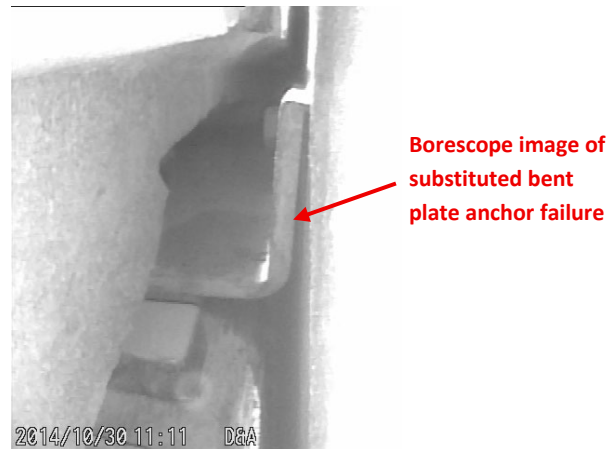
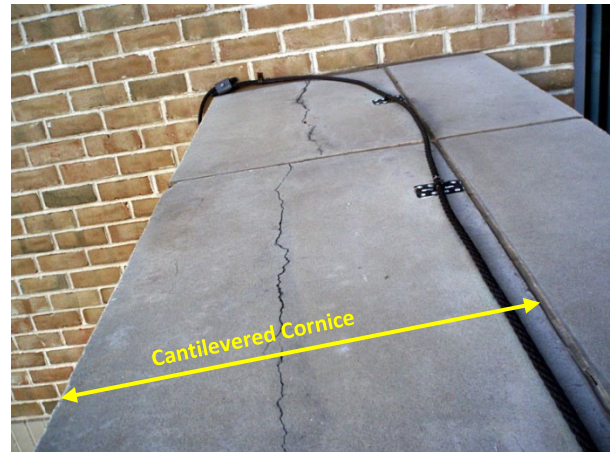


Vue Condominium Transition Warranty Analysis & Litigation Support



The Vue Condominium is a residential condominium project situated adjacent to the Inner Harbor area of Baltimore, Maryland. The project was completed in 2007 and consists of 123 dwelling units in the top 17 floors of a 30-story mixed-use complex. The Property is constructed of post-tensioned and conventionally reinforced concrete framing, with light gauge metal framed exterior walls clad with masonry veneer. The 29th floor steps back to form large private terraces with a masonry guardrail around the perimeter. The guardrail is topped with a cast stone coping and large cantilevered cornice to form a strong architectural feature at the top of the building. A similar cantilevered cast stone belt course is installed continuously at the 27th floor window sills.

Davidson & Associates was retained in 2014, seven years after completion of the building, to determine the cause of and remedy for ongoing water infiltration. **This issue had been reviewed previously by numerous consultants over the years, but without success.**

Challenges and Value Added:

The benefits of the following technical capabilities of D&A were demonstrated by the achievements during forensic analysis, testing, remedial design, and litigation support where prior firms could not identify deficiencies. This was due to the fact that, during the joint investigation, the Developer's local predominantly forensic engineer did not have testing equipment of the technical level necessary to repeat D&A's analysis. This resulted in their inability to determine that their remedial recommendations, due to concealed conditions, would result in the stones failing. The advantage of a single source being able to combine these technical resources is not typically provided by other forensic architecture or engineering firms.

- Rapid Identification of Life-Threatening Defects: At commencement of the investigation, D&A observed a predominant pattern of cracks extending down the length of the cast stone cantilevered cornice. The crack pattern on the stones were photographically documented for analysis. The top and underside cracks aligned indicating that the cracking was becoming full depth and the outer half of the **stones were separating from the building and in imminent danger of falling 29 stories** onto the public sidewalks and road below (top right photo). None of this was realized by the numerous forensic consultants retained to correct the water infiltration prior to D&A.
 - Value Added: D&A's 40 years of experience identified this deficiency during the first site visit after numerous full building envelope investigations failed to do so. Documentation and presentation of the life safety issue was sufficient to convince association and developer to cordon off the at-risk areas of sidewalks and provide overhead protection to the retail entrances in a relatively short period of time.
- In-House Borescopic Testing Advantages: D&A borescopic equipment was able to extend through the narrow sealant joints flanking the cast stone coping. This substantiated and documented that the cracks were extending full depth through the cantilevered cornice stones. It also revealed unidentified deficiencies including that the concealed steel angle anchors, which were the sole support for the cantilevered stones, were substituted with far weaker bent plates that were deflecting and pulling out causing the stones to rotate (bottom right photo). Continued borescopic analysis substantiated that the installation of deficient steel anchors was consistent on all sides of all terraces and, therefore, systemic. A joint investigation was performed so that the developer's forensic engineer could repeat the borescopic investigation to determine the validity of D&A's findings. **The equipment of the forensic engineer was of much lower caliber and could not fit through most of the joints. Without this information the forensic engineer's remedial scope recommending repairing cracked stones in place would not have prevented stones from falling.**
 - Value Added: By substantiating these concealed conditions were systemic and in imminent danger of failure the developer, at their cost, erected staging and temporarily secured all stones with stainless steel pins and epoxy injection into the cracks. Without borescopic analysis the final remedial scope would not have included replacing the failing steel anchors.
- In-House Pacometer Analysis of Cast Stones: This equipment is a nondestructive method to determine the depth and size of steel reinforcing in concrete. The developer represented that the cornice stone may have incorporated transverse steel reinforcing and therefore the cracks are stable and replacement of the stones was not necessary. In response D&A investigated the steel reinforcing placement in the cantilevered stones in the presence of the developer's forensic engineer.
 - Value Added: The pacometer not only confirmed the absence of transverse reinforcing but also substantiated that a notable number of stones had reinforcing discontinuous and at incorrect locations. This ended the prolonged remedial negotiations regarding leaving the stones in place.
- Nondestructive Brick Tie Substantiation: During the joint investigations with the developer's forensic engineer, borescope probes visually confirmed areas where the brick ties were properly installed and areas where the wire tie component was not embedded in the mortar joints. By comparing multiple settings at both locations, it was established that the pacometer used by D&A could be calibrated to accurately determine the areas where the tie embedments were omitted. The proven accuracy of the unconventional application of the pacometer provided the association with a nondestructive alternative to meet the burden of proof for litigation without the high costs of the conventional method of removing bricks or extensive borescopic probes for observation.
- Alternate Remedial Design Resulting in Settlement: A cash settlement offer, which included funds to replace the cast stone cantilevered cornice, based on a proposal obtained by the developer from a restoration contractor, was rejected by the association due to obvious scope omissions in the proposal and the total offer amount being too low. D&A prepared construction documents which incorporated a unique staging and hoist method to remove and reinstall the heavy cast stone that was notably more time efficient and cost effective. A bid for this work reduced the cost by **XX%** which resulted in a revised cash settlement offer being accepted which ended the litigation. The work was implemented at this cost without change orders.