Lam Geotechnics Limited
Ground Investigation & Instrumentation Professionals

華益土力有限公司

Ref : G1120/CS/L931/FEP-07/356/2009
Date : 13 February 2015

China State Construction Engineering (Hong Kong) Ltd
P.O. Box 35159
King's Road Post Office

Attn: Site Agent, Dr. Dave Chan

Dear Dr. Chan,

Contract No. HY/2010/08
Central – WanChai Bypass Tunnel (Slip Road 8 Section)
Silt Screen Deployment Plan (Rev. 2)

Referring to the captioned submission dated 13 February 2015 received on 13 February 2015, we have reviewed your submitted details and hereby certified this submission in accordance with Condition 2.9 of FEP-07/356/2009.

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

Yours faithfully,

Raymond Dai
Environmental Team Leader

c.c.

HyD	- Mr. Bond Chow	(By Fax: 2714 5289)
CEDD	- Mr. Jason Cheung	(By Fax: 2577 5040)
AECOM	- Mr. Peter Poon	(By Fax: 3912 3090)
AECOM	- 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
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ENVIRON

Ref.: AACWBIECEM00_0_6255L.15 16 February 2015

China State Construction Engineering (Hong Kong) Ltd By Post
P.O. Box 35159
King's Road Post Office

Attention: Dr. Dave Chan

Dear Sir,

Re: FEP-07/356/2009
Contract No. HY/2010/08
Central – Wan Chai Bypass Tunnel (Slip Road 8 Section)
Silt Screen Deployment Plan (Revision 2)

Reference is made to your submission of the Silt Screen Deployment Plan (Revision 2 dated 13 February 2015) to us through E-mail on 13 February 2015 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 2.9 of FEP-07/356/2009.

Please feel free to contact the undersigned should you have any queries.

Yours sincerely,

David Yeung
Independent Environmental Checker

c.c.	HyD	Mr. Bond Chow	by fax: 2714 5289
	CEDD	Mr. Jason Cheung	by fax: 2577 5040
	AECOM	Mr. Peter Poon	by fax: 3912 3090
	AECOM	Mr. Conrad Ng	by fax: 2691 2649
	LAM	Mr. Raymond Dai (ETL)	by fax: 2882 3331

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ENVIRON Hong Kong Limited 英環香港有限公司
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中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

Central – Wan Chai Bypass Tunnel
(Slip Road Section 8)
Contract No. HY/2010/08

Silt Screen Deployment Plan under condition 2.9 of FEP- 07/356/2009

Revision: 2

January 2015

Prepared by: Environmental Officer	C. M Wong	Date: 6 January 2015

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Abbreviation

Abbreviation	Terminology
Temporary Causeway Bay Reclamation	TCBR
Causeway Bay Typhoon Shelter	CBTS
Central Wan Chai Bypass – Tunnel Slip Road 8 Section	SR8
China State Construction Engineering (Hong Kong) Limited	CSHK
Environmental Monitoring & Auditing	EM&A
China Harbour Engineering Company – China Road and Bridge Company Joint Venture	CHEC-CRBC JV
Further Environmental Permit	FEP

1.0 Introduction

The purpose of this plan is to illustrate the design, installation and subsequent maintenance procedures of the silt screens to be deployed during the construction and removal after construction of the Central – Wan Chai Bypass – Tunnel (Slip Road 8 Section).

2.0 Scope of Works

The scope of works mainly includes:

i) Temporary reclamation works of around 3 ha in size including associated dredging works at CBTS; and

ii) Removal of the temporary reclamation after the construction of the Trunk Road; and reinstatement of CBTS.

In accordance with the contract requirement and the condition stipulated in the Environmental Permit No. EP-356/2009 and Further Environmental Permit No. FEP-07/356/2009. Under the EP and FEP condition 2.9, silt screens shall be provided as protection for the existing cooling seawater intakes, including Intake No.8 for the Excelsior Hotel & World Trade Centre/No.27-63 Paterson Street, and Intake No.9 for the Windsor House during the concurrent dredging activities take place at reclamation shoreline zones namely TCBR to the corresponding marine works, **Appendix A** refers.

The existing silt screens for Intakes No. 8 and 9, which were also referred as C6 & C7 in EM&A Manual, was designed and constructed by CHEC-CRBC JV (the Main Contractor for the Contract No. HY/2009/11). China State Construction Engineer (Hong Kong) Limited (CSHK), the Main Contractor for the Contract No. HY/2009/15 maintained these silt screen up to Nov 2013.

For silt screen No.8 / The Excelsior & World Trade Centre
A meeting was held on 20 May 2011 between representatives from The Excelsior, Kai Shing Management Services Ltd (Property management group for Excelsior Hotel and World Trade Centre), CHEC-CRBCJV, CSHK with Engineer's Representative and Environmental Team. Excelsior Hotel's representative advised that the seawater Intake No. 8 was no longer in use and the valves inside the pumping station had been closed. As a result to the abandonment of seawater intake, the removal of silt screen for Intake No. 8 was taken place on 21 May 2011

and intake water quality impact monitoring was terminated from 26 May 2011. Notes of the meeting have been attached in **Appendix D**. The silt screen was no longer existed.

For the possession of site, the silt screen No.9 / Windsor House.

From CHEC-CRBC JV (HY/2009/11) to CSHK (HY/2009/15)
On 23 May 2011, the silt screen for Intake No. 9 was handed over to CSHK (HY/2009/15) for subsequent operation, maintenance and removal. That is the silt screen has already existed.
The handover date of the silt screen before intake diversion No.9 / Windsor House would be 16 May 2014 (i.e. possession of site from CSHK (HY/2009/15) to CSHK (HY/2010/08)). A relevant letter attached in **Appendix E**.

From CSCHK (HY/2009/15) to CSHK (HY/2010/08)
CSHK (HY/2010/08) eventually take the responsibility of operation and maintenance of silt screen from CSHK (HY/2009/15) to CSHK (HY/2010/08). A relevant letter attached in **Appendix J**.
Instruction of silt screen take over by CSHK (HY/2009/15) has been attached in **Appendix E**.
Due to the commencement of marine works of SR8 of CSHK (HY/2010/08), such instruction will take over by HY/2010/08 start from 16 May 2014.

Arrangement (including regular checking, maintenance and repair in case of damage) will in-charge by CSHK (HY/2010/08) after the possession date.
CSHK (HY/2010/08) will take the responsibility of the silt screen after handover from CSHK (HY/2009/15) until completion of temporary reclamation removal and reinstatement works.
CSHK (HY/2010/08) will also reinstate the existing seawall whenever completion of the temporary reclamation.

3.0 List of Reference Document

Relevant conditions in the EP and FEP are listed as follows for ease of references.

EP and FEP Condition	Remarks
EP No. EP-356-2009, Condition 2.9 FEP-07/356/2009, Condition 2.9	The permit holder shall liaise with the owners and the operators of the seawater intakes as shown in Table 1 of this Permit on details of silt screen installation, maintenance and removal at the seawater intakes. The indicative locations of the intakes are shown in Figure 4 and Figure 5 of this Permit for reference.
EP No. EP-356-2009, Condition 2.9 FEP-07/356/2009, Condition 2.9	At least two weeks prior to the commencement of the marine works, the permit holder shall deposit with the Director four hard copies and one electronic copy of a silt screen deployment plan to provide details of the design, operation and maintenance requirement of the silt screen systems.
EP No. EP-356-2009, Condition 2.9 FEP-07/356/2009, Condition 2.9	The silt screen deployment plan shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendation contained in the approved EIA report (Reg. No. AEIAR –125/2008) and liaison results with the owners and the operators of the seawater intakes.
EP No. EP-356-2009, Condition 2.9 FEP-07/356/2009, Condition 2.9	Silt screens shall be installed at seawater intakes prior to the commencement of the corresponding marine works.
EP No. EP-356-2009, Condition 2.9 FEP-07/356/2009, Condition 2.9	To avoid refuse entrapment and to ensure representative impact monitoring results, silt screens shall be maintained and refuse around them shall be collected at regular intervals on a daily basis so that water behind the silt screens is kept free from floating debris during the impact monitoring period.

4.0 General Layout of Silt Screen

The location of silt screen for Intake No.9 is appended in **Appendix A**.

Current status:
The silt screen before intake diversion is made of CHEC – CRBC JV (HY/2009/11) since 2010 and now is maintained under the CSHK (HY/2010/08) eventually.

Maintenance the silt screen before intake diversion under the CSHK (HY/2010/08):-

i. Advanced notification to Windsor House prior maintenance works;
ii. Diver inspection for the silt screen will carry out in a regular monthly basis.
iii. Damaged silt screen layer will be removed and replaced by a new one.

5.0 Routine Maintenance Schedule

The maintenance schedule of the silt screens refers to the table below. It is prepared based on the latest Initial Works Programme and it may subject to changes to reflect the site situation / progress.

Items	Frequency
Visual Inspection of silt screen	Daily
Refuse Removal	Daily

*Regular visual inspection for silt screen & marine refuse removal will carry out in a daily inspection regularly.
Frequent inspection & refuse removal will be implemented subject to the safety reason & agreement with the property management of Windsor House, weather condition, site condition and works carried.

5.1 For Intake No. 9, site foreman or supervisor(s) will be assigned to check the condition of the silt screens at daily intervals during the course of the marine works. While floating refuse around the silt screens will be collected to avoid blockage of sea water flow by floating debris. Checklist for Intake No.9 has been designed to standardize the inspection and the format of the inspection checklist is enclosed in **Appendix B**.

5.2 Inspection checklists (**Appendix B**) shall be kept for record upon request.

5.3 If any of the silt screens is found damaged and repairing works are identified as necessary,

the silt screens would be lifted up from the sea by using chain block pulley system and with the aid of crane barge if necessary so that the damaged parts (e.g. geotextile filter, steel mesh, etc.) of the silt screens can be repaired/replaced.

5.4 Spare geotextile materials and other associated components such as silt curtain will be stored on site for readily repairing/replacement in case of damages.

6.0 Further Enhancement / Protection of Silt Screen Before Intake Diversion

6.1 To summarize the abovementioned information, there will be only (1) one seawater intake need to protect under the Further Environmental Permit FEP-07/356/2009.

6.2 Besides the protection the silt screen before intake diversion, two additional layers of silt curtain will deploy for such intake for Windsor House. Such proactive action used to protect the seawater intake additionally and deployment of silt curtain present on site during advance dredging works for seawall construction before intake relocation.
The additional layer of silt curtain form part of the silt screen system and maintenance and checking of silt screen system would including these silt curtain layer and details of the silt curtain, please refers to **Appendix F**.

For the silt screen after intake diversion,
Apart from the silt curtain material mounted on the steel frame, one additional layer of silt curtain would be deployed for intake of Windsor House.

6.3 For continuous seawater supply to Windsor House in the forthcoming period and maintain the flow rate of seawater supply.

Location of silt screen before intake diversion for Windsor House is located in the temporary reclamation for construction of SR8 so that diversion of the seawater intake for Windsor House is a must. Silt screen for seawater intake after diversion works would be design, construct and maintain under CSHK (HY/2010/08).

Diversion of the seawater intake to Windsor House would be established prior commencement of temporary reclamation works. New seawater intake will continue to supply seawater to Windsor House in a non-stop way. Source of new seawater intake will be protected by means of a new silt screen.

Layout & path of access for new silt screen, please refers to the **Appendix G** for more details**.**

The specification of the new silt screen, please find the **Appendix H**. The new silt screen considered carrying out impact water quality monitoring.

i) Establishment of the tank for Windsor House is

ii) Existing Windsor House Sump Tank = 2000 Gal (UK) = 9.1 m^3.

Volume of the temporary seawater tank = 6000 (length in mm) x 2000 (width in mm) x 2000 (height in mm) =24m^3.

i.e. The establishment of the temporary seawater tank is about 2.5 times of the existing sump tank.

Details of the tank, please refers to **Appendix G**.

6.4 Connection of seawater pipeline negotiated amongst the Perfect World Company Limited (the property management of Windsor House), representatives of Highways Department, representatives of resident site staff and CSHK.

The Perfect World Company Limited (the property management of Windsor House) satisfy the arrangement, details of meeting minutes refers to **Appendix I**.

6.5 Diversion of water source will be commenced on October 2014 and completed before by end of December 2014.

The dimensions and pipeworks will submitted to the Perfect World Company Limited & resident site staff/ AECOM for review and approval.

Submersible pump(s) in new silt screen for Windsor House will be situated in the middle of new silt screen. Vibration of the submersible pumps (during operation) will not neither affect the structure of the silt screen nor performance of silt curtain layers.

Details, please refers to **Appendix H**.

7.0 Technical Details and Materials of Silt Screen

The details of silt screen before intake diversion design and materials are fabricated under Contract HY/2009/11 as attached in **Appendix C**. The silt screen installed for pump after diversion works, please refers to **Appendix H**.

8.0 Removal of Silt Screen at Temporary Reclamation

Removal the silt screen at temporary reclamation would be after subjected to the reinstatement of the seawater intake at promenade of seafront.

All temporary reclamation would be removed and Causeway Bay Typhoon Shelter will reinstate afterward so that silt screen for Windsor House will no longer exist.

Bar screen will re-establish for the seawater intake of Windsor House and resume back to original.

Appendix A

Silt Screen Location Plan

Legend (圖例):

FUTURE SENSITIVE RECEIVER (AFTER PROJECT COMMISSIONED) 將來的敏感受體 (本項目工程施工後)
EXISTING SENSITIVE RECEIVER 現有的敏感受體

COOLING WATER INTAKE 冷卻水入口

1. HONG KONG CONVENTION AND EXHIBITION CENTRE EXTENSION (香港會議展覽中心新翼)
2. TELECOM HOUSE / HK ACADEMY FOR PERFORMING / SHUI ON CENTRE (電訊大廈 / 香港演藝學院/瑞安中心)
3. HONG KONG CONVENTION AND EXHIBITION CENTRE PHASE I (香港會議展覽中心第一期)
4. WAN CHAI TOWER / REVENUE TOWER / IMMIGRATION TOWER (灣仔政府大廈 / 稅務大樓 / 入境事務大樓)
5. GREAT EAGLE CENTRE / CHINA RESOURCES BUILDING (鷹君中心 / 華潤大廈)
6. SUN HUNG KAI CENTRE (新鴻基中心)
7. PROPOSED EXHIBITION STATION (擬建港鐵會展站)
8. EXCELSIOR HOTEL & WORLD TRADE CENTRE / NO.27-63 PATERSON STREET (香港怡東酒店 /世貿中心/ 百德新街 27-63 號)
9. WINDSOR HOUSE (皇室堡)
10. PROPOSED HKAPA EXTENSION (擬建香港演藝學院新翼)
11. CITY GARDEN (城市花園)
12. PROVIDENT CENTRE (和富中心)

WSD FLUSHING WATER INTAKE (水務署沖廁水入口)

WAN CHAI (灣仔)

Project Title: Wan Chai Development Phase II – Central Wan Chai Bypass - Tunnel (Slip Road 8 Section) (Contract No. HY/2010/08) – Marine Works
工程項目名稱: 灣仔發展計劃第二期 - 中環灣仔繞道-八號連接路段隧道工程（合約編號：HY/2010/08）- 海事工程
Environmental Permit No. : FEP- 07/356/2009
環境許可證編號 : FEP-07/356/2009

Figure 5: Indicative Locations of Seawater Intakes
圖 5: 海水進水口參考位置圖

(This figure was prepared based on Figure 5.2 of the EIA report (Register No.: AEIAR-125/2008))
(本圖是根據環評報告（登記冊編號 AEIAR-125/2008）圖 5.2 編製)

Appendix B

Daily Inspection Checklist

Silt Screen每日檢查表

位置 : For Intakes No. 9 編号 : _____

日期 : _____ 檢查員 : _____

	星期一	星期二	星期三	星期四	星期五	星期六
1. 整潔						
1.1 沒有垃圾在浮架內						
1.2 已清理架內垃圾						
1.3 其它 (請註明):						
2. 鐵架狀況						
2.1 鐵架沒有損壞						
2.2 鐵架接口沒有損壞						
2.3 螺絲沒有鬆脫						
2.4 其它 (請註明):						
3. 隔泥布狀況						
3.1 隔泥布沒有損壞						
3.2 隔泥布沒有鬆脫						
3.3 其它 (請註明):						
簽署 :						

說明: ✓ = 滿意 x = 不滿意須改善 - = 不適用

Appendix C

Specification for Silt Screen before Intake Diversion

CHEC-CRBC JV

Date : 8th October 2010
Our Ref. : CHEC-CRBC JV/C-257/01.22/001669

AECOM
8/F., Grand Central Plaza
Tower2, 138 Shatin Rural Committee Road
Shatin, Hong Kong

Attn.: Mr. David Kwan

Dear Sir,

Contract No. HY/2009/11
Central-Wan Chai Bypass – North Point Reclamation
Construction of silt screen at seawater intake for the Windsor House

Further to the joint meeting with the representatives of Highways Department, AECOM/RSS, the Windsor House and our colleagues on 5th October 2010, we will carry out the construction works of silt screen at seawater intake for the Windsor House and please find the following documents provided herewith for your information and onward processing:

1) Sketches of silt screen at seawater intake for the Windsor House;
2) A copy of details of anchor bolt and
3) A copy of details of material for silt screen.

Thank you for your kind attention.

