



Case Study 2: Drone Roof Survey of a Block of Flats in Scarborough, North Yorkshire, UK.

2nd March 2024

1. Introduction

In the picturesque coastal town of Scarborough, North Yorkshire, a block of six flats faced significant roofing issues that were compromising the safety and comfort of its residents. The property, a typical late-19th-century structure, had seen better days. Over time, the roof had deteriorated, leading to broken and missing slates, clogged gutters filled with vegetation, and water ingress that caused dampness in the top flat and stairwell.



Figure 1. Aerial view of the block of flats.

This case study explores how a drone roof survey, in collaboration with the leaseholders, freeholders, managing agent, and contractor, played a pivotal role in diagnosing the problems and facilitating effective repairs.

2. Background

The block of flats in question had been suffering from ongoing roofing issues for several years. The tenants, particularly those in the top-floor flats, had reported multiple incidents of water leaking into their homes. Damp patches had appeared on walls and ceilings, and in some cases, black mold had begun to form, posing health risks to the occupants.

To address these issues more efficiently, one of the leaseholders proposed a modern solution: conducting a drone roof survey. This method offered a quicker, less invasive way to assess the roof's condition, providing detailed visual data that could be used to pinpoint specific areas of concern.

What made this more challenging for all concerned, is that works had already started to the roofline when a major fire started in an adjacent property and this fire caused damage to refurbished areas of the roof.



3. The Challenges

Several challenges made this project particularly complex:

1. **Aging Roof Structure:** The roof was constructed decades ago, and many of the materials, including the slate tiles, were nearing the end of their lifespan. Over time, the harsh coastal weather had taken its toll, leading to significant wear and tear.
2. **Vegetation in Gutters:** The gutters were clogged with moss, leaves, and other debris, which prevented proper drainage and caused water to overflow, seeping into the building's structure.
3. **Water Ingress and Dampness:** The most pressing issue was the water ingress that had caused extensive dampness in the top-floor flats. The dampness had led to the growth of small amounts of black mold, creating an unhealthy living environment.
4. **Stakeholder Coordination:** The block of flats had multiple stakeholders, including leaseholders, freeholders, the managing agent, and the contractor. Ensuring that all parties were informed and in agreement with the proposed solutions was crucial for the success of the project.

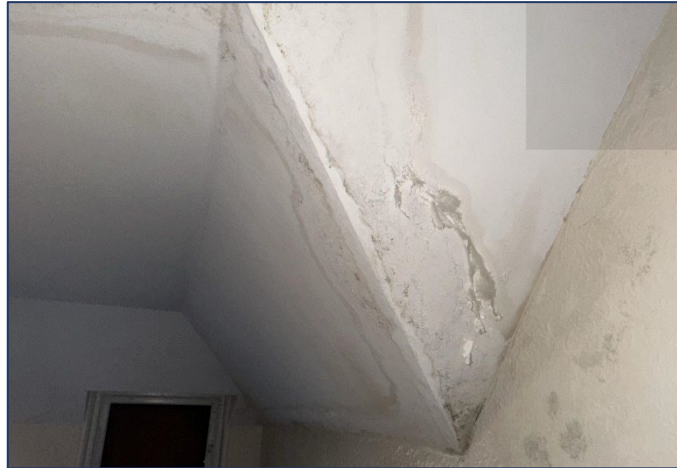


Figure 2. Areas of damp in top stairwell.

4. The Drone Roof Survey and Inspection.

The drone survey was conducted on a clear day to ensure optimal visibility and accurate data collection. The drone, equipped with high-resolution cameras, was able to capture detailed images and videos of the roof, gutters, and exterior walls. The survey took only a few hours, a fraction of the time that traditional inspection methods would have required.

Key Findings:

1. **Broken and Missing Slates:** The drone identified several areas where slates were either broken or missing entirely. These gaps were the primary entry points for water, leading to the issues experienced by the residents.
2. **Clogged Gutters:** The gutters were indeed filled with vegetation and debris, confirming the suspicions of the managing agent. The blockage was severe enough to prevent water from draining properly, exacerbating the dampness issue.
3. **Damage to Flashing and Chimney Stack:** The survey also revealed that the flashing around the chimney stack was damaged, further contributing to water ingress. The chimney stack itself showed signs of deterioration that needed attention.



