A Discussion Paper on Windows at Harbour Cove.
Carl Meilicke For submission to the Dec. 5, 2017 meeting of the CPTF.

Preface.

A clear message emerges from the following research. In terms of governance and management, Harbour Cove has entered an entirely new and extremely challenging era.

The days of relatively routine operating budget decisions, interspersed with the occasional special levy or ad hoc capital investment are over. The days of a seven member council operating in relative if not complete isolation must come to an end. The days of disengaged owners should be and must be left behind.

Harbour Cove is now facing years and years of multi-million dollar decisions that will be both administratively and politically very challenging. We must all make major adjustments if we are to even have a chance to preserve and enhance this wonderful urban asset with which we have been entrusted.

Introduction.

Looking at the recommendations in the 2017 RJC report, it is hard not to conclude that the single most important planning issue the CPTF must deal with in the near term is the window and door assemblies. One is led to the same conclusion by our three other envelope reports from 2006, 2014, 2017 and, as well, the recommendations made by Lee Hanson a number of times.

There are three reasons for this.

First, because of the high costs, the recommended timing, scope, and sequencing of the window and door replacement has the potential to very dramatically affect the sequencing and timing of all other depreciation activities.

In addition, deferring these recommendations for too long increases the probability that ad hoc repairs will become prohibitively expensive.

Finally, the consequences of window and door failures are among the most costly, unpleasant, and intrusive envelope failures that an owner can face and should be remedied as expeditiously as is possible.

Each of these three issues is discussed below.

1. **What is the overall impact of the RJC report?**

The RJC cost estimates for replacing the windows and doors total approximately 16 million dollars over 4 years with a start date of 2019. Even if by good management and good luck we were to reduce these costs by 20%, and spread the construction over ten years rather than four, the implications for other programs are dramatic.

Even when using the the above optimistic assumptions, the total cost still would be well over 12 million dollars and the time frame from start to finish would be 2019 to 2028. Even if we started the savings/payment process for this in 2018, it would require a cash infusion averaging more than one million dollars per year for ten years. In addition, during this time period, we have several million dollars of other RJC recommendations to deal with AND we are also hoping to deal with the 1470 hallways and the lobbies. For example, during this same time frame (2019-2028) RJC recommends 1.9 million for balconies, 3 million for corridor finishes, and 7.6 million for exterior walls, and 6 million for the plaza slab.

The point is clear. It is difficult to see how any long term plan can be considered without first making some major decisions about the timing and sequencing of window/door remediation.

2. Is an ad hoc approach to repairs cost effective?

As an asset approaches obsolescence, the cost effectiveness of continued repairs is reduced because the repaired asset will soon be replaced. This is especially true if the cost of routine repairs is relatively high.

The cost of repairs for these window and door assemblies is indeed high because the damage inevitably includes some or all of frames, IGUs, studs, wallboard, sills, brickwork, and interior finishes such as carpets, hardwood floors, and wall coverings or paint.

Unfortunately, unlike many depreciation issues, it is also relatively expensive to "piecemeal" these replacements because of the considerable time required for each job and, except on decks, balconies, and at ground level, the need to use bosun drops or scaffolding.

Even ad hoc repair and maintenance of relatively simple items is expensive. The cost of replacing IGU's since 2006, for example, has been well over a half a million dollars. There is also evidence of a significant increase over time in the need to replace complete window assemblies in individual suites. (These developments are discussed below.)

Given the above, determining at what point, and how, to prioritize replacement rather than repair is an important challenge.

3. What are the consequences of window and door failures?

The consequences can be loosely divided into structural and aesthetic.

There are a variety of structural issues, all of which can be found in this building. For example: frames can warp due to settling of the building and open up gaps leading to the outdoors; moisture ingress can rust and therefore weaken structural supports and create the potential for further distortion in the frames; moisture and/or weathering can damage essential components that hold the IGUs in place; wood infills can rot from moisture ingress and compromise the structural integrity of an entire window assembly; increased mould can create significant health problems; and, this is only a partial list. In addition, the longer replacement is delayed the more extensive, and expensive, the damage becomes.

The aesthetic consequences are the most personally expensive and intrusive for the owners of any depreciation issue except, perhaps, a leaky ceiling. As mentioned above, "the damage inevitably includes some or all of frames, IGUs, studs, wallboard, sills, brickwork, and interior finishes such as carpets, hardwood floors, and wall coverings or paint". It can also present a serious health hazard in the form of mould.

The four letters from owners in attachments A, C, D, and E amply demonstrate both the aesthetic and structural consequences of failure. [**Editors Note**: These cases were not "searched out and selected" by me. They just happen to be folks that I know. Without any effort, I can add four other cases. With a little effort, I could add many, many more.]

