



The new Identity of Trow Associates Inc.

Additional Investigations Report - Building Envelope

**Trinity Place, 2490 W 2nd Avenue
Vancouver, BC**

Owner

Strata Plan LMS 2833
c/o John Williamson Inc.,
Suite 120 – 2995 Princess Crescent
Coquitlam, BC – V3B 7N1

Project Number

011778-A0

Prepared By:

exp Services Inc.
7025 Greenwood Street
Burnaby, BC V5A 1X7
Canada

Date Submitted

2011.09.29



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September 29th, 2011

Reference No. 011778-A0

Strata Plan LMS 2833
c/o John Williamson Inc.,
Suite 120 – 2995 Princess Crescent
Coquitlam, BC – V3B 7N1

Attention: Mr. John Williamson

Re: Additional Investigations of Building Envelope Assemblies at
Trinity Place, 2490 W 2nd Avenue, Vancouver, BC

Dear Mr. Williamson:

1.0 INTRODUCTION

Per the scope of services included in the proposal dated: December 23, 2010, exp. Services inc. (formerly Trow Associates Inc.) conducted additional investigations to confirm the performance and as-built condition of the assemblies that were listed to be further investigated by RDH Engineering Limited, report dated: November 2010. We are providing this letter report summarizing our assessment of the performance and as-built conditions of the reviewed assemblies per request from Strata.

2.0 BUILDING DESCRIPTION AND BACKGROUND

The complex is a 30-unit 4-storey wood frame condominium building constructed above a one storey below-grade reinforced concrete parking garage in or around 1997. The building is clad with acrylic stucco and brick veneer and has a low-slope roof.

A building envelope assessment report was prepared by RDH Building Engineering Ltd. in November 2010. RDH report had included recommendations to replace exposed east elevation cladding with rainscreen stucco, replace windows on the east elevation, replace balcony membrane and second floor deck membranes, replace exposed wood swing doors, install additional canopies and replace wood trims at window sills at select locations. RDH had included recommendations to conduct additional investigation on the east elevation exterior walls adjacent to bathtubs and showers, soffit of roof deck adjacent to brick-clad wall assembly, windows at the brick-clad walls, EIFS band on Level 1 and the ground floor sandwich slab assembly.





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As these assemblies and building components were not adequately investigated in the previous investigation, we recommend their review prior to proceeding with the Project Documents

The Owners intended to proceed with the remedial work as recommended in the report and retained exp. services Inc. to prepare the project manual, procure a suitable contractor and conduct construction contract administration. Exp Services Inc. recommended conducting the additional investigations recommended by RDH prior to preparing the project manual.

3.0 INVESTIGATION

Exp conducted the following as part of the additional investigations (pertinent to the further investigations list in the RDH report) as noted below:

- Document review including the architectural drawings and detail package provided
- Visual review
- Moisture Content Readings
- Exterior exploratory openings
- Interior exploratory openings

On March 28th, 2011, Nikolas Tanaka of exp was on site to conduct a visual review of the exterior elevations, roof, parkade and to conduct 4 interior exploratory openings at Units 103, 105 and 108. The interior exploratory openings were conducted to review the interface detail between the exterior wall assembly and the parkade slab. The weather at the time of the review was periodic showers with 15° C. Moisture content readings were conducted at the exploratory opening locations.

Sathya Ramachandran and Nikolas Tanaka of exp were on site on May 10th, 2011 to conduct additional visual reviews of balcony decks, parkade, exterior elevations and conduct interior exploratory openings at Unit 108. The weather at the time of the review was overcast and 15° C. Moisture content readings were conducted at the exploratory opening locations.

Kelvin Klapak and Tarah Haley of exp were on site on July 12th, 2011 to conduct moisture content readings and exterior exploratory openings at the EIFS band, window sill at brick veneer, exterior wall of the east elevation and . The review also included on the design. Sathya Ramachandran and Dino Chies were present on site to review the as-built and performance conditions at the exploratory opening locations. The weather at the time of the review was overcast and 20° C. The property manager, Carey Grandy, was briefly on site at the time of assessment.





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4.0 OBSERVATIONS AND RECOMMENDATIONS

Following are our observations and recommendations in regards to the additional investigations recommended in the RDH report:

1. East elevation exterior wall adjacent to bathtubs and showers and below EIFS overhang

In regards to the exterior wall area adjacent to the bathtubs and showers, we note that this area is already decided to be rehabilitated and didn't warrant further investigation from the exterior. We note that there is potential for mold growth interior of the poly vapor barrier in this exterior wall assembly (adjacent to the bathtubs and showers), which we can review and address at the time of rehabilitation.

