



**Public Works**  
Manly Hydraulics Laboratory

# FLOODING SOLUTIONS FLOODPLANK LABORATORY TESTING SEPTEMBER 2013

Report MHL2240  
October 2013

Flooding Solutions Advisory Group

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## Foreword

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This report presents the methodology and results for testing undertaken by NSW Public Works' Manly Hydraulics Laboratory (MHL) on behalf of Flooding Solutions Advisory Group on the 'Floodplank' system. Testing was undertaken only to measure static water level leakage.

This report is commercial in confidence and can only be released with the permission of Flooding Solutions Advisory Group and MHL's Principal Engineer.

## Summary

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In April 2013 Flooding Solutions Advisory Group approached NSW Public Works' Manly Hydraulics Laboratory to undertake testing of their Floodplank system for leakage. As there is no Australian standard for testing of this type the BSI British Standard PAS 1188-1:2009 'Flood protection products – Specifications' was used as a guide. Only the static leakage rate test was undertaken.

The Floodplank system is a totally removable temporary floodwall, designed to offer similar performance characteristics to permanent flood barriers. Made from extruded aluminium, each Floodplank stacks on top of the previous plank, an operation that can be completed by a single individual. The Floodplank seals against flat floor surfaces. No sill is required, reducing the risk of trip hazards. Horizontal lengths to fit an opening width are made to measure. To provide continuous protection for larger openings or areas, multiple stacks of Floodplank can be joined together using support stanchions.

Hydraulics laboratory testing of a eight-plank high system with two wall brackets and two stanchions (length of 5.430 m), when correctly installed<sup>1</sup>, resulted in no observed leakage when the water level was set to three planks high. With slight modifications, there was a leakage rate of 23.2 L/hr, when the water level was set to 6.5 planks high (water level 2.01 m). The system survived water overtopping for a period of 30 seconds with no obvious damage.

As there are no current Australian Standards for flood protection products the British Standard Institute's PAS 1188 was used to compare the results obtained. During the testing the Floodplank system showed no measureable leakage at three planks high (705 mm), which is below the specified leakage rate of 1 litre per hour per metre as specified in PAS 1188-1 for Building Aperture Products.

Testing at 6.5 planks high (1520 mm) showed a leakage rate of 4.3 litres per hour per metre, or roughly 10% of what the acceptable target (40 litres per hour per metre) defined in PAS 1188-4 'Flood Protection Products'.

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<sup>1</sup> It is important that installation of the Floodplank system be undertaken only by trained personnel and in strict accordance with the manufacturer's installation protocols. Failure to install Floodplanks in the correct manner may lead to ineffective performance.

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# 1. Methodology

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The following outlines the equipment under test and the methodology use.

## 1.1 Equipment under Test - Floodplanks

The Floodplank system is a removable temporary floodwall, designed to offer similar performance characteristics to permanent flood barriers. Made from extruded aluminium, each Floodplank stacks on top of the previous plank, an operation that can be completed by a single individual. The Floodplank seals against flat floor surfaces. No sill is required, reducing the risk of trip hazards. Horizontal lengths to fit a particular opening width are made to measure. To provide continuous protection for larger openings or areas, multiple stacks of Floodplank can be joined together using support stanchions.

It is important that installation of the Floodplank system be undertaken only by trained personnel and in strict accordance with the manufacturer's installation protocols. Failure to install Floodplanks in the correct manner may lead to ineffective performance.

For the laboratory testing at MHL, the following components were used:

Type	Model	Description	Number
Floodplanks	FP02	1 to 2 metre with stability cleats	24
Stanchions	FPS7 Series 1	8 Floodplank height	2
Wall Connectors	VWC7	8 Floodplank height	2

The test section comprised two wall connectors and two stanchions. The overall length of the test section was 5.430 m (see Figure 1).

## 1.2 Test Method

The basic method of testing was:

1. Install Floodplank 8 planks high in a watertight head box.
2. Fill behind the system with water to 3 planks high and hold for 30 minutes.
3. If leakage occurs, monitor leakage.
4. Further fill behind the system to 6.5 planks high and hold for 30 minutes.
5. If leakage occurs, monitor leakage.
6. Further fill with water until overtopping of the system and hold for 30 seconds.

The head box had a controlled water supply and a drain valve. The floor of the head box was sloped down to the drain to allow for full capture of any leakage.

Due to the expected small leakage flow rate, the leakage flow was measured volumetrically at the end of each test. Water used was from Manly Dam (non-saline, stormwater equivalent).

Installation was undertaken by Flooding Solutions Advisory Group's staff. Testing was undertaken over two days. Test 1 occurred on 21 August 2013, and Test 2 and Test 3 took place on 3 September 2013.



**Figure 1 Floodplank as Installed**

## 2. Results

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Results of the test program described in Section 1 are presented below.

### **2.1 Test 1 – Water Level 3 Planks High**

Over the 30 minutes of the test there was no detectable or observable leakage in the Floodplank system over the 5.430 m long test section.

### **2.2 Test 2 – Water Level 6.5 Planks High**

With the water level at 6.5 planks high (water level behind the system was 2.01 m) there was leakage of 11.6 litres in 30 minutes. Before this test was commenced, additional bracing was added to stop the tops of the stanchions from moving. In the normal Floodplank system there would be a 45° brace on the stanchion but there was not enough room in the test head box for this to be accommodated, hence additional bracing was added between the stanchion and the Floodplank.

The bolt pattern holding the planks in place on the stanchion is evenly spaced. In future designs, it is recommended that the bolt pattern holding the Floodplanks be modified so that there are more bolts low down where the hydrostatic water force is greatest.

### **2.3 Test 3 – Water Overtopping**

The Floodplank system was overtopped for 30 seconds. There was no visible change or damage to the system.

## 3. References

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BSI British Standard PAS 1188-1:2009; Flood protection products – Specifications

BSI British Standard PAS 1188-4:2009; Flood protection products. Specification. Part 4: Demountable products.

Flooding Solutions website: <http://www.floodingsolutions.com.au/floodplank>



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