MOTT MACDONALD

Expansion of Hong Kong International Airport into a Three-Runway System

Pilot Test Report on Silt Curtain Efficiency

August 2017

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Expansion of Hong Kong International Airport into a Three-Runway System

Pilot Test Report on Silt Curtain Efficiency

August 2017

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

This Pilot Test Report on Silt Curtain Efficiency has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Condition 2.15 (ii) and (iii) of Environmental Permit No. EP-489/2014.

Certified by: 

Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 5 September 2017

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By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence TSUI, Principle Manager

5 September 2017

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Pilot Test Report for Silt Curtain Efficiency

Reference is made to the Environmental Team's submission of Pilot Test Report for Silt Curtain Efficiency under Condition 2.15(ii) and (iii) of the Environmental Permit No. EP-489/2014 certified by the ET Leader on 5 September 2017.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 1.9 of EP-489/2014.

Should you have any query, please feel free to contact the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.

Jackel Law
Independent Environmental Checker

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1 Introduction

1.1 Background

Under the Environmental Impact Assessment Ordinance, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) prepared for the "Expansion of Hong Kong International Airport into a Three-Runway System" (the 3RS Project) has been approved by the Environmental Protection Department (EPD), and an Environmental Permit (Permit No.: EP-489/2014) has been issued for the project.

Silt curtains have been recommended in the approved EIA report as a mitigation measure for suspended solids (SS) associated with marine construction activities of the project. A Silt Curtain Deployment Plan (SCDP) was published in accordance with the EP to present the requirements for implementation of the silt curtains for various marine construction activities of the 3RS Project. The EP also specified the requirement for a pilot test on silt curtain system to confirm the efficiency of the silt curtain system. Details of these requirements are presented in Section 5 of the SCDP.

This report presents the findings from the pilot test on silt curtain efficiency conducted for the project.

1.2 Objectives

As specified in EP Clause 2.15(ii) and (iii), a pilot test on silt curtain system shall be conducted during the early stage of construction to confirm the silt curtain removal efficiency, and this pilot test shall be conducted during the highest current speed condition, covering both flood and ebb tides, and include measurement of current speed and direction, turbidity and SS.

The objectives of the pilot test on silt curtain system include the following:

- To determine and confirm the silt curtain efficiency of the double layer floating type silt curtains proposed for the 3RS Project with comparison to the relevant assumptions of the EIA Report
- To apply the pilot test results with an aim to optimize the installation, workmanship and operation of the silt curtains to achieve effectiveness

It should be noted that regardless of the measured efficiency of the silt curtain system, the event and action plan as part of the environmental monitoring and audit (EM&A) requirements of the project should only be based on the monitoring results at the designated stationary monitoring stations as specified in the Updated EM&A Manual.

1.3 Structure of this Report

Following this introductory section, this pilot test report is structured as follows:

Section 2 Silt Curtain Pilot Test

Section 3 Analysis of Pilot Test Results

Section 4 Conclusion

2 Silt Curtain Pilot Test

2.1 Pilot Test Requirements

In accordance with the requirements specified in the SCDP, the pilot test was conducted on the floating 'Type III' silt curtain proposed for marine filling works. The pilot test was conducted over a period of five days, with one sampling day for obtaining baseline conditions beforehand and subsequently three sampling days for silt curtain efficiency testing. EPD was notified prior to commencement of the pilot test.

Baseline monitoring for the pilot test was conducted on 31 May 2017, while silt curtain efficiency testing was conducted on 2 June 2017 to 4 June 2017. Monitoring was conducted during the highest current speed conditions (mid-ebb tide and mid-flood tide respectively). The period of mid-ebb and mid-flood tide on each monitoring day is shown in **Table 2-1**.

Table 2-1: Mid-Ebb / Mid-Flood Tidal Period

Monitoring Day	Mid-Point Ebb Tide	Mid-Point Flood Tide	Mid-Ebb Tide	Mid-Flood Tide
31 May 2017	17:15	10:15	15:30 - 19:00	08:30 - 12:00
2 June 2017	08:15	13:15	06:30 - 10:00	11:30 - 15:00
3 June 2017	09:15	14:45	07:30 - 11:00	13:00 - 16:30
4 June 2017	10:00	16:00	08:15 - 11:45	14:15 - 17:45

Note: Tidal information based on predicted tides at Chek Lap Kok tidal station from Hong Kong Observatory
Mid-ebb / mid-flood = within ± 1.75 hour of the predicted time (of the 'mid-point') for ebb and flood tide respectively (as specified in the Updated EM&A Manual)

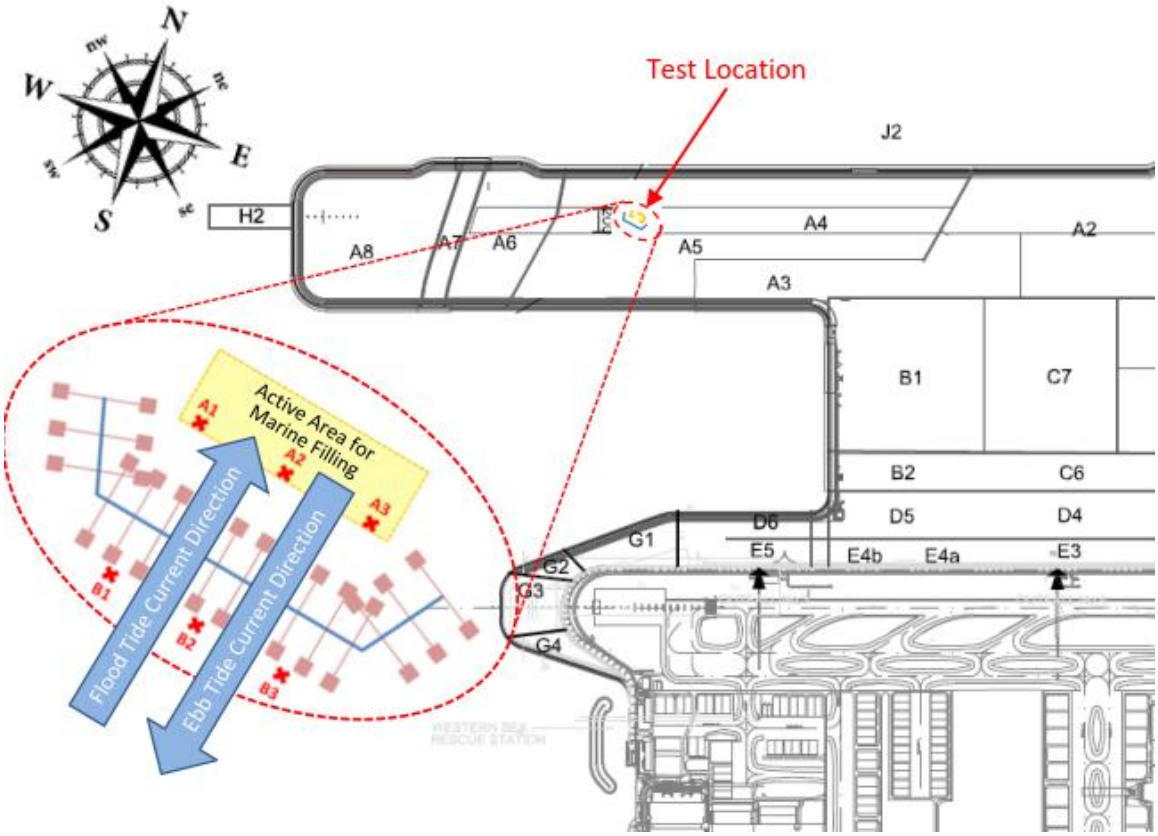
Prior to the pilot test, a diver survey was undertaken by the Contractor to check and confirm the silt curtain is in good condition. Any unsatisfactory items identified were rectified before commencement of the pilot test each day. The diver inspection checklists are provided in **Appendix A**.

During the silt curtain efficiency testing, a trial simulating actual marine filling works using sand fill was actively conducted within the works areas protected by the silt curtains, with a productivity of approximately 150 m^3/hr for a period of 4 hours during each tide.

2.2 Pilot Test Location

The pilot test was conducted for a fully deployed trial section (approx. 200 m in length) of the enhanced floating double-layer 'Type III' silt curtain. The location of the pilot test is shown in **Figure 2.1**.

Figure 2.1: Location of Silt Curtain Pilot Test



Monitoring locations A1, A2 and A3 were located inside the marine works area, spaced 50 m apart and <100 m from the silt curtain boundary. Monitoring locations B1, B2 and B3 were located outside the marine works area, spaced 50 m apart and <50 m from the silt curtain boundary. The coordinate locations of the monitoring stations are shown in **Table 2-2**.