Following are our observations:

- o The moisture content readings on this wall at the reviewed locations had readings higher than 19% Moisture Content (MC) readings, at 3 (readings of 21.4%, 25.2% and 29.6%) out of 8 probed locations. The readings were particularly higher at the window sill locations. Readings higher than 19% indicate possible moisture ingress and potential for deterioration of the wood components.
- o Exploratory opening was conducted at the location where moisture content reading was 29.6%. Exp observed the sheathing to be soft showing evidence of moisture.
- o Exp observed a portion of the exterior wall assembly and a window was replaced / repaired at the semi-protected east elevation wall. We understand that this repair was conducted to address a localized water ingress issue. See Photos 01 and 02.

Based on the moisture content readings and the exploratory opening, it is our opinion that the east elevation wall under EIFS band overhang also is experiencing moisture ingress and has potential for deterioration of wood components. While we note the damage may not be severe at this time, it is our opinion that replacement of this portion of the exterior wall is prudent considering the cost savings and reduced risks.

2. Base of wall detail at ground floor sandwich slab assembly

Based on the interior exploratory openings at Units 103, 105 and 108, it is our opinion that water ingress is not being experienced at the base of wall detail where the sandwich slab assembly intersects the podium slab detail. It appeared the base plate of the structural frame was anchored to the sandwich assembly as detailed. The condition of the wood frame structure at the reviewed locations was dry. See Photos 03 to 08.





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3. EIFS below window sill

Exp conducted moisture probe readings through the EIFS band below the window sill to confirm the performance. Two out of 4 readings were observed above 19% MC. However, we believe the high moisture content readings are due to the high exposure in the east elevation combined with possible deficient details at the window interfaces rather than the problems with the EIFS band itself. See Photos 09 and 10. EIFS band was observed wet showing water retention, but observed no damage to the inner components of the exterior wall assembly. It is our opinion that remedial measures at this point are not warranted at this time.

4. EIFS band on Level 1

Exp conducted exploratory openings and moisture content readings through the large EIFS bands between Level 1 and 2 at a crack location. See Photos 11 and 12. Moisture content readings were also conducted through the brick veneer exterior wall assembly below the EIFS band. Exp observed all 3 moisture content readings conducted in this assembly were below 19% and the exploratory opening conducted showed no evidence of moisture. The detail as designed per the design documents is low performing and has potential for failure. The detail predominantly relies on the sealant joint between the EIFS band and the brick veneer. Exp recommends monitoring the condition and reporting any evidence of water ingress through this assembly for further investigation and potential replacement of the band with proper detailing. Such measure at this point of time is not warranted based on our review.

5. Soffit at the Brick Veneer Wall

Exp conducted an interior exploratory opening at the base of the exterior wall assembly below the brick veneer soffit at Unit 108. No evidence of moisture was observed at the reviewed location. Based on the review, it didn't warrant any further investigation or remedial measures for this assembly at this time.

6. Wood trim at the brick-clad walls

Exp observed the exterior wood trims (horizontal and vertical) at the window sill of the brick veneer wall assembly on Level 1 at random locations was deteriorated. Exp conducted exploratory openings by removing a portion of the deteriorated wood trim and observed self adhered membrane installed over a flashing that bridges between the gap between the inner wythe and the brick veneer cladding. See Photos 13 and 14. The self adhered membrane was installed over the metal flashing. We note the detail as observed was not per the similar detail WD-05 in the details package. The installed detail appears to provide adequate weather seal and does not warrant remedial measure by removing the window. We recommend replacement of the deteriorated wood trim as required and recommend a sheet metal flashing be installed





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at the sill for longer durability. Exp recommends further review of the condition at the time of the wood trim replacement and conduct remedial work as required.

In addition to the additional investigation recommendations by RDH, exp reviewed and observed the following:

7. Drains through the exterior wall assembly

Exp observed the balcony deck drains are being routed through the exterior wall assembly per architectural drawings and on-site visual review. Exp conducted exploratory openings to confirm the systemic performance of these drains, e.g. condensation or water leaks. Based on our review at Unit 108 the drains within the exterior wall assemblies do not appear to have any systemic problems. See Photos 15 and 16.

