

Building Envelope Maintenance Report

July 2007

**The Brava Towers
1155 & 1199 Seymour St
Vancouver, BC**

BCS 1172

Conducted By:

B E M C O

Services Ltd.

Building Envelope Maintenance

Introduction

We have conducted a building envelope maintenance review of The Brava Towers complex located at 1155 & 1199 Seymour Street, Vancouver, BC. The review was conducted from July 10th – 13th, 2007 in order to evaluate the current condition of materials, 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. For the purposes of inspecting the hi-rise buildings, 22 drops from a boson chair were conducted. The drop locations were selected in order to maximize accessibility to details or components of interest.

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 do not guarantee that every potential problem has been itemized in the inspection. When the maintenance work is conducted on this building any additional issues that might be discovered should also be attended to.

Overview

The Brava Towers complex consists of two residential hi-rises, 26 & 32 stories, townhouses, a commercial component and was constructed on top of a 5 level underground parkade. The exterior walls are a combination of window wall, metal panels, and concrete.

In general, materials on the exterior of the building were in good condition. The following report outlines the overall condition of products and details, as well as listing areas that may require some remedial work.

During our review, we noted all conditions we observed which require attention, including matters that go beyond what would typically be considered maintenance issues. Photographs have been included and elevation drawings have been attached which correlate the location of inspection drops and our observations.

Roofs and Roof Decks

The roof sections of the buildings were constructed using a reinforced membrane, covered with insulation, filter clothe and gravel ballast. The upper roof decks, which cover the majority of areas, were constructed the same as the roof sections with concrete pavers instead of the gravel ballast. Generally, the roofs and roof decks were in good condition with the ballast well dispersed, penetrations in good condition and the drains clear and free of debris. In some locations organic growth and weeds were present between the pavers of some roof decks. Other roof decks were very clean and well maintained. The perimeter cap flashings and gum lip flashings were also in good condition and well sealed. Rust was present on the stack of the HVAC equipment on the very top roof of each tower.

It was reported to us that unit 2703 had experienced some signs of moisture ingress from the roof deck above. It is recommended that this be further investigated by a qualified roofing company.

Balconies / Decks

Concrete balconies occur throughout the building, and have been finished on their surface with a liquid applied membrane, except for the roof and patio decks, which have concrete pavers. The lower roof and patio decks were generally clean and drains clear. There were a couple of patio decks of Tower A on the 2nd and 3rd floor of the west elevation that had evidence that water was ponding and draining at the saddle connection of the balconies, as staining and organic growth are present in these locations. Also, in the southwest corner of the pool deck area a section of pavers appeared to have some water present underneath them.

The balconies have been coated with a liquid applied membrane and slope away from the building to drain over the outside edge. The balcony coatings appeared in good condition at this time with no signs of blistering or peeling noted. Some decks were somewhat dirty to varying degrees.

Residents should regularly clean the deck surface, checking the condition of the coating for any cracks, blisters, cuts or burns. Damaged areas should be repaired in a timely manner. Scuppers 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 recommended that plants and planters be kept from direct contact with deck surfaces, as they tend to retain moisture and increase the rate of deterioration. Also, mats that hold water can increase the growth of mold or mildew on the deck surface. Mats that are open or breathable are less likely to facilitate organic growth. It is important for owners to inspect the deck surface beneath mats or carpets on a regular basis.

Windows and Window Walls

The windows at Brava are aluminum framed double glazed units. Large sections of the buildings use a window-wall design, where the windows incorporate metal and / or glass panels and run floor to ceiling between the concrete slabs. The window wall sections are currently in good condition and well sealed at the joints where they meet the concrete wall sections. However; the corner post is detached from the window frame in some locations.

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 and well sealed at the perimeters. All of the exterior weep holes were clear, and where accessible, the rubber gaskets at the perimeter of the operable lights were checked, and found to be in good condition.

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

Metal Panels

The metal panel cladding was in good condition with no damage and was mainly used on the exterior walls of the townhouses and commercial sections of the complex.

Concrete

The concrete sections on this complex have been left as bare concrete and, as is normal, have some cracking and spalling present in various locations. Cracks were present at many window corners and cold joints. There were some areas where the concrete was loose and some where there were holes or pieces missing. In a couple of locations on the East elevation of Tower B there were loose pieces of concrete that appeared to be ready to fall.

Cracking in concrete is common and can occur over time due to curing, settlement, and movement. Cracks should be monitored and repaired as required.

Sealant

The majority of the sealant was in good condition. Sealant at most details, such as window perimeters, saddle connections, joints between concrete and window walls and other locations was generally in good condition throughout the project with only a few locations where it had separated or was missing.

Vents

There were quite a number of balcony soffit vents and vents behind metal panels in the window wall sections that were plugged or partially plugged. There were also some vent covers missing and some locations where the sealant along the top edge of the vent was separating.

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.

Flashings

Flashings have been used extensively around this complex and were in good condition. The cap flashings that protect the concrete roof up stand walls and other perimeter walls were in good condition in all locations. The gum lip flashings at the base of walls in all locations were in good condition and well sealed. There were a few locations where flashings had lifted slightly where they overlap the adjoining flashing. There was a gap between the flashing terminations by the corner post in some locations.

Miscellaneous

Glass Canopies

There are glass canopies just above the street level along Davie St. and Seymour St. There are two panels on the upper canopy on Seymour that were shattered.

Parkade

The upper floors of The Brava Towers have been constructed over a five level reinforced concrete underground parkade. The surface of the suspended slab levels of the parkade has been treated with a liquid applied traffic membrane, which was generally in good condition. However, the membrane was worn through on the ramp at level P2 and the parkade floor in general was dirty around the perimeter and at some stalls. There was the normal amount of cracks present in the ceilings and a few on the walls, some of these cracks had efflorescence present and should be monitored.

Cracks in parkades are very common and in most cases are not issues unless they are actively leaking.

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:

- Repair significant cracks and holes in concrete
- Remove and repair loose and spalled concrete
- Replace separated and missing sealant
- Establish a schedule for vent cleaning
- Install vent covers where required

Appendix

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

ON-SITE PERSONNEL / OWNER INSPECTIONS

Item To Inspected	Inspection Frequency	Inspect for
Roofing	Quarterly	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 & Gutters	Quarterly	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:

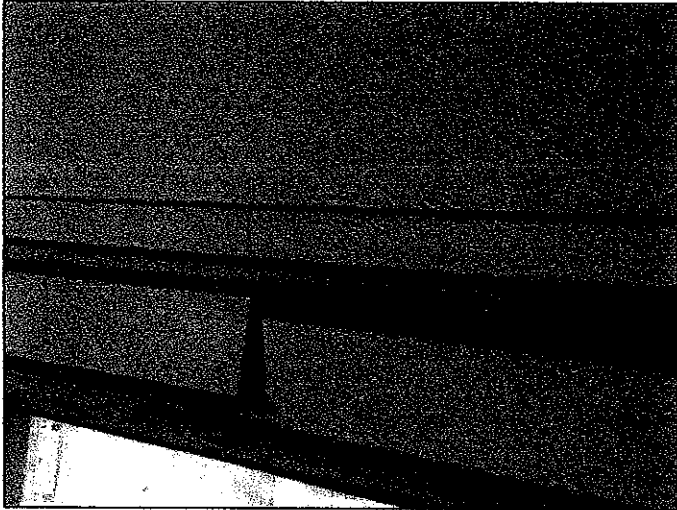


Photo #1- Flashing lifting at overlap.

