1.7 Concrete Masonry Wall Units

Introduction

The specification for concrete masonry wall units was initially covered by NZS 595, superceded by NZS 3102:1983 and finally overtaken by a joint Australian/New Zealand Standard AS/NZS 4455 Masonry units, pavers, flags and segmental retaining wall units. This latest document covers all masonry products, i.e. not just concrete as was the case of the earlier New Zealand Standard.

AS/NZS 4455 is published in three parts:

1. AS/NZS 4455 Part 1 Masonry units, pavers, flags and segmental retaining wall units - Masonry units.
2. AS/NZS 4455 Part 2 Masonry units, pavers, flags and segmental retaining wall units - Pavers and flags.
3. AS/NZS 4455 Part 3 Masonry units, pavers, flags and segmental retaining wall units - Segmental retaining wall units.

There is a testing suite of Standards AS/NZS 4456 Masonry units, segmental pavers and flags - Methods of test which details test procedures covering the performance parameters set out in NZS 4456.

The tests listed are:

- **4456.1** Sampling for testing
- **4456.2** Assessment of mean and standard deviation
- **4456.3** Determining dimensions
- **4456.4** Determining compressive strength of masonry units
- **4456.5** Determining the breaking load of segmental pavers and flags
- **4456.6** Determining potential to effloresce
- **4456.7** Determining core percentage and material thickness
- **4456.8** Determining moisture content, dry density and ambient density
- **4456.9** Determining abrasion resistance
- **4456.10** Determining resistance to salt attack
- **4456.11** Determining coefficients of expansion
- **4456.12** Determining coefficients of contraction
- **4456.13** Determining pitting due to lime particles
- **4456.14** Determining water absorption properties
- **4456.15** Determining lateral modulus of rupture
- **4456.16** Determining permeability to water
- **4456.17** Determining initial rate of absorption (suction)
- **4456.18** Determining tensile strength of masonry units and segmental pavers
- **4456.19** Determination of bow

Summary

The following are the principal requirements of AS/NZS 4455 Part 1 Masonry Units relating to concrete wall units. For full details, consultation of the full document is required.

- **Dimensional deviations**
  Test method DW4 AS/NZS 4456.3:
  Standard deviation of not more than 2 mm and a difference between the mean and work size of not more than 3 mm.

- **Unconfined Compression Strength**
  Test Method AS/NZS 4456.4:
  The minimum strength required for concrete masonry is specified by NZS 4210 as:
  1. 12.5 MPa for structural masonry.
  2. 10 MPa for non-structural external units.

- **Integrity**
  There are provisions to ensure the thickness and shape of units are suitable for transportation and handling.
• **Durability**

  The minimum requirement for durability for concrete masonry specified by *NZS 4210* is 10 MPa.

  Provisions for freeze thaw or salt attack resistance may be required for special locations.

• **Demonstration of Compliance for Strength**

  The standard does set compliance requirements:

  1. **Single Lot:**

     Mean value greater than specified characteristic value + 1.20.

     \[ S \text{ (standard deviation)} \text{ is based on 30 specimen’s results or taken as 0.15 times mean value.} \]

  2. **Lots taken in continuous manufacture:**

     Central level shall be greater than specified characteristic value \( \pm 1.65 \frac{2S}{\sqrt{n}} \).

     Each sample shall be at least five samples.

• **Requirements of New Zealand Concrete Masonry Association**

  The Association requires its members to produce masonry to meet the requirements of nationally set Standards, i.e. *NZS 4210* and *AS/NZS 4455* using the testing methods defined in *AS/NZS 4456*.

  Specification outlines for *AS/NZS 4455* Parts 2 and 3 are contained in Section 7 of the Manual.