

## Inspection Skills 101

“If it cannot be measured, it cannot be managed”

Inspecting a simple structure or a more detailed asset, requires some core skills to ensure accurate outcomes. These core skills include:

1. Understanding of the item being inspected – its materials, its operational aspects and its maintenance requirements
2. Good photography to capture the inspection progress
3. Recognising ‘the evidence’ present, that is relevant to the inspection scope
4. Consistency in outcomes, when inspecting multiple assets
5. Having the writing skills to present clear, concise and technical level documentation of the outcomes

**Understanding:** While it is imperative to have a thorough understanding of the item being inspected, it is also important to have ‘upstream and downstream’ knowledge of its operational aspects, as these can also impact on the asset and affect its performance. Protective coatings, concrete and steel structural limitations and construction techniques all play an important part in most water related infrastructure assets. These skills are acquired through technical training, ‘on the job’ experiences and sharing knowledge with others.

**Good photography:** Everyone with a smart phone considers themselves to be ‘good at photography’ (selfies being the evidence), however photography has to be learned and practised to be effective.

1. Camera settings are the first step. Set resolutions lower for most images – 500kb is effective for images being uploaded or inserted into documents. Use higher settings sparingly if technical detail is required for specialised defects, such as welds, cracks or things that need to be expanded for clarity.
2. Plan the shot to take in other aspects related to the individual image. When doing multiple asset inspections, take images from the same angle and perspective, so that comparisons can be made accurately. With renovations, take a ‘pre’ and ‘after’ shot from the same position to enable exact comparisons to be made.
3. Consider the background, shadows and other ‘photo bombing’ scenarios.
4. Frame the image so that it ‘tells a story’ to others, as that is the reason for conducting the inspection.
5. Take one, considered image of each item. If more detail is required, take a wider perspective shot, followed by a close up. This will establish where the defect is positioned in relation to other objects, and then follow with a close up image for better detail.

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**Recognising the evidence:** Take a broadly focused view when inspecting an asset, as small pieces of seemingly unrelated evidence, can often build a larger picture of the important issues being inspected. A patch of greener grass some distance away may indicate leakage from the primary asset. A screw or nut laying on the ground or floor may have come from a structural fixing or mechanical object that has the potential to fail. Bird faeces or staining on an upper wall area will indicate localised activity and possible contamination issues.

**Consistency:** For outcomes to be relevant, the inspector must maintain consistency in interpreting the evidence. Ratings must be established and maintained. Items which can be assessed as 'either way', should be rounded up or rounded down, but in a consistent manner. Images must match what is recorded in the written report, as it is not uncommon for two 'stories' being told within the inspection process. The person with the most skills, both technical and interpretive should be the one who creates the reports and finalises the inspection process. If more than one inspector is used, then constant de-briefs should be carried out to ensure that everyone is working to the same ratings and interpretations of findings. Confidence comes from consistency – if multiple reports of similar assets are varied, then the results may not be completely accurate and cannot be trusted by the end users to further their objectives.

**Writing skills:** The main object of an inspection process is to impart knowledge to others who were not present at the time, but who require the information to carry out asset management and maintenance processes. Inspection findings need to be analysed for consistency, accuracy and technical detail. The results of the analysis then need to be drafted into a document that is easy to understand, is not contradictory and can be understood by a variety of personnel, who may only have a limited knowledge of some aspects of the report. Good grammar, structured sentences and concise use of technical terminology is important. Proof reading by a second party, who may only have a limited understanding of the subject is another good test of conciseness and technical structure – if they can understand the 'import' of the document, then it has passed the test for 'knowledge transfer' to multiple levels of end user.

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