

3.2.2 -Learnings from outcomes to refine testing methods

- The testing methods (ASTM and SIT) were sufficient to capture the variation in infiltration rates. Creating a temporary seal between the equipment and the permeable surfaces was the most challenging aspect of the testing methods. Plumber's putty was used in this project to create the seal. This was sometimes difficult to remove and left an oily residual where applied (Table 9). It is recommended to use a wire brush to remove any pieces of putty that may become embedded into the asphalt matrix after testing.
- High spatial variation in infiltration rates was observed. It is recommended that future infiltration tests should commence with the ASTM method and then proceed to the SIT method if expected infiltration times are exceeded. A minimum of three testing sites per area is recommended. Each site should receive a pre-wet test and at least two tests further for recording infiltration performance. A third test should be conducted if the results differ significantly from the first two tests following the pre-wet.

Table 9. Plumber's putty oily residual

| Test | Test installed | Remaining residue |
|------|---|--|
| ASTM |  |  |
| SIT |  |  |

3.3 Thresholds for when cleaning should occur

3.3.1 Recommendations for frequency of cleaning

We consider that cleaning should be conducted when infiltration rates fall below 100 mm/hr. While an asset with even 30 mm/hr of infiltration could effectively infiltrate a 10% annual exceedance probability (AEP) event (assuming treatment area = catchment area), it becomes more difficult to accurately measure infiltration rates and more likely runoff will occur from some portions of the asset. An infiltration test that exceeds 35 minutes will indicate this point. This threshold is based on the following:

- Pressure washing, via the thorough approach, was observed to be the most effective cleaning method. This method was applied across all Sites at Harris St. The test results for this location were used to determine the frequency of cleaning.
- The median infiltration rate for each of the cleaned areas, at each testing period, were selected as representative values for Harris St. These values are provided in Table 10 and are graphed in Figure 18, Figure 19, Figure 20. The minimum and maximum values across these areas have also been included to highlight the level of variation observed. The selected medians for each area were used to produce exponential decay relationships. The Sites within each area are shown in Figure 27 and are listed below.
 - Area 1: Sites 10, 11, 12
 - Area 2: Sites 13, 14, 15
 - Area 3: Sites 16, 17, 18
- The decay relationships were used to predict when each area would reach 100mm/hr. An average of the three cleaning times was calculated to produce an overall cleaning frequency for Harris St. This period is 18 months or 1.5 years.

Table 10. Representative median infiltration rates for each area at Harris St

| Months after cleaning | Cleaning area | Infiltration rates (mm/hr) | | |
|-----------------------|-----------------|----------------------------|--------|--------|
| | | Min | Max | Median |
| 0 | Harris St 10-12 | 2,619 | 6,548 | 3,667 |
| 4 | Harris St 10-12 | 837 | 3,820 | 2,032 |
| 8 | Harris St 10-12 | 166 | 3,217 | 327 |
| 12 | Harris St 10-12 | 100 | 2,419 | 870 |
| 0 | Harris St 13-15 | 3,667 | 10,186 | 8,334 |
| 4 | Harris St 13-15 | 68 | 3,161 | 2,957 |
| 8 | Harris St 13-15 | 68 | 1,567 | 1,264 |
| 12 | Harris St 13-15 | 68 | 391 | 290 |
| 0 | Harris St 16-18 | 1,191 | 7,639 | 7,052 |
| 4 | Harris St 16-18 | 89 | 4,264 | 3,526 |
| 8 | Harris St 16-18 | 68 | 2,060 | 1,329 |
| 12 | Harris St 16-18 | 68 | 473 | 326 |