Table 2-2: Coordinates of Monitoring Stations

Inside Marine Works Area			Outside Marine Works Area		
Station	**Easting**	**Northing**	**Station**	**Easting**	**Northing**
A1	806671	820639	B1	806637	820520
A2	806720	820624	B2	806686	820507
A3	806767	820610	B3	806734	820494

2.3 Monitoring Regime

Monitoring procedures followed the requirements specified in Section 5 of the SCDP.

Measurements were taken four times (twice during mid-flood tide and twice during mid-ebb tide) each day, with the interval between consecutive samples no less than one hour. The water depth at all monitoring stations was >6 m, hence duplicate samples were taken at three depths (at 1m below surface, at mid-depth, and at 1m above bottom) at each location. The total number of samples per tide per day was:

2 replicates x 3 depths x 6 stations x 2 monitoring events = 72 samples per tide per day

The overall number of samples taken was:

72 samples/tide x 2 tides/day x 4 days (baseline + pilot test) = 576 samples

Parameters measured in-situ at each monitoring station included water depth, current speed, current direction, and turbidity, while SS was determined in the laboratory using the APHA 2540D method. The monitoring equipment adopted are as follows:

Water Depth / Current Speed and Direction – Sontek HydroSurveyor

Turbidity Meter – YSI 6920 V2

Water Sampler – Transparent PVC cylinder with a positive latching system and messenger. High density polythene bottles for storing the water samples.

Other relevant data was also recorded, including monitoring location, time, tidal stages, weather conditions, sea conditions and any special phenomena and work underway in the vicinity. All in-situ monitoring instruments were checked, calibrated and certified by a HOKLAS-accredited laboratory before use. The calibration certificates are presented in **Appendix B**.

Photos of the pilot test are shown in **Appendix C**. The full results of the pilot test are provided in **Appendix D**.

3 Analysis of Pilot Test Results

3.1 Approach for Determination of Silt Curtain Efficiency

Silt curtain efficiency is measured as the relative difference between SS concentrations 'inside the marine works area' and those taken 'outside the marine works area' on either side of the silt curtain. The following equation is adopted to determine silt curtain efficiency:

$$Silt\ Curtain\ Efficiency\ (\%) = \frac{Inside\ SS - Outside\ SS}{Inside\ SS}\ x\ 100\%$$

'Inside SS' is determined by averaging the SS concentrations at individual monitoring stations inside the marine works area (i.e. the average of A1, A2 and A3). 'Outside SS' is determined by averaging the SS concentrations at monitoring stations outside the marine works area (i.e. B1, B2 and B3).

The silt curtain efficiency equation is applied to the averaged SS results for each monitoring event, rather than to individual locations inside and outside the silt curtain. This provides a measure of the overall efficiency of the silt curtain system on 'a per monitoring event' basis, rather than trying to relate a specific monitoring location inside the silt curtain with a corresponding location outside the silt curtain.

The intermediate (daily-average) efficiency is determined by averaging the calculated efficiency results for the two monitoring events (per tide) per day. The overall silt curtain efficiency of the silt curtain system is the average of the three daily silt curtain efficiency results obtained during the pilot test period.

3.2 Baseline Results

Baseline monitoring for the pilot test was conducted on 31 May 2017. The weather and sea conditions were cloudy and moderate. No special phenomena, construction activities or marine traffic movements occurred in the vicinity during the baseline monitoring.

During ebb tide, baseline SS concentrations ranged from 3 to 9 mg/L, with an average of 6 mg/L. During flood tide, SS concentrations ranged from <2 to 19 mg/L, with an average of 5 mg/L. Overall, baseline SS concentrations were found to be low, hence the ambient SS in the marine environment is considered to have a negligible effect on the validity of the calculation for silt curtain efficiency and is thus not factored into the calculation.

3.3 Silt Curtain Efficiency

Silt curtain efficiency monitoring was conducted between 2 June and 4 June 2017. The weather and sea conditions were cloudy and moderate, except on 2 June 2017 when the sea conditions were rough. No special phenomena, construction activities or marine traffic movements occurred in the vicinity during the silt curtain efficiency monitoring.

With reference to **Figure 2.1**, silt curtain efficiency is calculated from ebb tide results only. Based on the ebb tide results, the calculated silt curtain efficiencies are summarised in **Table 3-1**, which shows that the daily average efficiencies of the silt curtain range from 82.3% to 95.9% over the three-day testing period, with an overall efficiency of 87.4%. The full calculated results are provided in **Appendix D**.

Table 3-1: Summary of Silt Curtain Efficiency

Test Date	Monitoring Event	Silt Curtain Efficiency (%)		
		Average of each monitoring round	Daily-average	Overall-average
2 June	1st round	82.0	82.3	87.4
	2nd round	82.6		
3 June	1st round	89.3	84.1	
	2nd round	78.9		
4 June	1st round	96.1	95.9	
	2nd round	95.6		

Compared to the EIA assumption of 61% silt curtain efficiency for floating double layer silt curtains, the silt curtains deployed for the 3RS Project are demonstrated to achieve a higher performance with respect to SS containment, thereby providing a greater level of protection to water sensitive receivers located outside the project boundary.

4 Conclusion

In accordance with the requirements specified in the SCDP, the pilot test was conducted on the floating 'Type III' silt curtain proposed for marine filling works. Silt curtain efficiency testing was conducted on 2 to 4 June 2017. The testing results have demonstrated that the tested silt curtain is able to achieve an efficiency greater than the 61% silt curtain efficiency as assumed in the approved EIA report for the 3RS Project.

With deployment of the enhanced silt curtains as specified in the SCDP, there will be a greater level of protection to water sensitive receivers located outside the project boundary compared to the EIA assumptions. Hence no further recommendations are required.

Appendices

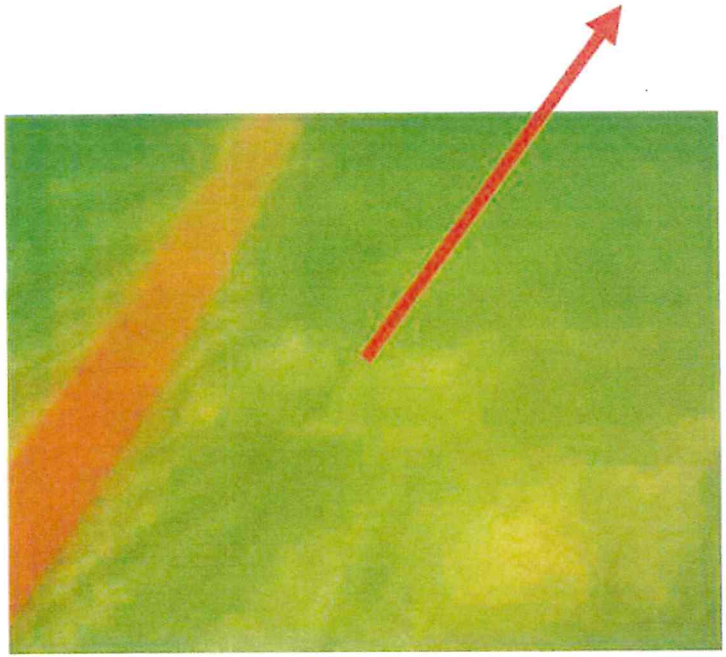
A. Record of Diver Inspections

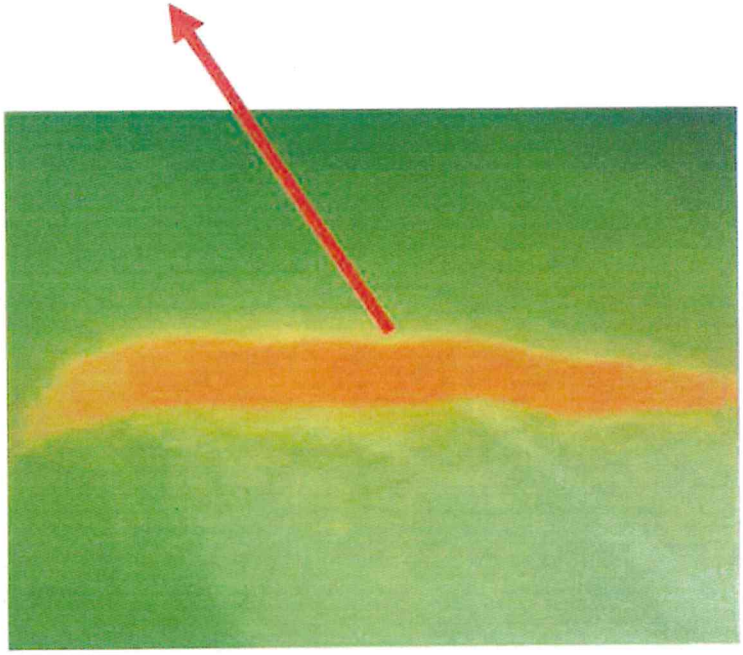
Hong Kong International Airport
Three Runway System
Contract 3206 – Reclamation Works

ZHEC - CCCC - CDC JV

Diver Inspection Photo for Silt Curtain (Pilot Test) on 2017-05-31

Silt Curtain for Pilot Test





The silt curtain condition is *satisfactory/~~-unsatisfactory/- damaged~~ according to the diver inspection.

