

Our Reference: PUB (CW) 90505/16

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Dear Sir

PREVENTING MUDDY WATERS FROM THE CONSTRUCTION SITES

Revised CCTV Requirements with Implementation of Silty Imagery Detection System (SIDS)

Since Sep 2013, contractors of construction sites of 0.5 ha area size and above, problematic sites and sites within sensitive areas are required to implement CCTV at the public drain to monitor the surface runoff discharges from the sites.

2 Currently, about 500 such CCTVs are installed by the contractors. These cameras enable the contractors, developers, consultants, construction industry professionals and PUB, to monitor the ECM performance at the construction sites via the web portal provided by the CCTV vendors.

3 Physical monitoring of these cameras however, is both laborious and time consuming. To overcome these challenges, PUB is working with A*Star to develop Silt Imagery Detection System (SIDS). SIDS uses image processing technology to detect silty discharge as well as CCTV downtime. PUB also worked with the various CCTV vendors to prepare a selection of CCTVs for the testing. Upon detection of silty discharge and high downtime, alerts would be sent to relevant stakeholders including the contractors and PUB. The system has been tested successfully and ready.

4 In view of the above, PUB has revised the CCTV requirements to factor in the necessary requirements in order to integrate the CCTVs with SIDS. The added requirements include painting a small sky blue background at the discharge outlet as well as setting the CCTV image link for SIDS to grab real-time images from the servers of the various CCTV vendors. The CCTV vendors have been prepared for the revision. The revised CCTV requirements is attached at Annex 1. Upon completion of the CCTV installation, the contractor, with the necessary assistance from his CCTV vendor, would also need to complete and submit a checklist (at Annex 2), comprising CCTV Installation and SIDS Interface details, to PUB.

5 Along with the increasing affordability of CCTV monitoring system and data transmission cost, PUB will also extend the CCTV requirements to construction sites between 0.2 ha and 0.5 ha.

6 The revised CCTV requirements would take effect from 1 Feb 2016, for all new construction sites with site area of 0.2 ha and above, sites with problematic ECM, and sites within sensitive areas.

7 With SIDS providing the auto-detection and alerts, we would like to urge the contractors to operate and maintain their CCTV in good working order and prevent causing silty water discharge at all time, so as to help keep our waterways and reservoirs free from muddy discharge.

8 For clarifications on the revised CCTV requirements and SIDS, please contact Ms Kadie Tan at DID: 67313953 or Mr Goh Hearn at DID: 67313419.

Thank you

Yours faithfully



RIDZUAN ISMAIL
DIRECTOR
CATCHMENT AND WATERWAYS DEPARTMENT

DISTRIBUTION (via e-mail):

President
Association of Consulting Engineers, Singapore (ACES)
18 Sin Ming Lane #06 - 01
Midview City
Singapore 573960
acesing@starhub.net.sg

President
Institution of Engineers, Singapore (IES)
70 Bukit Tinggi Road
Singapore 289758
ies@iesnet.org.sg

President
Real Estate Developers' Association of Singapore
(REDAS)
190 Clemenceau Avenue #07-01
Singapore Shopping Centre
Singapore 239924
enquiry@redas.com

President
Singapore Contractors Association Limited (SCAL)
Construction House
1 Bukit Merah Lane 2
Singapore 159760
enquiry@scal.com.sg

President
Singapore Institute of Architects (SIA)
79/79A/79B Neil Road
Singapore 088904
info@sia.org.sg

President
Singapore Institute of Building Limited (SIBL)
70 Palmer Road #03-09C
Palmer House
Singapore 079427
Josephine@sib.com.sg

President
Professional Engineers Board, Singapore (PEB)
52 Jurong Gateway Road #07-03
Singapore 608550
registrar@peb.gov.sg

President
Singapore Institute of Surveyors &Valuers
(SISV)
20 Maxwell Road #10-09B
Maxwell House
Singapore 069113
sisv.info@sisv.org.sg

President
Society of Project Managers (SPM)
1 Gateway Drive #21 - 12
Westgate Tower
SINGAPORE 608531
sproim@yahoo.com

Director of Infrastructure
School Campus Department
Ministry of Education (MOE)
1 North Buona Vista Drive
Office Tower Level 9
Singapore 138675
[Eng wee tong@moe.gov.sg](mailto:Eng_wee_tong@moe.gov.sg)

President
Board of Architects (BOA)
5 Maxwell Road 1st storey
Tower Block MND Complex
Singapore 069110
boarch@singnet.com.sg

Deputy Chief Executive Officer (Building)
Housing & Development Board (HDB)
480 Lorong 6 Toa Payoh
HDB Hub
Singapore 310480
SNG_Cheng_Keh@hdb.gov.sg