Yours faithfully,
For and on behalf of
China Harbour Engineering Company Limited –
China Road and Bridge Corporation Joint Venture

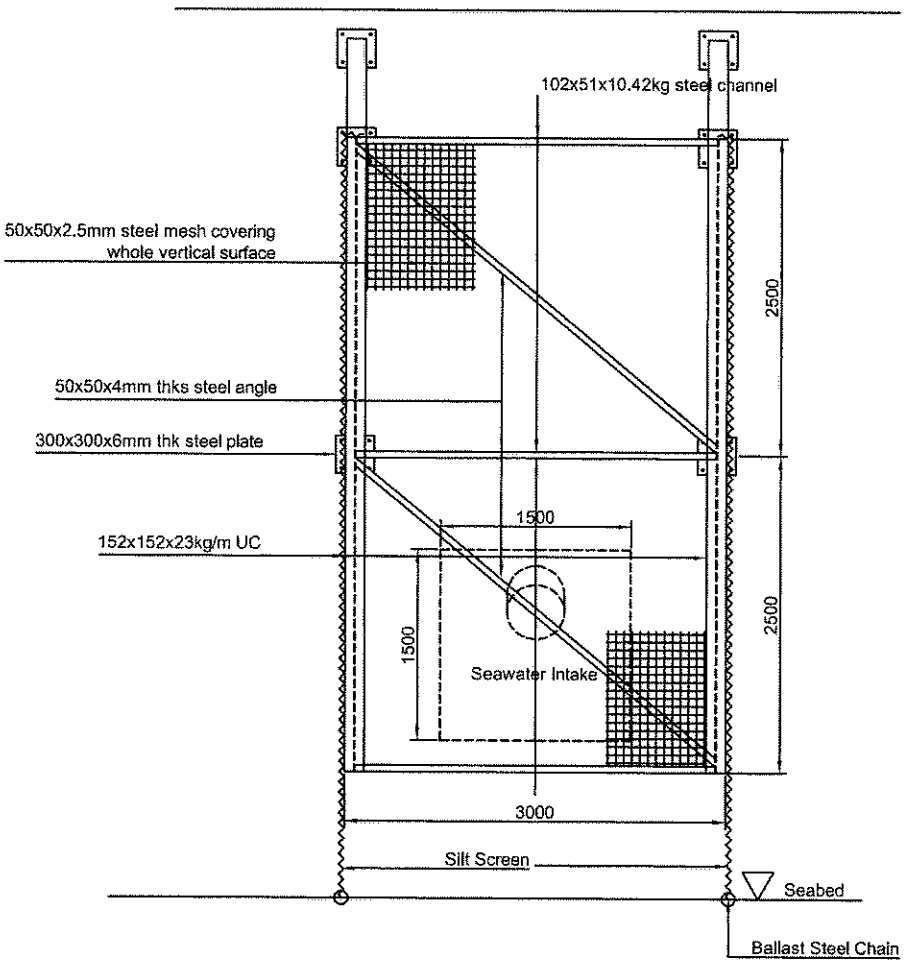
Daniel Cheung
Site Agent

Encl.

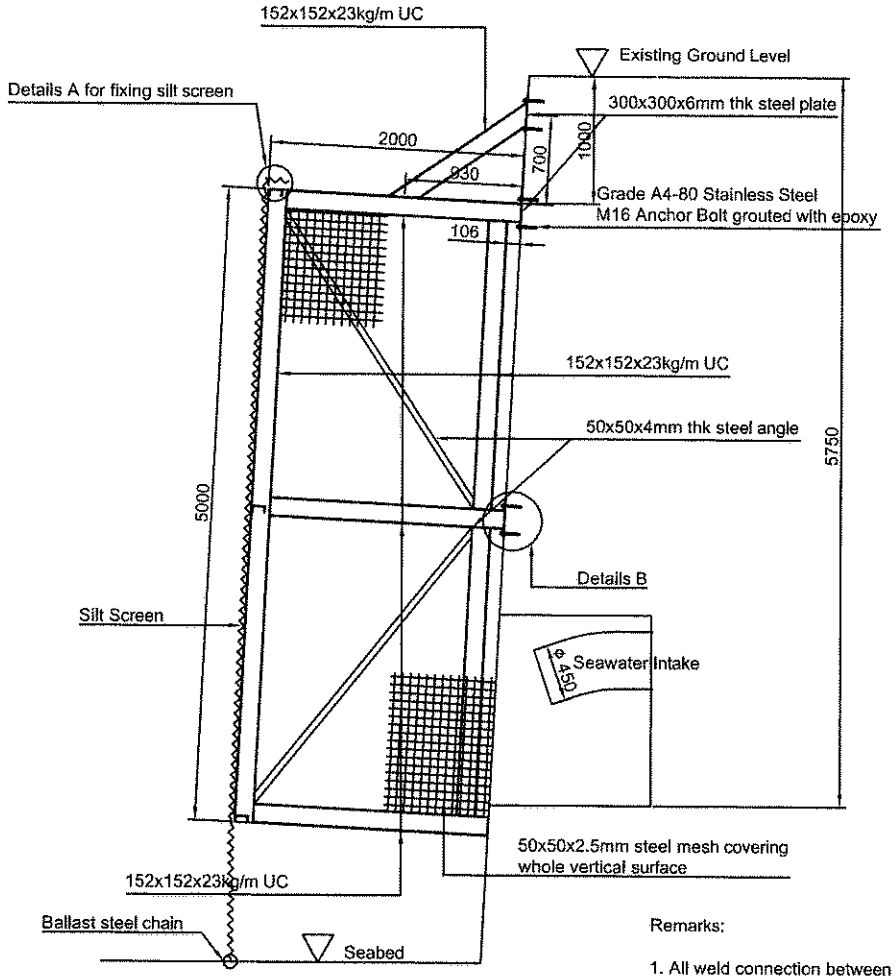
DC/JC/WCM/sy

c.c. AECOM – Mr. Kelvin Cheng

19th Floor, China Harbour Building, 370-374 King's Road, North Point, Hong Kong
Telephone: (852) 2887 8118 Facsimile: (852) 2512 0427



Elevation View of Screen at Seawater Intake



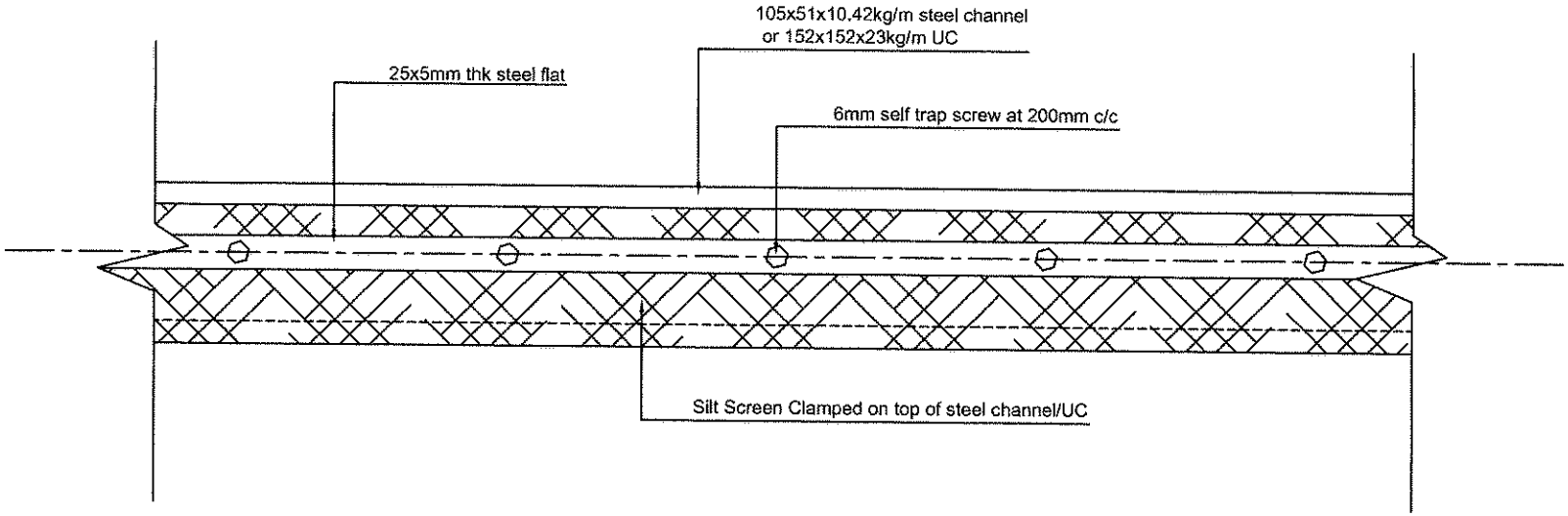
Side View of Screen at Seawater Intake

Remarks:

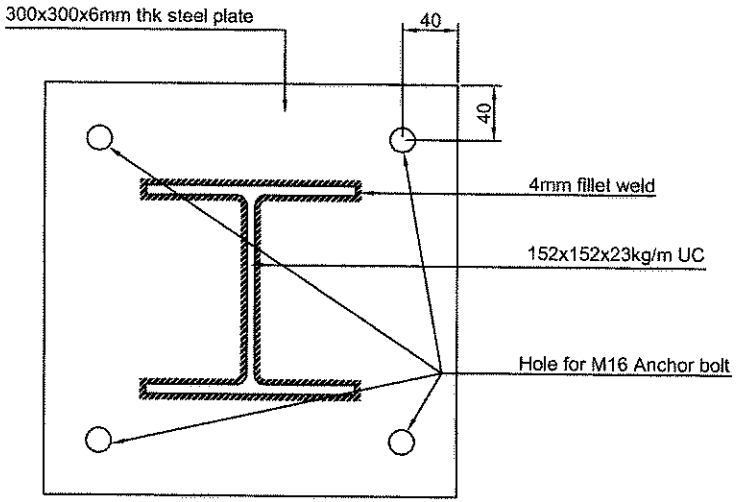
1. All weld connection between UC, plate, angle and channel should be 4mm fillet all around.
2. All units are in milimeter.
3. All steel should be Grade 43A
4. Silt Screen should cover from top of steel frame down to existing seabed

Silt Screen at Seawater Intake for Windsor House (Sheet 1 of 2)

Sketch No. SK3



Details A

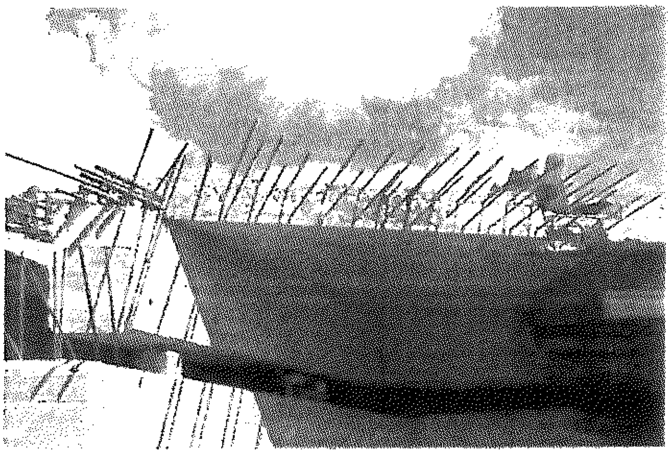


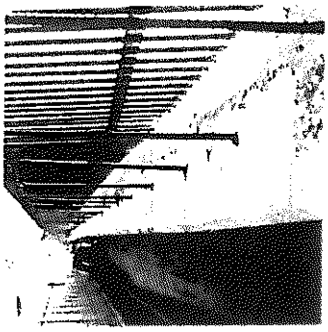
Details B

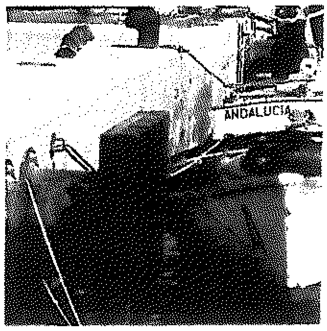
Silt Screen at Seawater Intake for Windsor House(Sheet 2 of 2)

Sketch No. SK4

HIT-RE 500 injection adhesive







Base material
- Concrete
- Hard natural stone
- Solid blockwork

Use
- Suitable to achieve high loads in concrete and stone
- For fixing the base of tower crane
- For fixing the fender in terminals
- For fixing post-installed rebar up to Y40 and anchor rod up M39
- **For underwater application**

Material
- 2-component ready mix epoxy resin (styrene-free)

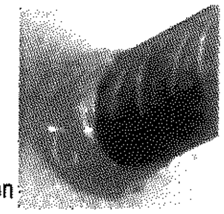
Curing Time

Temperature of the base material	Working time	Curing time
40°C	12 min.	4 hours
30°C	20 min.	8 hours
20°C	30 min.	12 hour
10°C	2 hours	24 hours
0°C	3 hours	50 hours
-5°C	4 hours	72 hours
less than -5°C	Contact Hilti advisory service	

Approvals: (Rebar)

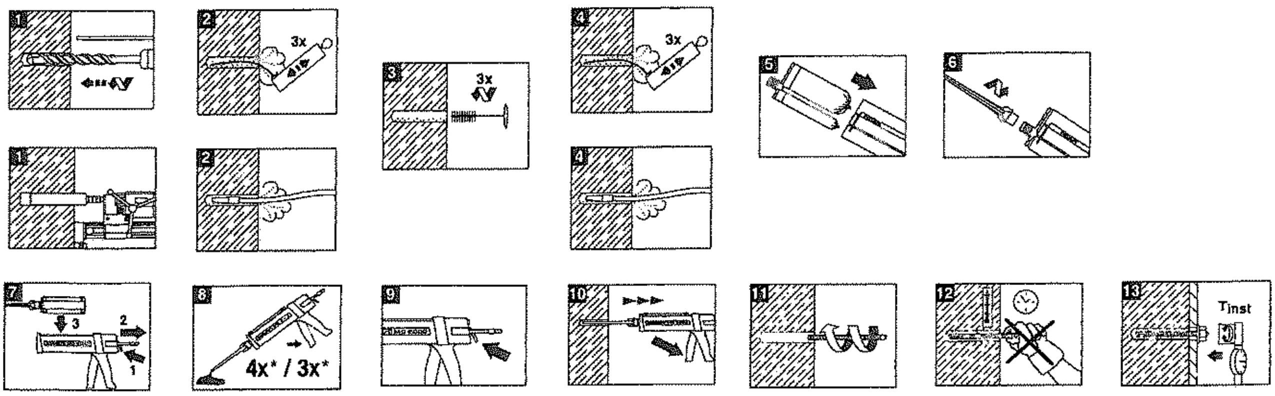
ETA ES DIBt SOCOTEC LEED Low VOC
WRAS NSF Tested as per BS5080

Benefits



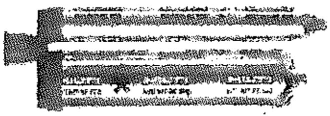
- Extremely high performance without expansion pressure
- User-friendly, odourless (styrene free)
- Lower sensitivity to oversized, dusty, wet holes and diamond coring holes
- Red colour adhesive for easy on site inspection
- Foil pack design reduces disposal cost
- With NSF and WRAS approvals for use in contact with drinking water
- Short dispensing time

Installation procedures



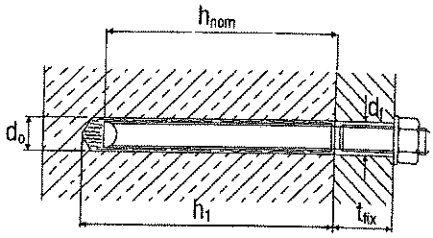
* Throw away first three trigger pulls for 330 ml cartridge, four trigger pulls for 500 ml cartridge.

HIT-RE 500 programme



Description	Including	Content (ml)	Package (pcs)	Ordering designation	Item no.
HIT-RE 500	1 mixer	500	20	FOIL PACK RE 500 /500/1	369109
HIT-RE 500	1 mixer	330	25	FOIL PACK RE 500 /330/1	337109
HIT-RE-M mixer			100	HIT-RE-M	337111

HIT-RE 500 with HAS-E anchor rod



Material

- Steel strength grade 5.8 and 8.8 for M8 to M24 and M27 to M39 respectively, galvanized at least 5µm
- Steel strength grade 5.8 and 8.8 for M8 to M24 and M27 to M39 respectively, hot dip galv. to 45µm
- A4-70 and A4-50 stainless steel for M8 to M24 and M27 to M39 respectively.
- High corrosion resistance (HCR) (M8-M24)
- A5-80 stainless steel (on request)

Technical data

Recommended load, F_{30} (kN), non-cracked concrete at 30N/mm², safety factor(γ)=3

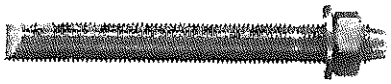
Model	Size	M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
HIT-RE 500 + HAS-E / -EF	Tensile Load, N_{rec}	5.7	9.1	13.3	25.3	39.4	56.7	69.9	91.7	107.7	128.1	146.8
	Shear Load, V_{rec}	3.6	5.8	8.4	15.8	24.8	35.7	75.2	91.3	113.9	133.6	160.7
HIT-RE 500 + HAS-ER / HCR	Tensile Load, N_{rec}	8.1	12.5	17.9	26.0	47.1	67.9	66.8	81.1	101.1	118.7	142.7
	Shear Load, V_{rec}	5.0	8.1	11.7	22.2	34.7	49.9	47.0	57.1	71.2	83.5	100.5

Remarks:
1) All the data applies to no edge distance, spacing and other influences
2) For detail design method please refer to Fastening Technology Manual
3) HAS-HCR anchor rod are only up to M24 only

Approvals: (Thread Rod)

ETA, LEED, Low VOC, WRAS, NSF, Tested as per BS5080

HAS-E Programme



Thread dia. (mm)	Drill bit nom. dia., d_o (mm)	Min. hole depth, h_1 (mm)	Anchorage depth, h_{nom} (mm)	Tighten. torque T_{inst} (Nm)	Max. fasten. thk. t_{fix} (mm)	Clearance hole, d_f (mm)	Width across flats, S_w	Filling Volume (ml)	Package (pcs)	Order designation	Item no
HAS-E galvanized version (min. 5µm)											
M8	10	85	80	15	14	9	13	4	20	**HAS-E M8x80/14**	**332219**
M8	10	85	80	15	54	9	13	4	10	**HAS-E M8x80/54**	**333099** ★
M10	12	95	90	30	21	12	17	6	20	**HAS-E M10x90/21**	**332220**
M10	12	95	90	30	61	12	17	6	10	**HAS-E M10x90/61**	**333100** ★
M10	12	95	90	30	81	12	17	6	10	**HAS-E M10x90/81**	**333101** ★
M12	14	115	110	50	28	14	19	10	20	**HAS-E M12x110/28**	**332221**
M12	14	115	110	50	88	14	19	10	10	**HAS-E M12x110/88**	**333102** ★
M12	14	115	110	50	128	14	19	10	10	**HAS-E M12x110/128**	**333103** ★
M12	14	115	110	50	168	14	19	10	10	**HAS-E M12x110/168**	**333104** ★
M16	18	130	125	100	20	18	24	15	10	**HAS-E M16x125/20**	**333105** ★
M16	18	130	125	100	38	18	24	15	20	**HAS-E M16x125/38**	**332222**
M16	18	130	125	100	108	18	24	15	10	**HAS-E M16x125/108**	**333106** ★
M16	18	130	125	100	148	18	24	15	10	**HAS-E M16x125/148**	**333107** ★
M16	18	130	125	100	198	18	24	15	10	**HAS-E M16x125/198**	**333108** ★
M16	18	130	125	100	348	18	24	15	10	**HAS-E M16x125/348**	**333109** ★
M20	24	175	170	160	48	22	30	43	10	**HAS-E M20x170/48**	**332223**
M20	24	175	170	160	68	22	30	43	10	**HAS-E M20x170/68**	**333110** ★
M20	24	175	170	160	108	22	30	43	10	**HAS-E M20x170/108**	**333111** ★
M20	24	175	170	160	158	22	30	43	10	**HAS-E M20x170/158**	**333112** ★
M20	24	175	170	160	208	22	30	43	10	**HAS-E M20x170/208**	**333113** ★
M24	28	215	210	240	54	26	36	65	10	**HAS-E M24x210/54**	**332224**
M27	30	250	240	270	60	30	41	71	4	**HAS-E M27x240/60**	**333114** ★
M30	35	280	270	300	70	33	46	124	4	**HAS-E M30x270/70**	**333115** ★
M33	37	310	300	1200	80	36	50	140	4	**HAS-E M33x300/80**	**333116** ★
M36	40	340	330	1500	90	39	55	160	2	**HAS-E M36x330/90**	**333117** ★
M39	42	370	360	1800	100	42	59	160	2	**HAS-E M39x360/100**	**333118** ★

