channel at Hong Kong Convention and Exhibition (HKCEC), which includes dredging and backfilling

iv) Dredging and placing of rockfill for the construction of blockwork seawall, caisson seawall, precast box culvert and outfall at east side of HKCEC

2.2 A brief programme showing the tentative commencement and completion dates of the above activities are enclosed in Appendix A.

3. Silt Curtain Design

3.1 General type slit curtain consists of a layer of geotextile tied on 300mm diameter buoys and extended to the seabed level secured by steel chain ballast. The buoys will be further positioned by nylon ropes tied on nearby existing structures. Sufficient length of geotextile shall be allowed such that the silt curtain can be extended from the water surface to the seabed during high tide condition. The layout and general arrangement of silt curtain is enclosed in Appendix B.

3.2 For dredging works where the operation is localized in the vicinity of the grab dredger or derrick barge, floating frame silt curtain of size approximately 15 m long X 12 m wide, with a layer of geotextile extended from the surface to the seabed, will be placed to enclose the grad dredging zone. For rock placing works where the operation is localized in the vicinity of the derrick barge, floating frame silt curtain of size approximately 5m long single layer, will be placed to enclose the filling zone. Water spraying will be carried out to rock fill materials before grabbing and placing into sea to wash out fine particles which maybe present around the rocks. During filling, the grab will also be lowered at about 2m above the filling surface to minimize disturbance to the surrounding marine environment. A floating steel frame formed by 400 mm diameter steel circular section will be fabricated for hanging up the silt

curtain. The top end of the silt curtain will be tied to the floating frame and the bottom end will be foxed to ballast steel chain to keep the silt curtain vertical during the dredging or rock placing operation. Different length of geotextile will be prepared. Geotextile on the floating frame will be changed from time to time in order to suit the variation of water depths at different location of marine works. The floating frame will be ties to barge by nylon ropes and the whole silt curtain will shift together with the barge when dredging or rock placing operation proceeds. The layout and general arrangement of the floating frame silt curtain is enclosed in Appendix C.

3.3 Refer Appendix D for the specification of the two types of proposed geotextile for the silt curtain. Pilot test will be conducted to demonstrate the capability of the silt curtain to reduce sediment loss as assumed in the approved EIA report (registered no. AEIAR – 125/2008, Section 5.8.17). Refer Appendix E for the proposal of pilot test for Slit Curtain.

3.4 Layout plans indicating the tentative location of proposed slit curtains during different stage of dredging and filling works are enclosed in Appendix F.

4. Silt Curtain Installation

4.1 General Type Silt Curtain

4.1.1 Link up 300mm buoys together by a net.

4.1.2 Tie the top end of the geotextile to the buoys net and the bottom end with steel chain ballast before transportation.

4.1.3 Transport the silt curtain to the location for fixing via a marine pontoon.

4.1.4 Workers tie the buoys to the water and then slowly out the geotextile with the steel chain ballast into sea.

4.1.5 Put the buoys to the water and then slowly out the geotextile with the steel chain ballast into sea.

4.1.6 In order to maintain the position of the silt curtain especially at location with strong current, place concrete sinkers to the seabed if required and tie the silt curtain to the sinkers with nylon strings by divers.

4.2 Floating Frame Type Silt Curtain

4.2.1 Prefabricate a 15m X 12m rectangular shape floating steel frame using 400mm diameter X 8mm thick steel circular hollow section. Details as per drawing no. SK/0907/MS/SC/1 and SK/0907/MS/SC/2.

4.2.2 Tie the top end of the geotextile to the steel frame by nylon strings / steel wires.

4.2.3 Tie the bottom end of the geotextile with ballast steel chain. This arrangement shall maintain the geotextile in vertical position during the course of dredging.

4.2.4 Place and unfold the silt curtain to the sea by grab dredger / derrick barge. Fix the floating steel frame alongside the grab dredger / derrick barge with a movement joint. Slowly put the geotextile together with the ballast steel chain to the sea.

4.2.5 Prepare different length of the geotextile for replacement in order to suit the various existing seabed level.

5. Maintenance of Silt Curtain

5.1 On-board supervisors will be assigned to check the condition of the silt curtain before commencement of works everyday. An inspection checklist will be prepared and filled in by the site supervisors. All checklists will be kept on site for record purpose. Refer Appendix G for the sample of Silt Curtain Inspection Checklist.

5.2 Dredging or backfilling works will stop immediately if silt curtain is found damaged. Lift up the silt curtain from the water by grab dredger / derrick barge. Sew (double-line sew) a new piece of geotextile to the existing geotextile to cover the damage area, with sufficient overlapping length (1m). Nearby marine works will resume after repairing of the damaged silt curtains

5.3 Refuse around the silt curtains will be collected at regular intervals on a daily basis so that water behind the silt curtains will be kept free from floating debris.

5.4 Sufficient spare geotextile will be kept on site for replacing of damaged silt curtains. The spare geotextile shall be kept in place to avoid direct contact with water and sunlight.

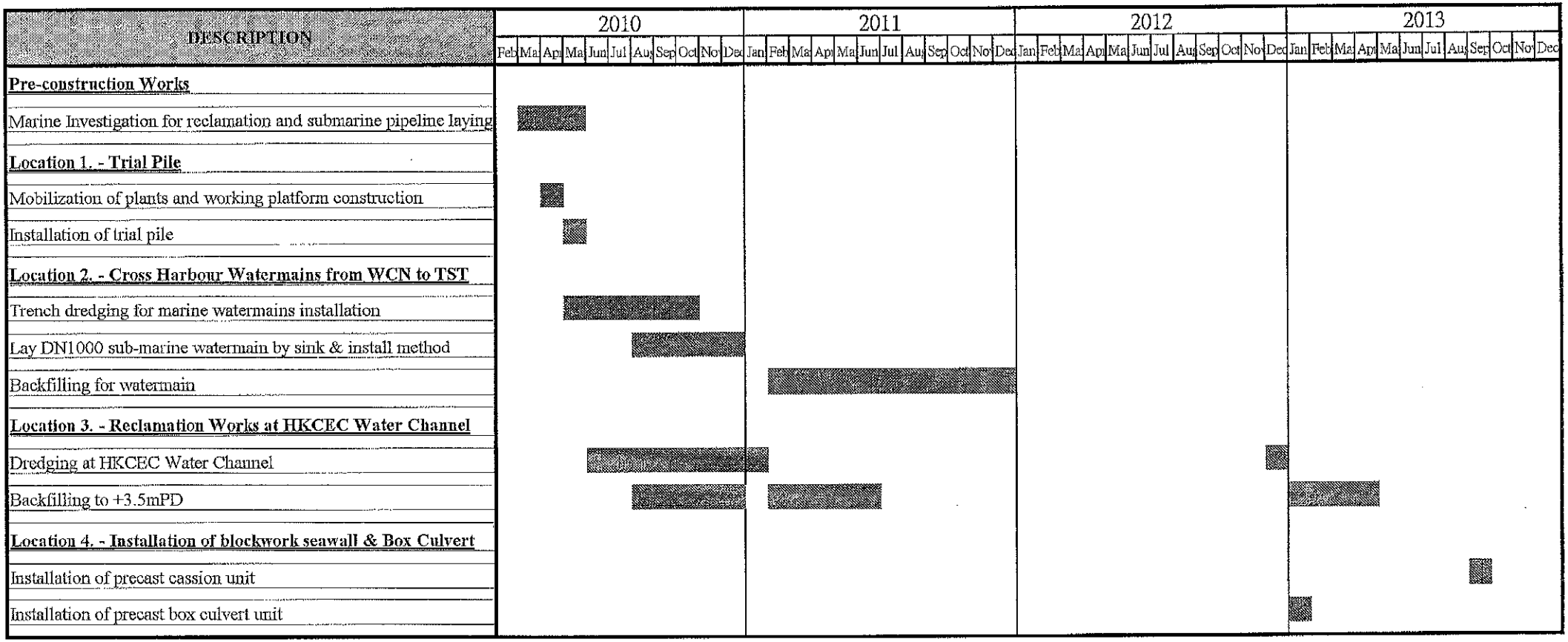
Appendix A

Programme of Major Marine Works

Contract No. HK/2009/01

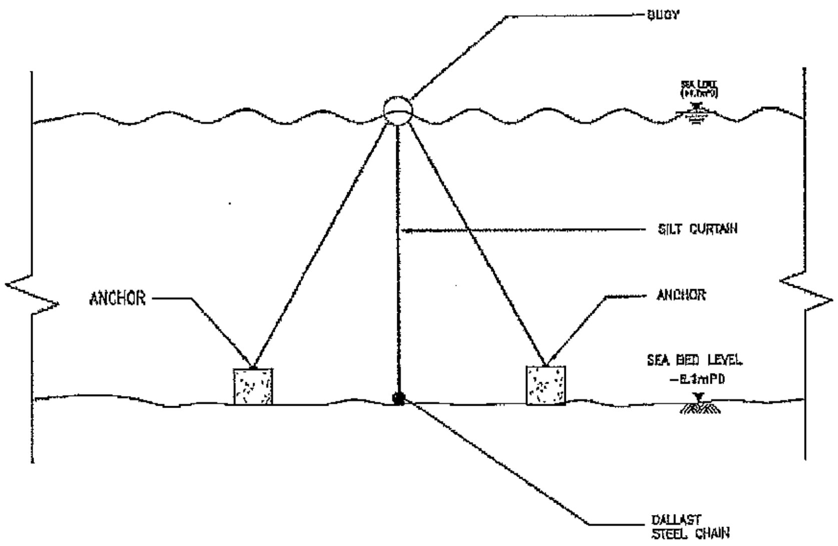
Contract Title : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Working Programme for Marine Works



Appendix B

Detail of General Type Silt Curtain



TYPICAL DETAILS FOR SILT CURTAIN DEPLOYMENT

NOTES:

1. NO DIMENSIONS ARE TO BE OBTAINED FROM SCALING DRAWINGS.
2. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN MILLIMETERS.
3. UNLESS OTHERWISE NOTED, ALL LEVELS ARE IN METERS RELATIVE TO HONG KONG PRINCIPAL DATUM (mPD).

0	CHECKED PRINT	KY	04-03-10
Rev	Description	By	Date

土木工程拓展署 Civil Engineering and Development Department

CONSULTANT: AECOM

CONTRACTOR: Chun Wo - Leader JV

WAN CHAI DEVELOPMENT PHASE II

TYPICAL DETAILS FOR SILT CURTAIN DEPLOYMENT

DRAWING NO. HK/2009/01/DW-RM-06

DATE 04-03-2010 SCALE N.T.S.

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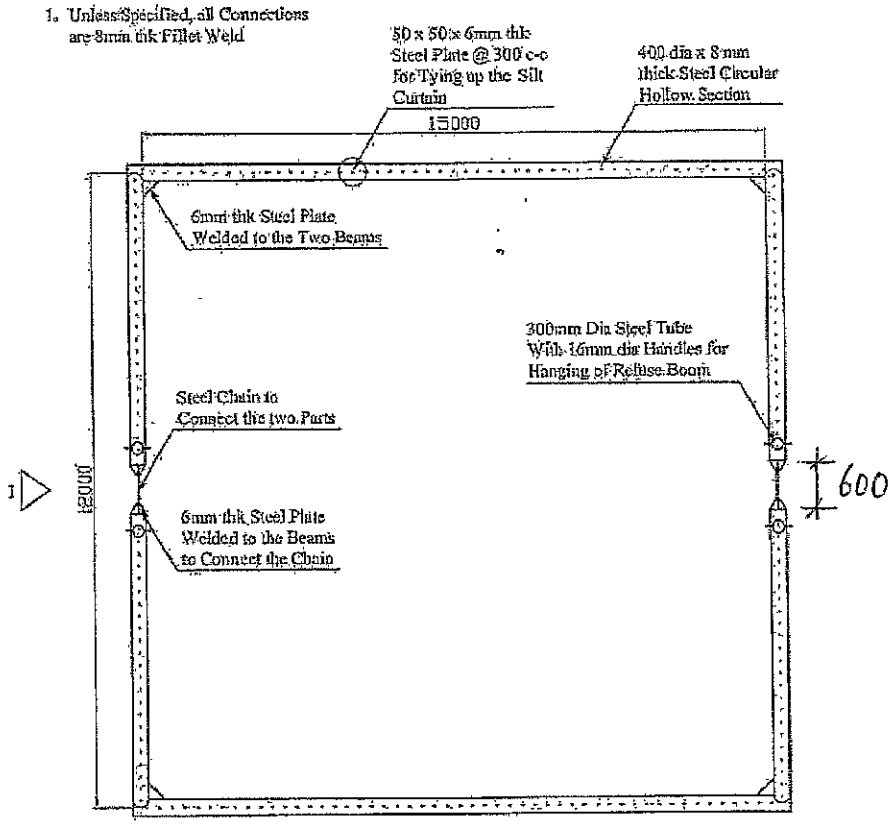
Appendix C

Detail of Floating Type Silt Curtain

Rev 1	Revision note	Date: 25 Jan 10		

Note:

1. Unless Specified, all Connections are 8mm thk Fillet Weld

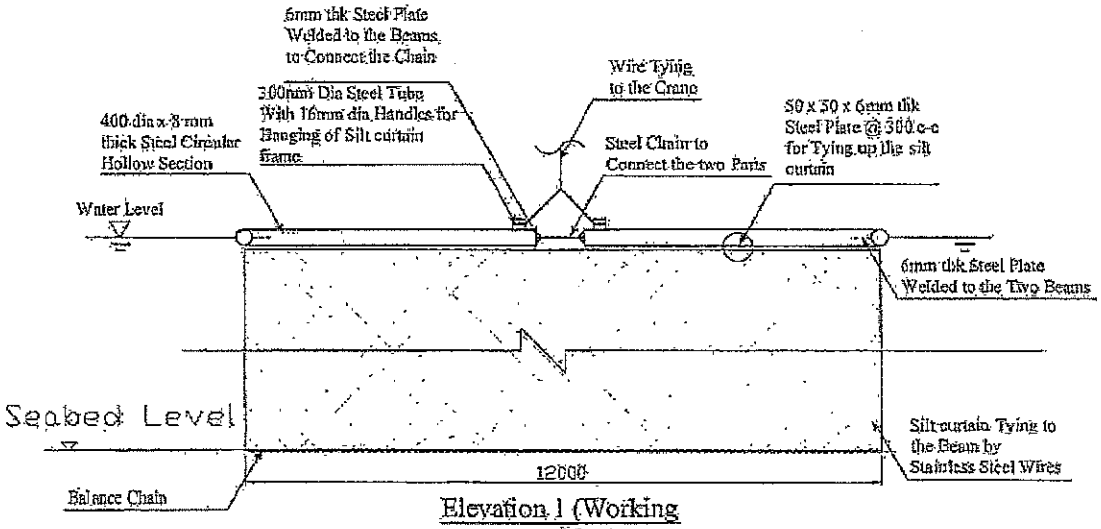


Plan

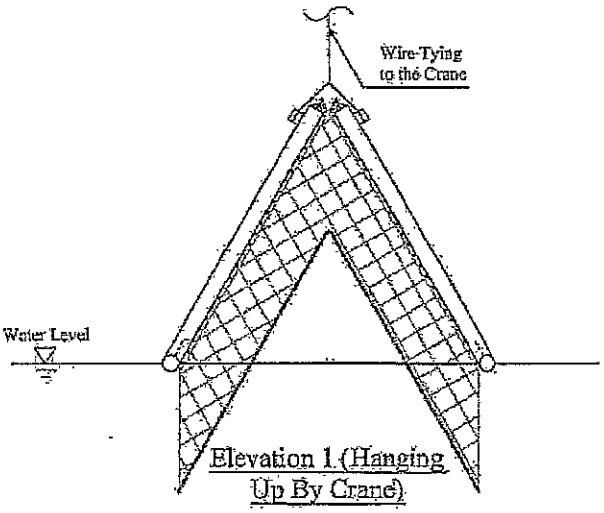
Designed by	Checked by	Approved by – date	File name	Date	Scale
KY Wong	David Wong	25 Jan 10	SK/0907/MS/SC/1	25 Jan 10	1:150

Owner	Title		
Chun Wo - Leader JV	Details of Silt Curtain	Edition	Sheet
		1	1

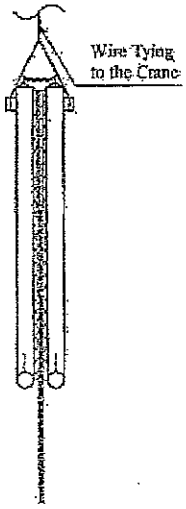
Rev 1	Revision note	Date:25 Jan 10		



Elevation 1 (Working Condition)



Elevation 1 (Hanging Up By Crane)



Elevation 1 (Finish)

Designed by	Checked by	Approved by - date	File name	Date	Scale
KY Wong	David Wong	25 Jan 10	SK/0907/MS/SC/2	25 Jan 10	1:150

Owner	Title		
Chun Wo - Leader JV	Details of Silt Curtain		
		Edition 1	Sheet 2

Appendix D

Specification of Geotextile for Silt Curtain

Table of Contents

Manufacturer Company Profile

WHY CHOOSE BONTEC® GEOTEXTILES ?

BONAR TECHNICAL FABRICS

Inherently good

bontec

woven and nonwoven geotextiles

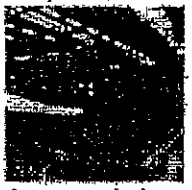
Bonar Technical Fabrics is Europe's premier manufacturer of woven and nonwoven geotextile products. Through our continuous commitment to quality, product development and production improvement, we have earned our position as a major player in our markets. Today, with over 30 years experience in the geosynthetics industry, and the full backing of our parent company, we are confident that we will continue to grow our business and remain at the forefront of our markets for many years ahead.

Manufactured under the brand name **Bontec®**, using state of the art **geotextile production technology**, our woven and nonwoven geotextile ranges offer product solutions for the functions of Separation, Filtration, Drainage, Erosion Control, Reinforcement and Protection.

Fibre Extrusion

In-house Fibre Production

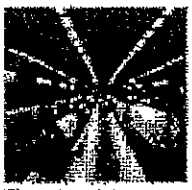
Fibre production involves the extrusion of continuous filaments that are then cut into short staple fibres. Through the careful identification of fibre formulation, filament density and staple fibre length, we can ensure that the mechanical and hydraulic properties are maximised for each of our nonwoven product ranges.



Non woven geotextiles

Nonwoven Geotextile Production

Using ultra modern needle punching looms and a unique thermal bonding process, our nonwoven geotextile production involves the processing of a uniform web of staple fibres that are orientated and bonded to form a finished sheet product.



Woven geotextiles

Woven Geotextile Production

Polypropylene tapes are manufactured in our slit film extrusion department prior to being woven on Sulzer looms. The warp tapes (machine direction) are beamed into the loom and the weft tapes (cross-machine direction) are threaded over and under alternate elements. The woven product that emerges offers very high mechanical strengths per unit weight.

State of the art laboratory

Quality and the Environment

All plants operate in accordance with an ISO 9001:2000 Quality Assurance System and ISO 14001 Environmental Management System. Products are tested internally in our fully equipped geosynthetics laboratory in accordance with the latest European and International standards.

First class customer service

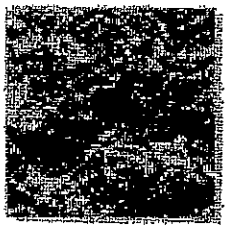
First Class Customer Service

At Bonar we believe the customer should be able to purchase the most appropriate product for his task. As such our staff are readily available to offer a full service package from the initial product selection phase, through to final delivery and the provision of after sales support.

