Building Envelope Maintenance Report

May 2010

The Compton
1316 West 11th Avenue
Vancouver, BC

LMS 4382

Conducted by:

BEMCO
Pacific Services Inc.
Building Envelope Maintenance

BEMCO Pacific Services Inc. 3636 East 4th Ave. Vancouver, BC V5M 1M3 Tel: 604-294-8111 Fax: 604-294-8184

Introduction

We have conducted a building envelope maintenance review of the Compton project located at 1316 West 11th Avenue, Vancouver, BC. The review was conducted on May 11, 2010 in order to evaluate the current condition of exterior materials and assemblies, and as the basis for the following observations and recommendations.

This review was not invasive, and did not include the removal or destructive testing of any areas of the building. The review is intended to report the condition of materials visible at the time of inspection. It should be noted, that while every effort has been made to identify defects, we can not guarantee that every potential problem has been itemized in the review. When the maintenance work is conducted on this complex any additional issues that might be discovered should also be attended to.

Building Description

The Compton is a 12 storey concrete framed residential building. The building was constructed circa 2001, and contains 50 units constructed over an underground concrete parking garage.

Exterior walls throughout the project are constructed of poured in place reinforced concrete that has been painted on its exterior. These mass concrete walls act as the environmental separator where present around the building.

Low sloped roofing throughout the project includes inverted roofs and roof decks which have been finished with rock ballast or concrete paving stones. Balconies have been waterproofed with a liquid applied polyurethane membrane.

Windows throughout the building are thermally broken aluminum framed double glazed units.

Overview

In general, materials on the exterior of the building appeared in good condition. There are however issues that should be dealt with at this time in order to enhance the long term performance of the exterior materials and systems. During our review, we noted all conditions we observed which require attention, including matters that go beyond what would typically be considered maintenance issues.

The following information outlines the general condition of particular materials, as well as noting specific areas of concern. Photographs and elevation renderings are included in the appendix. Photographs give an example of particular items noted in the report, and are not correlated with a specific area of the building unless otherwise noted. Situations where a given condition is common throughout the building will be noted in the appropriate material section of this report.

Roof

The main roof of the building is a low sloped roof that utilizes an inverted roof design. The roof is constructed with the waterproof membrane applied over the roof surface, which is then covered with rigid insulation, filter cloth and gravel ballast. Due to the nature of the inverted roof, a full inspection of the membrane condition is not practical; however observations regarding drainage and protection were made. Generally, the roof is in good condition from a maintenance standpoint with the ballast well dispersed and the drains clear, and free of debris. In one location, the plastic drain cover was broken, and gravel ballast will soon be able to make its way into the drain. This drain cover in this area should be replaced as soon as practical.

The cap flashings at the roof perimeter were in good condition as was the gum lip flashing at the base of the mechanical room wall. The roof penetrations were also in good condition.

The roof area should be visibly inspected regularly, and any debris removed and drainage problems rectified.

Balconies

The term balcony refers to those areas that do not occur over habitable space, and should not be confused with roof decks, which are covered in the following section. The balconies are constructed of reinforced concrete. In all locations the balconies are sloped to their exterior, and drainage occurs through a scupper drain in the upstand wall, or over the edge at the junction of the balcony slab and the wall. The balconies have been finished on their surface with a textured liquid applied coating.

The balconies appeared in good condition at this time.

Residents should inspect the condition of the membrane looking for cracks, blisters or cuts. Damaged areas should be repaired in a timely manner. Scupper drains should also be checked to ensure they are clear and any debris or blockage removed to facilitate free drainage. Large areas of ponding or standing water can reduce the service life of membranes, and should be rectified in a timely manner. Plants or mats that hold water can promote the growth of mold or mildew on the balcony surface. Mats that are open or breathable are less likely to facilitate organic growth than a piece of wet carpeting. Placing plants on a drainable table or mat will also reduce the potential for organic growth.

