



DUBAS ENGINEERING INC.

105 - 3993 Henning Drive
Burnaby, B.C. V5C 6N5

Phone: (604) 875-1930 Fax: (604) 875-1987

JAN 29 2004

LMS 3042
Engineers' St

Our File No. AP-0203

Revised on January 28, 2004

BUILDING ENVELOPE CONDITION ASSESSMENT

AT

STRATA PLAN LMS 3042 - THE CORONADO

137 - 147 EAST 1ST AVENUE,

NORTH VANCOUVER, B.C.



PREPARED BY:

**DUBAS ENGINEERING INC.
JANUARY 15, 2004**

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1.0 EXECUTIVE SUMMARY

- 1.1 Dubas Engineering Inc. was retained by the Owners of Strata Plan LMS 3042 – The Coronado to conduct a review of the building envelope prior to the expiry of the warranty. We visited the complex on December 18, 2003 to perform the required assessment.
- 1.2 Our observations, comments, and recommendations are presented in this report. In general, we found that The Coronado buildings are in fair condition for its age on all elevations except at one location with integrity concerns on the east elevation of the west building.
- 1.3 Among most important of the observations and recommendations, we consider that the following items require immediate attention:
 - .1 Complete repairs to the exterior walls, located on the east elevation of Units 107 and 207 of the west building. Due to the extent of water ingress and rot, the repairs to that location must be designed and conducted to implement a rainscreen cladding system. Some structural repairs will be necessary during the remediation.
 - .2 Repair and improvement are required to the building envelope components, particularly the metal flashings throughout the complex. These major components play a significant role in shedding the water away from the building. Deficient metal flashings can jeopardize the integrity of the building as a whole with respect to water ingress and related damages.
 - .3 Following completion of this Condition Assessment and preparation of this report, the Property Manager informed us regarding recent maintenance at localized areas of the buildings. At the same time, we learned that the Strata have the backup documents, such as related invoices to support the above work. At the time of our field review, we did not become aware of the above-mentioned maintenance. However, since the maintenance was of a localized nature, it is possible that these areas were not encountered during our Condition Assessment.

2.0 INTRODUCTION

- 2.1 Dubas Engineering Inc. was retained by the Owners of Strata Plan LMS 3042 to conduct a limited building envelope condition assessment at The Coronado buildings and to provide a written report with findings.
- 2.2 The building envelope assessment was conducted on December 18, 2003 by Mr. Doro Cornescu, B.Eng. and Mr. Allen Zavosh, B.A.Sc., P.Eng. of Dubas Engineering Inc. Our observations, findings, conclusions and recommendations are presented within this report.
- 2.3 The scope of the building envelope assessment was to gather information and prepare a report to assist the Owners in producing the necessary engineering documents, planning and review prior to the expiry of the warranty.
- 2.4 The Coronado is an 80-unit, four-storey, wood framed residential complex, built over a concrete parkade. All of the units have balconies, facing various directions. The complex is divided into two separate buildings. The west building is at 137 E. at 1st Avenue and the east building is at 147 E. 1st Avenue. The buildings have their own entrances. However, they share a courtyard, which is located in the middle of the complex.
- 2.5 Based on the architectural drawings submitted to our office, it appears that the building is approximately five years old.
- 2.6 The building is mainly clad with vinyl siding with sections of brick veneer. The vinyl siding system is based on a face-sealed concept. With this type of cladding system, the siding is installed directly on sheathing paper (building paper) attached to the building sheathing.
- 2.7 The brick veneer section of the cladding was only examined visually. We noted that there were several areas with cracks developed along the mortar joints. Also, the brick sealer is nearly at the end of its useful service life taking into account, if originally was applied.
- 2.8 The windows and patio doors are aluminum framed and double-glazed. They are thermally broken. Based on our observations, we concluded that they were installed during the original construction.