4. What are the potential remediation costs based on past history?

It would be helpful if we could trace the history of failures, and the cost of repairs, to determine if there is a pattern, especially a pattern of increasing costs

or a pattern by location, especially by stack. Unfortunately, our record keeping over the years has been less than ideal. However, there is some information that can be retrieved from council and AGM minutes as well as a couple of "reports". This data collection is proceeding and there will be more information available later. What follows is an overview of what has been found thus far.

4.1 IGUs prior to 2016

The strata began accepting responsibility for IGU replacement in 2008 due to a change in the Strata Property Act. At that time, the strata undertook to reimburse owners for IGUs replaced by owners in the previous six months and for present and future failures. Strata funding then proceeded on an ad hoc basis for a few months until it became obvious that a more carefully planned approach was required due to the large number of failures being reported.

A self response survey was done in 2009 and 393 failed IGUs were reported in 92 suites. Between 2009 and 2011, 301 IGUs were replaced at a total cost of $200,000. The balance were left unrepaired due to a continuing flood of reported IGU failures and concerns about costs. As the councillor who was in charge of this program put it, "We replaced as many as we could afford and chose by the greatest number in each stack/rise. Many windows were not replaced because the reports of failed windows came in faster than we could keep up."

During this time, as reported at the AGM in 2011, another $65,000 had been rebated to owners for IGUs they had replaced on their own. Thus, the total expenditure in these three years was at least $265,000 and, as is discussed later in this paper, thousands of additional dollars were spent during this time for repairing or replacing entire window assemblies.

4.2 The 2016 Survey of IGUs, the WSP Study and the RJC Proposal

[**Editors Note:** The data reported below are available, upon request from me, in spreadsheets prepared by our outgoing council.]

From 2011 until 2016 virtually no IGUs were replaced and in 2016 another self reporting survey was done. It uncovered 228 failed units in 153 suites. (We do not know the significance of the increase from 92 suites in 2008 to 153 in 2016 but it could reflect an increasing rate of failure.) Upon inspection of each reporting suite, the number of windows was increased to 290 of which 153 were "seriously fogged". That led to expenditures in 2017 of approximately $73,000 to replace 71 IGUs in 1470 and a budget for 2018-19 of $190,000 to replace the remaining 219 IGUs that had been reported.

There are an additional 303 failed IGUs in hallways, the bulk of which are in 1470, and the estimated costs for replacing them, including low-e glass, is $135,000. This estimate will be very much higher if the 1470 hallway window frames must also be replaced and there is one powerful argument for doing that: thermally broken aluminum frames would help to solve the tremendous temperature control problems in that hallway. Another reason is that the IGU failures in that location may have actually been caused by the existing frames.

The total expenditures in this time period (2016 to the present), completed, planned, and imminent are $398,000 for a grand total since 2008 of $663,000. There is no guarantee that the above record of costs is complete or that there won't be a lot more costs in the near future. If one just reads the letters attached to this paper it seems likely that there will be more. Furthermore, as the building ages, the rate of failure is likely to increase.

4.3 What else the survey revealed.

170 suites self reporting in the 2016 survey also were assessed by a glazier to confirm the failed IGUs that had been reported and, as well, a study was done by a firm called WSP Canada to assess moisture in the walls of 257 suites.

The suite by suite inspection by the glazier showed a large number of additional flaws other than failed IGUs including condensation, wood rot, mould, air leaks, warped frames, rusted frames, failed seals, broken handles, and malfunctioning hinges. Fifty-five percent of the suites reporting had one or more of the problems listed, including 20 (13%) that were found to have water leaks. It is important to note that this survey underreported problems for several reasons. For example, a properly qualified envelope specialist would probably have noted more problems than the glazier did. Also, the WSP study was done at a less than ideal time of year for a moisture study (summer) and the sample sizes were limited. (See Attachment B for a comment on this.) On top of that, self reporting surveys inherently result in under reporting as well as reporting errors.

It will take further analysis to determine whether the rate of IGU failure is increasing but simple logic would suggest that, due to normal aging, it will be and our consultants have repeatedly warned us that this will happen. In addition, we know that replacing an IGU in a faulty frame can lead to failure of the new IGU and that over time frames can twist and warp due to a number of variables, including weather exposure and settling of the building. A case in point is suite 507 in 1490 that has a large gap in the frame due to settling of the building. Also, the letter from an owner in Attachment C indicates that replacing IGUs in a faulty frame may lead to a repetition of IGU failure. If this is the case, by the way, it may well explain the mass failure of IGUs in the 1470 hallway where it may be that the intense exposure to sunlight and weather either causes so much expansion and contraction, or has modified the entire structure of window frames, that IGU failures have become chronic and, if this is so, it would not be cost effective to simply place the IGUs.

Given the historical costs experienced and the large number of IGUs that have not yet been dealt with, the downstream costs for IGU replacement could be quite large. In addition, the numerous “other” problems reported in the self reporting surveys mentioned above need to be more carefully assessed and dealt with.

