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CONSULTING ENGINEERS — TESTING LABORATORY

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January 19, 2002

Mr. Ken Cornwall
ProSet Systems, Inc.
1355 Capital Circle
Lawrenceville, Georgia 30043-5866

SUBJECT: Engineering Report 22007
Testing of Trap Guard

Dear Mr. Cornwall:

INTRODUCTION

On January 11, 2002, testing was initiated on a Trap Guard device manufactured by ProSet, Inc. The Trap Guard is intended to protect against sewer gases backing up into habitable areas when a floor drain trap has lost its water seal. Tests performed addressed whether or not the Trap Guard seal would be broken by stringed items flushed into the device, whether or not a plumbing snake could be effectively used with a Trap Guard installation, and what minimum water flow the Trap Guard could accommodate. Photographs are included in this report.

SPECIMEN

The Tap Guard device is a soft and flexible elastomeric tubing molded in the shape of a duck's bill, open at the top with a curl closure at the bottom (Photographs 1 through 3). The device is typically part of a 5-inch diameter floor drain assembly. The drain assembly includes a PVC base and metallic strainer and tail piece. The Trap Guard is inserted inside the tail piece. The product is designed to remain normally curled on the bottom to prevent the back flow of sewer gases into habitable areas. When wastewater flows into the drain, the curled end of the device straightens out and opens up to allow flow



TECHNICAL SOCIETIES

American Concrete Institute
American Society for Testing & Materials
American Society of Civil Engineers
American Society of Mechanical Engineers

Georgia Society of Professional Engineers
Institute of Electrical & Electronic Engineers
Microscopy Society of America

National Fire Protection Association
National Society of Professional Engineers
Society for Experimental Mechanics
Society of Automotive Engineers

PROCEDURE

The descriptions of the three tests performed on the Trap Guard device are as follows.

- Test 1. Testing was performed to determine the impact on sealing of stringed items flushed into the Trap Guard device. With the device installed in a simulated drain assembly with a vent stack, several pieces of cooked spaghetti were inserted into the drain so as to protrude out of the end of the curl at the bottom of the Trap Guard (Photograph 4). Initially, the test was performed with liquid. Water was poured into the vent stack to a level well above the Trap Guard. The device was observed to determine if the pieces of spaghetti caused the system to leak back through the Trap Guard. The test was repeated using gas instead of liquid. A small amount of water was poured over dry ice in the bottom of the test assembly. The vent stack was sealed (Photograph 5). The pressure caused by the mixture was recorded using a manometer. The Trap Guard was observed for any leakage.
- Test 2. Testing was performed to determine whether or not a plumbing snake could be effectively used with a Trap Guard installation. An attempt was made to insert a 1 ½-inch PVC pipe to provide an adequate pathway for a plumbing snake (Photograph 6). The pipe was lubricated with petroleum jelly and inserted down into the drain assembly.
- Test 3. Testing was performed to determine the minimum water flow the Trap Guard device could accommodate. An electric sump pump was installed into a portable test reservoir. The pump was set up so that the discharge would be diverted into the Trap Guard device set up in a simulated drain assembly (Photographs 7 through 9). Water was pumped through the device to determine if it could adequately handle the flow. The flow rate of the sump pump was then calibrated.

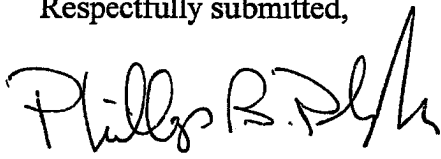
RESULTS

- Test 1. No leakage was observed with the spaghetti protruding from the bottom of the Trap Guard device, using either the liquid or gas test methods (Photographs 10 through 12). The pressure from the water / dry ice off gassing was initially measured at 5.2 PSF (Photograph 13). This pressure was increased with compressed air to 10.4 PSF with no changes in the results (Photograph 14).

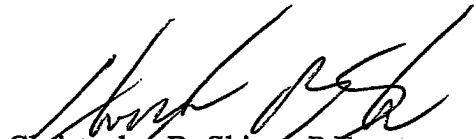
- Test 2. The 1 1/2-inch PVC pipe was easily inserted through the entire length of the Trap Guard device providing adequate clearance for the use of a plumbing snake (Photographs 15 and 16).
- Test 3. The Trap Guard device easily drained and discharged all water supplied by the sump pump. The sump pump was pumping in excess of 33-gallons per minute (Photographs 17 and 18).

If you have any questions or need additional information, please contact us.

