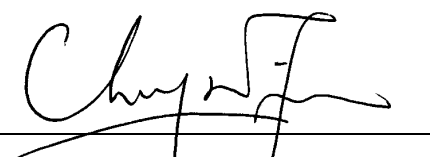


# Concentric – Hong Kong River Joint Venture

## Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels

### Silt Curtain Deployment Plan for Shek O (Version 2.0)

July 2014

Certified By	 _____ Dr. Priscilla Choy (Environmental Team Leader)
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REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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## 1 INTRODUCTION

### Background

1.1 The Shatin to Central Link (SCL) Project comprises of two sections:

- Tai Wai to Hung Hom Section which is an extension of the Ma On Shan Line (MOL) via East Kowloon to connect West Rail Line (WRL) at Hung Hom; and
- Cross Harbour Section which is an extension of the East Rail Line (EAL) at Hung Hom across the Victoria Harbour to Admiralty.

On completion of the SCL, the above rail lines would be re-organized to two operational lines: an East West Line (EWL) from Wu Kai Sha to Tuen Mun; and a North South Line (NSL) from Lo Wu / Lok Ma Chau to Admiralty.

- 1.2 The SCL scheme was authorised under the Railway Ordinance in March 2012. The reference design of the Cross Harbour Section, which comprises an approximate 1.8km cross harbour tunnel and its associated works, has been carried out under Consultancy Agreement No. C1107 – Construction Scoping and Sequencing for NSL Cross Harbour Tunnels. Construction of the cross harbour section is anticipated to commence in end of 2014.
- 1.3 As part of the advance works for NSL cross harbour tunnels, channel levelling and rock filling works will be carried out at Shek O Casting Basin in the third and fourth quarter of 2014 under Works Contract 11227.
- 1.4 Concentric – Hong Kong River Joint Venture was commissioned by MTR Corporation Limited as the Contractor of Works Contract 11227 which was awarded on 10 June 2014.
- 1.5 Pursuant to Environmental Permit (EP) Conditions 2.23.1, a Silt Curtain Deployment Plan shall be submitted by the Permit Holder to the Environmental Protection Department (EPD) for approval no later than one month before the commencement of marine works in Shek O.

### Purposes of the Submission

- 1.6 To fulfill the requirements as stated in the Environmental Permit, floating type silt curtain will be installed around the entrances of Shek O Casting Basin during the proposed levelling and rock filling works in, to avoid spreading of fine silt to the existing water body which increases turbidity and content of suspended solid.
- 1.7 The purpose of this report is to present the Silt Curtain Deployment Plan, which states the requirements for installations, operation and maintenance of silt curtain during marine activities mentioned in **Section 1.6**.

## 2 INSTALLATION OF SILT CURTAIN

### Area of Application

- 2.1 Floating-type silt curtain will be provided at both the northern gate and the southern gate throughout the duration of marine works at the Shek O Casting Basin.
- 2.2 The marine construction works under Works Contract 11227 comprises of channel levelling and rock filling works in the Basin. **Appendix A** shows the site location and layout plan of the proposed levelling and filling works.

### Material and Fabrication Details

- 2.3 The silt curtain will be manufactured of woven polypropylene geotextile fabric 'Bontec SG110/110', as manufactured by Bonar Technical Fabrics nv/sa and supplied by G and E Company Ltd.
- 2.4 Full particulars and specification of the material is attached in **Appendix B**. The key technical data is summarized in the following table: -

**Table 2.1 Properties of Geotextile Fabric**

	<u>Unit</u>	<u>Value</u>	<u>Test Method</u>
<b>Mechanical Properties</b>			
Tensile strength (md/cd)	kN/m	110/110	ISO 10319
Elongation (md/cd)	%	12/8	ISO 10319
CBR puncture resistance	kN	12.5	ISO 12236
Dynamic perforation	mm	10.0	ISO 13433
<b>Hydraulic Properties</b>			
Water permeability	l/m <sup>2</sup> /s	25	ISO 11058
Characteristic opening size	µm	230.0	ISO 12956
<b>Physical Properties</b>			
Mass per unit area	g/m <sup>2</sup>	464	ISO 9864
Thickness (under 2kPa)	mm	1.53	ISO 9863-1

- 2.5 The silt curtain system will principally comprise of floaters, woven geotextile fabric and ballast steel chains.
- 2.6 Pieces of geotextile fabric will be seamed by heavy-duty rope ties to form a continuous silt curtain. The silt curtain is to be trimmed to suitable length which would allow it to extend from the sea surface to the seabed under the varying tidal levels.
- 2.7 Floaters of 300mm diameter and ballast steel chain will be tied to the top and bottom end of the geotextile fabric, respectively, to maintain the silt curtain in upright position.
- 2.8 The typical details of silt curtain system is enclosed in **Appendix C**.
- 2.9 Single silt curtain will be deployed during the marine construction works in Shek O Casting Basin, based on the following considerations:

- According to Section 8.4.2 of the “Environmental Review Report – Variation for Design Changes of Shek O Casting Basin” (ERR) submitted to EPD in April 2014, no adverse water quality impact due to rock filling works is anticipated whereas a single silt curtain will be deployed as a precautionary measure.
- According to Section 8.4.1 of the ERR, no adverse water quality impact from the proposed seabed levelling works is expected. The installation of floating type silt curtains is only proposed as a precautionary measure. Therefore, the deployment of single silt curtain is considered adequate for mitigating any water quality impact due to the levelling works.
- Due to the limited size of the channel entrance where seabed levelling works will be carried out, it would not allow sufficient space for working vessels to manoeuvre through the marine access opening if a double silt curtain is deployed.
- Precautionary measures will be implemented during daily operation of the silt curtain, as described in **Sections 2.15 to 2.17**, to cater for temporary loss of protection by the single silt curtain system when working vessels gain marine access through the silt curtain.

### **On-site Installation Procedure**

- 2.10 The fabrication and assembly of the silt curtain system will be substantially completed in off-site workshop before mobilizing to the site for installation.
- 2.11 A derrick lighter barge will be deployed for transportation of the pre-assembled silt curtain to site. The barge will slowly place the floaters, geotextile fabric with ballast chains slowly into water, while a work boat will assist to align the silt curtain properly for fully enclosing the works area. At both of the longitudinal ends, land-based anchor in the form of precast concrete block or the like will be installed on the shore to fix the whole silt curtain system in secured condition.
- 2.12 Marker buoys fitted with flashing lights will be installed along the silt curtain at around 50m interval to mark its extent in accordance with the requirement of Marine Department.
- 2.13 To cater for possible strong current at the works area, concrete sinkers will be installed on the seabed and chained onto the buoys of the silt curtain to enhance its anchorage. Divers will be deployed for the operation such that the concrete sinkers are placed onto seabed slowly and carefully to minimize any disturbance to seabed.
- 2.14 The on-site installation procedure as outlined above is also illustrated figuratively in Drawing No. SCL11227/SCDP/SO-05 of **Appendix C**.

### **Daily Operation**

- 2.15 For enabling access by working vessels, a marine access opening will be allowed in the silt curtain at the northern gate of the Basin. When the access opening is at the ‘closed’ position, a minimum 50m length overlapping of silt curtain will be provided. A work boat will be deployed for daily operation of the access opening. When the silt curtain is temporarily opened to allow passage of working vessels, no seabed levelling works will be carried out until the opening is entirely closed up in order to prevent the escape of sediment to water column outside the silt curtain.

- 2.16 For the silt curtain installed at the southern gate for rock filling works, a continuous silt curtain will be installed across the whole width of the gate without any built-in opening. When marine access through the silt curtain is needed, the land-based anchoring at one of the longitudinal ends will be manually detached such that the silt curtain can be temporarily ‘opened’ to allow passage of vessels. Whenever the silt curtain is temporarily opened, the rock filling works will be suspended from 30 minutes before the curtain is opened until 30 minutes after the curtain is closed so as to allow for settlement of finer particles of the rockfill and possible re-suspension of filling material due to propeller wash caused by vessel traffic
- 2.17 Before either of the silt curtain at northern or southern gate is opened, visual inspection will be conducted by site supervisor to ensure that there is no sediment plume or floating debris in close proximity.

### 3 INSPECTION OF SILT CURTAIN

#### Regular Inspection

- 3.1 Diving inspection of the silt curtain system will be carried out after installation and prior to commencement of the marine works to ensure it has been satisfactorily installed and is functionally properly as intended. The inspection will, in particular, cover the underwater portions including the ballast chains and concrete sinkers, and ensure that the geotextile curtain is fully intact and extends to the seabed level. Inspection upon the removal of silt curtain will also be undertaken as described in **Section 4.3** in order to minimize the environmental disturbance.
- 3.2 Daily visual inspection will be carried out by site supervisors prior to commencement of the works in each working day. The scope of inspection shall include but not limited to the following items:
- Condition of floaters;
  - Condition of marker buoys and flashing lights;
  - Condition of geotextile fabric and tying ropes;
  - Presence of dispersion of sediment plume;
  - Presence of floating refuse trapped by silt curtain.
- 3.3 A sample checklist for diving inspection and daily visual inspection of silt curtain is enclosed in **Appendix D**. All completed checklists should be kept on site for record purpose.

