

Robert L. Nelson & Associates, Inc.
Construction Materials Laboratory
1220 Remington Road
Schaumburg, Illinois 60173
(847) 882-1146

September 22, 1998

Project:

1998 Product Research -- Water Permeability Study -- **Clear NWRT-91**

Test Method:

ASTM E 514-90, "Test Method for Water Penetration and Leakage Through Masonry"

ASTM C 270, "Specification for Mortar for Unit Masonry"

ASTM C 140, "Test Methods of Sampling and Testing Concrete Masonry Units"

TEST DATA:

Wall Fabrication

Two single wythe concrete masonry unit (CMU) walls were constructed according to ASTM E 514-90 requirements. The walls were built during a 24 hour period by an experienced lead mason. Workmanship was judged as to be average. Ambient temperature was maintained between 60F and 75F during the fabrication and subsequent curing period.

Each wall was constructed by the mason and required approximately 1.5 hours to complete. The wall was constructed on an inverted steel channel, and the bottom course was laid on a bed of mortar. Full faceshell and web bedded mortar joints were used, and the walls were constructed one course at a time by applying mortar the full length of the bed joint, then buttering the ends of a CMU one at a time before setting on the bed joint. The joints were initially struck and tooled with a concave jointer after the top course was laid, and a final tooling was done approximately 30 to 60 minutes later.

The walls were constructed in a random order to avoid potential systematic errors which might have occurred if the walls had been build in a particular order. The walls were cured according to ASTM E 514-90 which requires curing for 7 days enclosed in plastic sheeting and for a minimum of 7 days subsequent curing in laboratory air. The total curing time for the walls was 14 days. After the curing period, the walls were coated with Nawkaw Clear NWRT-91 sealant. The coverage rate was 125 sq. ft./gal. The walls were constructed of normal and split face concrete masonry units (see drawing at bottom).

Test Procedures

ASTM E 514-90 test procedures were followed throughout the tests. ASTM E 514-90 test chambers were constructed of welded aluminum angle stock, and the observation face of the chamber was outfitted with Lexan sheet to allow full view into the chamber. All fixtures and appurtenances were in conformity with ASTM F 514-90, Section 4. Each frame was outfitted with a manometer to measure interior pressure and a flow meter to monitor the amount of flow. During the testing, the frame was pressurized to 10 psf, and the water flow was adjusted to 40.8 gal/hr which is equal to 3.4 gal/ft²/hr. The units were held in place with clamps, and a closed cell foam gasket material and silicone caulking provided the proper tight seal. To facilitate a tight seal, the test frame was attached to the CMU making this the exposed face.

Sample Identification

Wall A Clear NWRT-91
Wall B Clear NWRT-91

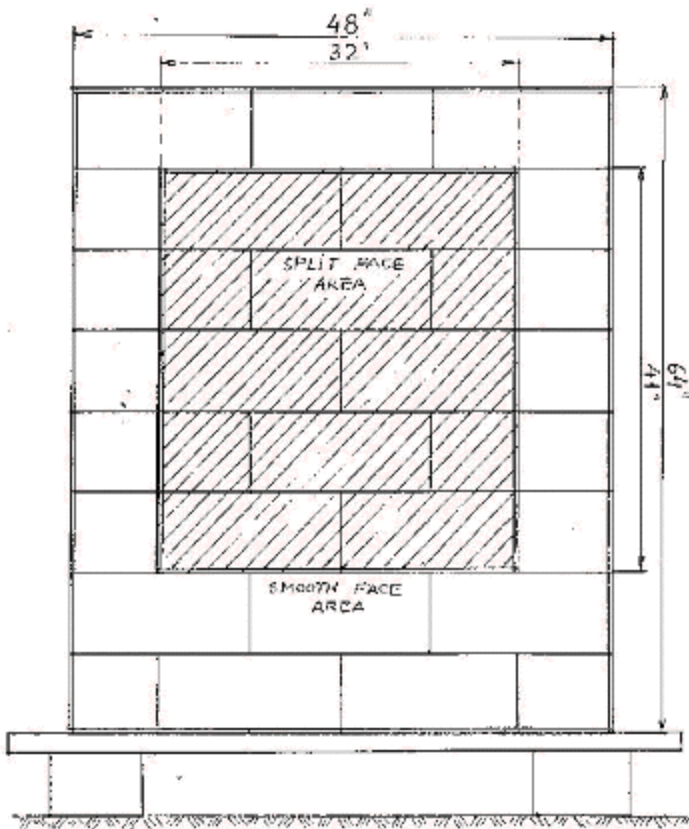
Mortar Analysis

Mortar Type	"S" Portland-Lime
Mortar Proportions	1 - ½ - 4½
Compressive Strength (PSI)	
7 days	2806
28 days	3050
Air Content (%)	4.1

**F 514 WATER PENETRATION TEST
RECORD OF OBSERVATIONS**

4 Hour Test Average of two walls tested		
Mix No.	<u>A</u>	<u>B</u>
Cast Date	8/28/98	8/28/98
Test Date	9/18/98	9/18/98
Time of appearance of first visible water (min)	None	None
Area of dampness after 4 hours (% of test area)	None	None
Water collected in 4 hour test period (liter)	None	None
Other observations	---	---

Figure 1



Respectfully submitted,
Authorizing Signature:

Robert L. Nelson
President

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