Respectfully submitted,

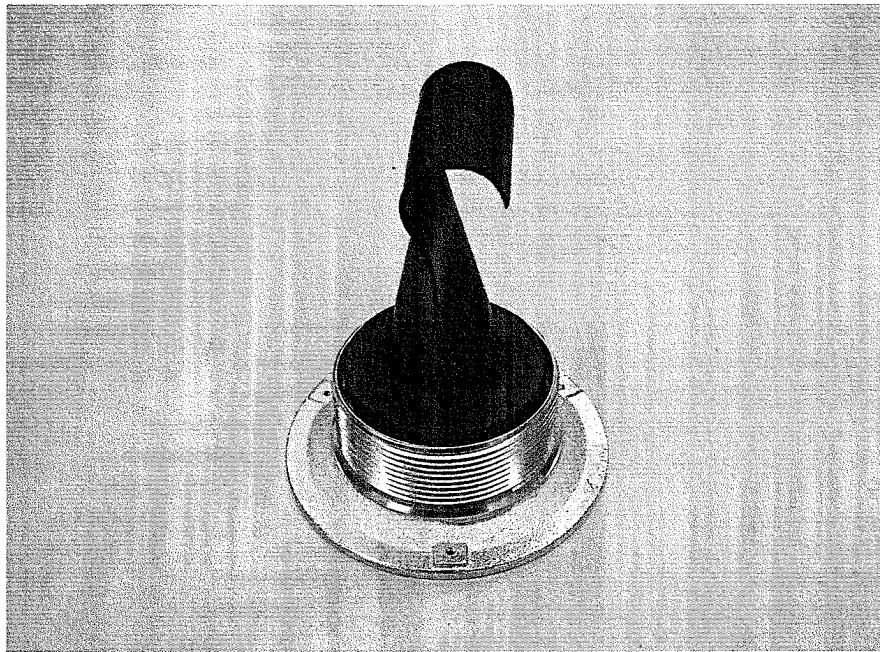


Phillip B. Plyler
Staff Engineer

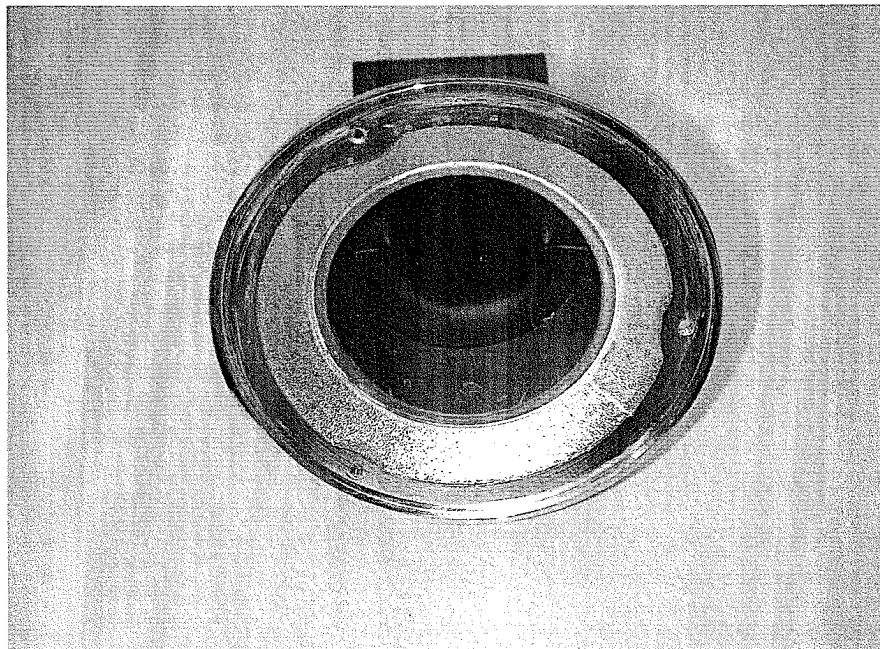


Christopher B. Shiver, P.E.
Vice President – Principal Engineer





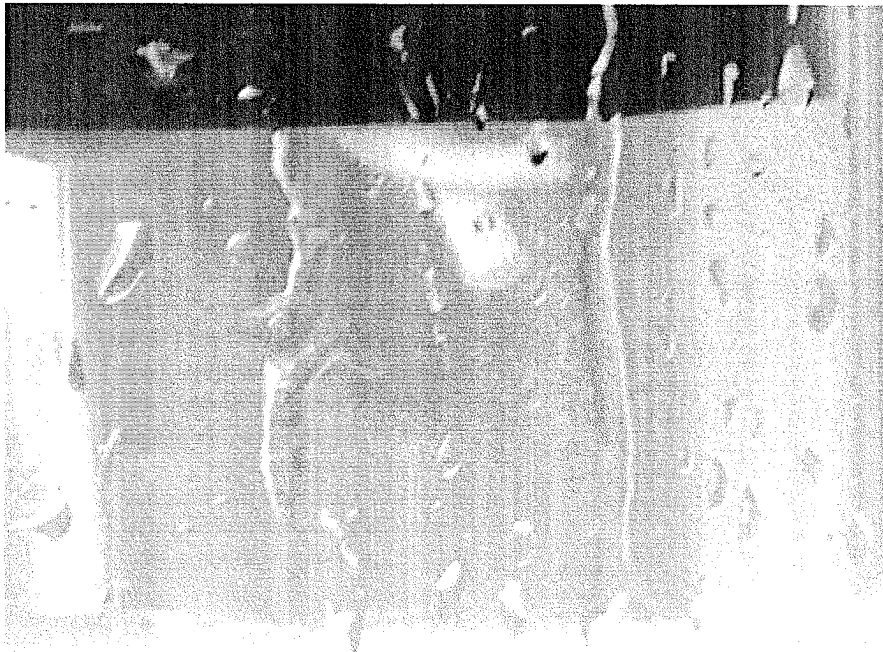
