



APPRAISAL of a Building Product: W Stevensons & Sons Ltd. DryBlock Technology – a water repellent masonry wall.



BEAL APPRAISAL C506 – Part 1 - Completed December 2005
Verification of Compliance with Clause E2 of the Building Code for

STEVENSON
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Summary

The W Stevenson & Sons DryBlock Technology is masonry technology that improves the weathertightness of concrete blocks by incorporating a water-repellent additive to both the block and the mortar.

The Building Element Assessment Laboratory (BEAL) was asked to verify the properties and the performance of the **DryBlock Technology** over a fourteen-day period.

To verify the properties and performance of the **DryBlock Technology** used in concrete blocks and mortar, a test was designed using three block walls with water sprayed on the backs of the walls continuously for fourteen days. Photographs were taken on a regular basis, to track the ability of the block and mortar to prevent the migration of water through the walls.

The first wall (Wall 1) was built using DryBlock and DryMortar containing a liquid water-repellent added to the mortar during mixing.

The second wall (Wall 2) was built using standard block and standard mortar. This wall was the control wall in order to demonstrate the difference between the standard block and mortar and the **DryBlock Technology**.

The third wall (Wall 3) was built using DryBlock and bagged premixed DryMortar. This is the system being marketed by Stevensons.

Figure 1 of the photographs in Appendix I illustrates the set-up for the three walls.

A tanking membrane and rebate system was used at the base of the walls to prevent any test moisture migration through the concrete floor. All walls were built using partially grouted masonry, with the joints tooled to a concave finish.

After less than sixty minutes of simultaneous water spraying onto the back of each wall, moisture could be seen coming through the standard block control wall. The other two walls using the **DryBlock Technology** showed no moisture coming through. The test was run for fourteen days and at the end of the fourteenth day, the two walls with **the DryBlock Technology** remained dry. On close examination it was evident that the **DryBlock Technology** had prevented any ingress of moisture into the blockwork or mortar joints, and prevented any migration through the walls.

BEAL was able to confirm the water-repellent properties and performance of the **DryBlock Technology** based on these results.

Objective

Compliance with the New Zealand Building Code

The Building Act 2004 requires that all new building work comply with the Building Code. While masonry has a long tradition as a strong, durable and weathertight material, it can be subjected to damage or neglect thereby increasing the risk of non-compliance.

Objective continued...

Use of the **DryBlock Technology** used in the manufacture of concrete blocks and mortar reduces any risk of non-compliance due to moisture migration through the block and or mortar to a negligible degree. A test was designed to evaluate the performance of a large wall built from blocks and mortar, two with and one without the DryBlock Technology.

This involved building three block walls 2.4 metres high by 1.6 metres wide, each with a small return wall on either side to prevent water spray contaminating the front wall face and contamination of the adjacent wall.

At the back of each wall a set of water spray nozzles was set up attached to its own water meter to record the amount of water applied to the back of the walls.

The test was designed to evaluate and confirm the water repellency that the **DryBlock Technology**, and allow comparison with a standard block and mortar wall. The test would be run continuously over fourteen days to provide a rigorous test.

Use of this technology can be used to demonstrate improved reliability and performance when considering designing a masonry wall to meet the requirements of clause E2 of the NZ Building Code.

Methodology

Procedure and record keeping

At the commencement of the test a record was taken of the water meter reading attached to the water sprays for each wall. Photographs were then taken of the three walls before the water sprays were turned on.

Photographs were then taken at 8am, 12am, and 4pm, from the same relative spots, to show any changes to the faces of each wall. A record was taken of the time and conditions when the photographs were taken.

At the end of the fourteenth day a careful examination was made of the three walls to ascertain whether or not there was any migration of moisture from the back of the walls to the front.

A set of close up photos were taken for record purposes.

Results

Verification of the DryBlock Technology

The photographs contained in Appendix I confirm the observed result, that the **DryBlock Technology** prevents moisture migration through concrete masonry block walls under saturated spray conditions.

Product QA Information

The **DryBlock Technology based concrete blocks and mortar** are manufactured to an in-house standard. It is the opinion of BEAL that the items are produced to a consistently acceptable standard. BEAL will carry out periodic audits of W Stevenson & Son's QA procedures to ensure ongoing compliance with this Appraisal.

Specific Limitations

Use of the **DryBlock Technology** is limited to the scope of application described in the DryBlock Quick Reference Guide (Dec 05) and DryBlock Specifications (Jan 06).

Health & Safety, Handling & Storage Information

DryBlock Technology presents no known health and safety issues. However personal dust protection when cutting the product is essential.

The storage requirements for each component are described in the DryBock Specifications (Jan 06).

Conditions of the APPRAISAL

1. The Products continue to comply with the quality assurance measures developed by W Stevenson & Son Ltd. These quality assurance measures have been viewed and approved by BEAL.
2. The products comply with the conditions of this appraisal and with the DryBock DryBlock specifications (Jan 06).
3. W Stevenson & Son Ltd. continues to have the DryBlock Technology as applied to concrete blocks and mortar for the same reviewed by BEAL.
4. The overall quality and expected performance of the products are maintained.
5. W Stevenson & Son Ltd. shall notify BEAL of any changes in specification or quality assurance measures prior to them coming into effect.
6. BEAL staff use BQI Interim Performance Standards (in the absence of a relevant AS/NZS Standard) for carrying out field-testing and assessment of External Moisture factors. These assessments are performed either on site or in BEAL's facilities and carried out by experienced and qualified specialists.
7. The system has been tested against one or more of the following criteria which was applicable at the time of the initial assessment:
 - a measurable criteria described in the Building Code
 - a relevant New Zealand or Australian Standard
 - a requirement set out in a Building Quality Institute interim Performance Standard
 - an appropriate requirement set out in a New Zealand Department of Building & Housing document
8. BEAL's verification of the building product or system as complying with one or more criteria is given on the basis that the criteria used were those that were used to demonstrate compliance with the Building Code at the time of the initial assessment. In the event that the criteria are withdrawn or amended at a future date, this Appraisal may no longer remain valid.

Authorised Signatory for BEAL



20 Jan 2006

C R Prouse – Building Scientist

Date