

Identification				Evaluation			Mitigation			
Subject	Work Process / Item	Integrity Risk	Inherent Risk Level (A)	Existing Practices	Mitigating Factor (B) (if the practice meets the criteria of mitigating factor)	Residual Risk Level (C = A - B)	Proposed Control Measure(s)	Action By	Mitigating Factor (D)	Revised Risk Level (E = C - D)
Works Supervision Process	Setting inspection requirements	Intentionally (e.g. due to excessive discretion in determining what to inspect) or inadvertently (e.g. due to disparate documentations ¹) omit or relax the supervision requirements of critical site activities in the absence of clear guidelines	2							
	Notification of works inspections	Skipping inspections of critical activities intentionally (e.g. not notifying inspecting officers for inspections, falsifying the notification date/time to cover up retrospective notification) by contractors	2							
	Inspection of works	Manipulating inspection results by using tampered equipment/measuring devices	2							
		Extorting advantages from the contractor by an inspecting officer who will otherwise delay the conduct of inspections/reply of inspection forms	2							
		Conniving at substandard works by blurring inspection accountability (e.g. omitting the details of inspection findings and/or particulars of the inspecting officers, paying lip service to the acceptance of works)	2							

¹ E.g. specification, contract drawings, Supervision Plan required under the Buildings Ordinance, Quality Site Supervision Plan, inspection and test plans of individual contractors

The worked examples (including the integrity risks, work processes/items, their corresponding inherent risk levels, and the recommended control measures) are compiled based on the analysis of previous ICAC cases and are by no means exhaustive and not intended to substitute any legal, regulatory or contractual requirements

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		Extorting advantages by inspecting officers from contractors through repeated rejections of works without proper and sound justifications	2							
		Unauthorised alteration of inspection records with a view to covering up substandard works/materials	2							
		Deliberately destroying inspection forms/records to cover up substandard works/materials	3							
		Falsifying inspection records (e.g. submitting duplicated photos)	3							
	Handling of non-conformance	Conniving at failed inspection results without taking remedial works	2							
	Monitoring of overall supervision	Harbouring or failing to detect promptly irregularities of inspecting officers/contractors due to a lack of supervisory accountability	2							

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Summary of Integrity Risks and Control Measures on General Works Supervision

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Works Supervision Process	Setting inspection requirements	Intentionally (e.g. due to excessive discretion in determining what to inspect) or inadvertently (e.g. due to disparate documentations ¹) omit or relax the supervision requirements of critical site activities in the absence of clear guidelines	2	<ul style="list-style-type: none"> • Draw up an Inspection and Test Plan (ITP), in particular for those critical construction activities and elements and their inspection and testing requirements, covering the following 5W2H – <ol style="list-style-type: none"> i. What to inspect – listing site activities requiring inspection; ii. When to inspect – setting out the frequency of inspection or at which stage; iii. Who to inspect – specifying the post/rank of officers responsible for carrying out inspections, having regard to the technical competency and professional qualifications required, etc; iv. What the acceptance criteria are – specifying the standard and tolerance, where applicable, of each works activity and keeping the cross reference to other documents to the minimum; 	Preventive

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				<ul style="list-style-type: none"> v. What to record – specifying the inspection findings/details to be recorded and the inspection forms to be used; vi. How to inspect – spelling out the method of inspection, or specifying the inspection items in a checklist; and vii. How to rectify substandard works – stipulating the rectification method of substandard works so identified. • Regularly review and update the ITP during construction to cater for changes in the supervision requirements (e.g. change in inspection items due to change of construction methods) 	
				<ul style="list-style-type: none"> • Conduct audits on the implementation of ITP to detect anomalies (e.g. omit the inspection of critical activities) 	Detective
				<ul style="list-style-type: none"> • Ensure both contractors and inspecting officers have access to the ITP to enhance their 	Educational

