

**中國水利電力對外公司**

**CHINA INTERNATIONAL WATER & ELECTRIC CORP.**

中國長江三峽集團成員

Our ref: CV201304/B1a/0531/KO/pl

Your ref:

Date: 7 March 2014

**See Distribution List**

**Contract No. CV/2013/04**

**Dredging Works in Kwai Tsing Container Basin and Its Approach Channel**

**Silt Curtain Deployment Plan**

Pursuant to EP Condition 2.9, please find attached amended Silt Curtain Deployment Plan Version 3 certified by ETL for your comment / verification.

Yours faithfully

For and on behalf of

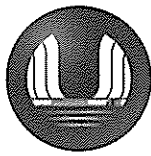
China International Water & Electric Corp.

K O Leung  
Site Agent

Encl.

c.c. CE/SD (W), CEDD - Messrs. Johnny Wong & Bill Ho (w/o) (fax only: 2714 0103)  
Head Office/Site





中國水利電力對外公司

CHINA INTERNATIONAL WATER & ELECTRIC CORP.

中國長江三峽集團成員

Our ref: CV201304/B1a/0531/KO/pl

Your ref:

**Distribution List**

Mott MacDonald Hong Kong Ltd.  
Kwai Yue Lane, Kwai Tsing,  
Engineer's Representative's Office  
New Territories, Hong Kong.

by Hand Only

Attn: Mr. Felix T C CHAU

ENVIRON Hong Kong Limited  
Room 2403, 24/F, Jubilee Centre,  
18 Fenwick Street,  
Wanchai, Hong Kong.

by Email and Post

Attn: Mr. Y. H. Hui



**MATERIALAB CONSULTANTS LIMITED**

---

Fugro Development Centre,  
5 Lok Yi Street,  
17 M.S. Castle Peak Road, Tai Lam,  
Tuen Mun, N.T., Hong Kong.  
Tel : +852 2450 8238  
Fax : +852 2450 8032  
E-mail : [mcl@fugro.com.hk](mailto:mcl@fugro.com.hk)  
Website : [www.materialab-consultants.com](http://www.materialab-consultants.com)

Date 7 March 2014  
Our Ref. MCL/ED/0077/2014/C

China International Water & Electric Corp  
Room 1508, 15/F.,  
Fortress Tower,  
250 King's Road,  
North Point, Hong Kong.

BY POST AND E-MAIL

Attn.: Mr. K. O. Leung

Dear Sir,

**Contract No. CV/2013/04**  
**Dredging Works in Kwai Tsing Container Basin and its Approach Channel**  
**- Silt Curtain Deployment Plan**

We refer to the Silt Curtain Deployment Plan, Version 3 submitted to us on 7 March 2014 for the captioned project and are pleased to certify in accordance to EP No. EP-426/2011/A Condition 2.9.

Should you require further information, please do not hesitate to contact me on 3565 4114 or our Vincent Chan on 3565 4159.

Assuring you of our best attention at all times.

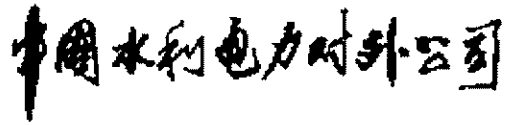
Yours faithfully,  
for and on behalf of  
MATERIALAB CONSULTANTS LIMITED



---

Colin Yung  
Environmental Team Leader

CY/vc



CHINA INTERNATIONAL WATER & ELECTRIC CORP.

DREDGING WORKS IN KWAI TSING CONTAINER BASIN AND  
ITS APPROACH CHANNEL

Contract No. CV-2013-04

***Silt Curtain Deployment Plan***

***Version 3***

*Index*

1. *General*
2. *Fabrication & Installation*
3. *Silt Curtain Material*
4. *Operation of the Silt Curtain*
5. *Maintenance of Silt Curtain*
6. *Construction Programme*

*Appendix*

1. *Annex A – Detail of Silt Curtain Design*
2. *Annex B – Silt Curtain Material Specification*
3. *Annex C – Construction Programme*

## 1. General

### 1.1 Introduction

*In accordance of the Particular Specification Appendix 21.47S (1) and particular Specification Appendix 21.3, a silt curtain is required for the dredging works and to fulfil the requirements as stated in Environmental Permit EP-426/2011/A, Clause 2.9.*

### 1.2 Reference Specification

- a. Particular Specification Section 21 & 25*
- b. Environmental Permit – EP-426/2011/A Clause 2.9*

### 1.3 Construction Plant

- a. Derrick Lighter                      2 Number*
- b. Grab Dredger                         2 Number*
- c. Work Boat                              1 Number*