- 4. Wall Dampness and Mold:** While the drone could not inspect the interior directly, the visual evidence of exterior damage aligned with the reports of internal dampness and mold. The data indicated that immediate repairs were necessary to prevent further damage.



Figure 3. Holes in the slate roof and many slates that were broken or displaced.

5. Collaboration and Decision-Making

With the survey data in hand, the managing agent organized a meeting with the leaseholders, freeholders, and contractor to discuss the findings and outline a plan of action.

The use of drone imagery made it easier for all parties to visualise the problems and understand the urgency of the repairs.

Key Points Discussed:

- 1. Cost Estimations:** The contractor provided estimates for the necessary repairs, including replacing the broken and missing slates, clearing the gutters, repairing the flashings, and addressing the chimney stack. The use of drone technology helped in creating a more accurate and detailed scope of work, which in turn led to more precise cost estimations.
- 2. Access and Safety:** One of the main advantages of using a drone was the reduced need for scaffolding, which would have been expensive and disruptive. However, for the actual repair work, scaffolding was still required for safety reasons. The stakeholders discussed the logistics of setting up scaffolding in a way that minimised inconvenience to the residents.
- 3. Timeline:** The group agreed on a timeline for the repairs, taking into account the weather conditions and the availability of the contractor. The aim was to complete the repairs before the onset of winter, when bad weather could worsen the existing problems.
- 4. Funding and Contributions:** As is often the case with leasehold properties, funding the repairs required contributions from the leaseholders. The managing agent facilitated discussions on how the costs would be divided, ensuring transparency and fairness.



6. The Repair Process

Once the plans were finalised, the contractor began the repair work. The first step was to clear the gutters of all vegetation and debris. This was done swiftly, preventing further water overflow and mitigating the risk of additional water ingress.

Next, the damaged and missing slates were replaced. The contractor sourced matching slates to maintain the aesthetic integrity of the roof, ensuring that the repairs blended seamlessly with the existing structure.



Figure 4. This image was taken 35 metres above the property, showing a hole in the roof caused by a missing slate.

The flashing around the chimney stack was repaired, and additional waterproofing measures were implemented to prevent future issues which included soakers and stepped flashings. The chimney stack itself was repointed and the flaunching renewed to address the wear and tear identified during the survey.

7. Outcome and Benefits

The drone roof survey proved to be an invaluable tool in addressing the roofing issues of the Scarborough flats. The key benefits realised included:

1. **Cost-Effective Inspection:** The drone survey was significantly less expensive than traditional inspection methods. It also provided a more comprehensive view of the roof's condition, leading to a more accurate diagnosis of the problems.
2. **Quick and Accurate Data Collection:** The survey was completed in a matter of hours, and the high-resolution images allowed for precise identification of the areas needing repair.
3. **Minimised Disruption:** By using a drone, the initial inspection process caused minimal disruption to the residents. The need for scaffolding was limited to the actual repair work, reducing the overall impact on the occupants.
4. **Improved Communication:** The visual data from the drone survey made it easier for all stakeholders to understand the issues and agree on the necessary repairs. This facilitated a smoother decision-making process and ensured that everyone was on the same page.



5. **Enhanced Safety:** The drone allowed for a safer inspection process by reducing the need for manual roof access, which can be dangerous, especially in poor weather conditions.

6. **Long-Term Solutions:** The repairs conducted were comprehensive and addressed both the immediate issues and potential future problems. This

proactive approach is expected to extend the lifespan of the roof and prevent similar issues from arising in the near future.



Figure 5. Zoom x 10 image of hole in roof, showing roofing lath underneath and part of a roofing truss.

8. Conclusion

The drone roof survey for the block of flats in Scarborough, North Yorkshire, was a resounding success. It demonstrated the effectiveness of modern technology in addressing traditional building maintenance challenges. By providing quick, accurate, and cost-effective data, the drone survey enabled the managing agent and other stakeholders to make informed decisions and implement repairs that have restored the safety and comfort of the residents.

This case study serves as a testament to the value of innovative solutions in property management and maintenance. The positive outcome not only resolved the existing issues but also set a precedent for how similar challenges can be tackled efficiently in the future.

9. Reviews

“Just had a survey done on Saturday and I'm now reading the full report Sunday evening. Great service from Ricky highly recommend his service and now I can pass on high quality images of all the damage to my roof as my roofer has been unable to get access for 3 months. So, if in doubt get a drone out”.

William Crammer

Source: Google Reviews