



MAHAFFEY ASSOCIATES PTY LTD (ABN 90 001 629 036)
Incorporating BEMAC Laboratories
Unit 9/108-110 Percival Rd (PO Box 2162) Smithfield NSW 2164
Ph (02) 9756 4003 Fax (02) 9757 4228 Email mahaffey@mahaffey.com.au

DRM/L01/10

9 May 2017

CLIENT: Radcrete Pacific

PROJECT: 39 Herbert Street Artarmon

SUBJECT: Water Penetration Testing of Cracks Treated with Radcon

OVERVIEW

Mahaffey Associates was engaged to assess water penetration through cracks previously treated with Radcon Formula #7 (Radcon). Testing carried out by others in 1993 showed that the water penetration did not occur through cracks after being treated with Radcon. The purpose of the testing covered by this report was to determine whether or not the performance previously demonstrated has been maintained.

It is understood that the slab was treated with Radcon prior to the 1993 testing and that no further applications have been made to the concrete.

The testing covered by this report showed that the cracks tested did not leak after the ponding of water over a series of cracks for a period of 6 days.

1. Introduction

In August 1993, the Building Research Centre of the University of New South Wales carried out testing of a slab treated with Radcon Formula #7 (Radcon) to assess water penetration through existing cracks. A copy of this report (Condition Survey of Applications Using Radcon Formula #7, dated August 1993) has been provided to Mahaffey Associates.

In April 2017, Mahaffey Associates was asked to do a follow up assessment of one of the slabs included in the BCRC report to determine if water was still not able to penetrate through cracks.

It is understood from the BCRC report that the slab was treated with Radcon prior to the preparation of the BCRC report. We have been advised that no further applications of Radcon have been made to the concrete in the intervening period.

Radcrete Pacific wished to confirm whether or not the water was still prevented from passing through cracks in this slab some 24 years after application.

2. Test Program

An area was selected for testing and a series of reservoirs were set up on the top floor carpark slab. 6 reservoirs were set up in total, three over un-cracked concrete and three directly over cracks (see Photograph A1 in Appendix A). The locations of the reservoirs are shown in Figure 1.

Visit 1 - 27 April 2017

David Mahaffey (DM) attended site and filled the reservoirs with water. The reservoirs were filled to the top, so that any loss of water would be apparent. The depth of the reservoirs was 100-110mm. A screw-on cap was then placed onto each of the reservoirs and this was secured with tape. The tape was signed by DM so that there could be no question of tampering between visits. The caps were also used to prevent evaporation of water or to prevent filling with rain during the test period. The taped reservoirs can be seen in Photographs A2 to A7.

Some initial movement of water into the crack could be seen at location 3 (see Photograph A8).

Visit 2 - 1 May 2017

DM attended site, removed the caps from each of the reservoirs and topped up the water. Some very minor water loss had occurred in this initial period. This was not measured, as some initial absorption of water into the concrete surface was expected.

The caps were then placed back onto the reservoirs and re-taped (see Photographs B1 to B6 in Appendix B).

The damp patch around the crack at location 3 was slightly larger than when the reservoirs were first filled (Photograph B7). Some initial movement of water into the crack could be

seen at locations 2 and 6 (Photographs B8 and B9).

The slab soffit was inspected during this visit and the cracks below locations 2, 3 and 6 identified. No water penetration was observed at any of the cracks. These cracks can be seen in Photographs B10-12.

Visit 3 – 3 May 2017

DM attended site and removed the caps. The water level in each reservoir was measured and the drop in water recorded. The measured drop in water was as follows.

- Location 1 (Uncracked) – 5mm
- Location 2 (Uncracked) – 9mm
- Location 3 (Cracked) – 11mm
- Location 4 (Cracked) – 7mm
- Location 5 (Uncracked) – 5mm
- Location 6 (Cracked) - 6mm

The water level in each reservoir at the time of measurement can be seen in Photographs C1 to C6 in Appendix C.

The damp patch along the crack at location 3 had reduced significantly in size between visits 2 and 3 (see Photograph C7). The dampness along the crack at location 2 had disappeared completely. The dampness along the crack at location 6 remained constant between visits (Photograph C8).

