

# Steel Window Services Pty Ltd

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Valonia Octavia  
Architects EAT  
Level 2, 118 Langridge Street  
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Re: Window Condition Report – Alfred Stables Building  
Alfred Lane, Melbourne

Dear Valonia,

Following my survey at the site above, I am pleased to supply this attached condition report for the steel frame windows therein.

Of the 96 windows, I was able to inspect 84, with 12 louvre windows inaccessible.

My report consists of three main parts:

- An overview describing general condition, range of condition and some technical explanations.
- A detailed spreadsheet listing for each window, with layout, condition, quantities of broken panes etc.
- Images of windows, both whole and detailed sections where appropriate.

I believe this should be sufficient for assessment of the necessary repairs and strategies to refurbish them to suitable use.

I will forward my invoice shortly.

Regards

Brian Scott

# Window Condition Report

## 'Alfred Stables' Building

### 1. Overview

- 1.1. The Alfred Stables building is currently undergoing major renovation and refurbishment works. For some time it has been occupied by the engineering department. I have been informed that the intention is for the building to be adaptively reused as office space.
- 1.2. The original steel windows in this building are typical of the steel frame windows in factory and warehouses from the 1920's to the 1960's. They utilised a mixture of window frame profiles and simple T and right-angle profiles for muntins and hoppers. Pivot sashes were constructed with right angle profile as opposed to the more complex male/female sash profiles.
- 1.3. All windows have the bite (mounting lip) on the inside which, fortunately, allows for easy glass replacement above the ground. Application of a modern paintable sealant on the outside edges is required to ensure a good seal. The old method of 'paint to the glass over putty' technique is not as effective in the longer term.
- 1.4. There is a mixture of sizes and pane layouts, with fixed louvre arrangements in bathroom and toilet areas.
- 1.5. Originally all windows would have been glazed with textured 'chicken wire' reinforced ¼" (6mm) glass. However only 26% of the panes retain this glass intact. The remainder are either broken or have been replaced with clear glass. Only the 12 windows on the 1st and 2nd levels facing Alfred Lane retain the majority (86%) of the chicken wire glass intact. It should be noted that this type of glass is no longer available. 'Georgian' wired glass is available but it's appearance and texture are very different.
- 1.6. The overall condition of the steel frames varies from good to fair in fixed and pivot sash sections and poor to very poor in the hopper and louvre sections. All show the need for external maintenance and refurbishment. This is quite common for steel frame windows, due to the reasonable belief that they are more robust than timber windows and thus require less maintenance. Although this is true to some extent, weathering over many years eventually can result in failures. The most common problem is insufficient attention to paint condition, followed by improper painting and over painting. Hoppers and louvre sections, due to their inherent design, have the additional problem of retaining dust, dirt and moisture and are difficult to maintain. The end result of this is:
  - 1.7. Failure of the paint seal between putty edges and glass, allowing moisture to penetrate behind the putty/bead – followed by
    - 1.7.1. Rusting of the frames, which creates expanding layers of rust, pushing out the putty/bead and eventually cracking the glass
    - 1.7.2. Over painting causing binding of the sash to frames, which can lead to distortion of the sash that, over time can lead to permanent warping of the sash and / or breakage of hinges which can create a dangerous situation where the whole sash can fall to the ground
    - 1.7.3. In fixed louvre sections, the pane retaining channels rust and enable panes to fall out
    - 1.7.4. Hopper frames rust in the lower corners, distorting the frame and breaking the glass
    - 1.7.5. Eventually frame sections will rust away, particularly in the bottom rails and corner areas.

Unlike timber windows, steel windows can survive longer given the same level of attention and rusted out sections are much easier to replace than rotten timber sections. However, steel windows are more likely to crack window panes from the expanding rust.