* Delete as appropriate

Mott MacDonald

Diver Inspection Checklist for Silt Curtains

Contract No.: 3206

Date: 31/5/2017

Weather: Fine

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Geotextile						
Curtain remains intact and without gap	☑Satisfactory ☐Unsatisfactory					
Curtain in upright position	☑Satisfactory ☐Unsatisfactory					
Curtain has no loose / flapping parts	☑Satisfactory ☐Unsatisfactory					
Curtain is securely attached at joints	☑Satisfactory ☐Unsatisfactory					

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Curtain fittings (e.g. chains, bands, plates, joint connectors etc.) are intact and in position	☑Satisfactory ☐Unsatisfactory					
Curtain extends to within ~~30m~~ 30cm from seabed level	☑Satisfactory ☐Unsatisfactory					
Curtain hem is not weighted down by sediment deposition	☑Satisfactory ☐Unsatisfactory					
Ancillary Components						
Anchors are undamaged and positions are correct	☑Satisfactory ☐Unsatisfactory					
Anchor lines are properly attached to the buoys / connectors of the silt curtain	☑Satisfactory ☐Unsatisfactory					
No parts are detached from the silt curtain system	☑Satisfactory ☐Unsatisfactory					

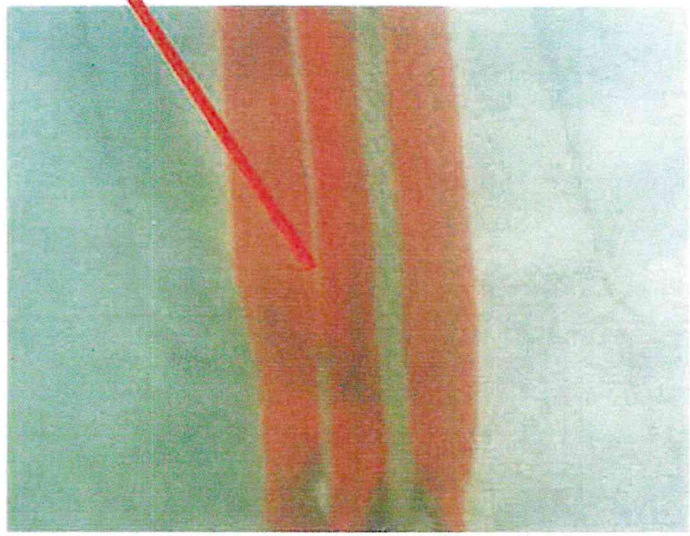
Checked By: _____

Hong Kong International Airport
Three Runway System
Contract 3206 – Reclamation Works

ZHEC - CCCC - CDC JV

Diver Inspection Photo for Silt Curtain (Pilot Test) on 2017-06-02

Silt Curtain for Pilot Test



The silt curtain condition is *satisfactory/~~unsatisfactory/ damaged~~ according to the diver inspection.

* Delete as appropriate

Diver Inspection Checklist for Silt Curtains

Contract No.: 3206

Date: 2/6/2017

Weather: Fine

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Geotextile						
Curtain remains intact and without gap	☑Satisfactory ☐Unsatisfactory					
Curtain in upright position	☑Satisfactory ☐Unsatisfactory					
Curtain has no loose / flapping parts	☐Satisfactory ☑Unsatisfactory	Middle Section of floater	Loose	Repair completely before starting of test	2/6/2017	
Curtain is securely attached at joints	☑Satisfactory ☐Unsatisfactory					

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Curtain fittings (e.g. chains, bands, plates, joint connectors etc.) are intact and in position	☑Satisfactory ☐Unsatisfactory					
Curtain extends to within ~~30m~~ 300cm from seabed level	☑Satisfactory ☐Unsatisfactory					
Curtain hem is not weighted down by sediment deposition	☑Satisfactory ☐Unsatisfactory					
Ancillary Components						
Anchors are undamaged and positions are correct	☑Satisfactory ☐Unsatisfactory					
Anchor lines are properly attached to the buoys / connectors of the silt curtain	☑Satisfactory ☐Unsatisfactory					
No parts are detached from the silt curtain system	☑Satisfactory ☐Unsatisfactory					

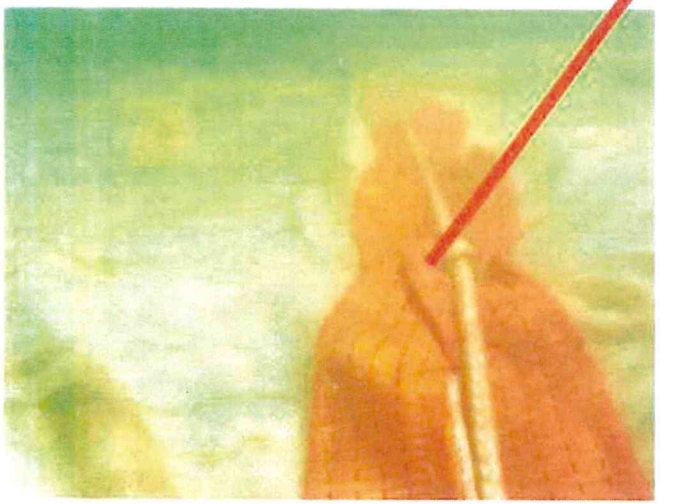
Checked By: _____

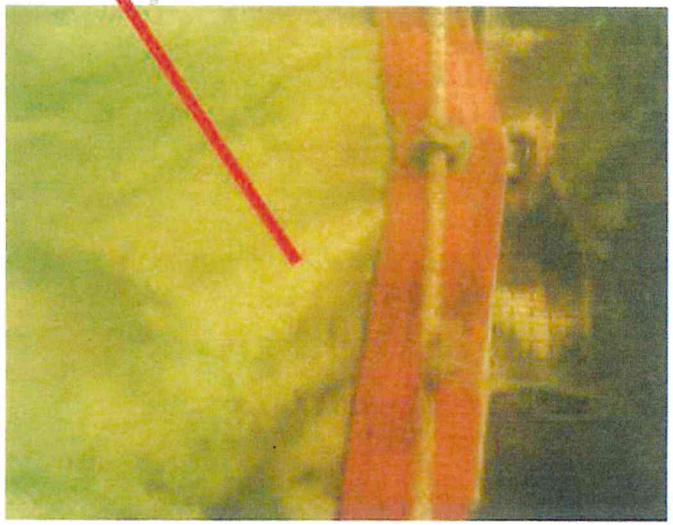
Hong Kong International Airport
Three Runway System
Contract 3206 – Reclamation Works

ZHEC - CCCC - CDC JV

Diver Inspection Photo for Silt Curtain (Pilot Test) on 2017-06-03

Silt Curtain for Pilot Test





The silt curtain condition is *satisfactory/~~unsatisfactory/ damaged~~ according to the diver inspection.

* Delete as appropriate

Mott MacDonald

Diver Inspection Checklist for Silt Curtains

Contract No.: 3206

Date: 3/6/2017

Weather: Fine

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Geotextile						
Curtain remains intact and without gap	☑Satisfactory ☐Unsatisfactory					
Curtain in upright position	☑Satisfactory ☐Unsatisfactory					
Curtain has no loose / flapping parts	☐Satisfactory ☑Unsatisfactory	Middle Section of floater	Loose	Repair completely before starting of test	3/6/2017	[illegible]
Curtain is securely attached at joints	☑Satisfactory ☐Unsatisfactory					

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Curtain fittings (e.g. chains, bands, plates, joint connectors etc.) are intact and in position	☑Satisfactory ☐Unsatisfactory					
Curtain extends to within ~~30m~~ 30cm from seabed level	☑Satisfactory ☐Unsatisfactory					
Curtain hem is not weighted down by sediment deposition	☑Satisfactory ☐Unsatisfactory					
Ancillary Components						
Anchors are undamaged and positions are correct	☑Satisfactory ☐Unsatisfactory					
Anchor lines are properly attached to the buoys / connectors of the silt curtain	☑Satisfactory ☐Unsatisfactory					
No parts are detached from the silt curtain system	☑Satisfactory ☐Unsatisfactory					