#### Adverse Weather

- 3.4 In the event of adverse weather or marine condition, visual inspection by a dedicated work boat will be conducted to the silt curtain upon the hoisting of Typhoon Signal No. 1 or Strong Monsoon Signal by Hong Kong Observatory.
- 3.5 When Typhoon Signal No. 3 is hoisted, all marine works will be suspended immediately. After Typhoon Signal No. 3 is lowered, visual inspection will be carried out to ensure the integrity of the silt curtain prior to the resumption of marine works. If any damage to the silt curtain is suspected, divers will be deployed for further inspection as necessary.

#### Rectification Works

- 3.6 In the event that any malfunctioning of the silt curtain system is observed or suspected, it will be reported to the Engineer accordingly. If considered necessary, diving inspection will be carried out for detailed investigation and identifying the nature and extent of damage or defect of the silt curtain.
- 3.7 If the silt curtain is found damaged and repairing works are necessary, all marine works in the corresponding portion of the site (i.e. channel levelling works for silt curtain near the northern gate and rock filling works for silt curtain near the southern gate) will be suspended immediately. Repairing of silt curtain, whenever necessary, will be carried out at a timeframe to be agreed with the Engineer on a case-by-case basis. Marine works will be resumed only after the repairing works are satisfactorily completed as approved by the Engineer.
- 3.8 A minimum of 1m lapping length shall be provided if a new piece of geotextile is to cover at the damaged location. Heavy-duty nylon ropes or similar material shall be used to stitch up

the lapping of new and existing geotextile.

- 3.9 If the extent of the damage is substantial that the silt curtain cannot be lifted up without causing further damage, the entire damaged section will be removed and replaced with a new piece of silt curtain complete with all associated components.
- 3.10 At least 20m length of spare geotextile material will be available on site at all time for emergency repairing of silt curtain.



#### **4 REMOVAL OF SILT CURTAIN**

##### **Upon Completion of Works**

- 4.1 The silt curtains will only be decommissioned and removed off-site upon completion of all marine construction activities in Shek O Casting Basin under Works Contract 11227.
- 4.2 Visual inspection will be conducted prior to removal of the silt curtain, to ensure there is no muddy water, floating rubbish or debris in the vicinity.
- 4.3 The bottom of silt curtain will be detached from the concrete sinkers by divers. Concrete sinkers will be removed from the seabed by derrick lighter. Divers will be deployed to assist in the operation such that the sinkers are removed slowly and carefully to minimize the disturbance to seabed and release of sediment into water.
- 4.4 The floaters together with the geotextile silt curtain will then be retrieved from water and transported off the site by a derrick barge.

## 5 DEPLOYMENT SCHEDULE

### Deployment Schedule in Shek O Casting Basin

- 5.1 **Table 5.1** below shows the anticipated deployment schedule of silt curtain for the levelling and rock filling works in Shek O Casting Basin.

**Table 5.1 Deployment schedule in Shek O Casting Basin**

Works Activity / Location	Anticipated Completion of Installation	Anticipated Decommissioning
Seabed Levelling (Northern Gate)	Late July 2014	Late November 2014
Rock Filling (Southern Gate)	Late July 2014	Late November 2014

- 5.2 Anticipated construction programme enclosed in **Appendix E** shows the breakdown of activities.
- 5.3 All works in connection with the deployment of silt curtain system, including installation, inspection, maintenance and removal, will be undertaken by the Contractor of Works Contract 11227, i.e. Concentric - Hong Kong River Joint Venture.

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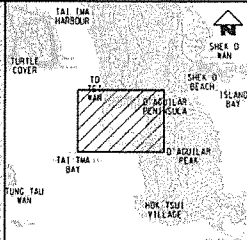
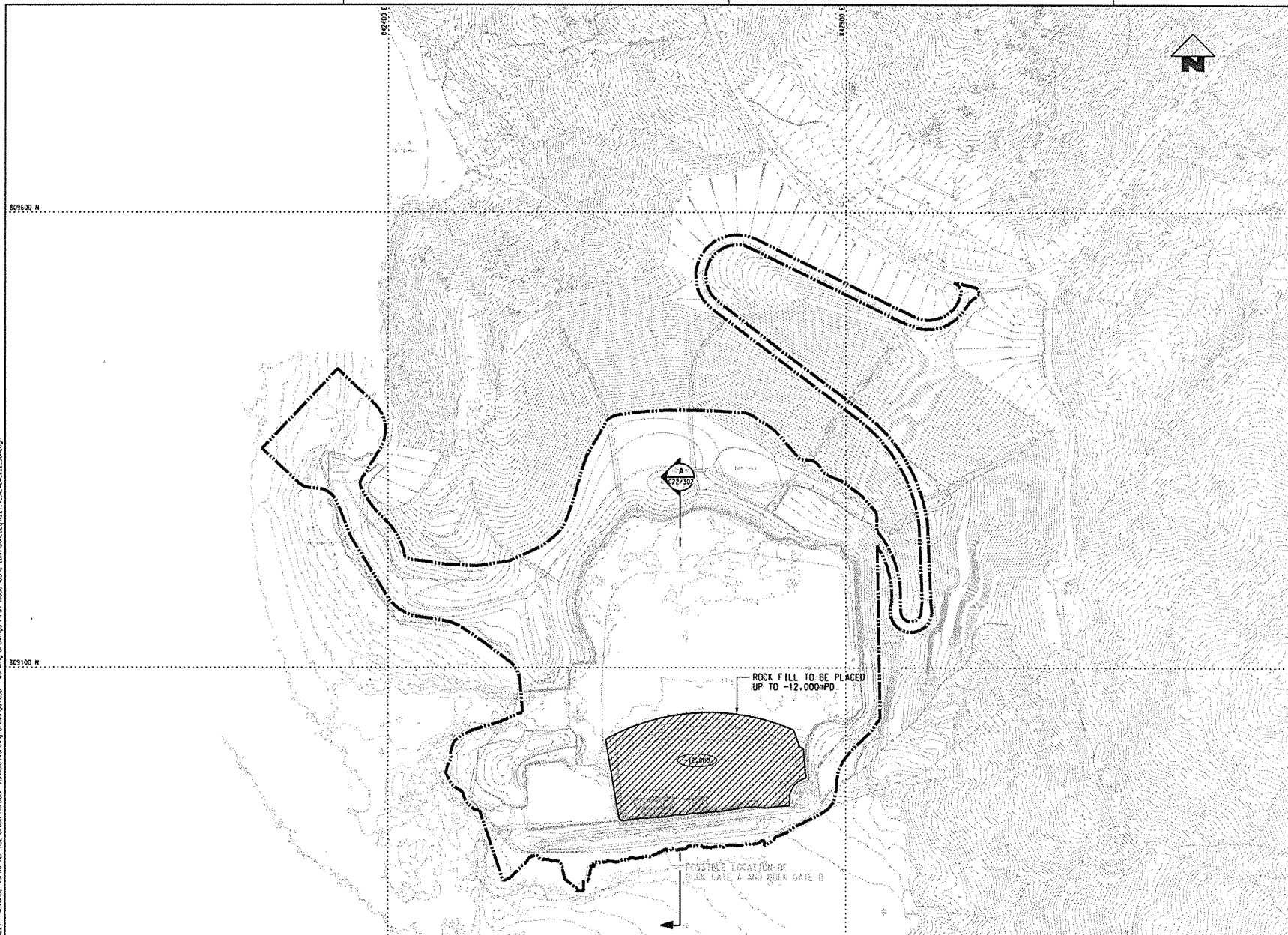
**APPENDIX A**

**LOCATION PLAN AND GENERAL  
LAYOUT OF MARINE WORKS**

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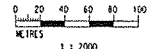
**KEY PLAN**

**NOTES:**

1. UNLESS NOTED OTHERWISE, LEVELS ARE SHOWN IN METRES RELATIVE TO HONG KONG PRINCIPAL DATUM (HKPD).
2. HYDROGRAPHIC SURVEY RESULTS SHOWN ON THE DRAWING ARE INDICATIVE ONLY.
3. BASED ON THE AVAILABLE G. I. INFORMATION SILTATION ON SEABED IS ANTICIPATED. HYDROGRAPHIC SURVEY RESULT IS SHOWN ON THE DRAWING FOR INFORMATION.
4. ROCK FILL SHALL BE OF GRADE 200 IN ACCORDANCE WITH THE SPECIFICATIONS AND PLACED EVENLY ACROSS THE FILLING AREAS IN MARINE CONDITIONS. ANY ALTERNATIVE FILLING MATERIALS WILL BE SUBJECT TO APPROVAL OF THE ENGINEER.

