

**FINAL REPORT PREPARED FOR
SSL ALLIANCE (METRONET)**

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**CHEMCRETE PAVIX CCC100 (PAVIX): PREVENTING BUDDLEIA
GROWTH ON MASONRY RAILWAY ARCHES**

LOCATION: PUTNEY BRIDGE STATION

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INTRODUCTION

The aim of the reported trial is to determine the contribution that Chem-Crete Pavix CCC100, a protective impregnation solution, might make in combating the growth of Buddleia on railway arch masonry. Buddleia grows readily on masonry and, if unchecked, can be extremely destructive.

The trial was conducted in two stages, both with photographic documentation. Six adjacent arches were adopted for the trial, these represented diagrammatically in figure 1. Under the first stage, masonry arches were selectively prepared and impregnated with Pavix CCC100. Two different levels of surface preparation were used in order to assess the possible effect of this. Under the second stage, an assessment was made of the re-occurrence of Buddleia growth.

BUDDLEIA

Buddleia, a hardy, deciduous, perennial shrub, was brought into Britain from the Himalayas to adorn Victorian gardens. There are seven common varieties, Nanho Blue being one of the most commonly observed at the trackside and on railway structures. It is fast growing and has powerful roots that penetrate bricks and mortar to find moisture. The wind readily disperses its light seeds which produce dense, long lasting flowering shrubs to 6ft-10ft in height. New shoots normally appear in April/May and die back with the first frost at the end of the year. Its blooms early in June and prospers in direct sunlight.

PAVIX CCC100

PAVIX CCC100 was originally formulated to protect new and old reinforced concrete from the highly destructive effects of water penetration, cyclic freeze-thaw loading and surface contamination. It is a water based, non-toxic impregnate that is rapidly gaining acceptability in several application areas, including statutory measures for highway bridge protection. It has also been applied extensively in airports.

PAVIX CCC100 is a crystallising hydrophobic material that responds defensibly to the prevailing moisture environment. Under wet conditions, tests prove that a high level of water proofing is delivered. Conversely, under drying conditions, the concrete is rendered vapour permeable i.e. it is able to breathe.

A range of product application methods are allowed, including brush and roller, back-pack spray and automated spray for large area projects. Application rates vary, depending on the condition of the concrete. For new concrete, a single coat application at 200ml/m² is appropriate. In the case of weathered or porous concrete, it is sometimes appropriate to increase this dosage. In the reported trial, a dosage rate of 200ml/m² was used.

RATIONALE OF TRIAL

The core idea in using Pavix was that it might cut off the supply of moisture needed for Buddleia to germinate and grow. Other beneficial characteristics are summarized as:

- Odourless and Non-Toxic
- Crack filling (widths <1.4mm)
- Freeze-thaw loading protective
- Colourless and non-staining
- Single, permanent application

TRIAL WORK

Stage 1

A complete photographic record of the masonry arch walls was made prior to preparing the wall surface for Pavix CCC100 impregnation. Figure 1, shows the approximate locations (marked A-H) and extent of Buddleia growth at 14th April. Surface preparation and impregnation followed within a few days of the photographic record being taken.

Prior to Pavix CCC100 impregnation, all existing vegetation was removed by hand. Arches 50 - 53 were prepared by manual wire brushing. No further surface preparation was carried out to arches 48 & 49.

The Pavix CCC100 solution was applied using a low pressure spray equipment to achieve a dosage rate of 200ml/m² on arches 48 - 51. Arches 52 & 53 were not treated with Pavix CCC100 to provide a reference.