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				awareness of the supervision requirements (e.g. the use of a common data platform to share information about supervision requirements) <ul style="list-style-type: none"> • Conduct briefing on the ITP to inspecting officers 	
	Notification of works inspections	Skipping inspections of critical activities intentionally (e.g. not notifying inspecting officers for inspections, falsifying the notification date/time to cover up retrospective notification) by contractors	2	<ul style="list-style-type: none"> • Adopt a digital tool (e.g. Digital Works Supervision System (DWSS)²) which is equipped with the following functionalities – <ol style="list-style-type: none"> i. link up with the ITP for handling of inspection forms such that request of works inspection is only allowed when there are valid inspection records of preceding activities; and ii. log the date and time of submission of inspection forms automatically. • Require contractors to submit an inspection form requesting inspection of works for critical activities in advance and within a specified time frame 	Preventive

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				<ul style="list-style-type: none"> • Only allow retrospective submission of inspection forms under exceptional circumstances, and require contractors to obtain approval from appropriate authority • Conduct audits on completed forms to detect anomalies (e.g. missing inspection points, frequent retrospective submissions) • Adopt a digital tool (e.g. DWSS)² which could link up with the ITP and integrate with visual aid (e.g. Building Information Model (BIM)) and programme information to detect missing inspection points in various locations and timing 	Detective

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	Inspection of works	Manipulating inspection results by using tampered equipment/measuring devices	2	<ul style="list-style-type: none"> • Require contractors to use equipment/measuring devices with valid calibration certificate(s) and submit the calibration certificate(s) to inspecting officers • Require inspecting officers to – <ul style="list-style-type: none"> i. verify the equipment/measuring devices against the calibration certificates provided; and ii. document the serial number(s) of equipment/measuring devices in the inspection forms. • Adopt measuring devices that can record the results automatically 	Preventive
				<ul style="list-style-type: none"> • Conduct audits on completed inspection forms to detect anomalies (e.g. missing information on calibration of equipment/measuring devices) • Maintain a database of calibrated equipment/measuring devices that could alert inspecting 	Detective

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				officers the need for calibration of equipment/measuring devices with expiry dates approaching	
		Extorting advantages from the contractor by an inspecting officer who will otherwise delay the conduct of inspections/reply of inspection forms	2	<ul style="list-style-type: none"> Request inspecting officers to provide justifications for failing to carry out inspections on schedule Adopt a digital tool (e.g. DWSS)² for handling of inspection forms which could prompt supervisors on late conduct of inspections/reply of inspection forms by inspecting officers 	Preventive
		Conniving at substandard works by blurring inspection accountability (e.g. omitting the details of inspection findings and/or particulars of the inspecting officers,	2	<ul style="list-style-type: none"> Standardise the inspection forms and require contractors and inspecting officers to include essential information in the forms, e.g. – <ol style="list-style-type: none"> details of the works to be inspected such as descriptions and locations of works, the proposed inspection date/time; identity of inspecting officers/counter-signing officers; and 	Preventive

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		paying lip service to the acceptance of works)		<ul style="list-style-type: none"> iii. inspection results, and reasons for rejection of inspections (if applicable) • Adopt a digital tool (e.g. DWSS)² with the following functionalities for handling of inspection forms – <ul style="list-style-type: none"> i. provide unique accounts and passwords to users (e.g. use of biometric authentication); ii. assign access rights which are commensurate with the roles and ranks of various users; iii. capture identities of users and log users’ activities (e.g. approving inspection results); iv. guard against tampering/external attack with security control (e.g. the use of blockchain); v. possess audit trails; and vi. preset inspection items (e.g. works to be inspected, locations of works) 	

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				<ul style="list-style-type: none"> Conduct audits and supervisory checks on completed inspection forms to ensure that inspections are conducted properly and information of works subject to inspection are recorded accurately Adopt a digital tool (e.g. DWSS)² to detect missing inspection details in inspection forms 	Detective
		Extorting advantages by inspecting officers from contractors through repeated rejections of works without proper and sound justifications	2	<ul style="list-style-type: none"> Require inspecting officers to provide reasons for rejection of inspections in inspection forms 	Preventive
		Unauthorised alteration of inspection records with a view to covering up substandard works/materials	2	<ul style="list-style-type: none"> Conduct audits and supervisory checks on rejected inspection forms to detect anomalies (e.g. undue discretion in rejecting inspections) Require inspecting officers to provide justifications when revising content of inspection forms/records Adopt a digital tool (e.g. DWSS)² with the following functionalities for handling of inspection forms – 	Detective
				<ul style="list-style-type: none"> Require inspecting officers to provide justifications when revising content of inspection forms/records Adopt a digital tool (e.g. DWSS)² with the following functionalities for handling of inspection forms – 	Preventive