CE Q&E igs

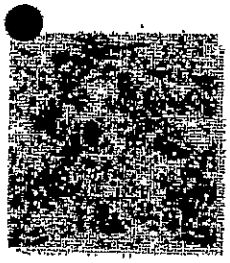
BONTEC - A TOTAL RANGE OF GEOTEXTILES

NON-WOVEN GEOTEXTILES



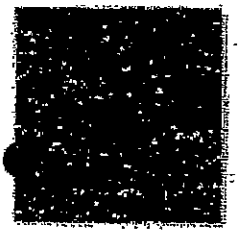
NW: Thermally Bonded Non Woven Geotextiles

Produced using mechanical and thermal bonding processes, the NW range is primarily used for lightweight separation and filtration. Their excellent hydraulic properties result in their preferred use in filtration applications. Typical uses include as a filter to encapsulate a french drain or a granular drainage blanket



SNW: Superior Needlepunched Nonwoven Geotextiles

Made from white high tenacity fibres the SNW range offers maximum performance per unit weight and is ideal for use in applications where both strength and elongation are key parameters of the geotextiles performance.



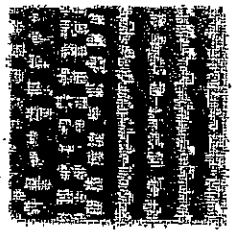
VNW: Coloured Needlepunched Nonwoven Geotextiles

Produced using multi-coloured staple virgin fibres, products range from 200 to 2800g/m2. VNW grades offer a felt like appearance and are used in the functions of protection, drainage and erosion control. Areas of application include membrane protection in landfill and reservoirs as for erosion control on riverbanks and coastlines.

LG: Geocomposites

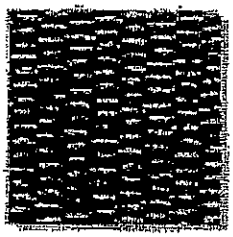
Produced via a combination of woven and nonwoven technology, the LG range offers the best of both product types in a single layer. The resulting products are ideally suited to uses where a high demand is placed on the geotextiles strength, penetration efficiency and physical robustness.

WOVEN GEOTEXTILES



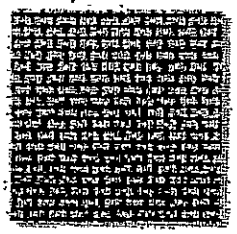
SG: Standard Grade Light Weight Woven Geotextiles

Including from 70 to 250g/m2 SG lightweights are used primarily for separation to prevent good quality granular fill intermixing with the poorer soil below. Typical uses include in new highways, car parks, airport runways, under stone foundation layers to new buildings etc



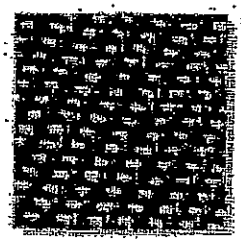
SG: Standard Grade Heavy weight Woven Geotextiles

With peak tensile strengths in excess of 200kN/m, SG heavyweight geotextiles are used in applications where the loadings are severe. Uses include steel form basal reinforcement, coastal erosion schemes or areas requiring general soil stabilisation.



HF: High Flow Woven Geotextiles

Used where there exists a requirement for the quick escape of excess water, HF fabrics are used primarily in erosion control applications eg. under culvert inverts, joints or between discrete layers of quick draining granular fill eg a coarse sand and crushed gravel.



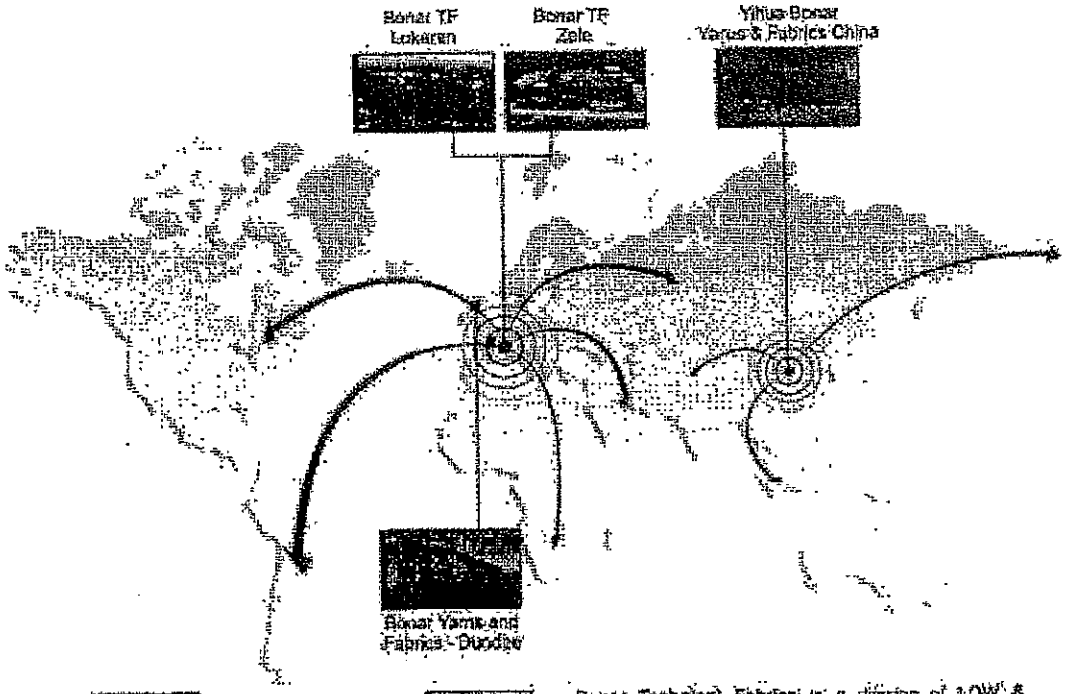
HS: High Strength Woven Geotextiles

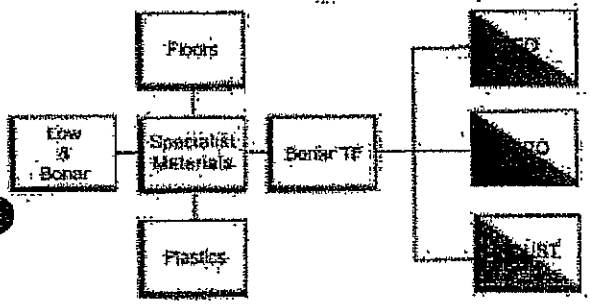
Produced from high tenacity polyester yarns, the HS products offer tensile strengths up to 600kN/m combined with low extension and excellent creep characteristics. Applications include the reinforcement of vertical walls, steep slopes and embankments over soft soil with long term design lives

bontec

woven and nonwoven geotextiles.

GROUP STRUCTURE





Bonar Technical Fabrics is a division of BOW & BONAR plc, an international group that manufactures and supplies a wide range of products in the Specialist Materials, Flooring and Plastics markets.

As part of the Specialist Materials division, Bonar TF focuses on the production of high quality product ranges including geotextiles, agrotextiles, and technical textiles for the industrial and building sectors. Its headquarters are situated in the Belgian town of Zele, a short distance from the main ports of Antwerp, Zeebrugge and Rotterdam. This proximity assures clients quick and economic delivery throughout the world.

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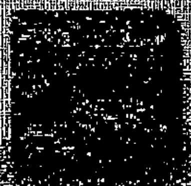
website: www.bonartf.com

NW NONWOVEN GEOTEXTILES



we undercover the world

bontec

A TOTAL RANGE OF GEOTEXTILES

website: www.bonartf.com

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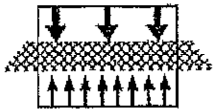
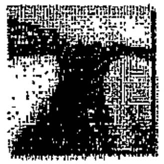
NW Nonwoven Geotextiles

PRODUCT PROFILE



SEPARATION

FILTRATION



"A range of white heat bonded nonwoven geotextiles that offer the highest levels of engineering performance and quality standards when used in the applications of Separation and Filtration."

SOIL SEPARATION, FILTRATION OR EROSION CONTROL?

The NW range of Staple Fibre Needle Punched and Thermally Bonded Nonwoven Geotextiles have been designed to offer optimum performance per unit weight. Their resulting mechanical robustness and excellent hydraulic properties make them the ideal choice for separation and filtration. Produced on state of the art equipment, the Bontec NW geotextile range sets standards in terms of quality and mechanical performance.

Bontec NW facts include:

- Uniform Tensile strengths in all directions up to 45 kN per metre (kN/m) width
- CBR Puncture Strengths ranging from 1.1 to 7.5 kN
  NW Mechanical Properties that offer maximum strength in all directions throughout the length and width of every roll
  Our unique manufacturing process utilising both mechanical and thermal bonding processes ensures that the NW range offer superior performance at lower weight
- Waterflows normal to the plane that are generally several times more than that required by design
- A range of consistent opening sizes suited for use in soils ranging from clay to coarse granular fill.
  NW hydraulic properties that stimulate the build up of a natural soil filter in the adjacent soil and so ensure long term filtration stability.
  Available ex-stock in 5.25m wide rolls or other widths to order

Through the incorporation of an NW fabric in a separation/stabilisation design you can be assured of improved soil bearing capacities and with it a more stable construction.

Typical applications for NW thermally bonded non woven geotextiles include:

- As a general purpose separator for use under site access roads and areas of hardstanding
- As a separation and strengthening layer under new roadways, car parks, industrial units etc.
- As a filter surround in the construction of a french drain or granular drainage blanket
  For separation: to prevent the intermixing of dissimilar soil layers
  For filtration: to allow the passage of fluids whilst preventing the uncontrolled passage of soil

NW Nonwoven Geotextiles play a major role in providing the functions of separation and filtration in numerous construction applications. In many instances the NW fabric actually performs both functions in one. A good example being their inclusion in Railtrack maintenance, where as a separator/filter layer below the track ballast, their use minimises potential track failure from pumping (the upward movement of fines from the underlying formation to the ballast).

Other geotextiles available within the Bontec range include Standard Grade, Highflow, High strength Wovens and Needlepunched Superior & Multicoloured Nonwovens

Visit us at our website: www.bonartf.com

For further product information, [illegible]

Product Specification

bontec

* bonar technical fabrics product

SG 100/100

Technical data sheet according to internal specifications Bonar TF: version 03 dd. 17/02/03
Accompanying documents CE marking: version 01 dd. 01/10/02

CE

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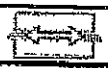
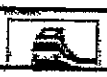
1137-CPD-601
03

				
separation	filtration	reinforcement	protection	drainage

	test method	value	tolerance
Mechanical properties			
Tensile strength MD	EN ISO 10319	110 kN/m	- 9,9 kN/m
Tensile strength CD	EN ISO 10319	110 kN/m	- 9,9 kN/m
Elongation MD	EN ISO 10319	20 %	+/- 4,6 %
Elongation CD	EN ISO 10319	11 %	+/- 2,53 %
Static puncture resistance – CBR	EN ISO 12236	12,5 kN	- 2,5 kN
Dynamic perforation resistance – cone drop	EN 918	10 mm	+ 2 mm
Hydraulic properties			
Water permeability normal to the plane	EN ISO 11058	23×10^{-3} m/s	- $6,9 \times 10^{-3}$ m/s
Water flow normal to the plane (*)	EN ISO 11058	23 l/m².s	- 6,9 l/m².s
Characteristic opening size	EN ISO 12956	190 µm	+/- 57 µm
Physical properties			
Thickness under 2 kPa (*)	EN 964/1	1,53 mm	+/- 0,31 mm
Weight (*)	EN 965	475 g/m²	+/- 47,5 g/m²
Composition	100 % polypropylene woven geotextile		

Durability	• geotextile has to be covered within 2 weeks after installation • 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 & under-ground 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. Roll dimensions are 5,25 m x 100/200 m. Other dimensions on demand.
3. Bonar Technical Fabrics reserves the right to alter product specifications without prior notice. It is the responsibility of all users to satisfy themselves that the above data is current.
4. Although not guaranteed, these results do to the best of our knowledge offer a true and accurate record of the product's performance.
5. Bonar Technical Fabrics cannot accept responsibility for the performance of these products as the conditions of use are beyond our control.

(*) Not mandated characteristics for CE marking.

BONAR TECHNICAL FABRICS

BONAR Technical Fabrics nv/sa
[illegible]

BONAR Yarns & Fabrics Ltd
[illegible]

Certification

CERTIFICAAT KWALITEITSMANAGEMENTSYSTEEM

ISO 9001 : 2000

Hiermee verklaart BQA, nv dat het kwaliteitsmanagementsysteem van de firma
Bonar Technical Fabrics NV – Site in Zele en Lokeren

BONAR TF

waarvan de zetel gevestigd is Industriestraat 39 – 9240 Zele - België, op 02-05-2005 beoordeeld werd en conform is met de norm ISO 9001, uitgave 2000, voor het volgende toepassingsgebied:

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

Dit certificaat is door BQA, nv verstrekt conform zijn kwaliteitshandboek betreffende kwaliteitssysteemcertificatie en na het afsluiten van het certificatiecontract N° AC/AJ/CER/02-05-2005/301, waarbij de firma zich onderwerpt aan de regelmatige controle van haar kwaliteitsmanagementsysteem.

Certificaat N° C/02-05-2005/301
Geldig tot 02-05-2008

BELCERT

BQA N° QS 006

A. COCHAUX
Directeur

BQA

AC/AJ/CER/02-05-2005

CERTIFICAAT MILIEUBEHEERSYSTEEM

ISO 14001 : 2004

Hiermee verklaart BQA, nv dat het kwaliteitsysteem van de firma
Bonar Technical Fabrics NV – Site in Zele en Lokeren

waarvan de zetel gevestigd is Industriestraat 39 – 9240 Zele – België, op 02-05-2005 beoordeeld werd en conform is met de norm ISO 14001, uitgave 2004, voor het volgende toepassingsgebied:

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

Dit certificaat is door BQA, nv verstrekt conform zijn kwaliteitshandboek EMS betreffende milieubeheersysteem-certificatie en na het afsluiten van het certificatiecontract N° AG/AJ/CER/02-05-2005/2/2,
waarbij de firma zich onderwerpt aan de regelmatige controle van haar milieubeheersysteem.

Certificaat N° C/02-05-2005
Geldig tot 02-05-2008

BEL CERT

BQA N° 018 EMS

A. COCHAUX
Directeur

BQA

Iedere persoon die kennis heeft van misbruik van dit certificaat wordt BQA, nv hierover te verwittigen. Het openbaar maken van dit certificaat is slechts toegelaten in zijn geheel.
BQA, nv – Montgomerystraat 34 (B3) – 1000 Brussel

AG/AJ/C/02-05-2005

bontec

a bonar technical fabrics product

Fax

Date: 11-Aug-04	
To: G and E – Hong Kong Mr. Gary NG	From: Isabelle Ruyffelaere – 0032 52 457 487 Philippe Grimmelprez – 0032 52 457 488
Fax:	Pages: 1
Your reference: Bonar TF acquisition of Uco Technical Fabrics	
	Our reference: G&E11082004.fax

To Whom it may concern

We hereby confirm that Bonar acquired the company UCO Technical Fabrics in October 1995 and all activities of the manufacturing and sales of Woven and Non woven geotextiles.

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

Its headquaters 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: wevérslaan 15, Lokeren, Belgium.

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

Best regards

Philippe Grimmelprez
Sales & Marketing Manager geotextiles

BONAR TF

Exchange: +32 (0) 52 45 74 11
Geo: +32 (0) 52 45 74 67
Agro: +32 (0) 52 45 74 01
Carpet & Fibres: +32 (0) 52 45 74 85
Accountancy: +32 (0) 52 45 74 10
Fax General: +32 (0) 52 45 74 54
Fax Geo/Carpet: +32 (0) 52 45 74 95
Fax Agro: +32 (0) 52 44 58 04

Zele, 24.02.05

CERTIFICATION OF CONFORMANCE

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

L/C n° BBHK04M041374

Type NW 30 :	5,250 m²
Type SG 100/100 :	5,250 m²
Type NW 10 525 :	34,125 m²

Manufacturer : Bonar Technical Fabrics N.V

BONAR TECHNICAL FABRICS N.V.

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

bontec

a bonar technical fabrics product

fax

Date: 14-Jun-05	
To: G and E – Hong Kong Mr. Gary NG / Mr Stanley	**From:** Isabelle Ruyffelaere – 0032 52 457 487 Philippe Grimmelprez – 0032 52 457 486
Fax:	**Pages:** 1 +
Your reference: SG 100/100	
	Our reference: G&E06142005.fax

Dear Gary,

- With reference to your inquiry of we hereby would like to confirm that

Bontec SG 100/100 geotextile is woven in our vertical integrated plant in Belgium according the strict Iso 9001 : 2000 quality and ISO 14001 environmental system.

a/ The material is resistant to all naturally occurring soil acids and alkalis.
b/ The material is resistant to biological attack.
c/ when used correctly (cfr installation guidelines), resistant to deterioration caused by the effects of exposure to weather and burial. The polymers contain special stabilizers to resist to normal UV and oxidation.
d/ this is stable over tameperatures of 0 – 60 °C.
e/ The material is resistant to normal forces imposed during installation. Special forces that might occur during construction / installation must be given to Bonar so that special studies can be done.

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

Best regards

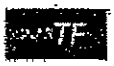
Philippe Grimmelprez
Sales & Marketing Manager

BONAR TECHNICAL FABRICS
Invisibly good

BONAR Technical Fabrics nv/sa
Industrielaan 39 • B-9240 Zele • Belgium
Tel +32 (0)52 457 411 • Fax +32 (0)52 457 483
E-mail geotextiles@bonartf.com

BONAR Yarns & Fabrics Ltd
St. Salvador Street • Dundee DD3 7EQ • United Kingdom
Tel +44 (0)1382 346102 • Fax +44 (0)1382 202379
E-mail rguild@bonaryarns.com

Installation Guideline



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 longitudenal axeis 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 edgeof 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 exposedsteel 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.

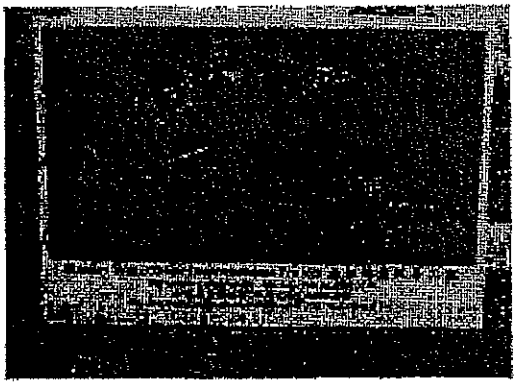
- Should the fabric be damaged during any step of the installation, the damaged section shall be repaired by covering it with a piece of fabric which extends at least 0,6 meter in all directions beyond the damaged area. The fabric shall be secured as directed by the engineer.

- Smoking shall not be permitted by personnel working on the fabric.