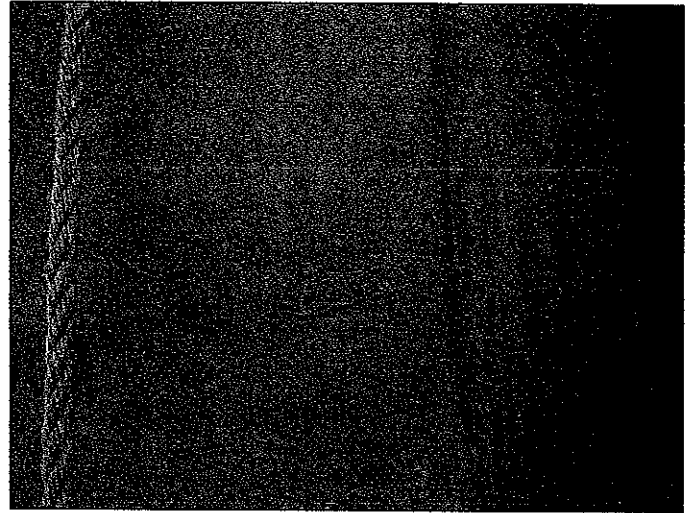


Photo #2- Horizontal crack in concrete.

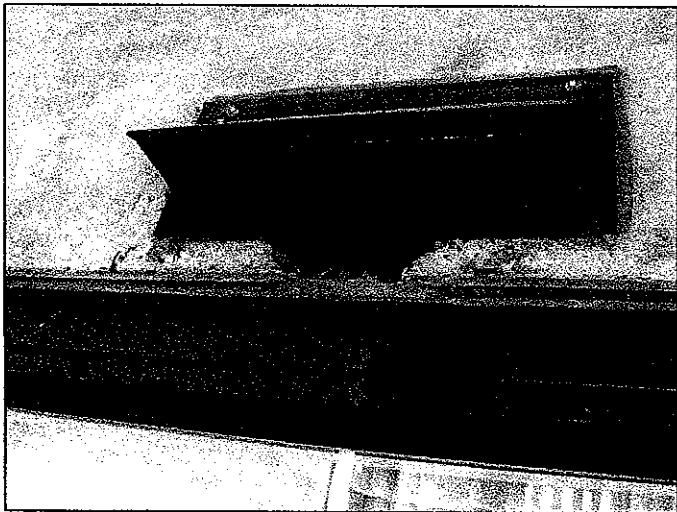


Photo #3- Hole in concrete.

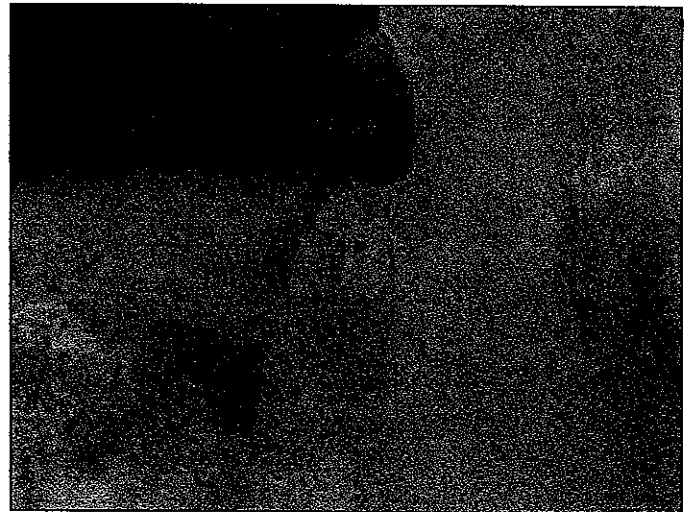


Photo #4- Vertical crack below window corner.



Photo #5- Sealant separating at vent.

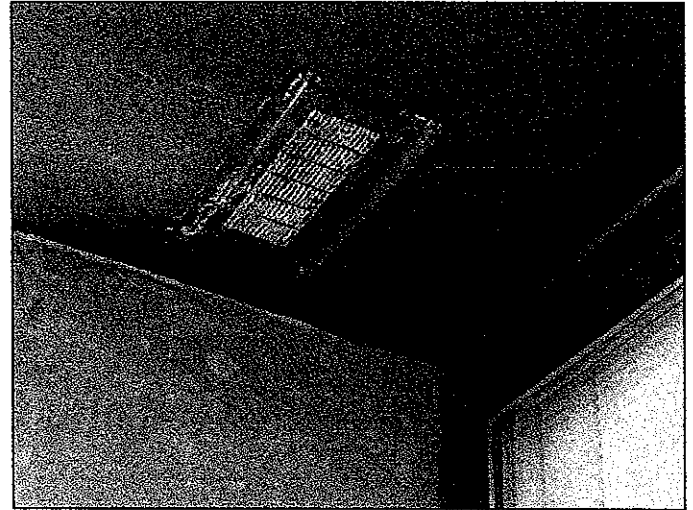


Photo #6- Vent plugged.



Photo #7- Rust present.



Photo #8- Missing sealant at flashing termination.

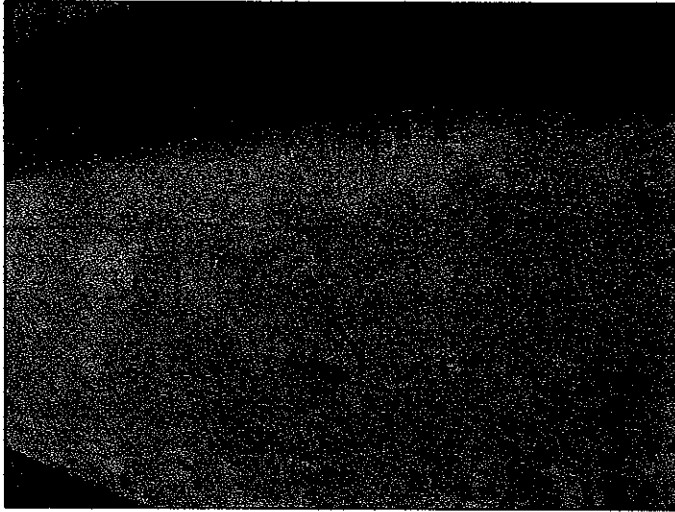


Photo #9- Crack and concrete spalling.

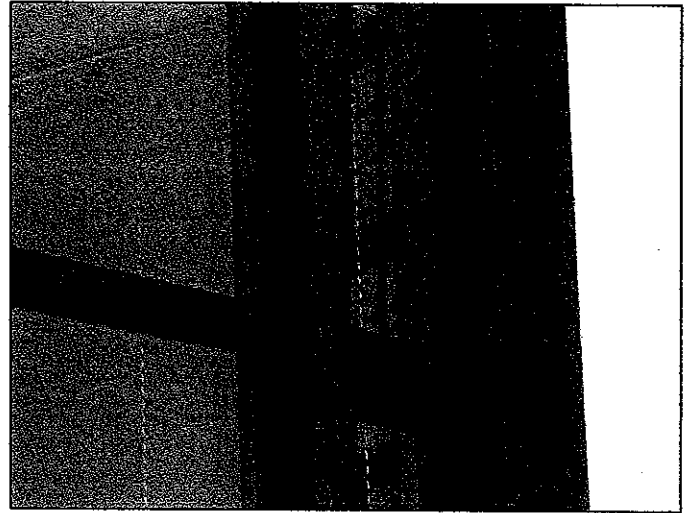


Photo #10- Corner panel detached from window frame.