The soffit cracking was inspected again and there was no evidence of water penetration in any of the areas tested.

3. Findings

The testing showed that, in the 6 days of the test program, water penetration through the cracks did not occur. The height of water in the reservoirs, at more than 100mm, generated

an amount of hydrostatic pressure which would not be present in service, as the slab is open and free draining. The conditions of the test are therefore more severe than the likely in-service conditions.

Some slight loss of water height in the reservoirs was observed, however, this is to be expected. The loss in height was generally consistent between cracked and un-cracked test areas, with the mean height difference being less than 2mm.

The performance of the slab is consistent with the findings of the BCRC report of 1993 and indicates that the cracks do not allow water penetration when subjected to the test conditions.

Yours faithfully,

Mahaffey Associates Pty Ltd



D. R. Mahaffey

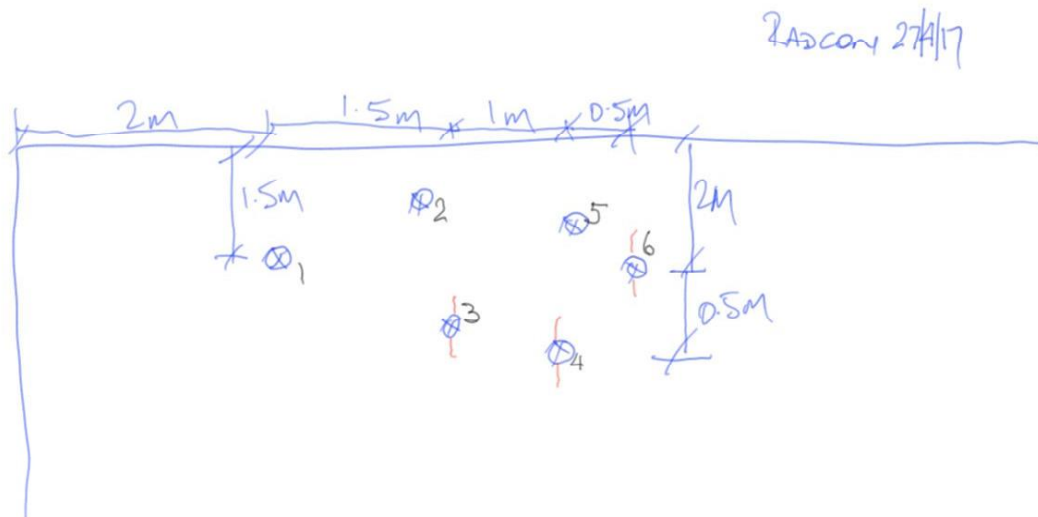


FIGURE 1 – Test Locations

Note: Red line indicates presence and direction of cracking

APPENDIX A

Visit 1 – 27 April 2017



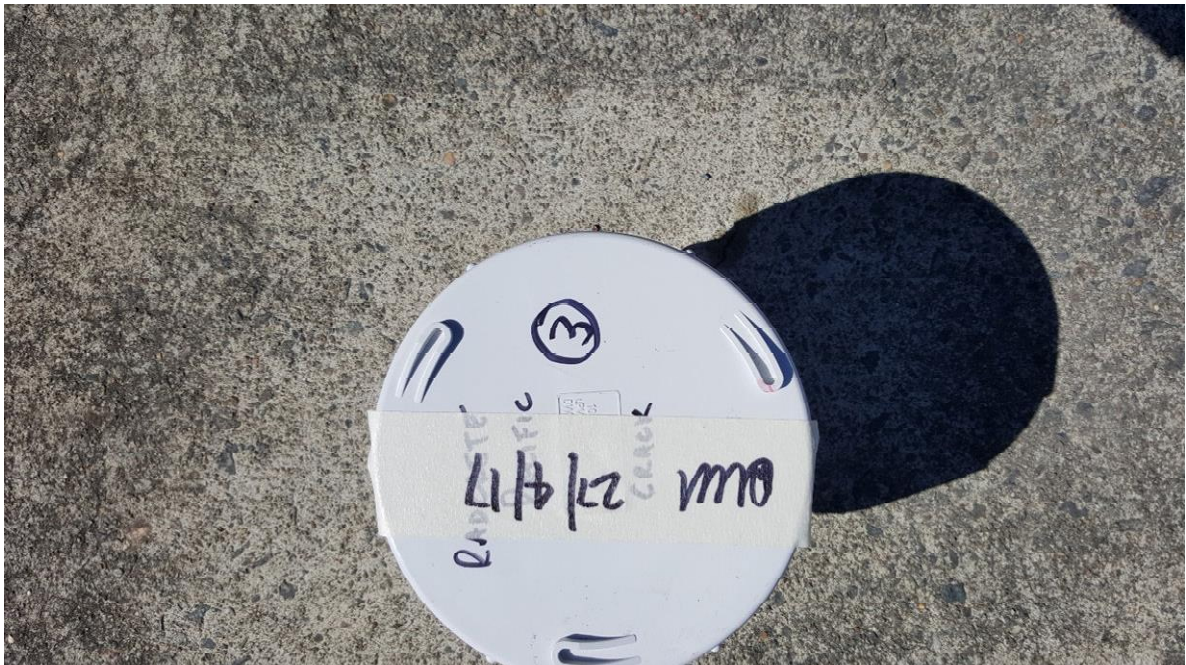
A1



A2



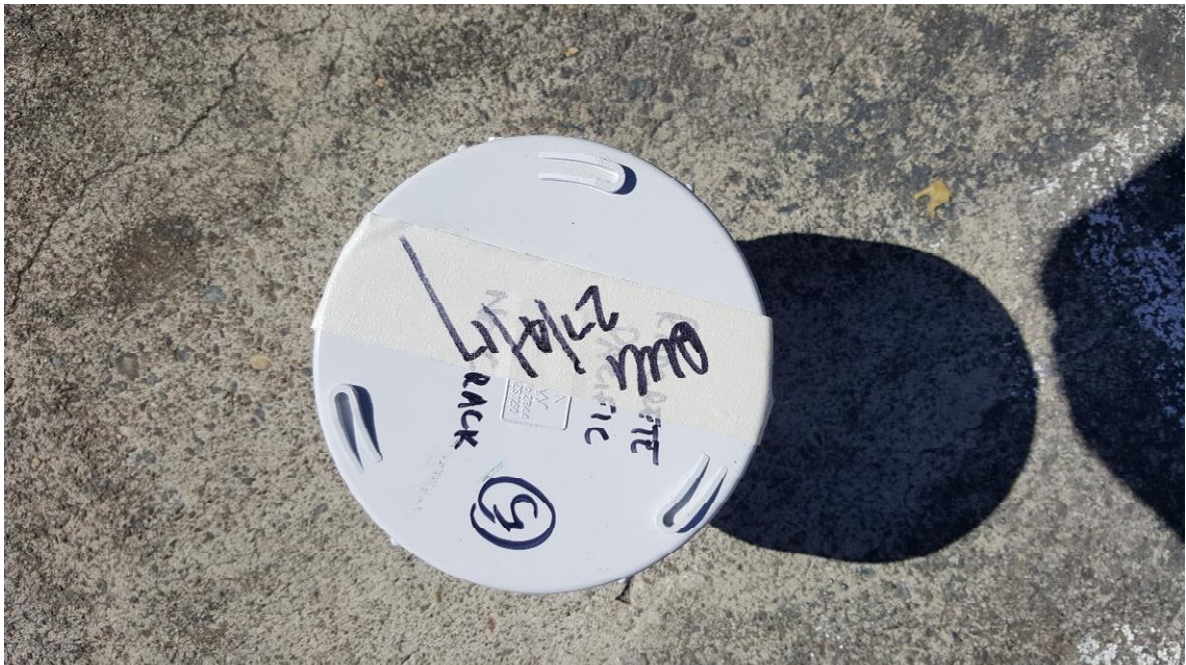
A3



A4



A5



A6