**LEGEND:**

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- [Hatched Area] APPROXIMATE BOUNDARY OF FILLING WORKS

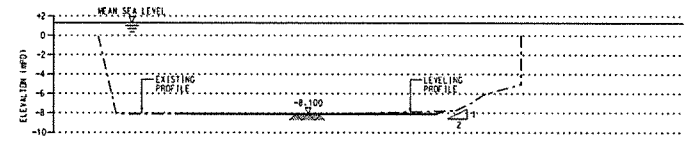


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CHECKED	ANKL																
APPROVED	HLHK																
DATE	10 JUN 2014																
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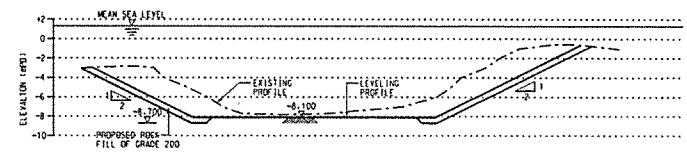
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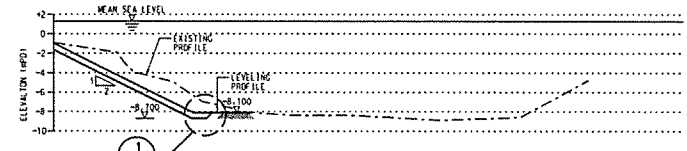
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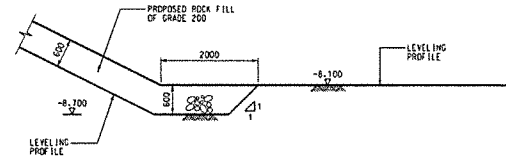
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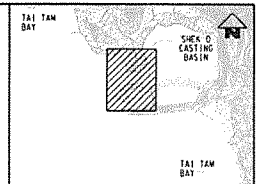
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SECTION C  
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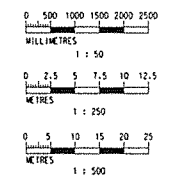
KEY PLAN

- NOTES:**
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- LEGEND:**
- WORKS BOUNDARY
  - HYDROGRAPHIC SURVEY RECORD
  - TOPOGRAPHICAL SURVEY RECORD (HPD)
  - LEVELING SIDE SLOPE
  - FINISH LEVEL
  - SETTING OUT POINT

**SETTING OUT POINT**

SETTING OUT POINT	EASTING	NORTHING	COORDINATES
SOP201	842479.794	809051.679	
SOP202	842585.299	809064.190	
SOP203	842472.424	809035.647	
SOP204	842581.026	809039.030	



REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN: BCHF DESIGNED: AH CHECKED: ANKL APPROVED: HLHK DATE: 10/JUN/2014 <small>SCALE 1:500 SHALL BE USED UNLESS OTHERWISE SPECIFIED IN THE DRAWING. FOR ALL DIMENSIONS, UNLESS OTHERWISE SPECIFIED, REFER TO THE DIMENSION LINES OR DIMENSIONS ON THE DRAWING. DIMENSIONS SHALL BE TO THE CENTERLINE OF THE STRUCTURE UNLESS OTHERWISE SPECIFIED.</small>	<b>MTR</b> SHATIN TO CENTRAL LINK ORIGINATOR: <b>AECOM</b> in association with Aedas, BMT and Swirett CADD REF: 11227_W_311_ACM_C22_303A.dgn
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<b>TITLE</b> CONTRACT 11227 NSL CROSS HARBOUR TUNNELS ADVANCE WORKS SHEK O CASTING BASIN LEVELING OF SEABED	SCALE: AS SHOWN @ A1 DRAWING NO: 11227/W/311/ACM/C22/303 REV: A
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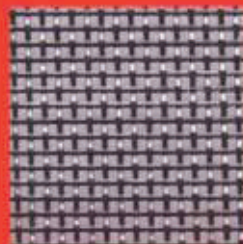
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**APPENDIX B**

**PRODUCT CATALOGUE AND  
SPECIFICATION**

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WE UNDERCOVER THE WORLD

**bontec**

woven and nonwoven geotextiles

A TOTAL RANGE OF GEOTEXTILES

## WHY CHOOSE BONTEC® GEOTEXTILES ?



**bontec**

woven and nonwoven geotextiles



Fibre Extrusion



Non woven geotextiles



Woven geotextiles



State of the art laboratory



First class customer service

**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.

### ■ 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.

### ■ 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 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.

### ■ 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

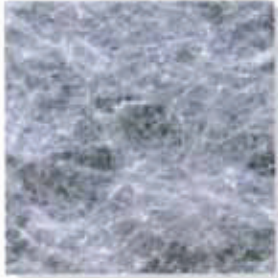
At Bonar we believe the customer should be able to purchase the most appropriate product for his task. As such our staff are readily available to offer a full service package from the initial product selection phase, through to final delivery and the provision of after sales support.





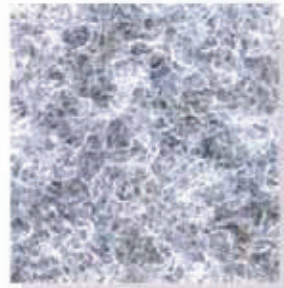
# BONTEC®: A TOTAL RANGE OF GEOTEXTILES

## 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.



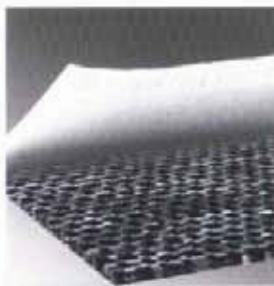
### ■ SNW: Superior Needleponched Nonwoven Geotextiles

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 Needleponched Nonwoven Geotextiles

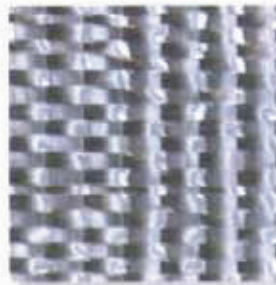
Produced using multi-coloured staple virgin fibres, products range from 200 to 1800g/m<sup>2</sup>. VNW grades offer a felt like appearance and are used in the functions of protection, drainage and erosion control. Areas of application include membrane protection in landfill and reservoirs, or for erosion 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



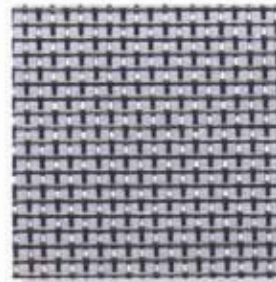
### ■ SG: Standard Grade Light weight Woven Geotextiles

Increasing from 70 to 200g/m<sup>2</sup> 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

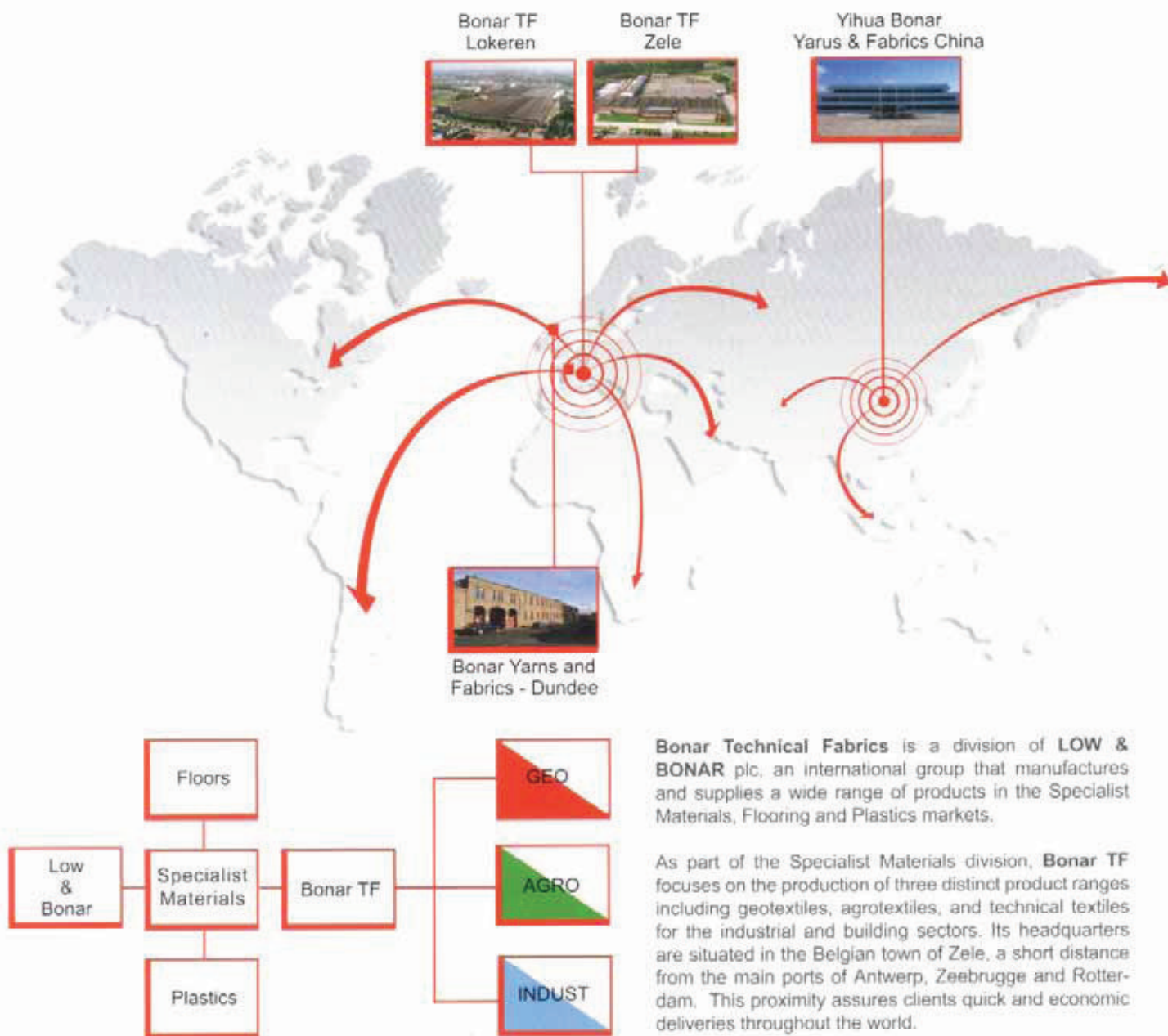
Used where there exists a requirement for the quick escape of excess water, HF fabrics are used primarily in erosion control applications e.g. under concrete revetment blocks or between dissimilar layers of quick draining granular fill e.g. a coarse sand and rounded gravel.