PHOTOGRAPH 1
TRAP GUARD DEVICE



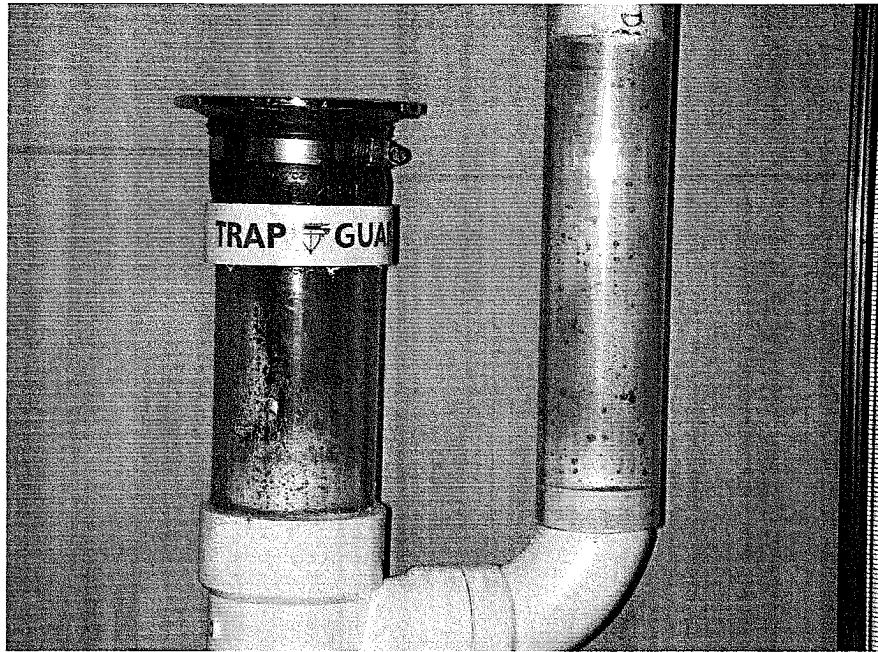
PHOTOGRAPH 2
TRAP GUARD DEVICE - TOP VIEW
THROUGH DRAIN ASSEMBLY



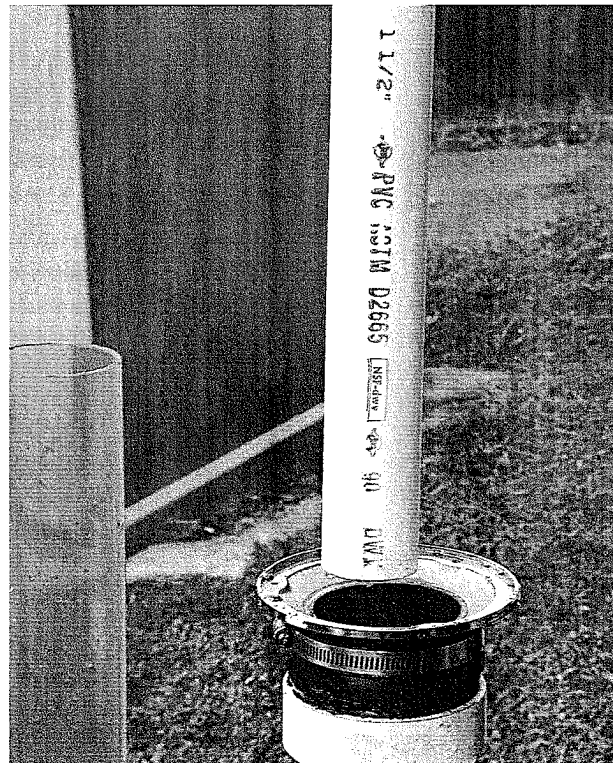
PHOTOGRAPH 3
**TRAP GUARD DEVICE IN SIMULATED
DRAIN ASSEMBLY**



