THE VALUE OF TESTING MMC SYSTEMS

Joanne Booth Business Manager - Construction

LUCIDEON

Overview

- Value engineering
- Structural testing
- Component tests
- Site testing
- Durability assessments
- Transportability studies



Value engineering

- Value engineering (VE) can be used at various stages throughout the whole process, from the design stage through to materials selection, manufacturing, transportation and build
- The biggest savings can be made at the start of the process
- VE is not just about reducing materials costs, it includes processes, construction methods, long-term use of the building and transportation
- The full savings can easily off-set the costs of the VE process

Value engineering design

- Design by Eurocode can lead to using larger material sections
- Designed connections
- Design for robustness for short periods of use
- Redundancy of fixings



Structural testing

- Compressive frame loading
- Wind loading
- Impact testing
- Racking loading
- Fatigue loading
- Floor loading

Structural testing



_

Structural testing





Component tests

- Chimneys
- Dormers
- Canopies
- Panel connections
- Balcony connectors
- Balustrades
- Bathroom pods

_

Component tests



Site testing

- Large-scale racking tests
- Water tightness
- Rain penetration
- Verification of loading points
- Impact testing
- Acoustic
- Thermal assessments



Site testing – Premier Modular

Large-scale assessment of racking resistance of full modules





Site testing – Premier Modular







Durability assessments

- Accelerated weathering
- Condensation risks
- Water tightness
- Air tightness
- Extended 60-year assessments
- Thermal performance



_

Durability assessments

- Testing of the full system must be carried out
- It's not sufficient to only test the individual components
- All components need to be CE marked individually
- The full system may fall outside of the exact scope of the available standards
- The most relevant standard must be chosen
- Composite action of the system is important

Hygrothermal test methodology - ETAGs

Cycles:

- 80 X 6 hour heat-rain cycles
 - Heat to 70°C and saturated with water at 13°C
- 5 X 24 hour heat-cold cycles
 - Heat to 50°C and freeze to -20°C
- 30 X 6 hour wet-freeze cycles
 Heat to 20°C, soak with water for 8 hours and then freeze to -20°C



Durability testing – Berkeley Modular



Durability testing – Berkeley Modular





Transportability studies

- Strain gauges on the frame
- Accelerometers
- Crack monitoring of the cladding
- Ultrasonic measurements
- Opening up of panel joints



Benchmarking levels

- The performance of the panels need to be benchmarked prior to lifting to establish any drop-off in performance due to lifting and transportation, this includes:
 - Measuring air leakage of panel joints
 - Thermal imaging to check insulation fill
 - Visual inspection of fixings
 - Visual inspection of cladding (particularly at reveals)
 - Penetration sizes

Transportability – WElink Homes

- Live strain readings on the frame taken from lifting onto stillages and on the full journey
- Fixed strain readings on the cladding system



Transportability – WElink Homes









_

Summary

Testing of systems ensures that building control, insurers and mortgage providers are satisfied that systems have adequate longevity and meet relevant regulations. This is achieved through:

- Structural assessments to ensure compliance with relevant fabrication / building standards
- Appropriate physical and environmental testing
- Assessment of fixings and ancillary components
- Monitoring of transportation, unloading and construction methods

Thank you

Contact details

- T +44 (0)1782 764410
- M +44 (0)7805 269886
- E joanne.booth@lucideon.com
- W www.lucideon.com