8. Balcony Deck

Per request from the Unit Owner of Unit 308, Exp reviewed the balcony deck. Exp observed deteriorated wood frame of the swing door assembly. Exp observed damage in the balcony deck membrane. Exp observed extensive staining in the trough at the balcony deck edge that is installed to drain water. See Photos 17 to 20. We note the replacement of the deck membrane and wood swing door is being conducted as part of the rehabilitation work per RDH report. We agree to the recommended measures of replacing the balcony deck membrane and wood swing doors per RDH report, based on our observations. In regards to the extensive staining in the trough, exp recommends a modification to eliminate the trough.

9. Amenity Unit

Exp conducted a visual review of the roof deck and the exterior wall of the bathroom of the amenity unit. We note the existing vinyl deck membrane at the roof deck of the amenity unit is not the preferred membrane for the assembly. However, no significant problems have been reported in the RDH report. Apart from the extensive staining in the deck membrane and exterior cladding of the parapet wall assembly, exp did not notice any significant performance issues. Exp observed exploratory openings and moisture content readings were conducted by RDH at the staining locations. See Photos 21 to 24. Moisture damage is not reported. Exp recommends monitoring the performance of the roof deck membrane and replace it at the end of the service life. Exp recommends installing more durable membrane. In regards to the exterior wall of the bathroom, exp didn't observe any evidence of damage. We note that this bathroom is expected to be sparsely used and hence reduced potential for damage. If the exterior wall assembly (east wall below EIFS overhang) from exterior will be rehabilitated, exp recommends to review the condition of the wood components and





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the poly vapor barrier for evidence of damage. It is not warranted to conduct openings at this time.

10. Parkade

Exp conducted a cursory review of the parkade and observed water ingress through the underside of the parkade slab at some locations, particularly at the cracks. Exp observed water ingress through the cracks and cold joints in the above grade wall adjacent to the ramp. Exp observed the above grade wall assembly was exposed from the exterior and that there are cracks in the assembly. Exp observed patch work conducted at the crack locations. Exp recommends further investigation by removing the overburden above the podium slab to expose and review the condition of the waterproofing membrane. Exp recommends the exposed concrete wall at the ramp be cleaned and installed with elastomeric coating to prevent water ingress through the wall assembly.

5.0 PROFESSIONAL LIMITATIONS

The information presented in this report provides an assessment of the current condition at the site, within the terms of reference and limitations outlined in our proposal. We have been asked to make recommendations and opinions based solely on a visual sampling of existing components. Exploratory openings, design review, quantity surveys, invasive testing, or instrument testing were carried out only where specifically mentioned in the report. Consequently, further investigation or additional testing may change our current recommendations and opinions.

We arrived at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice, we do not act as absolute insurers of the conclusions we reach, but we commit ourselves to care and competence in reaching those conclusions.

Refer also to our Interpretation and Use of Study and Report in Appendix A.





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6.0 CLOSURE

This report was prepared for the exclusive use of our client, John Williamson Inc. representing Strata Plan LMS 2833, known as Trinity Place, and cannot be used for any other purpose without written consent of exp Services inc.

Appendix A contains our "Interpretation and Use of Study and Report" instructions. These instructions form an integral part of this report and must be included with any copies of this report.

We appreciate this opportunity to be of service to you. If you have any questions regarding the contents of this report, or if we can assist you further on this project, please contact the undersigned.

Sincerely,

A blue ink signature of Sathya Ramachandran, consisting of a stylized 'S' followed by a horizontal line.

Sathya Ramachandran, B.Arch., M.A.Sc.
Project Manager
Building Science Division

A blue ink signature of Dino Chies, consisting of a stylized 'D' followed by a horizontal line.

Dino Chies, P.Eng., BEP
Branch Manager
Building Science Division Manager

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Appendix A

Interpretation and Use of Study and Report



Interpretation and Use of Study and Report

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty expressed or implied is made. Engineering studies and reports do not include environmental consulting unless specifically stated in the engineering report.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorize only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

- a. Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelope assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b. Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.
- c. To avoid misunderstandings, EXP should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by EXP. Further, EXP should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with EXP's recommendations. Any reduction from the level of services normally recommended will result in EXP providing qualified opinions regarding adequacy of the work.

