

Our Ref: PUB/CWD/SIDS/2024/01

Date: 28 Mar 2024

Attn: Developers/Contractors/CCTV Vendors

Dear Sir

REVISED CCTV REQUIREMENTS FOR SILT IMAGERY DETECTION SYSTEM (SIDS) IMPLEMENTATION

This letter is to inform the industry on the issuance of revised CCTV requirements taking effect from 1 Apr 2024 for all new construction sites required to install the Silt Imagery Detection System (SIDS) for monitoring of their treated water discharge (with site area of 0.2ha and above).

2 Currently, there are over 900 CCTVs installed by the contractors actively being monitored by the SIDS. These CCTVs have enabled built industry, including contractors, developers, construction industry professionals and PUB, to monitor the performance of the Earth Control Measures (ECM) for the construction sites and take prompt action should silty discharge be generated.

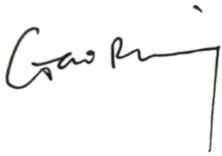
3 In the current CCTV requirements, contractors are required to paint specified background colour on the discharge pipe and set the CCTV image link for SIDS to receive real time images from the CCTV vendors for the monitoring of water discharge from the sites. It has however been observed that there are recurring alerts received due to improper setup of CCTV system including the discharge pipes and lightings as well as poor maintenance of the system.

4 PUB has since updated the CCTV requirements to provide clearer guidance to contractors and CCTV vendors on the system setup and maintenance as well as connection to SIDS, including the latest cyber security requirements. The revised CCTV requirement would be reflected in the Annex A of the ECM approval letter issued by PUB for new construction sites that are required to implement SIDS. You may also refer to Annex of this letter for the revised CCTV requirements.

5 PUB would like to remind all contractors with SIDS implemented for their existing sites to operate and maintain their CCTV system in good working condition at all times. For sites that fail to meet the operational uptime and maintenance requirement, PUB would not hesitate to take necessary enforcement action under the Sewerage and Drainage Act.

6 We look forward to your continued cooperation in keeping our waterways and reservoirs clean and free of silty water discharge. For any clarifications on the revised CCTV requirements and SIDS, kindly email pub_cwenf@pub.gov.sg.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Gao Ruoming', with a vertical line extending downwards from the end of the signature.

Gao Ruoming

Deputy Director (Drainage Operations)

Catchment & Waterways Department

PUB, Singapore's National Water Agency

Annex – Revised CCTV Requirements for ECM

CCTV Requirements for ECM

Installation of CCTV System

- (1) Contractor shall 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 and the condition of public drain
 - (ii) Distinct colour image indicating whether the discharged water is clear or muddy
 - (iii) Discharge pipe with blue-marker to be shown about half height of the image and placed towards the centre of image
- (2) Discharge pipe shall be painted with a waterproof blue-marker with the painting colour code of RAL 5012 (CMYK 77% 41% 4% 0%, Sky Blue) and installed at a fixed location (i.e. discharge point) where the discharged water would always flow downwards. The pipe shall be cut open to expose the inner side where a blue background can be implemented. Please refer to Figure 1.