★ Special Request

Thread dia (mm)	Drill bit nom. dia., d_o (mm)	Min. hole depth, h_1 (mm)	Anchorage depth, h_{nom} (mm)	Tighten. torque T_{inst} (Nm)	Max. fasten. thk. t_{fix} (mm)	Clearance hole, d_f (mm)	Width across flats, S_w	Filling Volume (ml)	Package (pcs)	Order designation	Item no
HAS-EF hot dip galvanized version (min. 45µm)											
M8	10	85	80	15	14	9	13	4	20	HAS-EF M8x80/14	333143★
M8	10	85	80	15	54	9	13	4	10	HAS-EF M8x80/54	333144★
M10	12	95	90	30	21	12	17	6	20	HAS-EF M10x90/21	333145★
M10	12	95	90	30	61	12	17	6	10	HAS-EF M10x90/61	333146★
M10	12	95	90	30	81	12	17	6	10	HAS-EF M10x90/81	333147★
M12	14	115	110	50	28	14	19	10	10	HAS-EF M12x110/28	333148★
M12	14	115	110	50	88	14	19	10	20	HAS-EF M12x110/88	333149★
M12	14	115	110	50	128	14	19	10	10	HAS-EF M12x110/128	333150★
M12	14	115	110	50	168	14	19	10	10	HAS-EF M12x110/168	333151★
M16	18	130	125	100	20	18	24	15	10	HAS-EF M16x125/20	333152★
M16	18	130	125	100	38	18	24	15	10	HAS-EF M16x125/38	333153★
M16	18	130	125	100	108	18	24	15	10	HAS-EF M16x125/108	333154★
M16	18	130	125	100	148	18	24	15	10	HAS-EF M16x125/148	333155★
M16	18	130	125	100	198	18	24	15	10	HAS-EF M16x125/198	333156★
M16	18	130	125	100	348	18	24	15	10	HAS-EF M16x125/348	333157★
HAS-EF hot dip galvanized version (min. 45µm)											
M20	24	175	170	160	48	22	30	43	10	HAS-EF M20x170/48	333158★
M20	24	175	170	160	68	22	30	43	10	HAS-EF M20x170/68	333159★
M20	24	175	170	160	108	22	30	43	10	HAS-EF M20x170/108	333160★
M20	24	175	170	160	158	22	30	43	10	HAS-EF M20x170/158	333161★
M20	24	175	170	160	208	22	30	43	10	HAS-EF M20x170/208	333162★
M24	28	215	210	240	54	26	36	65	10	HAS-EF M24x210/54	333163★
M27	30	250	240	270	60	30	41	71	4	HAS-EF M27x240/60	333164★
M30	35	280	270	300	70	33	46	124	4	HAS-EF M30x270/70	333165★
M33	37	310	300	1200	80	36	50	140	4	HAS-EF M33x300/80	333166★
M36	40	340	330	1500	90	39	55	160	2	HAS-EF M36x330/90	333167★
M39	42	370	360	1800	100	42	59	160	2	HAS-EF M39x360/100	333168★
HAS-ER A4 stainless steel version											
M8	10	85	80	15	14	9	13	4	20	HAS-ER M8x80/14	333119
M8	10	85	80	15	54	9	13	4	10	HAS-ER M8x80/54	333120 ★
M8	10	85	80	15	114	9	13	4	10	HAS-ER M8x80/114	333121 ★
M10	12	95	90	30	21	12	17	6	20	HAS-ER M10x90/21	333122
M10	12	95	90	30	61	12	17	6	10	HAS-ER M10x90/61	333123 ★
M10	12	95	90	30	81	12	17	6	10	HAS-ER M10x90/81	333124 ★
M10	12	95	90	30	111	12	17	6	10	HAS-ER M10x90/111	333125 ★
M12	14	115	110	50	28	14	19	10	20	HAS-ER M12x110/28	333126
M12	14	115	110	50	88	14	19	10	10	HAS-ER M12x110/88	333127 ★
M12	14	115	110	50	128	14	19	10	10	HAS-ER M12x110/128	333128 ★
M12	14	115	110	50	168	14	19	10	10	HAS-ER M12x110/168	333129 ★
M16	18	130	125	100	20	18	24	15	10	HAS-ER M16x125/20	333130 ★
M16	18	130	125	100	38	18	24	15	20	HAS-ER M16x125/38	333131
M16	18	130	125	100	108	18	24	15	10	HAS-ER M16x125/108	333132 ★
M16	18	130	125	100	148	18	24	15	10	HAS-ER M16x125/148	333133 ★
M16	18	130	125	100	198	18	24	15	10	HAS-ER M16x125/198	333134 ★
M20	24	175	170	160	48	22	30	43	10	HAS-ER M20x170/48	333135
M20	24	175	170	160	108	22	30	43	10	HAS-ER M20x170/108	333136 ★
M24	28	215	210	240	54	26	36	65	10	HAS-ER M24x210/54	333137
M27	30	250	240	270	60	30	41	71	4	HAS-ER M27x240/60	333138 ★
M30	35	280	270	300	70	33	46	124	4	HAS-ER M30x270/70	333139 ★
M33	37	310	300	1200	80	36	50	140	4	HAS-ER M33x300/80	333140 ★
M36	40	340	330	1500	90	39	55	160	2	HAS-ER M36x330/90	333141 ★
M39	42	370	360	1800	100	42	59	160	2	HAS-ER M39x360/100	333142 ★
HAS-HCR high corrosion resistance material											
M8	10	85	80	15	14	9	13	4	20	HAS-HCR M8x80/14	229504 ★
M10	12	95	90	30	21	12	17	6	10	HAS-HCR M10x90/21	229505 ★
M12	14	115	110	50	28	14	19	10	10	HAS-HCR M12x110/28	229506 ★
M16	18	130	125	100	38	18	24	15	5	HAS-HCR M16x125/38	229507 ★
M20	24	175	170	160	48	22	30	43	5	HAS-HCR M20x170/48	229508 ★
M24	28	215	210	240	54	26	36	65	5	HAS-HCR M24x210/54	229509 ★

anchor bolt

1

★ Special Request

Silt Curtain

Bontec SG100/100

April 2007

G&E
ENGINEERING

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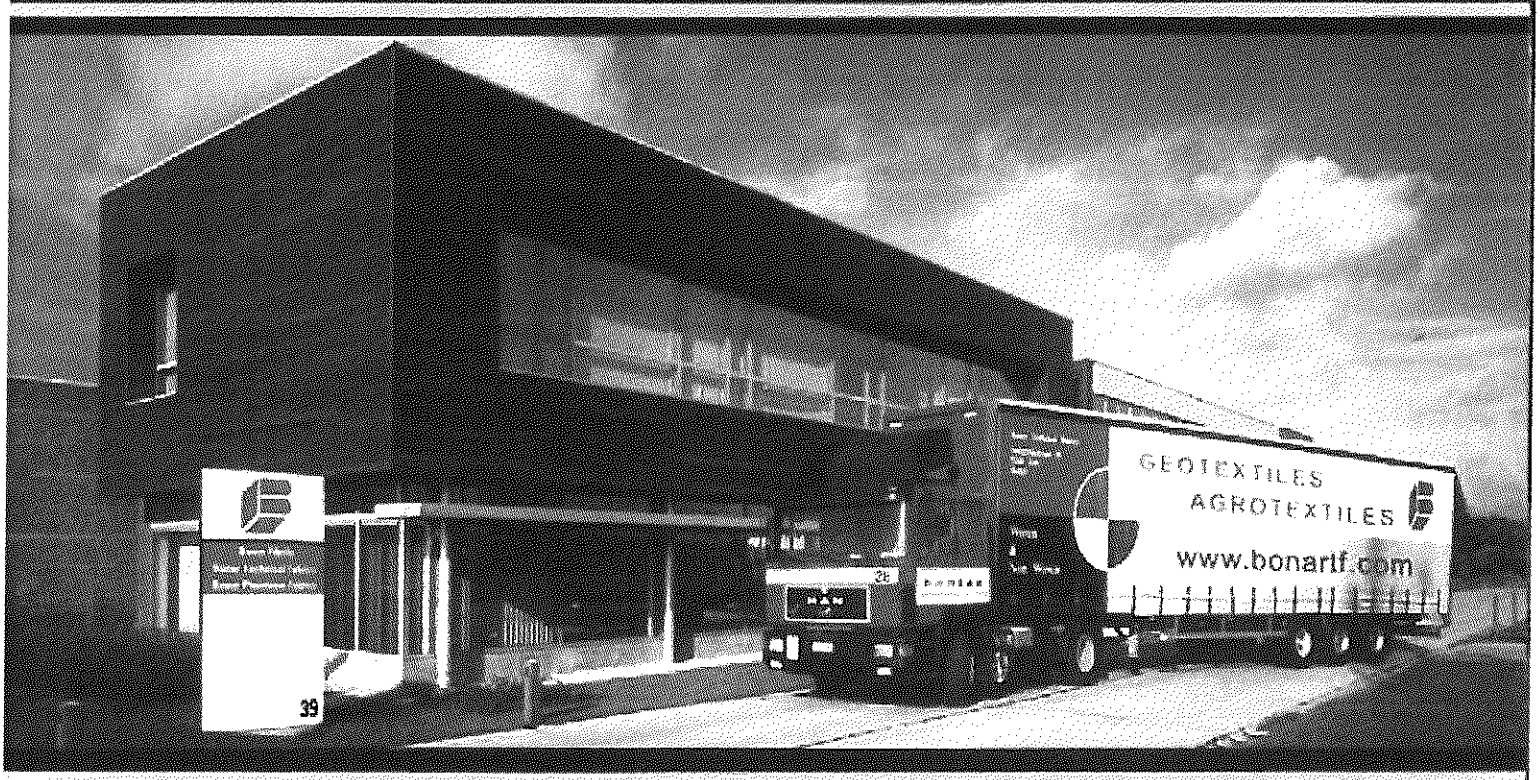
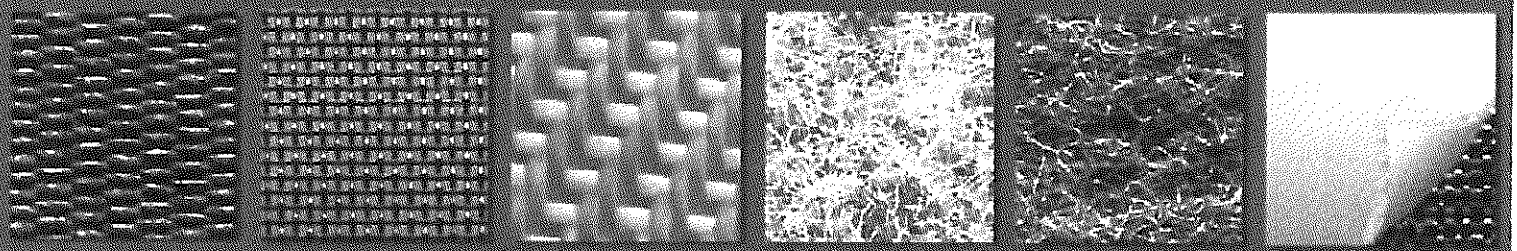
Manufacturer Company Profile





WE UNDER COVER THE WORLD

bontec

woven and nonwoven geotextiles

A TOTAL RANGE OF GEOTEXTILES

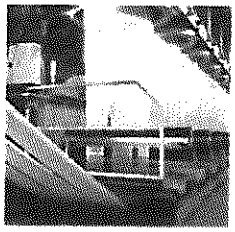
WHY CHOOSE BONTEC® GEOTEXTILES ?

BONAR TECHNICAL FABRICS
Invisibly good

bontec
woven and nonwoven geotextiles

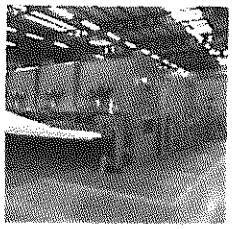
Bonar Technical Fabrics is Europe's premier manufacturer of woven and nonwoven geotextile products. Through our continuous commitment to **quality, product development and production improvement**, we have earned our position as a major player in our markets. Today, with over 30 years experience in the 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

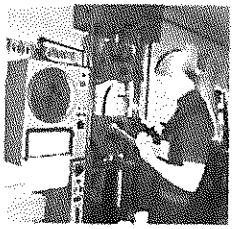
Nonwoven Geotextile Production

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

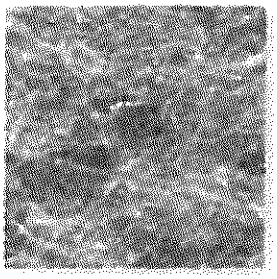
First Class Customer Service

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

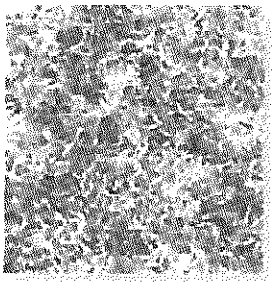
BONTEC©: A TOTAL RANGE OF GEOTEXTILES

NON-WOVEN GEOTEXTILES



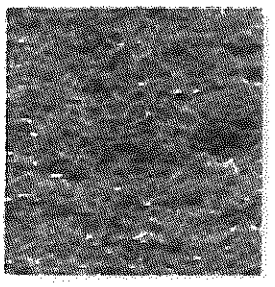
■ NW: Thermally Bonded Non Woven Geotextiles

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 trench drain or a granular drainage blanket.



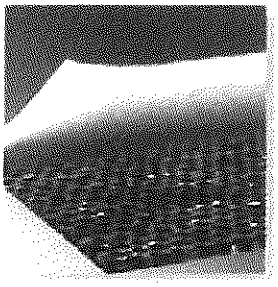
■ SNW: Superior Needlepunched Nonwoven Geotextiles

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

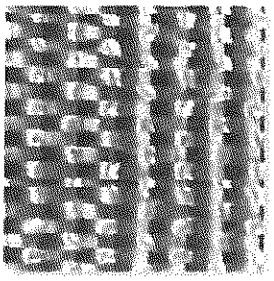
Produced using multi-coloured staple virgin fibres, products range from 200 to 1800g/m2. VNW grades offer a felt like appearance and are used in the functions of protection, drainage and erosion control. Areas of application include membrane protection in landfill and reservoirs, or for erosion control on riverbanks and coastlines.



■ LG: Geocomposites

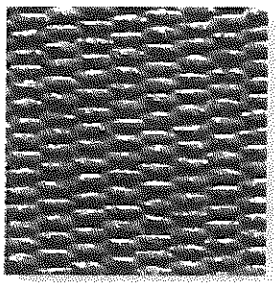
Produced via a combination of woven and nonwoven technology, the LG range offers the best of both product types in a single layer. The resulting products are ideally suited to uses where a high demand is placed on the geotextiles' strength, protection efficiency and physical robustness.

WOVEN GEOTEXTILES



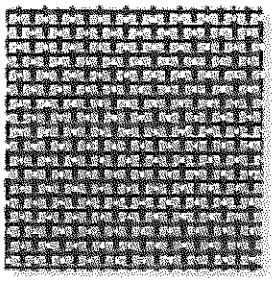
■ SG: Standard Grade Light weight Woven Geotextiles

Increasing from 70 to 200g/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 for new buildings etc.



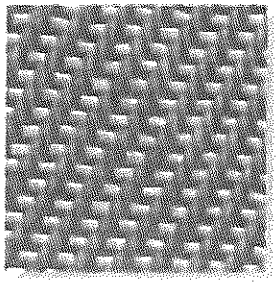
■ SG: Standard Grade Heavy weight Woven Geotextiles

With possible tensile strengths in excess of 200kN/m, SG heavyweight geotextiles are used in applications where the loadings are severe. Uses include short term 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 e.g. under concrete revetment blocks or between dissimilar layers of quick draining granular fill e.g. a coarse sand and rounded gravel.



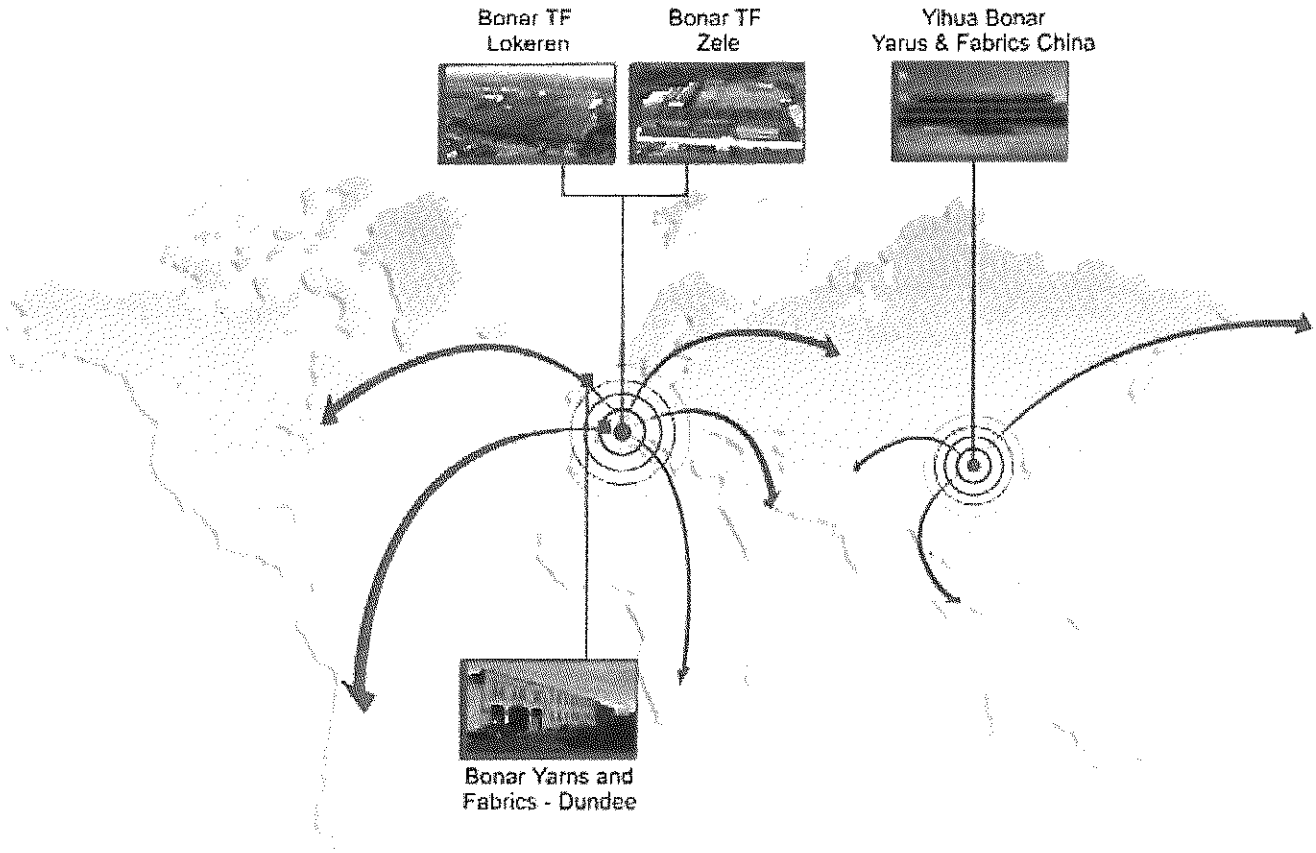
■ HS: High Strength Woven Geotextiles

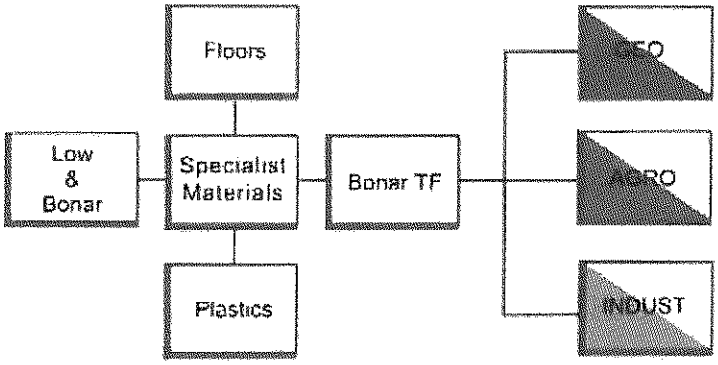
Produced from high tenacity polyester yarns, the HS products offer tensile strengths up to 600kN/m combined with low extension and excellent creep characteristics. Applications include the reinforcement of vertical walls, steep slopes and embankments over soft soil with long term design lives.

bontec

woven and nonwoven geotextiles

GROUP STRUCTURE





Bonar Technical Fabrics is a division of **LOW & 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 three distinct 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 deliveries throughout the world.

BONAR TECHNICAL FABRICS

Invisibly good

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E-mail: geotextiles@bonaryarns.com

website: www.bonartf.com

Product Specification

bontec

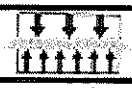
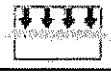
a bonar technical fabrics product

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

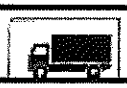
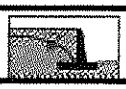
CE

1137
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 x 10^{-3} m/s	- 6,9 x 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
invisibly good

BONAR Technical Fabrics nv/sa
Industrielaan 3 • B-9240 Zele • Belgium
Tel +32 (0)52 45 71 11 • Fax +32 (0)52 45 71 35
e-mail geotex@bonartf.com

BONAR Yarns & Fabrics Ltd
St. Salvador Street • Dundee DD1 9TU • United Kingdom
Tel +44 (0)1382 346100 • Fax +44 (0)1382 201311
e-mail sgold@bonaryarns.com

Specification Comparison

Particular Specification vs Bonar SG 100/100

Updated: 25/08/2006

Properties	Particular Specification		Bonar SG 100/100	
	Test Method	Technical Data	Test Method	Technical Data
Tensile strength MD	(mean value)	55 kN/m	EN ISO 10319	110 kN/m
Tensile strength CMD	(mean value)	55 kN/m	EN ISO 10319	110 kN/m
Elongation MD	-	-	EN ISO 10319	20%
Elongation CMD	-	-	EN ISO 10319	11%
Mass per unit area	(mean value)	330 g/m^2	EN 965	475 g/m^2
Thickness at 2kN/m^2	-	-	EN 964-1	1.53 mm
Dynamic perforation resistance	-	-	EN 918	10 mm
Resistance to static puncture	-	-	EN ISO 12236	12.5 kN
Opening size O90	(maximum value)	190 um	EN ISO 12956	190 um
Water permeability	-	-	EN ISO 11058	23 mm/s
Material	-	PP woven	-	PP woven
Roll width	-	-	-	5.25 m
Roll length	-	-	-	100 m

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 kwaliteits-systeemcertificatie 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/C/02-05-2005

BQA, nv - Montoyerstraat 24 bte 9 - 1000 Brussel.

CERTIFICAAT MILIEUBEHEERSYSTEEM

ISO 14001 : 2004

Hiermee verklaart BQA, nv dat het kwaliteitssysteem 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 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° AC/AJ/CER/02-05-20052/2,
waarbij de firma zich onderwerpt aan de regelmatige controle van haar milieubeheersysteem.
Certificaat N° C/02-05-2005
Geldig tot 02-05-2008

BELCERT

BQA N° 018 EMS

A. COCHAUX
Directeur

BQA

AC/AJ/C/02-05-2005

BONAR TF

Exchange: +32 (0) 52 45 74 11
Geo: +32 (0) 52 45 74 87
Agro: +32 (0) 52 45 74 01
Carpet & Fibres: +32 (0) 52 45 74 83
Accountancy: +32 (0) 52 45 74 10
Purchase: +32 (0) 52 45 74 13
Fax General +32 (0) 52 45 74 54
Fax Geo/Carpet. +32 (0) 52 45 74 95
Fax Agro. +32 (0) 52 44 56 04
Fax purchase +32 (0) 52 45 74 19
www.bonartf.com

Zele, 14.07.06

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°ICBC04M606896

Type SG 100/100 :	13125,0 m²
Type VNW 200-PP-K	9773,2 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: 11-Aug-04	
To: G and E – Hong Kong Mr. Gary NG	**From:** Isabelle Ruyffelaere – 0032 52 457 487 Philippe Grimmelprez – 0032 52 457 486
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 1996 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: weverslaan 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 TECHNICAL FABRICS
invisibly good

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

BONAR Yarns & Fabrics Ltd.
St. Salvador Street • Dundee DD3 7EJ • United Kingdom
Tel +44 (0)1382 346102 • Fax +44 (0)1382 202278
E-mail ngald@bonaryarns.com

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 accurring soil acids and alkalis.
b/ The material is resistant to biological attack
c/ when used correctly (cfr installation guidelines), resistant to detoriation vaused 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 temeperatures 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
Industriestraat 39 • B-9240 Zele • Belgium
Tel +32 (0)52 457 411 • Fax +32 (0)52 457 495
E-mail geotextiles@bonartf.com

BONAR Yarns & Fabrics Ltd
St. Salvador Street • Dundee DD3 7EU • United Kingdom
Tel +44 (0)1382 346102 • Fax +44 (0)1382 202378
E-mail rguild@bonaryarns.com

Installation Guideline

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

RECOMMENDATION FOR THE INSTALLATION OF GEOTEXTILES

- The **BONTEC** geotextiles shall be kept in its original packaging in order to protect it from damaging UV-rays and high temperatures.

- The **BONTEC** geotextiles shall be stored protected from wind, rain, excess moisture or sunlight.

- The **BONTEC** geotextiles shall only be unpacked just before use. The material shall be covered within 1 week

- The **BONTEC** geotextiles shall be labelled and show the following data :

    - roll number
    - quality
    - name of the manufacturer
    - roll length & width
    - roll weight

- The **BONTEC** geotextiles shall be laid with the longitudenal ascis down slopes

- A minimum overlap of 500 mm between the different sheets shall be respected. Sewing of the different fabrics shall be done with a double prayer stitching technique with non deteriorating thread.

- Wherever visibility or installation of the BONTEC geotextile is poor an extra safety overlap of +/- 1 m shall be respected

- The surfaces to be covered with **BONTEC** geotextiles shall be smooth and free of sticks, roots, sharp objects, and all debris that may damage the fabric. The surface to be covered shall be firm and unyielding, with no sudden changes or brakes in grade.
- The compacted sub-base shall be maintained in a smooth, uniform and compacted condition during installation of the fabric.
- In area' s where wind is prevalent, fabric installation shall be started at the upwind side of the project and proceed downwind. The leading 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.

List of Project Reference

Bonar

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

		Co (Group)	Department	
Mar-06	HY/2005/06 Castle Peak Road Improvement West of Tsing Lung Tau	Shun Tat Construction Engineering Limited	Mouchel Halcrow JV	SG100/100
May-06	212 Main Works for the Proposed Third Golf Course Development at Kau Sai Chau, Sai Kung	China Harbour Engineering Co (Group)	Ove Arup and Partner	SG100/100 NW15
Jun-06	Hong Kong Convention and Exhibition Centre	Wai Kee (Zens) Construction & Transportation Co Ltd Kaden - Wai Kee (C&T) Joint Venture		SG100/100 SG100/100
Aug-06	EP/SP/52/06 Development of EcoPark in Tuen Mun Area 38	Kaden Construction Limited	Scott Wilson Ltd	SG100/100
Oct-06	Lamma Island Cable Landing	United Marine Co Ltd	Hong Kong Electric Co Ltd	SG100/100
Nov-06	CV/2004/01 Maintenance and Repairs to Seawalls, Piers and Other Port Works	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	SG100/100
Dec-06		Friendly Benefit Engineering Ltd		SG100/100
Feb-07	Prebored Socketted H-Piles at Hong Kong Convention & Exhibition Centre	Yee Hop Engineering Co Ltd		SG100/100

March 12, 2007

Approval Letters

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

RECEIVED 24 JAN

土木工程處
Civil Engineering Office

Web site 網址 : http://www.cedd.gov.hk
E-mail 電子郵件 :
Telephone 電話 : (852) 2760 5737
Facsimile 傳真 : (852) 2714 2054
Our reference 本署檔號 : ( ) in PW WC/CV0402/R20/340 Pt.1
Your reference 來函檔號 : KS330/2005

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

24 January 2005

BY MAIL & FAX No. 2780 2085

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

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

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

Contract No. CV/04/02			
Post	Initial	Copy	Action
CM			
PM			
SA			
Sub-A			
Eng.(1)			
Eng.(2)			
C.F			
Foreman			
Q.S			
Safety			
Material			
Survey			

Yours faithfully,

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

c.c.
SIOW/P2B – Site Copy

cls

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

Web site 網址 : http://www.cedd.gov.hk
E-mail 電子郵件 :
Telephone 電話 : (852) 2762 5035
Facsimile 傳真 : (852) 2714 2054
Our reference 本署檔號 : (15) in PW WC/CV0306/R20/540 Pt.01
Your reference 來函檔號 : CIV/002091/1.2/HW/SY/CC/me(S0087), CIV/002091/1.2/HW/SY/CC/me(S0118)

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

18 February 2005

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

Dear Sirs,

Contract No. CV/2003/06

Stanley Waterfront Improvement Project –
Construction of Pier and Boardwalk

Fabric for Silt Curtain

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

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

Yours faithfully,

(Paul Y K MA)
Engineer's Representative
Port Works Division
Civil Engineering and Development Department

c.c.
Site Office (Attn: SIOW/P1A)
CEG/P1A

File PW WC/CV0306/M10/300

YKM/sim

Post-it® Fax Note 7671 | Date 24/2/05 | pages 1
To MR. STANLEY WAN | From CHIEF SCE - HD
Co./Dept. G&E | Co. SFK
Phone # 25960028 | Phone # 60847705
Fax # 25700089 | Fax #

TOTAL P.01

Mott MacDonald Hong Kong Limited

Consulting Engineers

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

Our Ref : S287/NL1/25.7/283/JY 30 June 1992

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

Attn : Mr. S. Y. Yu

T.D.D. CONTRACT NO. NL 1/91
C. E. Dept.

DATE	ACTION	INFORM
SA		
DSA		
QS		
ENG		
SUR		
FOREMAN		
FILE		

Dear Sirs,

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

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

I have the following comments :

1) The proposed subsoil drain material - i.e. 300mm diameter ADS corrugated polyethylene subsoil drain pipes from Benpak Waterwise company is acceptable.

2) The proposed Geotextile SG17/15 from UCO (2 layers) as protection for subsoil drainage is acceptable in principal. Please submit further technical specification such as lapping and site storage requirements recommended by the manufacturer.

3) The proposed Greenfix Eromat Special type 5 from CCL is still under review. You will be notified of the outcome if a decision is made.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

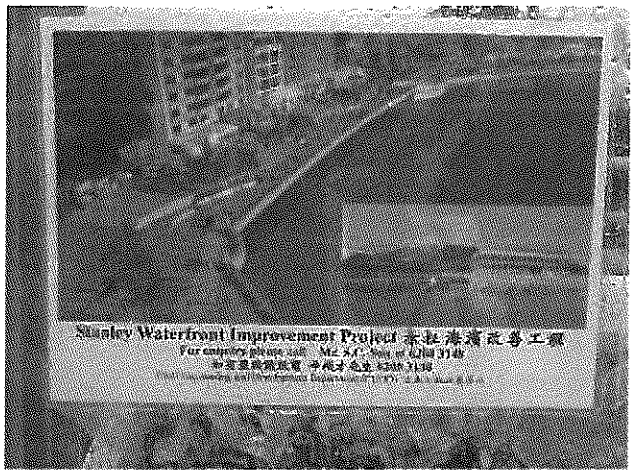
Luke Chi
Engineer's Representative

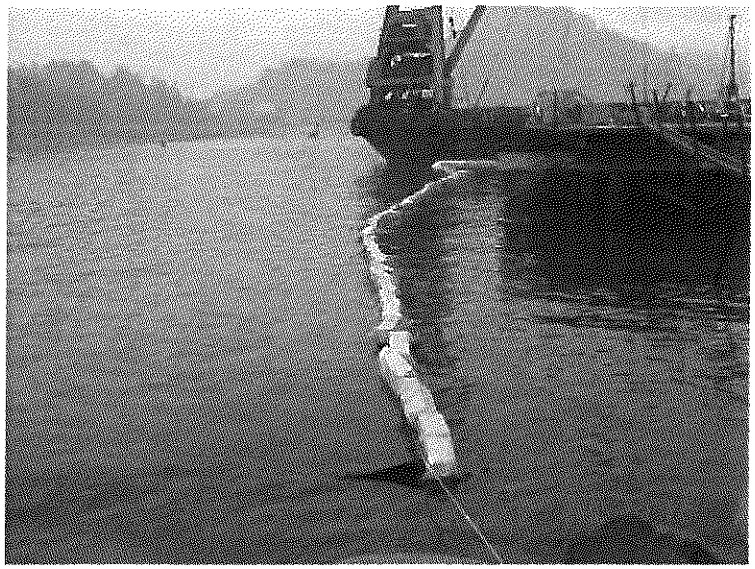
LC/JY/ak

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





Appendix D

Notes of Liaison Meeting for Silt Screen Removal after the Decommissioning of Seawater Intake No. 8

AECOM
8/F, Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong
香港新界沙田鄉事會路 138 號
新城市中央廣場第 2 座 8 樓
www.aecom.com

Engineer's Representative's Office
25 Hung Hing Road,
Causeway Bay, Hong Kong
香港銅鑼灣鴻興道 25 號
+852 3912 3000 tel
+852 3912 3010 fax

Your Ref. :
Our Ref. : CWB/(HY/2009/15)/M30/910/15B001371

15B001371

21 May 2011

24 MAY 2011
M30/910

See Distribution List

Dear Sir/ Madam,

Contract No. HY/2009/15
Central-Wan Chai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section)

Water Quality Monitoring Station C6 - Seawater Intakes for the Excelsior (and World Trade Centre)

I refer to the liaison meeting amongst Excelsior / Kai Shing / AECOM / ET / CSHK / CHEC CRBC JV held in 33/F Conference Room of the Excelsior on 17 May 2011.

The notes of the meeting is hereby attached for your reference.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Peter Poon
Principal Resident Engineer

Encl.

c.c AECOM - Attn. : Mr. Conrad Ng
M45/150

PP/EW/QMY/gw

Distribution List

	Company / Address	Contact Person
1.	The Excelsior Hotel 281 Gloucester Road Causeway Bay Hong Kong	Attn: Mr. Raymond Ho
2.	Kai Shing Management Services Ltd Room 1404, 14/F., World Trade Centre 280 Gloucester Road Causeway Bay Hong Kong	Attn: Ms. Margaret Lau/ Mr. Kelvin Tsang/ Mr. Cheng
3.	Lam Environmental Services Ltd. 11/F, Centre Point 181-185 Gloucester Road Wan Chai, Hong Kong	Attn: Mr. Raymond Dai
4.	CHEC-CRBC Joint Venture 19th Floor, China Harbour Building 370-374 King's Road North Point, Hong Kong	Attn: Mr. Daniel CHEUNG/ Mr. C M Wong
5.	China State Construction Engineering (Hong Kong) Ltd. 29/F, China Overseas Building 139 Hennessy Road Wan Chai, H.K.	Attn: Mr. Simon Tang

Notes of Meeting

Meeting Date/Time: 17 May 2011, 11:00 a.m.