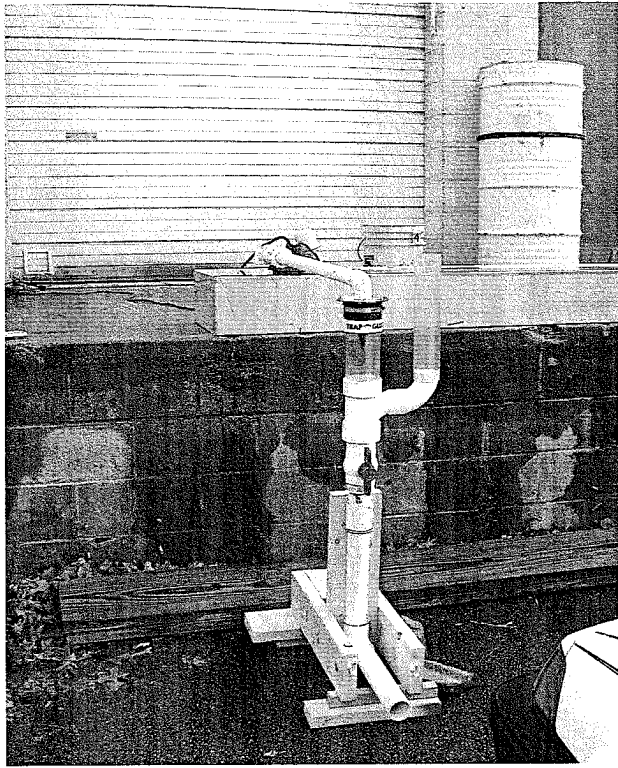
PHOTOGRAPH 4
**SPAGHETTI PROTRUDING OUT OF
BOTTOM END OF TRAP GUARD**



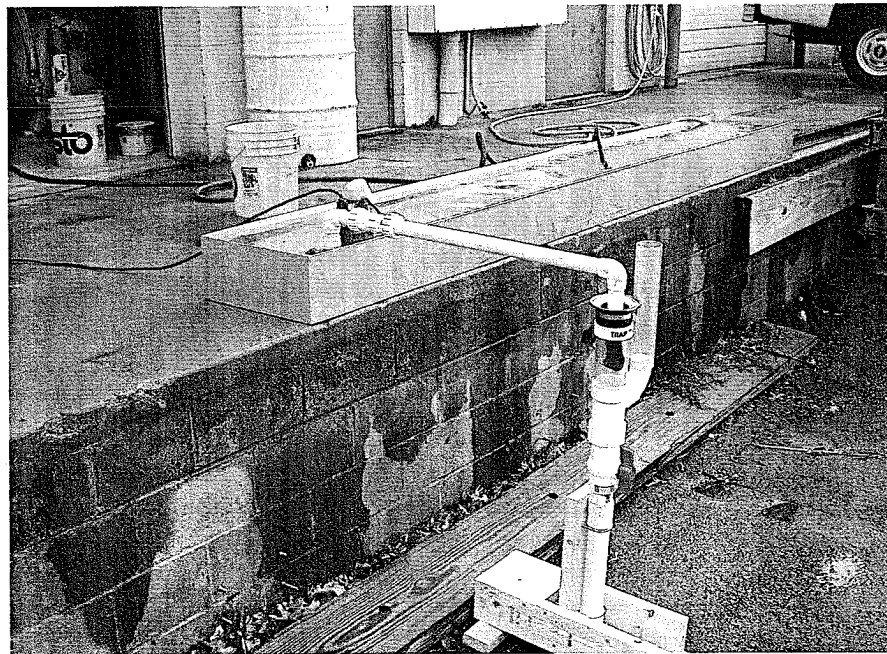
PHOTOGRAPH 5
TRAP GUARD DEVICE IN SEALED DRAIN
ASSEMBLY WITH WATER / DRY ICE
VAPORS INSIDE