Deputy Chief Executive
Infrastructure & Development
Land Transport Authority (LTA)
1 Hampshire Road Block 8 Level
Singapore 219428
chong_kheng_chua@lta.gov.sg

Senior Director (Building & Estates
Management)
People's Association (PA)
9 King George's Avenue
Singapore 208581
Foo_soon_leng@pa.gov.sg

Group Director
Land Planning & Redevelopment
JTC Corporation (JTC)
8 Jurong Town Hall Road
The JTC Summit
Singapore 609434
josephine_loke@jtc.gov.sg

Chief (Sports Facilities)
Sports Facilities Group
Sport Singapore
3 Stadium Drive
Singapore 397630
kenneth_hui@sport.gov.sg

Chief Planner
Urban Redevelopment Authority (URA)
45 Maxwell Road
The URA Centre
Singapore 069118
lim_eng_hwee@ura.gov.sg

Cc:
Director
Engineering Development and Procurement
Department
PUB, The National Water Agency
40 Scotts Road #18-01
Environment Building
Singapore 228231
young_joo_chye@pub.gov.sg

Site Control at Construction Sites CCTV Requirements

The contractor shall provide and operate a CCTV system as follows:

(1) Provide a CCTV system at the public drain near the discharge outlet(s) of the site to monitor the discharge from the site.

The CCTV shall display the following clearly:

- (i) Site discharge outlet(s) at the public drain
- (ii) Upstream public drain cross-section
- (iii) Colour image that can distinct if the flow/discharge is clear or muddy.
- (iv) Blue-Marker (see item #2) with size of at least 100x100 pixels in the captured image when there is no water discharge.
- (v) Lighting shall be provided such that the Blue-Marker is clearly visible in the CCTV image and can distinct from the image if the flow/discharge is clear or muddy at all time.

(2) A water proof (plastic board or solvent-based matt Sky Blue paint) **Blue-Marker** with the painting colour code of RAL 5012 (CMYK 77% 41% 4% 0%, Sky Blue) shall be installed at discharge point in one of the two formats explained below:

- To be placed at a fixed location at the discharge outlet where the discharged water would always flow over the marker in the captured image as shown in Figure 1.

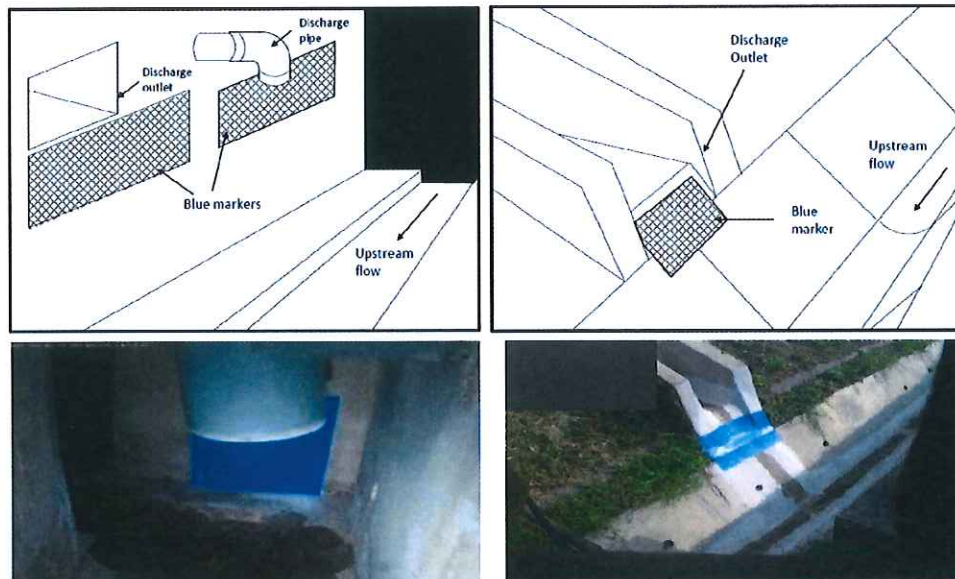


Figure 1. Examples of painted Blue-Marker at discharge points.

- Or, to be implemented on the end of the discharge pipe. The pipe shall have an elbow to direct the flow downwards and cut open to expose the inner side where a blue background can be implemented, as shown in Figure 2.



Figure 2. Example of Blue-Marker painted on cut-opened discharge pipe.