## 2. Current Condition

- 2.1. Other than hoppers and louvre sections, none of the existing steel frame windows inspected require replacement, and as far as can be ascertained, none of these have sections that would need to be cut out and replaced. However, rust due to 1a, 1d & 1c above has progressed in 86% of the hoppers and 100% of the fixed louvres to the extent that these sections will require removal and, if required, replacement. I should note that both hopper and fixed louvre sections are mounted in a fixed pane section, and thus these can be easily converted / reverted to a fixed pane.
- 2.2. The louvre insert sections and panes are all in very poor condition, being heavily rusted and will require removal and, if required, replacement. The louvre panes used chicken wire glass, which is unsuitable for this purpose as the wire is exposed at the edges and eventually rusts down through the pane. These louvres are also difficult to reach and maintain.
- 2.3. Almost all the hopper inserts (86%) are heavily rusted in their bottom corners and will require removal and, if still required, replacement. This is not unusual as this type of simplistic implementation creates a trap for dirt and moisture at the bottom corners. As noted above these sections were added/included onto a fixed pane section to allow for ventilation. None of the Alfred Lane windows, which share the same design (EW01) as some on the other elevations, had any hoppers installed.
- 2.4. Most pivot sashes (located at the top of some windows) are also binding or not closing fully, although it does not appear that any have suffered permanent distortion. This binding can be relieved to improve their closing.
- 2.5. All windows have flaking paint, surface rust, failing putty or beads and / or poor sealing, particularly on the lower edges of the frame in each pane. Where broken panes have been replaced the putty has sometimes not been repainted, exposing it to weathering and eventual failure.
- 2.6. Most pivot sash fittings are intact although most are not fully operational. All windows require treatment of rust, repainting and caulking.
- 2.7. Since it is unlikely that the windows have been painted for many years the windows are in relatively good condition – most likely due to the paint being properly applied at the time.

Several lintels are distorted due to expanding rust, although none appear to have distorted the window frame underneath at this time.

## 3. Recommendations

Unless repairs to the putty, poor paint condition, and exterior sealing are carried out, there will be an increasing number of broken windows and further degradation of the frames. Whilst these works would be significantly less than full replacement (and unlikely to approach this value until complete failure), the cost of repairs will gradually rise if the situation continues.

Considering the opportunities presented by current refurbishment & renovation project, I would make the following recommendations:

### 3.1. Alfred Lane Windows

- 3.1.1. The existing chicken wire panes can be retained with broken panes replaced with ones obtained from the other elevations. Installation of panes should use a Silicon Modified Polymer (preferable) or polyurethane
- 3.1.2. Loose rust scraped off and rust convertor applied, followed by a suitable primer
- 3.1.3. All external glazing edges should have loose or flaking paint and putty scraped.
- 3.1.4. These edges should then be caulked with a suitable exterior paintable Silicon Modified Polymer (preferable) or polyurethane
- 3.1.5. Frame edges should be caulked with Silicon Modified Polymer (preferable) or polyurethane
- 3.1.6. Frames should be primed and repainted as per typical procedures

### 3.2. South, East & West Facing Windows

- 3.2.1. All glazing to be removed, where possible recover chicken wire panes that are a suitable size for use on the Alfred lane facade
- 3.2.2. Loose rust scraped off and rust convertor applied
- 3.2.3. Frames should be primed and repainted as per typical procedures
- 3.2.4. All hoppers to be removed and if acceptable reverted to fixed panes
- 3.2.5. All Louvre sections to be removed and, if acceptable, converted to fixed panes or, if required, new operable louvre sections installed
- 3.2.6. Re-glaze all windows with suitable double-glazing panels using Silicon Modified Polymer (preferable) or polyurethane
- 3.2.7.
- 3.2.8. Rusted lintels should be repaired and water penetration above and around lintels should be addressed as this will cause structural damage.

## 4. Example Images

The following images identify the typical issues identified above. A full gallery of images is available.

View of the Alfred Lane windows, showing that almost all retain chicken wire glass.

Only 19 of 144 panes need to be replaced. There should be enough chicken wire panes resourced from the other facades to replace these:



This shows a typical hopper vent/pane frame condition:



Example of the condition of the louvre windows:

