October 31, 2012

VIA EMAIL

Strata Plan LMS 4456
938 Nelson Street
Vancouver, BC V6Z 3A7

Attention: Mr. Philip Jhin

Subject: One Wall Centre, 938 Nelson Street, Vancouver, BC
Elevator R5 Drive Malfunction

Dear Mr. Jhin,

We have reviewed the equipment and callback records related to the elevator R5 drive malfunction, and provide the following summary for your consideration.

Background

The gearless overhead traction elevator R5, 3500lbs capacity with a contract speed of 1000 fpm, has experienced continuous drive/control problems within the last three (3) months. The equipment was installed in 1999 by Richmond Elevator Maintenance (REM) and maintained by ThyssenKrupp Elevator (TKE) for the past several years.

The elevator drive appears to be original to the installation, and is a Motion Control Engineering (MCE) 12 pulse SCR unit. The drive's external and the elevator main line disconnect fuse(s) were blown on several occasions, the drive unit experienced vibration, and the elevator subsequently shut down.

The above situation was investigated by TKE, MCE engineers, and GUNN Consultants Inc. A callback records review was also conducted by our office. The following indicates our findings.

Review / Troubleshooting

There are several items that have been considered to resolve this issue.

1. **Drive malfunction** – Although TKE mechanics and MCE engineers investigated this item as most obvious cause of the elevator shutdown, it was not determined if the existing drive had any faulty components. Drive recalibration was implemented to ensure its proper operation.

2. **Control circuit malfunction** – The elevator control circuit responsible for correct drive operation was recommended to be changed based on MCE engineer troubleshooting.

3. **Insulation failure** – The isolation transformer and related circuits' insulation was recommended to be measured and confirmed adequate.

GUNN Consultants Inc., #207 - 338 West 8th Avenue, Vancouver, BC V5Y 3X2 / Tel: 604.630.2276 / Fax: 604.630.2277 / www.gunnconsultants.com

Repair log review

The repair log was also reviewed for this elevator (R5). The following tables summarize the available records.

Start Date	03-Aug-12
End Date	16-Oct-12
No. of Days	74

Repair Log Summary by Type

Type	Number of Repairs
Elevator Number	**Totals**
Drive	12
Mechanical	0
Control/Electrical	13
Door related	2
Security	0
Unknown	5
Totals	32

Callback Summary by Date

Date	Number of Repairs
Aug-12	10
Sep-12	12
Oct-12	10
No. of days	74
Mean time between repairs, days	2.3
Expected Minimum Mean Time Between repairs, days	90

Descriptions:

Drive – refers to problems with the elevator drive.
Mechanical - refers to problems with the car, counterweight, ropes, governor and levelling.
Control/Electrical– refers to problems with the control, or drive.
Door related – refers to problems with the door operating system.
Security – refers to problems related to the security system.
Unknown – Unknown problem.

Note: the tables above indicate number of repair activities registered for elevator R5, with some of them related to multiple site visits to rectify a particular problem when the elevator was shut down for an extended period of time.

GUNN Consultants Inc., #207 - 338 West 8th Avenue, Vancouver, BC V5Y 3X2 / Tel: 604.630.2276 / Fax: 604.630.2277 / www.gunnconsultants.com

Summary / Recommendations

The history of the callbacks, as well as our own survey, indicate that the drive and/or control equipment is the most possible cause of the equipment malfunction. However, all options were considered and potentially faulty boards replaced. The insulation of the equipment and applicable circuits were also measured (as per conversation with TKE supervisor on October 30, 2012). The defective drive was sent to the manufacturer for further investigation. The new drive has arrived and been tested onsite with positive outcome. The following items should be completed to finalize this issue:

1. Although TKE reported that the insulation readings were acceptable, it is recommended to obtain a written confirmation.

2. Determine the exact cause of the old drive malfunction before releasing the elevator back to service with the new drive. This will address the concern of identifying the original problem and ensure the new drive will not be damaged should the equipment malfunction again.

3. A schedule from TKE/MCE for the complete review/repair of the drive unit should be provided.

If you have any questions regarding this matter, please contact the undersigned.

Best Regards,

Alexey Kononenko
Tel.: (604) 630-2276
E-mail: alexey@gunnconsultants.com

Cc: Eric Peterson, P.Eng (GUNN Consultants)