*Adequate resources shall be deployed to suit the construction programme.*

## 2. Fabrication & Installation of Curtain Column

*Firstly, the cage frame will be fabricated in Guangzhou Lu Yu Construction Machinery Company Limited in China. This cage frame type silt curtain is made by a steel metal frame forming by 630mm diameter x 12mm thickness pipe. Once the frame has been completed and it will be delivered to Hong Kong China Harbour Shipyard at Tsing Yi Island for final checking and fix with pre-approved geotextile material.*

*The silt curtain fabric material will be ordered and deliver to the shipyard for seamed joints having sufficient overlap to prevent any leakage of sediment while dredging. The length of fabric will be measured and cut to fit the dredging depth requirement. The exact length will also consider the change different tidal level concern.*

### 3. Silt Curtain Material - Annex B

*Silt curtain fabric (woven polypropylene geotextile SG 110/110, see attached catalogue in Annex B) or equivalent product will be mounted on four sides of the steel frame and ballast attached to the bottom of silt curtain. The depth of the silt curtain will be extent from the seabed to the sea surface level so as to cover the entire water column.*

*After completion of assembly of the silt curtain, the cage frame will be mounted with the silt curtain material which will be lifted by a derrick lighter and towed to the dredger where the pre-positioned dredging area for installation of the silt curtain before the commencement of dredging operation.*

*The position of this cage frame type silt curtain would be secured by a chain and tighten by a rope fixed between the frame structure of silt curtain to the barge winches or bollards respectively. When the lashing and positioning of the dredger has been finished, the wrapped up curtain will be lowered to the seabed level. The dredging works by the grab dredger would then be carried within the perimeter of the cage frame type silt curtain. Dredging works will be suspended once the routine inspection for maintenance is undergoing.*

### 4. Operation of the Silt Curtain

*Note that the silt curtain does perform the spillage detention function, colour change of seawater inside and outside the silt curtain should be able to visualize whether the silt curtain is functioning properly*

*In contrary, if the silt curtain doesn't perform the spillage detention function, a diving team (composed by at least a scuba diver and a standby diver with a linesman in every task) is dedicated to rectify the defects / damage once the leakage phenomenon is observed. In sake of potential unstable sea condition, divers will carry out the partial maintenance or repairing underwater if so required, without any in-situ carnage / equipment operation involved. Standby diver with appropriate diving signal (diving flag) and the dredger foreman will stay beside the silt curtain to ensure no other vessel approaching during the silt curtain repairing or maintenance.*

*A cage frame type silt curtain is proposed to fully enclose the working area of grab dredger bucket while carrying out the dredging works and it shall be installed at the bow of the grab dredger for localized containment of sediment during the course of dredging works.*

*Spare silt curtain sheets and the associated material will be stored on board of the dredger to maintain the prompt replacement in case of the damage is occurred. Silt curtain will be wrapped up or released down to the extent of seabed level with a "Mechanical Pulley System" during the dredging, towing and mobilization or relocation because of the potential damage by the swelling. The curtain will be wrapped in like of accordion underneath the curtain frame while shifting into different location.*

*On the other occasion, if typhoon signal has been hoisted and the dredger needs to demobilize and enter to typhoon shelter for typhoon precaution, the cage frame with the wrapped up textile will be detached and lifted in a derrick lighter for temporary storage until the work can be resume after all the warning signal has been lowered. The same procedures of installation as the initial assembly operation will take place. The curtain sheet will be lowered in seawater again when the dredging work starts again.*

*For anti-swelling damage of the silt curtain, an extra floating curtain, formed of square shape Styrofoam (300 x 300mm cross-section) as buoyant, is added at the external perimeter (tidal range) of the cage type silt curtain. This serves the double guarantee of spillage containment.*

*Silt curtain cage frame will be pre-fabricated in Guangzhou Lu Yu Construction Machinery Company Limited., who has been providing the ferrous products for the other projects prior.*

#### **5. Maintenance of silt curtain**

- A. Dredger foreman will be responsible to inspect the condition of silt curtain daily during the course of dredging works, Dredging works will be suspended once the inspection or maintenance is undergoing. Silt curtain shall be visual inspected daily and repaired if necessary. An inspection checklist will be prepared and filled by the dredger foreman daily. All checklist will be keeping on board of the dredger for record or audit record purpose.*
- B. Silt curtain diving inspection is also scheduled at bi-weekly intervals. The diving inspection report would also be prepared by the diving team after the bi-weekly inspection and maintenance has been completed.*
- C. Sufficient spare silt curtain material will be kept on site for replacing of damaged silt curtains. The spare silt curtain will be kept in place out of direct contact with water and sunlight.*



