Structural Integrity Evaluation Checklist

This checklist is designed to guide you through a step-by-step process of evaluating the structural integrity of a building or infrastructure. It includes sections for documentation review, visual inspection, non-destructive testing (NDT) criteria, and monitoring equipment.

1. Documentation Review

- ☐ Concrete Crushing Tests
- ☐ Mix Design Analysis
- ☐ Previous Inspection Reports
- ☐ Maintenance Logs
- ☐ Construction Drawings
- ☐ Permits and Approvals
- ☐ Material Certifications
- ☐ Design Calculations

2. Visual Inspection

- ☐ Cracks and Deformations
- ☐ Water Damage (e.g., stains, mold, efflorescence)
- ☐ Corrosion and Rust (e.g., rebar, metal components)
- ☐ Foundation Settlement (e.g., uneven floors, tilting)
- ☐ Joint and Connection Integrity (e.g., gaps, misalignment)
- ☐ Spalling or Delamination of Concrete
- ☐ Drainage and Waterproofing Issues
- ☐ Signs of Overloading (e.g., sagging beams, deflections)

Non-Destructive Testing (NDT) Considerations

- ☐ Determine When to Move to NDT (e.g., based on visual findings)
- ☐ Ultrasonic Testing (e.g., for internal flaws, thickness measurement)
- ☐ Radiographic Testing (e.g., for weld integrity, internal cracks)
- ☐ Dye Penetrant Testing (e.g., for surface cracks)
- ☐ Acoustic Emission Monitoring (e.g., for active crack growth)
- ☐ Ground Penetrating Radar (GPR) (e.g., for subsurface defects)
- ☐ Rebound Hammer Test (e.g., for concrete strength)
- ☐ Infrared Thermography (e.g., for moisture detection, thermal anomalies)

4. Monitoring Tools

- ☐ Strain Gauges (e.g., for stress measurement)
- ☐ Displacement Sensors (e.g., for movement monitoring)
- ☐ Vibration Monitoring (e.g., for dynamic loads)
- ☐ Temperature Sensors (e.g., for thermal effects)
- ☐ Tiltmeters (e.g., for angular changes)
- ☐ Crack Monitors (e.g., for crack width measurement)
- ☐ Load Cells (e.g., for load distribution analysis)
- ☐ Data Loggers (e.g., for continuous monitoring)

5. Additional Notes

- ☐ Review Environmental Factors (e.g., seismic activity, weather conditions)
- ☐ Assess Compliance with Building Codes and Standards
- ☐ Document Findings and Recommendations
- ☐ Schedule Follow-Up Inspections or Repairs