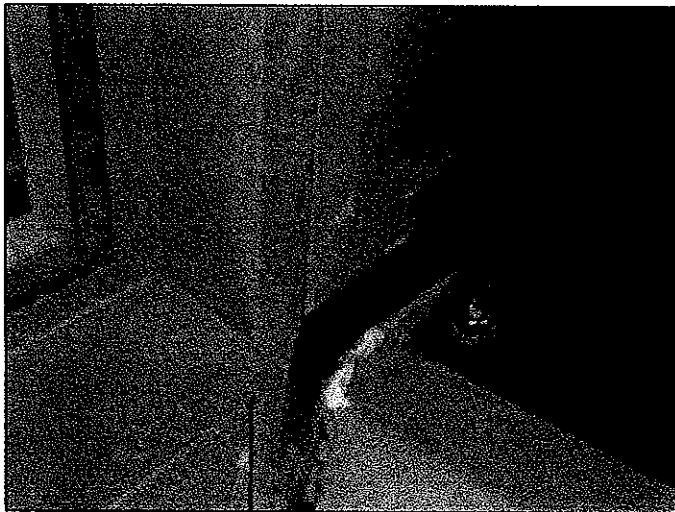


Photo #11- Sealant separating.

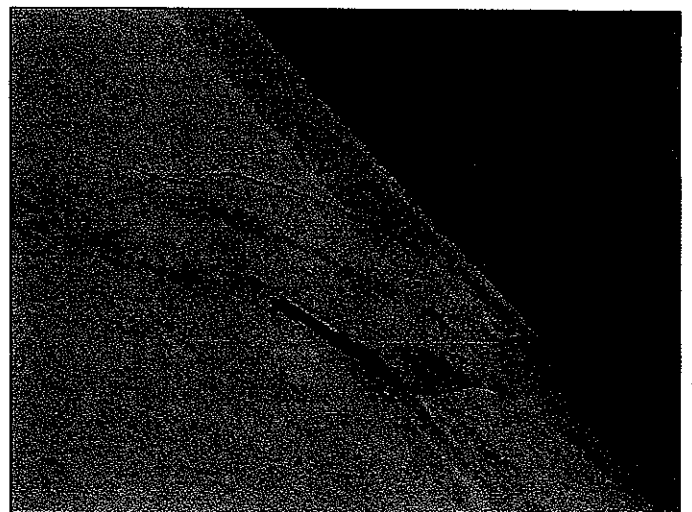


Photo #12- Concrete spalling.

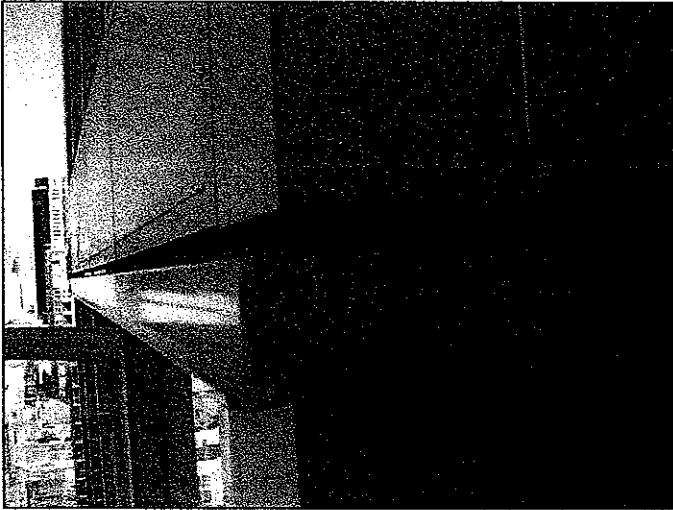


Photo #13- Gap with stop missing.



Photo #14- Deck dirty.

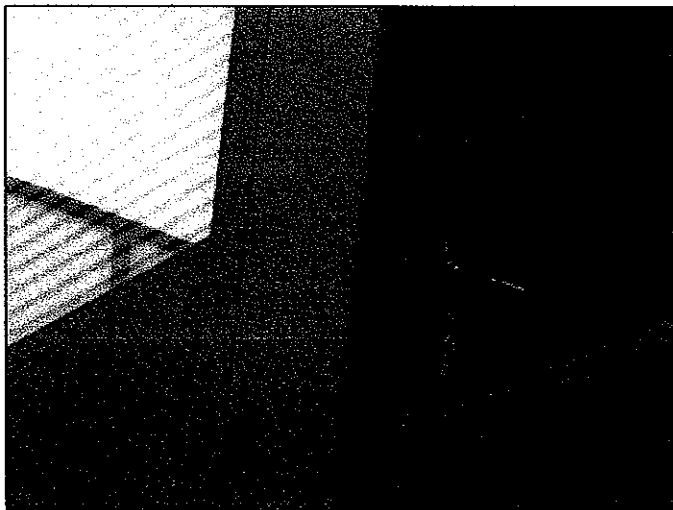


Photo #15- Gap where corner post meets flashing.

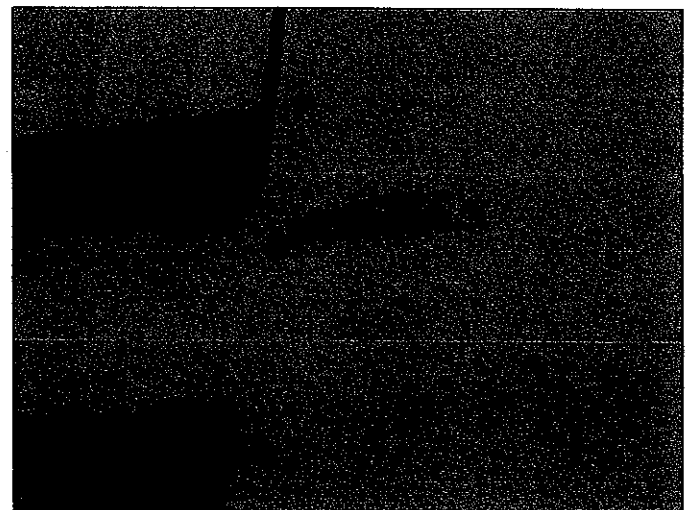


Photo #16- Concrete chipped.

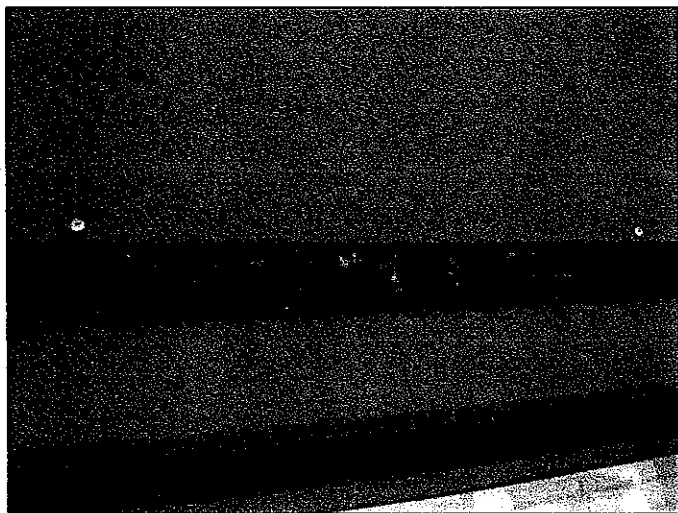


Photo #17- Vent plugged

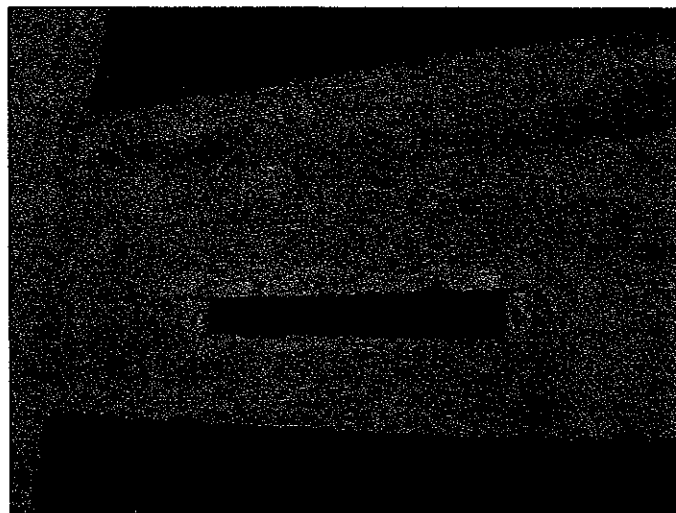


Photo #18- Vent cover missing.