4.4 Window Assemblies.

One of the first replacements of an entire window assembly seems to have been that reported in Attachment A, suite 707 in 1490. It was done in 2010 at a cost of $10,000. (More recent bids on other windows indicate much higher per unit costs.) While the problems with poor window design and shoddy workmanship in this suite may not be common, there is ample evidence that they are not unique.

Unfortunately, it is extremely difficult to reconstruct the history of entire window assembly replacements because there never was a formal “program” of remediation.

At the same time, analysis of the council minutes for just 2007-2010 show interventions in the following suites but, unfortunately, little detail about what was done and the cost:

2007: 503-1450,
2008: 01 stack - 1450,
507 - 1490,
2009: 409 - 1450,

305 - 1470,
02 stack - 1450,
3rd floor unit - 450

2010: 6th floor units – 1470
5th floor unit – 1490
4th floor unit – 1450
7th floor unit – 1490
4th floor unit – 1490 ($5,701)
6th floor unit – 1490 (water damage to hardwood floor)
7th & 8th 1490 and 5th 1470 ($263,000)
11th floor unit – 1450 (unsafe window, $4,892)
All floors - 1470 (wind deflectors were installed due to water ingress)
All floors - 1470 hallway (secured loose IGUs: 2 man weeks plus costs)
3rd floor unit - 1490 (received quotes of $12,000 and $13,000)

In the midst of these problems our envelope consultant of the day, Lee Hanson, made the following comments about the last mentioned window above in a report to council on Nov. 15, 2010: “This large window has numerous deficiencies; basically the various things we have found deficient in other areas are all a problem here (failed miter joints, no end dams at sill sections, no end dams at brick interface, inadequate void space drain at brick interface, improper sill extrusion used in one area, inadequate building wrap before sill installation, missing and/or improperly located sill drains, and failed caulking”.)
His following recommendation was to “replace all sills and window assemblies overall and install to modern best practices” and “drill weep holes at slab band/brick interface to facilitate draining of rain screen void space.” He concluded that “the alternative is to try to repair the old sill and frames, which is no guarantee that the water ingress problem will be solved. If we then have to replace frames, sealed units, and sills, the money for the repairs will be wasted.”

[**Editor’s Note**: One can also point out that, in general, early intervention in window and door assembly replacement is likely to save a good deal of money by minimizing spin-off damage to studs, sills, walls, and floors, which can be very expensive to repair.]

[**Editor’s Note**: At the time of this writing I came across a report by Layton Consulting, a structural engineering firm that among other things consult on curtain walls and glass in high rises. It was submitted to our council in July or August of 2010. I am unable at this time to integrate their report into this document but it is a must read for the members of this committee and will be sent to each of them in a separate e-mail. Not only does this report provide a lucid discussion of our windows but also it epitomizes the woeful inadequacies of our past planning activities. There is no evidence that I can find indicating that the impact of the information in this valuable report lasted more than a few weeks. I have only begun a careful analysis of several boxes of Archives dealing with such matters but it is already clear that over , and over, and over again, succeeding councils started their planning activities at zero, attempted in effect to reinvent the wheel, and dramatically sub-optimized their decision making potential. Under the circumstances of the time, much of this was explicable, and some of it is even defensible, but it is time for a change. History seldom repeats itself to be sure, but the present often rhymes with the past and the owners deserve better poetry than that.

Some of these problems appear to be failed IGUs but there is also evidence to the contrary. A recent case worth noting is 409 – 1450. (See Attachment D for more details.) This owner has lived here for 25 years and had no significant problems with the bedroom windows until 8 or 10 years ago. The windows then began to show condensation which steadily got worse and now Council has approved a six month study of humidity and air flow in his bedroom during 2018 when the evidence would suggest the window assembly has simply failed or is a bad design and needs to be replaced.

This case is also similar to the one described in Attachment E. In that case the glazier doing the site visit in the autumn of 2017 stated that it was useless to replace the failed IGUs because the entire window assembly needs to be replaced.

Finally, it is to be noted that council has approved the replacement of three window assemblies in 2017 at a total cost in well in excess of $84,000 although, unfortunately, I have not been able to determine the precise total costs (suites 706,707, and 1001 in 1470.) Two more units in 1470 are being assessed for replacement as this is being written.

5. Conclusion and recommendations.

The RJC cost estimates for remediation of our window and door problems are so large that implementing them in the time frame that RJC has proposed is probably neither financially nor politically feasible. If this was done, it would seriously distort the sequencing and timing of all other depreciation programs for many years.

At the same time, the basic approach to capital planning ever since the first days of Harbour Cove can be described as “disjointed incrementalism.” This may well have been been reasonably effective in the past but the situation has changed due to the advancing age of the building and the associated cascade of depreciation challenges.

Comprehensive and continuous long term planning for depreciation, repairs, and maintenance has now become essential.

