



**Company:**  
**Attention:** Bruce Pomeroy  
**Reference:** Brickwood Place  
Project No. 50-211

**From:** Daryl Massey  
**Date:** February 6, 2007  
**Sheet 1 of** 9

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On Friday we began the process of performing a Building Envelope Inspection to the South and East elevations of the above noted project. These elevations are stucco clad and viewed as a higher priority than the North and West elevations which are vinyl siding clad. The time frame for the completion of this report was very short and the process of the investigation was therefore modified to concentrate on those areas which have already been identified as troublesome to determine whether these problems are widespread on these elevations.

The process of this investigation was according to the following general guidelines:

- 1) All destructive investigative procedures were restricted to the East and South Elevations.
- 2) Approx. 40 - 3" round holes were cored through the stucco to review the condition of the sheathing and structure below. A visual inspection was performed and a moisture level reading was recorded before the hole was sealed again with a round PVC louvre caulked into place. These holes were located at sensitive junctions in the wall and deck interface locations where high moisture levels and structural decay were located at units 106, 108 and 110.
- 3) Aluminum soffit areas of the decks were removed to visually inspect the deck structure and sheathing condition.
- 4) Each deck was inspected for vinyl decking condition, rail mount details and caulking. Particular attention was paid to vinyl installation details and previous repairs.
- 5) The suspended slab was inspected to determine the detailing elements to the slab surface and slab edge where the 2 x 12 trim board and fence posts have been attached.

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The significant points of discovery include the following, a photo record is attached at the end of this document to identify each of these elements:

- 1) At the time of report preparation, 29 of 40 coring holes have been performed and documented. Of those 29, the following moisture levels were recorded using a Belmhorst - J Lite wood moisture meter. A reading below 19% is considered acceptable, readings from 19% to 22% are troublesome and deserve some attention, readings above 23% represent areas where active mould growth and structural decay are underway aggressively. The maximum reading the meter can record is 30+% which indicates a moisture saturated environment.

| Moisture Level Reading | No. Of Locations out of 29 Holes |
|------------------------|----------------------------------|
| 12 - 18%               | 3                                |
| 19 - 22%               | 2                                |
| 23 - 29%               | 5                                |
| 30 +%                  | 18                               |

At one location a reading was not able to be recorded due to the level of deterioration which did not provide sufficient material to be measured.

- 2) When the soffits areas were removed from the underside of the deck areas, two things were found. In 12 of 15 decks reviewed so far, the dryer vent from the unit expels it's exhaust air through a soffit vent installed in the soffit at various locations. In every case reviewed, the exhaust pipe was not mechanically attached to the soffit vent but simply terminated 2 - 3" above the soffit vent. Most of these vents were lint clogged and the interior joist cavities and deck sheathing above were filling with the hot and wet exhaust air from the dryers. These area were completely water saturated and dripping in some cases, several of the decks had mould growth actively underway with the start of structural deterioration underway as well. Moisture level readings in all cases were 30 +%.

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In 3 cases, additional structural decay was a result of water penetration through the deck rail mount location. At these areas the deck sheathing was deteriorated and "spongy" when stepped upon. In many cases the water damage from the deck edges was also visible from the underside with the sheathing water stained and deck joisting showing water damage as well.

Most of the damage which was seen in these joist cavities was surface damage and not yet severe. Some areas are definitely more advanced in their deterioration and will require more structural repair than most. The full extent of damage is hard to quantify until the areas are opened up more fully during the demolition process.

- 3) The deck surfaces themselves were in relatively damage free condition. 3 of the 15 decks reviewed so far had cuts or holes in them which are allowing water to penetrate the deck surface. All of the decks are suffering from debonding at the edges and poor detailing at the deck to wall interface. A few of the decks have been repaired with a small patch and diverter welded onto the vinyl surface in an attempt to divert water away from the wall junction. These repairs were surface repairs only and no evidence of a complete "boot" can be seen. The rail system is a surface mounted rail detail with the foot of the rail mounted on top of the vinyl surface with screws penetrating the vinyl surface with sealant applied over them. Only a small portion of the rail feet were able to be reviewed from the bottom where the soffit was removed, of those areas, 3 of 15, as noted above in 2), were causing some degree of water penetration damage. The sealant at the screw hole penetrations was reviewed and appears to be the original installation. The sealant has let go in many areas and has reached the end of its life span, as this occurs, more water is able to penetrate the screws holes into the deck structure.
- 4) The suspended slab was reviewed at the NE corner where it is exposed and its components are visible. It appears that the slab was covered with an built-up roofing based membrane and covered with a 2" asphalt top coat. At the slab edge a flashing was installed which acts as a finished edge for the asphalt top coat and a cover for the 2 x 12 trim board. The trim board runs continuously along the slab edge and the fence posts are mounted to the face of the trim board and anchored through the trim board into the structural slab. The posts and their bolts were not removed to determine the method or depth of fastening and these findings are based on observation only.