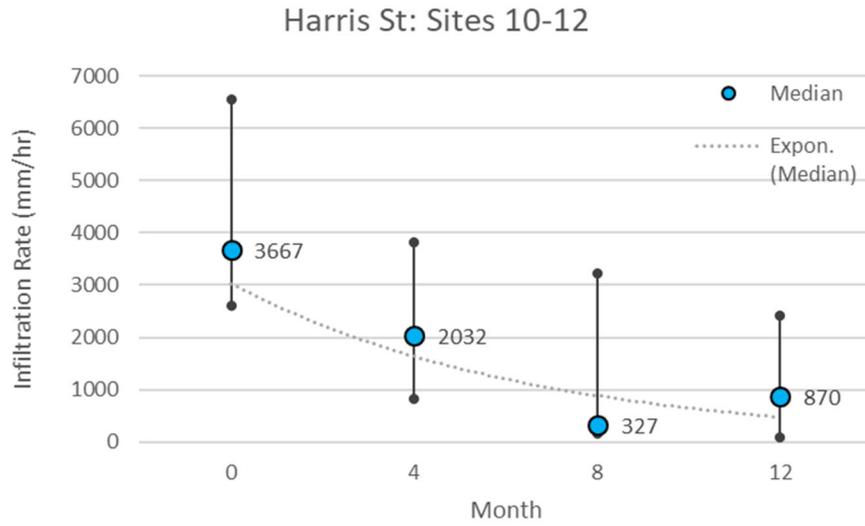


Figure 18. Harris St - Area 1

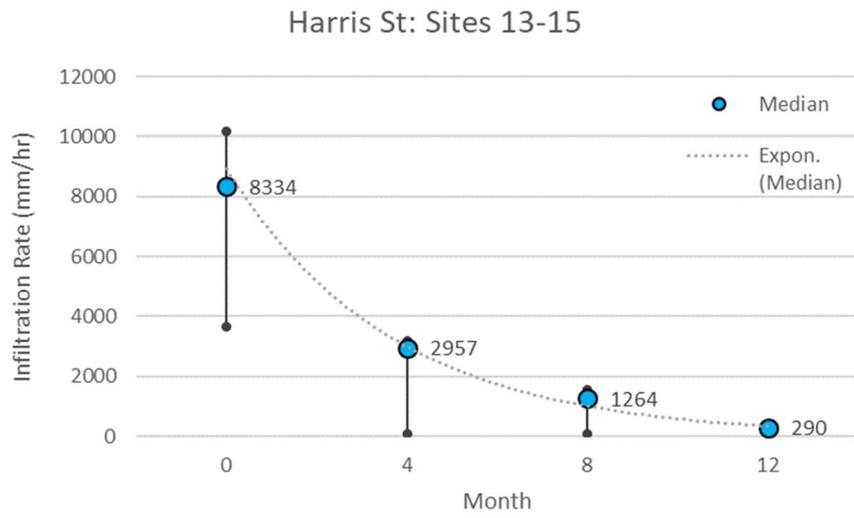


Figure 19. Harris St - Area 2

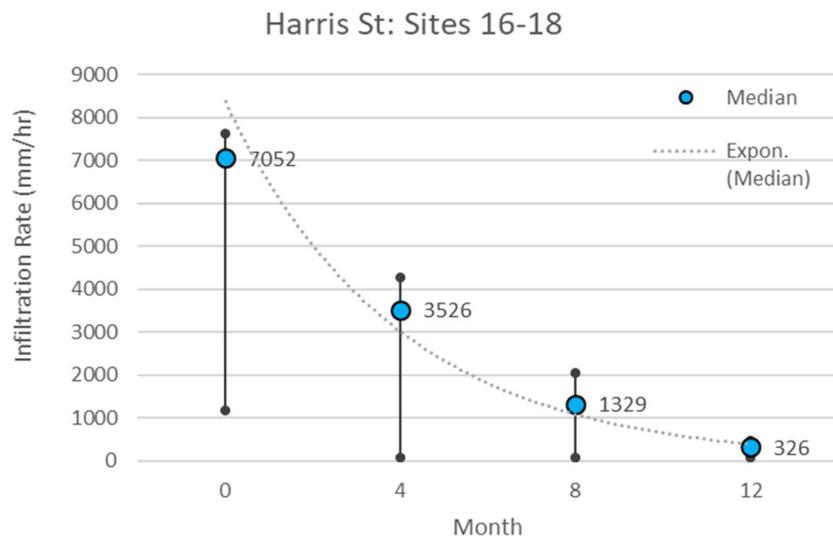


Figure 20. Harris St - Area 3