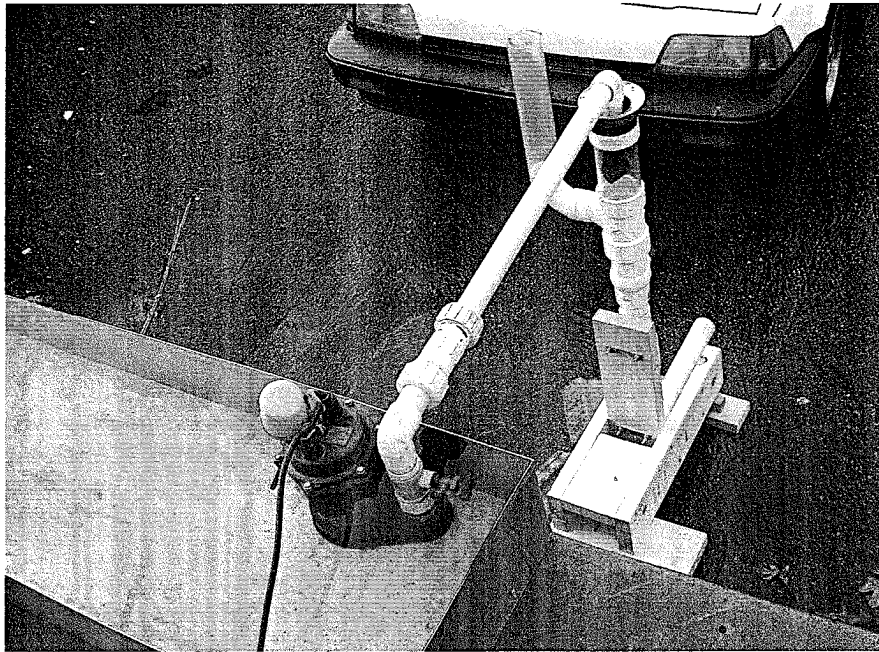
PHOTOGRAPH 6
1 1/2-INCH PVC PIPE TO BE INSERTED
INTO TRAP GUARD DEVICE



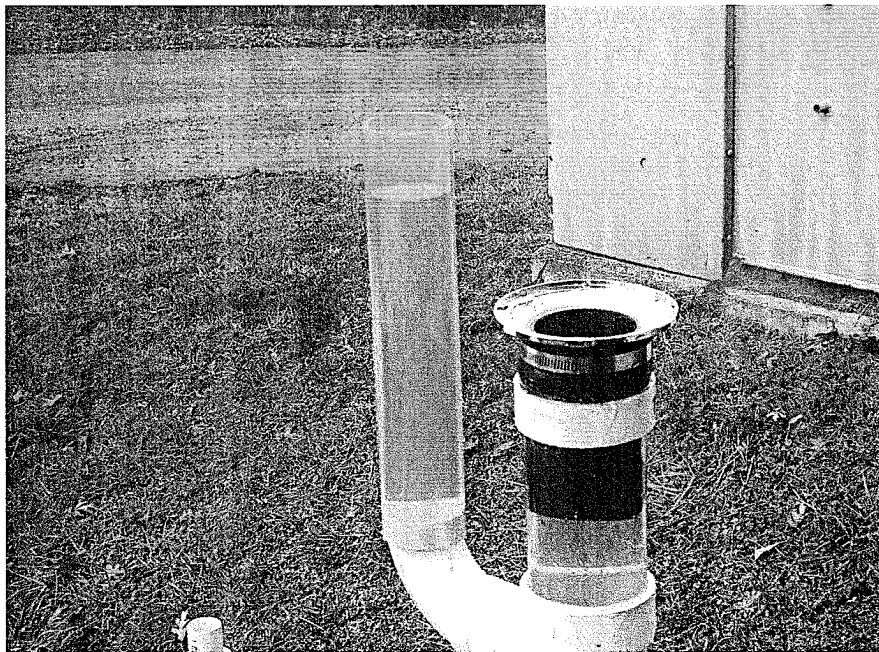
PHOTOGRAPH 7
**TRAP GUARD DEVICE IN SIMULATED
DRAIN ASSEMBLY WITH WATER SUPPLY ATTACHED**