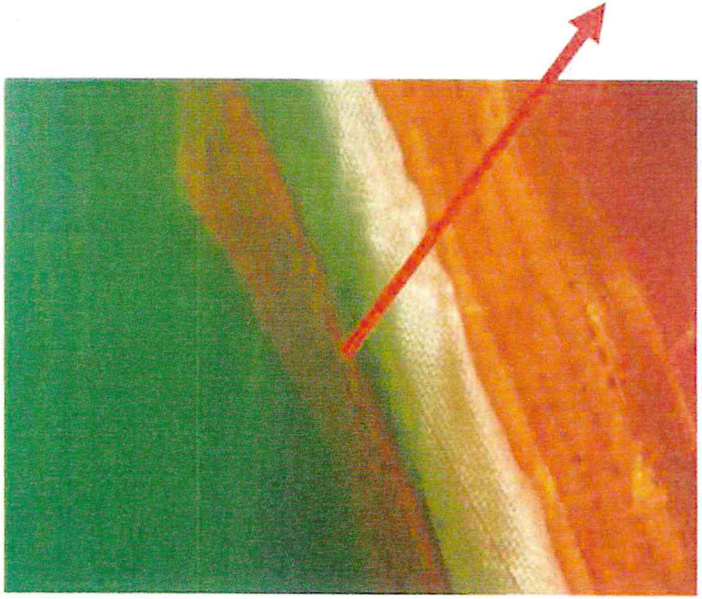
Checked By: _____

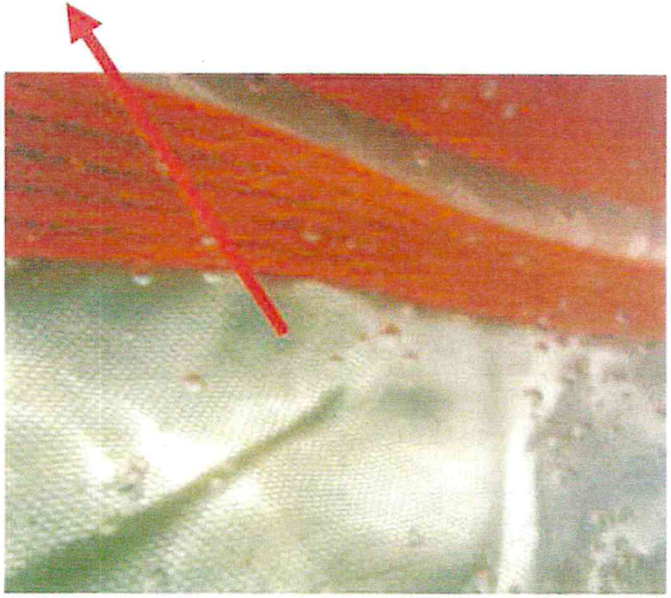
Hong Kong International Airport
Three Runway System
Contract 3206 – Reclamation Works

ZHEC - CCCC - CDC JV

Diver Inspection Photo for Silt Curtain (Pilot Test) on 2017-06-04

Silt Curtain for Pilot Test





The silt curtain condition is *satisfactory/~~unsatisfactory/ damaged~~ according to the diver inspection.

* Delete as appropriate

Diver Inspection Checklist for Silt Curtains

Contract No.: 3266

Date: 4/6/2017

Weather: Fine

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Geotextile						
Curtain remains intact and without gap	☑Satisfactory ☐Unsatisfactory					
Curtain in upright position	☑Satisfactory ☐Unsatisfactory					
Curtain has no loose / flapping parts	☑Satisfactory ☐Unsatisfactory					
Curtain is securely attached at joints	☑Satisfactory ☐Unsatisfactory					

Inspection Items	Result	If Unsatisfactory, provide details on the following				
		Coordinate / Locations of Affected Section(s)	Description of Unsatisfactory Item	Proposed Action	Date of Completion of Action	Confirmed / Completed By (name and signature)
Curtain fittings (e.g. chains, bands, plates, joint connectors etc.) are intact and in position	☑Satisfactory ☐Unsatisfactory					
Curtain extends to within ~~30m~~ 30cm from seabed level	☑Satisfactory ☐Unsatisfactory					
Curtain hem is not weighted down by sediment deposition	☑Satisfactory ☐Unsatisfactory					
Ancillary Components						
Anchors are undamaged and positions are correct	☑Satisfactory ☐Unsatisfactory					
Anchor lines are properly attached to the buoys / connectors of the silt curtain	☑Satisfactory ☐Unsatisfactory					
No parts are detached from the silt curtain system	☑Satisfactory ☐Unsatisfactory					

Checked By: _____

B. Calibration Certificates

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR ALEXI BHANJA	**WORK ORDER:**	HK1713677
CLIENT:	SMEC ASIA LIMITED	**AMENDMENT:**	1
ADDRESS:	27/F, FORD GLORY PLAZA,	**SUB-BATCH:**	0
	37-39 WING HONG STREET,	**LABORATORY:**	HONG KONG
	CHEUNG SHA WAN,	**DATE RECEIVED:**	07/04/2017
	KOWLOON, HONG KONG	**DATE OF ISSUE:**	22/05/2017

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Conductivity, Dissolved Oxygen, pH, Salinity, Temperature and Turbidity
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	6920 V2
Serial No.:	0001C6A7
Equipment No.:	--
Date of Calibration:	7 April, 2017

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico
Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1713677
Amendment: 1
Sub-Batch: 0
Date of Issue: 22/05/2017
Client: SMEC ASIA LIMITED

Description: Multifunctional Meter
Brand Name: YSI
Model No.: 6920 V2
Serial No.: 0001C6A7
Equipment No.: --
Date of Calibration: 07 April, 2017 Date of next Calibration: 07 July, 2017

Parameters:

Conductivity

Method Ref: APHA (21st edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	152.3	+3.7
6667	6582	-1.3
12890	12763	-1.0
58670	57582	-1.9
	Tolerance Limit (%)	±10.0

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
1.60	1.53	-0.07
4.52	4.60	+0.08
8.28	8.38	+0.10
	Tolerance Limit (mg/L)	±0.20

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.93	-0.07
7.0	7.16	+0.16
10.0	9.92	-0.08
	Tolerance Limit (pH unit)	±0.20

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0	--
10	9.86	-1.4
20	20.27	+1.4
30	29.80	-0.7
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1713677
Amendment: 1
Sub-Batch: 0
Date of Issue: 22/05/2017
Client: SMEC ASIA LIMITED

Description: Multifunctional Meter
Brand Name: YSI
Model No.: 6920 V2
Serial No.: 0001C6A7
Equipment No.: --
Date of Calibration: 07 April, 2017 Date of next Calibration: 07 July, 2017

Parameters:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.8	11.40	+0.6
21.5	20.20	-1.3
39.2	40.50	+1.3
	Tolerance Limit (°C)	±2.0

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	3.7	-7.5
40	41.4	+3.5
80	83.4	+4.3
400	426.3	+6.6
800	858.6	+7.3
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganics

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR ALEXI BHANJA	**WORK ORDER:**	HK1713672
CLIENT:	SMEC ASIA LIMITED	**AMENDMENT:**	1
ADDRESS:	27/F, FORD GLORY PLAZA,	**SUB-BATCH:**	0
	37-39 WING HONG STREET,	**LABORATORY:**	HONG KONG
	CHEUNG SHA WAN,	**DATE RECEIVED:**	07/04/2017
	KOWLOON, HONG KONG	**DATE OF ISSUE:**	22/05/2017

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Conductivity, Dissolved Oxygen, pH, Salinity, Temperature and Turbidity
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	6920 V2
Serial No.:	00019CB2
Equipment No.:	--
Date of Calibration:	7 April, 2017

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1713672
Amendment: 1
Sub-Batch: 0
Date of Issue: 22/05/2017
Client: SMEC ASIA LIMITED

Description: Multifunctional Meter
Brand Name: YSI
Model No.: 6920 V2
Serial No.: 00019CB2
Equipment No.: --
Date of Calibration: 07 April, 2017 Date of next Calibration: 07 July, 2017

Parameters:

Conductivity **Method Ref: APHA (21st edition), 2510B**

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	148.3	+1.0
6667	6826	+2.4
12890	12983	+0.7
58670	57826	-1.4
	Tolerance Limit (%)	±10.0

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
1.60	1.71	+0.11
4.52	4.65	+0.13
8.28	8.12	-0.16
	Tolerance Limit (mg/L)	±0.20

pH Value **Method Ref: APHA 21st Ed. 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.92	-0.08
7.0	7.06	+0.06
10.0	9.96	-0.04
	Tolerance Limit (pH unit)	±0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0	--
10	9.80	-2.0
20	18.56	-7.2
30	28.85	-3.8
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1713672
Amendment: 1
Sub-Batch: 0
Date of Issue: 22/05/2017
Client: SMEC ASIA LIMITED

Description: Multifunctional Meter
Brand Name: YSI
Model No.: 6920 V2
Serial No.: 00019CB2
Equipment No.: --
Date of Calibration: 07 April, 2017 Date of next Calibration: 07 July, 2017