Appendix B
Photographs



Photo 1: Unit 206 – Appears a localized rehabilitation of the exterior wall and window was conducted



Photo 2: Unit 206 – Localized rehabilitation of the EIFS band

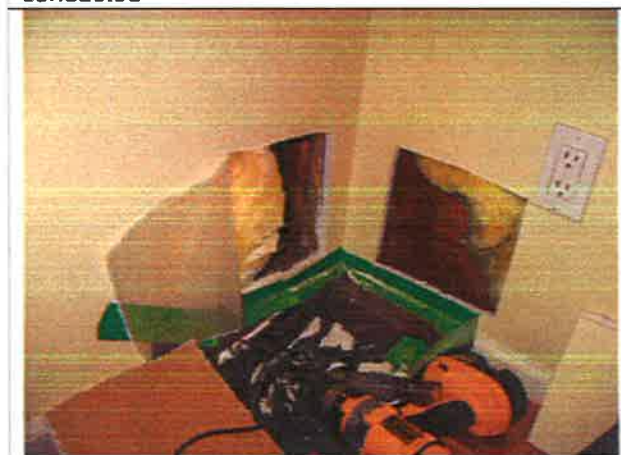


Photo 3: Unit 103 – Interior exploratory opening



Photo 4: Unit 103 – Interior exploratory opening



Photo 5: Unit 105 – Interior exploratory opening

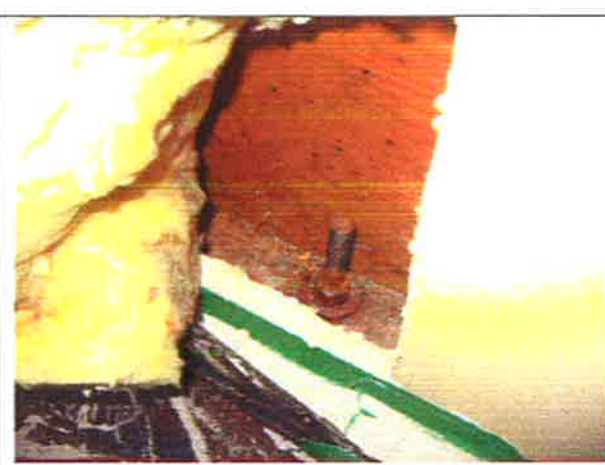


Photo 6: Unit 105 – Interior exploratory opening



Photo 7: Unit 108 – Interior exploratory opening



Photo 8: Unit 108 – Interior exploratory opening



Photo 9: Exploratory Opening at the EIFS below window sill in the east elevation



Photo 10: Exploratory Opening at the EIFS below window sill in the east elevation



Photo 11: Crack in the EIFS band



Photo 12: Exploratory opening adjacent to the crack in the EIFS band



Photo 13: Deteriorated wood condition at the window sill of the brick veneer cladding

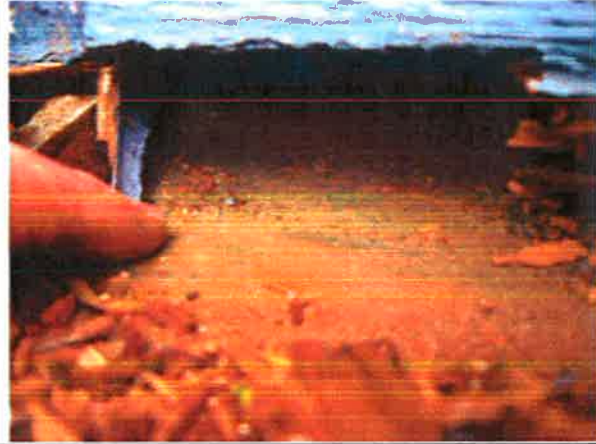


Photo 14: Membrane upturn and tie-in at the window sill over a metal flashing below deteriorated wood trim



Photo 15: Unit 108 - Interior exploratory opening to review the drain in the exterior wall



Photo 16: Unit 108 - Interior exploratory opening to review the drain in the exterior wall



Photo 17: Unit 306 - Evidence of water ingress and deteriorated wood frame of the swing door



Photo 18: Unit 306 - Deteriorated wood frame of the swing door



Photo 19: Unit 306 – Extensive staining at the tough of the balcony deck



Photo 20: Unit 306 – Cracked and delaminated balcony deck membrane



Photo 21: Amenity Unit - Vinyl deck membrane with staining



Photo 22: Amenity Unit - Vinyl deck membrane with staining



Photo 23: Amenity unit – Extensive staining of the parapet cladding at saddle and exploratory opening from earlier investigation



Photo 24: Amenity Unit – Extensive staining of the parapet cladding at saddle and exploratory opening from earlier investigation