What follows is a suggested list of some priorities for immediate consideration.

5.1 The CPTF should recommend that council ask the owners if they want to have a Capital Planning Committee institutionalized as a permanent standing committee. Something more than a “task force” is necessary because there must be a continuity of effort for many, many years. The time has come to consider a specialized standing committee because of the heavy workload for council members, and the fact that the criteria for council membership are not necessarily relevant to capital planning. This initiative is so important it requires the clear and open support of the owners.

It should be made clear to the owners that a permanent CPC will not be a sufficient cause of planning success by itself, but it definitely will be a necessary part of any planning effort that is to be successful.

5.2 The task of determining the timing and sequencing of window/door projects is absolutely essential before any other planning of significance goes forward and we should recommend to council that this begin immediately. There are varying degrees of urgency for remediation throughout the complex, depending on such things as the distribution of known problems, differential

exposure to sun and weather, the pattern of original construction errors, and so on. Fortunately, 1470, the smallest building, is probably the most in need of intervention and this can work to our advantage. It can provide a baseline of information at a minimal cost that will be invaluable in dealing with it as well as all other parts of the building.

Two things need to happen right away.

First, every bit of available data on problems with window and door assemblies needs to be collected, collated, and analyzed. This has been started, as evidenced in this paper, and it needs to be expanded with a high priority being given to the 1470 building.

Second, it is quite clear that even after this is done we will not have enough reliable and valid information to recommend a responsible decision about the millions of dollars that are at stake. However, as stated above, there already is enough evidence to warrant considering the replacement of all window assemblies in the entire 1470 building and it does make sense to recommend an immediate effort to determine the necessity and cost of doing this. These include a suite by suite and a hallway window inspection by a qualified envelope professional to determine the nature and extent of problems requiring remediation, a suite by suite moisture study as proposed in the aforementioned RJC proposal, cost estimates for replacing all of the window assemblies in the hallway, and cost estimates for replacing all of the window assemblies on the garden side of the building (RJC reps have mentioned $70-100 per square foot).

The above information could be generated at a relatively modest cost and would be invaluable for planning relating to the entire building. Some of the data from earlier surveys may prove to be useful, thereby further reducing the costs.

5.3 The capital planning committee needs to be authorized to collect and collate historical data about repairs and maintenance and the data needs to be made much more accessible. The building categories used in the 2017 RJC report (BE, BI, EG, etc) should be used as a template to organize existing and future data on all renewals, repairs, and maintenance. In addition, a suite by suite data base should be developed for historical and future information about relevant envelope issues. (This activity has already begun and should be given a high priority because it is essential for rational planning.) I understand that there is software available to assist strata in maintaining such information systems and this should be looked into immediately. We should ask council to approve the foregoing activities. Historical data regarding 1470 should be given top priority at this time.

5.4 There is also a need to establish a Financial Planning Committee, staffed with volunteers, to collect and collate historical and future cost data, to monitor government incentive programs, to analyze and describe financing options to owners, to assist council in formulating long-range funding options, and so on.

5.5 Last, but by no means least, the CPTF should recommend to council that the council make known its intention to inform and involve owners in a more proactive way. This can be done through statements in minutes and council led discussions in Town Hall and SGM meetings. It can also be done in deeds as well as words. Posting council agendas at the time a meeting is announced,

establishing a policy of allowing owners to attend committee meetings as well as council meetings, organizing information sessions and “library discussions”, eliminating sub-rosa meetings of council, publishing reports and policy documents on a website, reducing in camera council discussions to the legally required minimum, improving the accuracy of council minutes, and establishing a policy of recorded votes at council meetings are all matters worthy of careful consideration.

This is not only a practical approach to meeting our challenges, it is also legally and ethically the right approach. Harbour Cove is structured under the law as a democracy, not a private corporation. It is time the owners and the elected leaders made democratic principles the order of the day.

If this is not done, I have serious concerns about the future of Harbour Cove.

6.The following items are carried forward from the earlier paper entitled “An Introductory Planning Document for Depreciation Remediation. Oct. 31, 2017”.

[Editor’s Note: I recommend that the committee minute a formal decision on each of the following action recommendations.]

Action recommendations based on the foregoing discussion:

1.1 Because the consequences of compressor failure could be drastic, the dry pipe compressor in 1490 should be replaced immediately.

1.2 It would seem that the plaza injections have a long half-life and may accommodate to the proposed 2024 plaza slab waterproofing. This should probably be monitored carefully in some fashion or another.

1.3 The pool has been suffering repeated leaks for at least 14 years that I am aware of. Since we began using the injection technique in about 2008, it has been injected numerous times. One has to assume that many if not all of these leaks cause some degree of internal damage to the structure, especially because the water contains corrosive chemicals. Also, the leaks won’t stop and may well increase over time due to aging of the pool. Given the fact that relining the pool would presumably protect it for several decades for an estimated price of around $50,000, the CPTF should consider recommending this repair asap.