Parameters:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.8	11.60	+0.8
21.5	20.80	-0.7
39.2	41.10	+1.9
	Tolerance Limit (°C)	±2.0

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	--
4	3.8	-5.0
40	42.8	+7.0
80	85.2	+6.5
400	433.4	+8.3
800	838.4	+4.8
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

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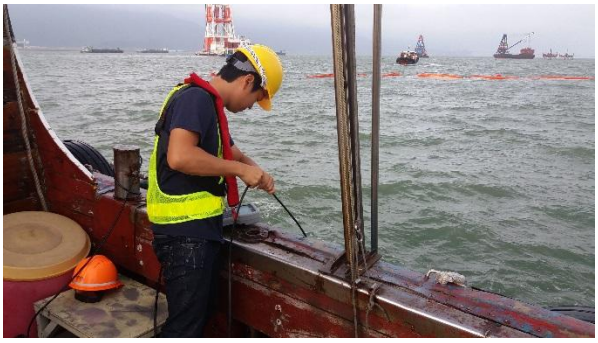
C. Pilot Test Photographs

Photo 1: Deployed section of silt curtain for pilot test

Photo 2: Marine filling activity for pilot test

Photo 3: Sea condition inside the silt curtain during the pilot test

Photo 4: Water quality sampling during the pilot test



D. Pilot Test Results

Baseline Monitoring Results (Ebb and Flood tide)

Inside Marine Works Area (Station A1 to A3)

Tide	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
31 May Ebb	A1	Cloudy	Moderate	1st	Surface	16:35	1	1.0	222	0.30	3.2	6	5	6
					Surface		2				3.2	4		
					Middle		1	3.8	234	0.22	3.5	5	5	
					Middle		2				3.6	4		
					Bottom		1	7.5	197	0.19	6.2	6	7	
					Bottom		2				6.2	7		
				2nd	Surface	17:45	1	1.0	266	0.28	2.8	4	5	6
					Surface		2				2.8	6		
					Middle		1	3.8	267	0.32	3.6	5	5	
					Middle		2				3.6	5		
					Bottom		1	7.6	205	0.07	5.2	9	9	
					Bottom		2				5.2	8		
	A2	Cloudy	Moderate	1st	Surface	16:40	1	1.0	238	0.19	3.1	5	5	6
					Surface		2				3.1	5		
					Middle		1	3.8	228	0.22	4.7	5	5	
					Middle		2				4.7	4		
					Bottom		1	7.5	249	0.14	6.6	8	9	
					Bottom		2				6.6	9		
				2nd	Surface	17:50	1	1.0	226	0.36	2.6	5	5	5
					Surface		2				2.4	4		
					Middle		1	3.9	271	0.11	3.6	4	5	
					Middle		2				3.6	6		
					Bottom		1	7.7	209	0.13	6.1	6	6	
					Bottom		2				6.1	5		
	A3	Cloudy	Moderate	1st	Surface	16:45	1	1.0	226	0.29	3.5	6	5	6
					Surface		2				3.5	4		
					Middle		1	3.8	238	0.20	5.2	6	6	
					Middle		2				5.2	6		
					Bottom		1	7.6	261	0.14	5.2	6	7	
					Bottom		2				5.2	7		
				2nd	Surface	17:55	1	1.0	222	0.26	3.1	6	5	6
					Surface		2				3.1	4		
					Middle		1	3.8	208	0.13	3.8	5	6	
					Middle		2				3.8	6		
					Bottom		1	7.5	249	0.13	5.8	6	6	
					Bottom		2				5.8	5		
31 May Flood	A1	Cloudy	Moderate	1st	Surface	09:35	1	1.0	315	0.15	2.4	5	5	10
					Surface		2				2.4	5		
					Middle		1	4.0	344	0.19	3.3	7	6	
					Middle		2				3.3	4		
					Bottom		1	7.9	325	0.12	3.7	19	19	
					Bottom		2				3.7	18		
				2nd	Surface	11:00	1	1.0	19	0.09	2.9	2	3	4
					Surface		2				2.9	3		
					Middle		1	4.0	21	0.21	5.4	4	4	
					Middle		2				5.4	3		
					Bottom		1	8.0	17	0.29	6.3	3	4	
					Bottom		2				6.4	5		
	A2	Cloudy	Moderate	1st	Surface	09:40	1	1.0	311	0.20	2.2	4	4	7
					Surface		2				2.2	4		
					Middle		1	3.9	1	0.21	2.9	5	5	
					Middle		2				2.9	4		
					Bottom		1	7.8	332	0.03	3.7	12	11	
					Bottom		2				3.7	10		
				2nd	Surface	11:03	1	1.0	19	0.14	2.1	3	3	5
					Surface		2				2.1	3		
					Middle		1	4.0	21	0.29	4.3	6	5	
					Middle		2				4.4	4		
					Bottom		1	7.9	17	0.27	4.4	6	7	
					Bottom		2				4.3	7		
	A3	Cloudy	Moderate	1st	Surface	09:45	1	1.0	14	0.07	2.4	5	5	6
					Surface		2				2.4	4		
					Middle		1	4.0	10	0.21	3.9	5	6	
					Middle		2				4.0	6		
					Bottom		1	8.0	29	0.10	5.2	8	8	
					Bottom		2				5.0	7		
				2nd	Surface	11:08	1	1.0	4	0.20	2.4	4	4	6
					Surface		2				2.4	4		
					Middle		1	3.9	29	0.28	3.6	8	7	
					Middle		2				3.8	6		
					Bottom		1	7.8	25	0.36	4.6	6	6	
					Bottom		2				4.4	6		

Outside Marine Works Area (Station B1 to B3)

Tide	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
31 May Ebb	B1	Cloudy	Moderate	1st	Surface	16:35	1	1.0	261	0.33	4.1	5	5	6
					Surface		2				4.1	5		
					Middle		1	3.9	244	0.26	5.7	5	5	
					Middle		2				5.7	5		
					Bottom		1	7.8	282	0.22	8.3	6	7	
					Bottom		2				8.3	8		
				2nd	Surface	17:45	1	1.0	219	0.31	2.9	3	3	5
					Surface		2				2.8	3		
					Middle		1	4.3	271	0.24	5.6	5	6	
					Middle		2				5.6	6		
					Bottom		1	8.5	208	0.16	6.3	4	5	
					Bottom		2				6.3	5		
	B2	Cloudy	Moderate	1st	Surface	16:40	1	1.0	222	0.30	4.7	4	4	5
					Surface		2				4.7	4		
					Middle		1	4.4	239	0.22	6.7	4	4	
					Middle		2				6.7	3		
					Bottom		1	8.8	207	0.28	9.1	7	7	
					Bottom		2				9.1	6		
				2nd	Surface	17:50	1	1.0	241	0.35	3.6	4	4	5
					Surface		2				3.6	4		
					Middle		1	4.2	208	0.16	5.1	5	5	
					Middle		2				5.1	4		
					Bottom		1	8.4	167	0.10	5.6	5	6	
					Bottom		2				5.6	7		
	B3	Cloudy	Moderate	1st	Surface	16:45	1	1.0	227	0.27	3.6	5	6	7
					Surface		2				3.6	6		
					Middle		1	4.1	241	0.22	4.5	6	6	
					Middle		2				4.6	6		
					Bottom		1	8.2	198	0.15	7.0	8	8	
					Bottom		2				7.0	7		
				2nd	Surface	17:55	1	1.0	231	0.26	4.3	4	4	6
					Surface		2				4.3	4		
					Middle		1	4.1	220	0.20	6.0	7	6	
					Middle		2				6.0	5		
					Bottom		1	8.1	199	0.11	7.4	6	7	
					Bottom		2				6.9	7		
31 May Flood	B1	Cloudy	Moderate	1st	Surface	09:35	1	1.0	314	0.21	3.7	4	4	5
					Surface		2				3.7	4		
					Middle		1	3.9	10	0.16	4.4	6	6	
					Middle		2				4.4	6		
					Bottom		1	7.8	31	0.11	4.3	6	6	
					Bottom		2				4.3	6		
				2nd	Surface	11:00	1	1.0	355	0.19	3.2	<2	<2	4
					Surface		2				3.2	<2		
					Middle		1	3.9	19	0.27	5.0	3	3	
					Middle		2				5.0	2		
					Bottom		1	7.8	32	0.27	9.5	4	4	
					Bottom		2				9.5	4		
	B2	Cloudy	Moderate	1st	Surface	09:40	1	1.0	298	0.24	3.3	<2	<2	4
					Surface		2				3.3	<2		
					Middle		1	3.9	5	0.15	4.3	5	4	
					Middle		2				4.3	3		
					Bottom		1	7.8	8	0.07	4.5	3	3	
					Bottom		2				4.5	3		
				2nd	Surface	11:03	1	1.0	360	0.20	4.1	4	4	6
					Surface		2				4.1	3		
					Middle		1	4.0	10	0.30	5.9	5	5	
					Middle		2				5.9	4		
					Bottom		1	7.9	26	0.18	6.4	9	8	
					Bottom		2				6.4	7		
	B3	Cloudy	Moderate	1st	Surface	09:45	1	1.0	292	0.24	3.5	<2	<2	3
					Surface		2				3.6	<2		
					Middle		1	3.9	17	0.15	4.2	4	3	
					Middle		2				4.2	2		
					Bottom		1	7.7	36	0.07	4.7	3	3	
					Bottom		2				4.7	3		
				2nd	Surface	11:08	1	1.0	2	0.28	3.1	3	3	4
					Surface		2				3.5	3		
					Middle		1	3.9	22	0.32	5.1	4	4	
					Middle		2				5.1	3		
					Bottom		1	7.7	23	0.26	7.2	4	5	
					Bottom		2				7.2	6		

