STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION

Research Investigation Report No. 92-3
(Workplan 92-C-14)

BACKGROUND

In response to a request from Mr. Edward F. Eaton, Road Commissioner and Trustee for the Village of Manchester, VT and with consideration given to the use of paving bricks on Vermont highways, freeze-thaw tests were conducted on two types of concrete bricks proposed for use on Route 7A and on Union Street at the junction with Route 7A in Manchester, VT.

PRODUCT

Hanover Prest Brick (concrete paving brick)
Brick #1 4" x 8" light gray
Brick #2 8" x 8" dark gray

MANUFACTURER

Hanover Architectural Products, Inc.
240 Bonder Road
Hanover, PA 17331
Tel: (800) 426-4242 or (717) 637-0500
Fax: (717) 637-7145

SUPPLIER

Capital Brick Center
501 New Karner Road
Albany, NY 12205
Tel: (518) 869-3787
Fax: (717) 637-7145

LABORATORY EVALUATION

Two concrete paving bricks were tested for resistance to rapid freezing and thawing in accordance with AASHTO T161, Procedure A, modified for use with a 3% sodium chloride solution. Prior to testing, the samples were saw cut to a 3"x8" size for the freeze thaw molds. The bricks were tested for percent weight change only, at approximate intervals of 50 cycles. Results are presented in Table 1.

RESULTS

TABLE 1

FREEZE THAW TEST RESULTS - PERCENT OF WEIGHT CHANGE

No. of Cycles	Brick #1 4" X 8"	Brick #2 8" X 8" Section 1	Section 2
47	-5.5	+2.0	+1.7
111	-86.5*	+1.3	+0.9
160		+0.2	-0.4
217		-0.7	-1.5
280		-1.8	-3.2
306		-2.0	-3.9

* Freeze-thaw testing was terminated after 111 cycles due to severe deterioration of the specimen.

SUMMARY

Resistance of the 4" X 8" concrete brick (light gray in color) to rapid freezing and thawing while submerged in a 3% sodium chloride solution was very poor. At the completion of 111 cycles in the freeze thaw cabinet, the 4" X 8" brick had a near total consistency of a wet sand.

Resistance of the 8" X 8" concrete brick (dark gray in color) to freezing and thawing while submerged in a 3% sodium chloride solution would indicate the brick to be satisfactory for use in a freezing and thawing environment. At the end of 306 cycles in the freeze thaw cabinet two samples saw cut from the 8" X 8" brick showed an average weight loss of 3.0%.

CONCLUSIONS

Test results would indicate that the 4" X 8" (light gray) brick is unsatisfactory for use in a freezing and thawing environment and that the 8" X 8" (dark gray) brick is satisfactory for use, pending further testing on a project by project basis.

NOTE: The only test performed on these bricks by the Vermont Agency of Transportation, Materials and Research Division was resistance to rapid freezing and thawing in a 3% sodium chloride solution (percent weight change).

The information contained in this report was compiled for the use of the Vermont Agency of Transportation. Conclusions and recommendations contained herein are based upon the research data and the expertise of the researchers, and are not necessarily to be construed as Agency policy. This report does not constitute a standard, specification or regulation. The Vermont Agency of Transportation assumes no liability for its contents or the use thereof.

Reviewed By:

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Date: 6 AUG 92

Materials & Research Division
Agency of Transportation
Date: August 6, 1992