

Public Works and  
Government Services  
**Canada**



**Project Brief for Reconditioning the Elevators  
at Complexe Guy-Favreau**

200, René-Lévesque Blvd. West, Montreal (Quebec)

**Project n° R.002079.036**

Presented to :

**Public Works and  
Government Services Canada**

Place Bonaventure, South-East Portal  
800, de La Gauchetière Street West  
Suite 7300  
Montreal (Quebec)  
H5A1L6

**March 20<sup>th</sup>, 2013**  
revised

**Project n°**

PWGSC: R.002079.036  
BFAA: 111212  
Exim: P0937  
SDK: 111221  
PMA: 2337-008-00  
TEQ: 1203



This study was prepared by the following firms:

Architecture:

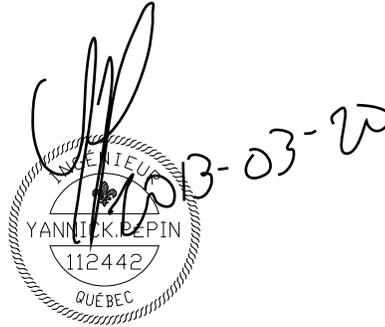


---

Danielle Bisson, Architect  
Bisson Fortin et associés architectes



Elevator consultant:



---

Yannick Pépin, Engineer  
Exim Consultants Inc.



**Structure:**



---

Stéphan Blais, Engineer  
SDK and Associates



---

Pierre-Olivier Gingras, Engineer  
SDK and Associates



Building electricals:



2013/03/20

---

Richard St-Laurent, Engineer  
Pageau Morel and Associates Inc.

Building mechanicals:



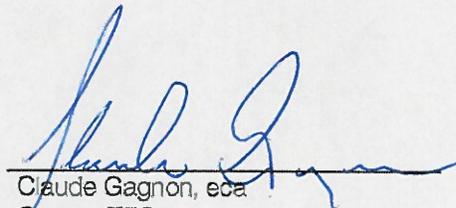
2013/03/20

---

Jean-Gabriel Joannette, Engineer  
Pageau Morel and Associates Inc.

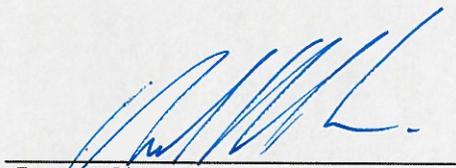


Cost and Scheduling Consultant:



---

Claude Gagnon, eca  
Groupe TEQ



---

Roberto Bianchini, Architect  
Groupe TEQ



## Table of Contents

### 1. INTRODUCTION

1.1	Project Description	1
1.2	Project Requirements	2
1.3	Building Description	3

### 2. OBSERVATIONS

2.1	Traffic Study	5
2.2	Observations	9
2.2.1	Observation Summary Table	9
2.2.2	General Remarks	13
2.2.3	Passenger Elevators Nos. 1 and 2	14
2.2.4	Service Elevator No. 3 – Firefighters' elevator	17
2.2.5	Passenger Elevator No. 4	20
2.2.6	Service Elevator No. 5 – Firefighters' elevator	24
2.2.7	Freight Elevator No. 6	28
2.2.8	Passenger Elevator No. 7	31
2.2.9	Passenger Elevators Nos. 9 to 13, West Tower	34
2.2.10	Passenger Elevators Nos. 14 to 19, East Tower	37
2.2.11	Key consoles and computer console	40

### 3. DRAWINGS OF EXISTING FACILITIES

3.1	Schematic cross section of the elevators	41
3.2	General layouts	43

### 4. MODERNIZATION WORK

4.1	General Remarks	63
4.2	Passenger Elevators Nos. 1 and 2	64
4.3	Service Elevator No. 3	66
4.4	Passenger Elevator No. 4	69
4.5	Service Elevator No. 5	73
4.6	Freight Elevator No. 6	76
4.7	Passenger Elevator No. 7	78
4.8	Passenger Elevators Nos. 9 to 13, West Tower	81
4.9	Passenger Elevators Nos. 14 to 19, East Tower	84
4.10	Control console for special operations, computerized console and communication system	86

### 5. DRAWINGS OF PROPOSED RENOVATIONS

5.1	Passenger Elevator No. 4	89
-----	--------------------------	----

### 6. EVALUATION OF THE BUILDING'S LOAD-BEARING CAPACITY 117

### 7. ANALYSIS OF THE CAPACITY OF THE POWER SUPPLY UNITS 119

8.	SEISMIC ANALYSIS	121
9.	PROJECT RESTRICTIONS	123
10.	SCHEDULING OF WORK	125
11.	BUDGET ESTIMATE	133
12.	MAINTENANCE PROGRAM	
12.1	Analysis of Current Maintenance Contract	155
12.2	Proposed Maintenance Program	156

## APPENDIX

Appendix A – Technical Data Sheets of Existing Elevators and Photographs

1



## 1. INTRODUCTION

### 1.1 Project description

All elevators in the Complexe Guy-Favreau (CGF) date from the original construction in the early 1980s. They have therefore been in service for more than 30 years. Although certain components have been replaced over the years, most are original. A number of major components have reached the end of their service life and must be replaced.

Moreover, given the age of the equipment, breakdowns and outages occur increasingly often, inconveniencing the occupants and generating substantial maintenance costs. Some spare parts are no longer commercially available and must be machined to order, generating additional costs and delays. Skilled workers trained to service this type of equipment are increasingly rare, limiting options and competition when the maintenance contracts come up for renewal.

Because of their age, the elevators do not satisfy current fire safety and universal accessibility standards, and the cab interiors are worn and outmoded, as well as no longer up to code with respect to flame spread and smoke development.

For all these reasons, major elevator modernization work is necessary to extend their useful life, ensure the comfort and safety of users and reduce maintenance costs to an acceptable level.

Elevator No. 4 servicing the Desjardins tunnel and access to the Métro is not large enough to enable those with reduced mobility to use it comfortably and in accordance with current standards. Given that Elevator No. 4 needs upgrading and a number of major components, including the cylinder, must be replaced, it was decided to enlarge it.

Elevator No. 7 servicing the Palais des Congrès tunnel constitutes a secondary access with a defective obstacle-free route. Given the elevator configuration (front entrance and exit without having to change direction), adding a control panel will enable persons in a wheelchair to use the elevator comfortably.

Accordingly, all of the 18 elevators and freight elevator, numbered 1 to 19 (there is no Elevator No. 8) will be upgraded to satisfy the various project requirements, specifically to bring them up to code (especially Elevators Nos. 3 and 5, intended to be firefighters' elevators, in order not to compromise safety), enhance elevator performance, reduce the frequency of outages and related expenses and improve the comfort of users. The project detailed in this study makes it possible to achieve the stated objectives.

## 1.2 Design requirements

A number of aspects were considered and analyzed as part of the conduct of this study. The following elements constitute design requirements:

- Analysis of all applicable regulations to assess the scope of the upgrade to code required for the elevators.
- Seismic analysis.
- Validation of the options proposed with the HRSDC Fire Protection Services.
- Surveys and inventory of elevator-related equipment to assess its condition and recommendation on the scope of work required for modernization and upgrading.
- Reduction of the frequency and costs of elevator maintenance.
- Improvement of ease of spare parts procurement.
- Validation of the feasibility and necessity of adding a new elevator allowing access to Level 00 of the CGF from the Desjardins tunnel (Métro access) and capable of accommodating persons with limited mobility travelling on four-wheel electric scooters as well as child transport systems. Several scenarios were evaluated.
- Traffic study, based on counter totals, to assess the necessity of preserving or increasing the current number of elevators.
- Analysis of the capacity of the backup generators to meet new needs detailed in the study, associated specifically with the generator project just completed.
- Consideration of the project to modernize the Security Operations Centre (SOC) currently being executed by another firm as part of another contract.
- Consideration of the National Report on CGF Elevators now in progress and being executed by another firm as part of another contract.
- Consideration of health and safety aspects.
- Consideration of any potential re-engineering projects planned for CGF when developing the proposed options.
- Integration of the PWGSC sustainable development policy in the proposed options.
- Environmental assessment.
- Development of an environmental protection strategy.
- Definition of the waste management requirements.
- Planning for the potential addition of access control systems and cameras to various elevators.
- Definition of requirements for commissioning and decommissioning elevators during project execution steps.
- Identification of project restrictions.
- Estimates (class C) of work described.
- Analysis of overall project cost (capital cost, operation and energy).
- Planning a work implementation and scheduling strategy, with consideration for constantly maintaining operations, operational and security restrictions, while maximizing cost reduction and scheduling.

- Analysis of the maintenance contract currently in force.
- Development of a strategy with regard to a future maintenance contract, taking into account the proposed work schedule and future needs.
- Risk management at all project stages.

### 1.3 Building description

The Complexe Guy-Favreau (CGF) is located at 200 René-Lévesque Boulevard West in Montreal between Jeanne-Mance and St-Urbain streets. This federal building, built between 1977 and 1983, is located in a sector of exceptional heritage value surrounding the Complexe Desjardins and Place des Arts. It includes housing and two office towers, the ten-storey West Tower and the twelve-storey East Tower. Both have a technical roof shed.

The office towers are occupied exclusively by federal departments. The Basilaire, a large underground area located at Level 00, is the link between the underground corridors that connect CGF to the Complexe Desjardins, the Palais des Congrès and the Métro. The Basilaire level represents a major link in the Underground Montréal network. It contains a commercial mall and several client departments, including Service Canada. There are two underground floors: Level S1, which contains the technical facilities, storage areas, receiving dock and parking for the Habitations Centre-ville apartments, and Level S2, which is reserved for public parking for CGF. The building consolidates the important activities of 16 Government of Canada departments in Montréal. The Basilaire is the property of the federal government, while the office towers are rented under a lease for purchase.

The West Tower contains 8 elevators, including 2 passenger elevators (elevators 1 and 2) which provide service to the public parking area on Level S2 and the first two Levels of the Complex (Levels 00 and 01), a service elevator (Elevator No. 3), which is also a firefighters' elevator, and 5 passenger elevators (Elevators Nos. 9 to 13) located in a controlled-access tower.

The East Tower also has 8 elevators: one service elevator (Elevator No. 5) which is also a firefighters' elevator, a freight elevator (freight Elevator No. 6) servicing Levels S1 and 00, and 6 passenger elevators (Elevators Nos. 14 to 19) located in a controlled-access tower.

In addition, the complex has two small passenger elevators (Elevators Nos. 4 and 7) that provide service for the tunnel Level and Level 00.

The elevators have not undergone any major upgrading since their initial installation by the Dover company.



2



## 2. OBSERVATIONS

### 2.1 Traffic study

We made analysis for each type of systems to assess the possibility of eliminating an elevator.

#### Populations

Analysis of the preliminary plans and development of occupation densities hypotheses (according to the PWGSC new standard Workplace 2.0) allowed us to estimate the number of users of vertical transport systems. We have established the most critical scenarios for elevator systems, either in the morning and afternoon.

Considering high occupancy rate (14 square meters per person) - compared to the current 18 smpp normally recognized for administrative buildings and professional – we obtain for the East Tower a maximum population of 1871 individuals on the floors above the Level 01, and for the West Tower, we obtain a population of 1134 individuals. Traffic intensities observed, that to say the number of users per peak period of 5 minutes used in our field, were 13.0% in the morning peak and 13.5% in the lunch peak.

#### East Tower – 6 elevators option, as existing

This analysis focused on 6 modernized traction elevators with a capacity of 1815 kg and a nominal speed of 2.5 meters per second. The following analysis results were obtained:

Peak	Floors	Waiting time	Intervals	Load factor	Handling
Morning	1 @ 12	25 sec	41 sec	53%	243 pers.
Lunch	1 @ 12	29 sec	39 sec	64%	253 pers.

Results: Waiting times comply with the criteria for this type of functions.

#### East Tower – 5 elevators option

This analysis focused on 5 modernized traction elevators with a capacity of 1815 kg and a nominal speed of 2.5 meters per second. The following analysis results were obtained:

Peak	Floors	Waiting time	Intervals	Load factor	Handling
Morning	1 @ 12	32 sec	46 sec	67%	243 pers.
Lunch	1 @ 12	37 sec	48 sec	79%	253 pers.

Results: Waiting times and intervals are somewhat on the high side, it is the load factors that are excessive and not meet the criteria for this type of functions - there will backflow and high traffic in cabs.

**West Tower – 5 elevators option, as existing**

This analysis focused on 5 modernized traction elevators with a capacity of 1815 kg and a nominal speed of 2.5 meters per second. The following analysis results were obtained:

Peak	Floors	Waiting time	Intervals	Load factor	Handling
Morning	1 @ 10	17 sec	39 sec	25%	147 pers.
Lunch	1 @ 10	21 sec	37 sec	28%	153 pers.

Results: The overall results are excellent and meet the criteria established for this type of functions.

**West Tower – 4 elevators option**

This analysis focused on 4 modernized traction elevators with a capacity of 1815 kg and a nominal speed of 2.5 meters per second. The following analysis results were obtained:

Peak	Floors	Waiting time	Intervals	Load factor	Handling
Morning	1 @ 10	24 sec	47 sec	31%	147 pers.
Lunch	1 @ 10	28 sec	49 sec	37%	153 pers.

Results: The overall results including waiting times comply with the criteria established for this type of functions.

**Analysis criteria**

- For an office building with similar physical characteristics (class A), the system whose average waiting time (TA) in the morning is less than 30 seconds is considered as excellent, between 30 and 33 seconds as good, superior to 33 seconds as average.
- For an office building with similar physical characteristics (class A), the system whose average waiting time (TA) at lunch is less than 33 seconds is considered as excellent, between 33 and 36 seconds as good, superior to 36 seconds as average.
- The interval (INT) represents the average time that elapses between the successive arrivals of elevators on the main level. Intervals less than 35 seconds are considered excellent while times greater than 45 seconds are marginal. Waiting times are more representative of the effectiveness of a system because it reflects the waiting on all levels.
- Handling (CS) is calculated from population data. It represents the number of people using the system for the busiest five minutes of the day.
- The load factor (LF) is defined as the ratio of the maximum number of passengers per trip on the maximum number that the cab can hold. System is characterized by optimum load factors below 50%. We consider as excessive a percentage greater than 60%, as passengers often complain that the cabs are too busy.

**Recommendation**

In each tower, given the results, especially in the case of the East Tower, we do not recommend reducing the number of elevators. Indeed, the modernization of all existing elevators systems of the East Tower will provide adequate performance levels for the type of function. Although the results for the West Tower show good levels of performance, we

recommend keeping the current number of elevators to ensure a better level of service, mainly in regards to the intervals and the impact of an elevator shutdown that would be important in a scenario of 4 elevators.

### References

Our analysis is based on the theories outlined in the manual written by George R. Strakosch: Vertical Transport: Elevators and Escalators, second edition and the analysis results are computed using the traffic simulation software Simex that we have developed.



2.2 Observations

2.2.1 Observation Summary Table

Elevator Consultant – Obsolescence (residual life expectancy)

	Elevators n°1 & n°2	Elevator n°3 (firefighter)	Elevator n°4	Elevator n°5 (firefighter)	Freight n°6	Elevator n°7	Elevators n°9 to n°13	Elevators n°14 to n°19
Hoist machine	20 to 25 years	20 to 25 years	20 to 25 years	20 to 25 years	20 to 25 years	20 to 25 years	20 to 25 years	20 to 25 years
Hydraulic cylinder	N/A	N/A	2 to 5 years	N/A	2 to 5 years	2 to 5 years	N/A	N/A
Control system	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years
Door equipment	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years
Fixture	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years
Cab interior	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years

Elevator Consultant - Conformity

	Elevators n°1 & n°2	Elevator n°3 (firefighter)	Elevator n°4	Elevator n°5 (firefighter)	Freight n°6	Elevator n°7	Elevators n°9 to n°13	Elevators n°14 to n°19
Fire Recall	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant
Firefighter elevator	N/A	Not Compliant	N/A	Not Compliant	N/A	N/A	N/A	N/A
Hall doors	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Stop button in cab	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Compliant	Not Compliant	Not Compliant	Not Compliant
Communication system	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Inspection unit	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Hydraulic cylinder	N/A	N/A	Not Compliant	N/A	Not Compliant	Not Compliant	N/A	N/A
Hoist machine	Compliant	Compliant	N/A	Compliant	N/A	N/A	Compliant	Compliant
Floor leveling	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Door protection	Compliant	Compliant	Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant
CSA B651-F04 code	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant	Not Compliant

Mechanical and electrical

	Elevators n°1 & n°2	Elevator n°3 (firefighter)	Elevator n°4	Elevator n°5 (firefighter)	Freight elevator n°6	Elevator n°7	Elevators n°9 to n°13	Elevators n°14 to n°19
Elevators on emergency power	Connected	Connected	Connected	Connected	Connected	Connected	Connected	Connected
2 hours fire protection 600V	N/A	Non-compliant	N/A	Non-compliant	N/A	N/A	Non-compliant	Non-compliant
Smoke detectors in elevator shaft	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant
Pre-signal on normal power recovery	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Generator signals	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Fire alarm signals	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Grounding 600V	Non-compliant	Non-compliant	Non-compliant	Non-compliant	Non-compliant	Non-compliant	Non-compliant	Non-compliant
120 V GFI (elevator mechanical room)	To replace	To replace	To replace	To replace	To replace	To replace	To replace	To replace
120 V GFI (pit)	To replace	To replace	To replace	To replace	To replace	To replace	To replace	To replace
120 V COS emergency for consoles	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Lighting (elevator mechanical room)	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant
Ventilation (elevator mechanical room)	Standard-compliant Fan to replace	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant Fan to replace	Standard-compliant Fan to replace	Standard-compliant	Standard-compliant
Filters	Dirty, to replace	N/A	Clean	N/A	Dirty, to replace	Dirty, to replace	N/A	N/A
Fire dampers	Standard-compliant	Standard-compliant	Standard-compliant	Non-compliant	Standard-compliant	Non-compliant	Standard-compliant	Standard-compliant
Wall grilles	Good condition	Dirty, to clean	Good condition	Dirty, to clean	Dirty, to clean	Dirty, to clean	Good condition	Good condition
Drainage (elevator mechanical room)	Floor drain and case to add	No drain	No drain	No drain	Funnel drain	Drain pit	Floor grate	Floor grate
Drainage (elevator shaft)	Standard-compliant	Non-compliant	Standard-compliant	Non-compliant	Non-compliant	Standard-compliant	Standard-compliant	Standard-compliant
Sprinklers (according to N.B.C)	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant
Portable extinguisher	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant	Standard-compliant



Architecture (residual life expectancy and backfitting)

	Elevators no. 1 & no. 2	Elevator No. 3 (firefighter)	Elevator No. 4	Elevator No. 5 (firefighter)	Freight Elevator No. 6	Elevator No. 7	Elevators no. 9 to no. 13	Elevators no. 14 to no. 19
Floor finish	1 to 2 years	5 to 10 years	1 to 2 years	5 to 10 years	Keep	1 to 2 years	1 to 2 years	1 to 2 years
Wall finish	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	Keep	2 to 5 years	2 to 5 years	2 to 5 years
Ceiling finish	2 to 5 years	2 to 5 years	2 to 5 years	2 to 5 years	Keep	2 to 5 years	2 to 5 years	2 to 5 years
Cab door finish	5 to 10 years	5 to 10 years	5 to 10 years	5 to 10 years	Keep	5 to 10 years	5 to 10 years	5 to 10 years
Handrail	5 to 10 years	5 to 10 years	5 to 10 years	5 to 10 years	Keep	5 to 10 years	5 to 10 years	5 to 10 years
Elevator shaft, fire separation integrity	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Machine room, fire separation integrity	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Airlock at basement Levels	Compliant, both double doors at S1 engage badly	Non-compliant. Door and frame non-compliant	N/A	Compliant	Compliant	N/A	N/A	N/A
Cab dimensions (mm)	1994 x 1302	2085 x 1825	1700 x 1260	2085 x 1825	2440 x 2940	1700 x 1260	2300 x 1600	2300 x 1600
Elevator doors, F.R.H.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.	1.5 f.r.h.
Mechanical shaft, F.R.H.	See note 1	2 f.r.h.	See note 1	2 f.r.h.	See note 1	See note 1	Voir note 1	Voir note 1

Note 1: We have no information on the type of block and its permeability and are thus unable to determine their degree of fire resistance. Exploratory openings at a subsequent step would make it possible to confirm the degree of fire resistance. Elevators Nos. 9, 14 and 19 have a concrete shaft with compliant fire resistance levels (2 hours).

FD = Fire damper

NBC = National Building Code

FRH = Fire resistance hour



### 2.2.2 Generality

We describe in this section the remaining life expectancy of the major components of the vertical transport system and work recommended for lifts to comply with code requirements in force, those related to obsolescence of the elevator systems (wear and technology) and those required to improve performance levels of equipment (levelling, waiting time and passenger comfort), all following our analysis of the condition and the type of equipment. The recommendations described in this section are based on the assumption that the preventive and corrective maintenance is performed according to the standards and rules of art.

### Glossary

**Hoist machine (traction):** Driving machine which ensures the movement of the cab by the adherence of the suspension ropes on a traction sheave.

**Hoist machine (hydraulic):** Driving machine which ensures the movement of the cab by a hydraulic machine and transmitted by a hydraulic cylinder. Unit comprising a pump, a motor, valves and internal piping which converts the electrical energy in the form of a liquid under pressure.

**Hydraulic cylinder:** Part buried in the ground of the cylinder / piston set, for moving a cab by a hydraulic machine.

**Control system:** Device or set of devices for controlling in a predetermined manner the devices to which it is connected. Located in the machine room.

**Door equipment:** System ensuring the operation of the doors comprising a door operator, the clutch, the door hanger, the suspension rollers, interlocks and door closer mechanisms of the landing doors.

**Fixture :** Fixture includes the following elements: control operation panel in the cab, hall call stations, fire recall system, position indicator in the cab and floors, direction lanterns, braille inscriptions to identify the buttons, gongs sound and a voice synthesizer.

**Fire recall :** Emergency maneuver for controlling the elevator at the triggering of the fire alarm.

**Communication system :** Used to communicate from the elevator to a location staffed by authorized personnel.

**Inspection unit :** The inspection unit is used to control the elevator from the car top.

**Floor levelling:** Vertical distance between the car and hall sill.

**Door protection:** Device ensuring the reopening of the car door when an obstacle is in its trajectory

### 2.2.3 Passenger Elevators Nos. 1 and 2

These two passenger elevators servicing the levels S2 to 01 (without stopping at S1). Their machine room is located at S2.

#### **Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hoist machines (traction)**, remaining useful life expectancy of about 20 to 25 years  
Existing hoist machines are geared traction type with DC motor located at the lower level. The machine is a good quality equipment and in good condition. Hoist cables are currently compliant and are covered by the maintenance contract.

**Control system**, remaining useful life expectancy of about 2 to 5 years  
The existing control system is base on Dover 1st generation Solid State and DC motor-generator. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years  
Door equipments, Dover brand, are obsolete but still functional. They will soon have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years  
Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years  
Cab interiors need to be refreshed and renewed. The carpet covering walls do not comply with current code.

#### **Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

### **Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

### **Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

### **Hall entrances**

The hall entrances are ULC approved.

### **Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

### **Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

### **Inspection unit**

The inspection units on the car top meet current code. They have a common button.

### **Hoist machine (traction)**

The machines have auxiliary emergency brakes and protection guards around the rotating parts.

### **Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

### **Door protection**

The existing door protection system is an infrared proximity detector type. This system complies with the CSA B651-F04 norm.

### **CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

### **Elevator consultant, access control**

There is no access control on these elevators.

### **Mechanical (Elevator mechanical room- Level S2)**

This room is ventilated with a wall exhaust fan (S2-4/E-05 system, ¼ HP, 0.2 kW) and a transfer duct, both equipped with a motorized damper interlocked to a wall mounted thermostat in the room. Air is supplied from the indoor parking ambient space and is exhausted to this same place.

Filters inspected on site are dirty.

Motorized dampers' actuators are in good condition.

The exhaust fan is dirty and obsolete but still works. It needs to be replaced.

The rigid frames on the ventilation ducts at the entrance and exit of the room suggest that fire dampers are installed. Code requires these fire dampers.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

We noticed that there is drainage piping coming from the floor above that does not serve the room itself; it should be protected against water leakage with a drainage pan.

Room is equipped with a funnel drain.

### **Electricity (elevator mechanical room)**

Ventilation system starter is old.

Lighting fixtures are equipped with T12 fluorescent lamps.

There are many smoke detectors.

### **Structure**

Not applicable.

### **Architecture**

The cab floor is covered with a worn carpet, the walls are covered with a very dark, dusty, non-reflective bouclé material, while the ceiling is a white laminate and has a *Paraline-type* suspended ceiling. The doors of the cab are of polished coloured stainless steel whose finish is in good condition. The handrail is made of stained wood.

The elevator block has an airlock in the basement that is Code-compliant for high-rise buildings. The walls of the machine room and the elevator shaft are made of 200 mm

concrete blocks and form fire-stop separations. However, we have no information about the type of block and its permeability and are thus unable to determine the degree of fire resistance. Exploratory openings at a subsequent stage would allow confirmation of the degree of fire resistance. The two pairs of doors of the airlock at Level S1 do not engage.

### 2.2.4 Service Elevator No. 3: Firefighters' elevator

This service elevator is servicing the levels S1 to 11. Its machine room is located on the mezzanine level of the West Tower (12th floor).

#### **Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hoist machine (traction)**, remaining useful life expectancy of about 20 to 25 years  
Existing hoist machines are geared traction type with DC motor located at the upper level. The machine is a good quality equipment and in good condition. Hoist cables are currently compliant and are covered by the maintenance contract.

**Control system**, remaining useful life expectancy of about 2 to 5 years  
The existing control system is base on Dover 1st generation Solid State and DC motor-generator. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years  
Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years  
Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed.

**Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

**Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

**Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

**Firefighters' elevator**

In addition to the Firefighters' Emergency Operation, a firefighters' elevator (required in high-rise buildings) must have a fire resistant hoistway and be connected to an emergency power supply (with fire resistant wiring). The following elements are lacking:

- The elevators are connected to the emergency power, but electrical engineer confirms that the cables are not fire resistant.

**Hall entrances**

The hall entrances are ULC approved.

**Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hoist machine (traction)**

The machines have auxiliary emergency brakes and protection guards around the rotating parts.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is an infrared proximity detector type. This system complies with the CSA B651-F04 norm.

**CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

**Rise extension to S2**

Although feasible, the extension of elevator no. 3 at S2 has drawbacks and risks. Given the fact that the code does not require a firefighters' elevator to access floor below ground level, and considering the risks, costs and disadvantages inherent in such work, it was agreed with representatives of PWGSC that the extension of scenario elevator no 3 at S2 is not selected.

**Elevator consultant, access control**

Access control is provided with a card reader installed in the cab.

**Mechanical (elevator mechanical room)**

The room is ventilated (recirculated air) and cooled by a *McQuay* water cooled unit interlocked with a temperature sensor located in the elevator mechanical room. This unit is in good condition.

- AC-3 system
- Unit model : W-FMS-1-60-F-Z-00-AA-11-Z-Z-A-1
- Serial number : 667202900

Motorized dampers' actuators are in good condition.

Wall grilles are dirty and need to be cleaned.

The rigid frames on the ventilation ducts at the entrance and exit of the room suggest that fire dampers are installed. Code requires these fire dampers.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

There is no floor drain or funnel drain in this room.

Elevator shaft is not equipped with a pumped drainage system (floor grate). Code requires this system hence it needs to be added.

### Electricity (elevator mechanical room)

Elevator power distribution is not 2 hours fire resistant as required for elevators that are intended to be used by firefighters.

### Structure

The existing elevator covers level S1 to level 11. It is surrounded by four concrete walls which are part of the lateral resistance system of the building. These four walls are resting on a structural slab measuring 4400 x 9900 x 900 mm at elevation 9300. This slab sits directly on the bedrock. There is 700 mm of space between the bottom of the slab on ground of level 10100 and the top of the foundation slab.

### Architecture

The floor of the cab is covered with a *checkered* type anti-slip steel plate, the walls are covered with a metallic laminate that shows damage, and the ceiling is finished with a white metallic covering. The cab doors are made of stainless steel whose finish is in good condition. The handrail is made of stainless steel.

The elevator is equipped with an airlock in the basement that is Code-compliant for high-rise buildings. This airlock is a compliant fire-stop separation, except for the doors and frame, which have 45-minute certification (1½ hour required).

The fire-stop integrity of the machine room and shaft is respected.

## 2.2.5 Passenger Elevator No. 4

This small passenger elevator is servicing the levels Desjardins Tunnel to 00 (Basilaire). Its machine room is located at level tunnel adjacent to the elevator.

### Elevator consultant, equipment condition - Obsolescence

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hydraulic machine**, remaining useful life expectancy of about 20 to 25 years

The pumping unit, dry belt unit type, is a generation from the 1980s. The machine as a whole is in fair condition and of rugged construction. The motor seems to have been replaced a few years ago. The hydraulic valve should be replaced during modernization in order to maintain acceptable service level in the medium and long terms.

**Hydraulic cylinder**, remaining useful life expectancy of about 2 to 5 years

The existing hydraulic cylinder is dating from the original installation and is buried in the ground. No protection against corrosion is installed. Cylinders buried in the ground can be

affected by subsurface conditions and should therefore be protected against corrosion due to galvanic or electrolytic action, salt water or other soil conditions.

It is to be noted that the existing cylinder is not installed in the center of the hole into the ground. The installation of a new PVC jacket will be impossible if the hole is not enlarged as the new cylinder will not be centered on the platform. On the other side, it will be almost unthinkable to increase the diameter of the hole as the required equipment for this operation can not be brought to this place.

An alternative solution must be studied. The installation of above ground cylinders on the side is the ideal solution. However, the hoistway must be enlarged to allow installation.

**Control system**, remaining useful life expectancy of about 2 to 5 years

The existing control system is base on Dover 1st generation Solid State. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed. The carpet covering walls do not comply with current code.

**Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

**Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now

meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

**Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

**Hall entrances**

The hall entrances are ULC approved.

**Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hydraulic cylinder**

A PVC jacket must be installed to ensure adequate protection against corrosion to eliminate the risk of soil contamination should a leak occur.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is an infrared proximity detector type. This system complies with the CSA B651-F04 norm.

**CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

However, the actual dimensions of the elevator does not allow to reach the minimum size requirements set forth in ASME A17.1-2010/CSA B44-10 and B651-F04 with respect to the accessibility for wheelchairs.

Minimal elevator cab dimensions

The existing cab dimensions of elevator no4 are as follows:

Door location:	Centered
Door clear width:	915 mm
Inside car, side to side:	1676 mm
Inside car, Back wall to front return:	1270 mm
Inside car, Wall to inside face of door:	1397 mm

The table below shows the different settings allowed by the ASME A17.1-2010/CSA B44-10 on minimum dimensions of elevator cab to accommodate a wheelchair.

ASME A17.1-2010/CSA B44-10

**Table E-1 Minimum Dimensions of Elevator Cars**

Door Location	Door Clear Width, mm	Inside Car, Side to Side, mm	Inside Car, Back Wall to Front Return, mm	Inside Car, Wall to Inside Face of Door, mm
Centered	1 065	2 030	1 295	1 370
Side (off-center)	915 <sup>2</sup>	1 725	1 295	1 370
Any	915 <sup>2</sup>	1 370	2 030	2 030
Any	915 <sup>2</sup>	1 525	1 525	1 525
<b>Minimum Diameter of LU/LA (Limited-Use/Limited-Application) Elevators</b>				
Any	815	1 065	1 370	Not specified

GENERAL NOTES:

- (a) E-1 is based on Table 407.2.8 in ANSI/ICC A117.1, metric values only.
- (b) A tolerance of -16 mm shall be permitted.

Elevator consultant, access control

There is no access control on this elevator.

Mechanical (elevator mechanical room)

This room is ventilated with a wall exhaust fan (S1-E1-13) and a transfer duct, both equipped with a motorized damper interlocked to a wall mounted thermostat in the room. Air supply comes from the indoor parking ambient space and is exhausted to this same place.

Filters inspected on site are clean.

Motorized damper actuators are in good condition but old.

The exhaust fan is in good condition.

There are fire dampers on the ventilation ducts at the entrance and exit of the room as required by code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

There is no floor drain or funnel drain in this room.

### **Electricity (elevator mechanical room)**

Lighting fixtures are equipped with T12 fluorescent lamps.

Many conduits are passing through the elevator mechanical room and are not intended for its use.

### **Structure**

At level S1, the structure is composed of a structural slab on beams at level 14200 on which rests a second structural slab at level 15770 (Desjardins tunnel level). The elevator pit is therefore located in the empty area between the two structural slabs with a height of approximately 1500 mm.

### **Architecture**

The cab floor is covered with a worn carpet, the walls are covered with a very dark, dusty, non-reflective bouclé material, while the ceiling is white laminate covered by a suspended *Paraline-type* mirror ceiling. The cab doors are of polished and coloured stainless steel whose finish is in good condition. The handrail is made of stained wood.

The walls of the machine room and elevator shaft are of 200 mm concrete blocks and form fire-stop separations. However, we have no information about the type of block and its permeability and are thus unable to determine their degree of fire resistance. Exploratory openings at a subsequent stage would allow confirmation of the degree of fire resistance.

## **2.2.6 Service Elevator No.5 – Firefighters’ elevator**

This service elevator provides service from Level S1 to Level 13. Its machine room is located on the mezzanine of the East Tower (14<sup>th</sup> floor).

### **Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hoist machine (traction)**, remaining useful life expectancy of about 20 to 25 years  
Existing hoist machines are geared traction type with DC motor located at the upper level. The machine is a good quality equipment and in good condition. Hoist cables are currently compliant and are covered by the maintenance contract.

**Control system**, remaining useful life expectancy of about 2 to 5 years

The existing control system is based on Dover 1st generation Solid State and DC motor-generator. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed.

**Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

**Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

**Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

#### **Firefighters' elevator**

In addition to the Firefighters' Emergency Operation, an Firefighters' elevator (required in high-rise buildings) must have fire resistant hoistway and be connected to an emergency power supply (with fire resistant wiring). The following elements are lacking:

- The elevators are connected to the emergency power, but electrical engineer confirms that the cables are not fire resistant.

#### **Hall entrances**

The hall entrances are ULC approved.

#### **Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

#### **Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

#### **Inspection unit**

The inspection units on the car top meet current code. They have a common button.

#### **Hoist machine (traction)**

The machines have auxiliary emergency brakes and protection guards around the rotating parts.

#### **Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

#### **Door protection**

The existing door protection system is an infrared proximity detector type. This system complies with the CSA B651-F04 norm.

#### **CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

#### **Elevator consultant, access control**

Access control is provided with a card reader installed in the cab.

**Mechanical (elevator mechanical room)**

The room is ventilated (recirculated air) and cooled by a *McQuay* water cooled unit interlocked with a temperature sensor located in the elevator mechanical room. This unit is in good condition.

- AC-3 system
- Model unit : W-FMS-1-60-F-Z-00-AA-11-Z-Z-A-1
- Serial number : 667262566

We noticed that there are no fire dampers on the ventilation ducts (supply and return). Fire dampers need to be installed to comply with code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

Supply and return grilles are dirty and need to be cleaned.

There is no floor drain or funnel drain in this room.

Elevator shaft is not equipped with a pumped drainage system (floor grate). Code requires this system hence it needs to be added.

**Electricity**

Since a high number of smoke detectors are installed our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

Elevator power distribution is not 2 hours fire resistant as required for elevators that are intended to be used by firefighters.

**Structure**

Not applicable.

**Architecture**

The car floor is covered with a checkered type anti-slip steel plate, the walls are covered with a damaged metallic laminate damaged and the ceiling is finished with a white metallic finish. The cab doors are made of stainless steel whose mirror finish is in good condition. The handrail is made of stainless steel.

The elevator has an airlock in the basement and the fire-stop integrity is compliant.

The fire-stop integrity of the machine room and shaft is respected.

### 2.2.7 Freight Elevator No. 6

The freight elevator provides service from Level S1 to Level 00. Its machine room is located on Level S2.

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hydraulic machine**, remaining useful life expectancy of about 20 to 25 years

The pumping unit, dry belt unit type, is a generation from the 1980s. The machine as a whole is in fair condition and of rugged construction. The motor seems to have been replaced a few years ago. The hydraulic valve should be replaced during modernization in order to maintain acceptable service level in the medium and long terms.

**Hydraulic cylinder**, remaining useful life expectancy of about 2 to 5 years

The existing hydraulic cylinder is dating from the original installation and is buried in the ground. No protection against corrosion is installed. Cylinders buried in the ground can be affected by subsurface conditions and should therefore be protected against corrosion due to galvanic or electrolytic action, salt water or other soil conditions.

**Control system**, remaining useful life expectancy of about 2 to 5 years

The existing control system is base on Dover 1st generation Solid State. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Peelle brand, are obsolete but still functional and have reached their useful life expectancy. The door protection must be replaced

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors, remaining useful life expectancy of about 2 to 5 years**

Cab interiors are acceptable. Wood flooring, however, should be replaced by a steel floor to ensure durability. The wood bumpers should be replaced with steel bumpers.

**Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

**Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

**Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

**Hall entrances**

The hall entrances are ULC approved.

**Stop button in cab**

There is a stop button in the cab. In the case of a freight elevator this button complies with code.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hydraulic cylinder**

A PVC jacket must be installed to ensure adequate protection against corrosion to eliminate the risk of soil contamination should a leak occur.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is an infrared proximity detector type. This system complies with the CSA B651-F04 norm, although not required for this type of device function. The proximity sensor also increases the level safety of users. An audible and visual

alarm should be installed to increase the safety of users of the freight elevator when the doors are closing.

**CSA B651-F04 Norm**

Although not required for this type of device function, the following items should be added during modernization: voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

**Elevator consultant, access control**

There is no access control on this freight elevator.

**Mechanical (elevator mechanical room)**

This room is ventilated with a wall exhaust fan (S2-1E-06) and a transfer duct both equipped with a motorized damper interlocked to a wall mounted thermostat in the room. Air supply comes from the indoor parking ambient space and is exhausted to this same place.

Filters inspected on site are dirty and need to be cleaned.

Motorized dampers' actuators are in good condition.

Even if functional, the exhaust fan is dirty and obsolete. It needs to be replaced.

The rigid frames on the ventilation ducts at the entrance and exit of the room suggest that fire dampers are installed, as required by code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

Room is equipped with a funnel drain.

Elevator shaft is not equipped with a pumped drainage system (floor grate). Code requires this system hence it needs to be added.

**Electricity (elevator mechanical room)**

Ventilation system starter is old.

**Structure**

Not applicable.

**Architecture**

The cab floor is covered with varnished wooden lathes, the walls are white metal and screens and have solid wood braces.

The freight elevator has an airlock in the basement that complies with code.

The walls of the mechanical wall and elevator shaft are made of 200 mm concrete blocks and form fire separations. However, we have no information about the type of block and its permeability and therefore cannot determine the degree of fire separation. Exploratory openings at a subsequent stage would make it possible to confirm the degree of fire resistance.

### 2.2.8 Passenger Elevator No. 7

This small elevator serves the Palais des Congrès tunnel level at Level 00 (Basilaire). Its machine room is located at Level S1.

#### **Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hydraulic machine**, remaining useful life expectancy of about 20 to 25 years

The pumping unit, dry belt unit type, is a generation from the 1980s. The machine as a whole is in fair condition and of rugged construction. The motor seems to have been replaced a few years ago. The hydraulic valve should be replaced during modernization in order to maintain acceptable service level in the medium and long terms.

**Hydraulic cylinder**, remaining useful life expectancy of about 2 to 5 years

The existing hydraulic cylinder is dating from the original installation and is buried in the ground. No protection against corrosion is installed. Cylinders buried in the ground can be affected by subsurface conditions and should therefore be protected against corrosion due to galvanic or electrolytic action, salt water or other soil conditions.

**Control system**, remaining useful life expectancy of about 2 to 5 years

The existing control system is based on Dover 1st generation Solid State. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing

the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed. The carpet covering walls do not comply with current code.

**Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

**Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10), in particular regarding the accessibility for people with reduced mobility.

**Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

**Hall entrances**

The hall entrances are ULC approved.

**Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hydraulic cylinder**

A PVC jacket must be installed to ensure adequate protection against corrosion to eliminate the risk of soil contamination should a leak occur.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is a safety edge with two light rays type. This system does not comply with the CSA B651-F04 norm.

**CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

However, the actual dimensions of the elevator does not allow to reach the minimum size requirements set forth in ASME A17.1-2010/CSA B44-10 and B651-F04 with respect to the accessibility for wheelchairs.

**Elevator consultant, access control**

There is no access control on this elevator.

**Mechanical (elevator mechanical room)**

This room is ventilated with a wall exhaust fan (S1-2E-20) and a transfer duct, both equipped with a motorized damper interlocked to a wall mounted thermostat in the room. Air supply comes from the indoor parking ambient space and is exhausted to this same place.

Filters and grids inspected on site are very dirty. Filters need to be replaced and grilles to be cleaned.

Motorized dampers' actuators are in good condition but old.

Even if functional, exhaust fan is dirty and obsolete. It needs to be replaced.

We noticed that there are no fire dampers on the ventilation ducts (supply and return). Fire dampers need to be installed to comply with code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

Room is equipped with drainage restraint pit.

**Electricity (elevator mechanical room)**

Ventilation system starter is old and we noticed some burned cables.

**Structure**

Not applicable.

**Architecture**

The cab floor is covered with worn carpet, the walls are covered with a dusty, dark non-reflective bouclé material and the ceiling is white laminate covered by a Paraline suspended mirror ceiling. The cab doors are of polished coloured stainless steel whose finish is in good condition. The handrail is made of stained wood.

The walls of the machine room and elevator shaft are made of 200 mm concrete blocks and form fire-stop separations. However, we have no information about the type of block and its permeability and are therefore unable to determine its degree of fire resistance. Exploratory openings at a subsequent stage would allow confirmation of the degree of fire resistance.

**2.2.9 Passenger Elevators Nos. 9 to 13, West Tower**

This elevator group provides service from Level 01 to Level 10. Their machine room is located on the mezzanine of the West Tower (12<sup>th</sup> floor).

Subject to the recommended corrective work, Elevator No. 9 could be considered an optional firefighters' elevator.

**Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hoist machines (traction)**, remaining useful life expectancy of about 20 to 25 years  
Existing hoist machines are gearless traction type with DC motor. The machine is a good quality equipment and in good condition. Hoist cables are currently compliant and are covered by the maintenance contract.

**Control system**, remaining useful life expectancy of about 2 to 5 years  
The existing control system is base on Dover 1st generation Solid State and DC motor-generator. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate

quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed. The carpet covering walls do not comply with current code.

#### **Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

#### **Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

#### **Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

#### **Hall entrances**

The hall entrances are ULC approved.

#### **Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hoist machine (traction)**

The machines have auxiliary emergency brakes and protection guards around the rotating parts.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is a safety edge with two light rays type. This system does not comply with the CSA B651-F04 norm.

**CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

**Elevator consultant, access control**

Access control is provided with card readers installed in the turnstiles giving access to elevator lobby on level 01.

**Mechanical (elevator mechanical room)**

The room is ventilated (recirculated air) and cooled by a *McQuay* water cooled unit interlocked with a temperature sensor located in the elevator mechanical room. This unit is in good condition.

- AC-X System
- Model unit : W-LMS-1-215-L-Z-00-U-06-AF-13-Z-Z-B-1
- Serial number : 107233600

We noticed that there are fire dampers on the ventilation ducts (supply and return) as required by code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

There is no floor drain or funnel drain but room is equipped with floor grates.

**Electricity (elevator mechanical room)**

All disconnect switches will have to be identified correctly with their feed points.

Since a high number of smoke detectors are installed our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

**Structure**

Not applicable.

**Architecture**

The cabin floors are covered with worn carpet, the walls are covered with a very dark, dusty, non-reflective bouclé material and the ceiling is white laminate covered by a Paraline-type suspended mirror ceiling. The cabin doors are polished coloured stainless steel whose finish is in good condition. The handrail is made of stained wood.

The shaft of Elevator No. 9 is made of 200 mm concrete and forms a 2-hour compliant fire-stop separation. The walls of the machine room and the shaft of Elevators Nos. 10 to 13 are made of 200 mm concrete blocks and form fire-stop separations. However, we have no information about the type of block and its permeability and cannot determine its degree of fire resistance. Explanatory openings at a later stage would make it possible to confirm the degree of fire resistance.

**2.2.10 Passenger Elevators Nos. 14 to 19, East Tower**

This elevator group provides service from Level 01 to Level 12. Their machine room is located on the mezzanine of the East Tower (14<sup>th</sup> floor).

Subject to recommended corrective work, Elevators Nos. 14 and 19 could be considered optional firefighters' elevators.

**Elevator consultant, equipment condition - Obsolescence**

No major upgrade has been performed since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be improved. With the exception of machines, they have indeed reached their normal useful life expectancy.

**Hoist machines (traction)**, remaining useful life expectancy of about 20 to 25 years  
Existing hoist machines are gearless traction type with DC motor. The machine is a good quality equipment and in good condition. Hoist cables are currently compliant and are covered by the maintenance contract.

**Control system**, remaining useful life expectancy of about 2 to 5 years

The existing control system is based on Dover 1st generation Solid State and DC motor-generator. It is an old generation from the 1980s. Components and spare parts are increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment are also rare.

The controllers are in acceptable condition but are outdated and have reached their useful life expectancy of about 25 years. It is also important to note that they could deteriorate quickly and cause many failures because spare parts are increasingly difficult to obtain for this type of controller.

To maintain a good quality of service and minimize downtime and service calls, it will be necessary to modernize the controllers. The equipment is at the end of its normal useful life, replacement parts will be increasingly difficult to obtain for this type of controller, increasing the risk of long breakdowns. Qualified service personnel on this type of equipment will be increasingly rare. It will also be difficult to obtain competitive prices for maintenance.

**Door equipments**, remaining useful life expectancy of about 2 to 5 years

Door equipments, Dover brand, are obsolete but still functional and have reached their useful life expectancy.

**Fixture**, remaining useful life expectancy of about 2 to 5 years

Hall and car fixture, Dover brand, is outdated but functional. Fixture should be replaced when modernizing to ensure compliance with the current Code.

**Cab interiors**, remaining useful life expectancy of about 2 to 5 years

Cab interiors need to be refreshed and renewed. The carpet covering walls do not comply with current code.

#### **Performance levels**

The current performance levels of the existing elevator system are less and less acceptable.

#### **Elevator consultant, conformity**

During our inspection of the equipment, we verified the compliance of the elevators according to the various codes in force. We find that the elevators such as they are now meet the requirements of building codes and elevator in force at the time of installation. However, they do not conform to the latest building and elevator codes (CNBC2010 and ASME A17.1-2010/CSA B44-10).

#### **Fire recall**

Firefighters' Emergency Operation (Phase I Emergency Recall Operation and Phase II Emergency In-Car Operation) are present. They comply with elevator code ASME A17.1/CSA B44-85. However, the operation shall meet the new requirements of the ASME A17.1-2010/CSA B44-10 code when upgrading.

#### **Hall entrances**

The hall entrances are ULC approved.

**Stop button in cab**

There is a stop button in the cab. This button shall be replaced by a key switch to meet the new requirements of the ASME A17.1-2010/CSA B44-10 code during modernization.

**Communication system**

There is a hands-free intercom type communication system in the cab. The system complies with the code but the height of the activating button does not comply with the new requirements of the ASME A17.1-2010/CSA B44-10 code.

**Inspection unit**

The inspection units on the car top meet current code. They have a common button.

**Hoist machine (traction)**

The machines have auxiliary emergency brakes and protection guards around the rotating parts.

**Floor levelling**

The accuracy of levelling of the car to the hall floor is acceptable. The current code requires a precision of 1/2".

**Door protection**

The existing door protection system is a safety edge with two light rays type. This system does not comply with the CSA B651-F04 norm.

**CSA B651-F04 Norm**

We noted that certain items should be modified in order to meet the requirements for persons with physical disabilities (Appendix E of the ASME A17.1-2010/CSA B44-10 code) and the CSA B651-F04 norm. The following items should be added: car door reopening device, voice synthesizers, gongs sound, braille inscription, button height and other. The full requirements of the code shall be integrated in the specifications during modernization.

**Elevator consultant, access control**

Access control is provided with card readers installed in the turnstiles giving access to elevator lobby on level 01.

**Mechanical (elevator mechanical room)**

The room is ventilated (recirculated air) and cooled by a *McQuay* water cooled unit interlocked with a temperature sensor located in the elevator mechanical room. This unit is in good condition. Air supply is provided through four wall grilles and air return is done by three floor grilles:

- 01-1/HE-13 System
- Model unit : W-LMS-1-215-L-Z-00-U-06-AF-13-Z-Z-B-1
- Serial number : 107213200

We noticed that there are fire dampers on the ventilation ducts (supply and return) as required by code.

Room is protected with an automatic water-type fire sprinkler system and thus is standard-compliant. On the other hand, sprinkler heads are not protected which is strongly recommended. Type 10-A: 120-B: C, 9.07 Kg (20 lbs) portable fire extinguisher is installed.

There is no floor drain or funnel drain but room is equipped with floor grids.

**Electricity (elevator mechanical room)**

All disconnect switches will have to be identified correctly with their feed points.

Since a high number of smoke detectors are installed our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

**Structure**

Not applicable.

**Architecture**

The cabin floors are covered by a worn carpet, the walls are covered with a very dark, dusty, non-reflective bouclé material and the wall is white laminate covered by a Paraline-type suspended metal ceiling. The cabin doors are of polished coloured stainless steel whose finish is in good condition. The handrail is made of stained wood.

The shafts of Elevators Nos. 14 and 19 are made of 200 mm concrete which offers a compliant 2-hour fire separation. The walls of the machine room and elevator shafts Nos. 15 to 18 are made of 200 mm concrete blocks and form fire-stop separations. However, we have no information about the type of block and its permeability, and we are not able to determine their degree of fire resistance. Exploratory openings at a subsequent stage would allow confirming the degree of fire resistance.

**2.2.11 Keys console and computer console**

**Elevator consultant**

No changes have been made since the original installation by the company Dover. Our site surveys demonstrate that the equipment, although still operational, must be upgraded to meet the new requirements of ASME A17.1-2010/CSA B44-10 code.

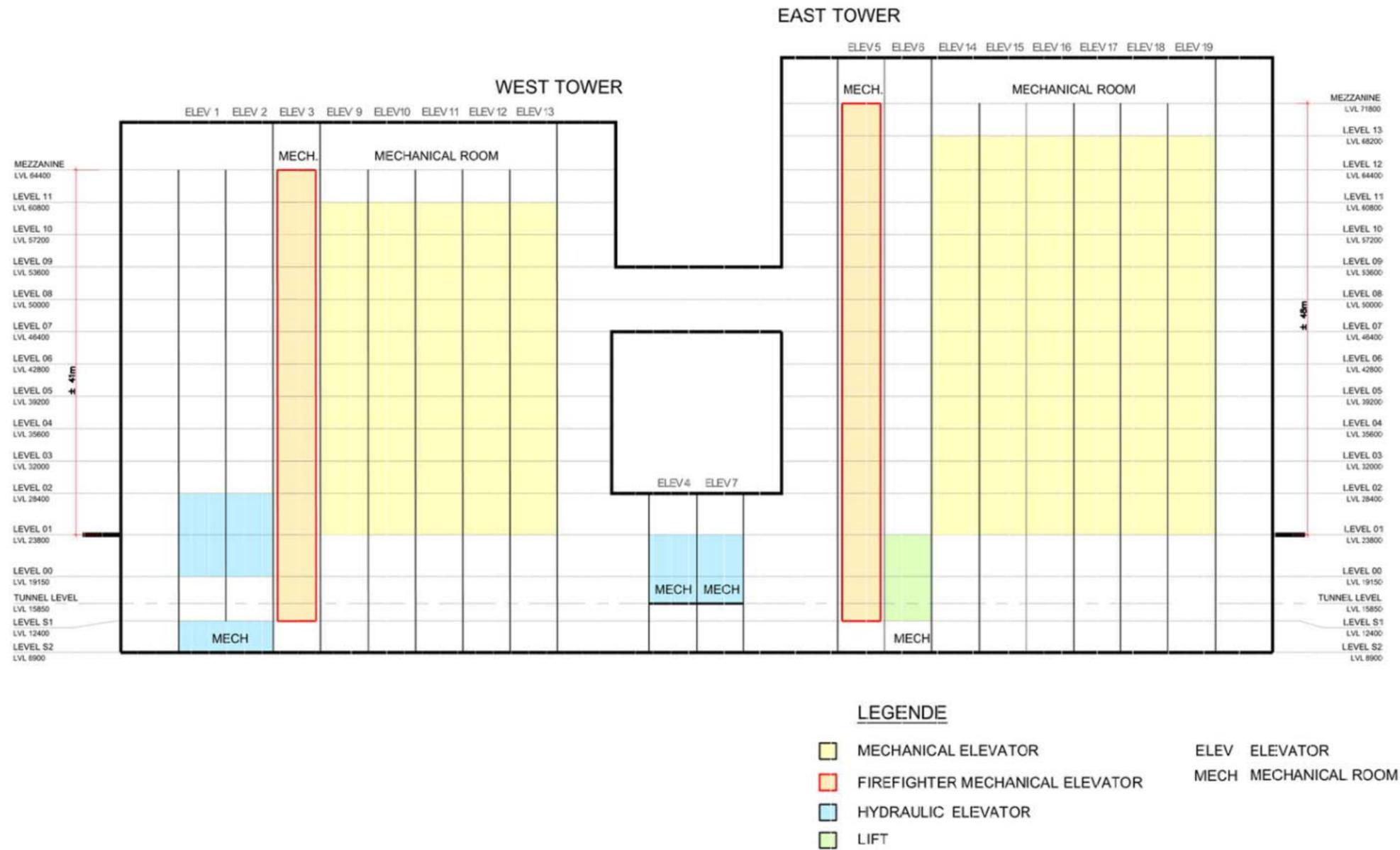
3



3.0 DRAWINGS OF EXISTING FACILITIES

3.1 Schematic cross section elevators

Notice : Elevator n°8 does not exist.

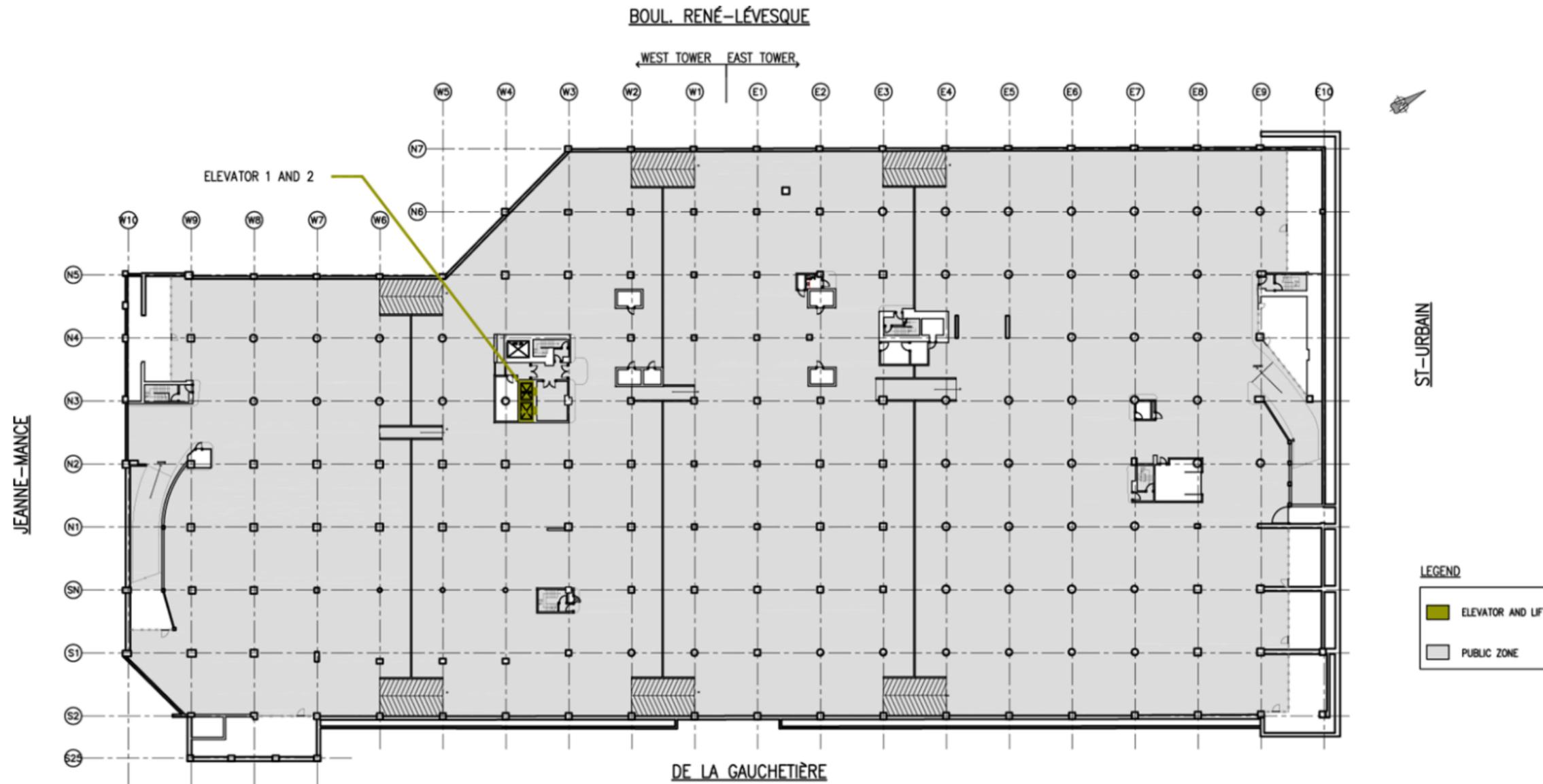




### 3.2 General layouts

Below, plan of **Level S2 (Public parking)** showing the elevators.