### ■ 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.

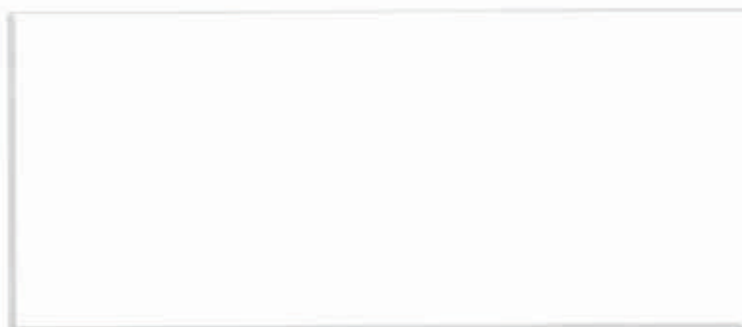
## GROUP STRUCTURE



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P/A: Industriestraat 39  
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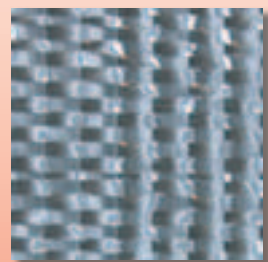
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website: [www.bonartf.com](http://www.bonartf.com)





# SG WOVEN GEOTEXTILES



we under<sup>cover</sup> the world

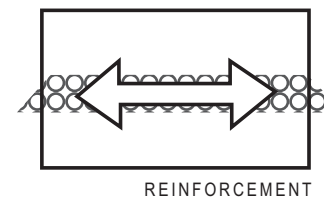
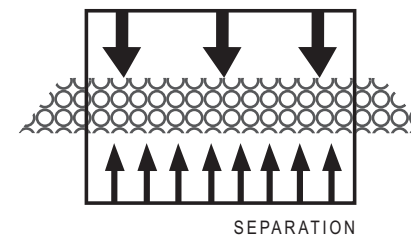
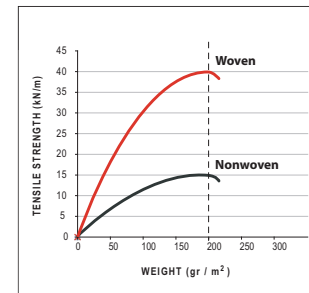
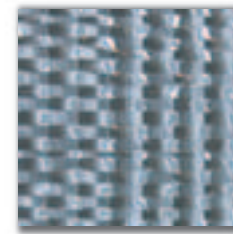


A TOTAL RANGE OF GEOTEXTILES

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E-MAIL: geotextiles@bonaryarns.com

website: [www.bonartf.com](http://www.bonartf.com)



Other geotextiles available within the Bontec range include Highflow, High strength Wovens and Thermally Bonded & Needle-punched Nonwovens

Visit us at our website:  
[www.bonartf.com](http://www.bonartf.com)

"An exciting range of Standard Grade geotextiles that offer the perfect solution to your Separation requirements. With tensile strengths ranging from 10 to 300 kN/m you can be certain that an SG fabric will be available with the performance that you are looking for."

DAILY SEPARATION, SOIL STRENGTHENING OR GROUND REINFORCEMENT?

**Bontec SG woven geotextiles** are manufactured from polypropylene tapes & yarns, and exhibit an excellent chemical resistance to commonly encountered acids and alkalis at ambient temperatures. Available in a lightweight range with products from 80 to 200g/m<sup>2</sup>, and a heavyweight range from 200 to 800g/m<sup>2</sup>.

**Bontec SG facts include:**

- Tensile strengths up to 300 kN per metre (kN/m) width
- CBR Puncture Strengths ranging from 1.800 N to 12.500 N

**SG Mechanical Properties** that offer maximum strength at minimal cost and ensure the products survivability both against installation damage and in the longer term.

**Lightweight woven geotextiles** typically offer greater mechanical strengths per unit weight than comparable nonwoven grades. This makes lightweight woven geotextiles the ideal choice for separation

- Waterflows normal to the plane that are generally several times more than that required by design
- A range of consistent opening sizes suited for use in soils ranging from clay to coarse granular fill.

**SG hydraulic properties** that are suited to the demands of everyday separators.

Available ex-stock in 4.5m and 5.25m wide rolls or other widths to order

**Typical applications for SG woven geotextiles include:**

- As a general purpose separator for use under site access roads and areas of hardstanding.
- As a separation and strengthening layer under new roadways, car parks, industrial units etc.
- As an erosion control layer under heavy rock armour in coastal defence projects.
- For any separation application where there exists a need to prevent the intermixing of soft foundation soils with good clean granular fill.



SG Woven Geotextiles have been manufactured as a cost effective solution to your soil separation and stabilisation applications. They are manufactured from highly durable polypropylene polymer and have a long life expectancy when used in permanent structures.

For further product information, be it a technical data sheet or to discuss your project with one of our in-house geotextile experts please do not hesitate to contact one of our offices listed below.

For UK and Ireland: **BONAR YARNS & FABRICS Ltd**  
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E-MAIL: geotextiles@bonartf.com



## 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

<b>separation</b>	<b>filtration</b>	<b>reinforcement</b>	<b>protection</b>	<b>drainage</b>

	test method	value	tolerance
<b>Mechanical properties</b>			
Tensile strength MD		<b>110,0 kN/m</b>	-9,9 kN/m
Tensile strength CD	EN ISO 10319	<b>110,0 kN/m</b>	-9,9 kN/m
Elongation MD		<b>12,0 %</b>	+/-2,8 %
Elongation CD	EN ISO 10319	<b>8,0 %</b>	+/-1,8 %
Static puncture resistance – CBR	EN ISO 12236	<b>12,50 kN</b>	-2,50 kN
Dynamic perforation resistance – cone drop	EN ISO 13433	<b>10,0 mm</b>	+2,0 mm
<b>Hydraulic properties</b>			
Water permeability normal to the plane		<b>25x10<sup>-3</sup> m/s</b>	-8x10 <sup>-3</sup> m/s
Water flow normal to the plane (*)	EN ISO 11058	<b>25 l/m<sup>2</sup>.s</b>	-8 l/m <sup>2</sup> .s
Characteristic opening size (AOS)	EN ISO 12956	<b>230,0 µm</b>	+/-69,0 µm
<b>Physical properties</b>			
Thickness under 2 kPa (*)	EN ISO 9863-1	<b>1,53 mm</b>	+/-0,31 mm
Weight (*)	EN ISO 9864	<b>464,0 g/m<sup>2</sup></b>	+/-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		

<b>roads</b>	<b>railways</b>	<b>foundations &amp; retaining walls</b>	<b>drainage systems</b>	<b>erosion control systems</b>
EN 13249:2000	EN 13250:2000	EN 13251:2000	EN 13252:2000	EN 13253:2000
<b>reservoirs &amp; dams</b>	<b>canals</b>	<b>Tunnels &amp; underground structures</b>	<b>solid waste</b>	<b>liquid waste</b>
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.