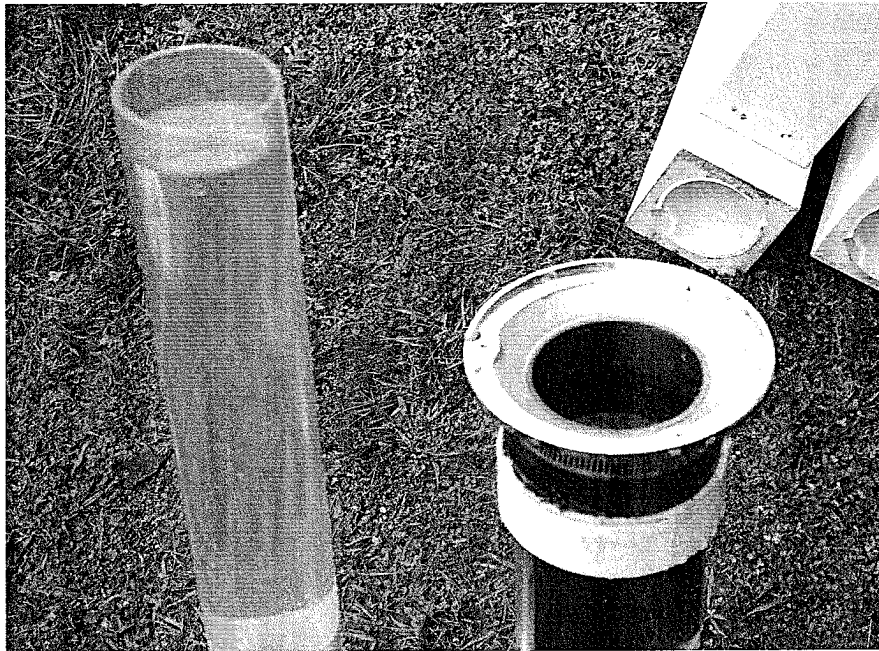
PHOTOGRAPH 8
TRAP GUARD DEVICE IN SIMULATED



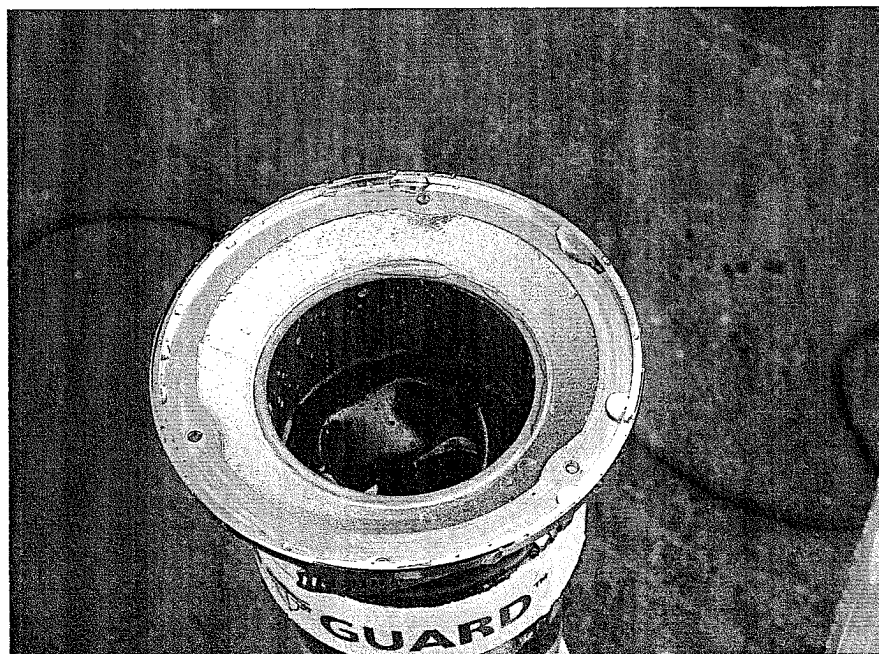
PHOTOGRAPH 9
**TRAP GUARD DEVICE IN SIMULATED
DRAIN ASSEMBLY WITH WATER SUPPLY ATTACHED**