1.4 Ciprian is confident that there are no urgent at grade waterproofing needs once the 1470 wall has been repaired. My recommendation is to continue with his ad hoc program of monitoring.

1.5 Ciprian reports that when the plumbing retrofit was done, the supply lines in the ceilings were replaced but the copper control valves were left in place. They continue to fail at a rate of one or two a year. The plastic replacement valves have a 25 year

warranty. Because it takes two years for a contractor to respond after a bid is accepted, bids on this replacement program should be solicited immediately.

1.6 Regarding the boiler in 1470, which also serves the recreation area, Ciprian reports that we have spare burners and an igniter on hand for emergency repairs. The other most vulnerable component is the motherboard but the boiler is in the 14th year of a 25 year warranty so it may be safe to defer replacement of it to 2029. ON the other hand, a failure, especially in the winter, would be a major catastrophe because acquiring and installing an new boiler could take days, if not weeks. If the CPTF is to accept not replacing that boiler, it should be done in the full knowledge of the risk.

1.7 There were some serious concerns about the EV issue raised at a recent "library conversation" and the CPTF should review this concerns with Jenny, who kept notes, and consider revisiting this topic.

2. Budget recommendations emerging from the above.

2.1 2017-18.

Roof Decks:	$400,000
Corridor finishes	$8,000
Emergency Generator	$5,000
Fire Suppression – Sprinkler Piping.	$4,000

2.2 2018-19

Roof decks (tentative)	$283,000
Fire Suppression – Compressor	$3,000
Plaza Slab Waterproofing (tentative)	$386,000

2.3 2019-20

Roof Decks (tentative)	$292,000
Entrance Lobby Finishes (tentative)	$398,000
Unit Substations	$3,000

2.4 2020-21

Piping – Sanitary System Drainage	$15,000
Air Handling Units – Corridors	$7,000

2.5 2022

Consider regrouting hot tub	$10,000

2.6 2029

1470 Boiler	Get estimate

Attachment A: 707 - 1490

June 28, 2011

Dear Strata Council,

I have loved living in Harbour Cove but I need to have the water ingress issues, in my suite, resolved once and for all. I have lived in varied 'states of construction' to repair the water ingress issues starting in 1998 and it has gone on long enough that it is affecting my quality of life and the investment I hold in this property.

Since moving here in 1997:

Bedroom:

I have had over 10 'major floods' where water has come in along the floor emanating from my bedroom wall (where it meets the floor) underneath the base of the whole window. My suite is a corner suite and each flood has seemingly been a result of wind driven rain. The water has seeped in along the whole length of the south wall from under the window where the drywall under the window meets the floor, and has extended into the bedroom by about 4 feet. With every flood I have stepped out of bed into a puddle of water. Brian and Chippy have been very responsive and have quickly brought up the Harbour Cove dryers the many times I have asked and no matter when I have called. Thank you to them.

Sierra Restoration (brought in by Harbour Cove) removed and replaced all of the drywall from under the complete length of my bedroom window extending up each of the adjoining walls by about 3 feet. The drywall at the southeast corner was mouldy along with the carpet underlay and carpet. The Sierra workers wore air respirators and told me the carpet and drywall was 'rotten with black mould'.

With the next big wind driven rain storms that following winter I started getting floods again. Incredible Restoration worked hard over a number of years to solve the water ingress problem with caulking and recaulking the window. Harbour Cove had a humidistat installed based on the belief that the floods were caused by too much humidity. I never believed that a gallon of water flooding in from where the floor meets the drywall (under the window) could be based on humidity but I appreciated any effort to resolve the problem.

I lived with bare concrete floors in my bedroom for almost a full year waiting to see if the water ingress had been resolved. With no leaks for the better part of a year I had the cold bare concrete floors covered with beautiful cork floors.

In the past few years, I have had a mouldy smell again in my bedroom, especially over the winters as the floods continued to occur. In my opinion the smell that developed was the same mouldy smell prior to Sierra removing the mouldy and 'rotten' drywall and carpet. What has also happened over the last number of floods is that my beautiful cork floors have split from the 'flood' water seeping underneath the cork.