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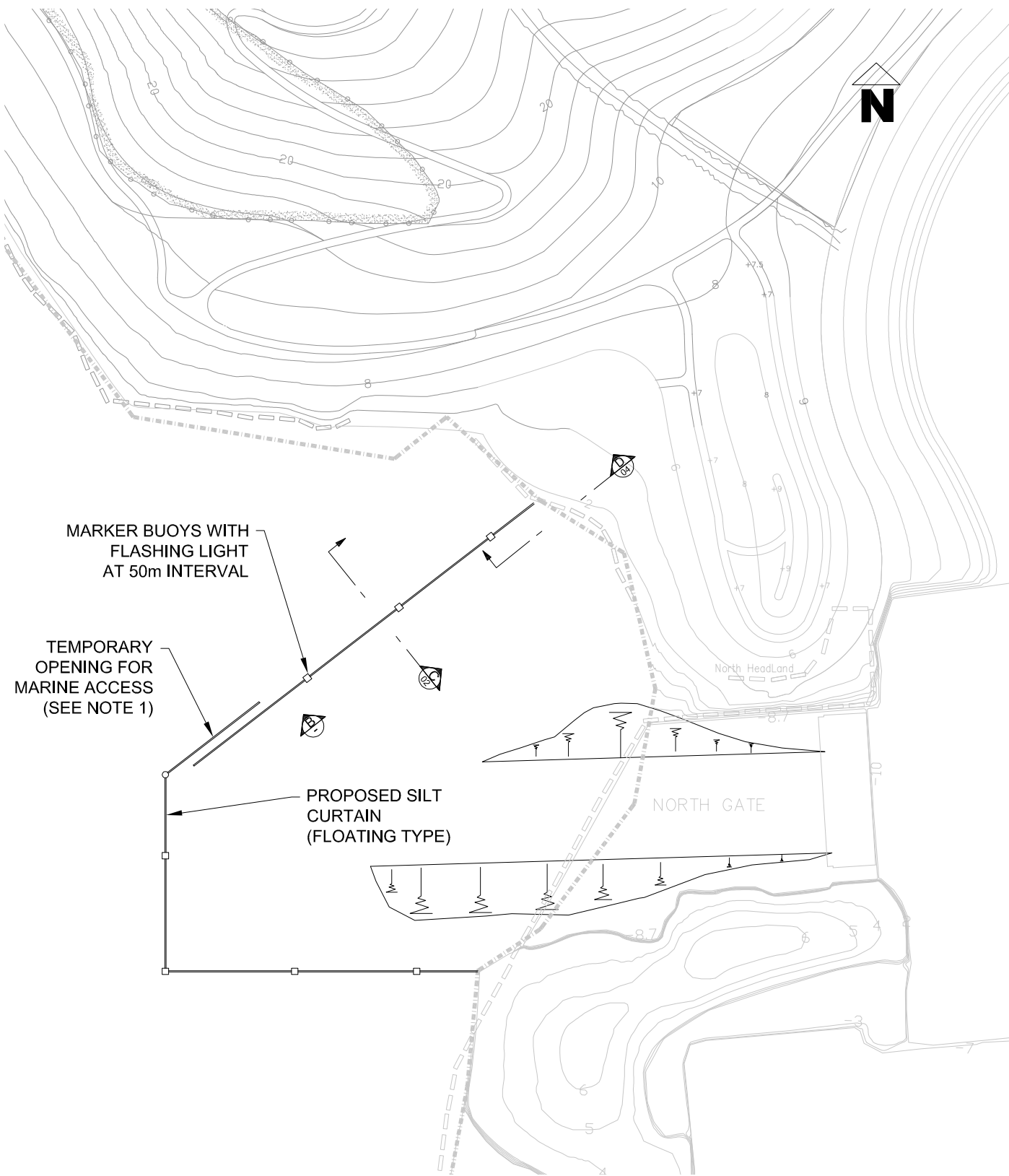
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**APPENDIX C**

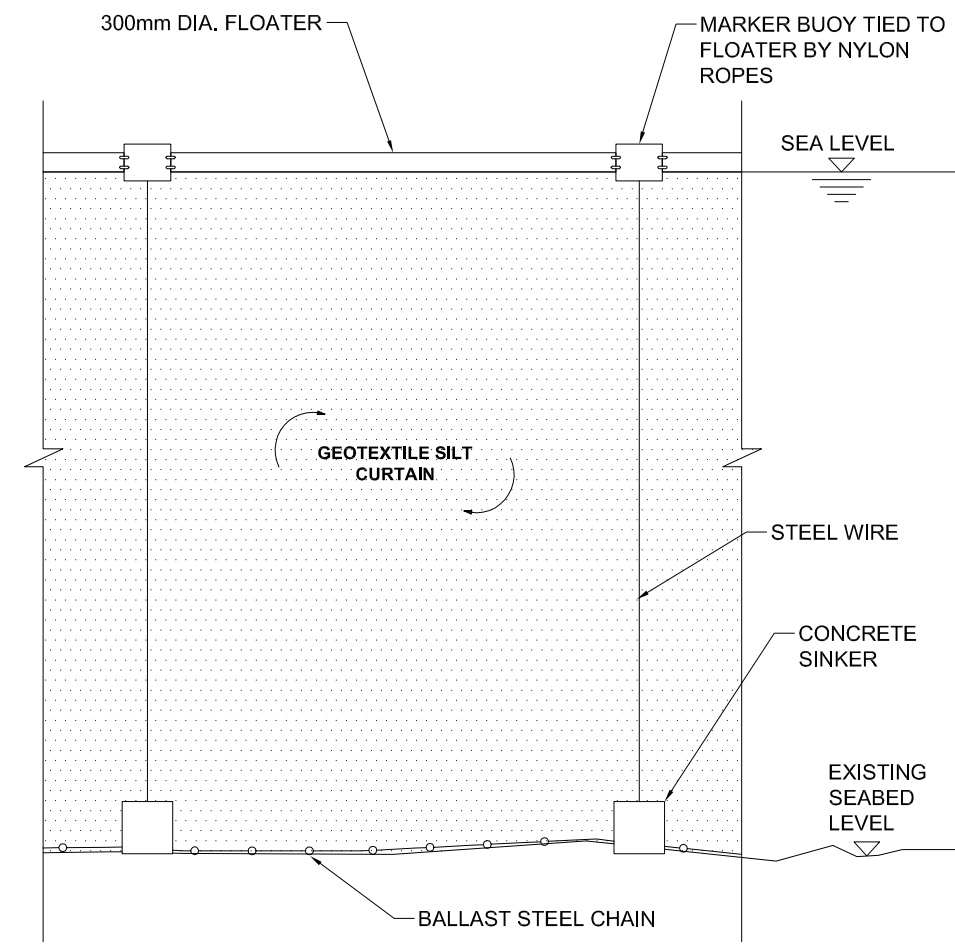
**TYPICAL DETAILS OF SILT  
CURTAIN**

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**PLAN**  
N.T.S.



**ELEVATION B**  
N.T.S.

**NOTES:**

1. AT LEAST 50m LENGTH OVERLAPPING OF SILT CURTAIN SHALL BE ALLOWED AT MARINE ACCESS OPENING.

DRAWN	IC
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APPROVED	YM
DATE	24/6/2014

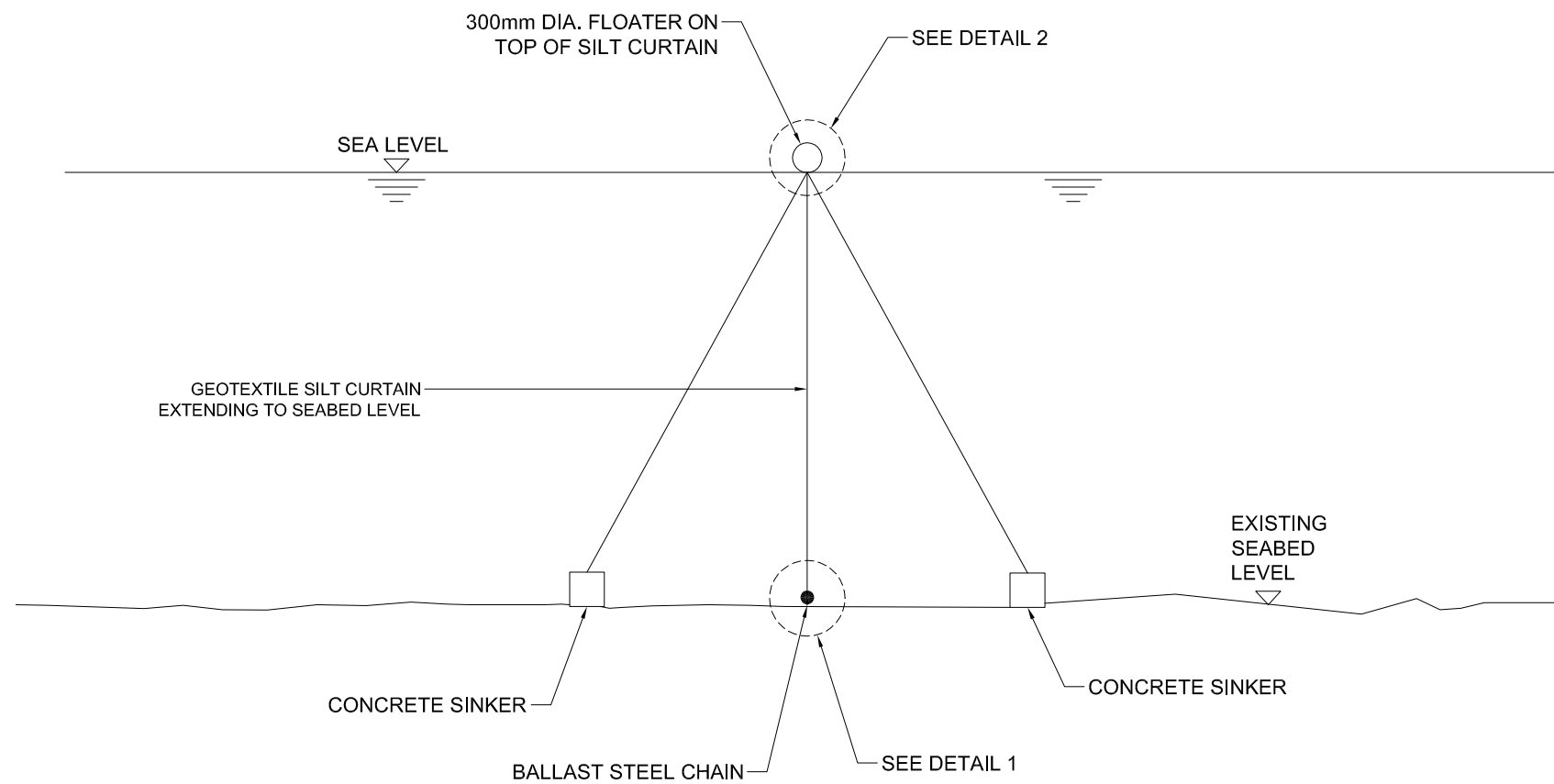
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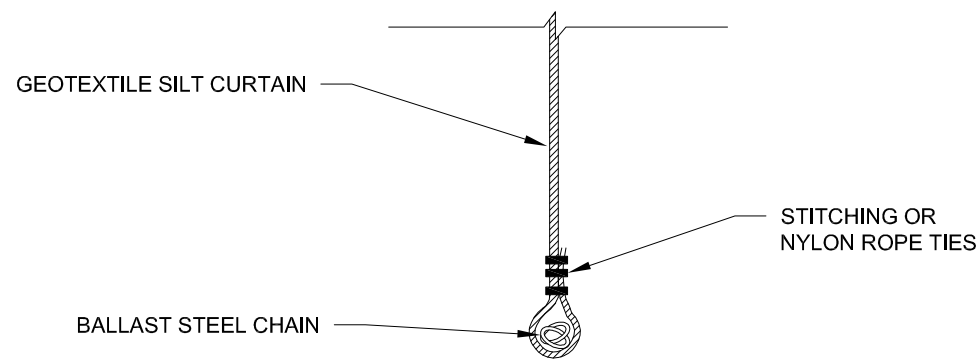
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**CONTRACT 11227**  
**ADVANCE WORKS FOR NSL CROSS HARBOUR TUNNELS**  
**Typical Details of Silt Curtain at Shek O (Sheet 1 of 4)**