Residents should regularly clean the deck surface, checking the condition of the coating for any cracks, blisters, cuts or burns. Organic growth such as moss and weeds should also be removed, as they tend to retain moisture. When cleaning balconies, it would be prudent to inspect any related sealants, flashing and railings at the balcony perimeter. When sweeping or cleaning it is also advisable to look up and check the condition of the

soffit above. Staining, moisture, or damaged areas can be an indication of membrane problems on the balcony above, and should be brought to the attention of the appropriate building personnel.

Roof Decks

The term roof deck refers to those exterior platforms that occur over habitable space, and act as roofs as well as being accessible deck areas. Roof decks at the Compton have been waterproofed with a liquid applied membrane that has been covered with rigid insulation and concrete pavers.

In this configuration, the membrane is protected from physical damage by the pavers, however it is still important to clear away any sharp debris such as nails or screws from the deck areas. Organic growth such as plants and moss should be removed, as the root systems can effect drainage, and reduce the lifespan of the membrane. The balconies finished with pavers typically drain through scupper or surface drains. It is important that these drains are monitored regularly by residents. Areas that sound 'squishy' when walked on, or appear to have standing water beneath them should be brought to the attention of the appropriate building personnel, and investigated further. Scupper drains which pass through the concrete upstand walls should also be checked to ensure they are clear of any blockage. Organic growth such as moss and weeds should also be removed, as they tend to retain moisture. It is important that all drains servicing the deck areas are reviewed and cleaned on a regular basis.

The balcony pavers are made of concrete, and as such are subject to efflorescence. Efflorescence is a whitish deposit that is created by the salts in the cement being carried to the surface of the stone or brick, by migrating water. Efflorescence in patio pavers is an expected, temporary occurrence, and as such, should generally be left alone. It most commonly occurs in the fall and winter months when drying rates slow and pavers stay damp for extended periods. Efflorescence can often be removed with a water wash and scrubbing. Unlike treating efflorescence on masonry walls, DO NOT use an acid wash on the patio stones as this can damage the rigid insulation and membrane below.

In general the roof deck areas appeared in good condition with no signs of ponding water of blocked drains.

The residents should clean and inspect the decks and balconies regularly. Plant and organic growth should also be removed from between pavers and at deck perimeters. Regular cleaning of decks and balconies not only helps to extend the life expectancy of the materials, it also provides an excellent opportunity for owners to assess the condition of these areas and ensure they are draining properly.

Concrete

Concrete is a versatile building material with a history of good performance. As with all materials, concrete has inherent strengths and weaknesses. While concrete is strong, it is also relatively rigid. In spite of concretes inherent durability, it can, and often does develop cracks in areas. Most cracks occur early in the life of a building and are usually a result of settlement, or drying shrinkage. Thermally induced expansion and contraction can also cause cracking throughout the building life. These cracks are generally superficial and easily repaired. Minor cracking is not an indication of structural failure, and should not be assumed to be of catastrophic proportions. As the concrete is the weather barrier portion of the wall, it is important to review its condition and conduct repairs on a regular basis.

As noted on the elevation drawings, cracks in the concrete are present in various locations around the building.

Previous crack repairs are visible around the building. In these locations the crack repairs appear in good condition with no signs of crack extension or sealant failure. There are however, areas where new cracks are present. The majority of these new cracks occur at horizontal reveals in the concrete (Photo 1). Small voids in the concrete at the base of the reveals were also noted in some locations (Photo 2 – 3). In one location, rusting was noted at the back of the reveal, and it appears a piece of reinforcing steel may be exposed behind the paint coating (Photo 4). Sealant should be applied in this area to minimize the possibility of further corrosion and possible damage to the concrete.

It should be noted that on many new concrete buildings it is now common practice to caulk these reveals during original construction as this is a location where cracking frequently occurs. As this is a problem that may get worse over time, consideration should be given to caulking these reveals at the Compton.

In some locations efflorescence staining is present (Photo 5). Where these stains occur near a crack, they can be an indication that moisture is exiting from the crack. Where present, cracks should be ground out and sealed in a timely manner in order to reduce the potential for future degradation of the concrete.