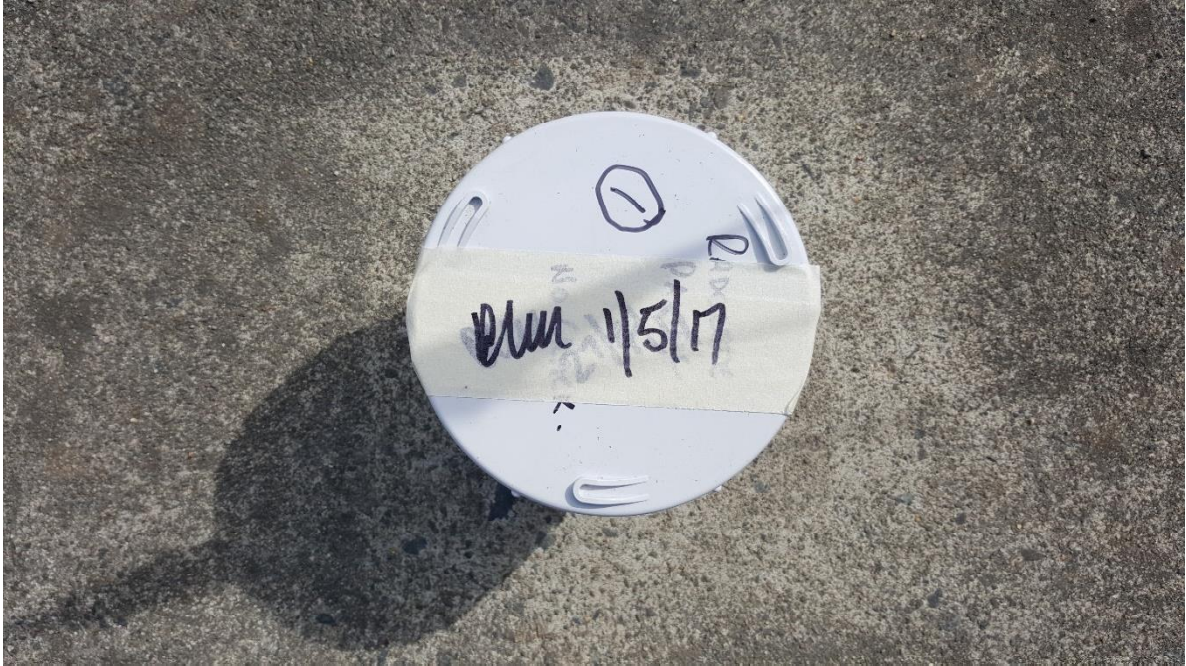
A7



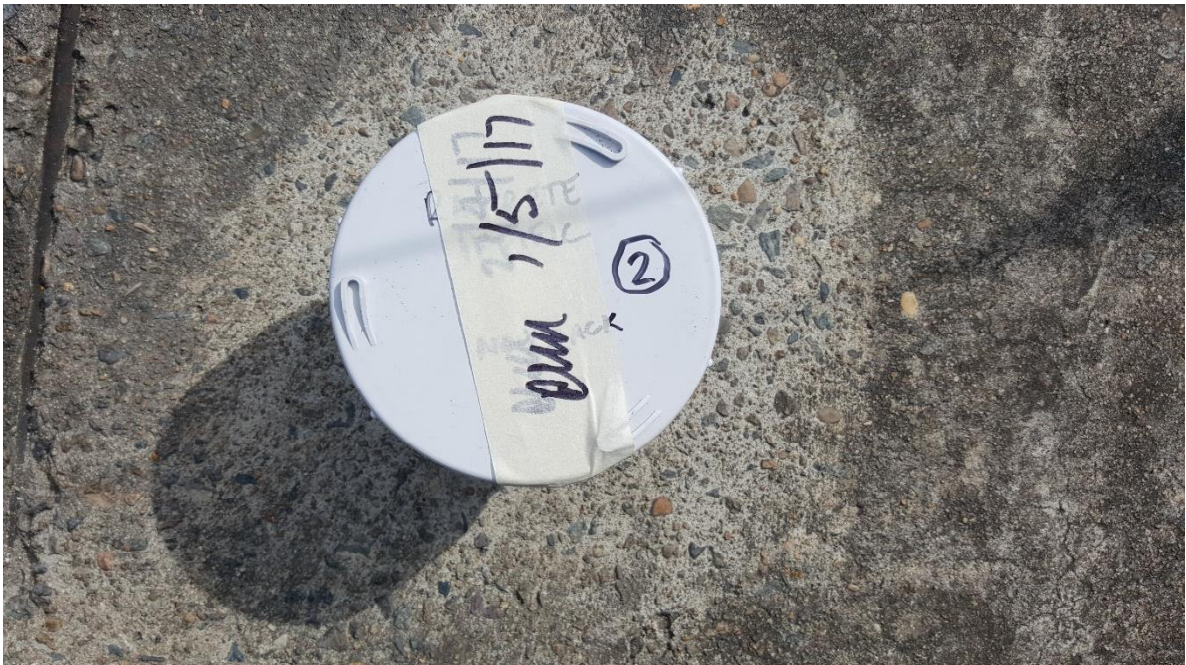
A8

APPENDIX B

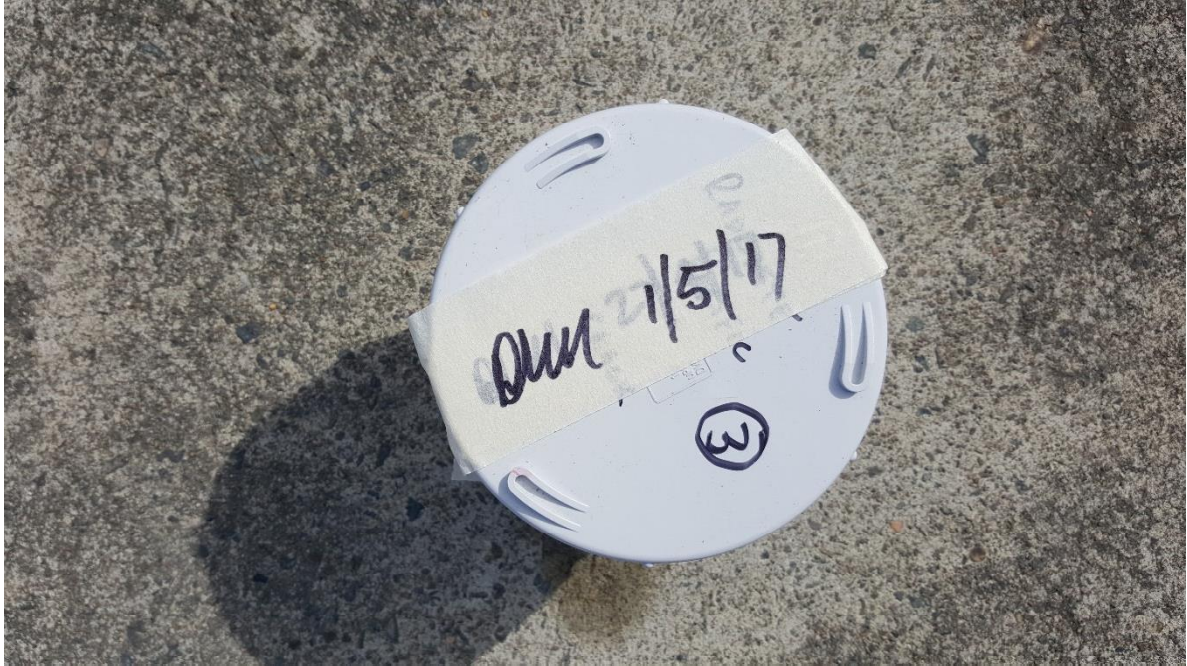
Visit 2 – 1 May 20117



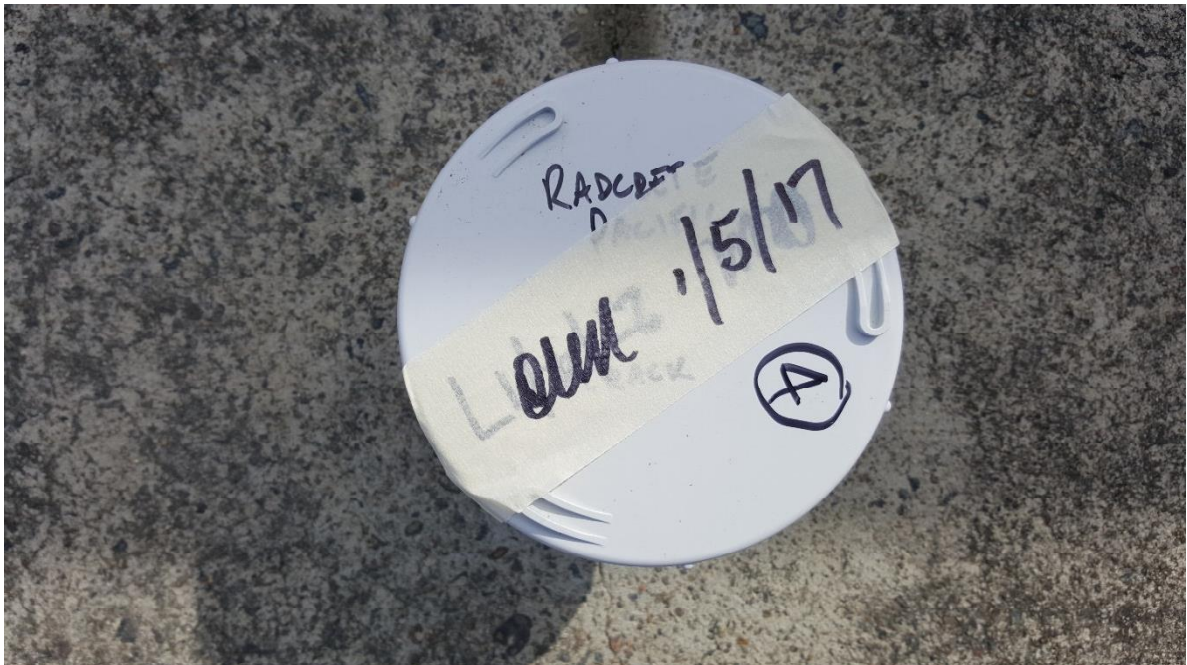
B1



B2



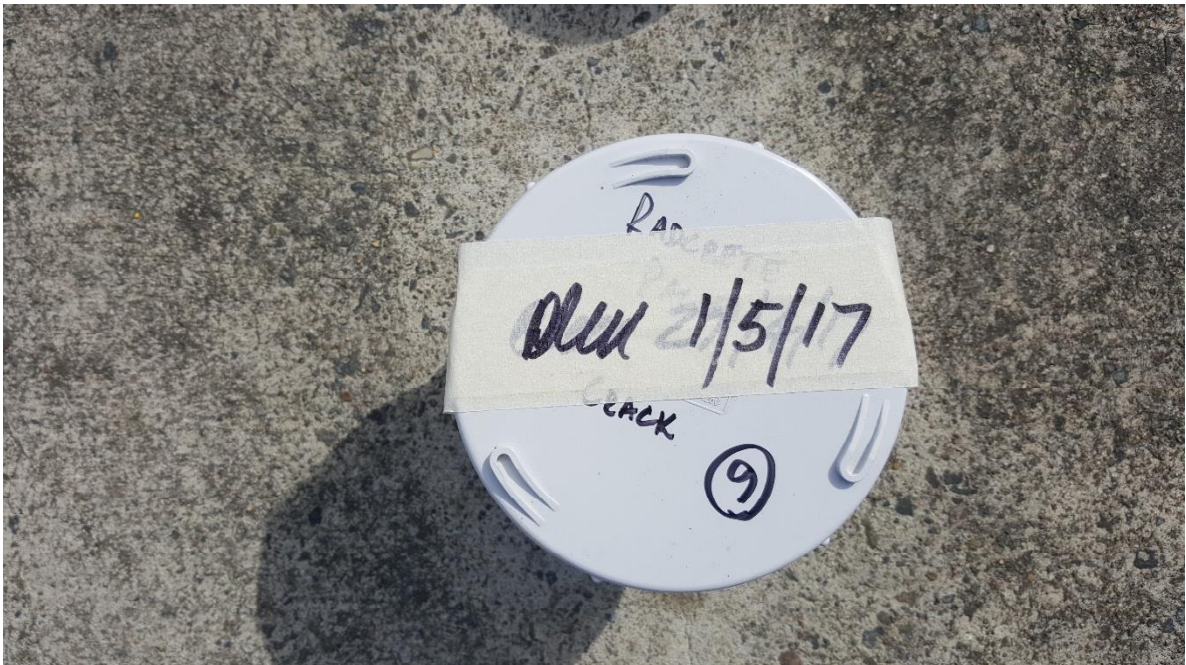
B3