Brian had the drywall removed again, four months ago, and again, the drywall in the southeast corner was mouldy. When the drywall was removed this time, Incredible Restoration found, not only, black mould in same southeast corner of

the drywall, but also, that Sierra Restoration had not replaced the insulation in the wall when they originally worked on this water ingress - window leak issue. The steel studs that attached to the drywall are so rusty, in places that they have split in pieces and crumbled from the water ingress.
I have contacted BC Hydro years ago when I realized my hydro costs are excessively high compared to my neighbours. Following Hydro's instructions, I have purchased energy efficient appliances, have installed wooden blinds to 'insulate' and have regulated the temperature of the thermostat. I now realize my hydro bills have been excessively high because Sierra failed to install insulation.
I also believe this lack of insulation is part of the humidity problem that I have in my suite which, in turn, has contributed to all of the mildew that constantly grows around the window frames. I also believe this lack of insulation has contributed to excessive amounts of water running down the inside of my bedroom windows. During the winter, I have a dehumidifier going for hours every day and practically every day I have had to use a towel to wipe the rivers of water from the inside of all of the bedroom windows and the oak window sill. It is like it rains on the inside. My oak window sill now is warped, discoloured from all of the water and cracked from all of the times it has expanded and dried out. I am asking Strata Council to replace my oak window sill.
I have had Burritt Bros. come in to estimate the cost of repairing my water damaged cork floors (please find the estimate enclosed). When they placed their hand under the 'water lifted' cork tiles they found the underside of the cork to be soaking wet. They stated the water ingress needs to be fixed before replacing the damaged cork. I am asking Strata Council to pay for the repair of my damaged cork floor once the ingress has been resolved.
Brian has recently informed me that Strata Council has approved replacing the complete window. Thank you. I am asking if Strata will pay to have the window treatment replaced on the glass when the new window is installed. I had a UV protective film placed on the windows to help protect my cork floors from being bleached by the sun. I understand this is an upgrade, however, I cannot control the fact that the window is faulty and needs replacing; if the window had no problem, my UV protective film would not need to be replaced.
Dining room:
Sierra Restoration (brought in by Harbour Cove) removed and replaced mouldy drywall from under the complete dining room window and extending about 2 feet along the west wall beside the window and about 2 or 3 feet vertically. The underlay and carpet in this corner was also 'rotten' with black mould. I have only had one puddle of water, since the repair, from where the floor meet the drywall under the window.

I am concerned, however, that Sierra (based on lack of insulation in the bedroom) did not replace the insulation under this window, also. I have to wipe the inside of this window regularly, also because it 'rains' on the inside. Brian has told me that Incredible will have a look to ensure insulation was placed. Thank you. I am asking, however that the caulking is checked around this window, or water pressure tests are performed to establish why I have had a flood since the original repair and to ensure I do not have damage to my cork floors or water ingress in my dining room, in the years to come.
Living room:

Sierra Restoration (brought in by Harbour Cove) removed and replaced mouldy drywall from under the complete living room (west) window and extending about 1 foot to the right of the widow along the west wall. The underlay and carpet in this corner was also 'rotten' with black mould. I have had no further water issues with this window, however,. I have to wipe the inside of this window regularly, also because it 'rains' on the inside. Brian has told me that Incredible will have a look to ensure insulation was replaced. Thank you.

Deck Ceiling:

I love my little deck, however, the water leaking from the deck above has manifested in unsightly paint bubbles (now in three spots) on my deck ceiling. The paint bubbles seem to follow a seam and originate from the outer edge of the deck roof and extend inward toward my suite by about one and a half feet. The wooden outer edge of the deck ceiling appears to be warping from water leaking in from the deck above. This apparent warping extends about one foot either way from where the seam of paint bubbles originates. A couple of months ago a piece of my deck ceiling fell out and exposed a hole and rusty rebar. This is unsightly, decreases the value of my suite and I am concerned that the water damage will continue and cause more damage. I ask Strata Council to remedy the water ingress from the deck above.

Nov, 2017 - The deck ceiling has had epoxy injected into the cracks that were exposed in the bubbled paint areas and new concrete was placed in the voids (over the rusty rebar). The paint is now bubbling again in the same repaired areas, as before.

Living Room, Dining Room,Den and Hallway Ceilings:

Water has leaked down from the deck above and has firstly discoloured the spray textured ceiling and has progressed to bubble the spray texture as the water seems to pool in certain areas.

Nov, 2017 - this has since been scraped, injected with expoxy & retextured.

Living Room Ceiling:

The living room ceiling spray texture discolouration and bubbles have, twice, been scraped to expose concrete, plugged with epoxy and retextured and the living room water ingress appears to have been solved. Thank you.

Dining Room Ceiling:

The dining room ceiling spray texture discolouration and bubbles have been scraped, plugged with epoxy and retextured four times. Each time, I have had to remove everything from the walls and move the furniture away from underneath the water ingress areas to enable repair. The water continues to leak in from the deck above. This last time, the water bubbled the ceiling spray texture around my dining room ceiling electrical box and continued to the point where the spray texture broke away and fell on the floor and on the dining room table. For the last number of months, Brian has had the bubbles scraped away, again and there are plugs sticking out as a conduit for the epoxy. I appreciate the fact that this has been left in a state of 'in progress' because new bubbles have appeared and Brian has had these new areas scraped and plugged as they appear. I am eager to have the dining room ceiling finished so I can reattach my chandelier for dining room light and move my furniture back to their spots. I appreciate the effort of working on the deck above to find the source of the water. Thank you. There was a goodly amount of rain, two days ago and I can see no new discolouration or bubbles.