Photos References

G AND E COMPANY LIMITED

Rm. B, 13/F Cheung Lee Ind. Bldg.
9 Cheung Lee Street
Chai Wan, Hong Kong
Tel: 2508 0028 / 2570 0103 Fax: 2570 0089



List of Project Reference

Bonar

Date	Project	Client	Consultant	Style
Aug-03	CV/2000/09 Infrastructure for Penny's Bay Development, Contract I	* China State Construction Engrg. Corporation	Maunsell Consultants Asia Ltd	SNW600 NW10
Nov-04	DC/2003/02 Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement, Stage 1, Phase 2A - Kam Tin and Ngau Tam Mei	* Sun Fook Kong (Civil) Ltd	Black & Veatch Hong Kong Ltd	NW10
Dec-04	GE/2003/01 10-Year Extended Landslip Preventive Measure Project Phase 4, Package I, Landslip Preventive Works for Slopes in Hong Kong Island, Kowloon and New Territories	* Kin Shing Construction Co Ltd	Civil Engineering and Development Department	NW21
Dec-04	HY/2003/19 Improvement to Tung Chung Road between Lung Tseng Tau and Cheung Sha	Yuk Shing Engineering Co Ltd Wing Kee Engineering Co	Mott Connell Ltd	NW10 NW10
Jan-05	GE/2004/32 10-Year Extended Landslip Preventive Measure Project Phase 3, Package L, Landslip Preventive Works for Slopes in Tai Po and Yuen Long	* Kin Shing Construction Co Ltd	Maunsell Geotechnical Services Ltd	NW20
Jan-05	2/WSD/04-KK Sheung Shui/Fanling Water Supply - Construction of Ping Che Fresh Water Service Reservoir and Associated Works	* Ming Hing Waterworks Engineering Co Ltd	Water Supplies Department	NW20
Jan-05		Evergreen Landscaping & Contractors Co		NW10

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/2004/01 Maintenance and Repairs to Seawalls, Piers and Other Port Works	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	NW20
Apr-05	CV/2002/04 Penny's Bay Reclamation Stage 2	Gammon Skanska Ltd	Scott Wilson Ltd	SG100/100
Apr-05	GE/2003/01 10-Year Extended Landslip Preventive Measure Project Phase 4, Package I, Landslip Preventive Works for Slopes in Hong Kong Island, Kowloon and New Territories	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	NW9
Apr-05	HK/12/02 CED, Central Reclamation Phase III, Engineering Works	Best Leader Engineering Ltd	Atkins China Ltd	SG100/100
Apr-05	Tong Fuk Road Widening & Site Formation Work	Lee Wo Construction Engineering Co Ltd	ESA Consultants Ltd	NW10
May-05	03/8013 Lamma Island to Cyberport	Leader Marine Contractors Ltd Honwin Engineering Ltd	Maunsell Geotechnical Services Ltd	SG100/100 SG100/100
May-05	HK/12/02 CED, Central Reclamation Phase III, Engineering Works	Leighton - China State - Van Oord Joint Venture	Atkins China Ltd	SG100/100
May-05	P337 Skypier People Mover Tunnel Works	Chun Wo - Fujita Joint Venture	Airport Authority Hong Kong	NW10

Jul-05	Shenzhen to Tai Po Twin Submarine Gas Pipeline Project	Honwin Engineering Limited		SG100/100
Aug-05	AL L372 Conversion & Extension to 4 nos Existing Aided Schools at Tin Shui Wai, Yuen Long	China Civil (HK) Building Ltd		NW9
Sep-05	EP/SP/45/03 Pillar Point Valley Landfill Restoration	Ka Shun Civil Engineering Co Ltd	Golder Associates	NW10
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
Oct-05	EP/SP/12/93 NENT Landfill	Rankine Engineering Co Ltd		NW20 VNW200 SNW45
Nov-05	HY/2004/02 East Tsing Yi Viaduct	Hin Sum Engineering Co Ltd	Ove Arup & Partners HK Ltd	NW10
Nov-05		Man Cheong Metals and Building Materials Co Ltd		NW10
Nov-05	HY/2002/26 Stone Cutter's Bridge	Hong Kong River Engineering Co Ltd		SG100/100
Feb-06	Aviation Permanent Fuel Facility Hong Kong International Airport	Leighton Contractors (Asia) Limited	Babtie Asia	NW10

Approval Letters

FROM : G AND E COMPANY LIMITED PHONE NO. : + 852 2578 0889 Apr. 28 2005 12:01PM P5

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/TY

30 June 1992

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

<u>Attn : Mr. S. Y. Yu</u>

T.D.D. CONTRACT NO. NL 1/91 D. E. Dept		
DATE	ACTION	INFORM
SA		[illegible]
DRA		
CE		
[illegible]		
[illegible]		
FOREMAN		
FILE	[illegible]	

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 Berpak Watreden 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 3 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/sk

FROM : G AND E COMPANY LIMITED PHONE NO. : + 852 2578 0089 Apr. 28 2005 12:02PM P7

24-FEB-2005 10:07 FROM SFK TO 25780089 P.01/01

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

Web site 網址 [illegible]
E-mail 電子郵件 :
Telephone 電話 : [illegible]
Facsimile 圖文傳真 : [illegible]
Our reference 本署檔號 : [illegible]
Your reference 來函檔號 : [illegible]

土木工程處
Civil Engineering Office

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

1? 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. GV/2003/04

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

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

File PW WC/CV0306/M10/300

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

土木工程處
Civil Engineering Office

Website 網址 : http://www.cedd.gov.hk
E-mail 電子郵件 :
Telephone 電話 : (852) 2762 5737
Facsimile 傳真 : (852) 2714 2054
Our reference 本署檔號 : ( ) in PW WC/CV0402/A20/340 Pt 1
Your reference 來函檔號 : KS/330/2005

4/F, Civil Engineering and Development Building,
101 Princess Margaret Road,
Kowloon, Hong Kong

RECEIVED

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 Piers

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 26.03(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.

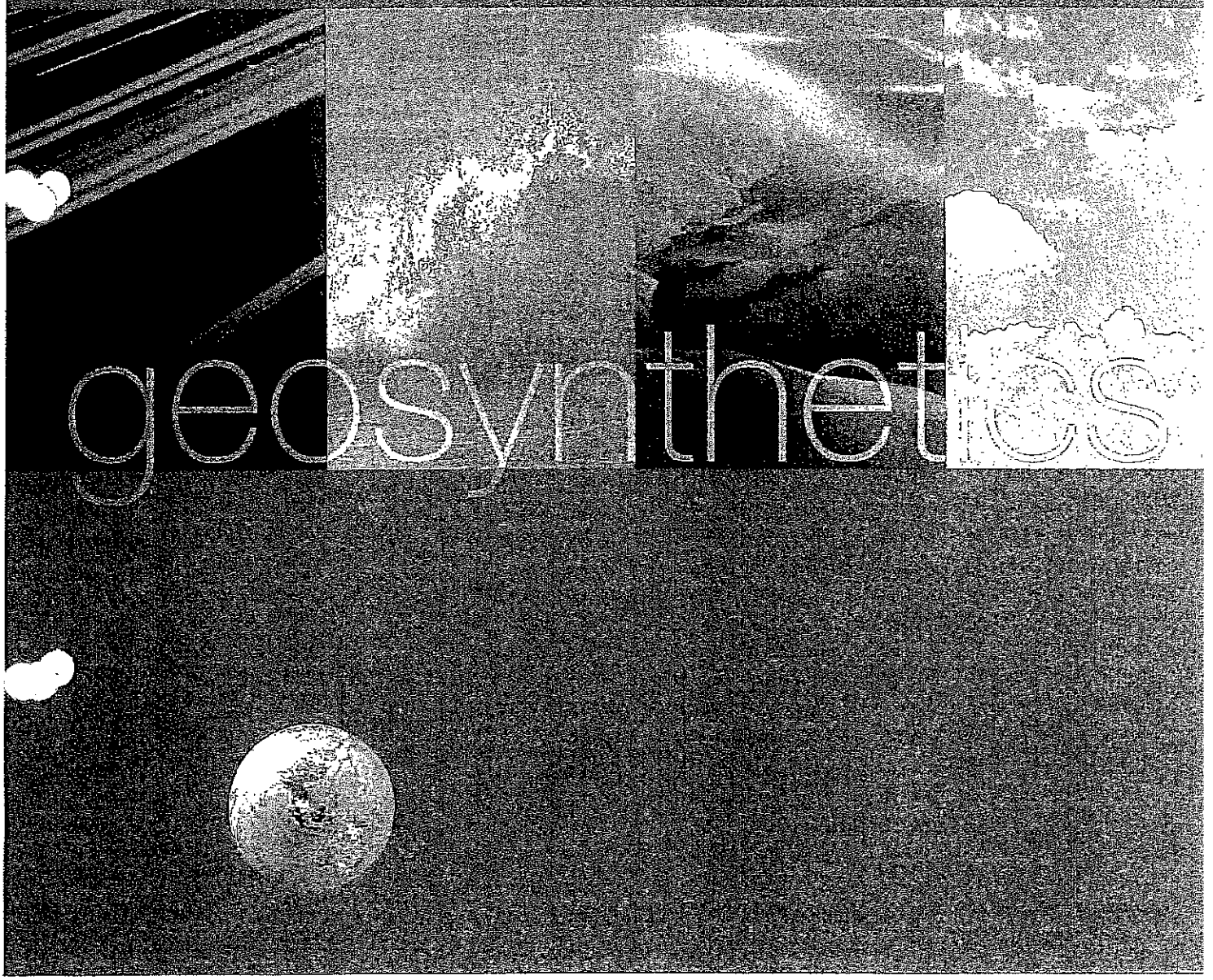
Yours faithfully,

(W H LEE)
Engineer's Representative
Port Works Division
Civil Engineering and Development Department

c.c.
SIOW/P2B – Site Copy

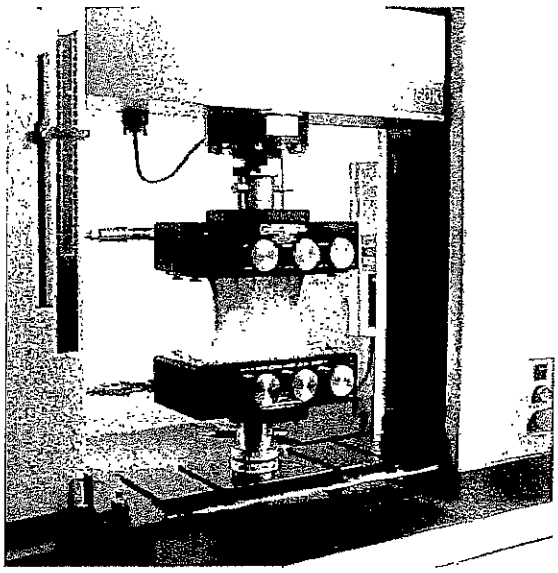
TENCATE
Mirafi

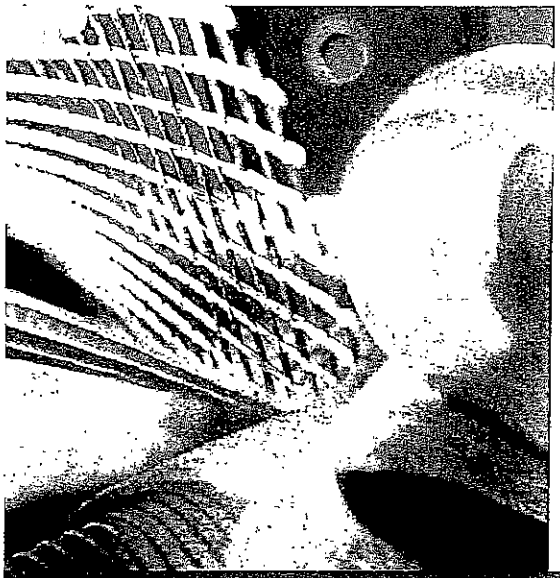
TenCate Geosynthetics



TENCATE
materials that make a difference

TENCATE Polyfelt® TENCATE Miragrid® TENCATE Mirafi® TENCATE Geotube®





TenCate Geosynthetics Asia

Company Profile

TenCate Geosynthetics Asia Sdn Bhd, is a subsidiary of Royal Ten Cate, Netherlands. Royal Ten Cate which is listed on the Amsterdam Stock Exchange is a 300 year old company specializing in high technology textiles and composites for protective fabrics, aerospace, antiballistic, construction and artificial grass industries. The Ten Cate Group is recognized as a global market leader in these fields and has manufacturing and sales and distribution facilities in North America, Europe and Asia.

TenCate Geosynthetics Asia is the leading manufacturer of geosynthetics and technical fabrics for civil and environmental engineering in Asia. Based in Kuala Lumpur, the TCG Asia services the Asian market region through a network of technical support offices throughout the regions. Over the many years of operating in Asia TCG Asia's exposure to complex problems has enabled the company to develop sophisticated products and technical solutions specific to local problems and engineering conditions. TCG Asia is therefore uniquely placed to provide reliable and cost effective solutions on almost any geosynthetics engineering problem.

Products and Services

TenCate is more than a company or product; it is a complete service of geosynthetics technical expertise and materials designed to solve typical geotechnical and environmental engineering problems. TenCate constantly embraces new technologies and innovation and is the industry standard for geosynthetic technical expertise, service, product quality and performance. To facilitate the rapid dissemination of information TenCate was one of the first companies to harness the power of the internet and provide a comprehensive internet based geosynthetics design facility available free of charge to engineers in a variety of languages.

Application Oriented Research and Development

TenCate is recognized as one of the most active companies in researching geosynthetics technology and application engineering. TenCate's engineering philosophy is based on precisely understanding critical geosynthetic performance criteria under field operating conditions. To fully understand how geosynthetics perform, the TenCate Group is constantly researching performance together with leading International Institutions and universities such as; Geosynthetics Research Institute (GRI), Drexel University, Strathclyde University, University of Nottingham, Oxford University, National University Singapore (NUS), Technical University Vienna, Technical University Munich, Franzius Institute Hanover, AIT Bangkok, Technical Research Centre Finland, Ecole Polytechnique Montreal, Grenoble University France and many others.

As a result of such research TenCate's design information allows engineers to precisely evaluate project site soil and operating conditions accurately select the appropriate geosynthetic and calculate the minimum performance values required to ensure performance.

Quality Control Assurance

The Tencate manufacturing process is custom designed to produce geosythetics with optimum combinations of strength, permeability, durability and resistance to construction installation and operating stresses. TenCate only utilises high quality polymers. Admixture of low quality or recycled polymers or fibers that easily break, tear or degrade is not possible. A full computerised statistical quality assurance process ensures consistent high quality manufacturing efficiency that complies in full to ISO 9001 standards is backed by a laboratory QC/QA system independently accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI–LAP), USA according to ISO/IEC 17025.

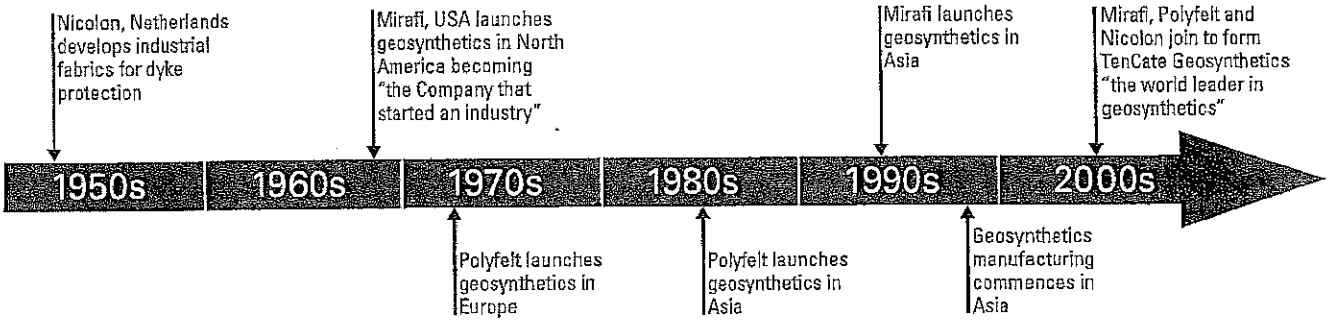
TenCate Geosynthetics Asia Sdn Bhd (Company No. 264232-U)
14, Jalan Sementa 27/91, Seksyen 27
40400 Shah Alam, Selangor Darul Ehsan, Malaysia
Tel: +60 3 5192 8568, Fax: +60 3 5192 8575
Email: info.asia@tencate.com, Website: www.tencate.com

TENCATE
materials that make a difference

TenCate Geosynthetics - the world leader in geosynthetics

Geosynthetics are polymeric materials used to enhance the performance of a variety of soil and hydraulic structures. They comprise geotextiles, geogrids and geocomposites.

TenCate Geosynthetics have been supplying geosynthetics for over 50 years as the history time-line below shows. TenCate Geosynthetics first started in the Netherlands and then expanded to the rest of Europe, North America and Asia. Today, TenCate is the world leader in geosynthetics.



TenCate Geosynthetics – the benefits

Geosynthetics are engineered specifically as a cost-effective solution for geotechnical, hydraulic and environmental applications.

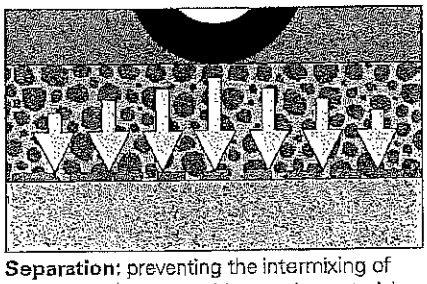
Geosynthetics are easy to install.

Geosynthetics are composed of highly durable polymers and can be utilised in permanent civil structures.

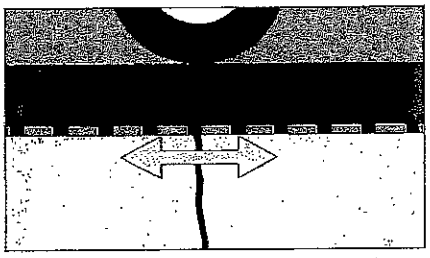
Geosynthetics are environmentally friendly as they save on the extraction and depletion of sands and aggregates.

TenCate Geosynthetics – the functions performed

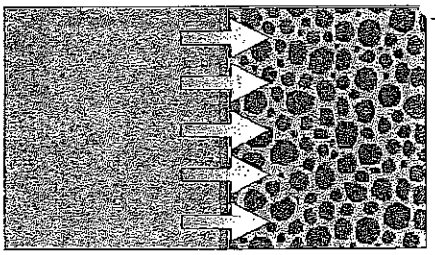
When TenCate geosynthetics are placed in soil, hydraulic and environmental structures they fulfil a range of functions that enhance the performance of those structures.



Separation: preventing the intermixing of soft foundation soils with granular materials thereby maintaining the structural integrity of the granular material.

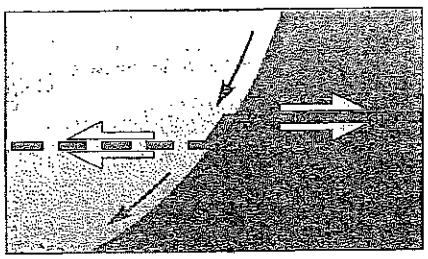


Stress/strain alleviation: reducing crack reflection in pavements by alleviating localised stress and strain.

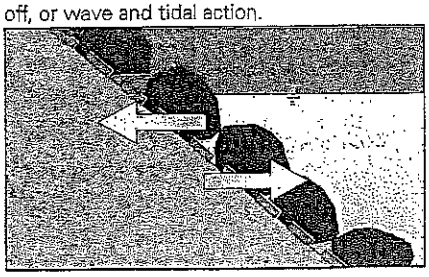


Filtration: allowing fluids to pass while preventing the migration of soil particles.

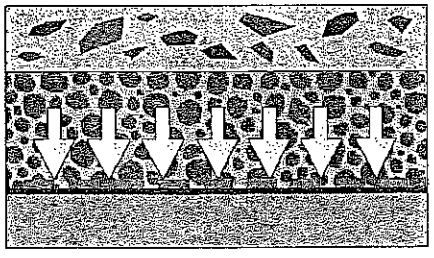
Reinforcement: maintaining the stability of soil by carrying tensile loads.



Erosion control: preventing the erosion of soil particles due to water flow, surface run-off, or wave and tidal action.