Venue: Conference Room, 33/F, The Excelsior

Project: (Contract no. HY/2009/15)
Central–Wan Chai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section)

Subject: Liaison meeting for silt screen removal after the Decommissioning of the Seawater Intakes for the Excelsior

Distribution: Excelsior, Kai Shing, ETL, CSHK, CHEC CRBC JV & AECOM

PRESENT:	Mr. Raymond Ho	}	The Excelsior, Hong Kong (Excelsior)
	Ms. Margaret Lau Mr. Kelvin Tsang Mr. Cheung	} } }	Kai Shing Management Services Ltd (Kai Shing)
	Mr. Eric Wong Mr. Y K Poon Mr. Ernest Wong	} } }	AECOM Asia Co. Ltd (AECOM)
	Ms. Cherry Mak	}	Lam Environmental Services Ltd, Environmental Team (ET)
	Mr. Samuel Tsui	}	China State Construction Engineering Ltd, The Contractor of HyD Contract No. HY/2009/15 (CSHK)
	Mr. Daniel Cheung Mr. C M Wong	} }	China Harbour Engineering Co. Ltd. China Road and Bridge Corporation Joint Venture The Contractor of HyD Contract No. HY/2009/11 (CHEC CRBC JV)

NO.	ITEM	ACTION
1.	Mr. Eric Wong (AECOM) briefly described the background of silt screen installation for seawater intakes (C6) for The Excelsior, which is a part of the environmental permit's requirements. CHEC CRBC JV was the party responsible for installation and maintenance of the silt screen at the seawater intakes for The Excelsior.	Noted
2.	Mr. Raymond Ho (Excelsior) advised that the seawater intake was no longer in use since 11 January 2011 as they had connected permanent water supply from WSD pipelines, and that the seawater intake had been abandoned with the valves inside the pumping station closed.	Noted
3.	Mr. Daniel Cheung (CHEC CRBC JV) suggested that the silt screen provision for C6 would be removed from 20 May 2011 (Friday) and expected that the removal works would need a few days to complete.	CHEC CRBC JV
4.	Ms. Margaret Lau (Kai Shing) suggested and CHEC CRBC JV agreed that the removal works would not be scheduled for Saturday or Sunday.	Note
5.	Mr. Eric Wong stated that a submission would be prepared by CSHK notifying EPD of the removal works.	CSHK
6.	Ms. Cherry Mak (ET) said that they would entirely disconnect and remove all power sockets inside the pump house accordingly. Advance notice would be sent to Ms. Margaret Lau.	ET
7.	Ms. Cherry Mak advised that the routine impact water quality monitoring for intake would be terminated subjected to the formal notification to EPD. The enhanced dissolved oxygen monitoring would be maintained.	Noted
8.	Ms. Margaret Lau stated that advance notice, as well as the working schedule and details of supervisor for silt screen removal, would be required from CHEC CRBC JV for information. CHEC CRBC JV agreed.	CHEC CRBC JV
9.	Mr. Daniel Cheung said that after removal of the silt screen, CHEC would take photos and share to all parties for record.	CHEC CRBC JV

EW/QMY/gw

Appendix E

Instruction of Take Over Silt Screen at Windsor House Seawater Intake

AECOM
8/F, Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong
香港新界沙田鄉事會路 138 號
新城市中央廣場第 2 座 8 樓
www.aecom.com

Engineer's Representative's Office
25 Hung Hing Road,
Causeway Bay, Hong Kong
香港銅鑼灣鴻興道 25 號
+852 3912 3000 tel
+852 3912 3010 fax

Your Ref. :
Our Ref. : CWB/(HY/2009/15)/C20/800/15B001478

2 June 2011

China State Construction Engineering (Hong Kong) Limited
29/F China Overseas Building,
139 Hennessy Road,
Hong Kong

Attn.: Mr. Simon Tang

Dear Sir,

Contract No. HY/2009/15
Central-Wan Chai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section)

Silt Screen at Windsor House Seawater Intake

Pursuant to P.S. Clause 25.05 (2) (i), you are instructed to take over the captioned silt screen effective on 23 May 2011, and carry out regular inspection and maintenance of the silt screen until such time that an instruction is made to you to cease the operation.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Peter Poon
Engineer's Representative

c.c. AECOM - Attn.: Mr. Conrad Ng

PP/EW/EH/WW/gw

Appendix F

Technical Details of Silt Curtain

中國建築工程(香港)有限公司 CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.	Contract No. HY/2010/08 Contract Title: Central – Wan Chai Bypass – Tunnel (Slip Road 8 Section)

CONTRACTOR'S SUBMISSION FORM (MATERIAL)

To : The Engineer's Representative
Attn: Mr. Peter Poon

Submission Ref. No:	**CDD/2002/CSF/MTL/TC/001015**	
CSF No:	**000296**	AECOM ref. no. (if applicable) :
Title of Submission:	**Geotextiles for Marine Works**	

Required Information	**Details Provided**
Name of Product or Service	Woven Geotextiles – Silt Curtain for Marine Works
Supplier's Address	Workshop E, 2/F., Effort Industrial Building, 2-8 Kung Yip Street, Kwai Chung, N. T. Hong Kong
Supplier's Name	Million Target Enterprises Ltd
Type of Product or Service	WG105
Applicable Specification Clause	
Applicable Standard	
Test / Backup Data Provided	As per attached
Previous History of Used	As per attached
Proposed Location of use	Silt curtain and Marine works
Proposed Duration for use	Whole Contract Period
Health and Safety Information provided	N/A
BD reference No.	N/A
FSD reference No.	N/A

Remarks :

The information, technical data sheet and sample of the proposed material are attached.

Purpose of Submission:

☑ **For Approval** ☐**For Information** ☐**For Record Purposes**

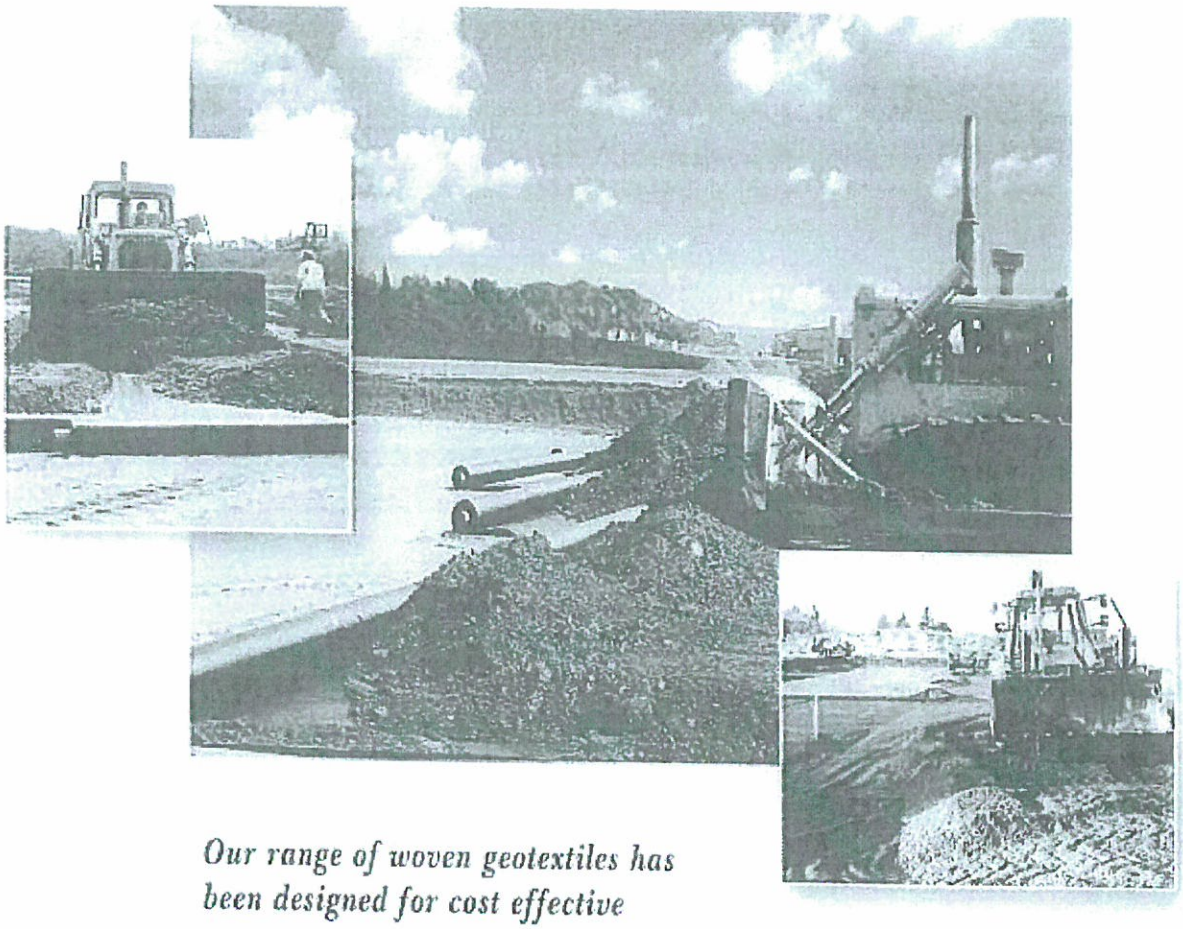
Date of Required Response : 15/9/2013	**Total Page : 1 + 6**

From: **Site Agent**
Name: **Dr. Dave Chan**
Signature: Dave
Date: **23 August 2013**

Prepared by: DC/SML/CPY/ysk
c.c.:MasterFile/QA/originator

Technical Fabrics

WOVEN Geotextiles



Our range of woven geotextiles has been designed for cost effective

- *Reinforcement*
- *Separation*
- *Filtration*

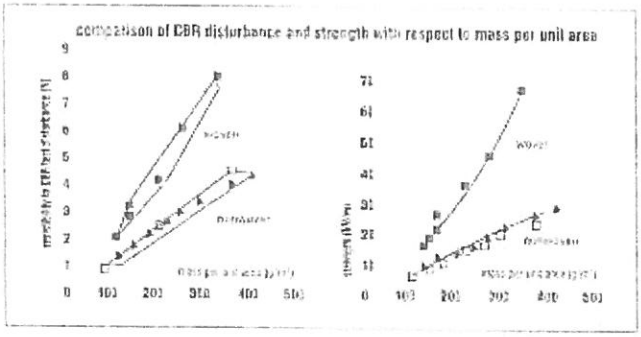
With over 25 years of experience Thrace Plastics continues to demonstrate its ability to extend project life and reduce construction cost.

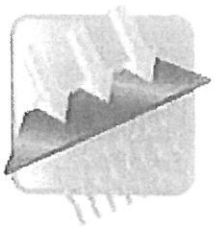
Thrace Plastics

Million Forget Enterprises Ltd T/A
MANDAS ENTERPRISES
明 達 企 業
Workshop E, 2/F., Effort Industrial Building, 2-8 Kung Yip Street, Kwai Chung, N.T. , Hong Kong
Tel. +852 2301 1693 Fax. +852 2398 3495 E-mail. info @mandas.com.hk Website. www.mandas.com.hk

WOVEN Geotextiles

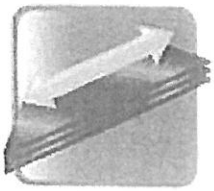
TECHNICAL FABRICS





Separation

Using Thrace woven geotextiles that provide strength, puncture resistance and the proper elongation properties separating layers in construction works can be achieved properly. Preventing the intermixing of two layers of soil is a common requirement in road works and railway constructions.

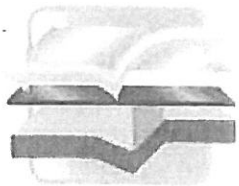


Reinforcement

The mechanical properties of Thrace woven geotextiles when installed under or in-between soil layers, help improve the soil layers mechanical properties by absorbing the tensile forces and reducing deformation. High strength & low elongation are ideal for reinforcing embankments of roads, slops, retaining walls.

Filtration

Thrace woven geotextiles creates a bridging zone and its pore size helps retain soil particles allowing movement of water , making it possible to maintain water flow while avoiding clogging.



Erosion Control

Using Thrace woven geotextiles helps prevent soil particles from washing away from slopes and shoreline. Geotubes and Thrace silt fence are both additional products made from Thrace woven geotextiles to prevent erosion control.

Million Target Enterprises Ltd. T/A
MANDAS ENTERPRISES
明 達 企 業
Workshop E, 2/F., Effort Industrial Building, 2-8 Kung Yip Street, Kwai Chung, N.T., Hong Kong
Tel. +852 2301 1693 Fax. +852 2398 3495 E-mail. info@mandas.com.hk Website. www.mandas.com.hk

Thrace
Nonwovens & Geosynthetics

High Strength Woven Geotextiles

WG series – Technical table (Metric values)


F=Filtration


S=Separation


D=Drainage


R=Reinforcement


Erosion Control

THRACE NWs&GEOs S.A. WG technical fabrics are polypropylene, UV stabilized, high strength, black woven geotextile, used for many civil engineering and building applications. It is manufactured at one of THRACE NWs&GEOs S.A. facilities that have achieved **ISO 9001:2008** certification for its systematic approach to quality. They are also resistant to chemicals and biological agents. WG geotextiles conform to the property values listed below. All technical data are based on statistical analysis from internal and external laboratory results.

PROPERTY	METHOD	UNIT	WG14	WG16	WG18	WG22	WG25	WG30	WG32	WG40	WG42	WG48	WG55	WG60	WG65	WG80	WG85	WG105
Tensile Strength (MD/CD)	EN 10319	kN/m	22/14	22/16	22/18	22/22	25/25	30/30	32/32	40/40	42/42	48/48	55/55	65/60	65/65	85/75	85/85	105/105
Elongation (MD/CD)	EN 10319	%	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12	15/12
Resistance to static puncture	EN ISO 12236	N	2300	2400	2500	3150	3400	3800	4000	5000	5600	6500	7000	7500	8500	10000	11000	13000
Dynamic Perforation resistance	EN 13433	mm	17	17	17	14	12	10	9	8	8	6	5	5	5	3	3	3
Characteristic Opening Size (O_{90})	EN ISO 12956	µm	250	250	250	250	250	230	230	200	200	200	180	180	225	225	200	175
Water Permeability normal to the plane (V_{H50})	EN ISO 11058	$m/s*10^{-3}$	15	7	7	10	10	10	10	7	15	15	10	10	9	9	9	7
Water Flow Rate (dh =50mm)	EN ISO 11058	l/m^2s	15	7	7	10	10	10	10	7	15	15	10	10	9	9	9	7
Mass/Unit Area	EN 9864	g/m^2	95	95	100	120	120	150	160	190	200	220	260	270	290	350	360	430
Thickness	EN 9863-1	mm	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.1	1.1	1.2	1.2	1.3	
UV Resistance	EN 12224	%retained @500hr	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Roll Width / Roll Length	Measured	m	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.3/100	5.2/100	5.2/100	5.2/100	5.2/100
Roll Area	Calculated	m^2	530	530	530	530	530	530	530	530	530	530	530	530	520	520	520	520

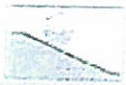
Applications and intended uses of High Strength Woven Geotextiles


EN 13249
F
R
F+S
R+S
F+R
F+R+S

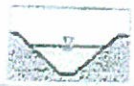

EN 13250
F
R
F+S
R+S
F+R
F+R+S


EN 13251
F
R
F+S
R+S
F+R
F+R+S


EN 13252
F
D
F+S
F+D
F+S+D


EN 13253
F
R
F+S
R+S
F+R
F+R+S


EN 13254
F
R
F+S
R+S
F+R
F+R+S


EN 13255
F
R
F+S
R+S
F+R
F+R+S


EN 13256


EN 13257
F
R
F+S
R+S
F+R
F+R+S


EN 13265
F
R
F+R

NOTES:

1. All the above figures are averages values obtained from testing to current EN standard in our laboratory and at external institutes.
2. THRACE NWs&GEOs S.A. Technical Fabrics reserve the right to alter product specifications at any time without prior notice. It is the responsibility of all users to satisfy themselves that the above data are current.
3. Polypropylene is the constituent polymer used in the production of the WG geotextiles series.
4. To be covered within one month after installation. All the above geotextiles are predicted to be durable for more than 50 years in soil temperatures >25°C and are resistant to highly acid and alkaline environments on the basis of a durability assessment. All of them have been satisfactorily assessed for resistance to oxidation (ENV ISO 13438), microbiological degradation (ENV 12225) and chemical ageing (ENV ISO 12960-Method A: inorganic acid and Method B: organic base).

CE

TÜV AUSTRIA HELLAS
ISO 9001:2008
Reg.No: 01010018

Certificate No: 338-CPD-382

Million Target Enterprises Ltd T/A
MANDAS ENTERPRISES
明 達 企 業
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Tel. +852 2301 1693 Fax. +852 2398 3495 E-mail: info @mandas.com.hk Website:

Thrace
Nonwovens & Geosynthetics

CE

Certificate No: 0338-CPD-392

Product Data Sheet
WG105

WG105 technical fabric is a polypropylene, UV stabilized, high strength, black woven geotextile, used for many civil engineering and building applications. It is manufactured at one of THRACE NWs&GEOs S.A. facilities that have achieved **ISO 9001:2008** certification for its systematic approach to quality. It is also resistant to many chemicals and biological agents. **WG105** conforms to the property values listed below. All technical data are based on statistical analysis from internal and external laboratory results.

PROPERTY	TEST METHOD	VALUE	METRIC VALUES		TOLERANCE
MECHANICAL					
Tensile Strength (MD/CD)	EN 10319	Average	kN/m	105/105	-5.0/-5.0
Elongation (MD/CD)	EN 10319	Average	%	20/15	±4/±3
Resistance to static puncture	EN ISO 12236	Average	N	12000	-1000
Dynamic Perforation resistance	EN 13433	Average	mm	3	+1
HYDRAULIC					
Characteristic Opening Size (O_{90})	EN ISO 12956	Average	µm	175	±50
Water permeability VI_{ISO}	EN ISO 11058	Average	$m/sec*10^{-3}$	9	-3
Water flow rate	EN ISO 11058	Average	$l/m^2/s$	9	-3
PHYSICAL					
Mass/Unit Area	EN 9864	Average	gr/m^2	480	±20
Thickness (2kPa)	EN 9863-1	Average	mm	1.4	±0.1
ENDURANCE					
Weathering Resistance (MD/CD)	EN 12224	Average	%retained @500hr	90	±10
STANDARD PACKAGING					
Roll Width	Measured	Typical	m	5.2	-0.01
Roll Length	Measured	Typical	m	100	-2
Roll Area	Calculated	Typical	m^2	520	-0.02


F=Filtration


S=Separation


D=Drainage


R=Reinforcement


Erosion Control

Applications and Intended uses of High Strength Woven Geotextiles


EN 13249
F,R
F+S
R+S
F+R
F+R+S


EN 13250
F,R
F+S
R+S
F+R
F+R+S


EN 13251
F,R
F+S
R+S
F+R
F+R+S


EN 13252
F,R
F+S
F+D
F+S+D


EN 13253
F,R
F+S
R+S
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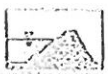
EN 13254
F,R
F+S
R+S
F+R
F+R+S


EN 13255
F,R
F+S
R+S
F+R
F+R+S


EN 13256


EN 13257
F,R
F+S
R+S
F+R
F+R+S


EN 13265
F,R
F+R

NOTES:

1. All the above figures are averages values obtained from testing to current EN standard in our laboratory and at external institutes.
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4. To be covered within one month after installation. All the above geotextiles are predicted to be durable for more than 50 years in soil temperatures >25°C and are resistant to highly acid and alkaline environments on the basis of a durability assessment. All of them have been satisfactorily assessed for resistance to oxidation (ENV ISO 13438), microbiological degradation (ENV 12225) and chemical ageing (ENV ISO 12960-Method A: inorganic acid and Method B: organic base).