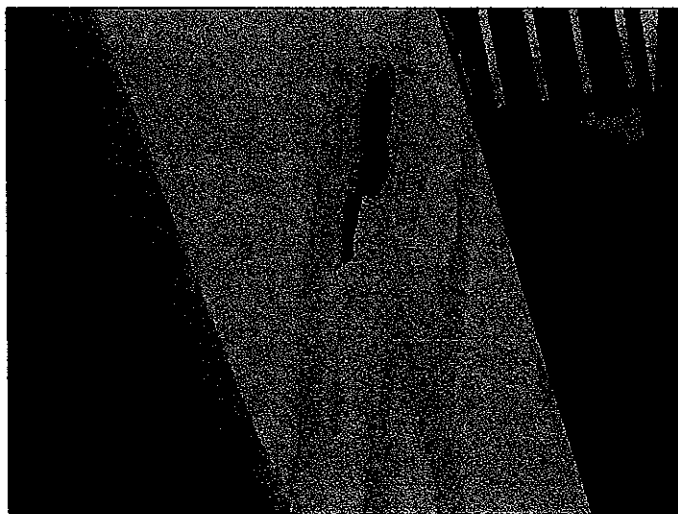


Photo #19- Concrete spalling.

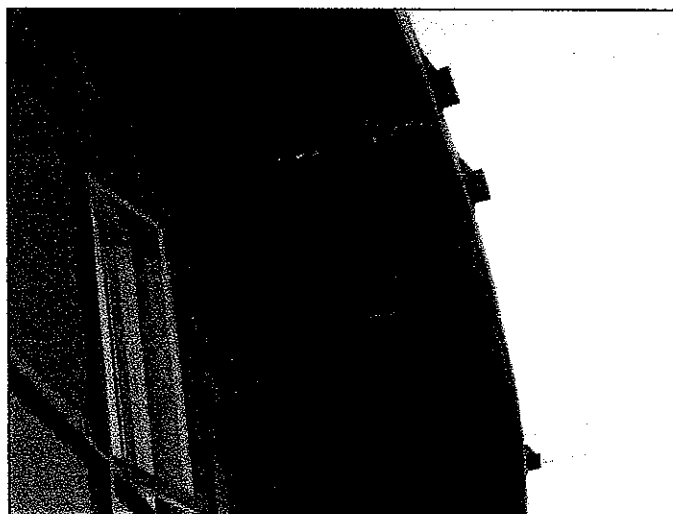


Photo #20- Cracks with efflorescence present.

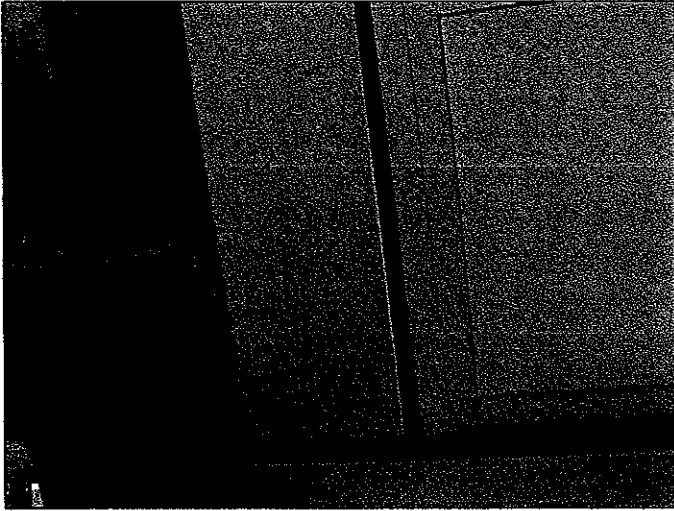


Photo #21- Corner post detached from window frame.

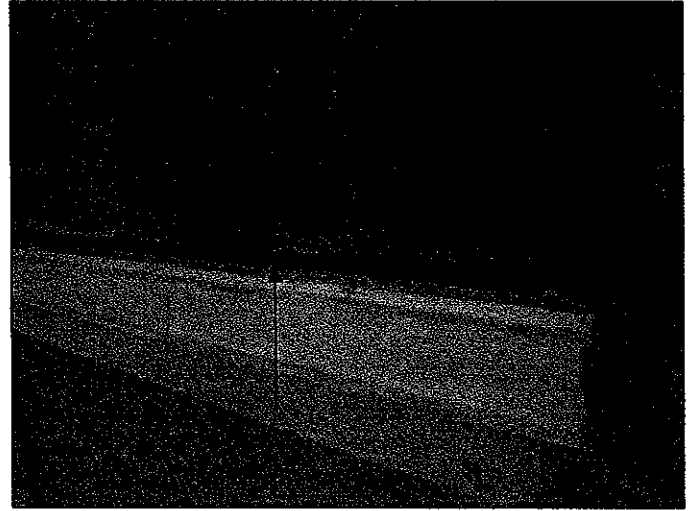


Photo #22- Missing sealant.

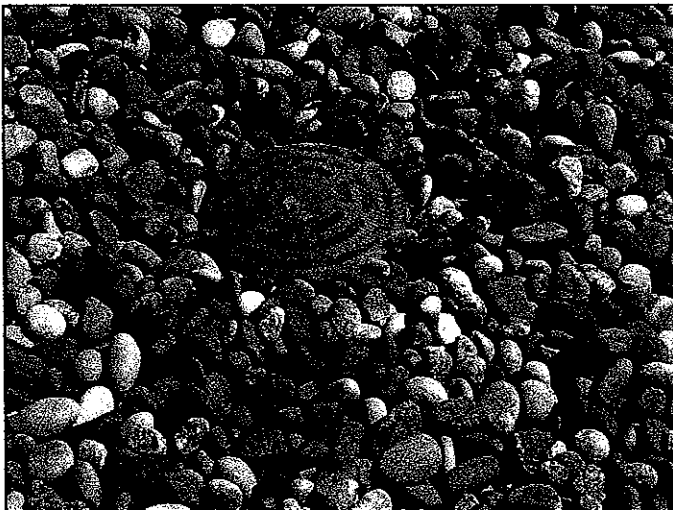


Photo #23- Drains clear.

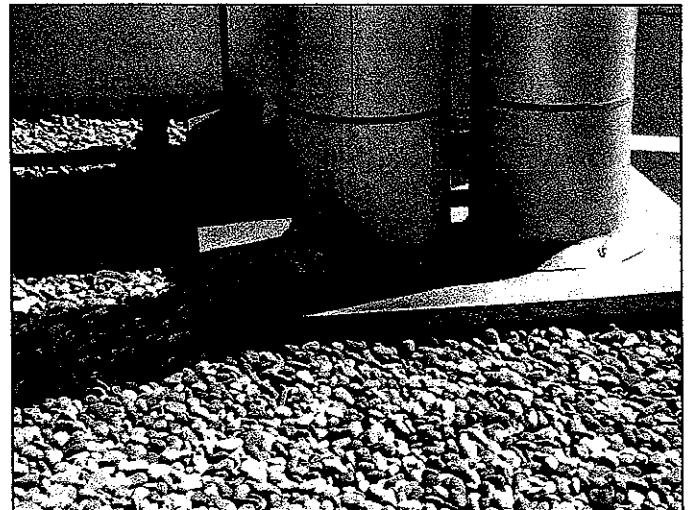


Photo #24- Rust present on roof stacks.