2.0 INTRODUCTION – Continued

- 2.9 The balconies have liquid-applied membrane with embedded granular for traction, which were likely installed during the original construction of the building.
- 2.10 We conducted 64 moisture content testing at various locations throughout the buildings.
- 2.11 In addition to the moisture testing, a number of exploratory openings were reviewed in order to examine the performance of the envelope details and condition of the underlying cladding elements (8 exploratory openings).
- 2.12 Visual observations were made on the condition of the building envelope components.
- 2.13 During the assessment, coloured photographs were taken and annotated and are included in this report under Appendix B. The photographs and annotations should be read in conjunction with this report.
- 2.14 During the moisture content testing, we primarily targeted problematic areas, such as the perimeter of the windows, saddle locations, junctions between horizontal and vertical planes and below vents, electrical fixtures, hose bibs and drainage systems.

3.0 TESTING

- 3.1 During the building envelope assessment, we observed that the buildings function in a relatively dry state during the wet season. Moisture readings taken in the middle of December 2003 showed significantly low moisture content in the exterior building elements. Therefore, Dubas Engineering also focused on performing exploratory openings to better understand and observe the condition of the envelope of the buildings.
- 3.2 The locations selected for moisture probe readings were based on our experience with typical locations, where problems due to poor detailing resulted in water ingress. These details include:
 - .1 Intersections between the wall and parapet wall (saddle detail)

3.0 TEST – CONTINUED

- .2 Areas underneath the windows and flashing terminations
 - .3 Areas under wall penetrations
 - .4 Joints between dissimilar materials
 - .5 Areas along the intersections, between vertical and horizontal planes
- 3.3 Only at one location, we obtained a moisture content reading of 34.1%. Most other locations showed moisture content in the exterior wall components in the range of 8% to 15%.
- 3.4 A moisture content reading less than 19% is considered acceptable by the Building Code. Moisture content above 19% indicates the risk of moisture-related problems and condition for the development of wood rot.
- 3.5 Because the buildings appear to have fair drying potential during the wet seasons, we proceeded with recording the condition of the sheathing at the exploratory openings and assigned the following colour coding, under Appendix "A":
- .1 Locations where the building sheathing, building paper, staples, and nails were found free of corrosion, unstained and generally without damage, are marked with green (considered acceptable readings).
 - .2 Locations where signs of limited water ingress have been observed (staining on the building paper and moderate corrosion of the fastener) have been marked in yellow and considered potential warning signs.
 - .3 Locations where excessive staining and/or rot have been observed on the building elements are considered serious problems and indicate deficient building envelope performance. These locations have been marked in red.

4.0 OBSERVATIONS AND DISCUSSIONS

4.1 WALLS

- .1 Based on observations and the provided architectural drawings, the typical wall assembly from the outside to inside would be:
 - .1 Vinyl siding
 - .2 Building paper, 2-4 layers of 30-minute
 - .3 Exterior sheathing, OSB
 - .4 Batt insulation between the wood studs at the wall cavities
 - .5 Poly vapour barrier
 - .6 Gypsum wallboard
- .2 The above wall assembly is based on a face-sealed design concept. The face-sealed system requires diligent maintenance, early detection of problems and prompt repairs.
- .3 We devoted a large portion of our time at the site during this assessment in reviewing the condition of the siding, as well as the protection offered by this cladding to the building walls. The outmost layer of every face-sealed cladding will play a significant role in the general performance of the assembly since this layer is the only line of defense against water ingress.
- .4 In general, we found that the siding has been performing as intended on all elevations except at the east elevation of Units 107 and 207 of the west building. Minimal water ingress has been observed at the other elevations beyond the vinyl siding.
- .5 The siding and the wall components on the east elevation of Units 107 and 207 were noted to function poorly. Large portions of the building walls have been observed with rot, moisture penetrations beyond the siding and the building paper. At that location, we found the building paper to be completely deteriorated. Rot in the OSB sheathing was also observed.
- .6 At localized locations, we also noted buckled sidings. The fasteners need to be slightly loosened to provide adequate space for expansion or contraction of vinyl siding strips.