As the concrete acts as the weather barrier portion of the wall, it is important to repair cracks in a timely manner. Allowing moisture to penetrate the concrete wall can lead to corrosion of the reinforcing steel, and further degradation of the wall.

Individual owners should report any cracking, spalling, or staining they come across to the appropriate building personnel. It is important that cracking or spalling be evaluated, and repairs instituted by someone capable of assessing the severity of the problem.

Paint

The concrete walls of the Compton have been coated with an acrylic based paint, which generally appeared in good condition. There are however some areas where the paint / membrane on horizontal ledges was observed to be peeling (Photo 6 - 7). Paint was also noted a fading irregularly in one location on the North elevation (Photo 8). Areas of peeling and fading paint have been noted on the attached renderings and should be repaired as soon as practical.

Paint coatings should be cleaned whenever they show signs of dirt, or organic growth buildup. This condition can attract and retain moisture, which can eventually cause the coating to deteriorate. The method of cleaning can range from a garden hose and soft bristled brush, to the use of cleaning agents, and a pressure washer. It is generally advisable to use as little force as is required by a given job.

Sealant

Sealant is a generic term for materials used on the interior or exterior of a building to seal joints, junctures or gaps against uncontrolled moisture or air infiltration. The life expectancy of sealant can vary greatly and is affected by numerous factors. Joint design, material selection, substrate preparation, service requirements and exposure levels, all affect the longevity of a sealant material. As sealants can play an integral roll in the overall performance of the building exterior, it is important that they be monitored on a regular basis. Regular inspection of sealants is an important component of any exterior maintenance regimen.

At the Compton, the majority of the sealant was in good condition and performing as intended. Sealant separation was observed in a few locations as noted on the attached elevation photographs (Photo 9 – 10). Sealant should be repaired in these areas as soon as practical.

Flashings

Flashings are used to deflect water at interfaces and joints within and between wall assemblies. They play an important role in the water management of a building exterior by directing moisture to controlled or designated areas. Flashings are used extensively throughout the building in areas such as window heads, windowsills, base of walls and wall cap flashings and gumlip flashings.

Flashing at the Compton appeared in good condition in all locations with the exception of some sealant separation at flashing ends noted on the renderings of the report.

Windows

The windows at the Compton are thermally broken aluminum framed double glazed units. Portions of the building use a window-wall design, where the window incorporates a metal spandrel panel that run past the concrete slab edge. Punched windows (Windows that occur in the middle of a wall) have also been used throughout the project.

In general the window units appeared in good condition, however there are some isolated issues which should be dealt with at this time. In a few locations, the rubber splines between the window frame and the glazing have fallen out of place, or are missing (Photo 11). These splines should be replaced or reinstalled where possible. In three locations, sealed glazing units had failed (Photo 12). These units should be replaced in a timely manner. While it is likely the manufacturers' original warranty has expired, it is possible that a 10 year warranty may have been given, and the strata may want to check the documentation handed over at the time of construction regarding the window warranty.

Residents should check their windows on a regular basis looking for things such as fogging between glazing panes and plugged weep holes. Also, the window hardware should be checked, to ensure of proper function.

Vents

Where observed the balcony soffit vents and exterior hooded vents appeared clear. In one location on the North elevation the soffit vent screen was partially detached, while in another location on this elevation the cover was fully detached. Theses covers should be refastened as soon as practical (Photo 13). In a few locations, vent hoods appeared damaged, and should be repaired or replaced (Photo 14).

In a number of wall vent locations, metal mesh screens have been installed over the vent hoods. In some locations, the screen has been positioned such that it is impeding the operation of the vent hood flapper (Photo 15). The screens are also very loosely secured in some locations. When conducting any maintenance work on the building, these screens should be adjusted to allow for the proper operation of the vent flapper valves.