TÜV AUSTRIA HELLAS
ISO 9001:2008
Reg.No: 01010018

CERTIFICATION BTTG SERVICES
Notified Body

4

CERTIFICATION SERVICES

BTTG

Certificate of Factory Production Control

BTTG Ref No: 5100316/1

0338-CPD-0687

In compliance with *Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products* (the Construction Products Directive or CPD), as later amended, it has been stated that the construction products

Polypropylene, UV Stabilized, Black Woven Geotextile Fabric

TP019011P, TP019013P, TP019016P, TP020014P, TP025025W, TP030030W, TP040035W, TP045045W, TP060060W, TP080080W, TP100100W

WG42HF, WG48HF, WG55HF, WG60HF, WG65HF, WG80HF, WG85HF, WG105HF

WG14, WG16, WG18, WG22, WG25, WG30, WG32, WG40, WG42, WG48, WG55, WG60, WG65, WG80, WG85, WG105

placed on the market by

Thrace Nws&GEOs S.A
20 Marinou Antipa str.
GR-174 55 Alimos Athens
Greece

factory address

Magiko Xanthis
GR-671 00
Greece

are submitted by the manufacturer to the initial type-testing of the product, a factory production control and that the notified body No. 0338 - BTTG - has performed the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control.

This certificate attests that all provisions concerning the attestation of factory production control described in Annex ZA of the standards

Intended uses: F + R + S	**EN 13249:2000/A1:2005; EN 13250:2000/A1:2005; EN 13251:2000/A1:2005; EN 13253:2000/A1:2005; EN 13254:2000/A1:2005; EN 13255:2000/A1:2005; EN 13257:2000/A1:2005**
Intended uses: F + S + D	**EN 13252:2000/A1:2005**
Intended uses: F + R	**EN 13265:2000/A1:2005**

were applied.

This certificate was first issued on 5 March 2012 and remains valid as long as the conditions laid down in the harmonised technical specification in reference or the manufacturing conditions in the factory or the FPC itself are not modified significantly.

Signed for and on behalf of BTTG

.....

Mike Nunney
Operational Head, Certification
BTTG
Date Signed: 5 March 2012

For terms and conditions of issue, see Page 2

BTTG Ltd. Registered Office: Wira House, West Park Ring Road, Leeds. LS16 6QL. United Kingdom
Registered in England No. 4628697
Tel: +44 (0)113 259 1999 Fax: +44 (0)113 278 0306 e-mail: info@bttg.co.uk

5

Terms and Conditions associated with the issue of EC Certificate of Factory Production Control No: 0338-CPD-0687

1. This certificate is issued subject to BTTG's standard terms of business.

2. Any change to the product and/or technical specification shall be immediately notified to BTTG.

3. The Manufacturer / Authorised Representative shall have continuous surveillance of Factory Production Control carried out by a Notified Body and a re-assessment of Factory Production Control every three years.

4. This certificate remains the property of BTTG and will be withdrawn if any of the conditions attached to its issue are not complied with.

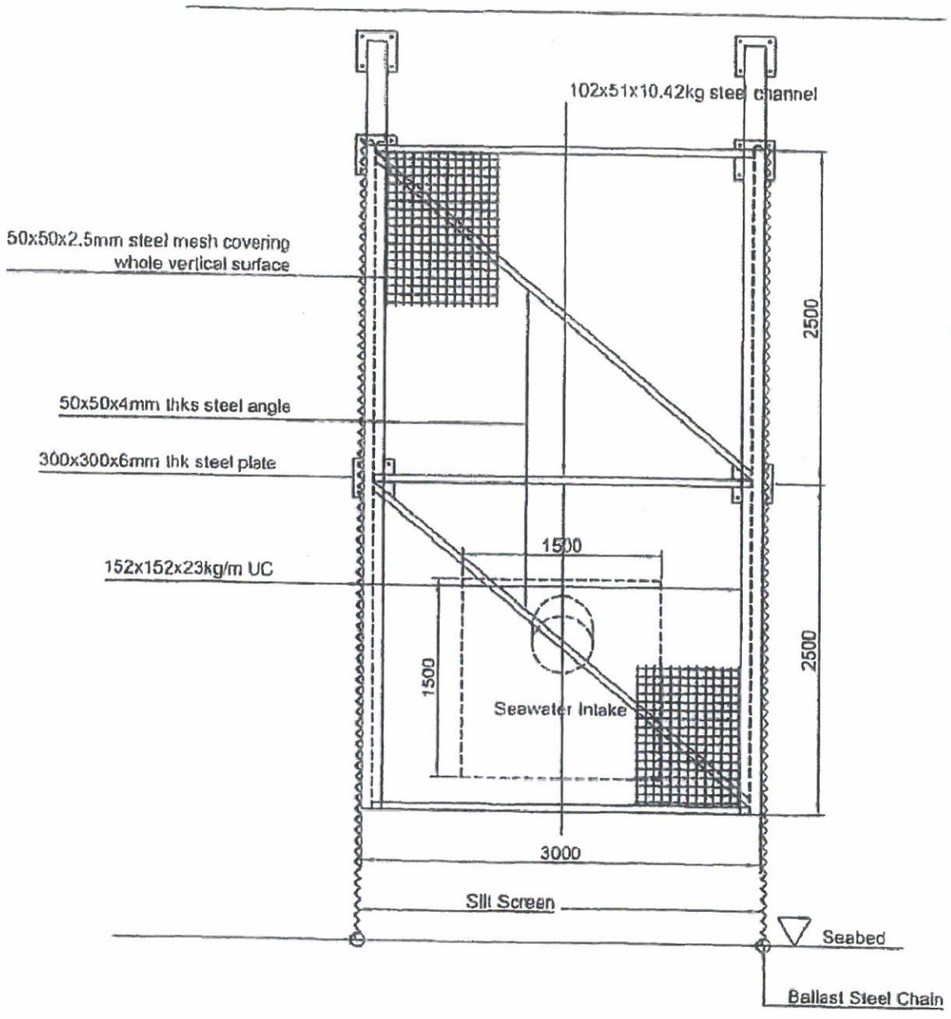
5. Marking and instructions have been assessed in the English language only. It is the Manufacturers/Authorised Representatives responsibility to obtain and supply language versions acceptable to the country where the product is to be sold.

6. This certificate remains valid only if satisfactory maintenance of independent certification against ISO 9001 is achieved.

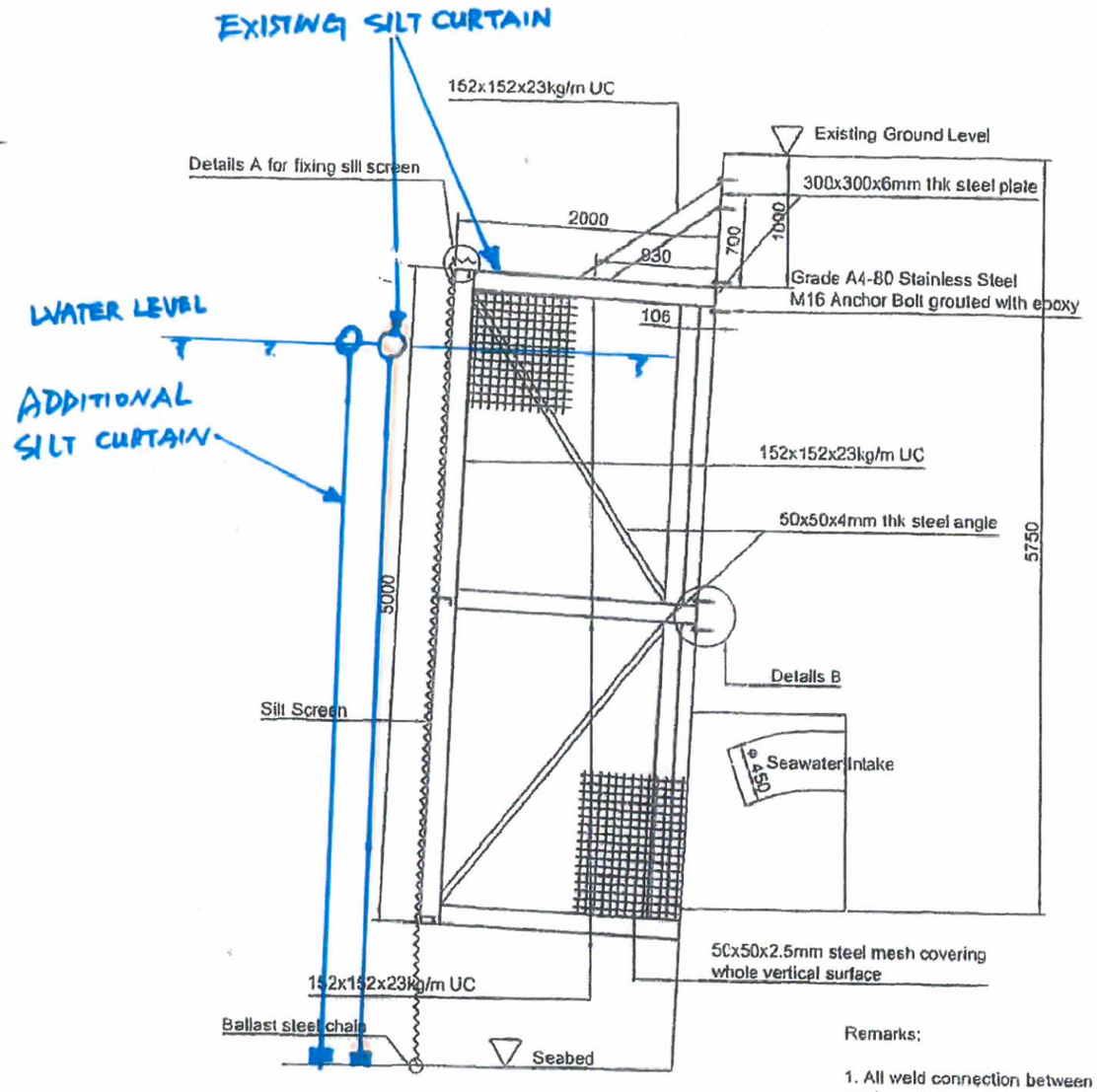
Appendix G

Details of Diversion of Seawater Intake for Windsor House


Additional Silt
Curtain layer
20m (Length)
5m (Depth)



Elevation View of Screen at Seawater Intake

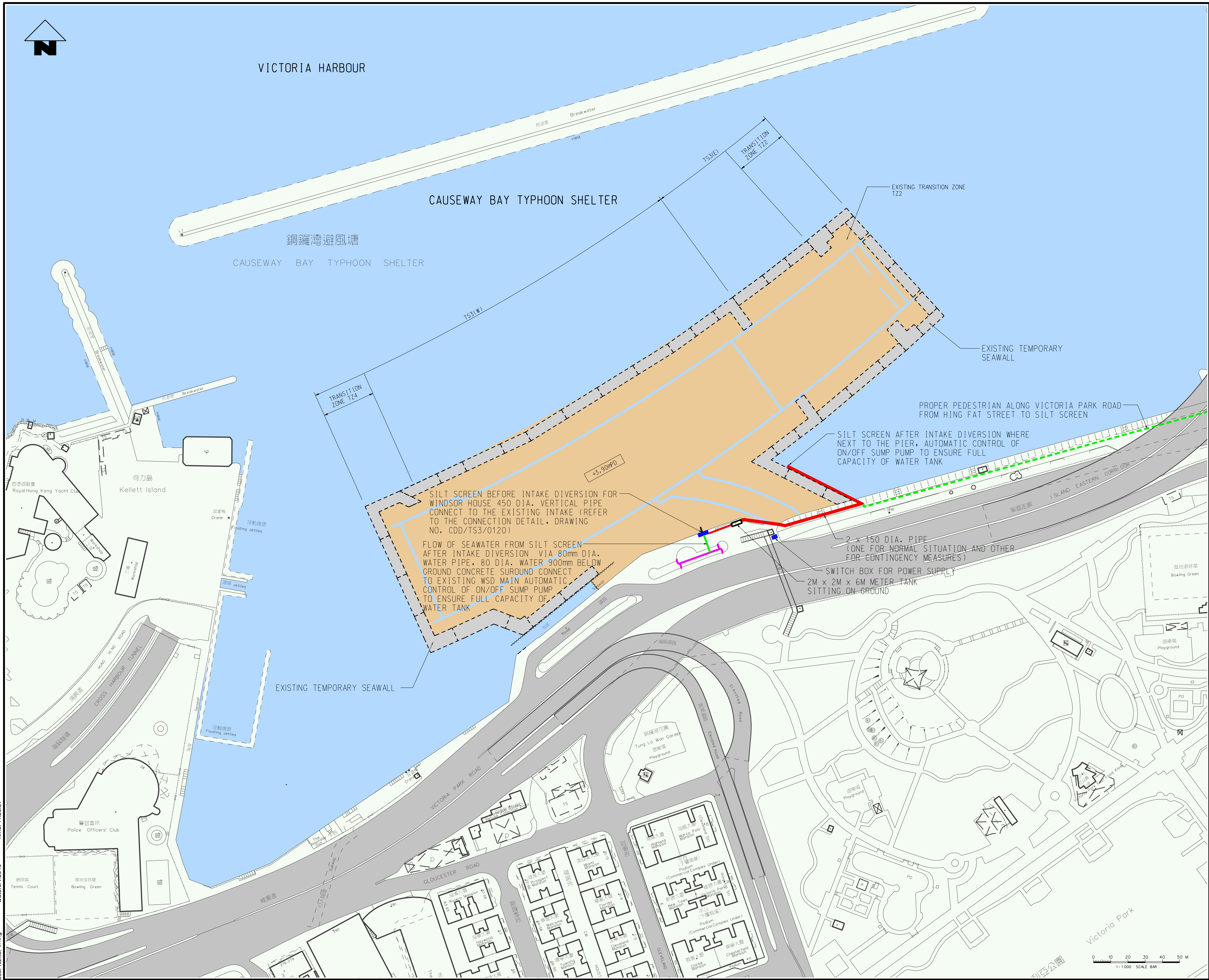


Side View of Screen at Seawater Intake

Remarks:

1. All weld connection between UC, plate, angle and channel should be 4mm fillet all around.
2. All units are in millimeter.
3. All steel should be Grade 43A
4. Silt Screen should cover from top of steel frame down to existing seabed

Silt Screen at Seawater Intake for Windsor House


VICTORIA HARBOUR
CAUSEWAY BAY TYPHOON SHELTER
銅鑼灣避風塘
CAUSEWAY BAY TYPHOON SHELTER
Breakwater
TS3(E)
TRANSITION ZONE TZ2
TS3(W)
TRANSITION ZONE TZ4
EXISTING TRANSITION ZONE TZ2
EXISTING TEMPORARY SEAWALL
PROPER PEDESTRIAN ALONG VICTORIA PARK ROAD FROM HING FAT STREET TO SILT SCREEN
SILT SCREEN AFTER INTAKE DIVERSION WHERE NEXT TO THE PIER, AUTOMATIC CONTROL OF ON/OFF SUMP PUMP TO ENSURE FULL CAPACITY OF WATER TANK
+3.90mPD
SILT SCREEN BEFORE INTAKE DIVERSION FOR WINDSOR HOUSE 450 DIA. VERTICAL PIPE CONNECT TO THE EXISTING INTAKE (REFER TO THE CONNECTION DETAIL, DRAWING NO. CDD/TS3/0120)
FLOW OF SEAWATER FROM SILT SCREEN AFTER INTAKE DIVERSION VIA 80mm DIA. WATER PIPE, 80 DIA. WATER 900mm BELOW GROUND CONCRETE SUROUND CONNECT TO EXISTING WSD MAIN AUTOMATIC CONTROL OF ON/OFF SUMP PUMP TO ENSURE FULL CAPACITY OF WATER TANK
2 x 150 DIA. PIPE (ONE FOR NORMAL SITUATION AND OTHER FOR CONTINGENCY MEASURES)
SWITCH BOX FOR POWER SUPPLY
2M x 2M x 6M METER TANK SITTING ON GROUND
EXISTING TEMPORARY SEAWALL
ISLAND EASTERN CORRIDOR
奇力島
Kellett Island
香港遊艇會
Royal Hong Kong Yacht Club
Floating Jetties
CROSS HARBOUR TUNNEL
VICTORIA PARK ROAD
GLOUCESTER ROAD
Police Officers' Club
Tennis Court
Bowling Green
Tung Lo Wan Garden Playground
Victoria Park
Bowling Green
Playground
0 10 20 30 40 50 M
1:1000 SCALE BAR

NOTES:

1. ALL LEVELS SHOWN ARE IN METRES REFER TO HONG KONG PRINCIPAL DATUM (HKmPD) UNLESS OTHERWISE STATED.
2. GRID LINES ARE IN H.K. METRIC GRID 1980
3. DECIMAL POINT OF SPOT HEIGHT IS THE SURVEYED POSITION OF SURVEYED POINT.