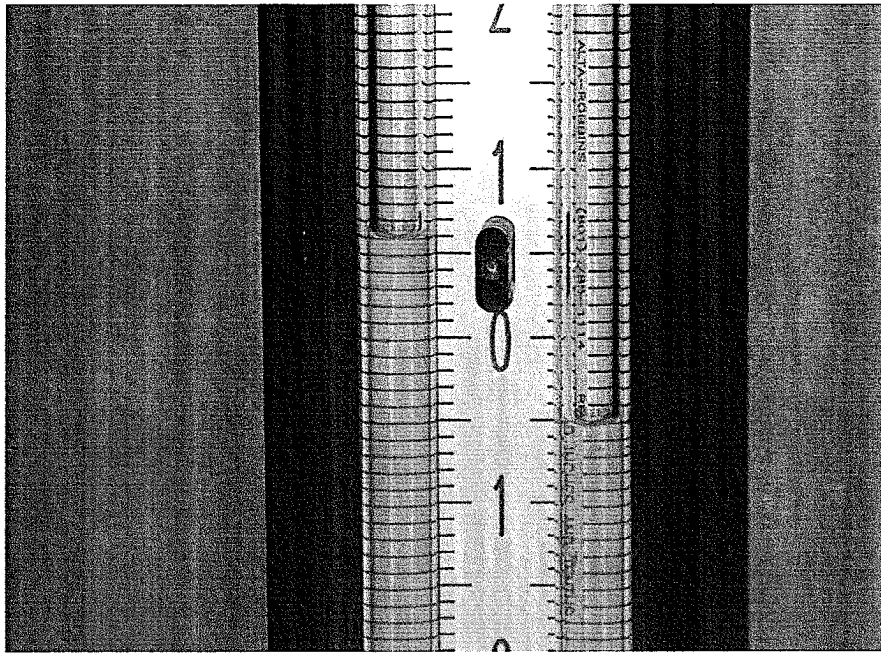
PHOTOGRAPH 10
**TRAP GUARD DEVICE WITH WATER
LEVEL ABOVE DRAIN LEVEL**



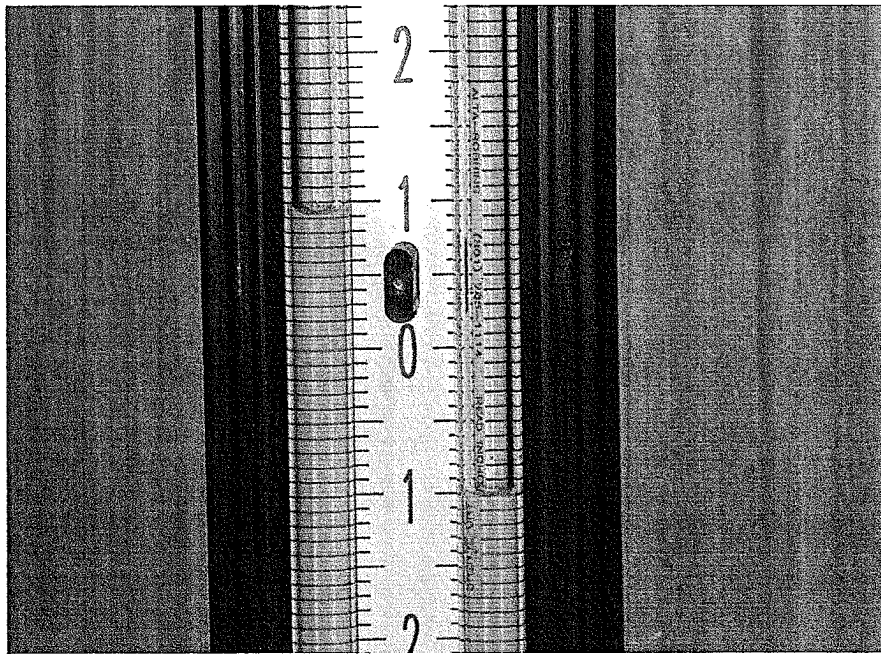
PHOTOGRAPH 11
**TRAP GUARD DEVICE WITH WATER
LEVEL ABOVE DRAIN LEVEL**



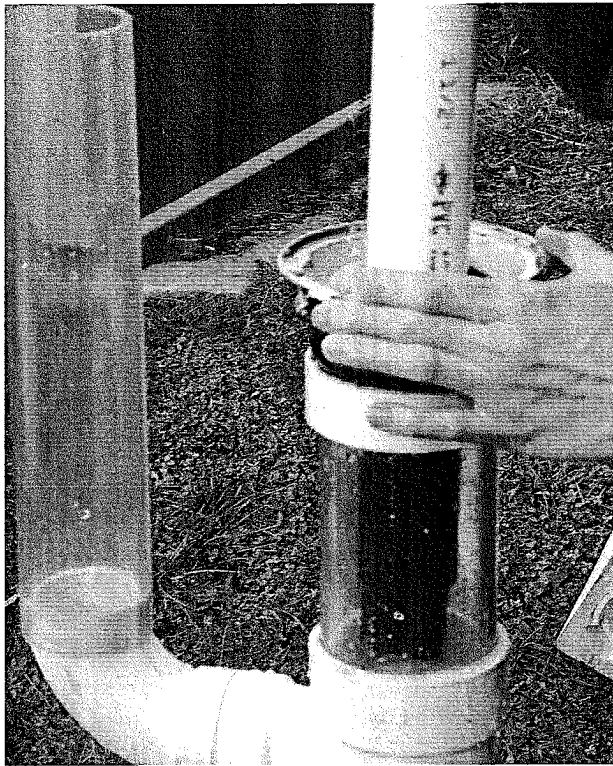
PHOTOGRAPH 12
**TRAP GUARD DEVICE WITH WATER
LEVEL ABOVE DRAIN LEVEL**



PHOTOGRAPH 13
1" H₂O (5.2 PSF) PRESSURE MEASURED
FROM WATER / DRY ICE GAS