It is important that a regular program be implemented to remind residents to clean the exterior vent covers, as well as to arrange for professional cleaning of the dryer ducting. A poorly maintained dryer vent can lead to moisture problems and staining within the building. Where accessible, exterior vent covers should be vacuumed by residents quarterly, and professionally cleaned annually. Dryer lint traps should be cleaned regularly to help minimize the build up of lint in the ducts as well as at the exterior vent.

Miscellaneous

In one location, water was present behind the cover of a wall mounted light fixture. Sealant should be applied at the top of the cover perimeter. Organic growth was present on a number of concrete ledges (Photo 16). These areas should be cleaned as a part of an ongoing maintenance program.

Summary

There are components on the exterior of the building, which at this time require remedial work in order to perform as originally planned.

In general, the following items should be reviewed with regard to future work:

- Replace broken drain cover
- Seal cracks in concrete
- Replace or reinstall window splines where loose or missing
- Replace failed sealant
- Repair peeling paint on concrete
- Reinstall vent covers and adjust wire mesh over vent hoods

Appendix

- **Homeowners Inspection List**
- **Photographs**
- **Elevation drawings with notes**

ON-SITE PERSONNEL / OWNER INSPECTIONS

Item To Inspected	Inspection Frequency	Inspect for
Roofing	Monthly	A cursory monthly check is intended to spot physical damage or drainage problems. This check is purely a visual inspection conducted from the ground.
Flashings	Semi annual	Physical damage. Look for flashing which may have been damaged or bent by gardeners, window cleaners or other operations around the building.
Decks / Drains	Monthly	Drain blockage, or physical damage. Individual deck drains and troughs should be checked frequently during the rainy season, and when debris is most prevalent in the fall. Check the membrane surface for cracks or splits when cleaning or sweeping. Check the soffit above for water stains.
Sealants	Semi annual	Look for damage or obvious sealant failure when cleaning windows or decks.
Paint	Semi annual	Observe condition of paint when cleaning windows or decks. Look for peeling or blistering paint.
Windows	Semi annual	Observe condition of hardware and weep holes when cleaning windows. Clear any dirt or debris from weep holes. Check sealant at mitered corners.
Vents	Semi annual	Regular cleaning of dryer lint screens will reduce the necessity to clean the exterior vent covers. Dirty or blocked exterior covers can lead to moisture accumulation in the vent pipe, and cause leakage and deterioration
Plants	Annual	Plants growing directly adjacent to or in contact with the building exterior can reduce the drying potential of the exterior cladding, and increase the likelihood of problems. Keep plants and shrubs away from exterior walls.
Doors	Annual	Doors should be checked in order to assess the hardware, and the perimeter seals. Poorly operating mechanisms or weatherstripping should be repaired or replaced.
Cladding	Annual	Visually observe the condition of the exterior materials, looking for any signs of damage or deterioration.

Notes:

_____
_____
_____
_____
_____

Photographs

Photo # 1 – Crack at back of reveal

Photo # 2 – Voids in concrete at back of reveal

Photo # 3 – Voids with efflorescence

Photo # 4 – Corrosion at back of reveal

Photographs

Photo # 5 – Efflorescence staining below concrete ledge

Photo # 6 – Peeling paint at concrete ledge

Photo # 7 – Peeling paint at concrete ledge

Photo # 8 – Faded paint on concrete wall

Photographs

Photo # 9 – Sealant separation at flashing

Photo # 10 – Sealant separation at flashing

Photo # 11 – Loose window spline

Photo # 12 – Failed sealed glazing unit

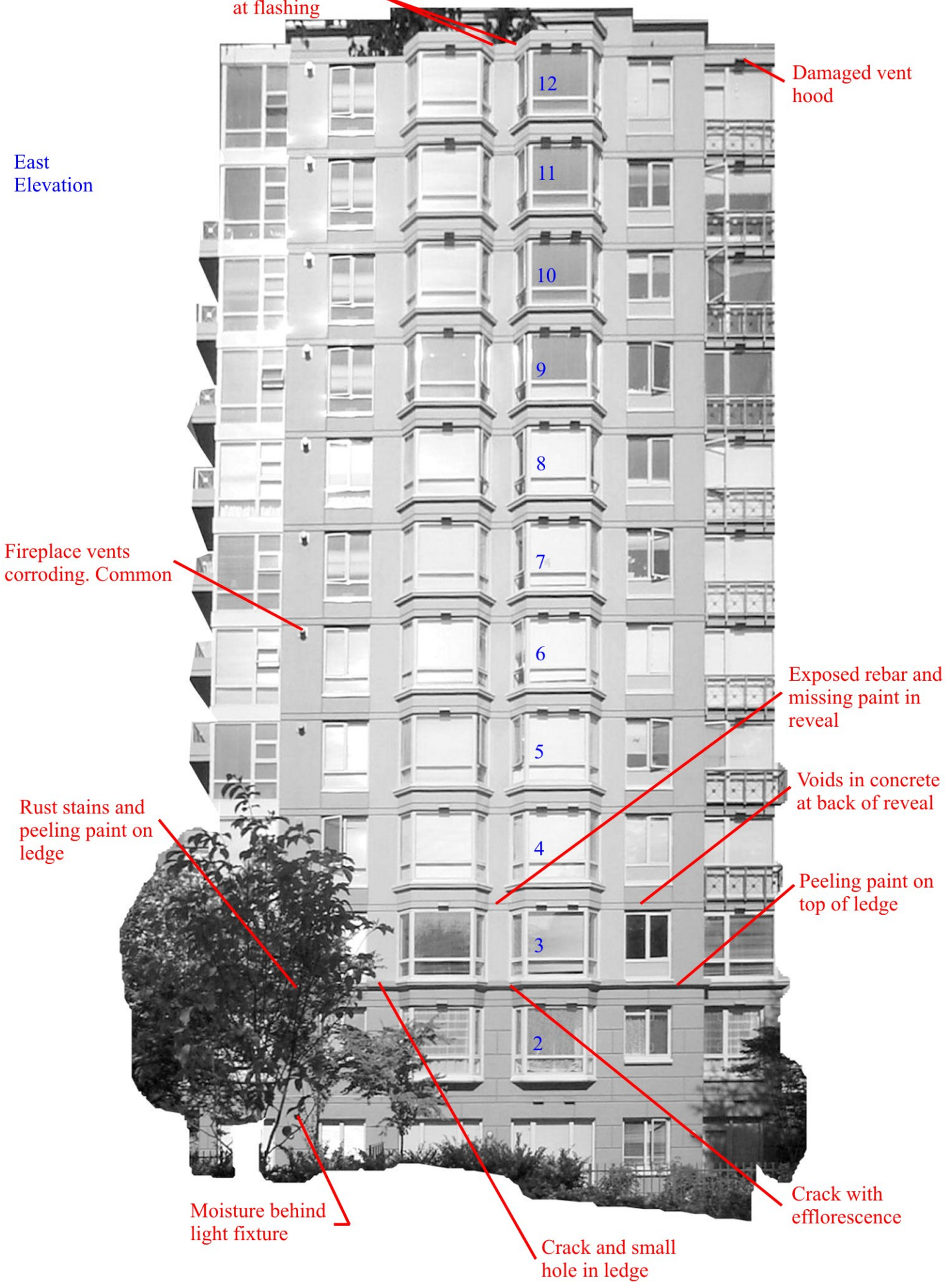
Photographs

Photo # 13 – Loose vent cover

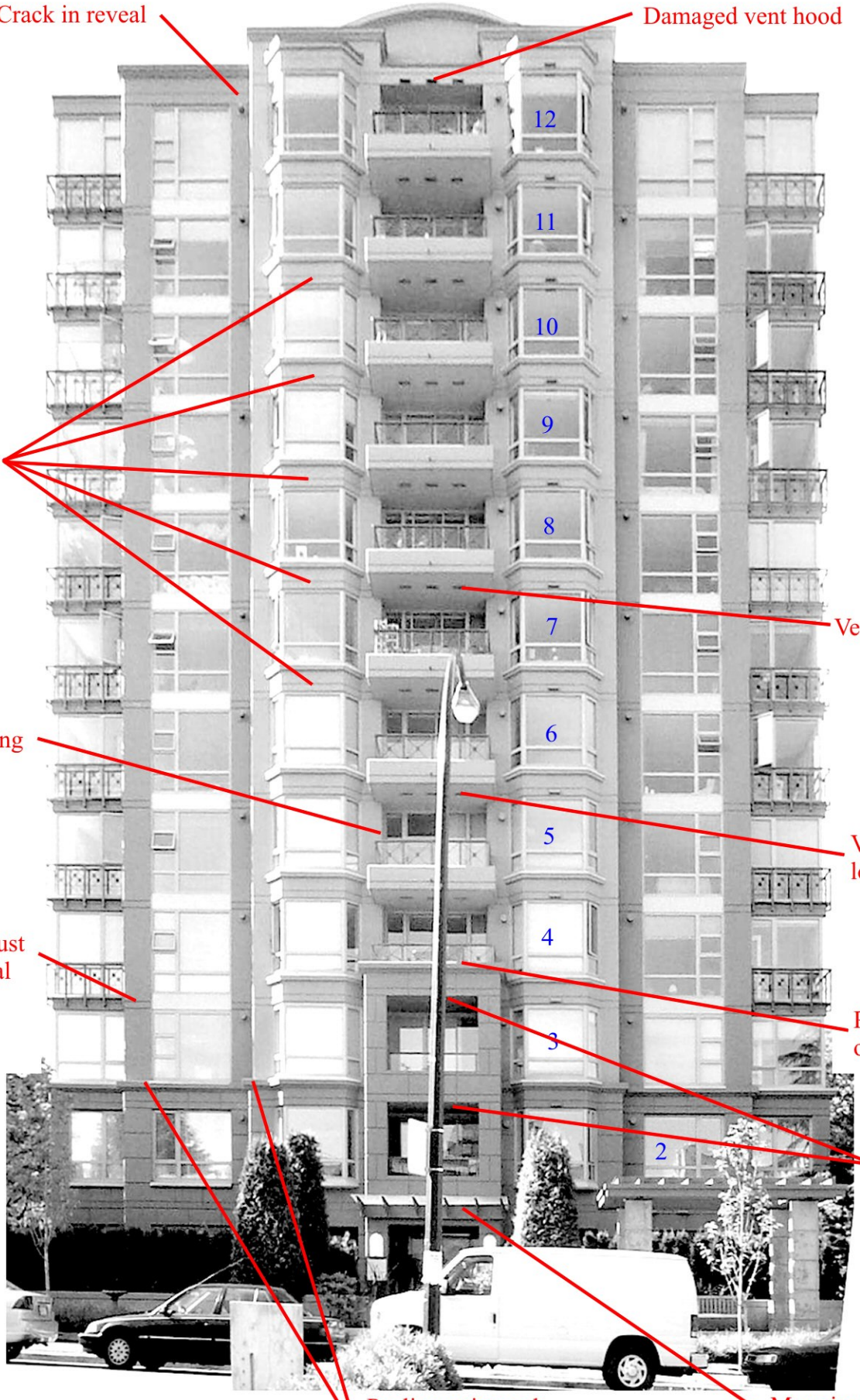
Photo # 14 – Damaged vent hood

Photo # 15 – Mesh impeding vent flapper

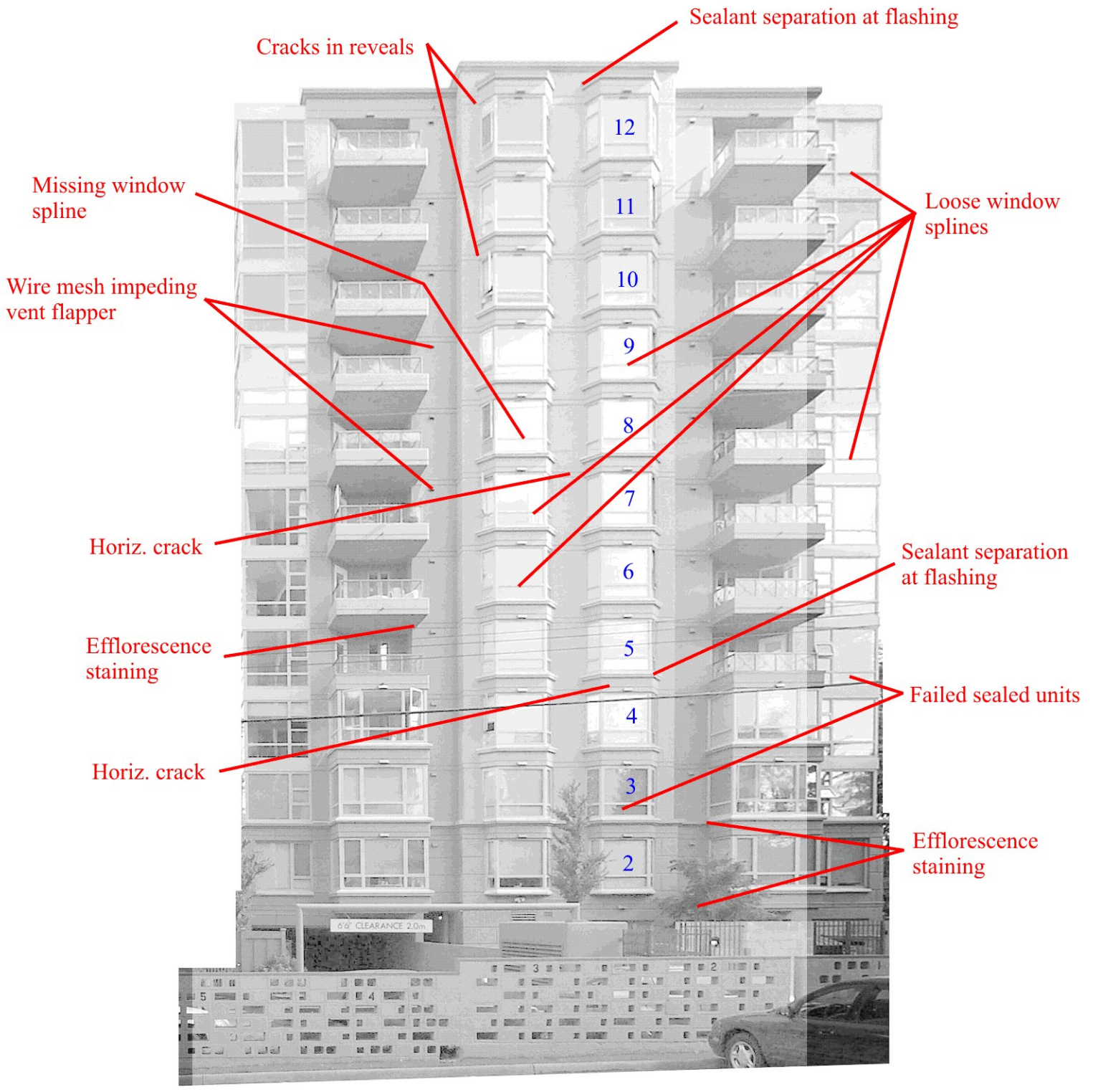
Photo # 16 – Organic growth on concrete ledge