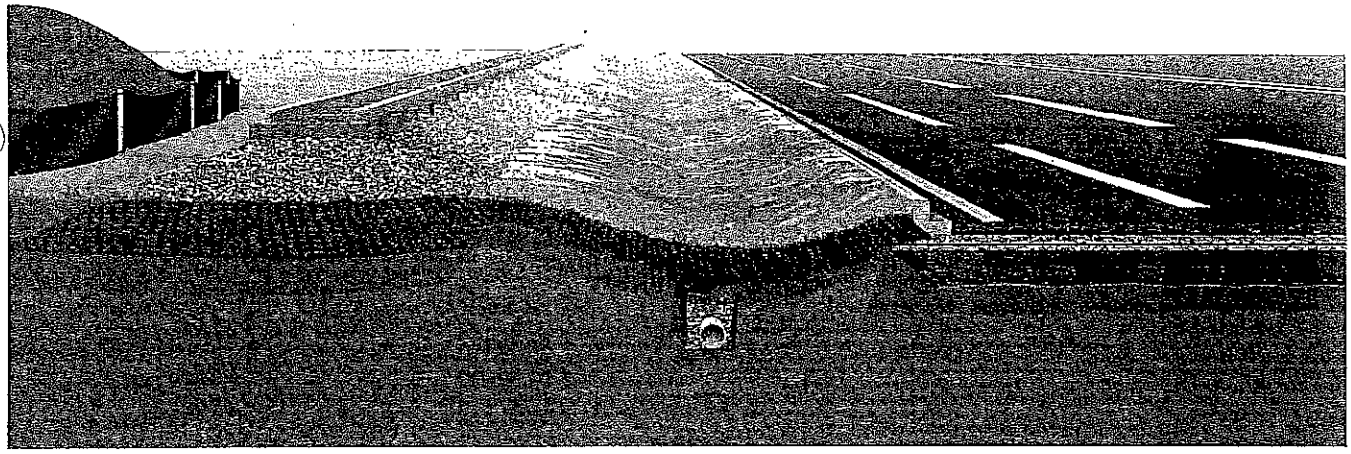


Protection: preventing or reducing the damage to a given surface or layer.



Transportation engineering

TenCate Geosynthetics enhance the performance and the design life of transportation engineering structures such as roads, railways, airfields and earthworks. For these applications, TenCate Geosynthetics are installed as separation and filter layers in areas where groundwater is a problem. They are also used as stress/strain alleviation layers in the maintenance of asphalt and concrete pavements. TenCate Geosynthetics offer the ideal characteristics of robust mechanical properties coupled with high water flow capabilities.



In road and airfield pavements TenCate Geosynthetics are placed on top of soft subgrades prior to placement of the granular subbase layer. The geosynthetic prevents the loss of the granular subbase material into the soft subgrade, thereby maintaining the structural integrity of the pavement. The use of TenCate Geosynthetics thus extends the maintenance-free life of pavements constructed on soft subgrades.

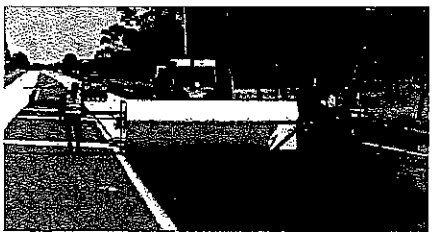
In railway tracks, TenCate Geosynthetics are placed between the existing formation and the ballast layer to prevent the subgrade from pumping into the ballast layer, thereby maintaining its structural integrity. The use of TenCate Geosynthetics significantly increases the periods between track maintenance with considerable savings on labour and material costs.

TenCate Geosynthetics are also used as a stress/strain alleviation layer in asphalt overlays for the maintenance of asphalt and concrete pavements. This layer retards reflective cracking and hence extends the maintenance-free life of pavement overlays.

In earthworks construction TenCate Geosynthetics is placed between two different kinds of fill to ensure that intermixing does not occur during placement and compaction. The geosynthetic maintains the distinct layer boundaries between dissimilar adjacent earthfill materials, maintaining their structural integrity.

TenCate Geosynthetics are used as filters for subsurface drainage to enhance the performance of pavement and earthworks structures. The geosynthetic allows the groundwater to pass into the subsurface drain without eroding the soil, and thus ensures long-term performance.

Mirafi® woven geotextile used for area stabilisation over soft foundation

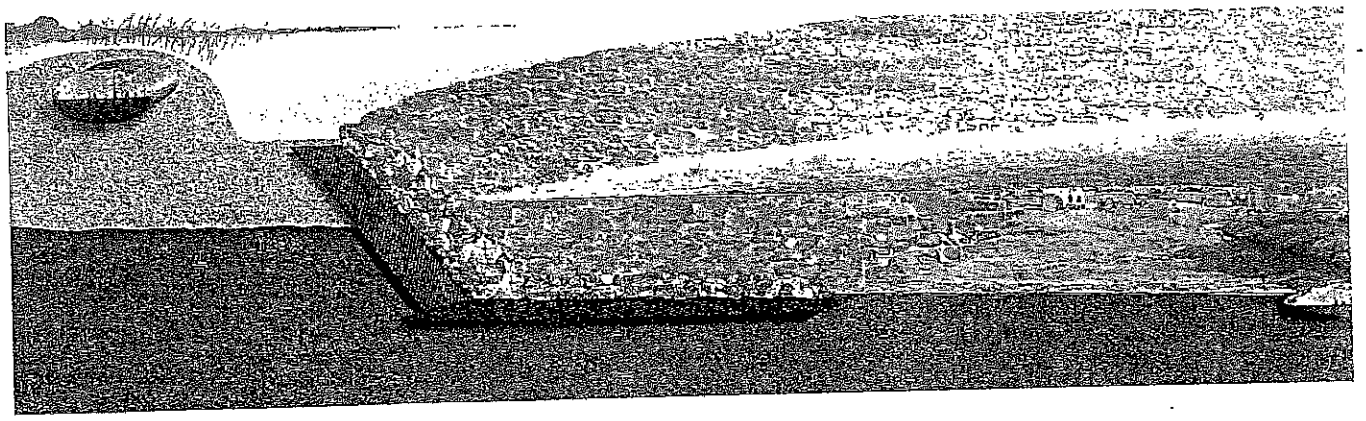


Polyfelt® nonwoven geotextile used in asphalt overlays

Polyfelt® nonwoven geotextile used as a filter for a drainage blanket

Hydraulic and marine engineering

TenCate Geosynthetics are used as integral components in the design and construction of a variety of hydraulic and marine structures such as revetments, levees, rubble-mound breakwaters, tubular containment structures and marine spoil containment structures. The materials used are easy to install beneath the water surface, in difficult conditions, and once in place provide continued performance.

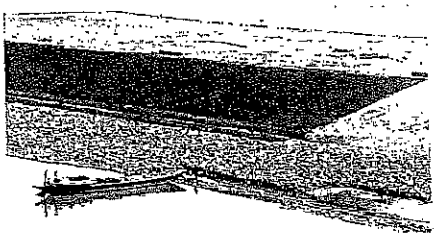


TenCate Geosynthetics act as filters in revetments to prevent the erosion of soil. The armour protection on top of the geosynthetic can consist of a wide range of materials such as rock, gabions and mattresses, concrete pattern-placed units, etc. Typical applications range from river bank protection to coastal defence works.

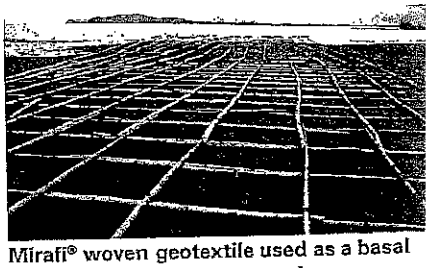
TenCate Geosynthetics can also be used as a filter at the base of rubble-mound breakwaters. In this location, the geosynthetic prevents the erosion of the foundation soil through the granular layers in the breakwater. In some instances, the geosynthetic may also be required to reinforce the base of the breakwater when it is constructed on soft foundation soils.

In hydraulic and marine applications TenCate Geosynthetics are used for Geotube® units that contain hydraulic fill to construct various protection structures. TenCate Geotube® units, while containing the hydraulic fill, also give shape to the resulting structure. These Geotube® structures are highly flexible and very economical as they can utilise locally dredged materials.

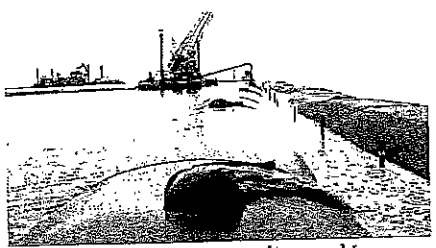
In marine applications TenCate Geosynthetics are used for Geocontainer® units which enable the placement of fill and spoil materials on the seabed in an orderly and controlled manner. Submerged structures such as breakwaters, groynes and spoil containment areas can be constructed cost-effectively using this technique.



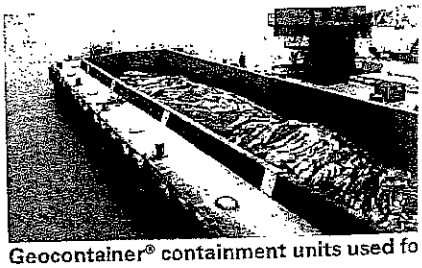
Polyfelt® nonwoven geotextile used as a filter beneath revetment armour rock



Mirafi® woven geotextile used as a basal filter in breakwater construction



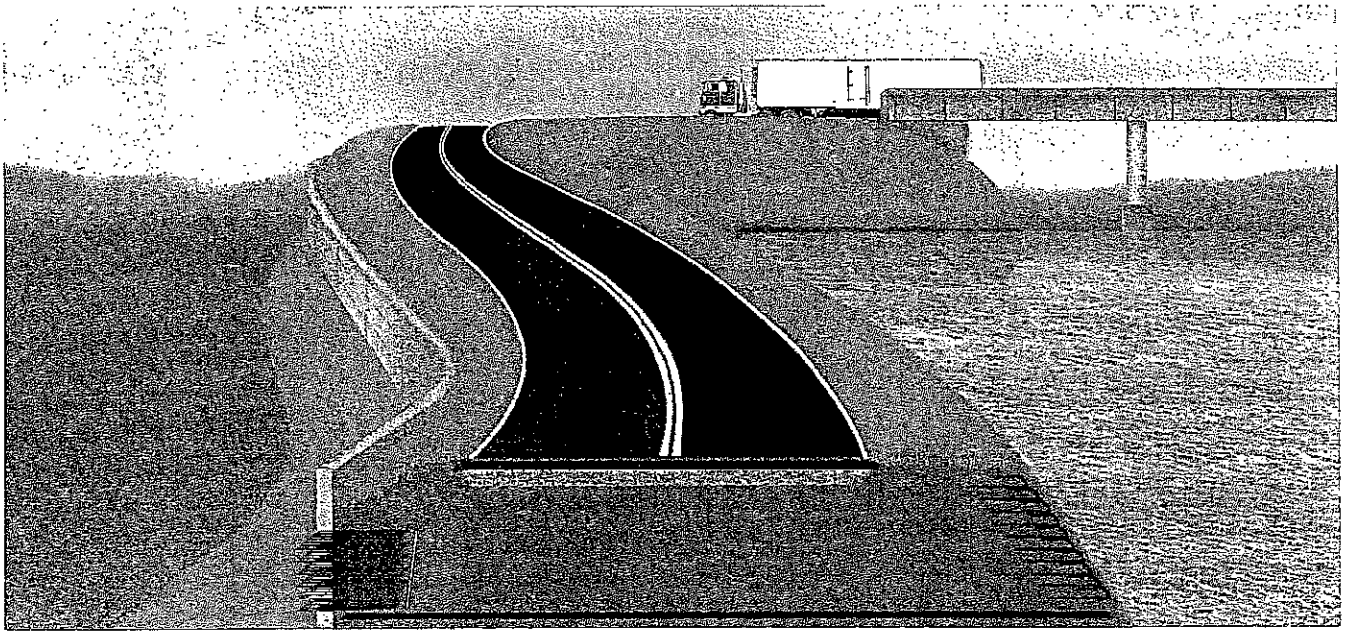
Geotube® containment units used to construct dykes for land reclamation



Geocontainer® containment units used fo offshore dyke construction

Reinforced soil engineering

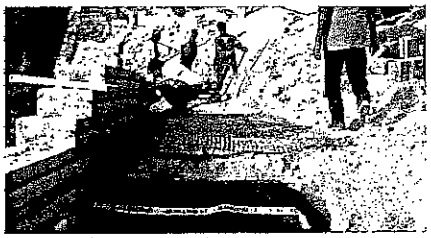
TenCate Geosynthetics are used as integral components in reinforced soil structures such as retaining walls, slopes and embankments. They provide structural resistance to the soil, thus enhancing shear strength and deformation resistance. This enables walls, slopes and embankments to be constructed cost-effectively and quickly. The TenCate Geosynthetics used for soil reinforcement have been designed to provide the ideal characteristics of high tensile strength, low elongation and low creep.



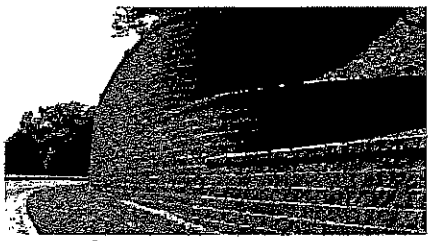
To steepen soil slopes TenCate Geosynthetics are placed in layers during construction to provide tensile resistance and enhance stability. The facing of the slope can be grass or another facing material. This technique enables slopes to be constructed to any height at any slope angle.

TenCate Geosynthetics are used to provide stability to retaining walls constructed using concrete blocks and panels. The geosynthetic is connected to the block facing and laid in layers in the backfill during construction of the wall. Retaining walls constructed in this manner are economical, efficient and aesthetic.

TenCate Geosynthetics are placed at the base of embankments to provide stability and limit differential settlements. Depending on the application, the geosynthetic may be placed directly on the soft foundation, over foundation piles, or over areas subject to void formation prior to the placement of the embankment fill.



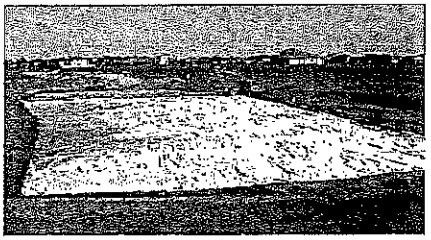
Miragrid® geogrid reinforced segmental block wall during construction



Miragrid® geogrid reinforced segmental block wall completed

Miragrid® geogrid reinforced fill slope during construction

Miragrid® geogrid reinforced fill slope completed

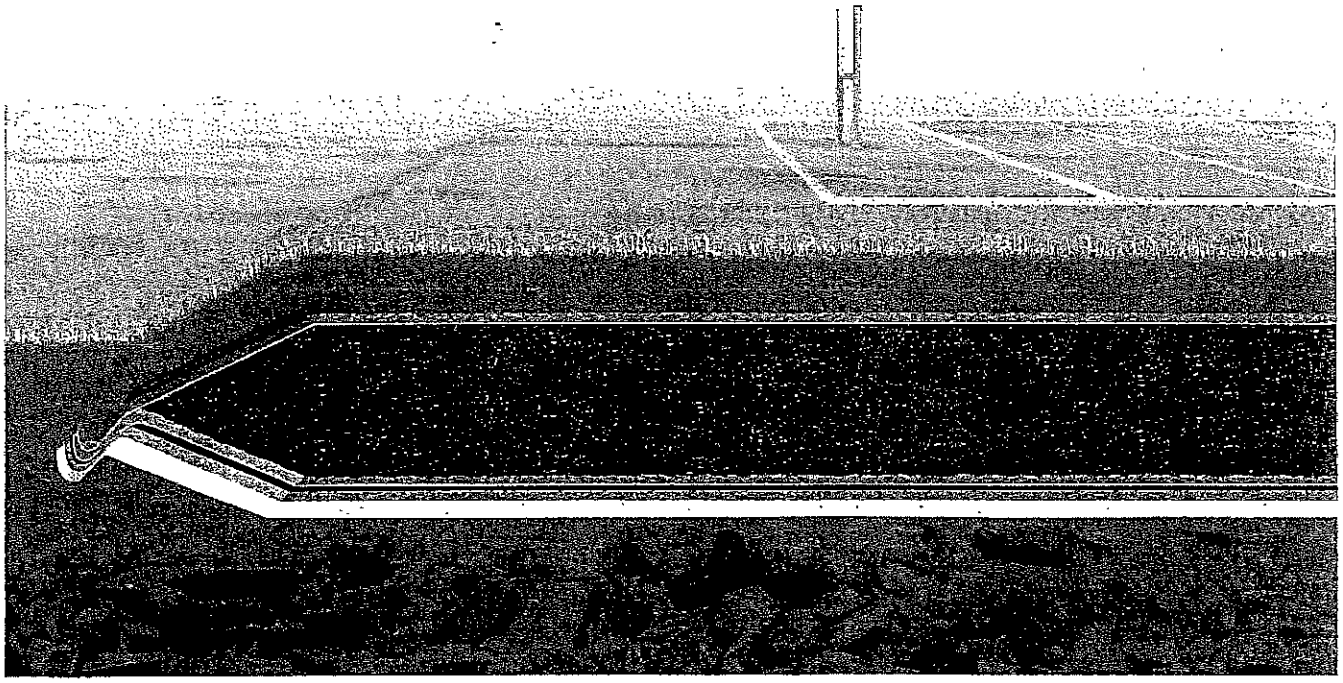


Mirafi® woven geotextile used for basal reinforcement of embankment on soft soil

Mirafi® woven geotextile used for basal reinforcement of embankment on piles

Environmental engineering

TenCate Geosynthetics are used for a variety of applications for landfill and waste-containment structures. Examples include protection layers for geomembrane liners, veneer reinforcement for the enhancement of material interface properties, reinforcement to steepen landfill containment slopes, reinforcement to support liner systems constructed over compressible foundations, reinforcement to reclaim soft tailings deposits, and drainage for gas and liquid removal. TenCate Geosynthetics are also used as tubular containment structures for the cost-effective dewatering of a wide variety of slurry wastes.



TenCate Geosynthetics acts as a protection layer for geomembrane liners in landfill and waste containment facilities. The geosynthetic protects the geomembrane from puncture enabling its installation adjacent to natural ground and granular layers.

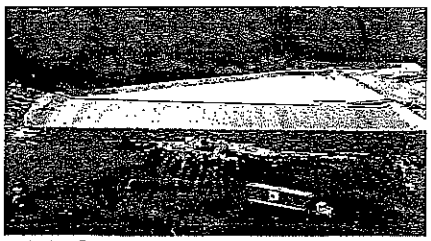
TenCate Geosynthetics can be used as a filter in the drainage layers of landfill and waste facilities. The geosynthetic can filter effectively the leachate and gases to outlet points.

TenCate Geosynthetics can be used for a variety of reinforced soil engineering applications within landfill and waste facilities. These applications range from steepening slopes to increase landfill capacity, to providing veneer reinforcement to increase interface friction between landfill liner layers, to supporting liner systems constructed over areas subject to differential deformation.

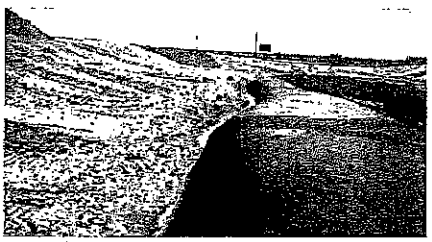
The early reclamation of tailings and other waste lagoons can be performed using TenCate Geosynthetics to facilitate the construction of capping layers. The use of TenCate Geosynthetics with high tensile stiffness characteristics enables a capping layer to be constructed economically over disused tailings lagoons at an earlier stage than would be possible employing conventional techniques.

TenCate Geosynthetics are used as permeable tubular containment structures to efficiently dewater slurry wastes. Here, the geosynthetic enables the water contained in the slurry waste to pass while the solid matter is retained within the tubular containment structure.