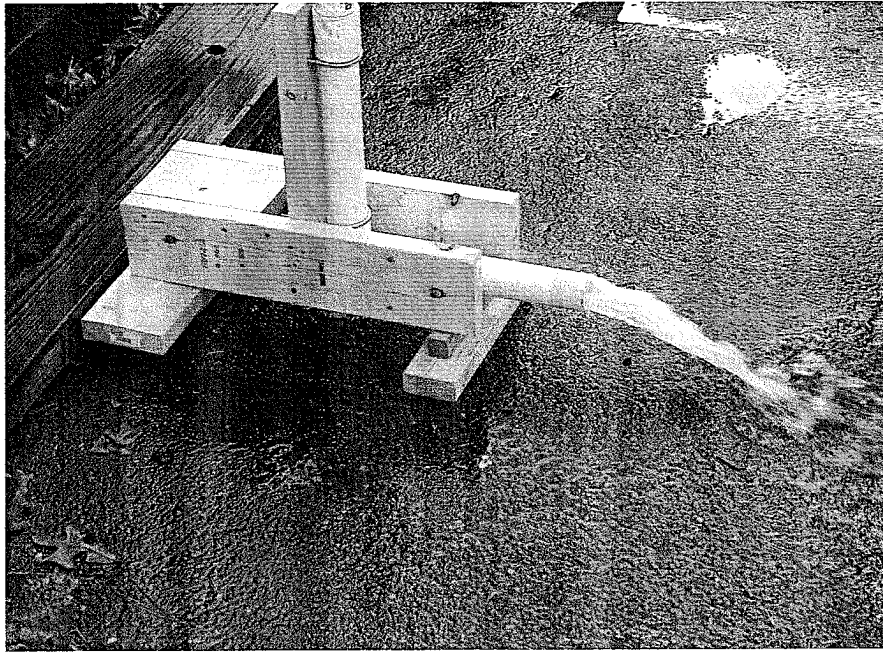
PHOTOGRAPH 14
2" H₂O (10.4 PSF) PRESSURE MEASURED
FROM WATER / DRY ICE GAS AND
COMPRESSED AIR



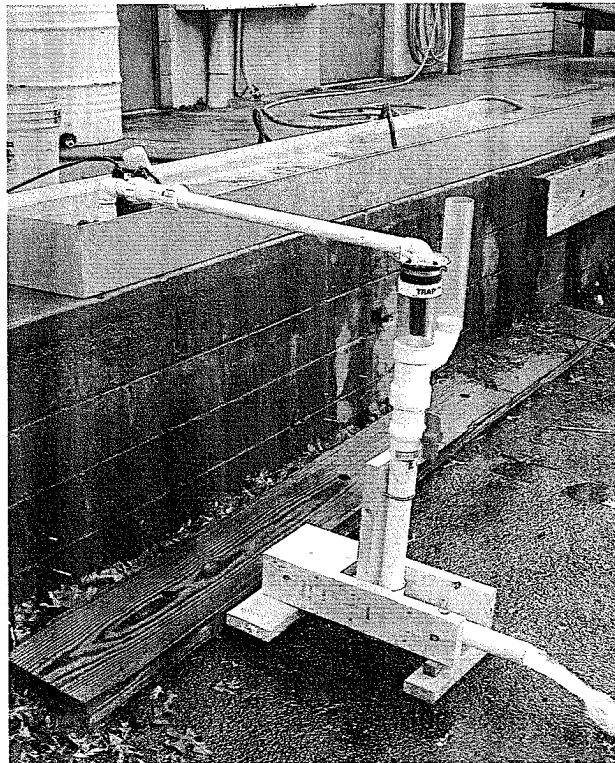
PHOTOGRAPH 15
**INSERTING 1 1/2-INCH PVC PIPE INTO
TRAP GUARD DEVICE**



PHOTOGRAPH 16
1 1/2-INCH PVC PIPE INSERTED



PHOTOGRAPH 17
WATER DISCHARGE IN EXCESS OF 33-
GALLONS/HOUR THROUGH TRAP GUARD DEVICE



PHOTOGRAPH 18
WATER DISCHARGE IN EXCESS OF 33-