Den Ceiling:

The den ceiling spray texture had a yellow discolouration that Brian sourced to follow the dryer vent line. (Harbour Cove had my dryer vent 'blown out' a couple of years ago). Two years ago, discolouration and bubbles in the ceiling spray texture appeared in the den closet. The den ceiling has been scraped and, similar to the dining room, currently has conduit tubes for epoxy. I appreciate Brian having the contractor come back to scrape additional discoloured areas and the bubbled areas in the den ceiling. I look forward to having the den ceiling resolved of water ingress, seemingly from the dryer vent and being able to move my furniture back from being all piled against the wall to enable repair access.
In both corners of the den ceiling closet, however, there are patches of black mould. I have kept my upright freezer in the den closet and with all of the air and heat generated from the freezer motor, I am unsure why this area has black mould and is not bone dry from the heat of the motor. Brian has suggested it is because the closet shelf (above the freezer) was stacked with storage boxes. I am unsure, however if using the closet shelf - as a shelf, is the cause and am worried the black mould may be from another water leak. I am not sure when the black mould is scheduled to be removed; I ask Strata Council to please ensure it is resolved prior to the den ceiling having the tubes cut and being retextured.
Nov, 2017 - this has now been fixed.
Hallway Ceiling:
Regrettably, with the heavy rain June 25th, there are new bubbles in the entrance hallway possibly following a vent line from the washroom. I have never had water ingress in the hallway, before and the timing with the heavy rain may be a coincidence. I am just guessing it might be an exhaust vent and not ingress from the deck above because the bubbles are in a straight line extending about two feet across the hallway

ceiling, opposite the washroom. I understand this new leak will need to be resolved prior to retexturing the ceilings in the rest of my suite but I ask Strata Council to please resolve the water ingress once and for all.
Nov, 2017 - this has now been fixed.
It has been very difficult living in a state of constant 'repair'. I have had workers in and out on a regular basis for years and years and years. My furniture and 'things' are never where they belong because they are always needing to be moved to enable access for the repairs. I have been looking at a bare concrete wall in my bedroom and have had unsightly scrapes and bubbles in my ceilings for over four months, this last go around. I have lived with black mould in my bedroom drywall for years and most recently in my den and am worried about the associated health concerns. I have a deck roof that is literally falling apart and is unbelievably unsightly.
I greatly appreciate everything Strata Council has done but I desperately need it all to be over. I am finding it difficult to live with the unsightliness of the damage, the worry of the mould and living in a constant state of repair any more: it has been going on for years and years. Respectfully, I ask Strata Council to please extend every effort to resolve these water ingress issues in my suite, once and for all.
[Editors Note: These problems are still continuing.]

Attachment B: The WSP and RJC Moisture Study.

In August of 2017, WSP Canada submitted their “Moisture Content Survey” to council. Copies are available on the Wynford website.

A summary of their findings is shown below.

1450: 117 suites entered; 21 exploratory openings; 12 previously; 91 just metered or visual; 6 moisture in wall.

1470: 59 suites entered; 10 exploratory; 9 previously; 49 metered or visual; 5 moisture.

1490: 81 suites entered; 16 exploratory; 12 previously; 69 metered or visual; 13 moisture.

In sum, only 80 suites out of the 257 that were entered had new or existing holes in the wall examined. The balance had a moisture reader or visual inspection. 24 suites were found to have moderate to severe signs of moisture. This report has been criticized by some as being too small a sample and conducted at a time of year (summer) when moisture is least likely to be found in wall assemblies. There is a considerable amount of anecdotal data supporting these criticisms. One example is my suite, where the WSP technician declined my request to test the wall below a window that shows clear signs of mould and chose to test a wall that I was able to assure him had no moisture because I had recently had it opened for an electrical installation. Meanwhile, my neighbour has two areas of plaster board failure due to moisture in a pony wall supporting several feet of windows and his suite was not tested at all.

A comparison is inevitably made to an RJC proposal that was submitted to council in November of 2016. It is referred to here because it will come up later in the body of this paper.A key difference between the two studies was that the RJC proposal provided for an average of two carefully selected new, or else, existing 3.5 inch exploratory holes in every suite in the complex. This study would have much more detailed information with a much higher degree of reliability and validity.

Attachment C: 211 - 1450

Summarized below is the best information we can find on dates of IGU failures and replacements for the two sets of windows with a total of 14 IGUs in our suite.

We are surprised at the strength of the conclusions we think we can draw from this data.

We will check this again with a fresh perspective in the morning and will be interested to hear your comments on whether our arguments are substantiated despite the limited data.

If they do stand up to critical review then they are a powerful repudiation of the wisdom of incrementally replacing IGUs without replacing frames and thus dealing with the adjacent walls.