Mirafi® woven geotextile used to filter leachate in a landfill



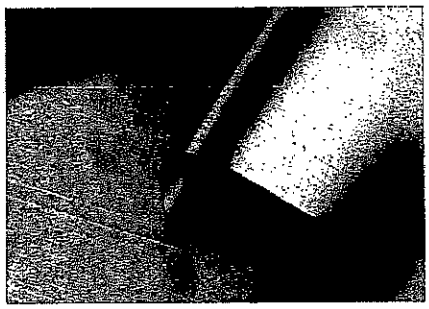
Polyfelt® nonwoven geotextile used for liner protection in a landfill



Mirafi® woven geotextile used to construct capping layer over very soft tailings

TenCate Geosynthetics product range

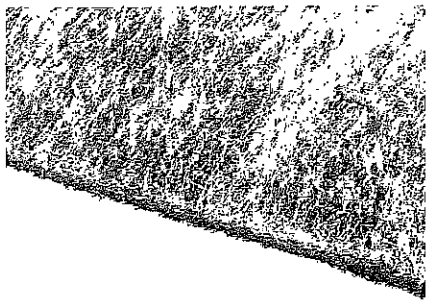
TenCate Geosynthetics provide an extensive range of geosynthetics that have proved ideal for transportation, hydraulic and marine, reinforced soil and environmental engineering applications. This range of geosynthetics can be divided into four material categories as described below.



TENCATE Mirafi

Mirafi® woven geotextiles manufactured from high modulus polypropylene (PP) and polyester (PET) yarns. These materials combine properties of high tensile strength at low strains that enable them to be used as separation and basal reinforcement layers in conjunction with soft foundation soils and voids. They are also installed in difficult and severe hydraulic conditions.

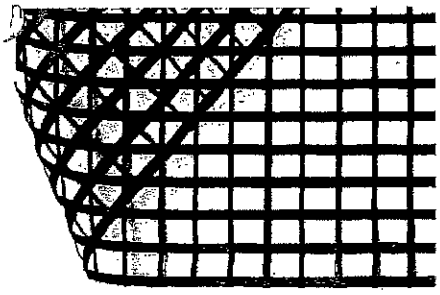
Mirafi® FW series PP geotextiles are used where critical filtration and strength are required. **Mirafi® PP** and **HP** series PP geotextiles are used for stabilisation over very soft soils and for difficult hydraulic applications. **Mirafi® PET** series geotextiles are used for basal reinforcement beneath embankments constructed over soft foundations, over voids and over piles.



TENCATE Polyfelt

Polyfelt® nonwoven geotextiles manufactured from continuous polypropylene (PP) fibres. These materials combine the properties of medium tensile strength and high strains with high water flow rates. This makes them ideal for separation, filtration, strain alleviation and geomembrane protection layers.

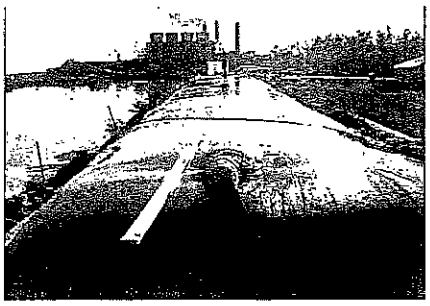
Polyfelt® TS series geotextiles combine robust mechanical properties with high water flow rates and small pore sizes to effectively separate and filter a wide range of soil types.



TENCATE Miragrid

Miragrid® geogrids manufactured from high modulus polyester (PET) yarns are used for reinforced soil slopes and walls. These materials combine properties of good tensile strength at defined strains that enable them to be placed in layers in the slope or wall to enhance stability and control deformations.

Miragrid® GX series geogrids combine the properties of excellent long term strength at low strains to effectively reinforce soil slopes and retaining walls.



TENCATE Geotube

Geotube® containment units manufactured from woven polypropylene (PP) engineered fabrics. These units enable the containment and controlled drainage of sand, other soils, and various slurry wastes.

Geotube® GT series containment units are made from high modulus PP engineered fabrics combined with high capacity seams to ensure container integrity during filling and during operational life.

TENCATE
Mirafi®

SEPARATION

Mirafi® X-Series Woven Polypropylene Geotextiles
for Soil Separation

Mirafi® X-Series Woven Polypropylene Geotextiles

TenCate™ develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

The Difference Mirafi® X-Series Geotextiles Make:

- Construction. Woven slit-film construction offers good resistance to installation abuse.
- Strength. High grab tensile and puncture strengths provide good performance in a wide range of roadway applications.
- Environmental. Mirafi® X-Series geotextiles are chemically stable in a wide range of aggressive environments.
- Cost Effective. Mirafi® X-Series geotextiles provide economical solutions to many civil engineering applications including a cost-effective road base separation layer.

APPLICATIONS

Mirafi® 500X applications include separation under parking lots, residential streets, and roadways. Mirafi® 500X is used over good to moderate strength subgrades for separation of base materials. Mirafi® 500X meets AASHTO M288-00 Specifications for Stabilization and Separation - Class 3.

Mirafi® 600X is used for separation and stabilization over moderate subgrades where coarse, angular, and abrasive base material is required. Mirafi® 600X provides separation and stabilization when moderate loads are expected. Mirafi® 600X meets AASHTO M288-00 Specifications for Stabilization and Separation - Class 1 and 2.

INSTALLATION GUIDELINES*

Geotextile Placement

Direct placement of the geotextile on the prepared site is usually preferable. Generally, it is advisable to leave vegetative cover such as grass and weeds in place to provide a support matting for construction activities. It should be rolled out flat and tight with no folds. The rolls should be oriented as shown on plans to insure the principal strength direction of the material is placed in the correct orientation. Adjacent rolls should be overlapped or seamed as a function of subgrade strength (CBR).

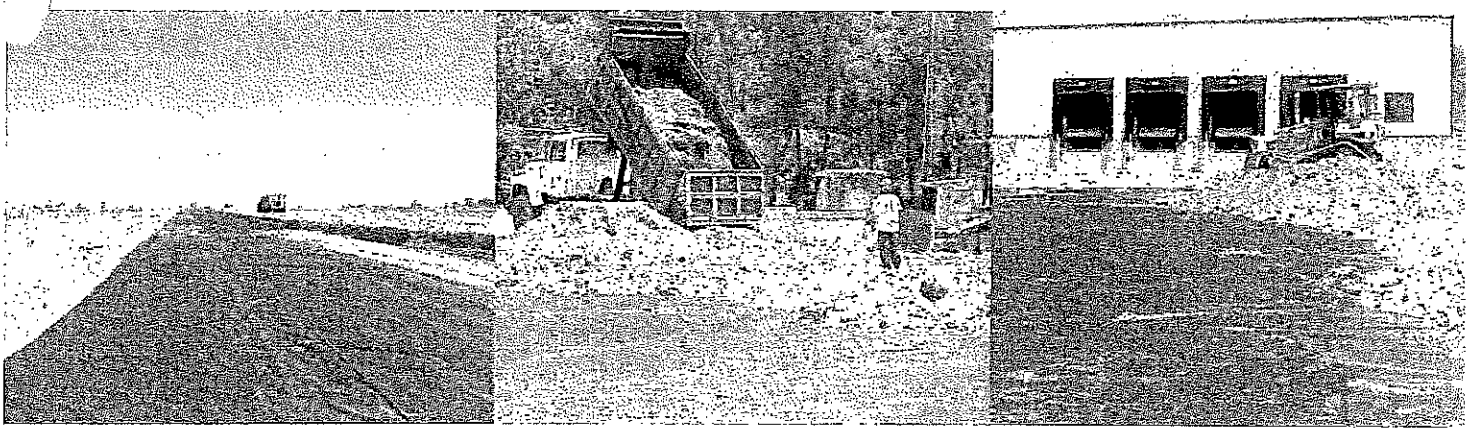
Prior to fill placement, the geosynthetic should be held in place using suitable means such as pins, piles of soil, etc. so that it does not move around during fill placement.

Fill Placement

Fill should be placed directly over the geosyn thetic in 20cm (8in) to 30cm (12in) loose lifts. For very weak subgrades, 45cm (18in) or thicker lifts may be required to stabilize the subgrade, as directed by the engineer.

Typically, vehicles should not be driven on Mirafi® X-Series geotextiles. Tracked construction equipment should not be operated directly upon the geosynthetic. A minimum fill soil thickness of 15cm (6in) is required prior to operation of tracked vehicles over the geosynthetic. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geosynthetic.

* These guidelines serve as a general basis for installation. Detailed instructions are available from your TenCate™ representative.



Protective & Outdoor Fabrics
Aerospace Composites
Armour Composites
Geosynthetics
Industrial Fabrics
Synthetic Grass

TENCATE
materials that make a difference

TENCATE
Mirafi

Mirafi® X Woven Polypropylene Geotextiles

Properties of Mirafi® X Woven Polypropylene Geotextiles

Property		Unit	500X	550X	600X
Mechanical properties					
Wide width tensile strength					
ISO 10319, ASTM D4595					
Mean ultimate tensile strength	MD	kN/m	25	35	50
Mean ultimate tensile strength	CD	kN/m	25	35	50
Extension at peak strength	MD	%	20	20	20
Extension at peak strength	CD	%	20	20	20
Grab tensile strength					
ASTM D4632					
Mean tensile strength	MD	kN	1.0	1.2	1.5
Mean tensile strength	CD	kN	1.0	1.2	1.5
Extension at peak strength	MD	%	15	15	15
Extension at peak strength	CD	%	10	10	15
CBR puncture strength					
ISO 12236, ASTM D6241					
Mean puncture strength		kN	3.2	4.2	5.5
UV resistance after 500 hrs					
ASTM D4355					
Strength retention		%	70	70	70
Hydraulic properties					
Apparent opening size – ASTM D4751		mm	0.425	0.425	0.425
Water permeability – ASTM D4491					
Mean flow rate		l/m²/s	5	5	5
Mean permittivity		s^{-1}	0.05	0.05	0.2
Nominal roll width		m	4	4	4
Nominal roll length		m	200	200	200
Estimated roll weight		kg	115	140	160

200-605-Ide-11/07

Ten Cate Industrial Zhuhai Co., Ltd.
South of Nangang Road W,
Harbour Industrial Zone, Zhuhai 519050, China
Tel: +86 756 886 1516, Fax: +86 756 886 1610
Email: info.zhuhai@tencate.com

TenCate Geosynthetics Asia Sdn. Bhd.
14, Jalan Sementa 27/91, Seksyen 27,
40400 Shah Alam, Selangor Darul Ehsan, Malaysia
Tel: +60 3 5192 8568, Fax: +60 3 5192 8575
Email: info.asia@tencate.com

TENCATE
materials that make a difference

WEST KOWLOON RECLAMATION

Your Ref.: WK/505/245 & 247

Our Ref. : UA5/8.16/93/1344

Date : 8th April 1993

Chief Resident Engineer's Office,
West Kowloon Reclamation,
Junction of Tonkin Street and
Tung Chau Street (CWA 55),
Cheung Sha Wan, Kowloon.
Tel. No.: 304 3288
Fax. No.: 304 3071

Contractor's Representative,
Kumagai-HAM-Maeda J. V.,
West Kowloon Reclamation Site Office.

Dear Sir,

Contract No. UA5/90
West Kowloon Reclamation Northern Area Phase I
Area TK1 - Revetment MN

I refer to your above letters dated 1st and 3rd April 1993 respectively, and wish to confirm that I have no objection to your proposal to use Mirfai 600X woven geotextile membrane instead of Terram 2000 for the construction of the short length of revetment at the northern end of revetment MN provided there will be no additional cost and time to the contract.

Yours faithfully,

T.J. McKinlay
Engineer's Representative

MJF/VAR/cwl

c.c. TWA
LKY

KUMAGAI-HAM-MAEDA		
RCVD. 13 APR. 1993		
File: WK/505		
	ACT	INF
FK Man 沈		
Matsuki		✓
Hamer		✓
O/S		
A/C		
MF		
[illegible]	✓	

Appendix E

Proposal of Pilot Test for Silt Curtain

Contract No. HK/2009/01
Wan Chai Development Phase II
Central – Wan Chai Bypass at Hong Kong Convention and Exhibition Centre

Proposal on Pilot Test for Silt Curtain – Revision 0

1 Introduction

According to the Contract requirement and the requirement in the Environmental Permit, silt curtain shall be deployed around seawall dredging and seawall dredging and seawall trench filling in reclamation shoreline zones to minimize migration of suspended soil particles into the water course.

As per Particular Specification Clause 21.54 (20), a pilot test shall be carried out to demonstrate the capability of the silt curtain to reduce sediment loss in accordance with the Environmental Permit.

This proposal describes in details the arrangement of the pilot test for the silt curtain.

2 Pilot Test Setup

2.1 A steel sediment tank with size 2.4m long X 1.2m wide X 1.2m high will be used for the pilot test.

2.2 Cut a piece of proposed geotextile to be tested with size approximately 1.5m X 1.2m.

2.3 Fix the geotextile to the centre of the steel sediment tank. Hang the top of the geotextile to a steel tube to keep the geotextile in vertical position. The sides of the geotextile will be fixed to the side wall of the tank with rubber seal and the bottom of the geotextile will be fixed by steel chain or other means of sinker to prevent migration of suspended soil particles from one side of the geotextile to the other side through the gaps between the geotextile and the steel tank.

2.4 Fill the steel sediment tank with tap water to 900mm deep.

3 Pilot Test Arrangement

3.1 Collect sediment from the existing seabed within the site.

3.2 Add approximately 500ml of sediment to one side of the sediment tank. It is estimated that 500ml of sediment will bring up the SS value of one side of the sediment tank to 200mg/L. More sediment may be added to the tank if required.

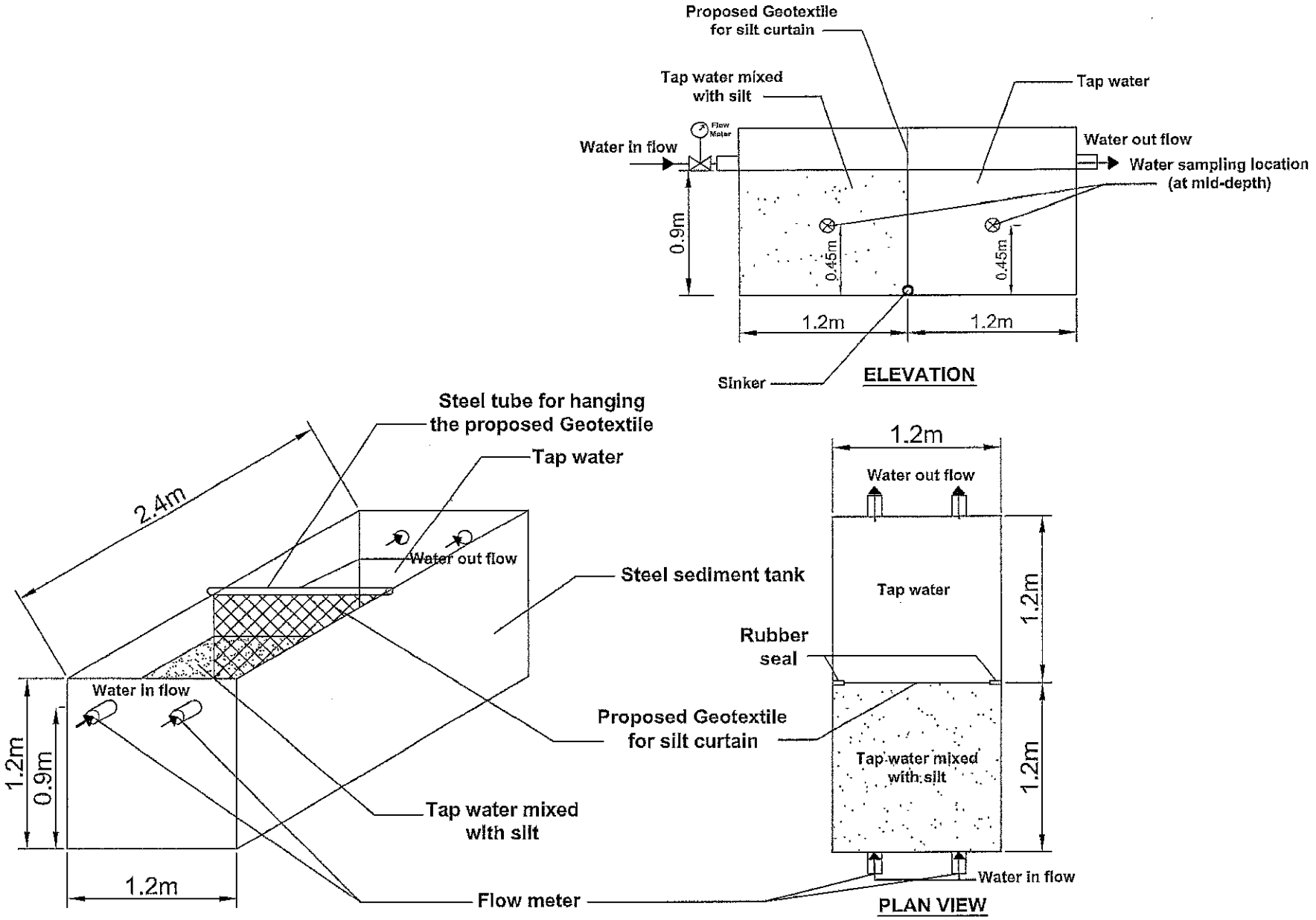
3.3 To simulate the flow of water through the site curtain, tap water will be continuously added to the tank on the side where sediment is added and water will continuously flow out through the outlet holes on the other side of the tank. A flow meter will be installed at the intake holes of the tank to monitor and control the flow rate. According to the criteria in EIA report under clause 5.8.12, the flow rate for the pilot test should not greater than $1.0ms^{-1}$

3.4 Using a tailor-made paddle, thoroughly mix the sediment with the water on one side of the tank for minimum 3 minutes.

3.5 Take water samples immediately after mixing of the sediment. Take one water sample on each side of the geotextile, at mid-depth of the tank. Approved laboratory will be employed to take water samples and to carry out laboratory testing to obtain the SS value of the corresponding water samples.

3.6 RSS inspector, representatives of Environmental Team (ET) and Independent Environmental Checker (IEC) will be invited to witness the pilot test.

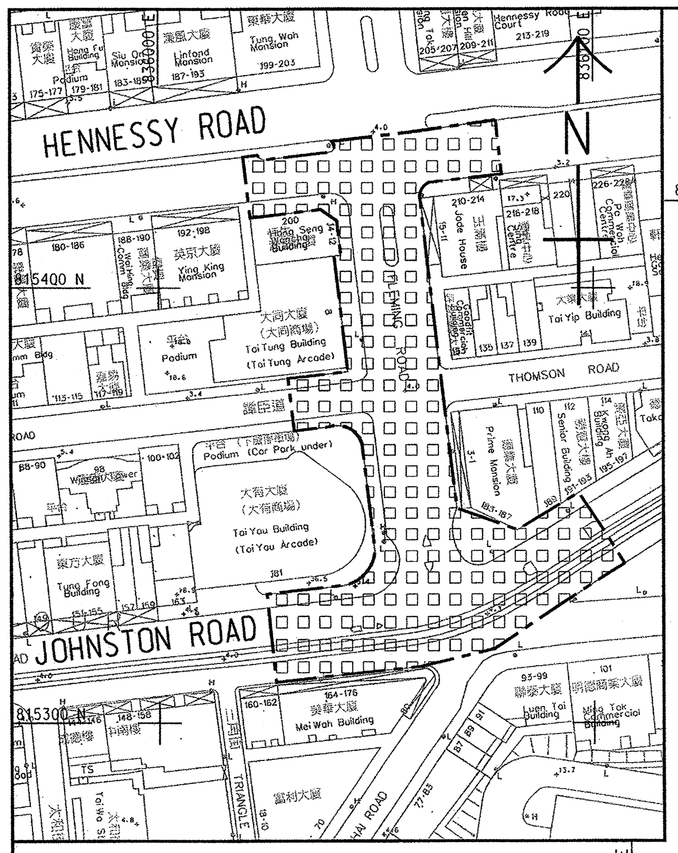
3.7 According to the criteria in EIA under clause 5.8.17, the geotextile shall reduce the dispersion of SS by a factor of (or about 75%).