Pilot Test - Impact Ebb Tide

Inside Marine Works Area (Station A1 to A3)

Day	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
1 (2 June)	A1	Cloudy	Rough	1st	Surface	08:30	1	1.0	244	0.33	4.9	30	33	31
					Surface		2				4.9	35		
					Middle		1	4.1	241	0.16	8.0	34	29	
					Middle		2				9.3	24		
					Bottom		1	8.1	208	0.11	114.8	36	32	
					Bottom		2				92.6	28		
				2nd	Surface	09:41	1	1.0	261	0.32	19.2	55	47	44
					Surface		2				17.0	39		
					Middle		1	4.0	220	0.32	21.1	32	43	
					Middle		2				20.5	53		
					Bottom		1	8.0	220	0.18	64.2	57	41	
					Bottom		2				54.5	25		
	A2	Cloudy	Rough	1st	Surface	08:34	1	1.0	241	0.29	5.0	19	21	60
					Surface		2				4.9	23		
					Middle		1	4.0	208	0.16	3.6	167	106	
					Middle		2				3.5	45		
					Bottom		1	8.0	198	0.14	95.3	50	52	
					Bottom		2				94.0	53		
				2nd	Surface	09:44	1	1.0	266	0.28	4.9	51	55	49
					Surface		2				4.9	59		
					Middle		1	3.9	214	0.14	40.0	84	78	
					Middle		2				42.7	71		
					Bottom		1	7.8	200	0.11	72.2	11	15	
					Bottom		2				89.1	18		
	A3	Cloudy	Rough	1st	Surface	08:38	1	1.0	233	0.32	6.4	36	36	48
					Surface		2				6.4	36		
					Middle		1	4.0	217	0.15	3.6	36	28	
					Middle		2				3.5	20		
					Bottom		1	7.9	200	0.12	53.6	93	80	
					Bottom		2				50.4	66		
				2nd	Surface	09:47	1	1.0	249	0.35	4.5	45	56	91
					Surface		2				4.5	67		
					Middle		1	4.0	216	0.18	41.7	164	125	
					Middle		2				47.5	85		
					Bottom		1	8.0	205	0.11	83.7	116	92	
					Bottom		2				72.6	67		
2 (3 June)	A1	Cloudy	Moderate	1st	Surface	09:15	1	1.0	251	0.29	38.4	46	46	82
					Surface		2				38.4	45		
					Middle		1	3.8	224	0.20	90.3	95	93	
					Middle		2				93.4	91		
					Bottom		1	7.5	208	0.14	143.7	100	106	
					Bottom		2				133.0	111		
				2nd	Surface	10:20	1	1.0	254	0.27	19.4	37	35	30
					Surface		2				20.0	33		
					Middle		1	3.8	216	0.16	41.3	23	23	
					Middle		2				42.9	23		
					Bottom		1	7.5	227	0.11	53.5	39	32	
					Bottom		2				52.1	25		
	A2	Cloudy	Moderate	1st	Surface	09:19	1	1.0	243	0.25	37.6	35	38	95
					Surface		2				36.4	41		
					Middle		1	3.8	223	0.17	54.8	39	42	
					Middle		2				54.7	44		
					Bottom		1	7.5	197	0.13	84.8	205	206	
					Bottom		2				81.1	207		
				2nd	Surface	10:24	1	1.0	220	0.30	29.6	22	22	29
					Surface		2				29.6	22		
					Middle		1	3.8	219	0.21	34.2	18	21	
					Middle		2				34.5	24		
					Bottom		1	7.5	199	0.17	40.1	43	44	
					Bottom		2				40.7	44		
	A3	Cloudy	Moderate	1st	Surface	09:23	1	1.0	243	0.32	93.6	47	40	93
					Surface		2				94.5	33		
					Middle		1	3.8	231	0.18	42.3	56	56	
					Middle		2				42.5	56		
					Bottom		1	7.5	199	0.12	317.3	172	184	
					Bottom		2				297.7	195		
				2nd	Surface	10:28	1	1.0	255	0.26	24.3	38	40	31
					Surface		2				24.4	41		
					Middle		1	3.8	210	0.10	25.2	34	37	
					Middle		2				25.3	40		
					Bottom		1	7.5	204	0.10	22.2	16	16	
					Bottom		2				22.5	15		
3 (4 June)	A1	Cloudy	Moderate	1st	Surface	09:45	1	1.0	253	0.28	70.7	80	83	74
					Surface		2				72.1	85		
					Middle		1	3.8	216	0.14	53.9	42	44	
					Middle		2				52.9	45		
					Bottom		1	7.5	211	0.11	48.4	107	94	
					Bottom		2				48.4	80		
				2nd	Surface	10:45	1	1.0	250	0.26	103.4	42	59	122
					Surface		2				103.4	76		
					Middle		1	3.8	243	0.20	95.5	233	242	
					Middle		2				94.3	250		
					Bottom		1	7.5	221	0.12	87.4	76	66	
					Bottom		2				87.6	55		
	A2	Cloudy	Moderate	1st	Surface	09:49	1	1.0	256	0.28	91.4	74	90	99
					Surface		2				91.2	106		
					Middle		1	3.8	231	0.15	91.2	205	133	
					Middle		2				90.1	61		
					Bottom		1	7.5	235	0.13	85.9	75	73	
					Bottom		2				85.9	71		
				2nd	Surface	10:49	1	1.0	247	0.27	114.2	151	155	80
					Surface		2				114.3	159		
					Middle		1	3.8	201	0.22	101.9	37	43	
					Middle		2				101.9	49		
					Bottom		1	7.5	230	0.16	70.1	42	42	
					Bottom		2				70.1	42		
	A3	Cloudy	Moderate	1st	Surface	09:53	1	1.0	257	0.29	76.2	106	125	112
					Surface		2				76.2	143		
					Middle		1	3.8	238	0.23	62.1	135	142	
					Middle		2				62.1	149		
					Bottom		1	7.5	202	0.13	54.1	72	68	
					Bottom		2				54.1	64		
				2nd	Surface	10:53	1	1.0	249	0.27	84.8	31	33	50
					Surface		2				84.8	34		
					Middle		1	3.8	222	0.22	80.4	79	91	
					Middle		2				81.2	102		
					Bottom		1	7.5	219	0.20	63.5	25	26	
					Bottom		2				64.8	27		

Outside Marine Works Area (Station B1 to B3)

