

LOAD INDUCED WATER DISPLACEMENT TEST REPORT

PaveVent - Pothole Relief Device



TEST DATE:
30th April 2026



TEST COMPLETED BY:
Pothole R&D Team



SAMPLE REFERENCE:
PRD-LWD-001



TEST EQUIPMENT:
Compacted asphalt block
Sand bed (sub-base simulation)
Water supply (via device)
Manual impact tool (hammer)

1 OBJECTIVE

To evaluate the functional performance of the PaveVent Pothole Relief Device in enabling load-induced water displacement when installed within an asphalt structure.

The test aimed to demonstrate:

- Activation of the device under applied vertical load
- Upward displacement of water from the sub-base through the device
- Effectiveness of the device in relieving trapped water beneath asphalt
- Visible and repeatable water ejection response

2 TEST METHOD

- A compacted asphalt block was prepared with a PaveVent device installed centrally.
- The block was placed on a sand bed to simulate a road sub-base.
- Water was introduced beneath the asphalt via the device to simulate trapped groundwater conditions.
- The system was allowed to stabilise to ensure saturation at the base.
- A downward force was applied to the asphalt surface using repeated hammer strikes.
- Observations were recorded to determine whether water was displaced vertically through the device.
- The test was repeated multiple times to confirm consistency of response.

4 KEY OBSERVATIONS

- Hydraulic Activation**
Water movement was initiated only when load was applied, confirming load-responsive behaviour.
- Vertical Displacement**
Water consistently travelled upward through the device opening, demonstrating controlled flow direction.
- Repeatability**
The mechanism performed consistently across multiple impacts without degradation.
- System Integrity**
The device remained securely embedded within the asphalt with no visible displacement or damage.
- Effective Function**
The device effectively converts downward load into upward water displacement, helping relieve trapped water beneath the pavement.

3 EVIDENCE / RESULTS

TEST SETUP – DEVICE INSTALLED IN ASPHALT BLOCK



Compacted asphalt slab with centrally installed PaveVent device, positioned on a sand bed to simulate sub-base conditions. Water introduced through the device opening to establish saturated conditions beneath the asphalt layer.

LOAD APPLICATION – IMPACT EVENT



Downward compressive force applied to the asphalt surface to simulate traffic loading.

RESULT – WATER EJECTION RESPONSE



Immediate vertical ejection of water observed through the device upon application of load, demonstrating load-induced displacement from the sub-base.

RESULT SUMMARY

- ✓ Water was forcibly ejected through the device immediately upon application of vertical load
- ✓ The ejection was clearly visible and occurred in a direct upward path through the device opening
- ✓ The response was repeatable across multiple impacts
- ✓ The test confirms that the device enables rapid pressure relief of trapped sub-surface water
- ✓ No blockage or structural failure of the device was observed
- ✓ The observed behaviour is consistent with load-induced hydraulic displacement through a defined vertical flow path

5 CONCLUSION

The Load Induced Water Displacement Test demonstrates that the PaveVent Pothole Relief Device effectively converts downward mechanical load into upward water movement.

This indicates:

- Effective relief of trapped water beneath asphalt
- Functional activation under simulated traffic loading conditions
- Reliable and repeatable hydraulic performance
- Suitability for mitigating water-related pavement degradation

OVERALL CONCLUSION:

The PaveVent Pothole Relief Device successfully demonstrated load-activated water ejection from a simulated sub-base environment.

The device shows strong potential for reducing water accumulation beneath asphalt surfaces and improving pavement longevity in real-world conditions.

6 RECOMMENDATIONS / NEXT STEPS

- Conduct controlled load testing with measured force inputs
- Perform cyclic loading tests to simulate real traffic conditions
- Evaluate performance under varying saturation levels
- Undertake field trials in live road environments
- Measure flow rates and discharge volume for quantifiable validation

Note: This is a simple test conducted in a laboratory environment for observational purposes. Further controlled testing in real-world conditions is recommended to validate long-term performance.