

TO **Ms. Bev Andrews**
EMAIL **bandrews@novuscom.net**
Strata Plan LMS712
888 Beach Avenue
Vancouver BC V6Z 2P9

3436.081
888 Beach Avenue
Maintenance & Renewals
2015

DATE May 1, 2015

REGARDING **Water Ingress at Main Entrance**

Dear Ms. Andrews,

RDH Building Engineering Ltd. (RDH) has been investigating the cause of the water ingress at the entrance to Beach Tower for several years. Understandably, the Owners have become somewhat frustrated with the leakage that continues to occur. The purpose of this letter is to provide a general overview of the leakage that has been ongoing at the main entrance to Beach Tower, and to provide comments on the steps that have been taken to correct the problem.

General Overview

Leakage at Base of Curtain Wall

RDH first investigated the leakage at the base of the curtain wall in the Beach Tower lobby in 2007 (Figure 1). A simple flood test was performed at the base of the curtain wall (the surface of the exterior granite tiles were flooded) (Figure 2). Water leaked into the lobby. Upon inspection, it was determined that the bottom of the curtain wall was not sealed to the waterproof membrane under the granite tile. RDH arranged for a contractor to install a sealant bead between the base of the curtain wall and the concrete curb below as per typical curtain wall termination details. This repair was intended as a temporary repair until the waterproof membrane below the granite tiles was replaced.



Figure 1 – Damaged gypsum sheathing and wood paneling at north side of lobby.



Figure 2 – Flood testing on granite tiles.

During the investigation, it was also determined that a large quantity of water had been leaking into the mechanical space below the lobby (Figure 3).



Figure 3 – Leakage into mechanical space below lobby.

Inspection of the grate at the main entrance determined that the drain was plugged and leakage was occurring through the pan below the grate (Figure 4).



Figure 4 – Pan below grate at main entrance.

Leakage at Deck of 710

The waterproof membrane at Suite 710 was leaking into Suite 611. During replacement of the membrane at Suite 710, a poor tie-in was identified between the parapet wall and the curtain wall. Leakage from this source was likely penetrating behind the brick masonry and was potentially contributing to the lobby leakage. The tie-in detail between the parapet wall and the curtain wall was corrected at the time the new membrane was installed at Suite 710.

Leakage at Brick to Curtain Wall Interface

Leakage continued after the initial temporary interface was implemented, and after the membrane at Suite 710 was replaced (the leakage into Suite 611 was corrected, however). Therefore, RDH flood tested the gutter between the canopy and the curtain wall. No apparent water ingress occurred as a result of this testing.

During this period, it was determined that leakage was occurring from the drain pipe in the space above the ceiling in the lobby. Water from this source was running down the wall within the lobby. The Owners retained a mechanical contractor to correct the problem. In short, the pipe had become plugged with corrosion product and the water back-up was leaking at a clamp seal. RDH discussed the issue with the mechanical contractor. Continued review has confirmed that this source of water ingress has been corrected.

While above the ceiling in the lobby, water stains were noted at the curtain wall to brick interface (Figure 5).



Figure 5 – Staining at brick to curtain wall interface above leakage location into lobby. This leakage path was confirmed through testing. Note, the staining was present before the testing was initiated.

This photograph was taken above ceiling in lobby entrance.

RDH worked with a contractor to have an additional access hatch installed into the ceiling closer to the point of water ingress. Once the hatch was in place, a series of water tests were performed at the curtain wall to brick interface (Figure 6). Water ingress occurred during this testing. The water wetted the previously stained areas and wetted the lobby in the damaged area.

The exhaust grill was also removed to allow inspection inside of the duct. No significant problems were noted inside of the exhaust duct.

As a result of our leak investigation, the seal between the curtain wall and the brick clad wall areas was improved. Simultaneously, a new waterproof membrane was installed at the balcony of Suite 511 because water from this source was likely entering the wall below (above the leakage location). Also, the membrane at Suite 511 had been poorly installed. The required work was completed by TEK Roofing.



Figure 6 – Water penetration testing was performed at the brick to curtain wall interface immediately above leak location in lobby. The exhaust grate was covered in poly during test to confirm it was not the point of ingress.

Additional Canopy Water Testing

Unfortunately, the leakage into the lobby continued after the curtain wall to brick interface was remediated. Further water testing was performed at the canopy level to try and determine the source of the water ingress. Also, the curtain wall above the canopy was flood tested. This testing resulted in water bypassing the gutter at the canopy to curtain wall interface, but leakage did not occur into the lobby.



Figure 7 – Water testing at canopy.



Figure 8 - Water testing of canopy.

Water testing was continued at the curtain wall to brick interface low on the wall and at the base of the curtain wall. The test area was expanded to the brick paving stones on the sidewalk. Once the testing extended uphill (north) on the side wall, leakage occurred into the lobby.



Figure 9 - Flood testing along sidewalk.

RDH arranged for a contractor to remove the brick paving stones and expose the waterproof membrane (the structural slab above the parking structure extends approximately 4 feet out under the brick paving stones on the sidewalk). Figure 10 illustrates the exposed membrane.

Several observations have been made:

- The granite tiles are installed on a low-strength concrete slab, which is installed over a bed of rubble (sand, gravel, bricks, etc.). Therefore, water can flow under the granite tiles and under the concrete topping (Figure 11).
- The concrete at the base of the building is pre-cast elements. The waterproof membrane from the structural slab extends up behind the pre-cast elements. There is water under the membrane at the edge of the pre-cast elements (Figure 12).

→ There is extensive water under the membrane on the structural slab (Figure 13).



Figure 10 – Brick paving stones have been removed to expose the base of wall at west sidewalk.



Figure 11 – Granit tile at main entrance is set on a low-strength concrete slab, which is sitting on a bed of rubble.



Figure 12 – Waterproof membrane extends under the pre-cast slab. The arrow indicates a location where there is water under the membrane.



Figure 13 – Water under membrane on podium slab.

Based on our current observations and testing, water is getting in behind the pre-cast elements and traveling laterally into the lobby. Unfortunately, correction of this problem is not easy. We will provide a recommendation shortly. Also, we have been unable to confirm a leakage source that has caused the staining on the south side of the lobby adjacent to the curtain wall.

Summary

So far, five sources of water ingress into the lobby have been identified. Three of the sources have been corrected. We will continue to work with the Strata to correct the remaining sources of water ingress.

Please contact RDH if you wish to discuss this letter or any other aspect of the project.

Yours truly,

Marcus Dell | P.Eng.
Managing Principal, Senior Building Science Specialist
mdell@rdh.com
RDH Building Engineering Ltd.



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cc Tony Guillard, RDH Building Engineering Ltd.
Michael Roche, RDH Building Engineering Ltd.

EMAIL tguillard@rdh.com
mroche@rdh.com