REV.	DESCRIPTION	CHK.	DATE
A	MINOR AMENDMENT	CMW	02/JAN/15
-	FIRST ISSUED	CMW	08/NOV/14

路政署
Highways Department
主要工程管理處
Major Works Project Management Office

AECOM

CENTRAL-WAN CHAI BYPASS-TUNNEL (SLIP ROAD 8 SECTION)

TITLE:

LAYOUT PLAN FOR WATER INTAKE (WINSOR HOUSE)

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

DRG. NO. 圖紙編號 CDD TS3 0883	REV. 修訂 A
CONTRACT NO. 合約編號 HY/2010/08	DATE OF ISSUE 發出日期 02/JAN/2015
CHECK BY 覆核 WCM	DRAW BY 繪圖 NTM
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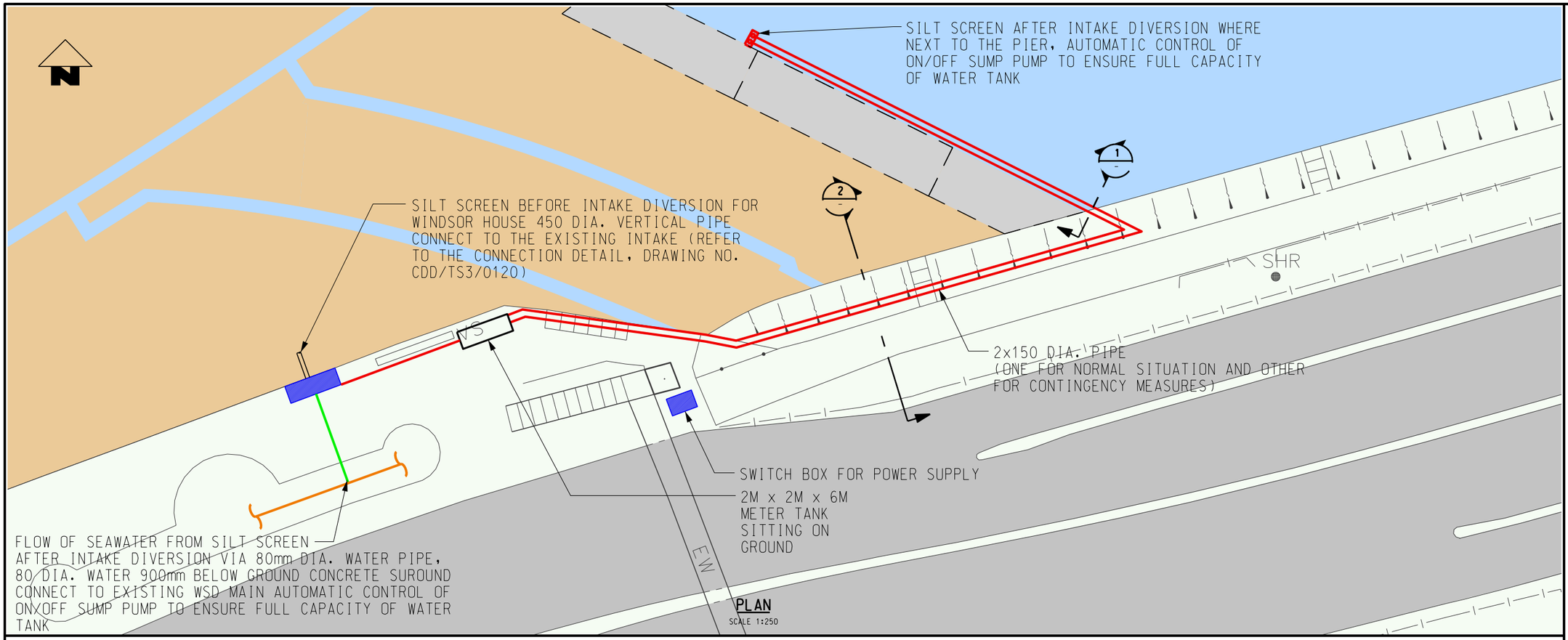
User name: tm.ng Date:6/1/2015 Time: 11:26:57

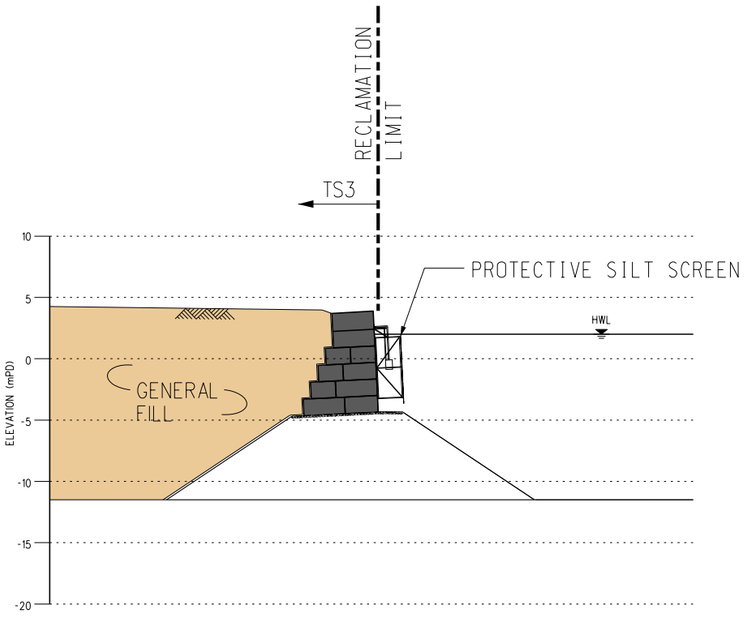
Filename: X:\13_DWG\06 Site Sketch\883A.dgn



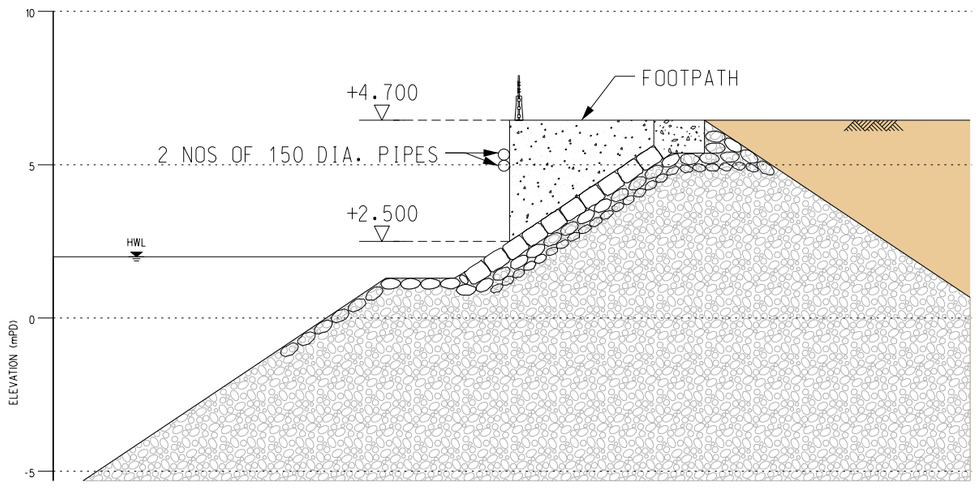
PLAN
SCALE 1:250

NOTES:

1. ALL LEVELS SHOWN ARE IN METRES REFER TO HONG KONG PRINCIPAL DATUM (HKmPD) UNLESS OTHERWISE STATED.
2. GRID LINES ARE IN H.K. METRIC GRID 1980
3. DECIMAL POINT OF SPOT HEIGHT IS THE SURVEYED POSITION OF SURVEYED POINT.



SECTION 1
SCALE 1 : 250



SECTION 2
SCALE 1 : 100

REV.	DESCRIPTION	CHK.	DATE
A	MINOR AMENDMENT	CMW	02/JAN/15
-	FIRST ISSUED	CMW	08/NOV/14

路政署
Highways Department
主要工程管理處
Major Works Project Management Office

AECOM

CENTRAL-WAN CHAI BYPASS-TUNNEL (SLIP ROAD 8 SECTION)

TITLE:
PLAN AND SECTIONS FOR WATER INTAKE (WINSOR HOUSE)

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

DRG. NO. 圖紙編號 CDD TS3 0889	REV. 修訂 A
CONTRACT NO. 合約編號 HY/2010/08	DATE OF ISSUE 發出日期 02/JAN/2015
CHECK BY 覆核 CMW	DRAW BY 繪圖 NTM
SCALE 比例 AS SHOWN	STATUS 階段 FOR INFORMATION
DIMENSION ARE IN 單位尺寸 M	PAPER SIZE 圖紙尺寸 A1

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1:100 SCALE BAR (A1)
0 5 10 M
1:250 SCALE BAR (A1)

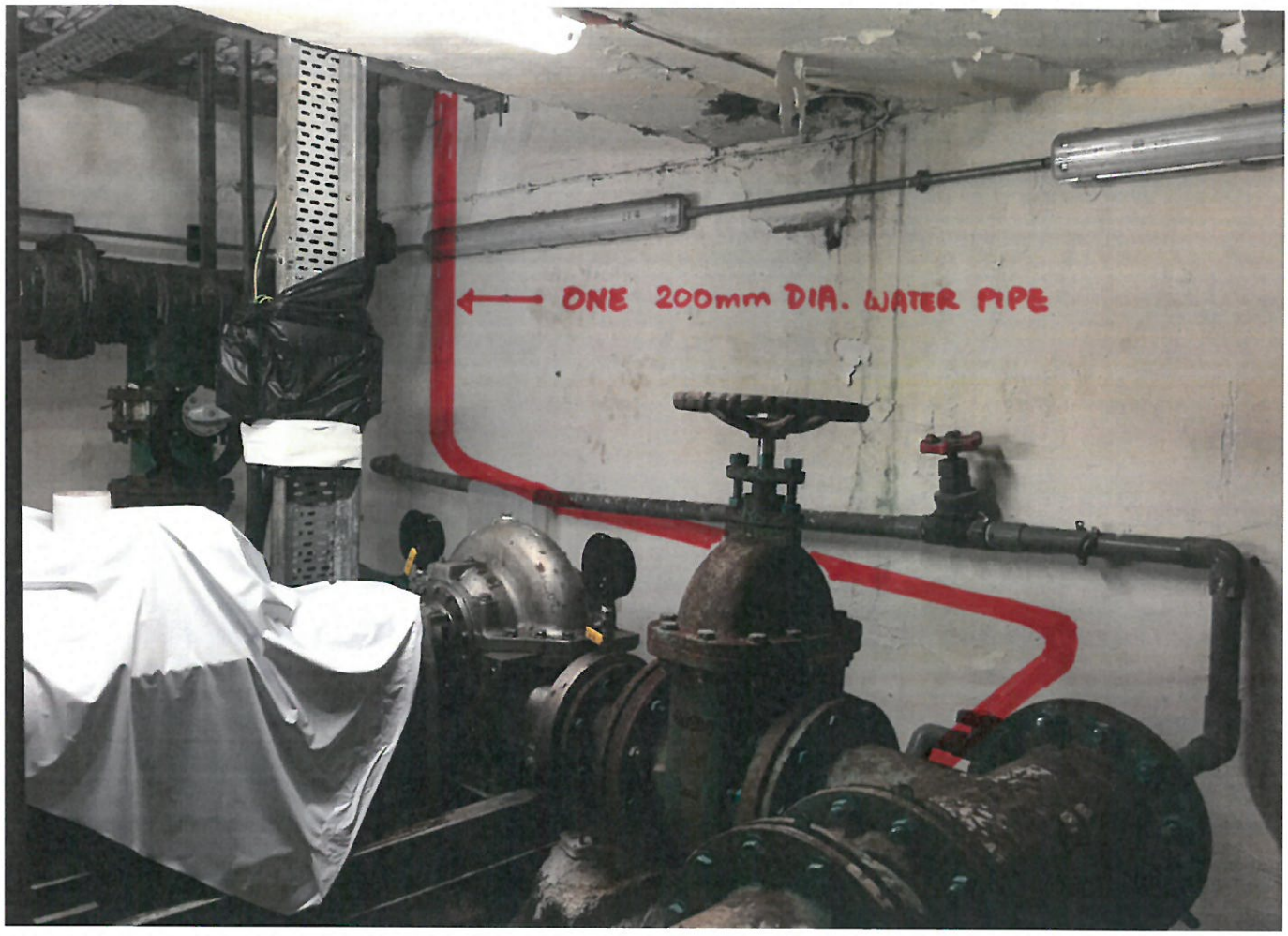
Time: 11:24:36
Date: 6/1/2015
User name: tm.ng
Filename: X:\13_DWG\06 Site Sketch\889A.dgn

SKETCH 1

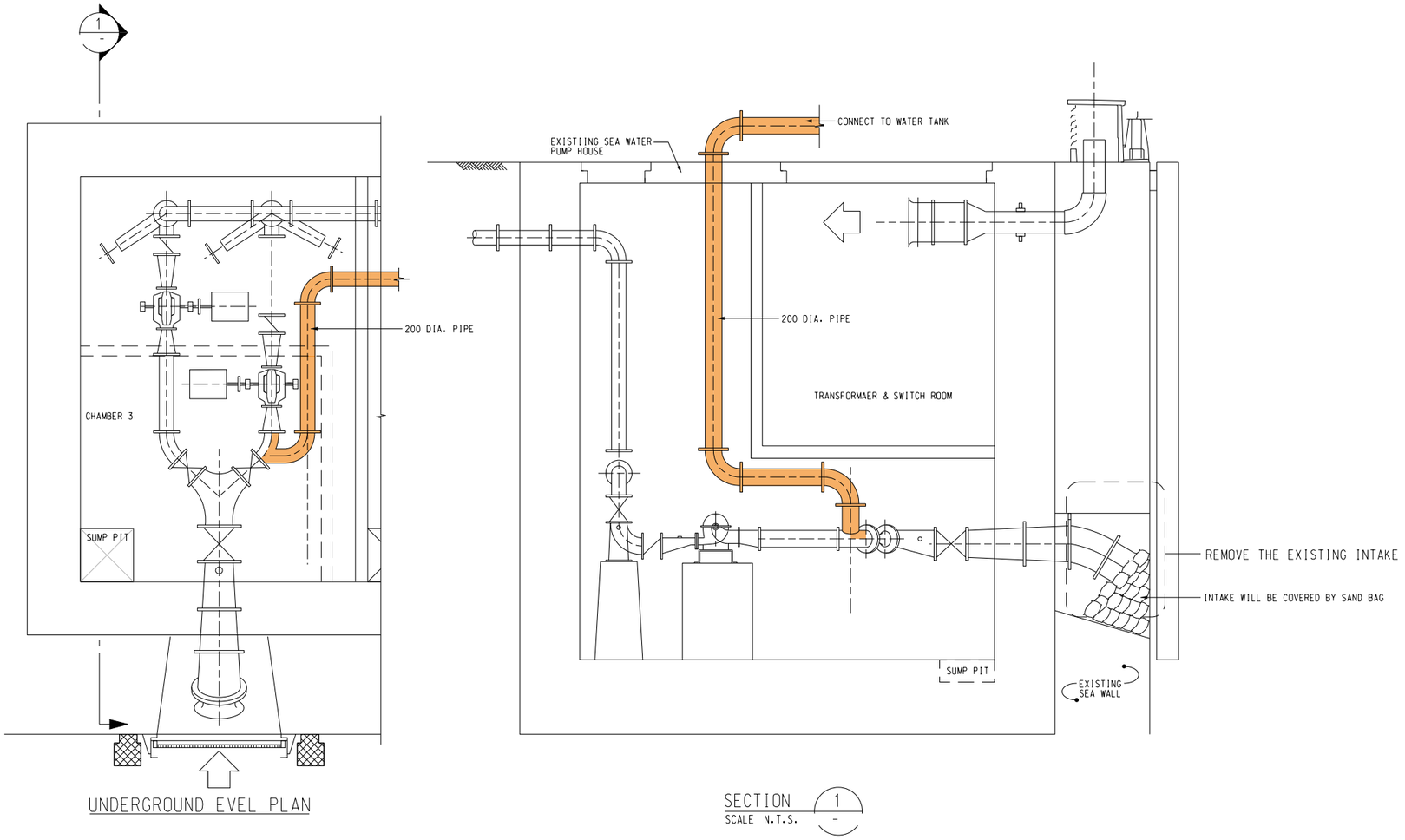
ONE 200mm DIA. WATER PIPE CONNECT TO WINDSOR HOUSE PUMP ROOM ON THE FOOTPATH

CONCRETE RAMP WILL BE CONSTRUCTED FOR PEDESTRIAN ACCESS

SKETCH 2



SKETCH 3



UNDERGROUND EVEL PLAN

SECTION 1 - SCALE N.T.S.

REV.	DESCRIPTION	CHK.	DATE
C	MINOR AMENDMENT	CMW	02/JAN/15
B	REVISED DESIGN	EK	31/OCT/14
A	SITE INSTRUCTION	AL	03/APR/14
-	FIRST ISSUED	AL	22/OCT/13

路政署
Highways Department
主要工程管理處
Major Works Project Management Office

AECOM

CENTRAL-WAN CHAI BYPASS-TUNNEL
(SLIP ROAD 8 SECTION)

TITLE:
INSTALLATION OF VERTICAL PIPE TO CONNECT THE EXISTING WINDSOR HOUSE WATER CHAMBER

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

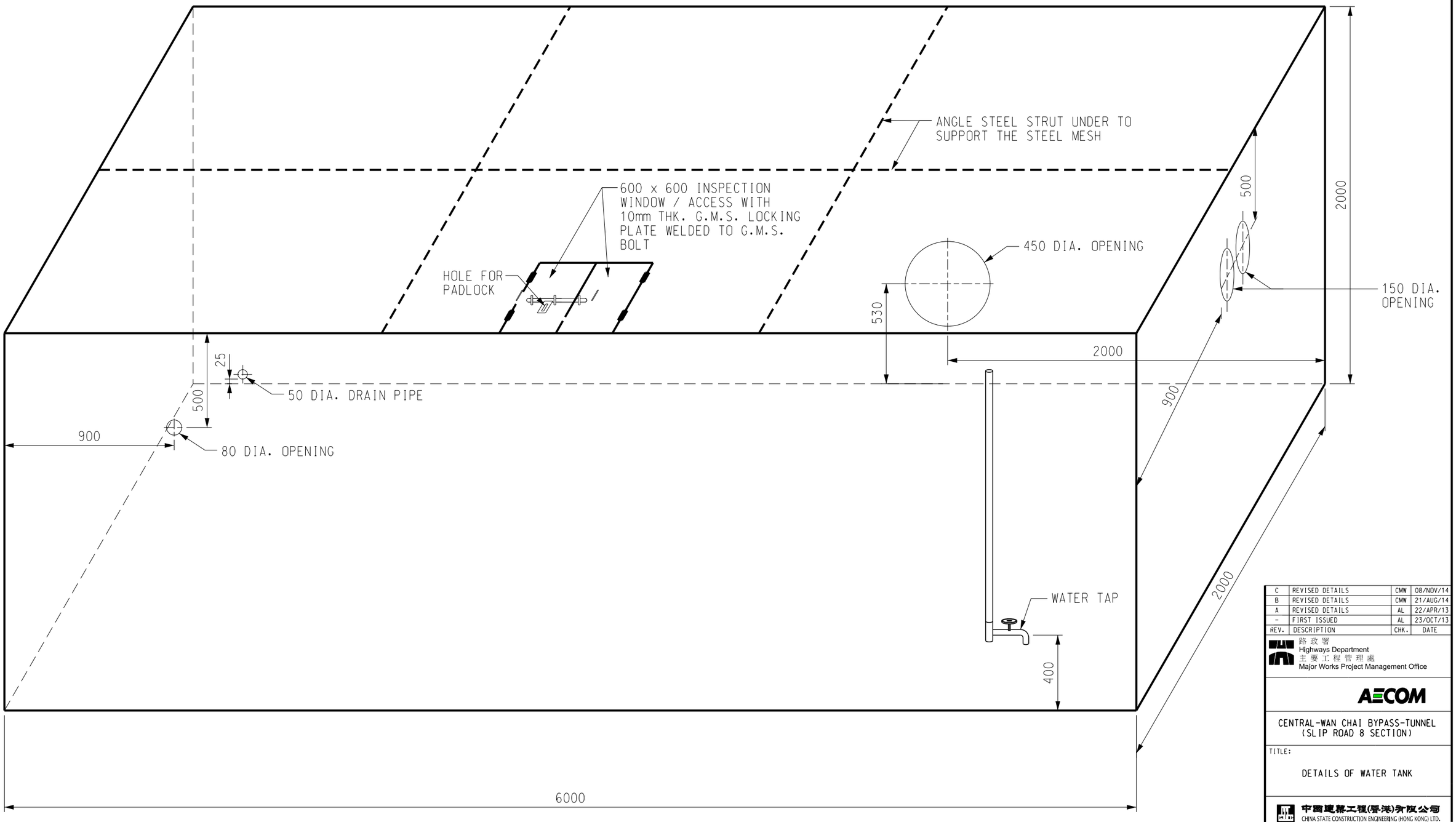
DRG. NO. 圖紙編號 CDD/TS3/0120	REV. 修訂 C
CONTRACT NO. 合約編號 HY/2010/08	DATE OF ISSUE 發出日期 02/JAN/2015
CHECK BY 覆核 CMW	DRAW BY 繪圖 NTM
SCALE 比例 N.T.S.	STATUS 階段 -
DIMENSION ARE IN 單位尺寸 -	PAPER SIZE 圖紙尺寸 A1

User name: tm.ng Date:2/1/2015 Time: 17:29:05

Filename: X:\13_DWG\06 Site Sketch\120C.dgn

NOTES:

1. ALL LEVELS SHOWN ARE IN METRES REFER TO HONG KONG PRINCIPAL DATUM (HKmPD) UNLESS OTHERWISE STATED.
2. GRID LINES ARE IN H.K. METRIC GRID 1980
3. DECIMAL POINT OF SPOT HEIGHT IS THE SURVEYED POSITION OF SURVEYED POINT.