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				<ul style="list-style-type: none"> i. disallow changes to submitted, reviewed or approved inspection forms by unauthorised users; ii. transfer the information of the original inspection form to the subsequent inspection form(s) automatically if re-inspection is required and disallowing users from changing the information copied from the original inspection forms when they submit revised inspection forms by the digital tool unless with proper justifications; and iii. utilise block chain to log all amendments (if applicable) made to inspection forms. 	
				<ul style="list-style-type: none"> • Adopt a digital tool (e.g. DWSS)² to prompt supervisors of altered inspection forms 	Detective
		Deliberately destroying inspection forms/records	3	<ul style="list-style-type: none"> • Scan completed inspection forms as early as possible and safekeep completed forms (in hard and soft copy) for a period sufficient to ensure 	Preventive

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		to cover up substandard works/materials	3	traceability and quality of works/materials <ul style="list-style-type: none"> Adopt a digital tool (e.g. DWSS)² with the following functionalities for handling of inspection forms – <ol style="list-style-type: none"> disallow unauthorised tampering/deletion of inspection forms; and log activities of users (e.g. alterations to inspection details) 	
		Falsifying inspection records (e.g. submitting duplicated photos)			<ul style="list-style-type: none"> Conduct audits on completed inspection forms to detect anomalies (e.g. loss of inspection forms)
				<ul style="list-style-type: none"> Adopt a digital tool (e.g. DWSS)² for handling of inspection forms which requires inspecting officers to take contemporaneous records (e.g. photos) capturing inspection dates, times, and locations (e.g. using global positioning system) automatically with the use of mobile devices Disallow inspecting officers from uploading inspection photos from sources other than the 	Preventive

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				digital tool	
				<ul style="list-style-type: none"> • Conduct audits on completed inspection forms to detect anomalies (e.g. repeated submission of identical photos) • Adopt technology that could compare photos submitted and prompt supervisors of red flags (e.g. identical photos) • Establish a list of risk indicators, and adopt a digital tool with data analytics to facilitate systematic/automatic detection of red flags which could be indicators of potential falsified inspection records (e.g. short time gaps between the inspection time recorded on inspection forms by the same inspecting officer, re-inspections to be arranged outside office hours by the same inspecting officer, frequent submission of "covering" inspection forms) 	Detective
			2	<ul style="list-style-type: none"> • Require contractors to request re-inspection for 	Preventive

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	Handling of non-conformance (NC)	Conniving at failed inspection results without taking remedial works	High	<p>failed inspection results</p> <ul style="list-style-type: none"> • Require inspecting officers to – <ul style="list-style-type: none"> i. issue non-conformance reports (NCRs) for major NC as appropriate with proper cross-reference to inspection forms; and ii. document minor NC that could be lessons learnt to prevent major NC • Adopt a digital tool (e.g. DWSS)² to computerise the process for handling NC (e.g. issuing and keeping NCRs, monitoring the completion of rectification works) • Require reporting of NC (whether major or minor) in regular meeting(s) between inspecting officers and contractors <p>• Adopt a digital tool with visual aid (e.g. BIM) to facilitate monitoring of the close-out status of NC and prompt inspecting officers of NCs that are not closed out yet</p>	Detective

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	Monitoring of overall supervision	Harbouring or failing to detect promptly irregularities of inspecting officers/contractors due to a lack of supervisory accountability	2	<ul style="list-style-type: none"> • Adopt a digital tool which is equipped with the following functionalities to facilitate management oversight and taking of necessary follow-up actions – <ul style="list-style-type: none"> i. analyse the data/information with artificial intelligence; ii. generate management reports and statistics with dashboard; and iii. generate automatic alerts to officers responsible for irregularities detected and escalate such alerts to supervisors/management automatically considering the types and severity of these irregularities. 	Detective

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