6. *Detail Design of Silt Curtain*

*Silt Curtain Design – Annex A*

7. *Silt Curtain Material*

*Silt Curtain Material Specification – Annex B*

8. *Construction Programme*

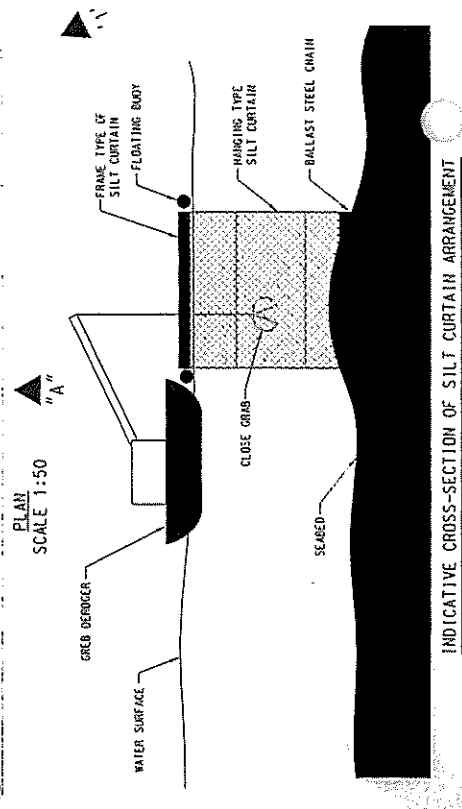
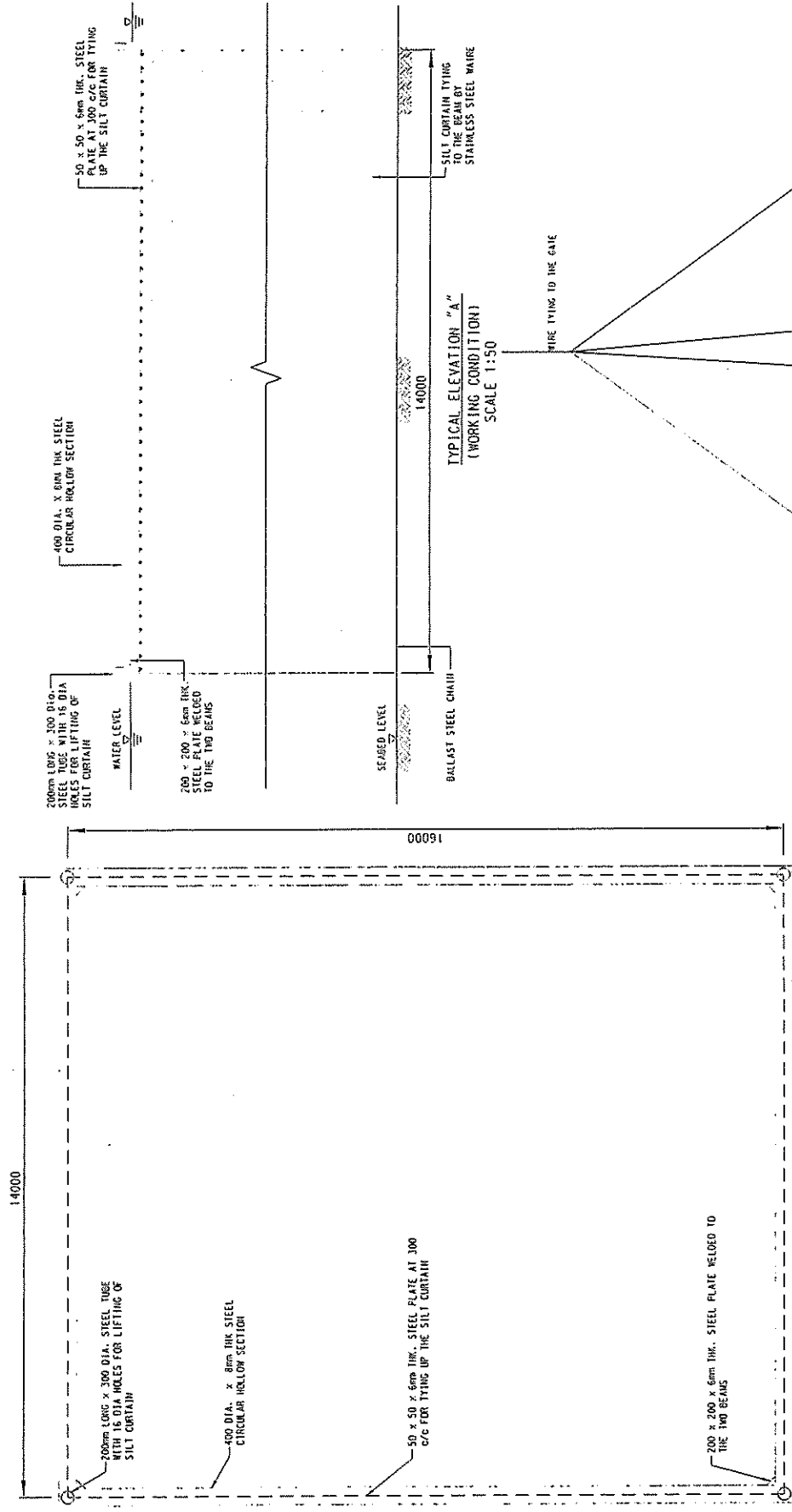
*The Construction Programme is shown as attached – Annex C*

