

OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 10, 1972

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To: Max N. Clyde
Engineer of Testing & Research

From: L. T. Oehler

Subject: Evaluation of Manhole Step (Giant Step No. 170), Construction Products Corp. Research Project 72 NM-311, Research Report No. R-812

This letter concerns the non-corrosive manhole step submitted for product evaluation on March 24, 1972. This evaluation parallels a previous one transmitted in a letter on March 8, 1971 on a plastic-coated manhole step submitted by M. A. Industries (Research Project 71 TI-25).

According to the information supplied by the manufacturer, the subject step is a 30 percent glass-reinforced polyester, molded into the shape of the standard manhole step. The material is mineral filled to obtain the Underwriter's Flame Classification SEO (self-extinguishing without dripping or glowing). It is being considered for installation in pre-cast manhole sections to provide a corrosion-proof entrance ladder.

The step was cast into a concrete block to the depth indicated, the concrete was cured and the step was loaded in the testing frame at room temperature. The step withstood a 1000-lb applied load with very little deflection but then failed in a brittle manner as the load was increased further. Although the results of one test are not conclusive, the load capacity of the step appears to be adequate for the intended use at room temperature. However, at subzero temperatures the step might become brittle and fracture at lower load values if a stress raiser were present. This would need to be investigated before the product could be sanctioned for use. In addition, the step is quite easily chipped and a brittle fracture could initiate at such a chipped position at a significantly reduced load.

The most serious shortcoming of the subject step was that it is rendered useless by direct exposure to a flame. Although the material will not burn, it was observed that the glass fiber and polyester filler completely separated under direct flame exposure and hence the step loses its load capability. It is felt that although the possibility of a step in a manhole being exposed to flame may seem remote, it is advisable to provide steps that would remain serviceable if such exposure were to occur.

In view of the flame susceptibility, the low resistance to abrasion and chipping, and the possibility of brittle fracture at low temperatures, it is recommended that the Giant Step No. 170 manufactured by the Construction Products Corporation not be approved for use as ladder steps in pre-cast manhole sections.

TESTING AND RESEARCH DIVISION

Le Roy T. Oeller

Engineer of Research
Research Laboratory Section