

Structural Integrity Inspections



What is Structural Integrity and Why it is Important?

Structural integrity inspections evaluate all structures within an operation, identifying potential risk areas that may prevent these structures from performing their intended design functions.

Australia's mining industry is a cornerstone of the region's economy, playing a critical role in energy production, mineral production, and export revenues. However, the inherent risks associated with mining operations highlight the necessity of maintaining high safety and structural standards. This is where structural integrity inspections become crucial. Regular inspections are vital to ensure the longevity and safety of these structures.



Why Conduct Structural Integrity Inspections?

To Provide a Safe Work Environment

The primary reason for conducting structural integrity inspections is to safeguard the health and safety of miners and other personnel. Regular inspections help identify and address structural issues before they lead to incidents. Conducting these inspections at a frequency aligned with the condition of the plant can prevent unforeseen events. Since 2011, Queensland alone has reported 129 incidents involving the failure of structures in the mining and quarrying sector, with 19 of these occurring in 2022. Adequate inspections and remediation could have prevented these incidents.

To Comply with State Legislation

Compliance with state legislation is another critical reason for conducting structural integrity inspections. Each state in Australia has regulations that require regular inspections and risk assessments to ensure safety. Below is a summary of the legislative requirements:

- **Queensland:**

Under the Coal Mining Safety and Health Act 1999 and the Coal Mining Safety and Health Regulation 2017, operators are required to regularly assess and manage the integrity of mining structures.

- **New South Wales:**

The Work Health and Safety (Mines) Act 2013 mandates regular structural inspections for mining operations.

- **Victoria, Western Australia, South Australia, Tasmania, Northern Territory:**

Similar regulations across these states require regular inspections to maintain safety and operational standards.

A risk assessment is crucial to understanding the appropriate frequency for these inspections. The risk assessment should consider:

- **Age of the Plant:**

Older structures may require more frequent inspections due to wear and tear.

- **Operating Environment:**

Factors like moisture, spillage, and chemical exposure can affect structural integrity.

- **Comparison to Original Design:**

Assess how current structures compare to the original design documents, identifying any deviations or issues.

Our Structural Integrity Inspection Process

At Prime Project Group, we have developed a comprehensive process to identify structural integrity issues before they compromise safety. Our process includes:

- **Data Collection:**

Gather all relevant structural information, including drawings and modifications, to understand the structures to be inspected.

- **Baseline Audit:**

Conduct an audit to identify current issues, determine rectification methods, and prioritize the work. We use a custom inspection application to efficiently capture and manage these issues.

- **Further Inspection:**

Highlight areas that require additional inspection or work to ensure a complete assessment.

- **Risk Assessment:**

Develop a Structural Integrity Management Plan based on a thorough risk assessment.

- **Rectification Details:**

Provide details of the necessary rectification work, including any additional structural analysis or engineering required.

- **Issue Database:**

Maintain a database of all identified issues, facilitating work planning and communication to manage outstanding issues.

How do we inspect the structures?

Our inspections involve a visual assessment aimed at capturing the following:

- Corrosion and its potential cause
- Structural damage (mechanical damage, fatigue or cracking)
- Structural modifications
- Walkway compliance to AS1657
- Guarding compliance to AS4024

Visual inspections typically capture most issues, but Non-Destructive Testing (NDT) techniques such as thickness testing and ultrasonic testing may be employed for a more detailed analysis. These tests are usually carried out by a third party.



Deliverables:

What Do You Get?

Our custom application generates a complete report with a defect database. Each entry details the defect's location, severity, and structural effect. Additionally, we detail any proposed remedial tasks, including techniques, supplies, and timelines for repair. When you engage with us for structural integrity inspections, you receive a comprehensive package that ensures all identified issues are thoroughly documented, prioritized, and actionable. Our deliverables include:

Comprehensive Inspection Report:

- **Detailed Findings:**

A complete report that documents every identified defect, including its location, severity, and the potential impact on the structure's integrity.

- **Visual Documentation:**

High-resolution images of defects are included, providing clear visual evidence of the issues observed during the inspection.

Defect Database:

- **Centralized Information:**

A fully searchable database containing all identified defects.

- **Severity Classification:**

Defects are classified by severity, allowing for easy prioritization of remedial actions.

- **Impact Analysis:**

Each defect entry includes an analysis of its potential structural impact, helping to understand the urgency of each issue.

Proposed Remedial Actions:

- **Step-by-Step Remediation Plan:**

Detailed instructions on how to address each defect.

- **Cost Estimates:**

A preliminary cost estimate for the remedial work, facilitating budget planning.

Structural Analysis:

- **Further Evaluation:**

If needed, additional structural analysis or engineering assessments are recommended and outlined, ensuring the long-term stability of the structure.

- **Compliance Checks:**

Verification that the proposed remedial actions comply with relevant industry standards and regulations.