# Annex A

*Detail of Silt Curtain Design*

**NOTES :**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. ALL CONNECTIONS ARE 6mm FILLET WELD ALL AROUND UNLESS OTHERWISE SPECIFIED.
3. ALL STEEL MEMBERS ARE GRADE 215.



**PLAN**  
SCALE 1:50

**INDICATIVE CROSS-SECTION OF SILT CURTAIN ARRANGEMENT**  
SCALE N.T.S.

**TYPICAL ELEVATION "A"**  
(WORKING CONDITION)  
SCALE 1:50

WIRE TYING TO THE GATE

**ISOMETRIC VIEW "1"**  
(LIFTING CONDITION)  
SCALE N.T.S.

|     |                         |      |       |
|-----|-------------------------|------|-------|
| Rev | Description of Revision | Date | Cont. |
|     |                         |      |       |

**CEDD**  
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

**WE**  
China International Water & Electric Corp.

Project  
Contract No. CV/2013/04  
DRAGGING WORKS IN KWAI TUNG CONTAINER BASIN AND ITS APPROACH CHANNEL

Drawn  
DETAILS OF SILT CURTAIN

Drawing Number  
MISEL/CV2013-04/SC/01

# Annex B

*Silt Curtain Material Specification*

## SG 110/110

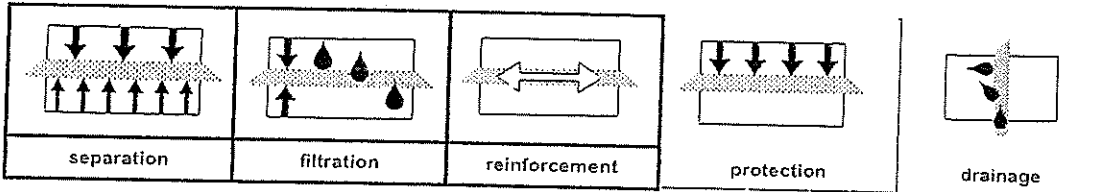
Woven polypropylene geotextile made of slit film tapes

Technical data sheet according to internal specifications Bonar TF: version 06 dd. 05/01/10  
Accompanying documents CE marking: version 04 dd. 05/01/10



1137-CPD-615

10



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

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

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

# *Annex C*

*Construction Programme*

Master Programme (Stages/Sections of works)

| Nr of Mths   | Wet Season (April to October)  |     |     |     | Dry Season (November to March) |     |     |     | Wet Season (April to October) |     |     |     | Dry Season (November to March) |     |     |     |     |     |     |     |    |    |  |
|--|--------------------------------|-----|-----|-----|--------------------------------|-----|-----|-----|-------------------------------|-----|-----|-----|--------------------------------|-----|-----|-----|-----|-----|-----|-----|----|----|--|
|  | 2                              | 3   | 4   | 5   | 6                              | 7   | 8   | 9   | 10                            | 11  | 12  | 13  | 14                             | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22 | 23 |  |
| Apr  | May                            | Jun | Jul | Aug | Sep                            | Oct | Nov | Dec | Jan                           | Feb | Mar | Apr | May                            | Jun | Jul | Aug | Sep | Oct | Nov | Dec |    |    |  |
| <p>Dredging at Zone A &amp; B</p> <p>[REDACTED]</p> <p>Dredging of Type 3 Cat HF</p> <p>[REDACTED]</p> <p>Dredging of Zone C</p> |                                |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |
| Western<br>Railway<br>Zone D & E   | Dredging from Zone E & D       |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |
| Western<br>Railway<br>Zone C   | Dredging of Sub-marine Outfall |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |
| Inner Container Basin  | Dredging at Zone A & B         |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |
| Northern<br>Railway<br>Zone C  | Dredging of Zone C             |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |
| Northern<br>Railway<br>Zone D & E  | Dredging of Zone C             |     |     |     |                                |     |     |     |                               |     |     |     |                                |     |     |     |     |     |     |     |    |    |  |

- Dredging in Portion A & B
- Modification of sub-marine outfall in Portion
- Removal of type HF sediment material
- Dredging in Portion C, D & E