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The edge flashing appears to be sealed into the slab surface membrane, however, it is evident that it is acting to retain water on the slab surface. This is quite clearly seen over the garage area entrance with water dripping behind the 2x12 trim board where the slab surface membrane has failed. During demolition of the asphalt topping at the base of the building wall, water pressure from under the membrane was pushing water back into the area of demolition.

5) The large 4th floor deck on the NE corner ( 416?) was reviewed specifically because of the large amount of staining visible on the underside of the soffit below it. Upon examination the following significant concerns were noted:

- a) the vinyl had been replaced previously with a new surface placed over the previous surface. This installation terminated under the stucco stop only ( 1-1/2" upturn) and was debonded along its entire length allowing water easy access to the wall and deck surface below.
- b) there were four large soft and "spongy" deck surface areas which indicate the deterioration of the deck sheathing below.
- c) there was no overflow scupper to the deck area
- d) this is a large cantilevered deck area with a support beam running perpendicular to the building at about the centre point. The soft deck areas are above this beam location and damage to this beam must be considered as serious.
- e) the pitched roof area to the south of the deck drains onto the deck surface and uses some questionable roofing and membrane practices. Roofing membrane has been bonded on top of the vinyl decking, there is back-lapped and loose roofing membrane allowing water penetration, and ill-fitted flashing components.

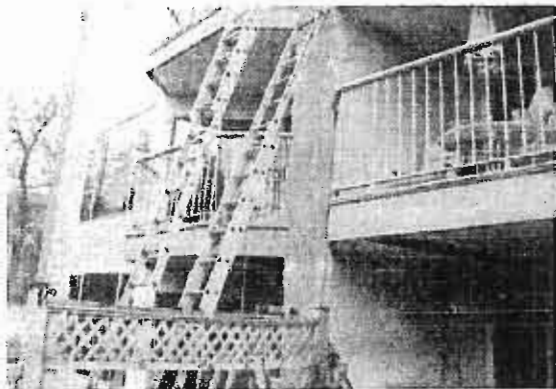
The investigation was not complete at the time of this report preparation and therefore these findings are not complete. However, the findings so far are consistent and it is therefore reasonable to assume that the same sort of results will be found as the investigation continues.

The North and West elevations were not investigated to the extent that the East and South elevations were but a "walk-around" was performed with the following general observations:

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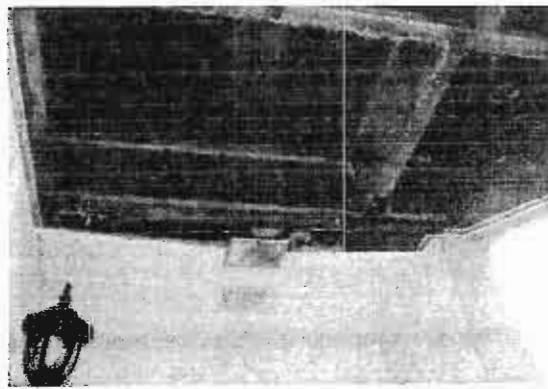
- 6) The vinyl siding had mould growth on its surface and requires a good cleaning.
- 7) The detailing around the windows and penetrations were questionable as the head flashing was minimal and the vinyl "J" detailing would allow water penetration. There was no sealant at the junction between windows frames and the vinyl "J".
- 8) Some back-lapping had occurred in the installation of the outside corner trim pieces at some locations.
- 9) None of the wall vents had any flashing or sealant protection
- 10) Caulking was missing or incomplete at some locations.
- 11) The deck vinyl surfaces showed the same signs of delamination at the edges etc. as those on the East and South elevations.

