Drone inspections offer an efficient and safe method for assessing real estate and infrastructure for structural defects, damage, and wear. By utilizing advanced cameras and sensors, detailed visual and thermographic analyses can be conducted without physical contact.

**2. Preparation**

**2.1 Project Planning & Risk Analysis**

* **Project Name:**
* **Location:**
* **Date:**
* **Project Manager:**

**Risk Analysis**

| **Risk** | **Impact (High/Medium/Low)** | **Measures** |
| --- | --- | --- |
| Unstable weather | High | Schedule backup inspection day |
| GPS signal loss | Medium | Provide manual control |
| Hazardous zones (high-rise buildings, bridges) | High | Adjust flight path |
| Battery failure | High | Carry extra batteries and emergency landing procedures |
| Loss of visual contact | Medium | Deploy additional observer |
| Signal interference due to infrastructure | Medium | Test alternative routes |
| Privacy issues | Low | Obtain prior permissions |
| Data corruption | Medium | Implement redundant storage and backups |
| Incorrect measurements | High | Calibrate sensors beforehand |
| Mechanical drone failure | High | Conduct regular maintenance checks |

**2.2 Checklist Before Inspection**

* Weather check (wind, rain, temperature)
* Drone and battery status verified
* Camera settings adjusted for optimal image quality
* Flight plan loaded
* Safety procedures reviewed

**3. Conducting the Inspection**

**3.1 Inspection Report for Real Estate & Infrastructure**

| **Component** | **Remarks** | **Damage Detected? (Yes/No)** | **Recommendation** |
| --- | --- | --- | --- |
| Roofing | Visible cracks | Yes | Specialist inspection required |
| Facade | Moisture spots detected | Yes | Further investigation needed |
| Bridge structure | Rust on beams | Yes | Repair work recommended |
| Windows | Leakage visible | Yes | Replace seals |
| Ventilation ducts | Blocked air channels | Yes | Cleaning and inspection required |
| Foundation | Cracks in concrete | Yes | Stability analysis needed |
| Electrical installations | Loose wiring | Yes | Electrical inspection required |
| Solar panel roofs | Displacement due to wind | Yes | Check mounting systems |
| Interior walls | Moisture spots from leakage | Yes | Leak detection required |
| Gutters | Blockage due to leaves | Yes | Develop maintenance plan |

* Visual and thermographic images attached
* Comparison with previous inspections conducted

**3.2 Flight Report for Drone Inspection**

* Number of flights: X
* Total flight time: X minutes
* Maximum flight altitude: X meters
* GPS signal strength: Good/Moderate/Poor
* Weather conditions: Sunny/Windy/Cloudy

**6. Root Cause Failure Analysis (RCFA) Template**

| **Problem** | **Possible Cause** | **Recommended Action** | **Remarks** |
| --- | --- | --- | --- |
| Moisture spots on facade | Poor water drainage | Repair and additional coating | Extend preventive maintenance |
| Rust on bridge beams | Exposure to moisture and salt | Anti-corrosion treatment | Add regular inspections |
| Cracks in roofing | Material aging | Replace roofing | Increase inspection frequency |
| Unstable solar panels | Poor installation | Optimize mounting systems | Improve wind resistance |
| Loose electrical cables | Poor installation | Install brackets and protective covers | Regular visual inspection |
| Worn ventilation ducts | Deposits and dust accumulation | Thorough cleaning and inspection | Schedule annual maintenance |
| Structural cracks in foundation | Ground movements | Perform stability calculations | Additional foundation reinforcement |
| Glass breakage in windows | Thermal stress | Use tempered glass | Implement sun protection measures |
| Leakage in gutters | Accumulation of debris | More frequent cleaning and inspections | Install gutter protection |
| Corrosion of metal structures | Poor protective coating | Apply anti-rust treatment | Regular re-treatment |