REV	DESCRIPTION	BY	DATE	APPROVED

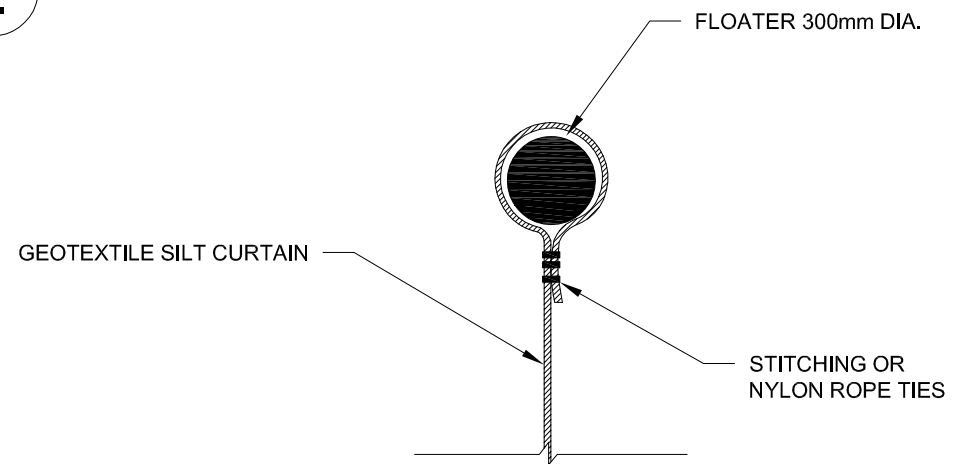
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**SECTION C**  
N.T.S.



**DETAIL 1 (BALLAST STEEL CHAIN)**  
N.T.S.



**DETAIL 2 (FLOATER)**  
N.T.S.

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APPROVED	YM
DATE	24/6/2014

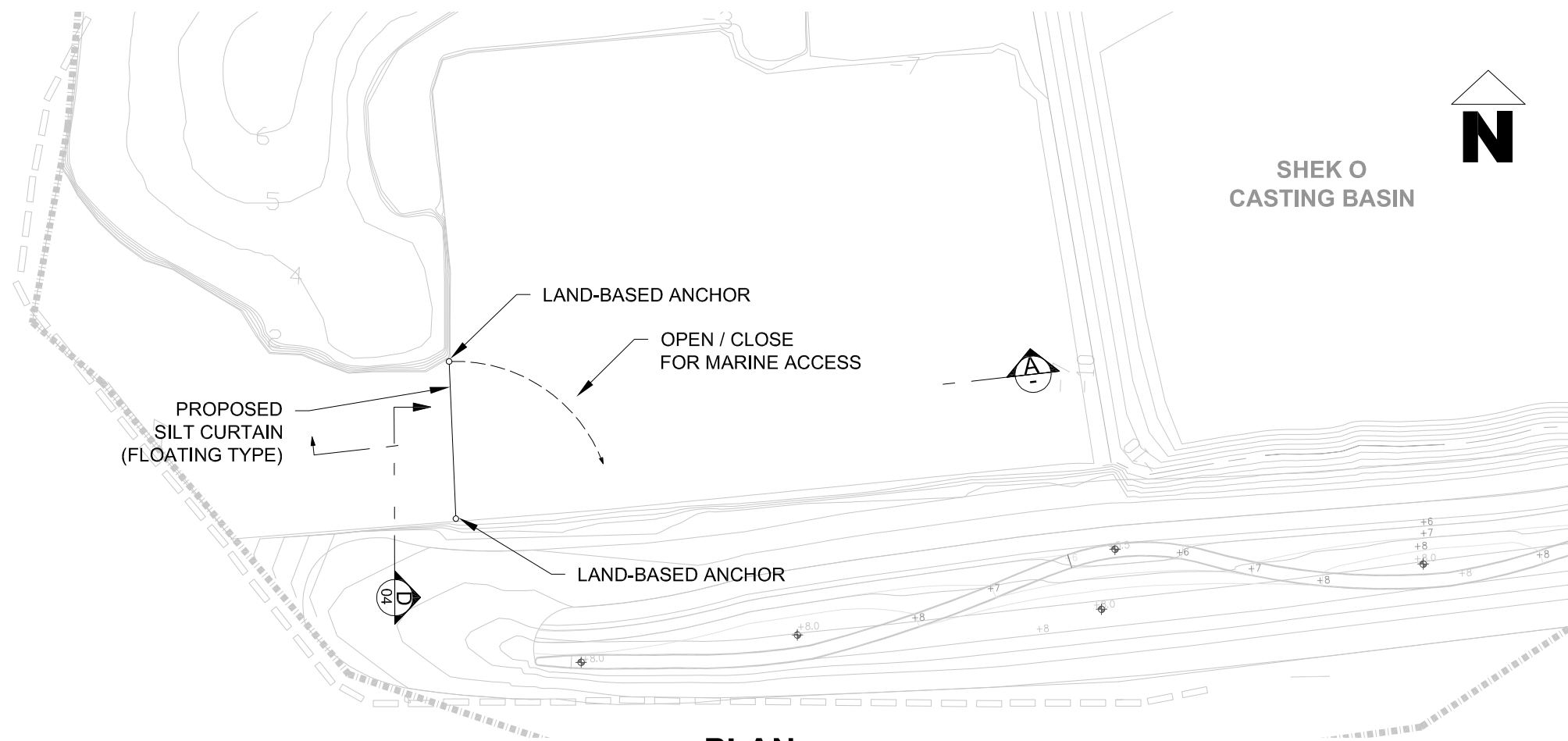
**SHATIN TO CENTRAL LINK**



TITLE  
**CONTRACT 11227**  
**ADVANCE WORKS FOR NSL CROSS HARBOUR TUNNELS**  
**Typical Details of Silt Curtain at Shek O (Sheet 2 of 4)**