The following photo record identifies the findings as indicated above:



#### **Moisture Level Readings**

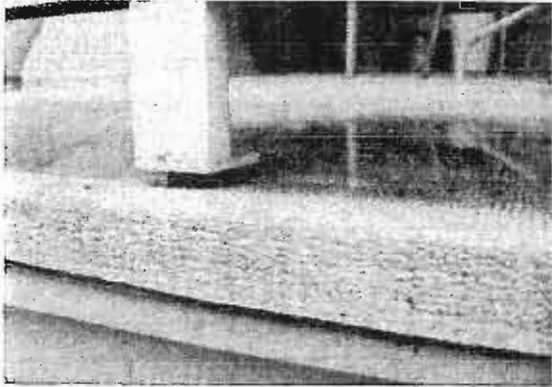
3" round holes were cored through the stucco to record moisture levels and to inspect the structure beneath



#### **Dryer Vent Conditions**

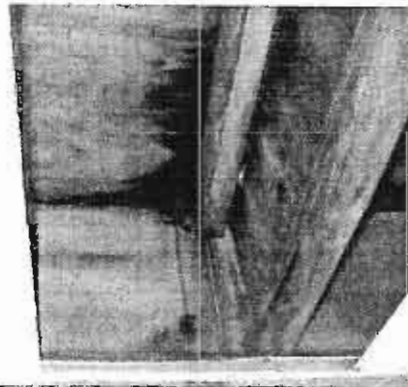
The damage from moisture in the joist spaces is clear. The vent is not connected to the dryer duct pipe

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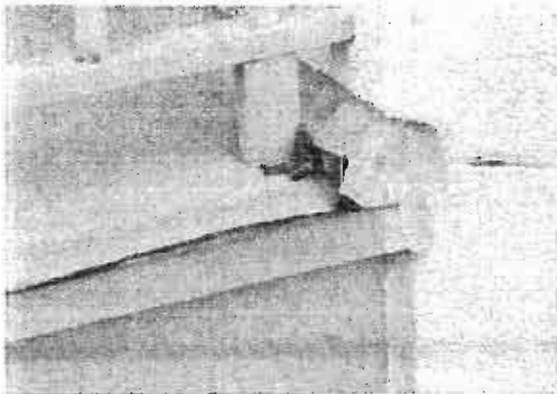
#### **Deck Rail Mounting**

The rail foot here is actually raised off of the deck surface. The ponding water is able to penetrate the deck surface through the exposed penetrations



#### **Deck Rail Mounting**

The damage directly below the rail foot is very evident and can be seen to be actively leaking in this photo



#### **Deck Edge Repair**

This photo shows a previous deck edge repair which relies largely on caulking

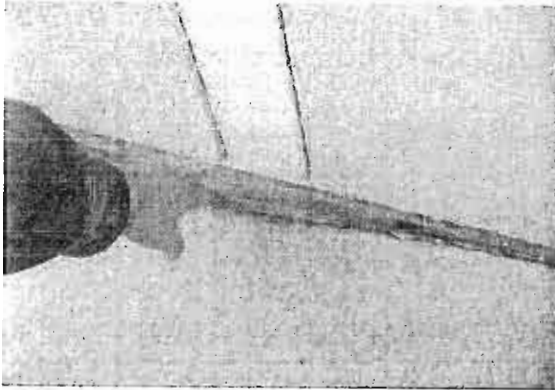


#### **Suspended Slab Edge**

The components of the slab edge can be seen here. The flashing configuration is acting as a dam and is causing water to back-up under the membrane.

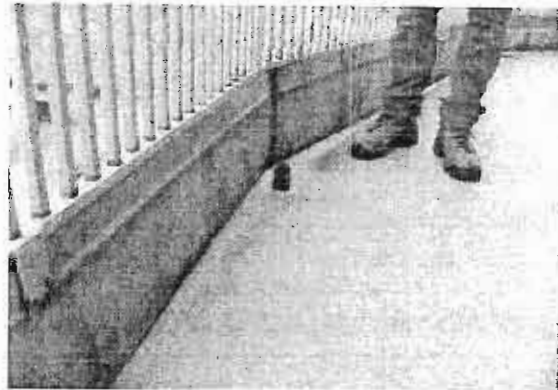
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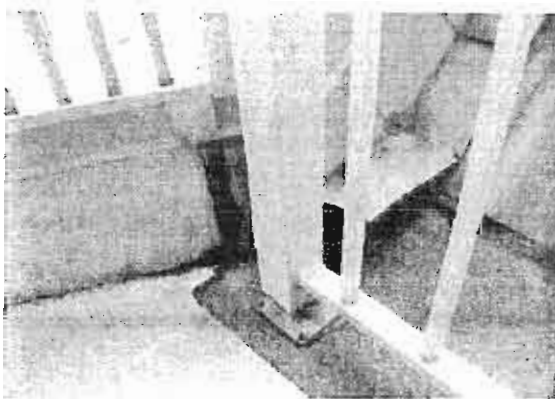
**Deck at unit 416**

There is no upturn on the recent vinyl repair and the entire edge is debonded. Water is easily able to penetrate the surface to the structure below.