Photo #25- Concrete splashed on window frames.

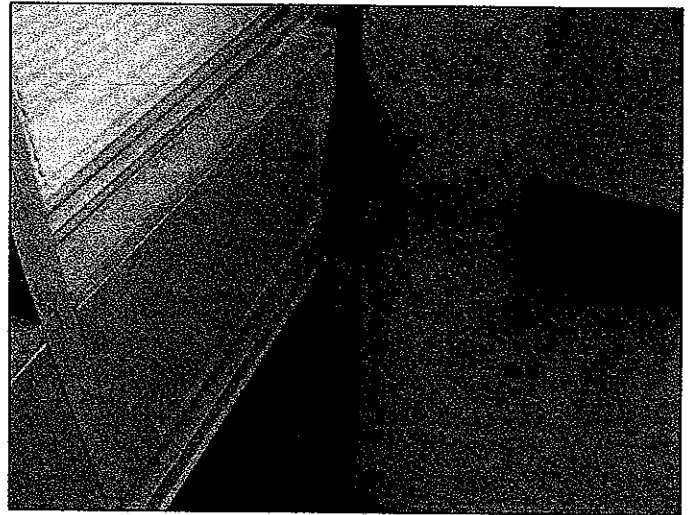


Photo #26- Weeds growing at balcony connection.



Photo #27- Sealant separating and corner post detached from frame.

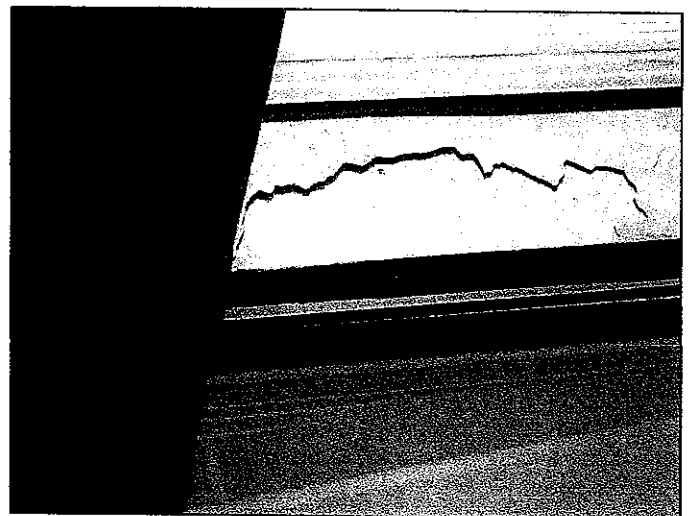
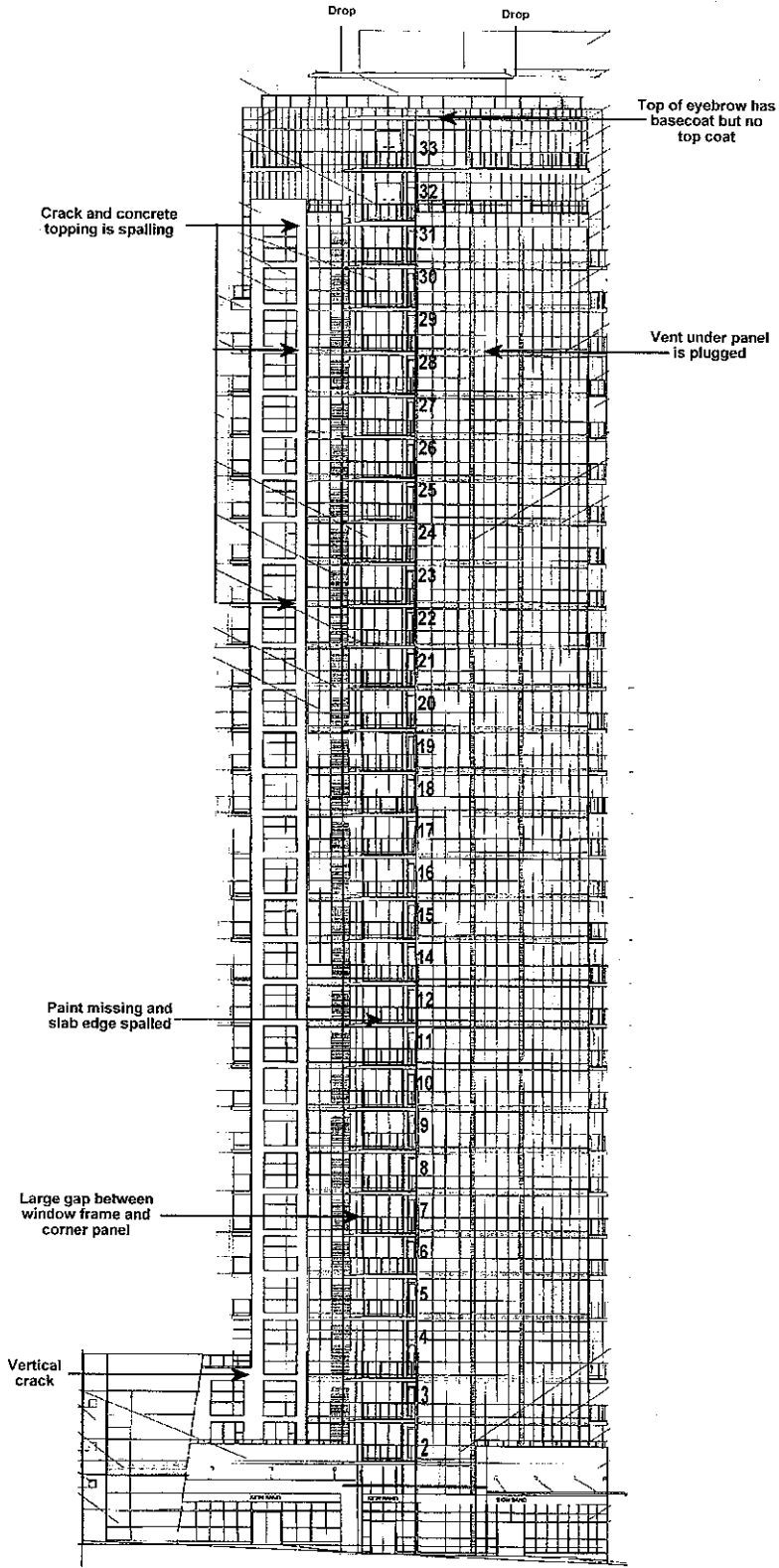
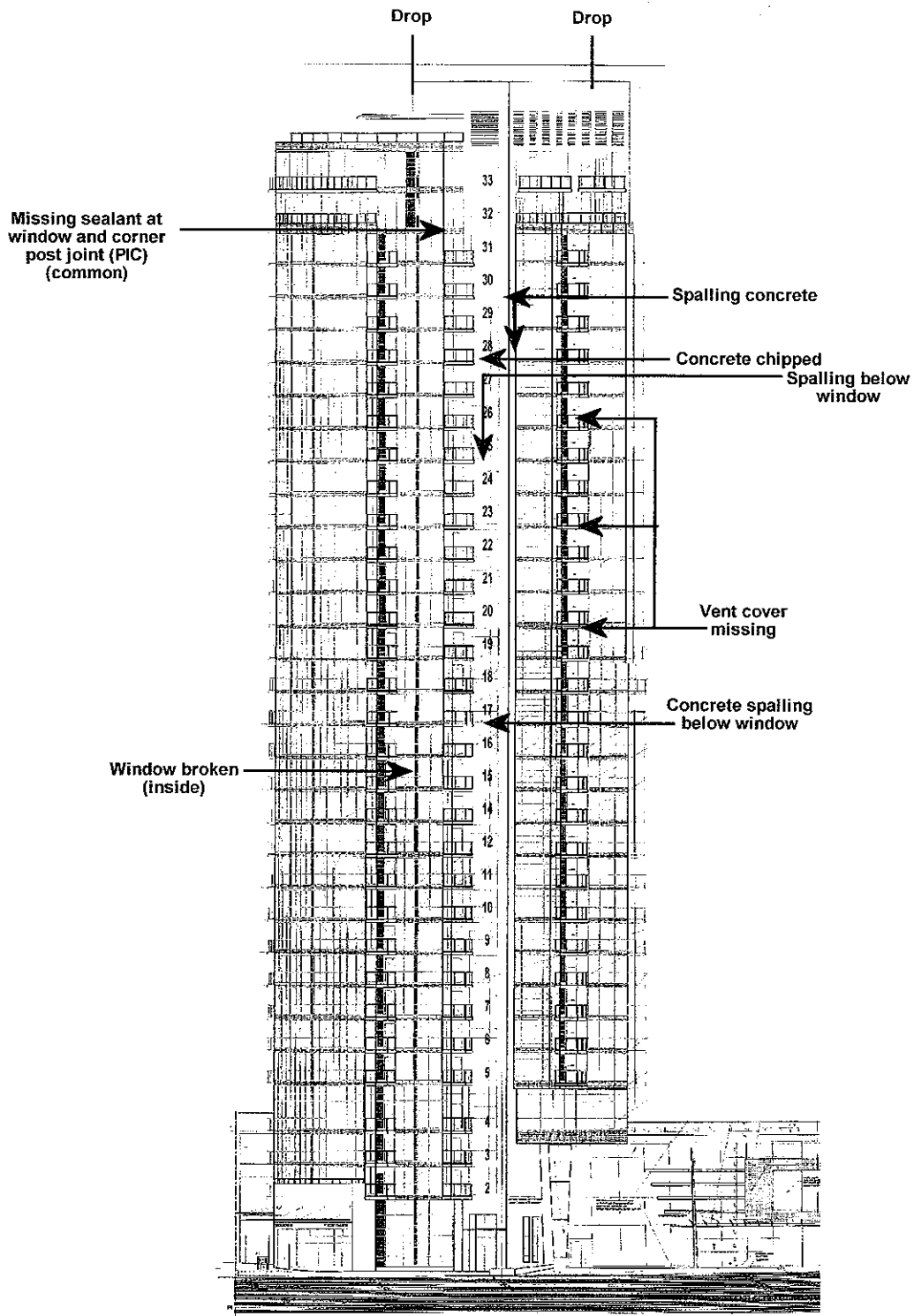