4.0 OBSERVATIONS AND DISCUSSIONS – Continued

4.1 Walls – Continued

- .7 In order to minimize destructive testing, we concentrated on visual observations only. Several localized cracks were discovered along the mortar joints at both buildings, which require repairs. Also, application of brick sealer is required.

4.2 WINDOWS AND PATIO DOORS

- .1 The window of the buildings are aluminum framed, double-glazed casement units.
- .2 It appeared that the windows were manufactured by Agma Windows in Langley, B.C. The fabrication date of the windows was 1997.
- .3 The windows are generally in fair condition. However, the weather strips show signs of deterioration.
- .4 We noted several specimen with condensation buildup on the inside face of the glazing units.
- .5 We did not observe sill flashing installation at the windows.
- .6 The patio doors are also aluminum-framed and double-glazed. The patio doors do not represent a concern at this time due to their locations, which are mostly protected against water penetration by the upper floor balcony decks.

4.3 BALCONIES

- .1 The balconies are waterproofed with liquid-applied membrane. For extra traction, granular materials were embedded into the membrane at the time of the application.
- .2 We observed water ponding on several balcony decks. However, it appeared that the waterproofing membrane has so far provided a fair seal to the balconies.

4.0 OBSERVATIONS AND DISCUSSIONS - Continued

4.3 BALCONIES - Continued

- .3 The membrane has slightly delaminated along the edges at various locations. Localized staining was found on deck membranes at various locations, particularly at the perimeter of the balconies.
- .4 Due to water ponding, algae growth was observed at the localized areas of the balcony deck membrane.
- .5 During our survey, we did not observe damage around balconies, despite the presence of deficient sealants at joints of various components.
- .6 We noted that the balconies have gypsum sheathing beyond the perforated aluminum soffits. At several locations, the aluminum soffits and the condition of the underlying layers were reviewed. Except for minor localized water stains on the gypsum boards, no other alarming conditions were noted. General observations were conducted on the soffit system and it was noted that they were clean and free of rust.
- .7 The aluminum railings at the balconies were connected to the building walls with fasteners; however, the existing sealant around the connection plates and fasteners were completely deteriorated.

4.4 METAL FLASHING

- .1 At several locations throughout the building, we observed deficient flashing with respect to their negative slope or shortcoming to completely protect the areas they were intended to.
- .2 The metal flashing with negative or improper slopes need to be adjusted to drain the water adequately.

4.0 OBSERVATIONS AND DISCUSSIONS – Continued

4.5 SEALANT

- .1 The existing condition of the sealant along windows, doors, wood trims, walls, vents, electrical and water penetrations, and other envelope details has cracked and separated from the adjoining surfaces in various locations. It also appeared to be affected by UV and has lost its elasticity.
- .2 In addition, the sealant application at the time of the original construction appeared to be poorly finished. In many locations, such as the cap flashings over the privacy walls of the balconies, the sealant was not applied continuously along the joint laps. More than 70% of the length of the joint laps was completely exposed to the wind-driven rain and moisture penetrations.

5.0 OCCUPANT SURVEY

- .1 The occupant survey appeared to confirm our testing and visual observations. Approximately forty-one percent (41%) of the forms were returned to us.
- .2 Nine percent (9%) of the respondents described problems with condensation on their windows.
- .3 None of the respondents indicated problems with their windows or patio doors.
- .4 None of the respondents signaled problems with respect to stains on walls or ceiling of the units.
- .5 Eighteen percent (18%) of respondents indicated water ponding on the balconies.
- .6 At the time of the assessment, we were not able to access Unit 400 of the west building to review the condition of the deficiency described by the tenant in the survey form. However, it appeared that a section of the floor sheathing adjacent to the window of the master bedroom has warped and caused an uneven surface underneath the carpeted area.

5.0 OCCUPANT SURVEY - Continued

- .7 The returned occupant survey forms are attached to this report under Appendix C. Also, the results were summarized in a spreadsheet, which is also included under Appendix "C".