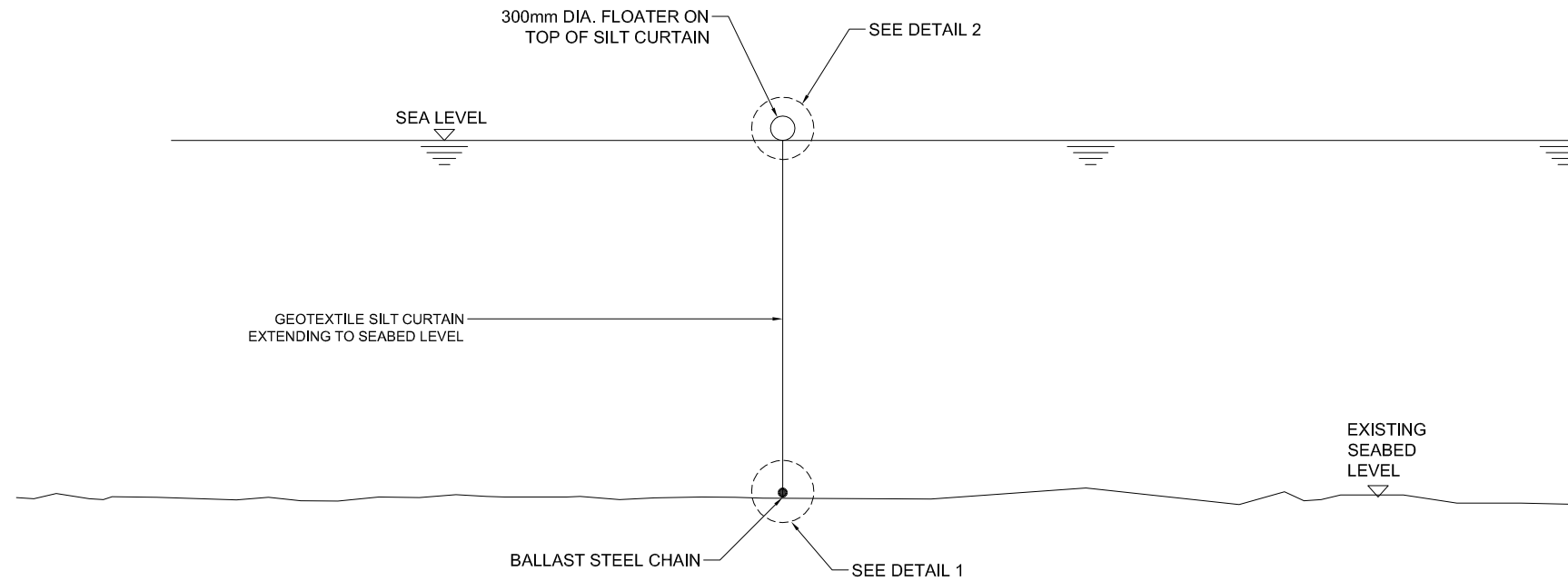
SCALE <b>N.T.S.</b>	DRAWING NO. <b>SCL11227/SCDP/SO-02</b>	REV. <b>-</b>
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REV	DESCRIPTION	BY	DATE	APPROVED
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**PLAN**

N.T.S.



**SECTION A**

N.T.S.

**SHATIN TO CENTRAL LINK**



**TITLE**  
**CONTRACT 11227**  
**ADVANCE WORKS FOR NSL CROSS HARBOUR TUNNELS**  
**Typical Details of Silt Curtain at Shek O (Sheet 3 of 4)**

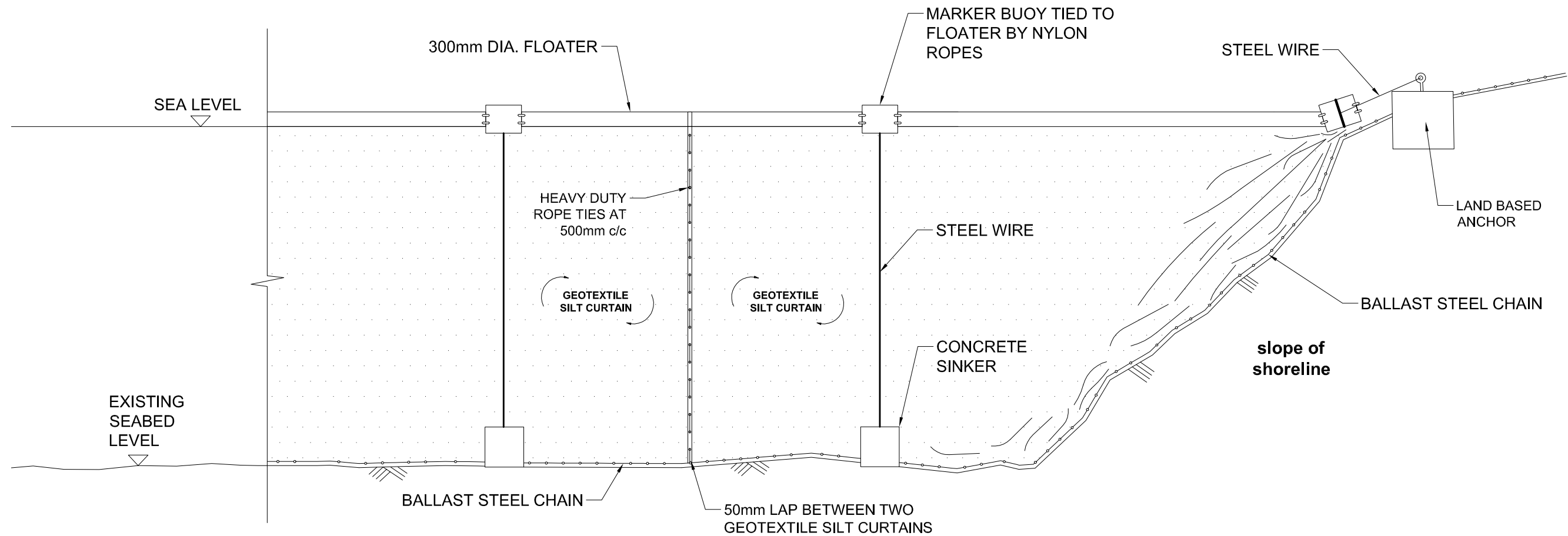
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<b>APPROVED</b>	YM
<b>DATE</b>	24/6/2014

CADD REF.

REV	DESCRIPTION	BY	DATE	APPROVED
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**SECTION D**  
N.T.S.

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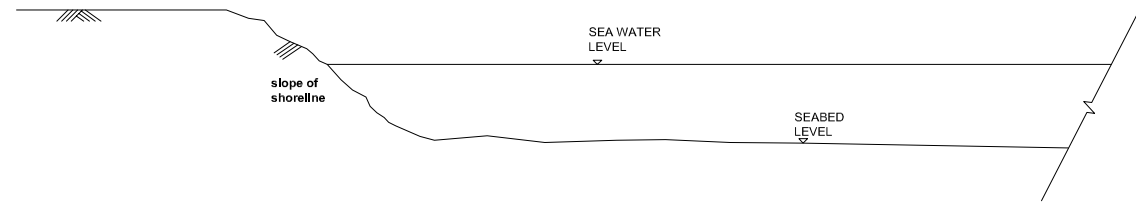
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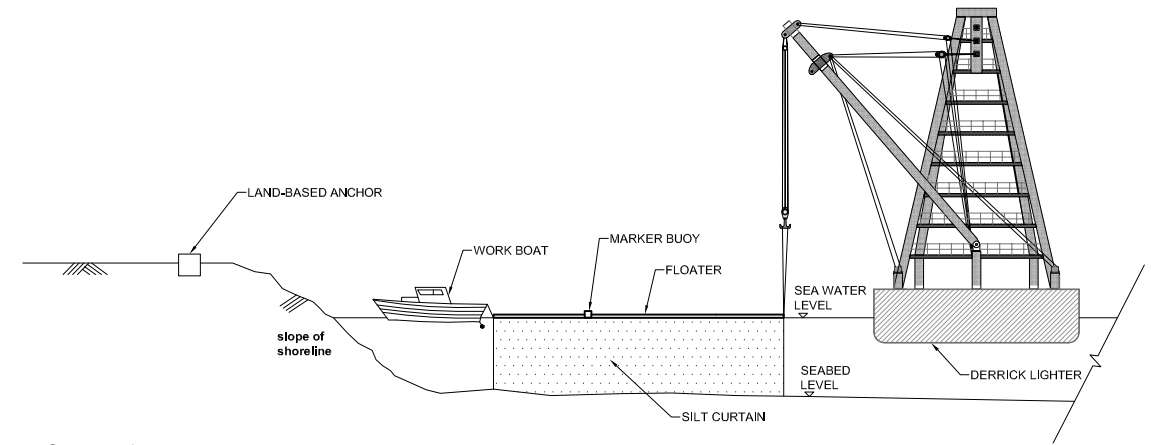
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**CONTRACT 11227**  
**ADVANCE WORKS FOR NSL CROSS HARBOUR TUNNELS**  
**Typical Details of Silt Curtain at Shek O (Sheet 4 of 4)**