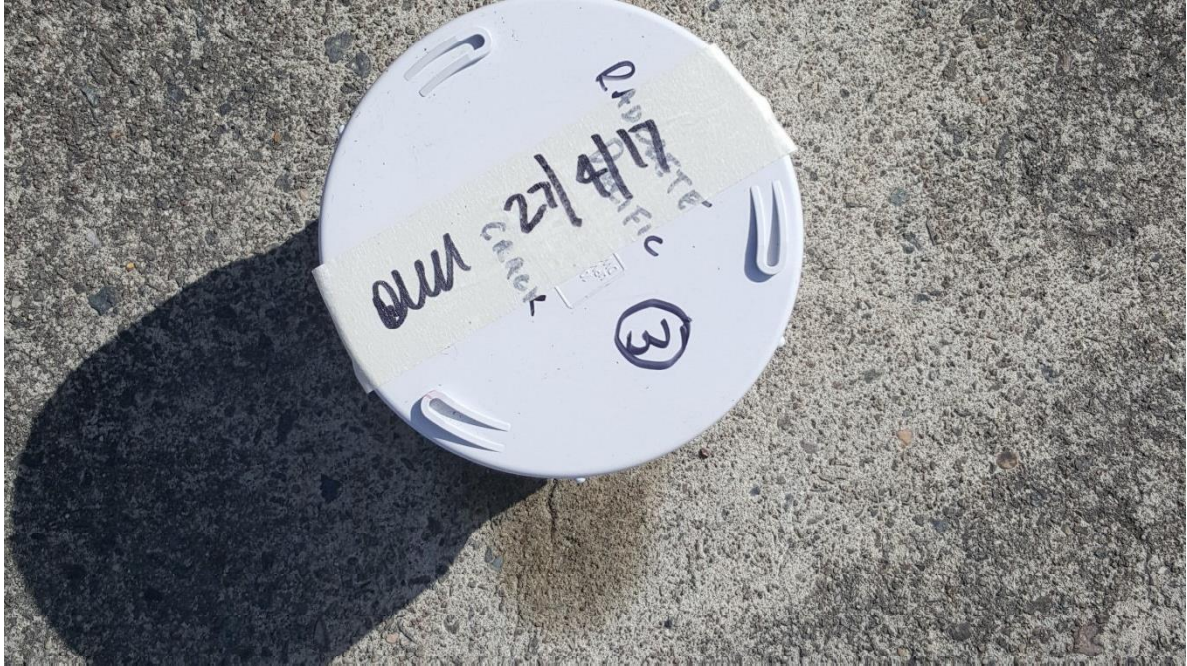
B4



B5



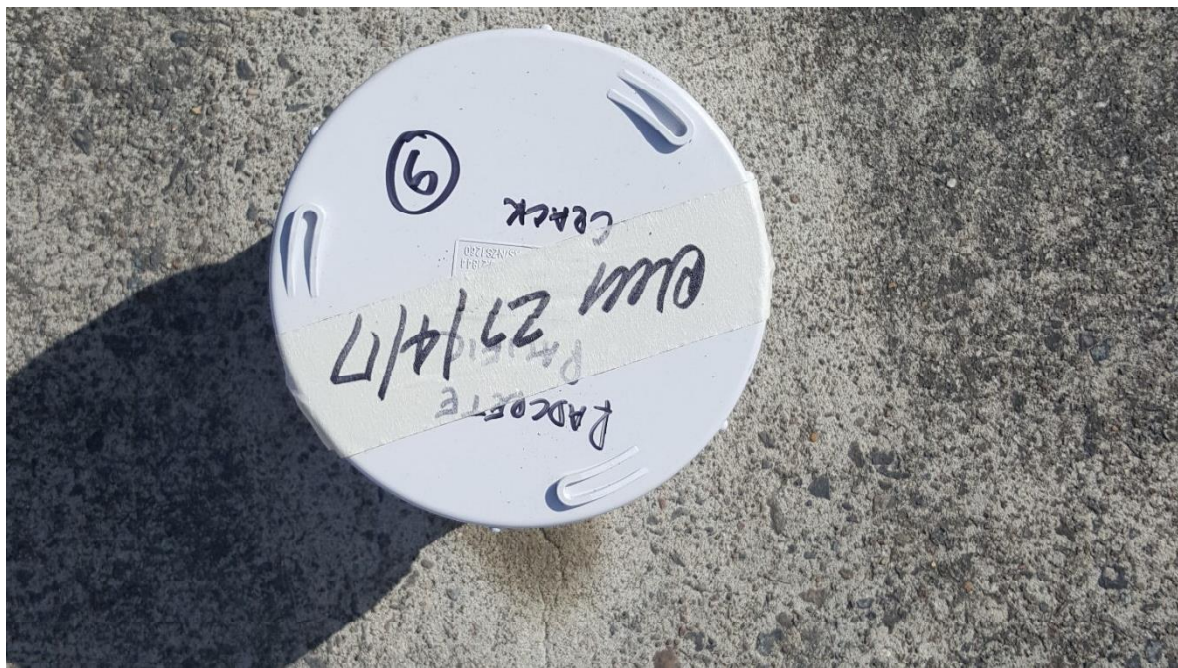
B6



B7



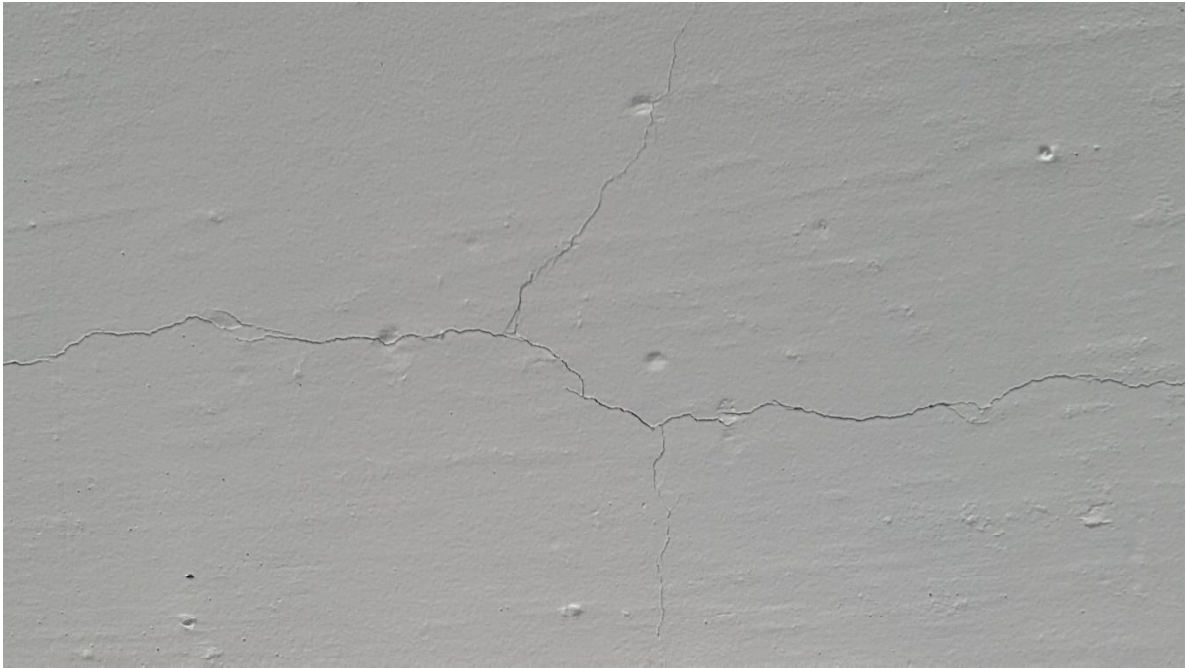
B8



B9



B10



B11



B12

APPENDIX C

Visit 3 – 3 May 20117



C1



C2



C3



C4



C5



C6



C7



C8