Stage 2

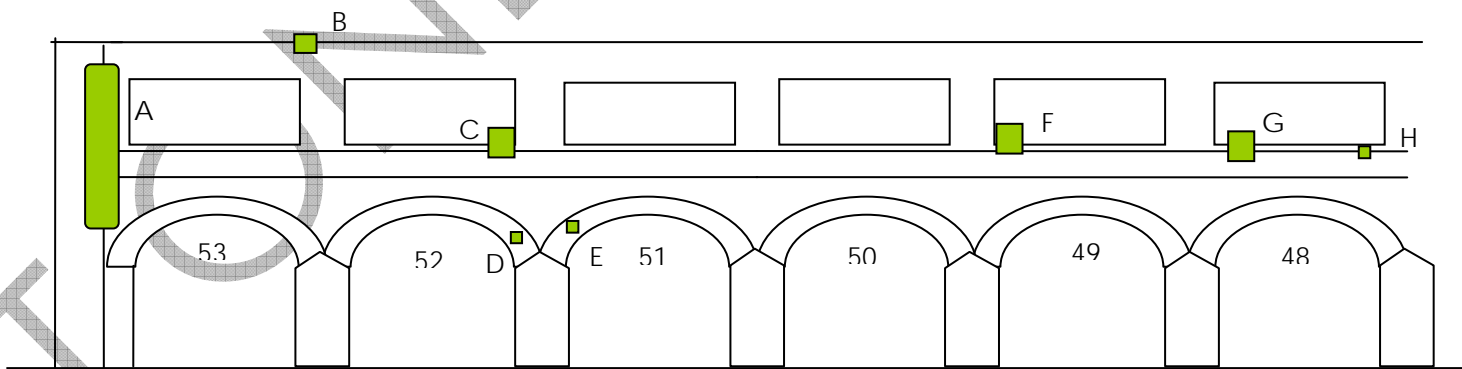
Figure 1 shows the post treatment situation as recorded on 27th May 2005. Close examination revealed Buddleia growth at the single location marked A on arch 53. The remainder of the wall was clean in appearance.

CONCLUSIONS

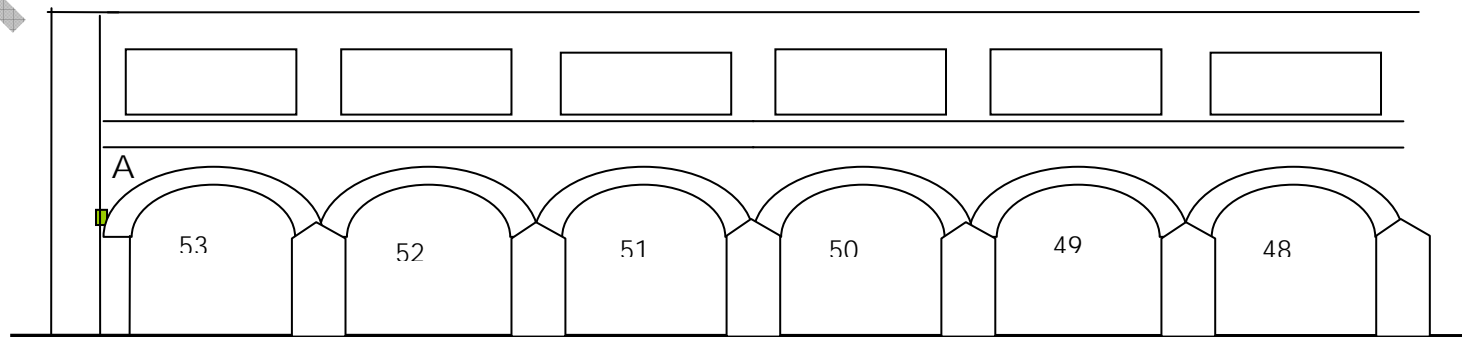
The main conclusions are summarised as follows:

- Over the 12 month growing season, there was no re-occurrence of Buddleia on surfaces impregnated with Pavix CCC100.
- For Pavix treated surfaces, removing vegetation and wire brushing showed no improvement over just removing vegetation.
- Removing vegetation and wire brushing without Pavix CCC100 impregnation failed to prevent re-occurrence of Buddleia growth.

From the trial it appears that Pavix CCC100 impregnation is effective in combating the growth of Buddleia on masonry. This should be applied following removal of all vegetation. Wire brushing might be beneficial because it focuses attention in the vegetation removal work. To aid the absorption of Pavix CCC100, it should be applied only in dry weather conditions. Application should ideally follow 24 hours of rain free conditions.



Pre Pavix Treatment (14th April 2004)



Post Pavix Treatment (27th May 2005)

Figure 1.