Project No. 5041.12

June 27, 2012

OCP 831 0969 (o/a Westmount Place)
c/o Montgomery Ross & Associates
#400, 1414 – 8th Street SW
Calgary, Alberta
T2R 1J6

Attention: Ms. Vicci O'Brien

RE: WESTMOUNT PLACE – POST-TENSIONING SYSTEM REVIEW

1.0 Introduction

At the request of Montgomery Ross & Associates, on behalf of OCP 831 0969 (o/a Westmount Place), a review of the post-tensioning system contained within the main floor and the suspended parking slabs was completed. The purpose of the review program was to qualify the condition of the subject slabs, and to provide recommendations for analysis, repair, replacement, upgrading, or additional investigations.

A review of the upper floor post-tensioned cables was not completed.

2.0 Description of Structure

Westmount Place is located at 1100 – 8th Avenue SW in Calgary. The facility is a 28 storey residential/commercial building with four levels of underground parking. The main floor and the three suspended parking levels are post-tensioned concrete construction. The upper floors, which are not part of this review, are post-tensioned slabs. The lowest parking level is a concrete slab-on-grade.

Drawings for this site were not provided.

3.0 Review Methodology

The review program consisted of three parts:

- View Engineering Reports prepared by Manticore Engineering Ltd., dated December 1995, July 2000, October 2005, August 2008, and July 2010
- View post-tensioning cables at existing recesses in the floor slabs
- View condition of the subject concrete slab surfaces and soffits

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Engineering Consultants

Steel plates that cover the cables at the existing recesses were removed. The condition of the cables and the presence of moisture and corrosion were observed at the recesses. Penetration tests were conducted on the cables to qualify stress. After the test the steel cover plates were reattached to conceal each recess opening.

The environment around the cables within the recesses can change as a result of the original exposure. There is a possibility that moisture observed within the sheaths during the initial exposure has evaporated over time. Thus, comparisons of observations regarding the presence of moisture from the initial investigation to subsequent reviews are not made.

4.0 Observations and Discussions

4.1 Post-Tension Cable Conditions

The condition of 223 cables was confirmed at 65 existing recesses. Table 1 summarizes the condition of the cables observed.

Table 1
Summary of Observed Cable Conditions

Cable Location	# of Cables Viewed	# of Cables Unstressed
Main Floor Slab	77	2 (3%)*
P-1 Level Slab	41	4 (10%)
P-2 Level Slab	48	0 (0%)
P-3 Level Slab	57	1 (2%)

* *One cable was removed in 1996*

Ninety seven percent (97%) of the cables viewed appear stressed. Seven fully unstressed cables are present. Two unstressed cables are located in the main floor slab, four are located in the P-1 slab, and one is located in the P-3 slab. One of the cables in the main floor slab was removed in 1996 and is considered unstressed for this report.

Two cables have failed since 2010. Both of these cables are located in the P-1 level slab. This indicates that deterioration of the post-tensioning system continues.

Some of the cables display evidence of corrosion. These are located at cracks in the slab where through slab leakage appears to be occurring or has occurred in the past.

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4.2 Waterproofing

Waterproofing is present on the surfaces of the post-tensioned parking slabs. The waterproofing is a liquid applied traffic-grade coating and appears to be in good condition.

Injection ports were observed along the soffit of the slabs indicating that a crack injection program had been completed in the past.

A review of the main floor waterproofing system located around the exterior of the tower was not performed as the waterproofing is located below hard and soft landscaping.

5.0 Conclusions and Recommendations

5.1 Post-Tension Cables

Deterioration of the post-tensioning system has occurred since 2010 with two additional unstressed strands confirmed. Because the breaks are relative far apart from each other, repairs or replacement of post-tensioning cables are not presently required.

Ongoing monitoring of the post-tensioning system is essential to reduce the risk that unsafe conditions develop due to corrosion induced deterioration. On-going deterioration may be occurring at areas along the length of the cable, other than at the recesses. Biennial review of the post-tensioning system is recommended. The next cable review is due in June 2014. The estimated cost to review the cables within the existing recesses is $3,500 per event.

The upper floor slabs are post-tensioned concrete construction. No review of these slabs has been completed. It is recommended that a review of the upper floors be performed.

6.0 Closure

The evaluation program has not included a review of the structural design of the slabs. It has been assumed that the slabs were designed and constructed in accordance with all standards and codes of practice applicable at the time of construction.

The intent of this reporting was to identify situations that are obvious to a professional engineer under the current terms of reference. The conclusions and recommendations presented are based on a limited strand sample size and may not represent all strand conditions within the slabs, and conditions may vary widely away from the recess locations.

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We trust this information meets with your present requirements. Should you have any questions please contact Manticore Engineering Ltd. at (403) 252-8454.

Yours truly,

Mike Collins, C.E.T.

Reviewed by,

PROFESSIONAL ENGINEER ALBERTA
5041-12

Jeff Small P. Eng
Principal
June 11, 2012

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