Day	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
1 (2 June)	B1	Cloudy	Rough	1st	Surface	08:30	1	1.0	286	0.34	8.2	6	8	8
					Surface		2				8.3	9		
					Middle		1	3.9	266	0.29	7.4	8	8	
					Middle		2				7.3	8		
					Bottom		1	7.8	267	0.16	7.6	9	9	
					Bottom		2				7.7	8		
				2nd	Surface	09:41	1	1.0	283	0.33	9.7	9	11	16
					Surface		2				9.7	13		
					Middle		1	4.1	246	0.30	12.2	14	13	
					Middle		2				12.6	11		
					Bottom		1	8.1	250	0.14	16.8	17	23	
					Bottom		2				15.4	28		
	B2	Cloudy	Rough	1st	Surface	08:34	1	1.0	277	0.34	6.8	6	7	9
					Surface		2				6.8	8		
					Middle		1	4.0	267	0.27	7.3	6	7	
					Middle		2				7.4	7		
					Bottom		1	8.0	237	0.16	8.4	12	12	
					Bottom		2				8.3	11		
				2nd	Surface	09:44	1	1.0	264	0.32	6.6	6	6	7
					Surface		2				6.6	5		
					Middle		1	4.0	244	0.25	6.6	10	8	
					Middle		2				6.5	6		
					Bottom		1	7.9	238	0.15	7.3	10	8	
					Bottom		2				7.4	6		
	B3	Cloudy	Rough	1st	Surface	08:38	1	1.0	247	0.38	6.6	7	8	8
					Surface		2				6.6	8		
					Middle		1	4.0	240	0.16	6.8	10	9	
					Middle		2				6.8	8		
					Bottom		1	8.0	187	0.20	7.2	8	8	
					Bottom		2				7.1	8		
				2nd	Surface	09:47	1	1.0	256	0.27	6.6	6	8	9
					Surface		2				6.6	10		
					Middle		1	3.9	216	0.18	6.7	8	9	
					Middle		2				6.7	9		
					Bottom		1	7.8	223	0.11	7.0	11	10	
					Bottom		2				7.0	8		
2 (3 June)	B1	Cloudy	Moderate	1st	Surface	09:15	1	1.0	291	0.26	5.0	3	6	6
					Surface		2				5.2	8		
					Middle		1	3.9	255	0.27	6.3	6	6	
					Middle		2				6.3	6		
					Bottom		1	7.8	235	0.16	6.5	7	6	
					Bottom		2				6.4	4		
				2nd	Surface	10:20	1	1.0	294	0.40	4.5	7	7	7
					Surface		2				4.5	6		
					Middle		1	4.0	285	0.30	5.5	6	6	
					Middle		2				5.5	5		
					Bottom		1	7.9	277	0.26	6.0	7	7	
					Bottom		2				6.0	6		
	B2	Cloudy	Moderate	1st	Surface	09:19	1	1.0	264	0.29	13.7	19	17	15
					Surface		2				13.7	15		
					Middle		1	4.0	244	0.24	25.8	18	16	
					Middle		2				25.9	14		
					Bottom		1	8.0	251	0.21	9.3	13	12	
					Bottom		2				9.3	11		
				2nd	Surface	10:24	1	1.0	278	0.26	4.7	5	6	6
					Surface		2				4.7	6		
					Middle		1	3.9	290	0.34	5.4	5	6	
					Middle		2				5.3	6		
					Bottom		1	7.8	337	0.17	5.8	5	5	
					Bottom		2				5.8	5		
	B3	Cloudy	Moderate	1st	Surface	09:23	1	1.0	209	0.21	4.9	4	6	8
					Surface		2				4.9	7		
					Middle		1	3.9	260	0.29	5.7	8	9	
					Middle		2				5.7	9		
					Bottom		1	7.7	235	0.14	7.7	12	9	
					Bottom		2				7.7	5		
				2nd	Surface	10:28	1	1.0	279	0.26	5.7	4	5	6
					Surface		2				5.7	5		
					Middle		1	3.9	285	0.25	8.1	9	7	
					Middle		2				8.2	5		
					Bottom		1	7.7	295	0.24	12.6	4	6	
					Bottom		2				12.6	7		
3 (4 June)	B1	Cloudy	Moderate	1st	Surface	09:45	1	1.0	260	0.28	3.4	<2	4	3
					Surface		2				3.4	5		
					Middle		1	3.5	268	0.27	4.8	3	3	
					Middle		2				4.8	2		
					Bottom		1	7.0	236	0.12	5.0	2	3	
					Bottom		2				5.0	3		
				2nd	Surface	10:45	1	1.0	271	0.21	4.9	3	4	4
					Surface		2				4.9	5		
					Middle		1	4.0	275	0.27	6.0	<2	4	
					Middle		2				6.0	6		
					Bottom		1	8.0	284	0.09	6.4	<2	4	
					Bottom		2				6.4	5		
	B2	Cloudy	Moderate	1st	Surface	09:49	1	1.0	261	0.33	4.0	3	3	4
					Surface		2				4.0	2		
					Middle		1	3.9	254	0.25	6.5	3	3	
					Middle		2				6.5	3		
					Bottom		1	7.8	229	0.07	8.1	6	5	
					Bottom		2				8.1	3		
				2nd	Surface	10:49	1	1.0	278	0.24	4.6	<2	2	4
					Surface		2				4.6	<2		
					Middle		1	4.0	279	0.23	6.5	8	6	
					Middle		2				6.5	4		
					Bottom		1	7.9	306	0.10	6.7	<2	3	
					Bottom		2				6.7	4		
	B3	Cloudy	Moderate	1st	Surface	09:53	1	1.0	278	0.25	3.1	4	5	4
					Surface		2				3.1	5		
					Middle		1	3.9	273	0.27	5.0	7	5	
					Middle		2				5.0	3		
					Bottom		1	7.7	268	0.11	9.0	4	3	
					Bottom		2				9.0	2		
				2nd	Surface	10:53	1	1.0	279	0.24	4.8	5	4	3
					Surface		2				4.8	3		
					Middle		1	3.8	279	0.30	6.5	4	3	
					Middle		2				6.5	2		
					Bottom		1	7.6	234	0.38	6.2	3	3	
					Bottom		2				6.2	3		

Pilot Test - Impact Flood Tide

Inside Marine Works Area (Station A1 to A3)

Day	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
1 (2 June)	A1	Cloudy	Rough	1st	Surface	11:40	1	1.0	15	0.27	4.0	6	6	6
					Surface		2				4.0	6		
					Middle		1	3.9	5	0.13	4.0	6	8	
					Middle		2				4.0	10		
					Bottom		1	7.7	304	0.11	4.8	5	5	
					Bottom		2				4.8	5		
				2nd	Surface	12:40	1	1.0	42	0.29	4.1	5	5	5
					Surface		2				4.0	5		
					Middle		1	3.8	39	0.22	4.1	4	5	
					Middle		2				4.1	5		
					Bottom		1	7.6	35	0.13	4.8	6	6	
					Bottom		2				4.8	5		
	A2	Cloudy	Rough	1st	Surface	11:44	1	1.0	47	0.28	3.0	5	6	6
					Surface		2				2.9	7		
					Middle		1	3.9	60	0.15	3.6	5	6	
					Middle		2				3.6	6		
					Bottom		1	7.7	69	0.11	4.2	5	6	
					Bottom		2				4.1	7		
				2nd	Surface	12:44	1	1.0	35	0.27	3.8	6	6	5
					Surface		2				3.9	6		
					Middle		1	4.0	49	0.16	4.3	3	4	
					Middle		2				4.3	5		
					Bottom		1	8.0	47	0.13	4.3	5	6	
					Bottom		2				4.2	7		
	A3	Cloudy	Rough	1st	Surface	11:48	1	1.0	21	0.32	3.9	4	4	4
					Surface		2				3.9	4		
					Middle		1	4.1	8	0.16	4.7	4	5	
					Middle		2				4.7	6		
					Bottom		1	8.1	1	0.22	4.6	4	4	
					Bottom		2				4.6	4		
				2nd	Surface	12:48	1	1.0	25	0.39	3.3	4	5	6
					Surface		2				3.3	5		
					Middle		1	3.9	26	0.24	4.6	6	7	
					Middle		2				4.6	7		
					Bottom		1	7.8	35	0.11	4.3	5	6	
					Bottom		2				4.3	6		
2 (3 June)	A1	Cloudy	Moderate	1st	Surface	13:05	1	1.0	339	0.29	6.5	5	5	6
					Surface		2				6.5	4		
					Middle		1	3.8	326	0.21	7.4	5	5	
					Middle		2				7.4	4		
					Bottom		1	7.5	330	0.16	7.5	6	7	
					Bottom		2				7.7	7		
				2nd	Surface	14:05	1	1.0	349	0.32	6.1	7	5	5
					Surface		2				6.1	2		
					Middle		1	3.8	316	0.16	6.8	6	5	
					Middle		2				6.8	4		
					Bottom		1	7.5	310	0.11	9.0	5	6	
					Bottom		2				8.2	7		
	A2	Cloudy	Moderate	1st	Surface	13:09	1	1.0	344	0.31	6.5	4	4	5
					Surface		2				6.5	4		
					Middle		1	3.8	34	0.14	8.3	4	4	
					Middle		2				8.4	4		
					Bottom		1	7.6	318	0.12	10.2	5	6	
					Bottom		2				10.2	7		
				2nd	Surface	14:09	1	1.0	27	0.35	6.3	5	5	6
					Surface		2				6.3	4		
					Middle		1	3.9	18	0.11	10.7	6	6	
					Middle		2				10.8	6		
					Bottom		1	7.7	345	0.10	17.2	6	7	
					Bottom		2				17.2	7		
	A3	Cloudy	Moderate	1st	Surface	13:13	1	1.0	358	0.28	6.5	2	2	4
					Surface		2				6.5	2		
					Middle		1	3.8	13	0.13	7.4	4	4	
					Middle		2				7.5	3		
					Bottom		1	7.6	11	0.16	8.0	4	6	
					Bottom		2				7.9	8		
				2nd	Surface	14:13	1	1.0	333	0.27	6.1	6	6	6
					Surface		2				6.1	5		
					Middle		1	3.8	316	0.22	8.5	6	6	
					Middle		2				8.6	5		
					Bottom		1	7.5	18	0.16	19.4	5	6	
					Bottom		2				17.2	6		
3 (4 June)	A1	Cloudy	Moderate	1st	Surface	14:15	1	1.0	359	0.29	7.2	7	6	5
					Surface		2				7.2	5		
					Middle		1	3.9	47	0.18	8.3	5	5	
					Middle		2				8.3	4		
					Bottom		1	7.7	36	0.20	9.1	4	4	
					Bottom		2				9.1	3		
				2nd	Surface	15:15	1	1.0	16	0.28	7.5	12	9	8
					Surface		2				7.5	6		
					Middle		1	3.9	38	0.14	8.4	5	6	
					Middle		2				8.4	6		
					Bottom		1	7.8	37	0.13	11.6	7	8	
					Bottom		2				11.6	8		
	A2	Cloudy	Moderate	1st	Surface	14:19	1	1.0	343	0.28	7.1	5	5	5
					Surface		2				7.1	4		
					Middle		1	3.9	330	0.13	8.5	6	6	
					Middle		2				8.5	5		
					Bottom		1	7.8	1	0.10	8.5	5	4	
					Bottom		2				8.5	3		
				2nd	Surface	15:19	1	1.0	352	0.29	7.4	5	6	5
					Surface		2				7.4	7		
					Middle		1	4.0	306	0.24	8.5	5	5	
					Middle		2				8.5	5		
					Bottom		1	7.9	311	0.20	9.4	5	5	
					Bottom		2				9.4	4		
	A3	Cloudy	Moderate	1st	Surface	14:23	1	1.0	354	0.28	7.0	20	17	15
					Surface		2				7.1	13		
					Middle		1	3.9	298	0.24	7.9	10	10	
					Middle		2				7.9	9		
					Bottom		1	7.7	17	0.13	9.9	14	17	
					Bottom		2				9.9	20		
				2nd	Surface	15:23	1	1.0	2	0.27	7.0	4	4	4
					Surface		2				7.1	4		
					Middle		1	3.9	16	0.14	8.0	4	5	
					Middle		2				8.0	5		
					Bottom		1	7.8	330	0.13	11.0	3	3	
					Bottom		2				11.0	3		