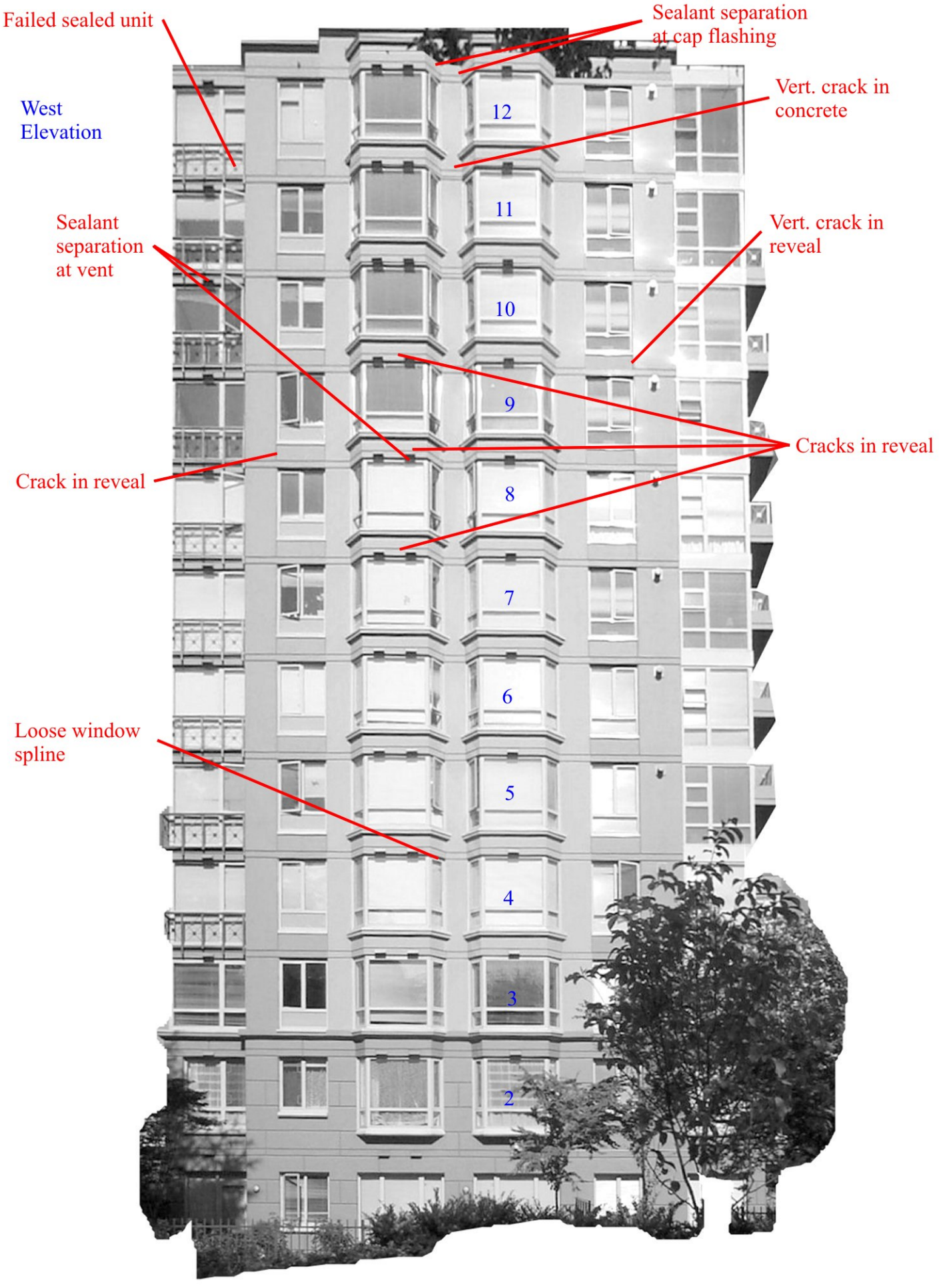

Sealant sepration at flashing
Damaged vent hood
East Elevation
12
11
10
9
8
7
6
5
4
3
2
Fireplace vents corroding. Common
Exposed rebar and missing paint in reveal
Voids in concrete at back of reveal
Rust stains and peeling paint on ledge
Peeling paint on top of ledge
Moisture behind light fixture
Crack and small hole in ledge
Crack with efflorescence

North Elevation



South Elevation




Failed sealed unit
Sealant separation at cap flashing
West Elevation
Vert. crack in concrete
Sealant separation at vent
Vert. crack in reveal
Cracks in reveal
Crack in reveal
Loose window spline
12
11
10
9
8
7
6
5
4
3
2