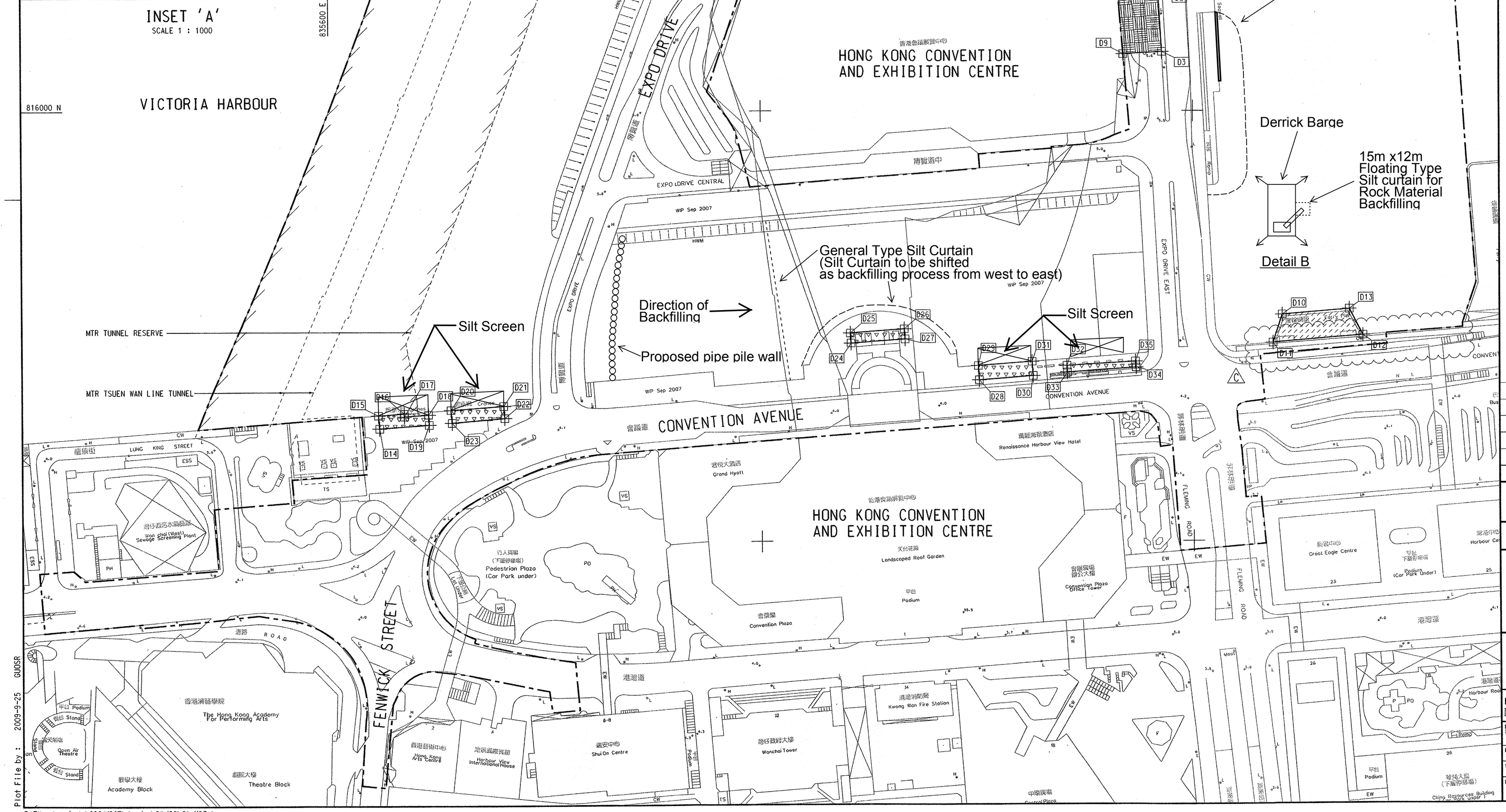


Proposed Pilot Test Arrangement for Silt Curtain

Appendix F

Layout Plan Indicating the Tentative Location of Proposed Silt Curtains during Different Stage of Dredging and Filling Works





KEY PLAN
SCALE 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60041297/C1/100/1101.
2. SETTING OUT POINT OF PORTION GLA-THK 1397 TGLA SHALL REFER TO DRAWING NO. 60041297/C1/100/1203.
3. THESE PARTS OF THE SITE INCLUDE THE GROUND FLOOR ONLY. THAT IS, THE CONTRACTOR WILL BE GIVEN POSSESSION OF SWITCHROOM NO. FD1242 AND SWITCHROOM NO. FD1658 ONLY, WHICH ARE LOCATED AT THE GROUND FLOOR OF THE HKCEC, AS SHOWN ON DRAWING NO. 60041297/C1/700/7004.

INT	COORDINATES	
	EASTING	NORTHING
D1	836021.714	816061.636
D2	835984.056	816059.333
D3	835985.784	816027.817
D9	835967.907	816026.725
D10	836041.258	815905.224
D11	836036.928	815892.191
D12	836078.504	815895.450
D13	836072.229	815907.674
D14	835623.144	815853.003
D15	835622.571	815859.010
D16	835634.478	815859.907
D17	835634.613	815858.545
D18	835645.758	815859.394
D19	835646.068	815854.666
D20	835656.110	815861.535
D21	835680.564	815863.378
D22	835681.064	815857.655
D23	835656.708	815855.546
D24	835841.525	815892.163
D25	835841.165	815896.881
D26	835866.184	815898.859
D27	835866.549	815894.085
D28	835900.854	815874.931
D29	835900.425	815881.632
D30	835925.797	815876.844
D31	835925.284	815883.543
D32	835941.372	815881.565
D33	835941.631	815878.419
D34	835973.496	815880.698
D35	835973.148	815883.610
D36	836018.347	816094.306
D37	836034.925	815892.034
D38	836026.080	815979.896
D39	836079.813	815986.102
D40	836018.347	816094.306

REV. 修訂	DESCRIPTION 內容摘要	CHECKED 複核 D.E.	CHECKED 複核 P.E.	DATE 日期
D	WORKING DRAWING	SWKM	JYL	JAN 10
C	TENDER ADDENDUM NO.4	SWKM	JYL	SEP 09
B	TENDER ADDENDUM NO.3	SWKM	JYL	SEP 09
A	TENDER ADDENDUM NO.1	SWKM	JYL	SEP 09
-	TENDER DRAWING	SWKM	JYL	AUG 09

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

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II -
CENTRAL - WAN CHAI BYPASS AT
HONG KONG CONVENTION AND EXHIBITION CENTRE

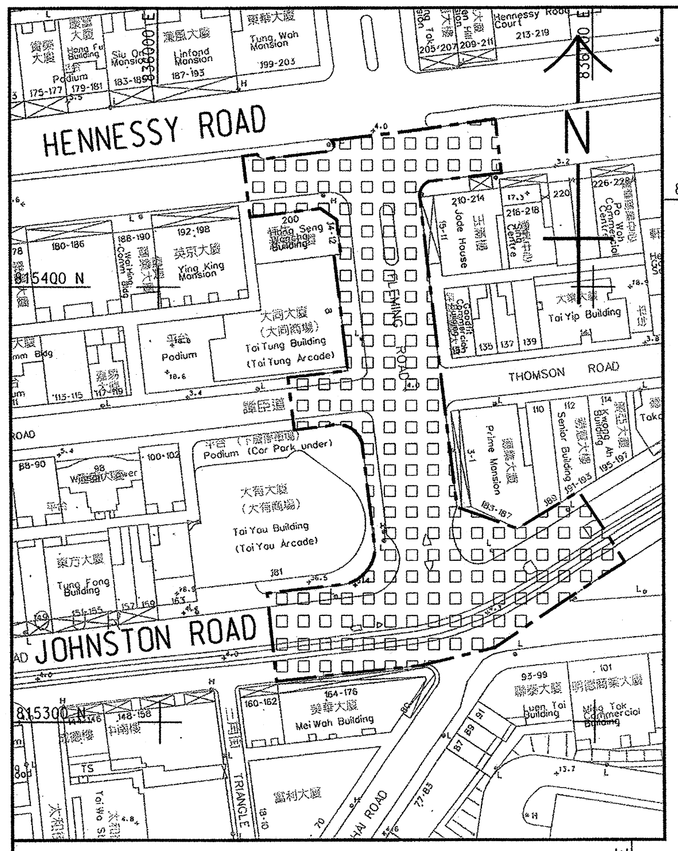
PORTIONS OF THE SITE

SHEET 3 OF 3

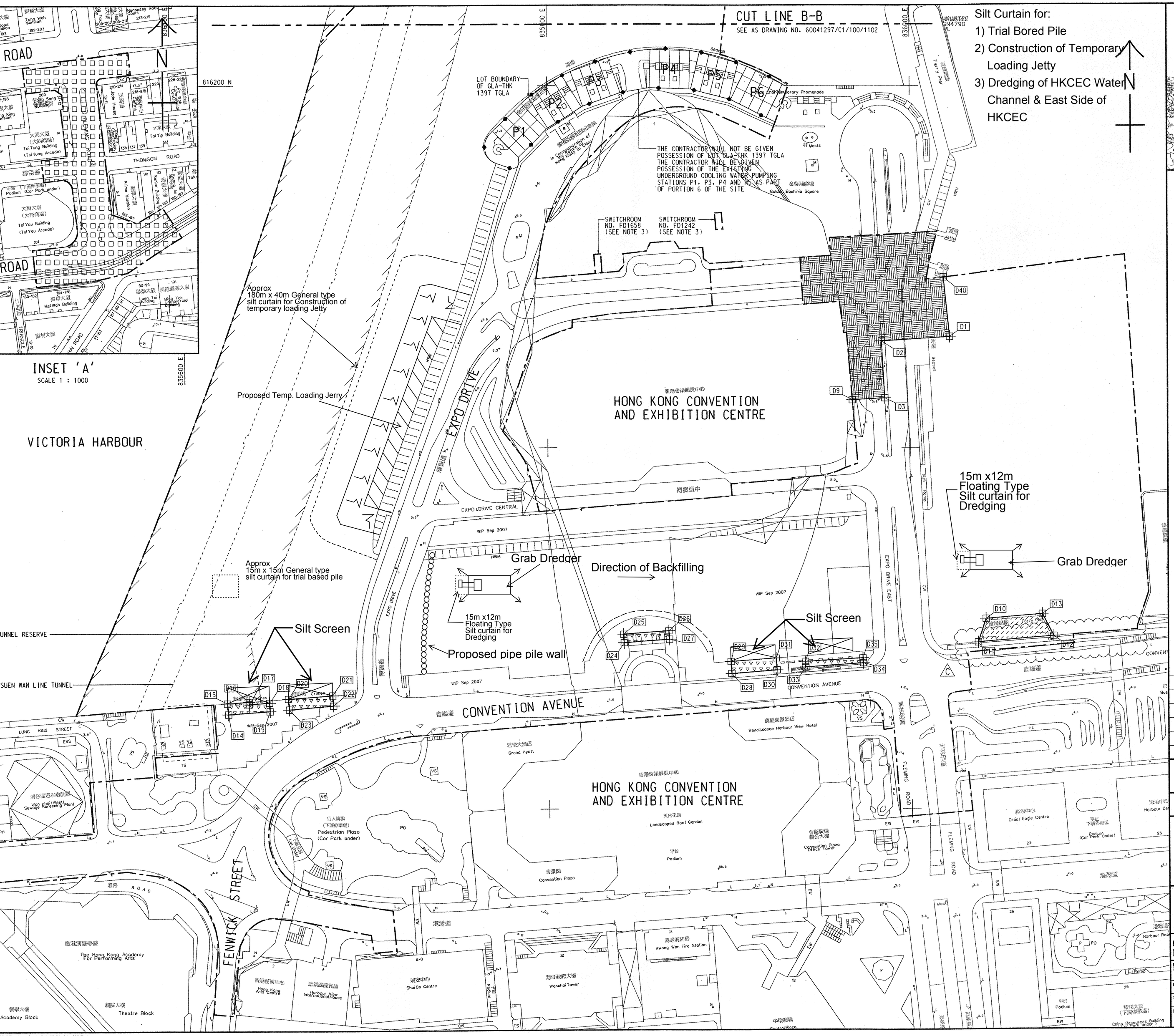
AECOM

DRG.NO. 圖紙編號 60041297/C1/100/1103D

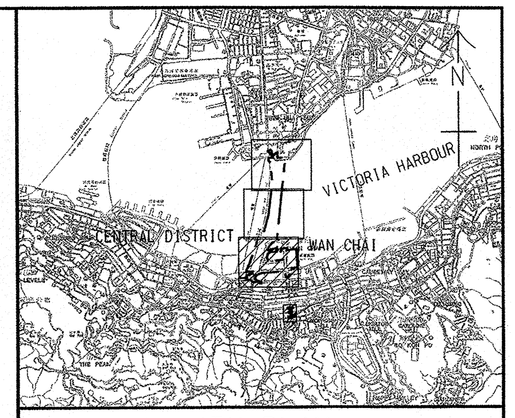
DESIGNED BY 設計 AWSY
CONTRACT NO. 合約編號 HK/2009/01
P. Dir. APPROVED 批准人 PMC
DRAWN BY 繪圖 ADC
SCALE 比例 A1 1:1000
DIMENSIONS ARE IN 尺寸單位 METRES
STATUS 階段 WORKING DRAWING



INSET 'A'
SCALE 1 : 1000



Silt Curtain for:
1) Trial Bored Pile
2) Construction of Temporary Loading Jetty
3) Dredging of HKCEC Water Channel & East Side of HKCEC



KEY PLAN
SCALE 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60041297/C1/100/1101.
2. SETTING OUT POINT OF PORTION GLA-THK 1397 TGLA SHALL REFER TO DRAWING NO. 60041297/C1/100/1203.
3. THESE PARTS OF THE SITE INCLUDE THE GROUND FLOOR ONLY. THAT IS, THE CONTRACTOR WILL BE GIVEN POSSESSION OF SWITCHROOM NO. FD1242 AND SWITCHROOM NO. FD1658 ONLY, WHICH ARE LOCATED AT THE GROUND FLOOR OF THE HKCEC. AS SHOWN ON DRAWING NO. 60041297/C1/700/7004.

INT	COORDINATES	
	EASTING	NORTHING
D1	836021.714	816061.636
D2	835984.056	816059.333
D3	835985.784	816027.817
D9	835967.907	816026.725
D10	836041.258	815905.224
D11	836036.928	815892.191
D12	836078.504	815895.450
D13	836072.229	815907.674
D14	835623.144	815853.003
D15	835622.571	815859.010
D16	835634.478	815859.907
D17	835634.613	815858.545
D18	835645.758	815859.394
D19	835646.068	815854.666
D20	835656.110	815861.535
D21	835680.564	815863.378
D22	835681.064	815857.655
D23	835656.708	815855.546
D24	835841.525	815892.163
D25	835841.165	815896.881
D26	835866.184	815898.859
D27	835866.549	815894.085
D28	835900.854	815874.931
D29	835900.425	815881.632
D30	835925.797	815876.844
D31	835925.284	815883.543
D32	835941.372	815881.565
D33	835941.631	815878.419
D34	835973.496	815880.698
D35	835973.148	815883.610
D36	836018.347	816094.306
D37	836034.925	815892.034
D38	836026.080	815979.896
D39	836079.813	815986.102
D40	836018.347	816094.306

REV. 修訂	DESCRIPTION 內容摘要	DES. 設計	CHECKED 復核	DATE 日期
D	WORKING DRAWING	SWKM	JYL	JAN 10
C	TENDER ADDENDUM NO.4	SWKM	JYL	SEP 09
B	TENDER ADDENDUM NO.3	SWKM	JYL	SEP 09
A	TENDER ADDENDUM NO.1	SWKM	JYL	SEP 09
-	TENDER DRAWING	SWKM	JYL	AUG 09

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

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II - CENTRAL - WAN CHAI BYPASS AT HONG KONG CONVENTION AND EXHIBITION CENTRE

PORTIONS OF THE SITE

SHEET 3 OF 3

AECOM

DRG.NO. 圖紙編號 60041297/C1/100/1103D

DESIGNED BY 設計	AWSY	CONTRACT NO. 合約編號	HK/2009/01
DRAWN BY 繪圖	ADC	P. Dir. APPROVED 批准人	PMC
SCALE 比例	A1 1:1000	STATUS 階段	WORKING DRAWING
DIMENSIONS ARE IN 尺寸單位	METRES	© COPYRIGHT RESERVED 版權所有	

Plot File by : 2009-9-25 GUOSR

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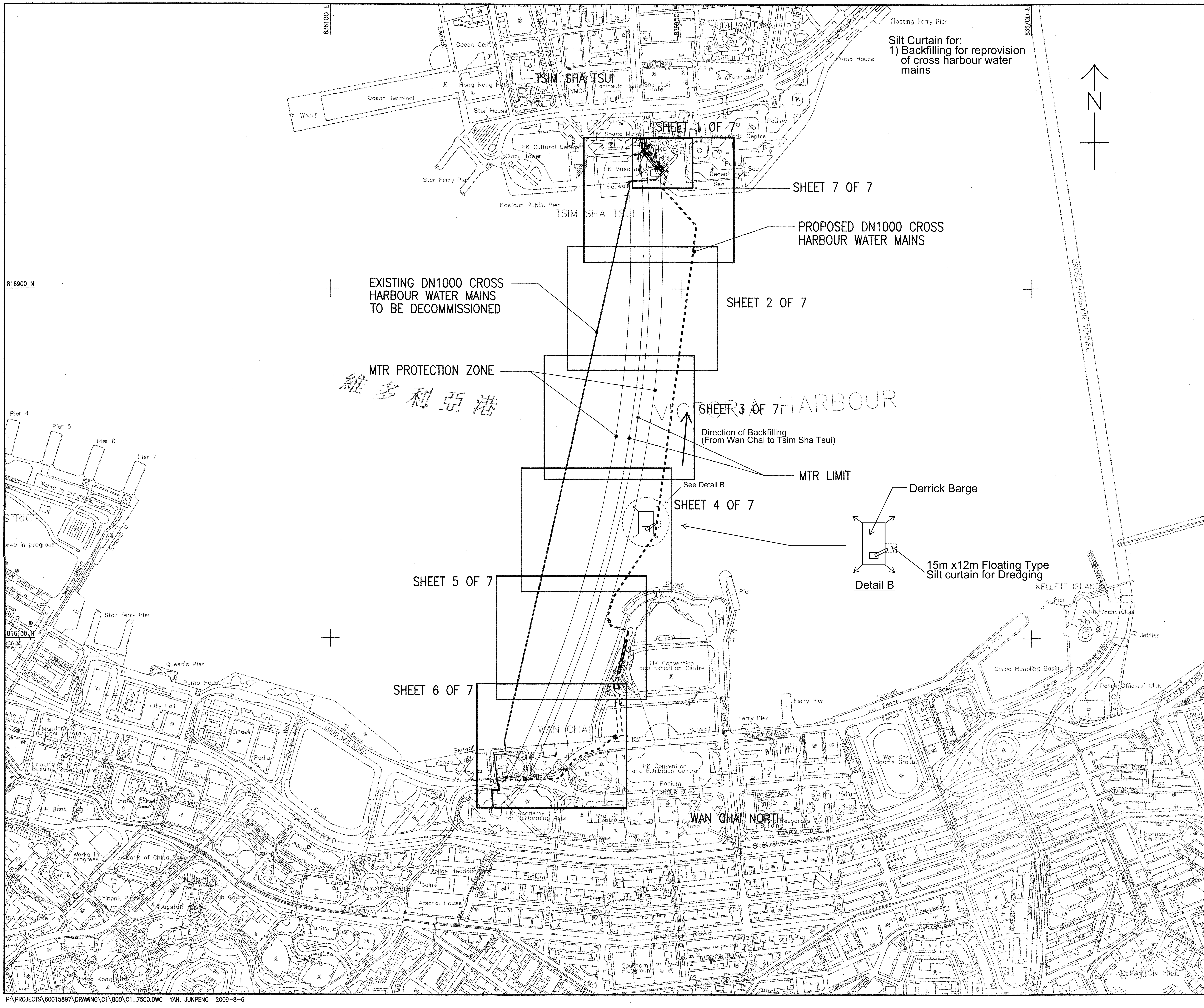

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NO. 60041297/C1/800/7502 TO 7507.
2. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60041297/C1/800/7501.

REV. 修訂	DESCRIPTION 內容摘要		CHECKED 覆核	DATE 日期
A	WORKING DRAWING	SWKM	JYL	JAN 10
-	TENDER DRAWING	SWKM	JYL	AUG 09

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

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II – CENTRAL – WAN CHAI BYPASS AT HONG KONG CONVENTION AND EXHIBITION CENTRE

KEY PLAN – CROSS HARBOUR WATER MAINS

AECOM

DRG.NO. 圖紙編號 60041297/C1/800/7500A

DESIGNED BY 設計 YMC	CONTRACT NO. 合約編號 HK/2009/01	P. Dir. APPROVED 批准人 PMC	
DRAWN BY 繪圖 LL	STATUS 情況 WORKING DRAWING		
SCALE 比例 A1 1:4000			
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版權所有		

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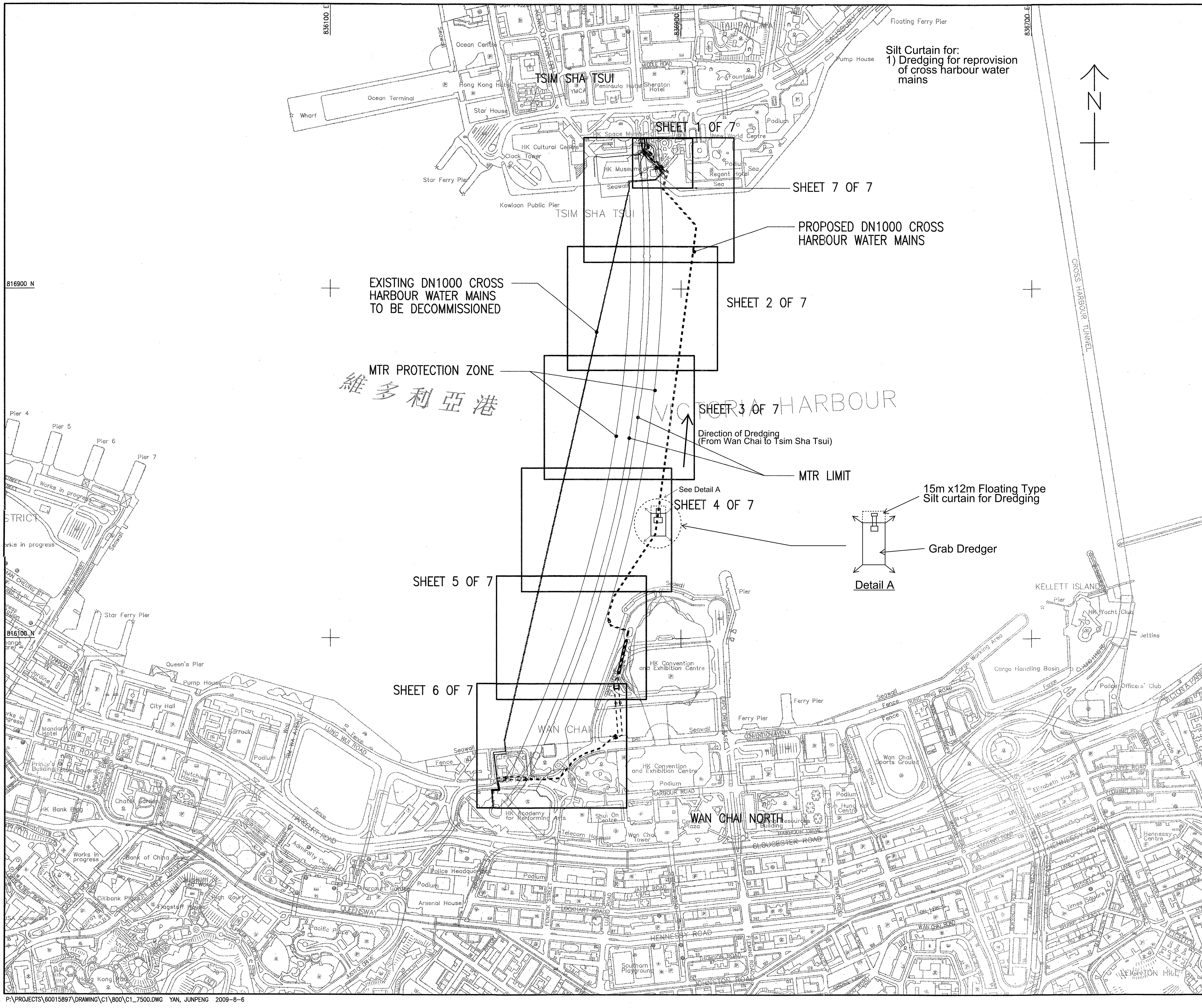


NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NO. 60041297/C1/800/7502 TO 7507.
2. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60041297/C1/800/7501.

REV. 修訂	DESCRIPTION 內容摘要		CHECKED 覆核	DATE 日期
A	WORKING DRAWING	SWKM	JYL	JAN 10
-	TENDER DRAWING	SWKM	JYL	AUG 09

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

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II – CENTRAL – WAN CHAI BYPASS AT HONG KONG CONVENTION AND EXHIBITION CENTRE

KEY PLAN – CROSS HARBOUR WATER MAINS

AECOM

DRG.NO. 圖紙編號 60041297/C1/800/7500A

DESIGNED BY 設計 YMC | CONTRACT NO. 合約編號 HK/2009/01 | P. Dir. APPROVED 批准人 PMC

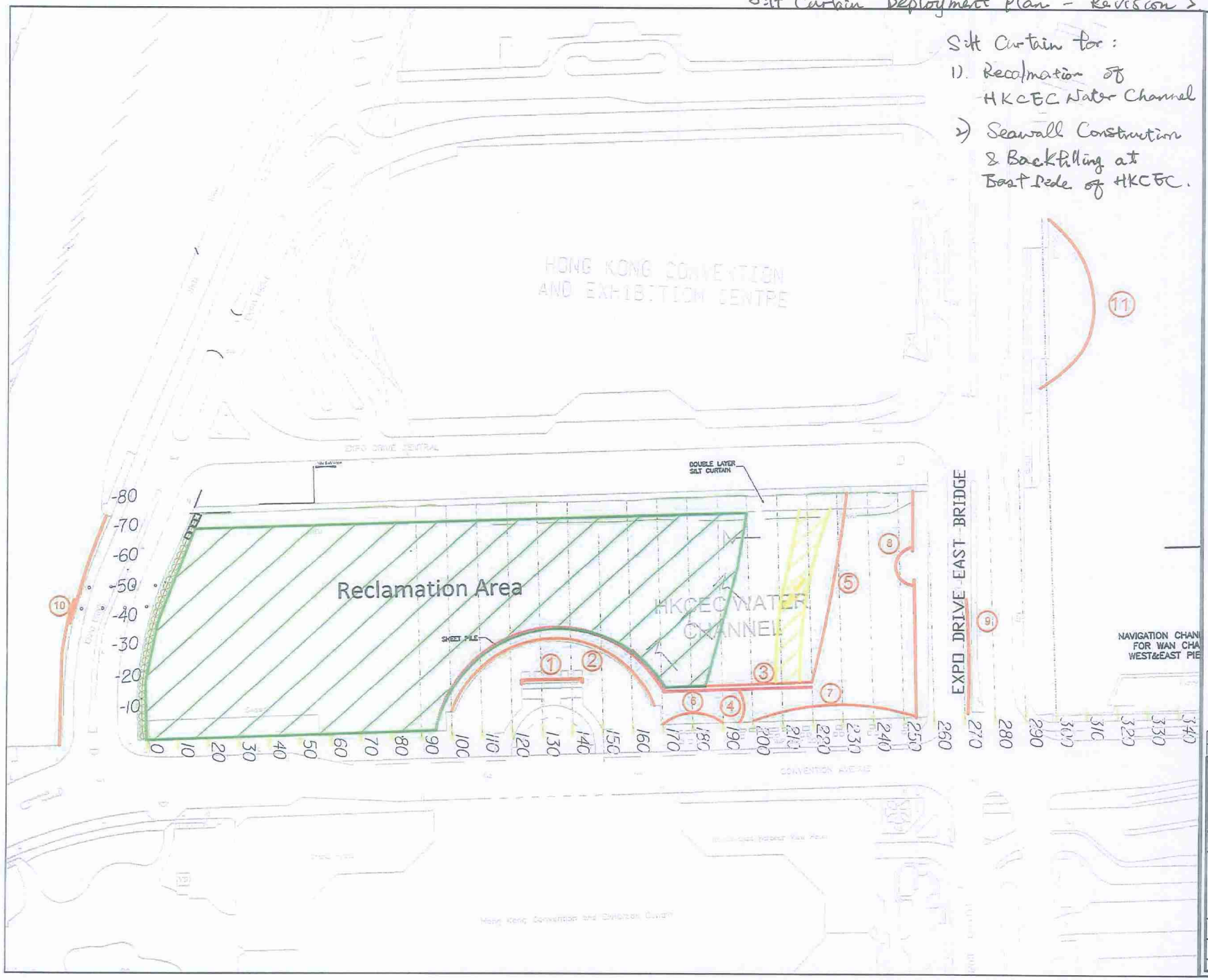
DRAWN BY 繪圖 LL | STATUS 狀況 WORKING DRAWING

SCALE 比例 A1 1:4000

DIMENSIONS ARE IN 尺寸單位 METRES

P:\PROJECTS\60015897\DRAWING\C1\800\C1_7500.DWG YAN, JUNPENG 2009-8-6

Silt Curtain Deployment Plan - Revision 5 (Sheet 5 of 5).



Rev	Description	By	Date
0	CHECKED PRINT	KW	18-10-11

CONTRACTOR

Chun Wo - Leader JV

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II - CENTRAL - WAN CHAI BYPASS AT HONG KONG CONVENTION AND EXHIBITION CENTRE

SILT CURTAIN PROFILE AT HKCEC WATER CHANNEL

DRAWING NO. SKETCH NO. 01

DATE 20-07-2012

SCALE NTS

Appendix G

Silt Curtain Inspection Checklist

隔泥幕檢查表 Silt Curtain Inspection Checklist

隔泥幕名稱：Silt Curtain at HKCEC Water Channel

地點：Location plan as per attached (Please tick for which silt curtain has been checked)

No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13

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？						

檢查人：_____

俊和－利達 聯營

Noted：_____

AECOM

*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。

俊和 CHUN WO 利達 LEADER 俊和 - 利達聯營
CHUN WO - LEADER JOINT VENTURE

Our Ref.: CL0907/03.09.00.00/1367/L
Date: 15 November 2010

Environmental Protection Department
Branch Office
28th Floor, Southorn Centre
130 Hennessy Road,
Wan Chai, Hong Kong.

By Post

Dear Sir,

Contract No. HK/2009/01
Wan Chai Development Phase II – Central -Wan Chai Bypass at Hong Kong Convention and Exhibition Centre
Report on Field Test for Silt Curtain (Rev. A)

Pursuant to Further Environmental Permit No.: FEP-02/356/2009 – Condition 2.8 Silt Curtain Deployment Plan and referring to your letter under your reference (11) in EP2/H4/S3/15 Pt.7 dated 28 May 2010 regarding the Silt Curtain Deployment Plan, we submit herewith the captioned report for your approval. We would like to supersede the captioned report (Rev. 0) submitted on 26 August 2010 (Our Ref.: CL0907/03.09.00.00/1105/L).

The captioned report is certified by Environmental Team Leader (ETL) and verified by Independent Environmental Checker (IEC).

Should you have any enquiries regarding this issue, please do not hesitate to contact our Mr. Shelton Chan by phone: 2162-9946, mobile: 5395-5470 or email: shelton.chan@leadercon.com.hk.

Yours faithfully
For and on behalf of
Chun Wo - Leader Joint Venture

Paul Yu
Site Agent
ST/PY/YCL/TW/BW/SC/KKC/jf

Encl.
c.c. AACL – H.O. (w/e Encl.)
AECOM – Mr. Henry Chan (w/o Encl.)
LAM / ETL – Mr. Raymond Dai (w/o Encl.)
ENVIRON / IEC – Mr. David Yeung (w/o Encl.)

Lam Geotechnics Limited
Ground Investigation & Instrumentation Professionals

華益土力有限公司

Ref : G1001/CS/L225/FEP-02/356/2009
Date : 12 November 2010

Chun Wo – Leader Joint Venture
5C, Hong Kong Spinners Industrial Building, Phase I,
602 – 603 Tai Nan Street,
Cheung Sha Wan
Kowloon

Attn: Project Manager

Dear Sir,

Contract No. HK/2009/01
Wanchai Development Phase II – Central –Wan Chai Bypass at Hong Kong Convention and Exhibition Centre
Report on Field Test for Silt Curtain (Revision A)

Referring to the captioned submission dated 11 November 2010, we have reviewed your submitted details and hereby certified this submission in accordance with Conditions 2.8 of FEP-02/356/2009.

Should you have any enquiry, please feel free to contact the undersigned at 2839 5666.

Yours faithfully,

Raymond Dai
Environmental Team Leader

c.c.

CEDD	- Mr. Patrick Keung	(By Fax: 2577 5040)
AECOM (WDII)	- Mr. Frankie Fan	(By Fax: 2587 1877)
ENVIRON	- Mr. David Yeung	(By Fax: 3548 6988)

11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong
Tel: (852) 2882-3939 Fax: (852) 2882-3331
Website: www.lamgeo.com Email: info@lamgeo.com

ENVIRON

Ref.: AACWBIECEM00_0_0613L.10 11 November 2010

Chun Wo – Leader Joint Venture
5C, Hong Kong Spinners Industrial Building Phase 1
601-603 Tai Nan West Street
Cheung Sha Wan
Kowloon

By Post and E-mail

Attention: Mr. Paul Yu

Dear Sir,

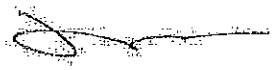
Re: Contract No. HK/2009/01
Wan Chai Development Phase II – Central-Wan Chai Bypass at Hong Kong Conventional and Exhibition Centre
Report on Field Test for Silt Curtain (Revision A)

Reference is made to Chun Wo – Leader Joint Venture's submission of the captioned Report on Field Test for Silt Curtain (Revision A) on 11 November 2010.

Please be informed that we have no adverse comments on the captioned submission. We write to verify the captioned submission according to Condition 1.9 and 2.8 of FEP-02/356/2009.

Thank you for your kind attention. Please feel free to contact the undersigned at 3743 0788 should you have any queries.

Yours sincerely,



David Yeung
Independent Environmental Checker

c.c.	CEDD	Mr. Patrick Keung	by fax: 2577 5040
	AECOM	Mr. Frankie Fan	by fax: 2587 1877
	AECOM	Mr. Kelvin Cheng	by fax: 2691 2649
	LAM	Mr. Raymond Dai	by fax: 2882 3331

Q:\Projects\AACWBIECEM00\Corr\AACWBIECEM00_0_0613L.10.doc

俊和 - 利達聯營
CHUN WO - LEADER JOINT VENTURE

Contract No. HK/2009/01

Wan Chai Development Phase II – Central -Wan Chai Bypass at Hong Kong Convention and Exhibition Centre

Report on Field Test for Silt Curtain

Revision	Date of Issue	Remarks	Author	Approved
0	6 Aug 10	Initial issue	DW	PY
A	11 Nov 10	Updated field test result for Mirafi FW300	SC	PY

Contract No. HK/2009/01
Wan Chai Development Phase II – Central – Wan Chai Bypass at Hong Kong Convention and Exhibition Centre

1. Date and Time of Field Test

1.1 1st Field Test
Date: 20th July 2010
Time: 17:30

1.2 2nd Field test
Date: 19th Oct 2010
Time: 10:30

2. Introduction

Pursuant to the Section 5.8.17 of Volume 1 of the approved Environmental Impact Assessment (EIA) Report and letter dated 28 May 2010 issued by Environmental Protection Department (EPD) a Field Test for Silt Curtain should be performed to demonstrate to the satisfaction of EPD that the silt curtain could reduce the dispersion of suspended solids at least by a factor of 4 (or about 75%).

3. Methodology

Please refer to the "Proposal on Field Test for Silt Curtain".

4. Test Result

Suspended Solids (SS) samples were collected at the designated sampling points (as drawn in the attached diagram: *Sketch for the Sampling Location*) and analyzed by HOKLAS laboratory. The results were shown as follow:

4.1 Geotextile material for the fabrication of silt curtain was "Bontec SG100-100".

Sampling Point	Sample ID	Measured SS (mg/L)	Average Measured SS at Sampling Point	Screening Ability (% SS reduction, to 2s.f.)	Satisfied with the standard (75% SS reduction)
1	A	180	151	N.A.	N.A.
	B	122			
2	A	9	9	94%	Yes
	B	9			
3	A	8	7	96%	Yes
	B	6			
4	A	17	17	89%	Yes
	B	17			
5	A	11	10.5	93%	Yes
	B	10			

4.2 Geotextile material for the fabrication of silt curtain was "Mirafi FW300".

Sampling Point	Sample ID	Measured SS (mg/L)	Average Measured SS at Sampling Point	Screening Ability (% SS reduction, to 2s.f.)	Satisfied with the standard (75% SS reduction)
1	A	83	94	N.A.	N.A.
	B	105			
2	A	9	8	91%	Yes
	B	7			
3	A	8	8.5	91%	Yes
	B	9			
4	A	9	8.5	91%	Yes
	B	8			
5	A	9	9	90%	Yes
	B	9			

5. Conclusion

The silt curtains installed were able to satisfy the environmental performance stated in the approved EIA report.

Appendix A
HOKLAS Laboratory Report

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700732 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/1A

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature (1 °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	180

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

---- End ----

Tested By : T.K. HO

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : CHEMIST

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700740 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/1B

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	122

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

--- End ---

Tested By : T.K. HO

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : CHEMIST

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

HKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700758 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/2A

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand, (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

--- End ---

Tested By : T.K. HO

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : CHEMIST

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
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TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700766 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/2B

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

*: Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

----- End -----

Tested By : T.K. HO Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : CHEMIST

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HKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700774 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/3A

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	8

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

---- End ----

Tested By : T.K. HO Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : CHEMIST

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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700782 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/3B

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_6)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	6

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

--- End ---

Tested By : T.K. HO Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : CHEMIST

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700790 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/4A

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	17

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

---- End ----

Tested By : T.K. HO

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : CHEMIST

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TEL.: 852-2365 9123 FAX NO.: 852-2765 8034

HKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700805 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/4B

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-CT : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	17

* : Information provided by client

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

--- End ---

Tested By : T.K. HO Approved Signatory :

Checked By : GU CHIN Name : GU CHIN

Post : CHEMIST

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC10070813 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/5A

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	11

* : Information provided by client.

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

---- End ----

Tested By : T.K. HO Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN Post : CHEMIST

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TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC100700821 Date of Issue : 23-07-2010

Client* : Chun Wo - Leader Joint venture Date Received : 21-07-2010

Client Address* : -

Project* : Wan Chai development Phase II - Central-Wan Chai Bypass

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 22-07-2010

W.O. No.* : - Contract No.* : - Date Completed : 23-07-2010

GCE Serial No. : - Sampling Date* : 20-07-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101087 Test Unit No. : CH10093 Sample I.D.* : 100720/1730/M/58

Description : Field Test of Silt Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [	1 °C	In-House Method EWA-C1 : 2004	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 20ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	10

* : Information provided by client.

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-14

--- End ---

Tested By : T.K. HO

Checked By : GU CHIN

Approved Signatory :

Name : GU CHIN

Post : CHEMIST

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HOKLAS 624

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000216 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/1A

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	83

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8034
HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000224 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/1B

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	105

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICAL & CONCRETE ENGINEERING (H.K.) LTD.
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HKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000232 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/2A

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho Approved Signatory : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LIMITED
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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000240 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/2B

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	7

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

----- End -----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.
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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000258 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/3A

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	8

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000266 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/3B

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_6)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

--- End ---

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD
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HKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000274 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/4A

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed.4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho

Checked By : Gu Chin

Approved Signatory :

Name : Gu Chin

Post : Chemist

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HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000282 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/48

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	8

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

---- End ----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LIMITED
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 6894

HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000290 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/5A

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

----- End -----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LIMITED
6 KO SHAN RD., GROUND FL., HUNG HOM, KOWLOON, HONG KONG.
TEL.: 852-2365 9123 FAX NO.: 852-2765 8004

HOKLAS 024

TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000305 Date of Issue : 22-10-2010

Customer* : Chun Wo-Leader Joint Venture Date Received : 20-10-2010

Customer Address* : P.O. Box No. 28947 Gloucester Road Post Office

Project* : Wan Chai Development Phase II - Central - Wan Chai Bypass at HKCEC

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 21-10-2010

W.O. No.* : - Contract No.* : - Date Completed : 22-10-2010

GCE Serial No. : - Sampling Date* : 19-10-2010 Sample Type* : Sea Water

GCE Reg. No. : GCE101597 Test Unit No. : CH10134 Sample I.D.* : 101019/1030/m/5B

Description : Field test for Site Curtain

DESCRIPTION		TEST METHOD	TEST RESULT
pH Value at test solution temperature [ ] °C		APHA 21ed 4500-H^+ B	-
Biochemical Oxygen Demand (BOD_5)	mg/L	APHA 21ed 5210 B	-
Chemical Oxygen Demand (COD)	mg O_2/L	APHA 21ed 5220 D	-
Total Solids (TS)	mg/L	APHA 21ed 2540 B	-
Total Dissolved Solids (TDS)	mg/L	APHA 21ed 2540 C	-
Total Suspended Solids (TSS)	mg/L	APHA 21ed 2540 D	9

* : Information provided by customer

NOTE : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

REMARKS : 1. Batch No. of TSS : 2010-25.

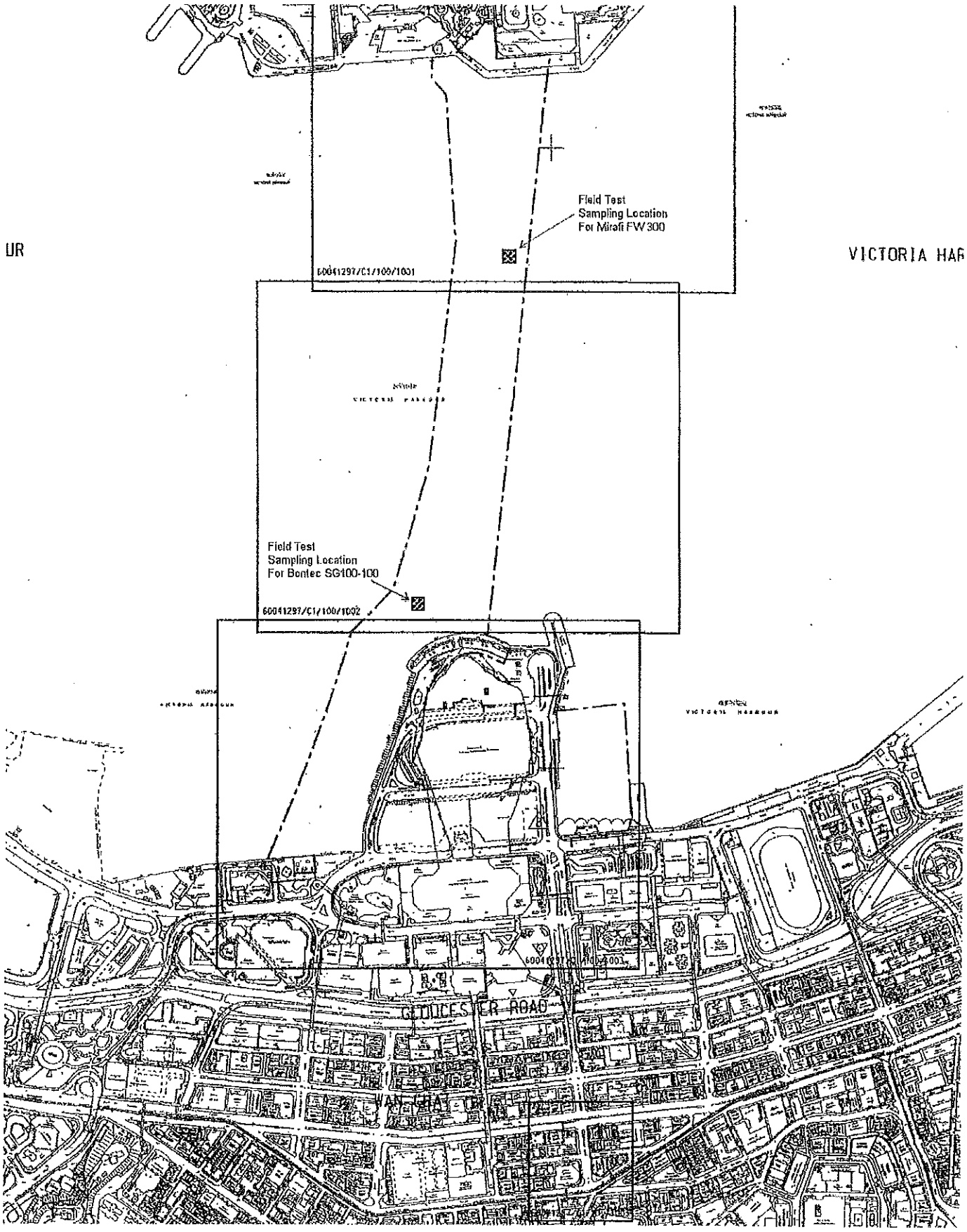
---- End ----

Tested By : T.K. Ho Approved Signatory :

Name : Gu Chin

Checked By : Gu Chin Post : Chemist

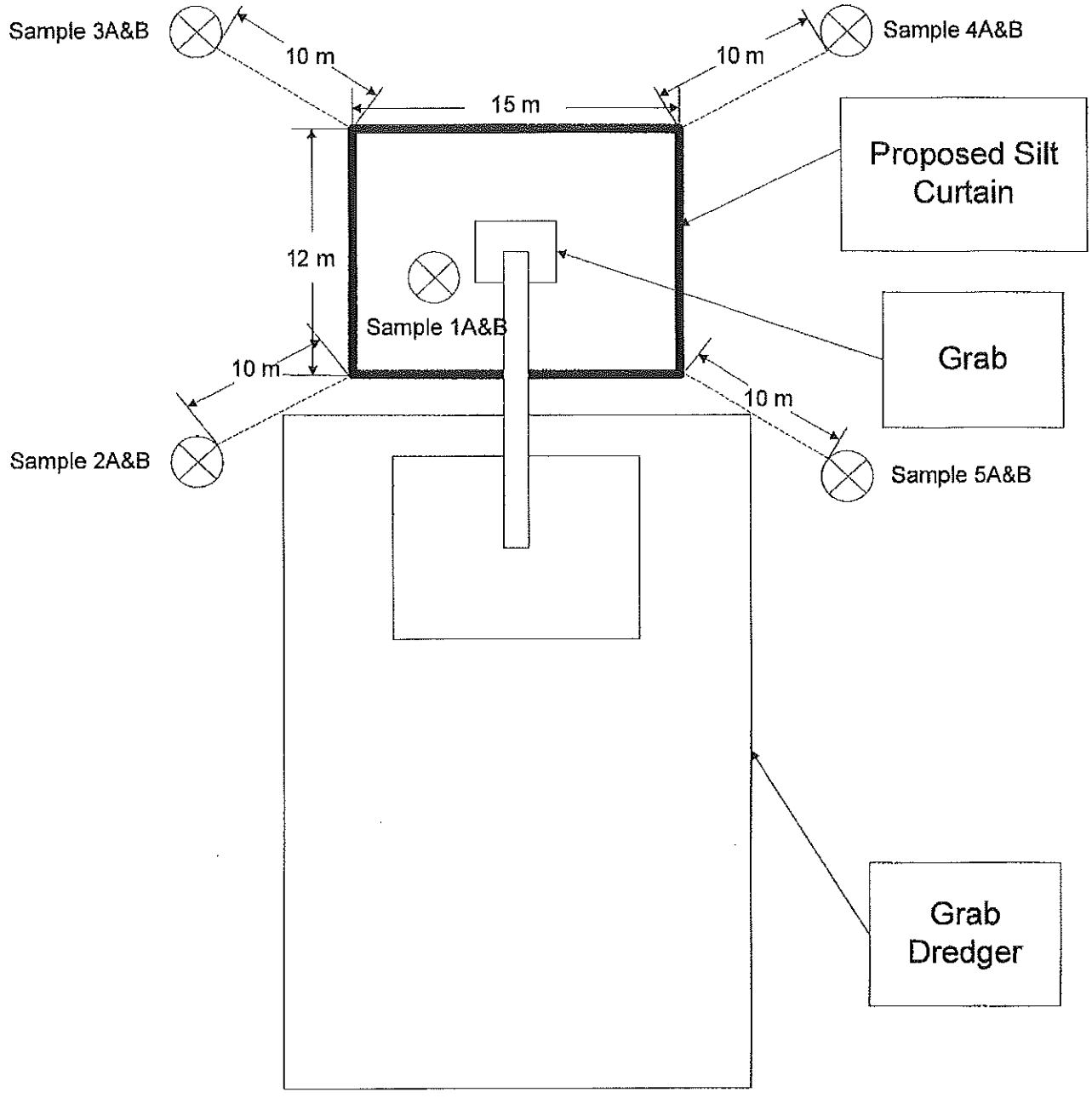
Appendix B
Layout of Silt Curtain



Layout of Silt Curtain

Appendix C
Sketch for the Sampling Location

Sketch for the Sampling Location



1st Field test (20th Jul 2010)

Location	Easting	Northing
1A&B	835784.742	816254.857
2A&B	835766.239	816253.015
3A&B	835780.837	816273.331
4A&B	835802.036	816256.479
5A&B	835790.585	816238.398

Key:

⊗ = Water Sampling Point at Mid-depth.

2nd Field Test (18th Oct 2010)

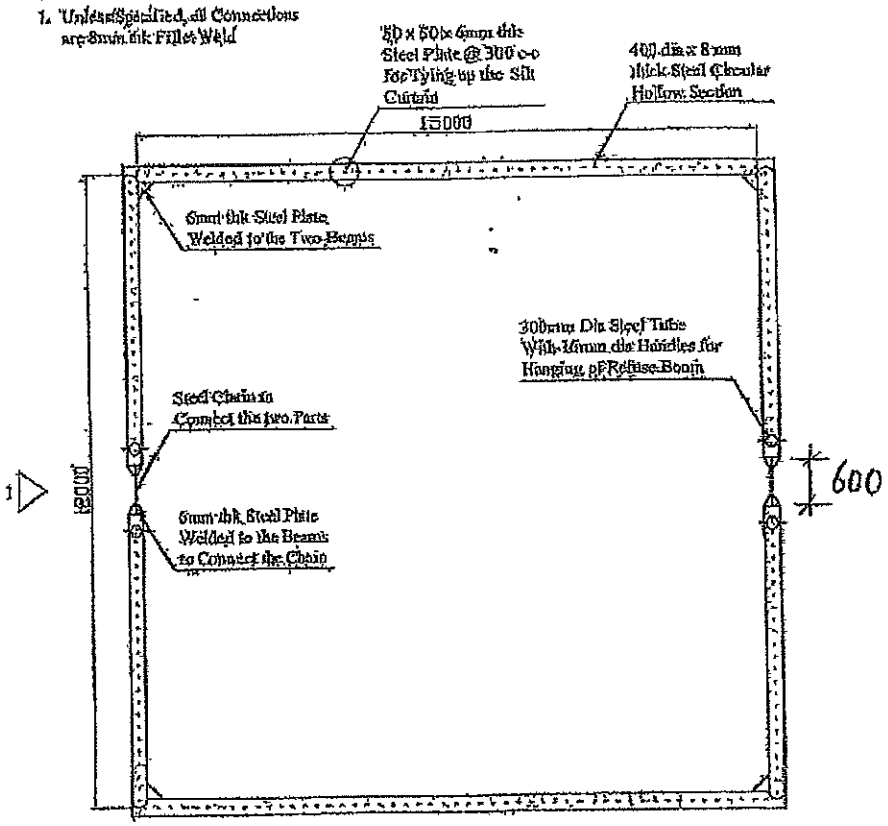
Location	Easting	Northing
1A&B	835920.975	816945.588
2A&B	835913.691	816938.737
3A&B	835913.904	816952.659
4A&B	835927.726	816852.339
5A&B	835927.516	816938.634

Appendix D
General Arrangement of Silt Curtain

General Arrangement of Silt Curtain —— Drawing 1

Rev	Revision note	Date
1		25 Jan 10

Note:
1. Unless Specified, all Connections are 8mm thk Fillet Weld



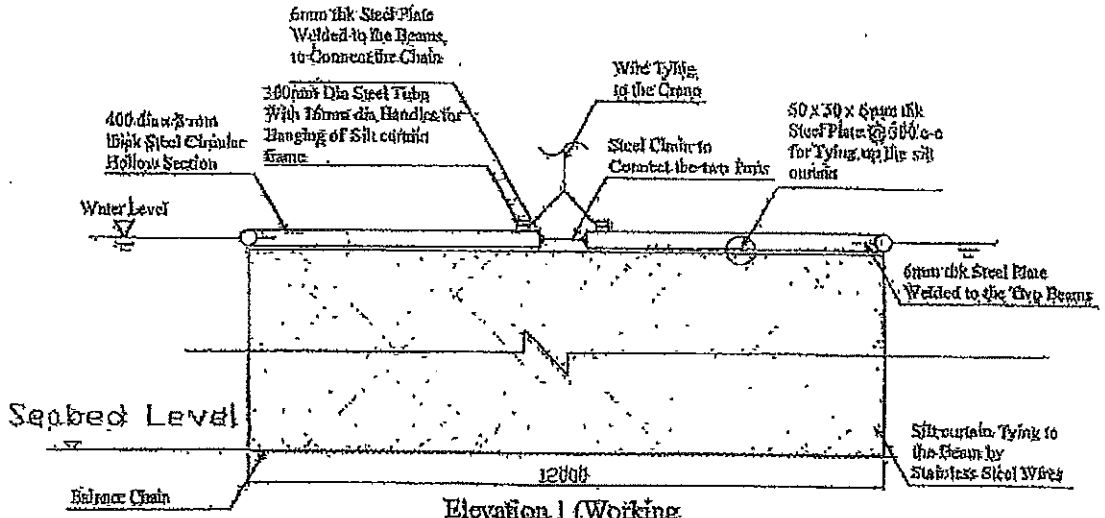
Plan

Designed by	Checked by	Approved by - date	File name	Date	Scale
KY Wong	David Wong	25 Jan 10	SK/09077MS/SC/1	25 Jan 10	1:150

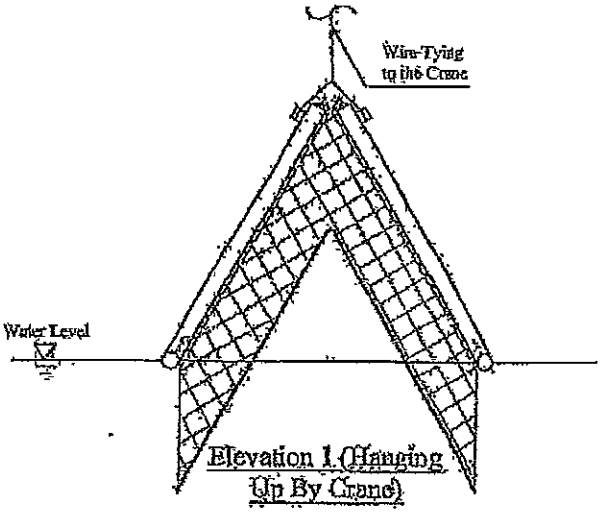
Owner	Title	Edition	Sheet
Chun Wo - Leader JV	Details of Silt Curtain	1	1

General Arrangement of Silt Curtain —— Drawing 2

Rev 1	Revision note	Date 25 Jan 10		



Elevation 1 (Working Condition)



Elevation 1 (Hanging Up By Crane)

Elevation 1 (Finish.)

Designed by	Checked by	Approved by - date	File name	Date	Scale
KY Wong	David Wong	25 Jan 10	SK/0907/MS/SC/2	25 Jan 10	1:150

Owner	Title		
Chun Wo - Leader JV	Details of Silt Curtain	Edition	Sheet
		1	2

俊和 - 利達聯營
CHUN WO - LEADER JOINT VENTURE

Our Ref.: CL0907/03.09.00.00/1378
Date: 19 November 2010

Environmental Protection Department
Branch Office
28th Floor, Southorn Centre
130 Hennessy Road,
Wan Chai, Hong Kong.

By Post

Attention: Mr. Raymond Lai

Dear Sir,

Contract No. HK/2009/01
Wan Chai Development Phase II – Central -Wan Chai Bypass at Hong Kong Convention and Exhibition Centre
Report on Field Test for Silt Curtain - Supplementary Document

Pursuant to Further Environmental Permit No.: FEP-02/356/2009 – Condition 2.8 Silt Curtain Deployment Plan and our subsequent explanation verbally through telephone-conversation, we confirmed that the 2 geotextile materials, i.e. "Mirafi FW300" and "Bontec SG100-100" had been used on site. According to the result of Field Test for Silt Curtain Report which were submitted on 15 November 2010 (Our Ref.: CL0907/03.09.00.00/1367/L), we noted that the silt curtains using both types geotextile installed on site were able to satisfy the environmental performance stated in the Approved EIA Report (Register No.: AEIAR– 125/2008).

Should you have any enquiries regarding this issue, please do not hesitate to contact our Mr. Shelton Chan by phone: 2162-9946, mobile: 5395-5470 or email: shelton.chan@leadercon.com.hk.

Yours faithfully
For and on behalf of
Chun Wo - Leader Joint Venture

Paul Yu
Site Agent

ST/PY/YCL/TW/JC/BW/SC/KKC/jf

c.c. AACL – H.O.
AECOM – Mr. Henry Chan
LAM / ETL – Mr. Raymond Dai
ENVIRON / IEC – Mr. David Yeung

Chun Wo –Leader Joint Venture
Site Office Correspondence Address : P.O. Box No. 28947 Gloucester Road Post Office
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