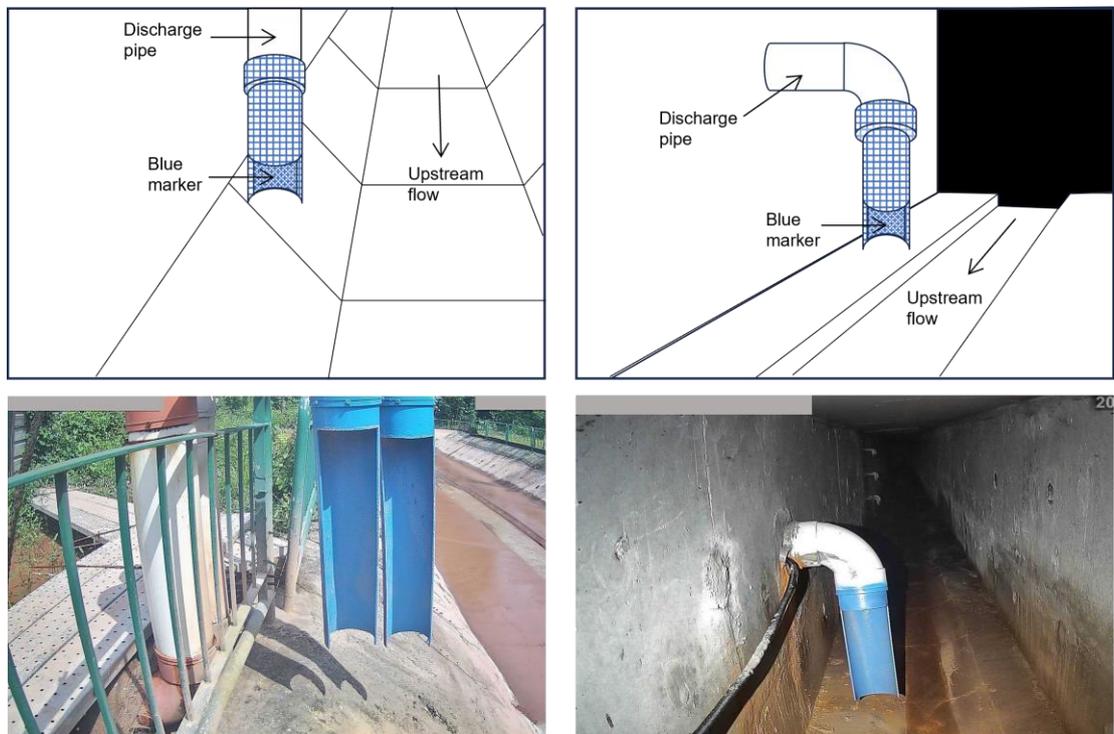


Figure 1. Examples of painted Blue-Marker at discharge points.

- (3) Adequate white LED lighting shall be provided during night time and kept on at all time, with colour temperature within 5,000K to 10,000K to ensure that the Blue-Marker is clearly visible in the CCTV image for detection of silty discharge.
- (4) Contractor can refer to Appendix 1 for common issues observed from installation of CCTV system and suggested workarounds.

Connection of CCTV to Silt Imagery Detection System (SIDS)

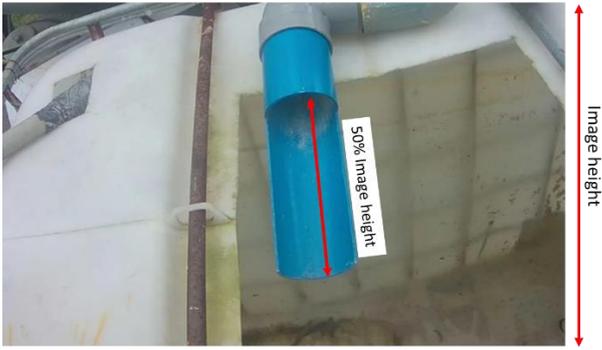
- (5) Upon commencement of the site work, contractor shall, with the assistance of the CCTV vendor (refer to Appendix 2), complete the CCTV installation checklist (refer to Appendix 3) and submit the completed copy to PUB via pub_cwenf@pub.gov.sg to apply for connection to SIDS and creation of account to access SIDS.
- (6) Contractor shall arrange with CCTV vendor to provide web access to the CCTV system include the following:
- (i) A colour snapshot of the drain at 5 min interval at 1280x720 resolution in JPEG image format shall be displayed
 - (ii) The snapshot shall only be imprinted with date/time stamp and CCTV number but without other information
 - (iii) Read access for the snapshot image of the CCTV shall be provided via a URL link in the following format: http://www.CameraVendorCo.com/SiteName/current_image.jpg
 - (iv) CCTV system shall whitelist SIDS IP for access and deny unauthorised web traffic
 - (v) Archived images of snapshots must be kept in separate folders for each year, month, and day in format of YYYY/MM/DD
 - (vi) The image name in these archived folder must be in the format of hhmmss.jpg (hh = hours in 24 hours format, mm = minutes, ss = seconds) in the respective DD subfolder and shall be accessed via the URL link in the following format: <http://www.CameraVendorCo.com/SiteName/yyyy/mm/dd/hhmmss.jpg>
 - (vii) The web access shall be of open platform and easily accessible via mobile or desktop browser without the need to install any extra/specific version of software or plug-in. Web protocol shall be minimally secured using HTTPS to ensure strong security, where unauthorised users would be unable to view the image without authentication

Operation and Maintenance of CCTV System

- (7) Upon request by PUB, Contractor/CCTV vendor shall provide at least the past 14-day, 5-min interval snapshots of the CCTV within 3 working days to facilitate PUB's investigation.
- (8) CCTV system including the camera lens, lighting and blue-marker discharge pipe shall be well maintained to be free of stain/silt deposit, debris and other objects at all times (refer to Appendix 1 for illustration of common maintenance issues). The marker should be replaced or repainted once the blue colour fades.
- (9) SIDS would send alerts via mobile messages and email for contractor to when the following scenarios occur, which would be considered as operational downtime as this impacts SIDS's ability to detect any silty discharge:
- (i) Installation of CCTV system does not meet with the requirements as specified above;
or
 - (ii) CCTV system is found to be offline; or
 - (iii) There is no further update of CCTV image in SIDS; or
 - (iv) Blue-marker discharge pipe is found to be faded or obstructed by stain/silt deposit, debris or other objects.
- (10) For sites that consistently fail to meet the operational uptime and maintenance requirement, PUB would not hesitate to take enforcement action under the Sewerage and Drainage Act.