6.0 CONCLUSIONS AND RECOMMENDATIONS

- .1 From our visual observations, moisture readings, and exploratory openings gathered during this condition assessment, Dubas Engineering concludes the following:
 - .1 The Coronado buildings are in fair shape for its age and taking into account that the walls are constructed based on a face-sealed system. The fact that the building has a drying potential is an advantage, but should not be relied upon to balance any defects in the building envelope.
 - .2 The structural integrity of the envelope on the east elevation of Units 107 and 207 of the west building is deteriorated and require immediate attention. This section of the west building needs to be repaired. The remediation must include removal of the existing deteriorated building paper and wood framing. The replacement of the new components should be based on rainscreen concept.
 - .3 For consistency and obtaining enhanced details and longer lasting repairs, the wall system must be detailed and reviewed during the construction by a building envelope consulting firm.
 - .4 The buckled vinyl sidings need to be removed and fastened adequately to provide sufficient room for expansion or contraction.
 - .5 The cracked mortar joints of the brick veneer cladding need to be repaired by means of proper grinding and patching. Application of the brick sealer is also recommended.

6.0 CONCLUSIONS AND RECOMMENDATIONS - Continued

- .6 There are several areas with ponding water over the balcony deck areas. Adequate slopes need to be provided in order to drain the water from these areas to the closest drainpipes or perimeter gutters. Other elements of the balconies, which require attention, are removal and replacement of existing sealant at the cap flashings, guardrail connection plates, and at the balcony columns.
- .7 The slope of the metal flashings with inadequate shedding direction needs to be revised in order to perform as intended. The deficient metal flashings were mainly observed at the through-wall locations and at cap flashings over parapet walls.
- .8 We are of the opinion that maintenance to both buildings must be performed at the same time with conducting the repairs at the east elevation of the above-mentioned units.
- .9 The maintenance work should include but not limited to:
 - .1 Maintenance of the joint sealant (replacement and re-application)
 - .2 Maintenance of paint (fascia boards)
 - .3 Installation of additional joint sealant of other details
 - .4 Vinyl siding repair
 - .5 Re-slope and extension of the metal flashings
- .8 We are of the opinion that the Owners of the Strata should also consider a program which consists of periodical (once a year) monitoring of the performance of the existing systems, specifically at the critical areas such as saddle locations, windows and junctions between similar components. This program should be based on the maintenance manual prepared for the project.

7.0 LIMITS OF LIABILITY

- 7.1 The Building Envelope Condition Assessment undertaken by Dubas Engineering Inc. was of a visual nature, including limited testing and dismantling of some of the cladding components only.
- 7.2 Dubas Engineering's review of the buildings was conducted on a random basis with no attempt to review every element or portion of the complex to ascertain the quality or sufficiency of any particular aspect of the complex. As such, our opinion cannot be extended to elements and portions of the buildings not reviewed, or situations reasonably beyond the control of Dubas Engineering Inc.
- 7.3 The intent of this Assessment was to determine in a general way the overall quality and sufficiency of the work, and to determine areas of empirically obvious deterioration or need for repair. Our comments are not a guarantee or warranty of any aspect of the condition of the buildings whatsoever. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. Dubas Engineering Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

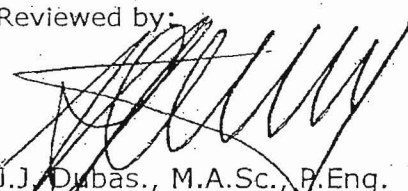
Prepared by:

DUBAS ENGINEERING INC.
Per:


Allen Zavosh, B.A.Sc., P.Eng.
Project Engineer
azavosh@dubasengineering.com
ARZ/cv



Reviewed by:


J.J. Dubas., M.A.Sc., P.Eng.
Senior Project Engineer



July 15, 2004

Assertive Property Management
& Real Estate Service Inc.
19 North Renfrew Street
Vancouver, BC
V5K 3N6

JUL 23 2004

Attention: Jim Allison, Property Manager

Dear Mr. Allison,

Re: Coronado – LMS 3042

Further to our letter of June 14, 2004, we wish to confirm that the work outlined in the Dubas Engineering Building Envelope report dated January 29, 2004, and our letter of June 14, 2004, has been completed.