- (3) The CCTV system shall be connected to an all-day power supply and operated at all time. The CCTV shall not have more than 4% downtime per month. An auto-alert system via email shall be provided to the contractor if the system is not in operation.
- (4) Both CCTV and Blue-Marker shall be well maintained to be free of debris, stain or silt deposit. The marker should be replaced or repainted if the blue colour fades.
- (5) The position of ROI (Region of Interest) on the blue mark shall be checked and maintained at all time.
- (6) Provide at least the past 15-day, 5-min interval snapshots of the CCTV within 2 days upon request by PUB.
- (7) Provide web access to the CCTV system include the following:
- (i) A colour snapshot of the drain for that 5 min interval at 1280x720 resolution in JPEG image format.
 - (ii) The snapshot shall be imprinted with a short description of the project title and date/time stamp at the top right corner of the image.
 - (iii) Read access for the snapshot image of the CCTV via a URL link with no username/password required.
 - (iv) Example: http://www.CameraVendorCo.com/SiteName/current_image.jpg
 - "SiteName" is unique for each CCTV camera and must be in the following format:
[Catchment Code]-[Road]-[Company]-[Camera no.]
 - There should be no space in SiteName.
Examples: E4-Seletar_West_Link-KTC-02
E4-Seletar_West_Link-WohHup-01
 - (v) The web access shall be of open platform and easily accessible via smart phones and PCs without the need to install any extra/specific version of software.
 - (vi) Project profile including signboard information and key contact personnel and contact nos, shall be inserted in the vendor's and SIDS's web portals and updated when there is change of information.
- (8) Complete the attached CCTV installation checklist and submit to PUB before commencement of earthwork.

Note:

- The contractor should take note of the following when installing the CCTV:
 - (a) Type of weather proofing required for closed or open drain and other considerations.
 - (b) Adequate lighting
 - (c) Continuous power supply.

- Please contact Mr Lee Kim Liang at DID: 6731 3423 or Mr Mohd Noor at DID: 6731 3458 for clarifications.

Some CCTV vendors and contacts for easy reference

S/No	Name of Company	Person In-charge	Contact No	Email Address
1	Absolute Instrument Systems Pte Ltd	Ms Irene & / Yvonne	62968012	Sales@aisys.com.sg irene@aisys.com.sg
2	Shecey (Singapore) Pte Ltd	Mr Chester Suen	96448533	chestersuen@shecey.com.sg
		Mr Louis Lye	82880455	louislye@shecey.com.sg
3	YHH Trade & Technologies Pte Ltd	Mr Gwee Cheng Hong	96431893	chenghong@yhh.com.sg
4	Flexi Systems (Sg) Pte Ltd	Mr Yang Yi	81891788	sales@flexisystems.com.sg
5	EnvProTech Pte Ltd	Mr Ng Swee Chow	96272500	sweechow_ng@singnet.com.sg
		Mr Daryl Lee	90020146	daryl@ept-envprotech.com
6	Hi Con (S) Pte Ltd	Mr James Chen	96888218	james.chen@hicon.com.sg

CCTV Installation Checklist

BCA Ref No:			
Project Title:			
Contractor:			
Company Address:			
Contact Person:		Designation:	
Contact Person Hp:			
Contact email:			
Developer:			
CCTV Vendor:			
Number of CCTVs:	_____ of _____	(separate checklist to be provided for each CCTV)	
Image URL:			
Site Latitude:		Site Longitude:	

S/No:	Items	Yes	No
1	The installed CCTV shows the discharge outlet and upstream public drain cross-section (as shown in Photo-1)	<input type="checkbox"/>	<input type="checkbox"/>
2	The discharge outlet is painted water-proof sky blue (as shown in Photo-2)	<input type="checkbox"/>	<input type="checkbox"/>
3	Adequate lighting is provided (as shown in Photo-3)	<input type="checkbox"/>	<input type="checkbox"/>
4	The blue marker and cross-section of public drain are clearly captured in the CCTV image during day and night time (as shown in Photo-4 and Photo-5)	<input type="checkbox"/>	<input type="checkbox"/>
5	The CCTV system is connected to an all-day power supply (as shown in Photo-6)	<input type="checkbox"/>	<input type="checkbox"/>
6	The web-link and its contents including project profile, prepared in according to the CCTV requirements and ready to be accessed by the users (attached Photo-7)	<input type="checkbox"/>	<input type="checkbox"/>
7	The CCTV vendor has access to SIDS portal	<input type="checkbox"/>	<input type="checkbox"/>
8	The CCTV vendor has configured/entered the CCTVs in the SIDS portal (as shown in Photo-8)	<input type="checkbox"/>	<input type="checkbox"/>

I confirm that the above information and the CCTV installation are in order.

Name of Contractor/ Signature/Date

Company stamp

Photos of CCTV Installations

Photo-1	Photo-2
Photo-3	Photo-4
Photo-5	Photo-6
Photo-7	Photo-8 [Region of Interest (ROI) on the blue marker]