We have checked with Ciprian and he says that there may be historical information for our unit in the archived records BUT that it would be a monstrous task to search for and through them.

The Living Room windows consist of 6 IGUs with no bends in the 3-part framing and have a slightly more northerly orientation.

The Dining Room windows consist of 8 IGUs with 2 bends in the 4-part framing and have a slightly more easterly orientation.

We came to our suite in 1992 and so we do not know of any replacements of the 1981 originals before that date.

You will see below that as of today 4 of the 14 IGUs (29%) are still originals dated 1981; 3 are in the Living Room set and 1 in the Dining room set.
The first date of replacement for which we have a record is for one of the Dining Room windows in 1999. BUT that does not necessarily mean there were no replacements before 1999; because we have no records in our possession for that period we may be missing earlier replacements (e.g. a 1981 IGU shown below as being replaced in 2012, for example, might have actually been replaced in 2001 and we just don't have a record of it now). To the extent there are unrecorded earlier failures in our data, the failure rates shown below would be higher (i.e. they are possibly underestimates of failure rates.)

SUMMARY OF IGU REPLACEMENTS (numbering system was used in our periodic reporting of status)

LIVING ROOM
1 Upper 1981
1 Lower 1981
2 Upper 1981
2 Lower 1981 2017
3 Upper 1981 2017
3 Lower 1981 2001

DINING ROOM
4 Upper 1981 2012 2017
4 Lower 1981 2012
5 Upper 1981 2012 Beck marked for replacement 2017
5 Lower 1981 Beck marked for replacement 2017
6 Upper 1981 2012
6 Lower 1981 1999 Beck marked for replacement 2017
7 Upper 1981 2001
7 Lower 1981 2004 Beck marked for replacement 2017

Analysis and Conclusions
From the data above there are several major conclusions to be drawn.
Length of life of original 1981 originals varies, with generally increasing failure rates over time, as one would expect.

- Replacements of 1981 originals by year
    - 1 in 1999 after 18 years,
    - 2 in 2001 after 20 years,
    - 1 in 2004 after 23 years,
    - 4 in 2012 after 31 years,
    - 2 in 2017 after 36 years.

Length of life for 2012 replacements is very much less than 1981 originals (i.e. failure rate of IGUs is increasing rapidly with increased age of frames).

- The 1 replacement in 1999 has failed by 2017 after 18 years.

- The 1 replacement in 2004 has failed by 2017 after 13 years.
- Of the 4 replacements in 2012, 2 have failed by 2017, 50% after only 5 years.

Length of life for IGUs in the Dining Room window frames is dramatically less than for the Sitting Room windows, as would be expected from the weaker 4-part frame structure with 2 bends in it.

- In the Living Room 3 1981 IGUs (50%) are still OK in 2017, after 36 years.
- In the Dining Room zero 1981 IGUs (100%) are still OK in 2017, after 36 years.

- Relatively high likelihood that the remaining 3 IGUs from 1981, now 36 years old, will fail in the near future.
- Relatively high likelihood that the more recent replacements, although relatively young, will fail in the near future.

Attachment D: 509 -1450

For the past five to six years we have had an increase in humidity with the consequent build up of growing concentrations of mould in our suite. Humidity in the bedrooms is very high during the winter cold spells. Water drips down the glass windows and doors to the balcony, as well as on the metal frames. Last year I had the mold removed and bought a dehumidifier that holds up to five gallons of water. I have it running most of the day and fills up quickly, I have to empty the tank at least three times a day. The dehumidifier consumes a lot of power, significantly increasing the cost of my BC Hydro bill.

The ceiling in the living room above the window has had mould built up for a number of years. The whole window assembly was replaced in 2010, we were told that it was thermo broken, however it does not stop the water dripping down the glass and on the frames.

Various council members over the past six years have come to see and inspect the suite, in some cases accompanied by engineers from RJC. Pictures were taken, most recently by Jenny Thomas and Brian Gordon. About a year ago we were told that the problem must be mechanical ventilation which requires specialized tests.

About two weeks ago I received a memorandum from RJC advising that the tests will start on November 17 to install temperature and humidity sensors as well as humidity data loggers which will need to be inside our suite for about six months.

I will give you a copy of RJC memorandum.

Attachment E: 305 – 1490.

The primary problem we have had with moisture is our suite has been the windows in the master bedroom. The seals in the window glass are all broken and the windows steam up every night in the winter months. The run off was so bad that 3 years ago we spent $1700 to have the window sill replaced along with the steal drain which could not handle the volume of water runoff .

We had the IGU committee inspect the windows last month and they said the problem cannot be fixed unless the frames are replaced along with the

glass….tough it out ….we were told. Every night we have to leave the heat on under the windows and have the blinds at half-mast….great for privacy and light coming in the room all night long. Then we squeegee the windows every morning. Hopefully we can get a good fix in the near future.