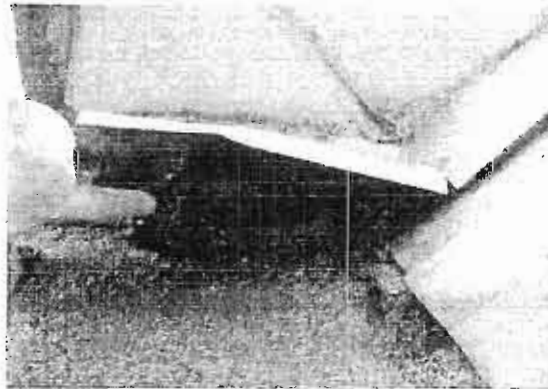
**Deck at unit 416**

Several areas of the deck surface are soft with water ponding. The cap and rail configuration do not shed water properly and the sealants have reached the end of their serviceable life.



**Deck at unit 416**

The pitched roof beside the deck runs onto the vinyl resulting in some very questionable detailing



**Deck at unit 416**

This photo shows delaminated and back-lapped roofing membrane at this location

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**Recommendations:**

- 1) There are essentially 8 stacks of decks with 3 decks in each stack on the East and South elevations. 3 of these stacks are adjoining and should be considered together, therefore, there are essentially 5 reasonably distinct work areas. The findings of this investigation indicate that the decks are suffering from some significant building envelope failure issues which are consistent throughout the East and South elevations. A repair strategy should consider that an entire stack of units be addressed as one defined work area for several reasons which include efficiency of manpower and repair strategies, stucco and vinyl repair, and the fact that work at the bottom of a wall area is dependant upon repair being completed at the top of a wall area first.
- 2) All the deck surfaces require new deck membrane installation c/w upgraded details at deck edges and deck to wall interface. Stucco should be removed sufficiently to accommodate repair work similar to that which has been exposed at units 106, 108 and 110 already. Damage to the wall surfaces appears to be contained to the wall sheathing in most cases, therefore, it may not be necessary to include the adjoining window area in the repair strategy. Once the initial demolition has been accomplished and the extent of structural repair has been determined this question can be answered more fully.
- 3) The existing rail configuration has proven to be troublesome in our experience and is no longer considered to be an acceptable detail in new construction and in building remediation. We would recommend a new, faced mounted rail system be considered which would see the rails mounted to the face of the deck edge and not through the top of the deck membrane.
- 4) The dryer duct venting is a serious issue which must be corrected. The existing configuration has caused significant damage to the deck joists and sheathing already which may require some repair and replacement and not just drying out and cleaning. The fullest extent of the damage can only be know once the demolition process has been completed. The duct piping must be mechanically connected to the vent and sealed from air leakage. It may be necessary to adjust the piping and venting to ensure that moist air build-up in the joist cavity is eliminated.

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- 5) The slab edge detail should be reviewed more carefully to determine whether a change to its configuration is necessary. If the edge flashing is causing a water retention problem on the slab edge it may be leading to other problems not yet identified. These problems may include premature deterioration of fence posts and trim boards, water leaks in the underground parkade, etc. This issue should be considered with a longer range consideration to the asphalt deck topping repair and base of wall repair detailing currently underway at units 106, 108, 110.
  - 6) The deck at unit 416 is in serious condition. For safety reasons this deck should be closed off to access until the extent of damage can be determined more fully. Even though wall areas at units 106, 108 and 110 have already been opened up, this deck area should be given the highest priority in the continuing repair process. It is my opinion that the beam supporting the deck should be reviewed ASAP to make sure that it is structurally sound and not representing a safety hazard to the residents. The roof area adjoining this deck should be reviewed and its details should be inspected to ensure that non-compatible membranes and techniques are corrected.
  - 7) The North and West elevations should be considered for a full review as well as there is enough visual evidence to suggest that other problems may be developing if left unattended.

The complete record of photographs are available for review on the project specific area of our web-site. A complete package of repair details can be prepared once a scope of repair has been determined or considered.

I anticipate that this information shall met with your approval, the complete record of findings from this investigation shall be included as they become available. If you have any questions, or if you require any further information please contact me.

Yours truly,

Daryl Massey  
Superintendent -Pomeroy Building Maintenance Ltd.

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