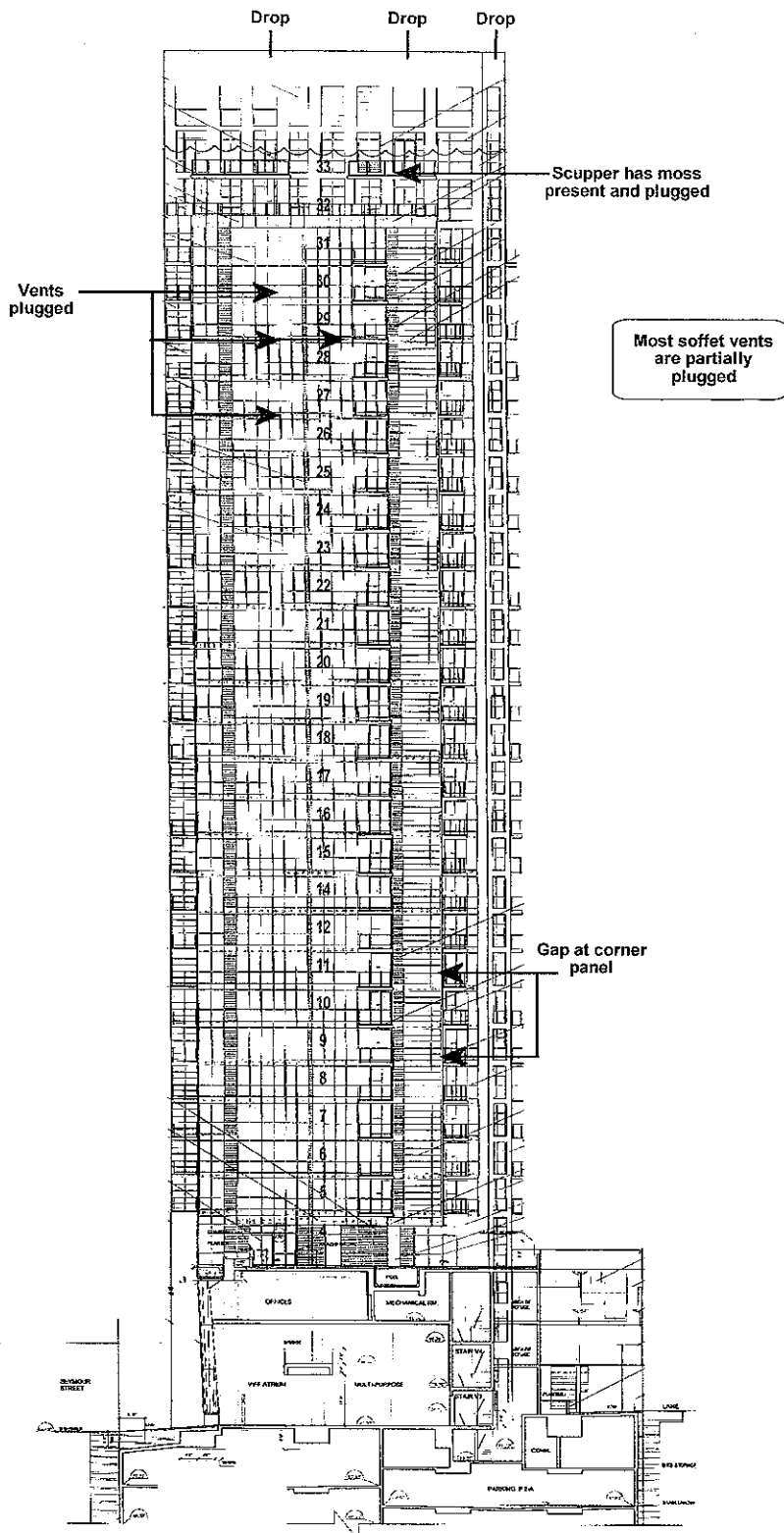
Photo #28- Concrete chipped.