Appendix 1 - Common Issues Observed for CCTV System and Suggested Workarounds

Installation issues

S/ N	Common issues and suggested workarounds	Illustrated photos
1	<p>Zoom settings too close to the blue pipe (i.e. full extent of blue pipe cannot be seen from CCTV) → Contractors are advised to zoom out, where the size of the blue pipe shall be about half height of the image and placed towards the centre (see example below).</p> 	
2	<p>Greyscale images → Contractors shall ensure that the lighting be turned on and image is not in greyscale so that the blue marker can be clearly seen.</p>	
3	<p>Discharge pipe does not face downwards → Contractors shall either physically rotate the camera or digitally rotate via camera settings, to ensure that the blue pipe is shown to be facing downwards.</p>	
4	<p>Discharge pipe overexposed by white light → Contractors shall ensure that the lighting be adjusted to a colour temperature within 5000K to 10000K so that blue marker can be clearly seen.</p>	

5	Background of discharge pipe is also in blue → Contractors shall ensure that the blue-marker of the discharge pipe is distinct.	
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Maintenance issues

1	Obstructions to viewing of the full blue pipe discharge → Contractor shall ensure that any obstructions be removed during the installation and routine inspections.	
2	Stain/silt deposit on blue-marker discharge pipe → Contractor shall ensure blue pipe has been cleaned on a regular basis and upon receiving alerts from SIDS	
3	Blurry image due to rain or discharge splatter → Contractor shall ensure that the camera lens is well maintained and free of wet mark/stain.	

Appendix 2 - List of CCTV Vendors

Company Name	Company Contact	Name	Email Address	Contact
Absolute Instrument Systems (Pte.) Ltd.	6296 8012	Sankar Selvarasu	tech@aisys.com.sg	86836200
		Yvonne Tang	sales@aisys.com.sg	98263186
		Eric Ng	eric@aisys.com.sg	96328256
BIOFUEL INDUSTRIES PTE LTD	9818 9200	Eugene Lee	eugene@biofuelindustries.sg	9818 9200
EnvPro Tech Pte Ltd	9627 2500	Ng Swee Chow	sweechow_ng@singnet.com.sg	9627 2503
		Eugene Chong	eugene921020@gmail.com	8299 9382
Flexi Systems (Singapore) Pte. Ltd.	6368 5177	Yang Yi	sales@flexisystems.com.sg	8189 1788
		Henry Tan	sales@flexisystems.com.sg	9451 4878
HI CON (S) Pte Ltd	6862 3126	James Chen	james.chen@hicon.com.sg	9688 8218
		Louis Tan	louis@hicon.com.sg	8308 9692
iSJC ScienTech Pte Ltd	8766 5923	Joseph Cruz	Joseph.cruz@isjscientech.com	8766 5923
		Chai Chong Hin	chai@scottvickers.com.sg	6552 2933
		Koh Hao Ming	haoming.koh@isjscientech.com	8800 1975
OXEN SYSTEM & TRADING	9617 1383	Ang Huai Kee	ang@oxen.com.sg	9617 1383
		Chai Hoon Teng	c_hoonteng@oxen.com.sg	9159 0242
		Dean Lee	dean@oxen.com.sg	8822 0029
SHECEY (SINGAPORE) PTE LTD	6276 3383	Nandini	nandini@shecey.com.sg	6276 3383
		Ken Tay	kentay@shecey.com.sg	8686 1384
		Shamirul	shamirul@shecey.com.sg	8748 8901
Triaxial Solutions Pte Ltd	6291 5516	Shawn	shawn@triaxial.com.sg	9072 4072
TRITECH SYSENG (S) PTE LTD	6287 5710	Tan Chuan Chiat	tan_chuan_chiat@syseng.com.sg	8112 2114
		Kai Hua	kaihua@syseng.com.sg	-

Note:

- (i) Listing of selected vendors is updated as at 28 Mar 2024 and will be refreshed as and when necessary
- (ii) Listing is by no mean an endorsement of the service quality by any individual CCTV vendor
- (iii) For the latest listing of top 5 CCTV vendors in terms of CCTV uptime, please refer to SIDS website at <https://siltycctv.pub.gov.sg>

Appendix 3 - CCTV Installation Checklist

BCA Ref No:			
ECM Clearance Cert No:			
Number of CCTVs:	_____ of _____	(separate checklist to be provided for each CCTV)	
Image URL:			
Site Latitude:		Site Longitude:	

S/No:	Items	Yes	No	Attach Photos
1	The installed CCTV shows the discharge outlet to public drain and pipe discharge is facing downwards	<input type="checkbox"/>	<input type="checkbox"/>	Photo 1
2	Discharge pipe with blue marker is shown about half height of the image and placed towards the centre of the image	<input type="checkbox"/>	<input type="checkbox"/>	
3	The blue marker is clearly captured in the CCTV image during day time	<input type="checkbox"/>	<input type="checkbox"/>	
4	White LED lighting with colour temperature within 5000K to 10000K	<input type="checkbox"/>	<input type="checkbox"/>	Photo 2
5	The blue marker is clearly captured in the CCTV image during night time	<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