DETAILS OF WATER TANK

SCALE 1:10

REV.	DESCRIPTION	CHK.	DATE
C	REVISED DETAILS	CMW	08/NOV/14
B	REVISED DETAILS	CMW	21/AUG/14
A	REVISED DETAILS	AL	22/APR/13
-	FIRST ISSUED	AL	23/OCT/13

路政署
Highways Department
主要工程管理處
Major Works Project Management Office

AECOM

CENTRAL-WAN CHAI BYPASS-TUNNEL
(SLIP ROAD 8 SECTION)

TITLE:

DETAILS OF WATER TANK

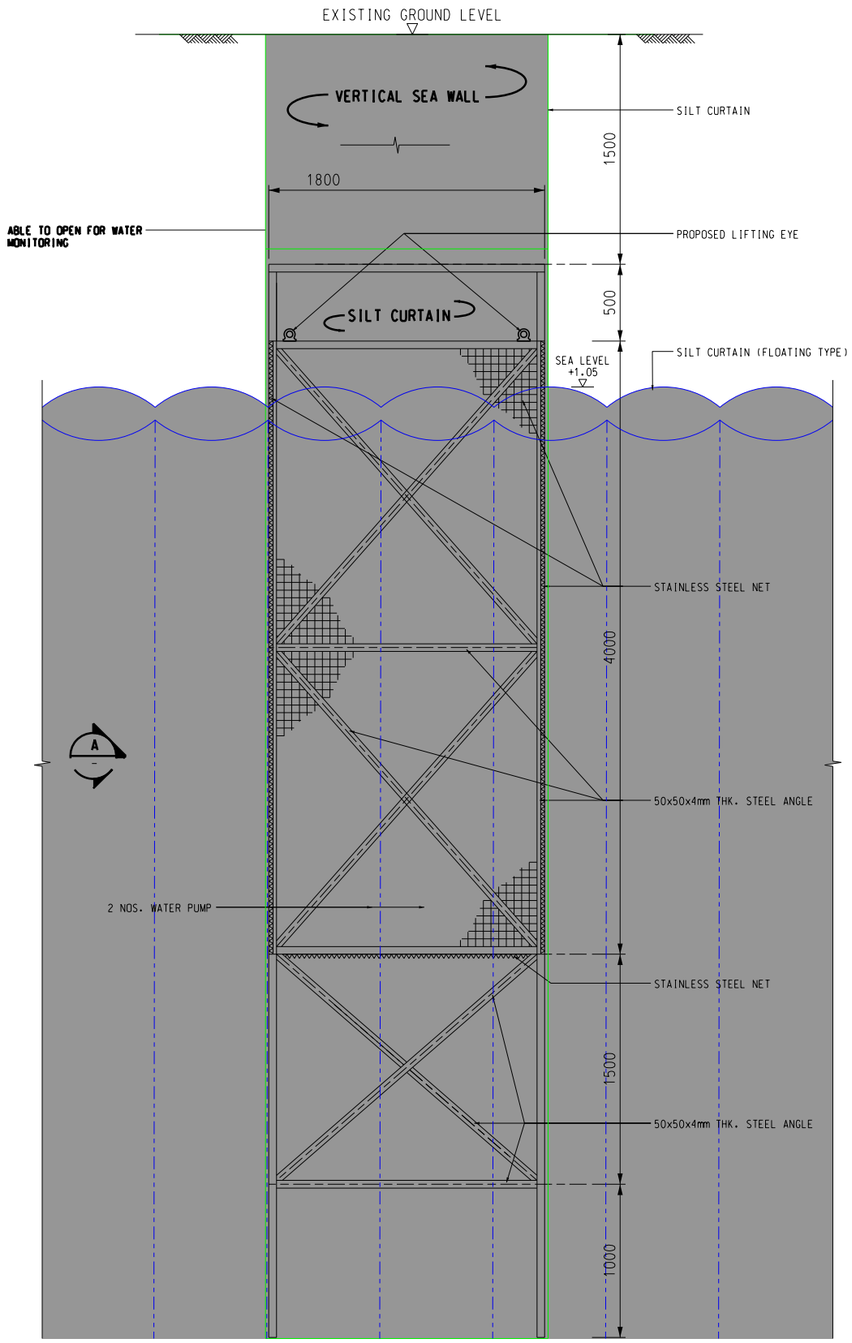
中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

DRG. NO. 圖紙編號	CDD/TS3/0121	REV. 修訂	C
CONTRACT NO. 合約編號	HY/2010/08	DATE OF ISSUE 發出日期	08/NOV/14
CHECK BY 覆核	CMW	DRAW BY 繪圖	NTM
SCALE 比例	AS SHOWN	STATUS 階段	SUBMISSION
DIMENSION ARE IN 單位尺寸	MM	PAPER SIZE 圖紙尺寸	A1

Time: 18:27:13
Date:8/11/2014
User name: tm.ng
Filename: X:\13_DWG\06 Site Sketch\121C.dgn

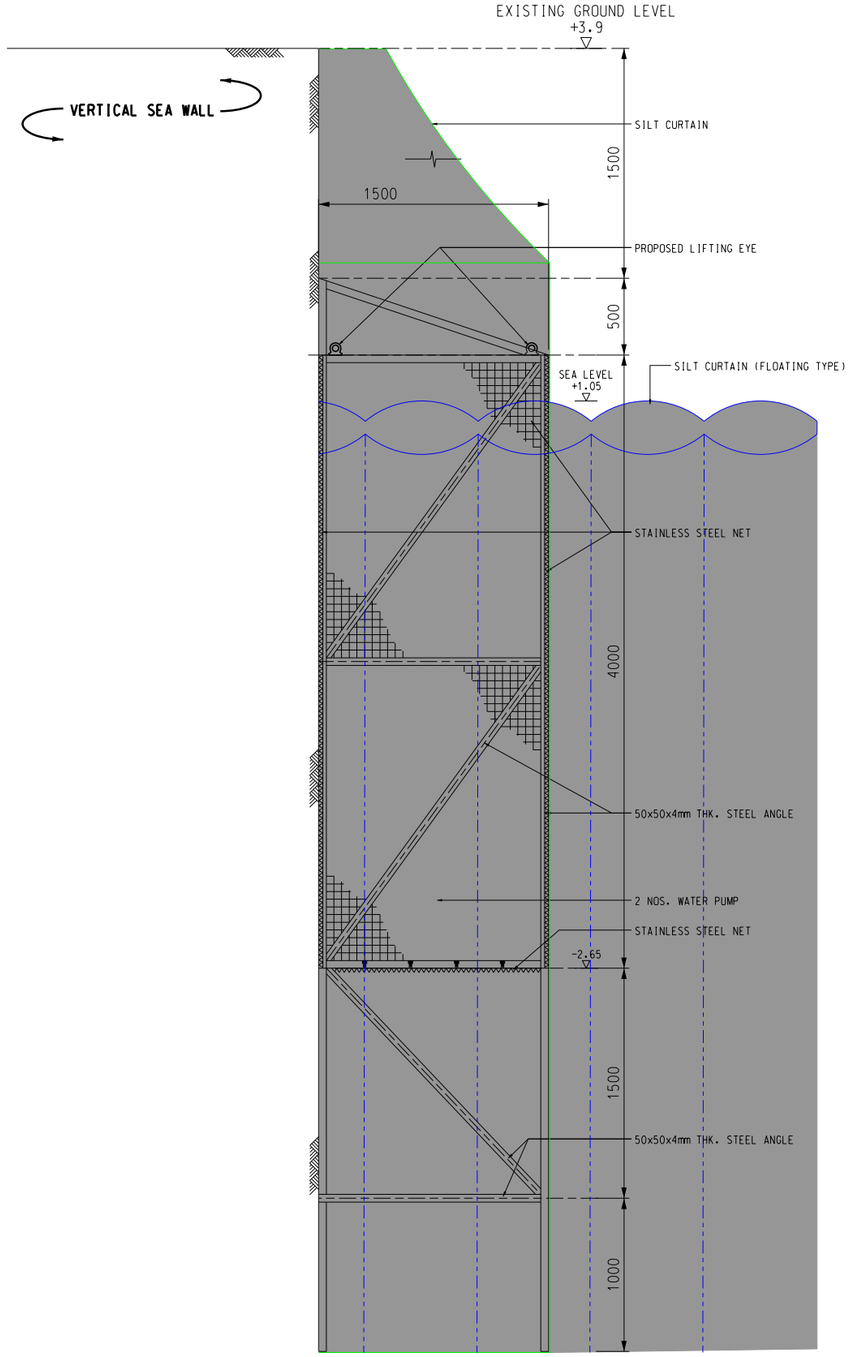
Appendix H

Specification of Silt Screen after Intake Diversion



ELEVATION VIEW OF SILT SCREEN FOR PUMPS

SCALE 1:20



VIEW A

SCALE 1:20

NOTES:

1. ALL LEVELS SHOWN ARE IN METRES REFER TO HONG KONG PRINCIPAL DATUM (HKmPD) UNLESS OTHERWISE STATED.
2. GRID LINES ARE IN H.K. METRIC GRID 1980
3. DECIMAL POINT OF SPOT HEIGHT IS THE SURVEYED POSITION OF SURVEYED POINT.

REV.	DESCRIPTION	CHK.	DATE
I	MINOR REVISED	EK	02/JAN/15
H	MINOR REVISED	EK	31/OCT/14
G	MINOR REVISED	SML	04/OCT/14
F	MINOR REVISED	SML	30/DEC/13
E	MINOR REVISED	SML	28/DEC/13
D	MINOR REVISED	SML	27/DEC/13
C	MINOR REVISED	SML	26/NOV/13
B	MINOR REVISED	SML	19/NOV/13
A	MINOR REVISED	SML	11/NOV/13
-	FIRST ISSUED	SML	24/OCT/13

路政署
Highways Department
主要工程管理處
Major Works Project Management Office

AECOM

CENTRAL-WAN CHAI BYPASS-TUNNEL
(SLIP ROAD 8 SECTION)

TITLE:

DETAILS OF SILT SCREEN
FOR PUMPS

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

DRG. NO. 圖紙編號 CDD/TS3/0125	REV. 修訂 I
CONTRACT NO. 合約編號 HY/2010/08	DATE OF ISSUE 發出日期 02/JAN/2015
CHECK BY 覆核 SML	DRAW BY 繪圖 NTM
SCALE 比例 N.T.S.	STATUS 階段 SUBMISSION
DIMENSION ARE IN 單位尺寸 MM	PAPER SIZE 圖紙尺寸 A1

User name: tm.ng Date:2/1/2015 Time: 15:25:10

Filename: X:\13_DWG\06 Site Sketch\125I.dgn

Appendix I

Minutes of Meeting with Perfect World Company Limited (Property Management Company of Windsor House)

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

香港軒尼詩道一三九號中國海外大厦二十九樓
29/F, China Overseas Building, 139 Hennessy Road, Hong Kong.
電話Tel: (852)2823 7888 傳真Fax: (852)2527 6782
網址: http://www.csci.com.hk

Your ref: -
Our ref: CDD/3007/L/MRN/TS3/002415
Date: 13 March 2014

By Hand

Perfect World Company Limited
1/F, MassMutual Tower,
38 Gloucester Road,
Wanchai, Hong Kong

Attn: Mr. Chan Cheuk Yin, Chris

Dear Sir,

Contract No. HY/2010/08
Central – Wan Chai Bypass – Tunnel (Slip Road 8 Section)
Record of Meeting held on 19 February 2014 - Proposed Diversion of Water Intake for Windsor House

We enclose herewith the self-explanatory minutes of meeting held on 19 February 2014 regarding the captioned for your information and action.

Please be informed that your areas of concerns had been fully discussed and addressed during the meeting.

Yours faithfully,

For and on behalf of
China State Construction Engineering (Hong Kong) Ltd.

Dr. Dave Chan
Site Agent

Encl.

c.c. Hyd – Attn: Mr. Jones Lai
PRE/CWB – Attn: Mr. Peter Poon

DC/SML/sls

Contract No. : HY/2010/08

Central – Wan Chai Bypass – Tunnel
(Slip Road 8 Section)

Contract No.: HY/2010/08 **Contract Title:** **Central – Wan Chai Bypass – Tunnel** **(Slip Road 8 Section)**	**Date of Meeting: 19 February 2014** **Time: 3::00 pm** **Location: Room 1215, 12/F Seaview Estate** **CRE Office**
Subject: Record of meeting for Windsor House Sea Water Intake Diversion	
Recorded by: Simon Law	**Preparation Date: 27 February 2014**

Attendees

Name	Company	Position
Chris Chan	Perfect World	Managerment Office of Windsor House
Griffin Chu	Perfect World	
Ms Ho	Perfect World	
Jones Lai	HyD	Senior Engineer
Henry Tse	HyD	Engineer
Terry Siu	AECOM	Senior Resident Engineer
Eric Wong	AECOM	Senior Resident Engineer
Ken Shum	AECOM	Resident Engineer
Alex Lyn	AECOM	Resident Engineer
Chris Leung	CSHK	Deputy Project Manager
Dave Chan	CSHK	Site Agent
Simon Law	CSHK	Section Agent

Contract No. : HY/2010/08

Central – Wan Chai Bypass – Tunnel
(Slip Road 8 Section)

Item	Description	Action By	Due Date
1	HyD welcomed all to join the meeting. As CSHK scheduled to carry out the temporary reclamation for TS3 at Causeway Bay Typhoon Shelter in mid 2014, the existing seawater inlet of Windsor House would be affected and temporary diversion of seawater pipe would be required. This meeting aimed at working out a diversion scheme acceptable to Perfect World.		
2	China State tabled and explained in detail the proposed diversion scheme for Windosr House's existing seawater intake, see attached. In gist, seawater would be pumped from the new intake at the east of the Site near the existing seawall, into a water tank placed at the ground level at the seafront near Windsor House's existing underground pump room, and finally to the Windsor House's existing pumping system. The design flow capacity of the inlet pump would be well above the Windsor House's existing pumping system. An additional standby pump and a connecting pipe would be provided to assure a continuous seawater supply during maintenance and any emergency situation. China State also proposed that a secondary water tank connecting to WSD watermain could be installed so as to separate the potable water and seawater as back-up plant for emergency case. This proposal would be subjected to the approval of WSD. Perfect World generally considered that this new arrangement was practicable, provided that the seawater quality would not be worse than the existing situation.	Noted Noted Noted	
3	HyD supplemented that according to the Environmental Permit, the project team had to arrange the environmental team to take water samples near the seawater intakes for testing the water quality. In order to ensure the quality of the seawater supplied to Windsor House, silt curtain would be provided at the proposed temporary intake to fllter the seawater. The make and arrangement of such silt curtain should be approved by EPD. In addition, China State would carry out regular checks, cleaning and maintenance of the temporary water tank and Perfect World was welcomed to join the inspection and take water samples for their own testing if they wished.	CSHK Perfect World	

2

4	For Perfect World's concern on the potential damage of their inlet pump during the construction period, HyD advised that a Third Party Insurance was procured in the Contract and indemnity would be provided according to the established insurance practices.	Noted	
5	AECOM and CSHK would closely communicate with Perfect World regarding the detailed design of the proposed scheme and operation & maintenance schedule, etc to ensure that the quality of seawater supply would be maintained.	Perfect World/ AECOM /CSHK	
6	Perfect World was satisfied with the above arrangement. CSHK would proceed with the diversion works accordingly.	Noted	

Meeting was adjourned at 4:00 pm.

Attachment:
Distribution: All Attendees

Appendix J

Letter for Operation and Maintenance of Silt Screen from CSHK(HY/2009/15) to CSHK (HY/2010/08)

AECOM
8/F Grand Central Plaza, Tower 2 +852
138 Shatin Rural Committee Road +852
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com

08A003290

Our Ref. : CWN:PP:icyc:60095653/C8/M15/801-2014004590T

17 JUN 2014

AECOM Asia Co. Ltd.
HY/2010/08

File Ref			M15/801		
	Action	Info		Action	Info
PRE			RE(PR)-B15		
CRE-B2		✓	RE(GEN)-B16		✓
SRE(C)-B2			SQS-B		✓
SRE(C)-B8		✓	QS-B2		✓
SRE(S&E)-B4		✓	SLS-B		
SRE(I&P)-B5			LS-B		
SRE(C)-B6			SFO-B		
SRE(G)-B7			STO-B		
RE(C)-B3			SIOW(C)-B2		
RE(C)-B4			SIOW(C)-B5		✓
RE(C)-B5			SCO-B		
RE(C)-B17			CO-B2		
RE(C)-B18			LRO-B2		
RE(G)-B			HO		
RE(S)-B11					
RE(ENV)-B12					
RE(I&P)-B13					
RE(MAK)-B14					
Action Taken					
Date:					

13 June 2014

China State Construction Engineering (Hong Kong) Limited
29/F China Overseas Building,
139 Hennessy Road,
Wan Chai,
Hong Kong

Attn.: Dr. Dave Chan

Dear Sir,

Contract No. HY/2010/08
Central-Wan Chai Bypass – Tunnel (Slip Road 8 Section)

Instruction of Provisional Item (PI/002)

Pursuant to Clause 25.05 of the Particular Specification and Paragraph 1(c) of Part I of the SMM, we hereby instruct you to carry out the works itemized as provisional items in the Bills of Quantities as shown in the following table:

Item No.	Description	Paid against	Remarks
	Silt Screens to Water Intakes	BQ Item no.	
1	Operation and maintenance of existing silt screens to water intakes, Windsor House	1.168	Subject to re-measurement in accordance with the respective Contract provisions.

The above BQ item covers the measurement and payment for operation and maintenance of existing silt screens to the water intake for Windsor House to be instructed as necessary by the ER during the Contract Period. For the avoidance of doubt, no works shall be measured except for those instructed by the ER.

We would also confirm that the operation and maintenance of this silt screen will be required commencing from and including 16 May 2014 until further instructed. Please proceed with the works as instructed expeditiously.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Conrad Ng
Executive Director

c.c. PRE/CWB - Attn.: Mr. Peter Poon
RQS – B2