REV	DESCRIPTION	BY	DATE	APPROVED

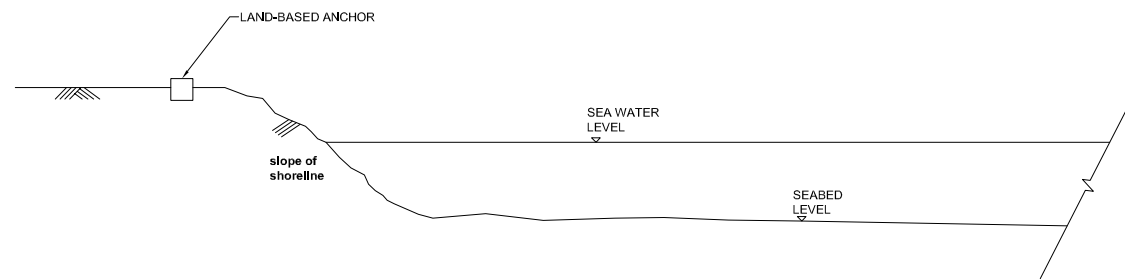
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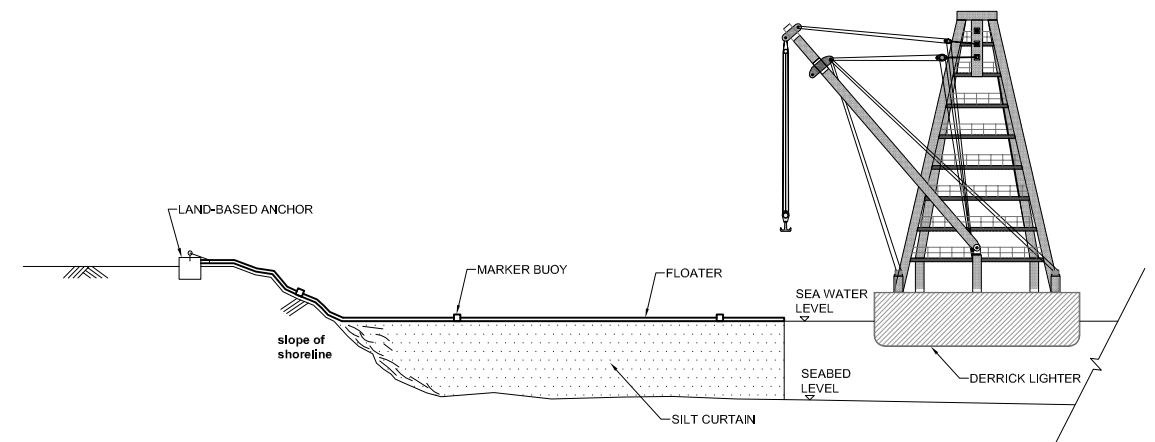
**Stage 1:**  
Fabricate and assemble the silt curtain system in off-site workshop.



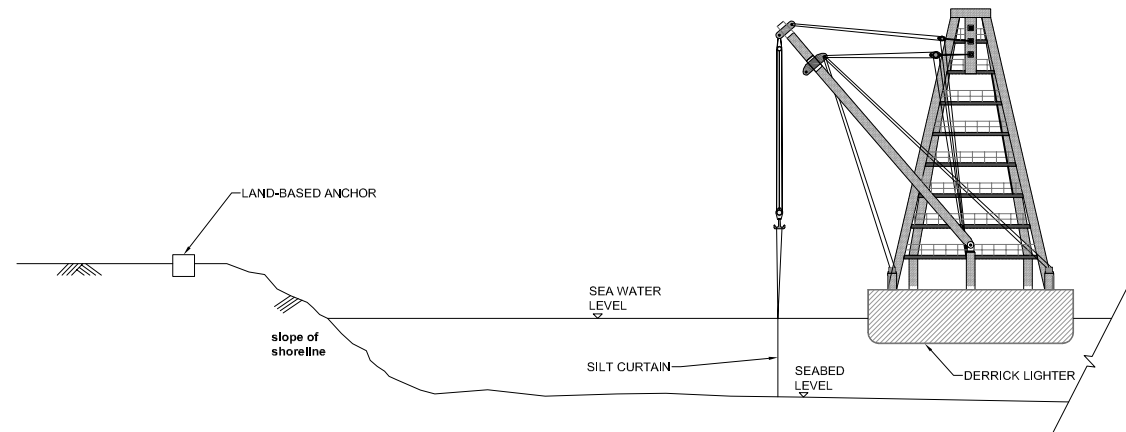
**Stage 4:**  
Install and align the silt curtain in position by work boat.



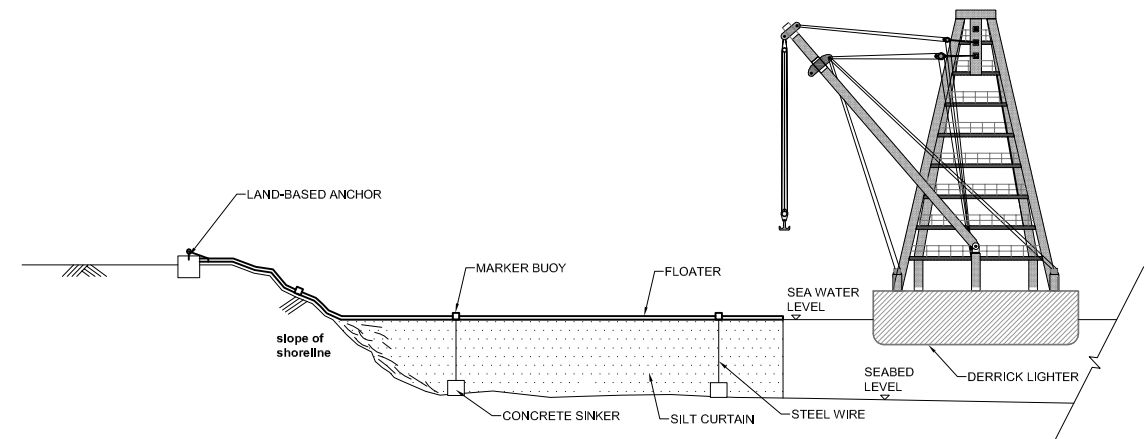
**Stage 2:**  
Install land-based anchors on shore.



**Stage 5:**  
Fix both ends of the silt curtain to land-based anchors on shore.



**Stage 3:**  
Transport the pre-assembled silt curtain to site and place into water by derrick lighter.



**Stage 6:**  
Position concrete sinkers on seabed and chain onto the buoys of silt curtain.  
Divers shall be deployed to assist in the operation and conduct final inspection.

DRAWN	IC
DESIGNED	TS
CHECKED	TS
APPROVED	YM
DATE	15/7/2014

**SHATIN TO CENTRAL LINK**



TITLE  
**CONTRACT 1127**  
**ADVANCE WORKS FOR NSL CROSS HARBOUR TUNNELS**  
**Installation Procedure of Silt Curtain at Shek O**

SCALE <b>N.T.S.</b>	DRAWING NO. <b>SCL11227/SCDP/SO-05</b>	REV. <b>-</b>
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REV	DESCRIPTION	BY	DATE	APPROVED
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CADD REF.

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**APPENDIX D**

**SAMPLE CHECKLIST FOR  
INSPECTION OF SILT CURTAIN**

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**環保網每天檢查表 (Daily Inspection Checklist for Silt Curtain)**

日期 Date : \_\_\_\_\_ 天氣 Weather: \_\_\_\_\_

地點 Location : 石澳 Shek O  
( 北面 Northern / 南面 Southern )

地點 Location	檢查事項 Inspection Items	評核 Results	修正 Rectification	
			目標完成日期 Target Completion Date	實際完成日期 Actual Completion Date
<b>Geotextile</b> 隔泥布狀況	Geotextile curtain remains intact and without gap 隔泥布沒有破損或缺口	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Geotextile curtain in upright position 隔泥布保持直立位置	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Silt curtain has no flapping or dislocation 環保網沒有鬆脫擺動或移位	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	No floating refuse trapped by the silt curtain 沒有垃圾在環保網內漂浮	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	No sediment plume dispersed through the silt curtain 沒有泥水彌散在環保網外	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
<b>Ancillary Facilities</b> 附屬設施狀況	Floater in good working conditions 浮標狀態良好	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Flashing lights in good working conditions 閃燈狀態良好	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Wire ropes in good working conditions 鋼索狀態良好	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		

檢查員 Checked By: \_\_\_\_\_



**環保網潛水檢查表 (Diving Inspection Checklist for Silt Curtain)**

日期 Date : \_\_\_\_\_

天氣 Weather: \_\_\_\_\_

地點 Location : 石澳 Shek O

( 北面 Northern / 南面 Southern )

分類 Category	檢查事項 Inspection Items	評核 Results	修正 Rectification	
			目標完成日期 Target Completion Date	實際完成日期 Actual Completion Date
<b>Geotextile</b> 隔泥布狀況	Geotextile curtain remains intact and in upright position 隔泥布沒有破損及保持直立位置	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Geotextile curtain is securely attached to floaters 隔泥布已被牢固地繫於浮標上	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Silt curtain extends from sea surface to seabed level 隔泥布高度由海面延伸至海床平面	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Ballast chain at bottom of silt curtain remains in position 隔泥布底部之壓載鏈條保持完好	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
<b>Ancillary Facilities</b> 附屬設施狀況	Marker buoys and flashing lights in good order 浮筒及閃燈狀態良好	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		
	Concrete sinkers is securely attached to bottom of silt curtain 海床上之石矽墜物已牢固地繫於隔泥布底部	<input type="checkbox"/> 滿意 Satisfactory <input type="checkbox"/> 不滿意 Unsatisfactory		

檢查潛水員 Checked By Diver : \_\_\_\_\_

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**APPENDIX E**

**ANTICIPATED CONSTRUCTION  
PROGRAMME**

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**Shatin to Central Link (SCL)**

**Works Contract 11227 - Advance Works for NSL Cross Harbour Tunnels**

**Programme of Marine Works (Shek O)**

Item	Activity	Year 2014					
		Jul	Aug	Sep	Oct	Nov	Dec
1	Mobilization of vessels and equipment						
2	Deployment of silt curtain for seabed levelling (northern gate)						
3	Seabed levelling works at channel exit						
2	Deployment of silt curtain for rock filling (southern gate)						
4	Rock filling works in Casting Basin						
5	Completion of marine works						
6	Decommissioning of silt curtains						
7	Demobilization of vessels and equipment						