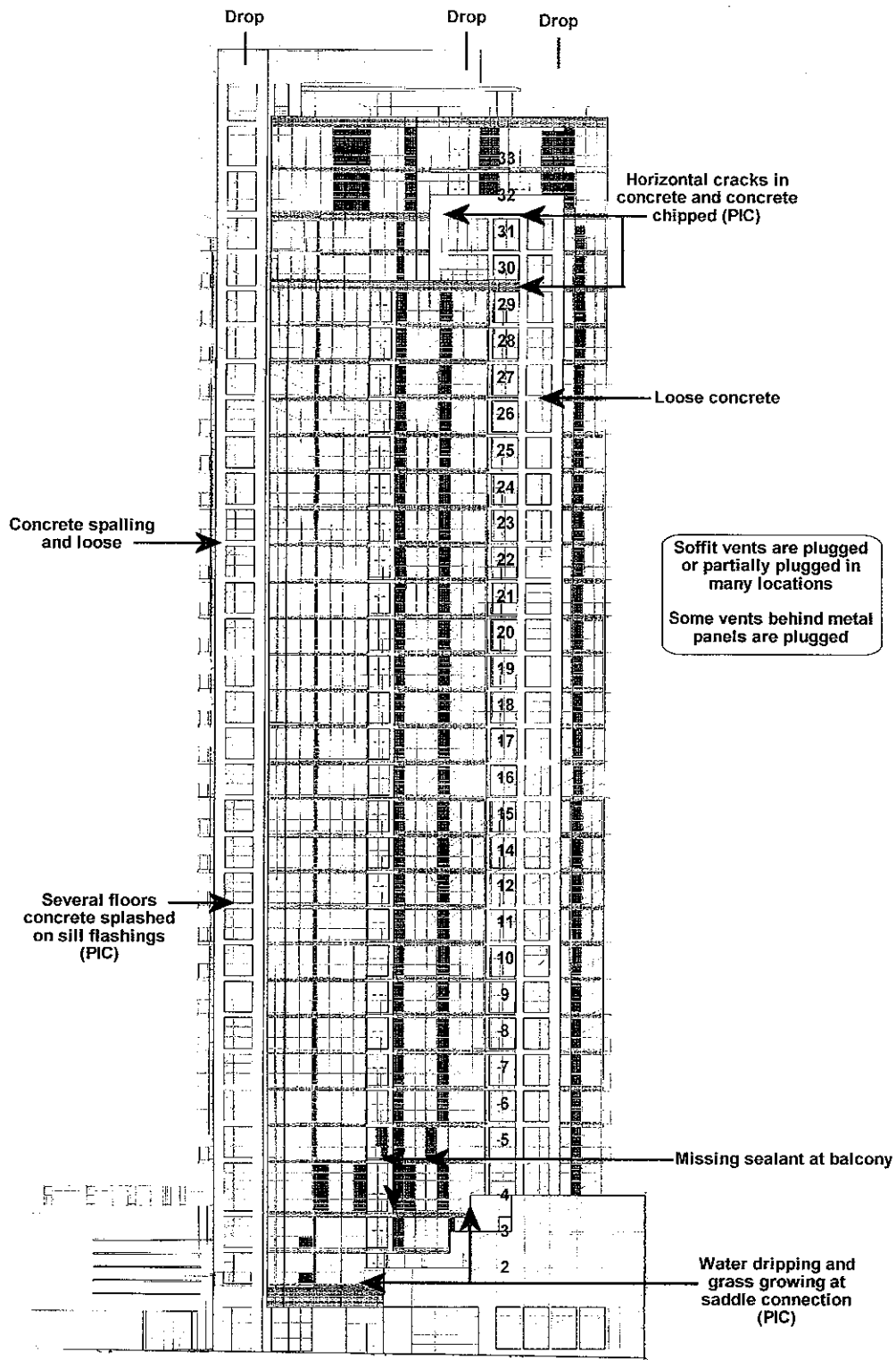
BRAVA
Tower A
South Elevation



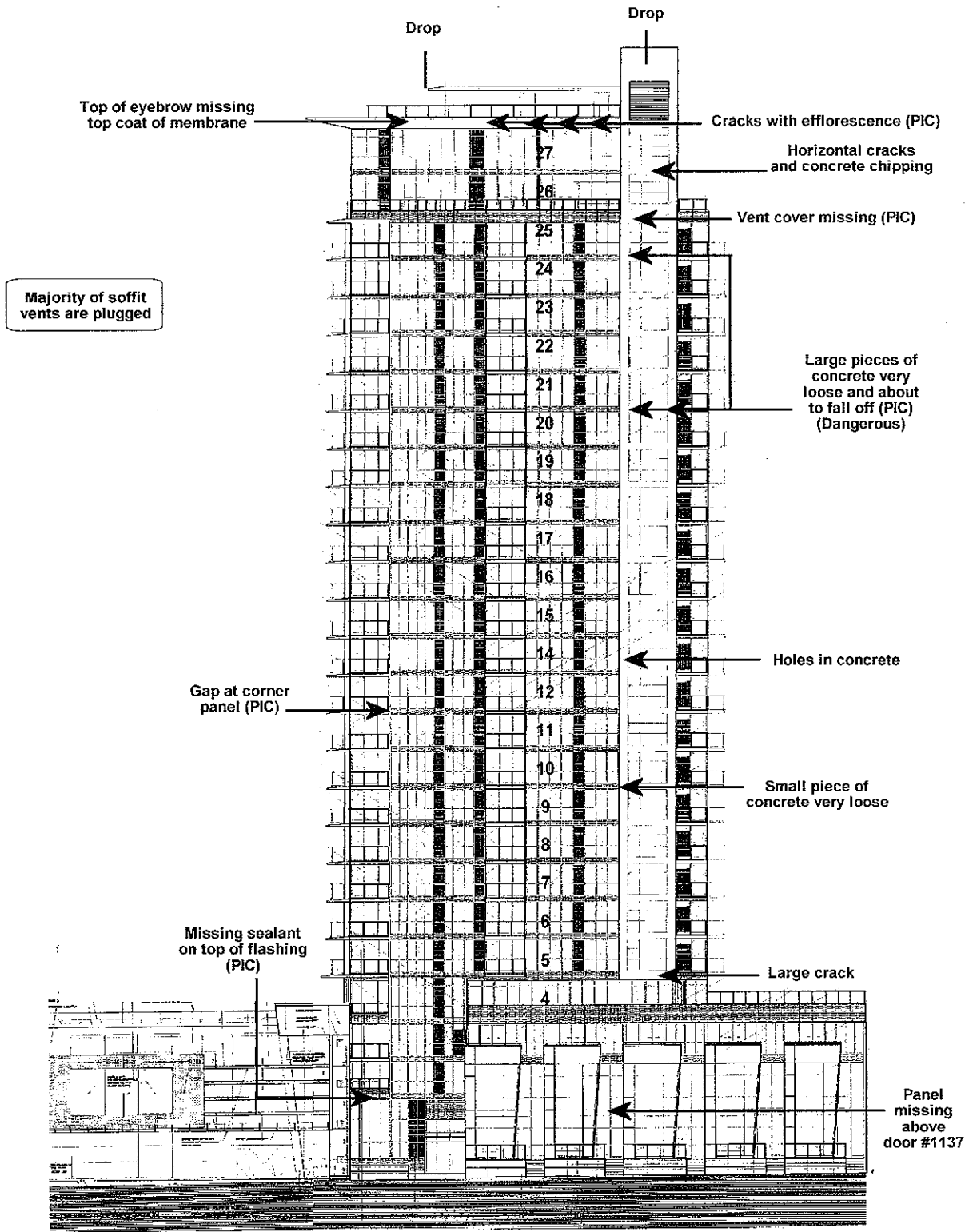
BRAVA
 Tower A
 East Elevation



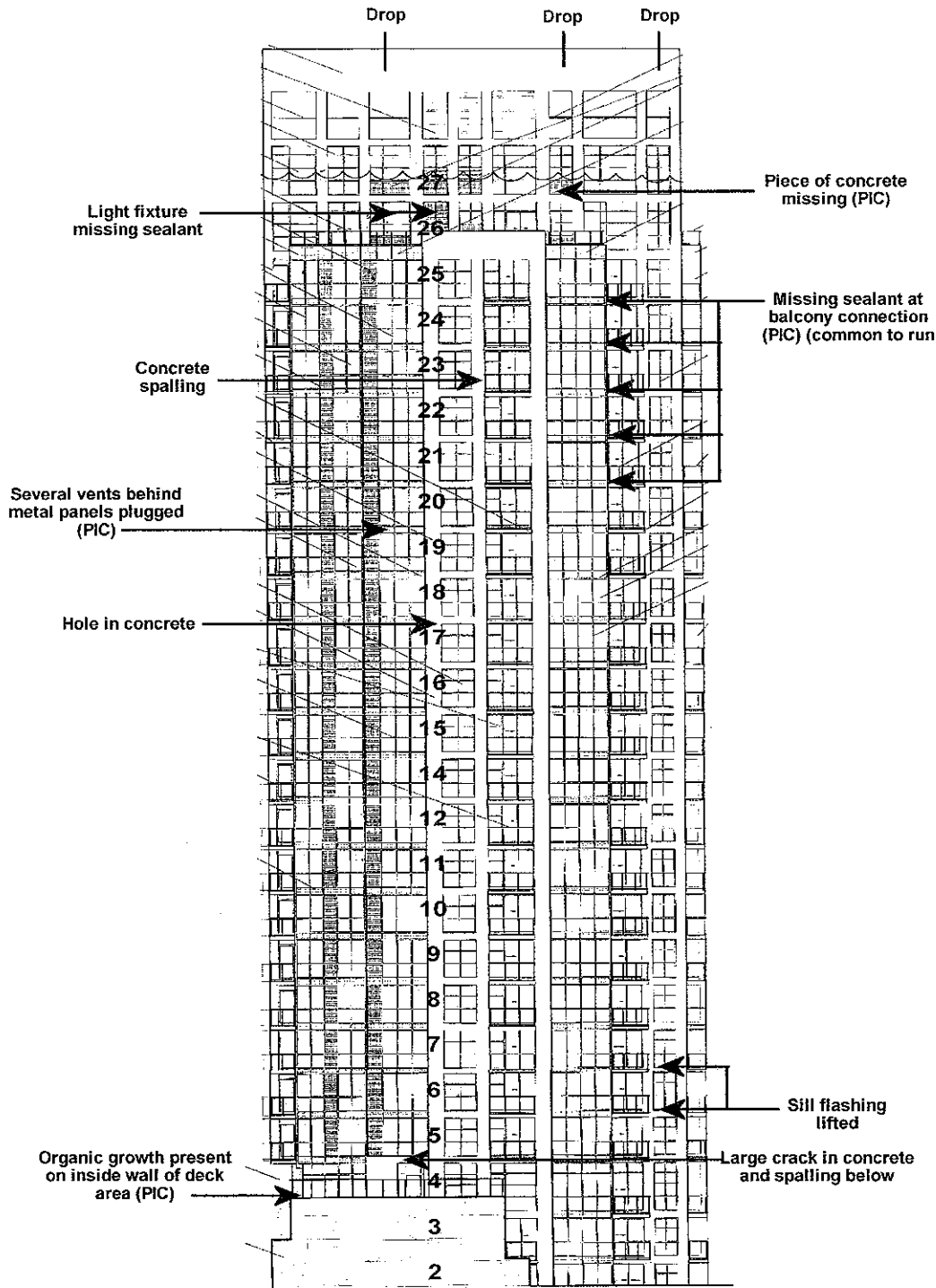
BRAVA
Tower A
North Elevation



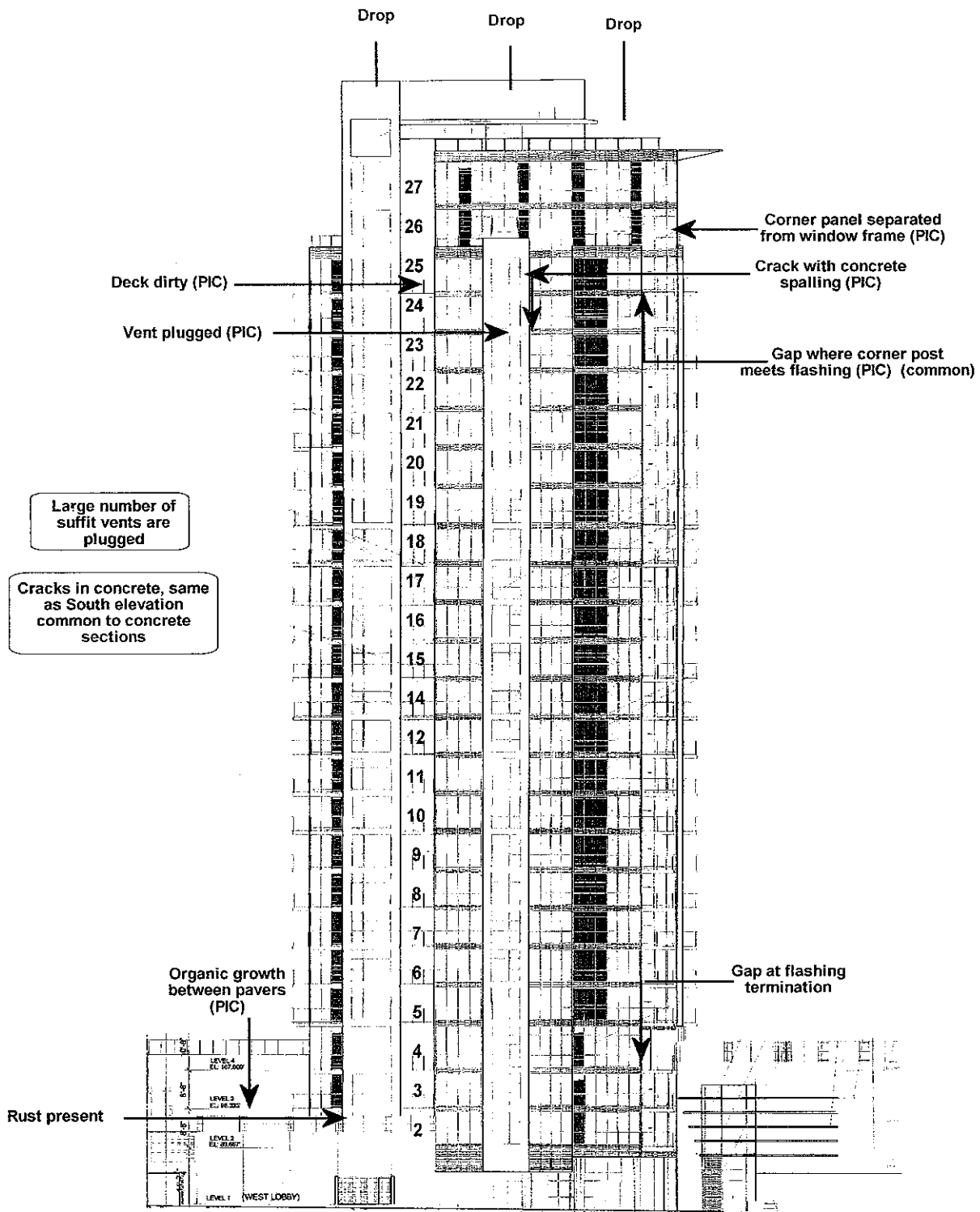
BRAVA
Tower A
West Elevation



BRAVA
Tower B
East Elevation



BRAVA
Tower B
North Elevation



Large number of
suffit vents are
plugged

Cracks in concrete, same
as South elevation
common to concrete
sections

BRAVA
Tower B
West Elevation

