



Thinking Outside the Industry

A construction solution inspired by composite sailboats.



CCI Balconies was founded when three engineers met over a pint and sketched some designs on the back of a napkin. At about this point, innovation stories usually leap to the big idea, but this is where the CCI Balconies story is different. When Dave Bradly, Phil Locker and Peter Goodeve met that afternoon, they didn't focus on a solution; but on the problem.

Goodeve, a structural engineer with Goodeve Manhire Partners, began the conversation with 'I have this thing I need to solve. It's a big problem and it's only going to get worse.'

His problem – or more accurately the industry's problem – was the thermal bridging that occurs with concrete balconies on multi-residential buildings. In effect, concrete balconies act like the cooling fins on engines and can drain valuable heat from each apartment unit. At that time, it was thought that the only way to get around thermal bridging would be to use a very expensive bracket.

But what if they could build a balcony out of composites instead of concrete?

Summary

- **The Problem?** Thermal bridging from concrete balconies.
- **The Solution?** A balcony made 100% from composite; no concrete or organic material whatsoever.
- **Why is it Better?** Superior strength and durability, ultra-lightweight, architectural freedom, cost effective and above all, energy efficient (score LEED points).
- **The Impact?** CCI Balconies anticipates composite balconies will be the preferred choice among multi-family residential developers.

As founders of Competition Composites, Bradley and Locker know composites. For about 15 years they had been building specialized composite parts for the marine, military, aerospace and telecommunications industries. Other companies' earlier attempts at simply covering wooden balconies with composites had met with disaster when the rotting of the wood was hidden and accelerated. What Bradley and Locker proposed was a balcony made 100% from composite; no organic material whatsoever.

Fast forward a few months from that initial lunch at the pub and the guys had tried the many designs, had run materials through Finite Element Analysis (FEA) programs, and had figured out how to attach the balcony to a building (arguably the hardest part). They were ready for testing: first with simulations and then with actual prototypes.

After the static tests, they wanted to 'test to destruction', a task which proved to be much more difficult than anticipated. It took an entire afternoon and countless concrete blocks, hunks of steel, and water-filled drums. Finally, after what they calculated to be the weight of two Range Rovers parked at the edge, the balcony broke. As Bradley said, from a life-safety perspective, the results were fantastic, but there was quite a bit of clean up after all of that.

Next up were the rules and regulations. Interestingly, when it came to the fire test there was no baseline for concrete so first they had to simulate a blow out and fire to test concrete. Within 90 seconds of starting the test, the concrete, which is a great conductor of heat, was untenable for human life. Simply put, it would cook you. Flames scaled the building and within minutes the concrete balcony had failed. The same tests on the composite prototype produced very different results. The temperatures never climbed past 120 degrees Fahrenheit, the flames did not spread up the

building and after 45 minutes the balcony was still standing. Arguably the hardest test, passed better than concrete. A lot better.

Today, after one-and-a-half years, the composite balconies are just getting to the end of the life safety testing – and passing with flying colours.

Composites are used by structural engineers in many applications, including sailboats, submarines and bridges, but until now, not balconies. All that is about to change. CCI Balconies have low-rise installations with Urbandale and Innovative Construction Project Management (ICPM) and a high rise instance with Homestead . Once the CCMC certification for high-rise comes through (early 2016), the company anticipates that the strength, durability, architectural freedom and above all, the energy efficiency, will make composite balconies the preferred choice among multi-family residential developers. Indeed, the only choice in years to come.



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