

Structural Integrity Surveys



Can your facility carry the load?

A structural integrity survey is an assessment that determines whether the structure in question is fit for purpose and able to support the loads for which it is anticipated to encounter during its service life.



The structure's life cycle may be broken up into four main phases: Inception, Construction, Operation and Demolition or Renewal. At inception, the designer makes some assumptions in developing the structural model.

However, in each phase of the structure's life, failings from unforeseen variables and inadvertent deviations may accumulate, jeopardizing the structure's intended service life. Thus, the structure's integrity is not just dependent on good design, but also good execution and continued maintenance.

Fortunately, where there is a deviation between the intended design and the actual service conditions, remedy is possible.

To conduct a structural integrity survey, it is important that the appointed structural engineer has a good understanding of the structure's behaviour and design. This is so that appropriate measures may be implemented to meet the structure's design objectives.

This is a serious undertaking in which the structural engineer has an obligation to the users, owners, and the broad public.

Depending on the complexity and nature of the problem, structural integrity surveys may be conducted by architects who are also well-versed in the design of structural systems and the requirements of the National Building Regulations. For concerns around building settlement, a geotechnical engineer may also be contacted to conduct inspections.

A structure must be assessed prior to the introduction of major alterations or before the purchase of a new facility. Also, where concerning damage is noticed, the structural engineer or duly qualified individual may be asked to inspect the facility. Overall, attention should be paid to worrisome cracks, spalling, impact damage, unusual sagging and general “out of plumbness” of structural members. Excessive vibration and material deterioration may also be cause for alarm.

As a “rule of thumb” one may require that weekly maintenance is performed by operations staff, whilst a more formal inspection of the facility is completed annually. Thereafter, a detailed inspection may be completed every 5 years. In each instance, record must be made of the completed inspection and of any remedial works carried out. In essence, structural integrity surveys are an ongoing legal and insurance requirement. The structural integrity survey provides litigation support and assists in establishing liability for damages.

The structural integrity survey is important because it allows for early detection of any defects and subsequent mitigation of risk. In so doing, the structure can meet its intended service life in good condition, and where required, adjusted to changed demands placed on it in the duration of its service life.



Prior to conducting a structural integrity survey, an objective is required. Objectives range from implementing an inspection as a proactive measure of a maintenance program or reactive measure following an incident effecting the end users’ comfort or worse yet, their safety.

Or otherwise, it may be that an extension or modification in the structure’s function is anticipated, in which case it is vital to understand whether the existing structure is able to accommodate these changes. The objective provides a focus for the investigation.

The engineer, equipped with relevant prior research, a notebook, marker, binoculars, flashlight, measuring tape, crack comparator and chipping hammer may then proceed with the survey. Depending on the agreed approach, the initial inspection most often involves a visual assessment, along with non-destructive tests conducted on the structure. Destructive tests may be required if information obtained during the visual inspection require further verification or are found to be inconclusive. Items considered in the survey depends on the material of the components being surveyed. The observations made are measured against the criteria set forth by relevant design standards and accepted practice.

During the survey, cognizance is given to the structure's age, with a reasonable expectation on what the structures condition should be. After the survey the findings observed on site are logged and recommendations made. Ultimately, the engineer's report will indicate whether there's a need for immediate remedy, less urgent remedial works or further testing.

Typical causes of failure are incorrect information on the requirements given in the design phase or erroneous design, poor execution during construction, the use of substandard materials or the inappropriate use of the structure during operations along with poor maintenance.

A structure unable to sustain the loads for which it was designed may result in either monetary loss, severe injury or loss of life of occupants. Thus, periodic structural integrity surveys will assist in preventing such loses. More than that, the structural integrity report also ensures that the structure can sustain any future alterations or rule out any inherit failings prior to acquisition. An organization's infrastructure is an asset, playing an integral role in the organization's ability to meet its strategic objectives.

Therefore, it is essential that its structural integrity is maintained so that its full potential may be realized.

To contact Astratek Manufacturing Engineers for assistance and advice on Structural Integrity Surveys or Inspections for your FMCG facility you can scan the QR code and complete the online form or e-mail us at info@astratek.co



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