Outside Marine Works Area (Station B1 to B3)

Day	Station	Weather Condition	Sea Condition	Event	Depth	Time	Sample	Depth	Current		Turbidity	SS	Average SS (mg/L)	
									Direction	Speed				
								(m)	(degree)	(m/s)	(NTU)	(mg/L)	Depth	DA
1 (2 June)	B1	Cloudy	Rough	1st	Surface	11:40	1	1.0	349	0.41	7.2	5	5	5
					Surface		2				7.3	5		
					Middle		1	3.9	347	0.33	7.2	4	5	
					Middle		2				7.2	5		
					Bottom		1	7.7	12	0.21	7.3	5	5	
					Bottom		2				7.3	5		
				2nd	Surface	12:40	1	1.0	351	0.45	8.7	6	7	7
					Surface		2				8.7	7		
					Middle		1	3.9	29	0.35	9.0	6	6	
					Middle		2				9.0	6		
					Bottom		1	7.8	334	0.22	9.6	8	8	
					Bottom		2				9.7	8		
	B2	Cloudy	Rough	1st	Surface	11:44	1	1.0	351	0.38	7.1	3	4	5
					Surface		2				7.1	4		
					Middle		1	4.1	310	0.22	8.4	5	5	
					Middle		2				8.3	4		
					Bottom		1	8.1	16	0.19	7.9	6	6	
					Bottom		2				7.9	6		
				2nd	Surface	12:44	1	1.0	342	0.38	6.5	5	5	6
					Surface		2				6.5	5		
					Middle		1	4.0	355	0.28	7.0	5	6	
					Middle		2				7.0	6		
					Bottom		1	8.0	349	0.24	7.3	6	6	
					Bottom		2				7.1	5		
	B3	Cloudy	Rough	1st	Surface	11:48	1	1.0	38	0.34	6.8	4	4	6
					Surface		2				6.7	4		
					Middle		1	4.0	352	0.33	7.9	4	5	
					Middle		2				7.9	5		
					Bottom		1	8.0	12	0.29	10.2	10	10	
					Bottom		2				10.2	9		
				2nd	Surface	12:48	1	1.0	44	0.21	5.3	3	4	5
					Surface		2				5.4	4		
					Middle		1	4.0	43	0.19	5.5	5	5	
					Middle		2				5.5	4		
					Bottom		1	8.0	301	0.41	5.7	5	5	
					Bottom		2				5.3	4		
2 (3 June)	B1	Cloudy	Moderate	1st	Surface	13:05	1	1.0	16	0.35	4.9	5	5	4
					Surface		2				4.9	4		
					Middle		1	4.0	42	0.33	6.5	2	3	
					Middle		2				6.5	4		
					Bottom		1	8.0	44	0.28	10.6	4	4	
					Bottom		2				9.9	4		
				2nd	Surface	14:05	1	1.0	46	0.37	5.9	6	5	5
					Surface		2				5.9	4		
					Middle		1	4.0	50	0.29	10.4	4	5	
					Middle		2				10.4	5		
					Bottom		1	7.9	90	0.25	12.3	7	6	
					Bottom		2				12.4	5		
	B2	Cloudy	Moderate	1st	Surface	13:09	1	1.0	91	0.31	5.1	3	3	4
					Surface		2				5.1	3		
					Middle		1	4.1	44	0.30	7.4	3	3	
					Middle		2				7.4	3		
					Bottom		1	8.1	18	0.29	9.2	4	5	
					Bottom		2				8.2	5		
				2nd	Surface	14:09	1	1.0	92	0.33	4.9	5	5	4
					Surface		2				4.9	4		
					Middle		1	3.9	48	0.41	5.9	4	4	
					Middle		2				5.9	4		
					Bottom		1	7.8	18	0.30	7.5	4	4	
					Bottom		2				7.5	4		
	B3	Cloudy	Moderate	1st	Surface	13:13	1	1.0	44	0.29	6.3	2	4	4
					Surface		2				6.3	5		
					Middle		1	4.0	49	0.36	7.9	6	5	
					Middle		2				7.9	3		
					Bottom		1	8.0	18	0.18	8.9	3	4	
					Bottom		2				8.9	4		
				2nd	Surface	14:13	1	1.0	100	0.22	6.2	5	5	5
					Surface		2				6.3	5		
					Middle		1	4.0	40	0.25	8.2	4	5	
					Middle		2				8.4	5		
					Bottom		1	7.9	16	0.21	8.1	5	6	
					Bottom		2				7.9	6		
3 (4 June)	B1	Cloudy	Moderate	1st	Surface	14:15	1	1.0	47	0.34	4.7	5	5	4
					Surface		2				4.7	4		
					Middle		1	4.0	61	0.19	5.5	3	4	
					Middle		2				5.5	5		
					Bottom		1	7.9	53	0.38	6.7	3	3	
					Bottom		2				6.7	3		
				2nd	Surface	15:15	1	1.0	49	0.28	5.3	<2	2	4
					Surface		2				5.3	2		
					Middle		1	4.1	44	0.30	7.9	4	5	
					Middle		2				7.9	6		
					Bottom		1	8.2	41	0.26	7.8	3	4	
					Bottom		2				7.8	5		
	B2	Cloudy	Moderate	1st	Surface	14:19	1	1.0	79	0.38	5.0	2	2	3
					Surface		2				5.0	2		
					Middle		1	4.1	62	0.33	5.6	4	4	
					Middle		2				5.7	3		
					Bottom		1	8.1	54	0.36	6.4	4	4	
					Bottom		2				6.4	3		
				2nd	Surface	15:19	1	1.0	67	0.32	4.8	3	3	4
					Surface		2				4.8	3		
					Middle		1	3.9	66	0.40	6.2	4	4	
					Middle		2				6.2	3		
					Bottom		1	7.8	10	0.18	7.6	5	5	
					Bottom		2				7.6	4		
	B3	Cloudy	Moderate	1st	Surface	14:23	1	1.0	85	0.27	5.1	4	4	4
					Surface		2				5.1	4		
					Middle		1	4.1	46	0.22	6.3	2	3	
					Middle		2				6.3	4		
					Bottom		1	8.1	44	0.19	6.1	3	4	
					Bottom		2				6.1	5		
				2nd	Surface	15:23	1	1.0	79	0.34	6.0	3	3	4
					Surface		2				6.0	3		
					Middle		1	4.1	68	0.24	7.1	4	4	
					Middle		2				7.1	4		
					Bottom		1	8.2	31	0.22	6.7	6	5	
					Bottom		2				6.7	3		