During our May 7, 2004, site meeting with you and members of the Coronado Strata Council, you requested that all remediation work be attended to under the supervision of a professional specializing in Building Envelope remediation.

Polygon retained the services of Paul Kompauer of Inter-Coast Consultants to attend to this work (report attached).

The Building Envelope Warranty at Coronado expired in February, 2004. This concludes Polygon's Building Envelope Warranty obligations for this project.

We strongly suggest that recommendations in the Dubas Engineering report, relating to maintenance and upgrades, be attended to by Strata LMS 3042.

In the penultimate paragraph of the June 14, 2004, letter, Mr. DeBron recommended that an oil-based paint not be used for the painting of this project and preference be given to the use of a water-based solid stain. Another option the owners may wish to consider is the use of high quality acrylic-type paint. As this is a durability issue, we recommend that the benefits of the various coating options be explored.

Should you have any questions, please do not hesitate to contact me. I can be reached through the Customer Service Desk at 604-877-1751.

Yours truly,

POLYGON CONSTRUCTION MANAGEMENT LTD.

R.V. (Bob) Switzer
Senior Vice President, Quality and Customer Service

RVS/th

cc. Joyce Taylor, Strata President
Lucky DeBron, Senior Customer Service Field Manager



June 14, 2004

Assertive Property Management
& Real Estate Service Inc.
19 North Renfrew Street
Vancouver, BC
V5K 3N6

JUN 15 2004

Attention: Jim Allison, Property Manager

Dear Mr. Allison,

Re: Coronado – LMS 3042

We wish to inform you of our findings in regards to the Dubas Engineering Report forwarded to our office.

We opened up the three areas noted in their report and found the following:

- Test Area 9 Moisture reading came in at 14%.
 - There is no indication of any problems in the sheathing.
- Test Area 57 – Moisture reading came in at 8%.
 - This test was taken directly above the Dubas probe point with the sheathing peeled back.
 - There were no indications of any problems.
 - Both of these areas were re-assembled.
- Test Area 57 – Moisture reading concurred with Dubas report.
 - The area was opened above and below the test point to determine a point of entry. It appears that moisture was entering at a flashing miter.
 - The siding and building paper were removed to a point where no further water damage was noted. The total area affected was approximately 20 square feet. All the affected material was removed or treated and is in the process of being re-constructed.
 - Paul Kompauer of Inter-Coast Consultants Ltd., the building envelope engineer, was on site to review this area and ensure that re-construction was acceptable.
- Completion of this area should be the week of June 14, 2004.

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While we were opening the building face for inspection, we were approached by a gentleman indicating that he would be doing the repainting of Coronado. He mentioned that he would be power-washing the building. We strongly recommend against this procedure, as it can do more damage than good when cleaning building faces. A cleaner applied with a low pressure applicator and cleaning with a light brushing followed by a garden hose spraying to remove the dirt is far safer and more effective.

My phone message to you stated our concern in regards to the pressure washing, but I want to re-state our concern. The painter also stated he would be using oil-based enamel paint. We do not recommend using this type of paint. A water-based stain would be preferable, but suggest you contact your envelope consultant for their recommendations.

Should you have any questions, please do not hesitate to contact me. I can be reached through the Customer Service Desk at 604-877-1751.

Yours truly,

POLYGON CONSTRUCTION MANAGEMENT LTD.

A handwritten signature in cursive script that reads "Lucky DeBron".

Lucky DeBron
Customer Service Field Manager

LD/th

cc. Joyce Taylor, Strata President
Bob Switzer, Senior Vice President, Quality and Customer Service