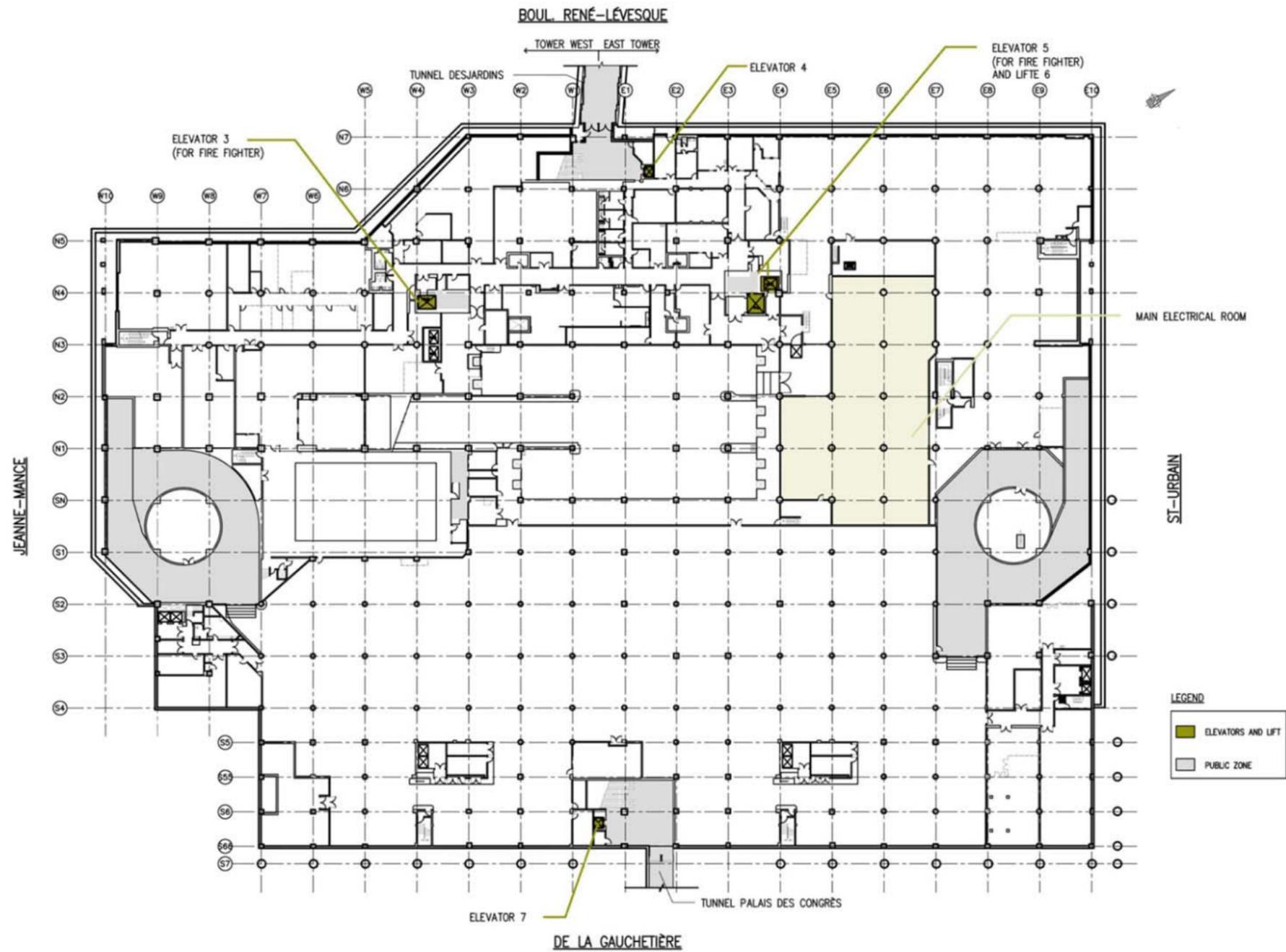
Notice : Elevator n°8 does not exist.





Below, plan of Level S1 (Habitations Centre-ville apartments parking and technical space ) showing the elevators.

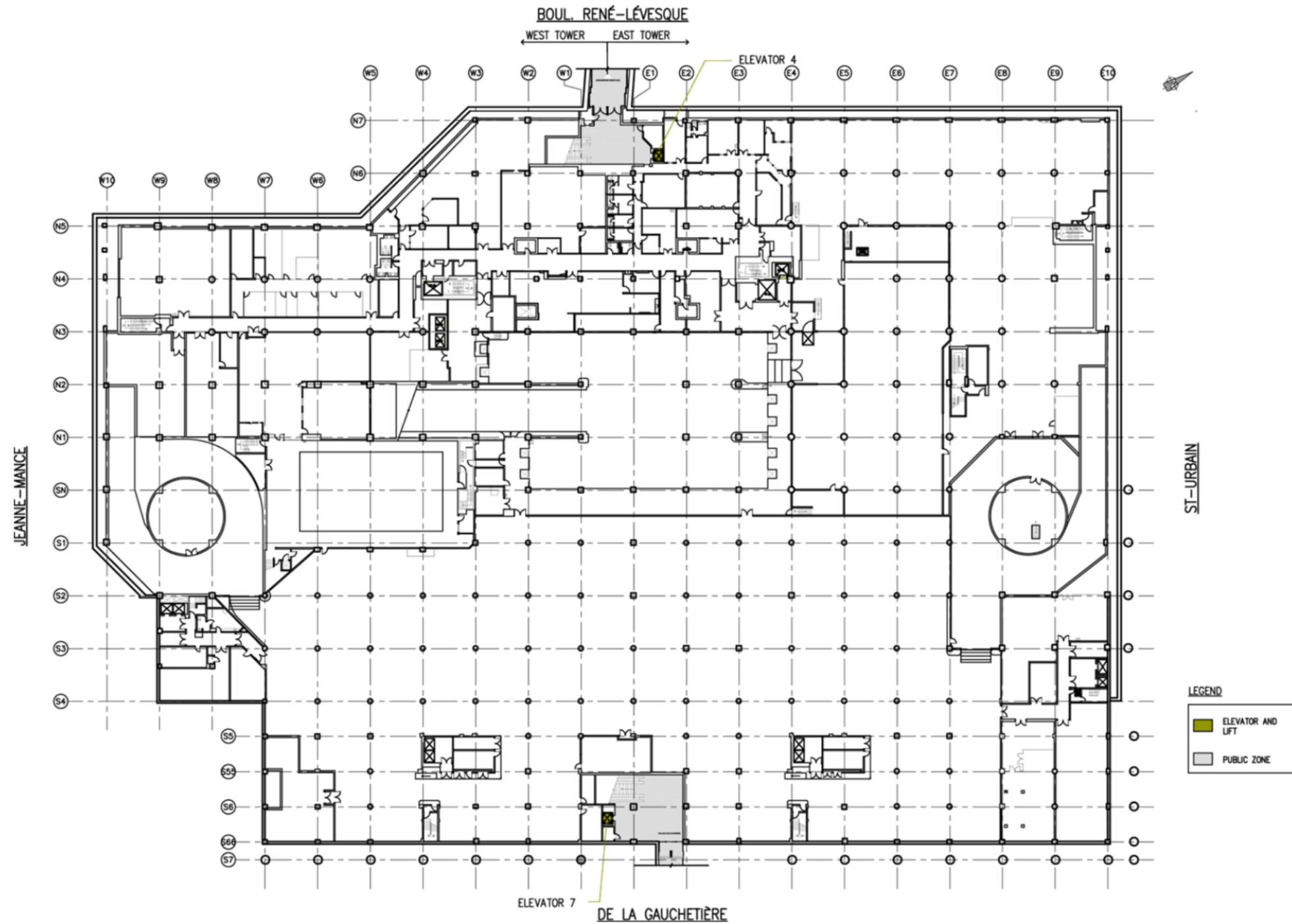
Notice : Elevator n°8 does not exist.





Below, plan of Tunnels Level (Desjardins and Palais des Congrès) showing the elevators.

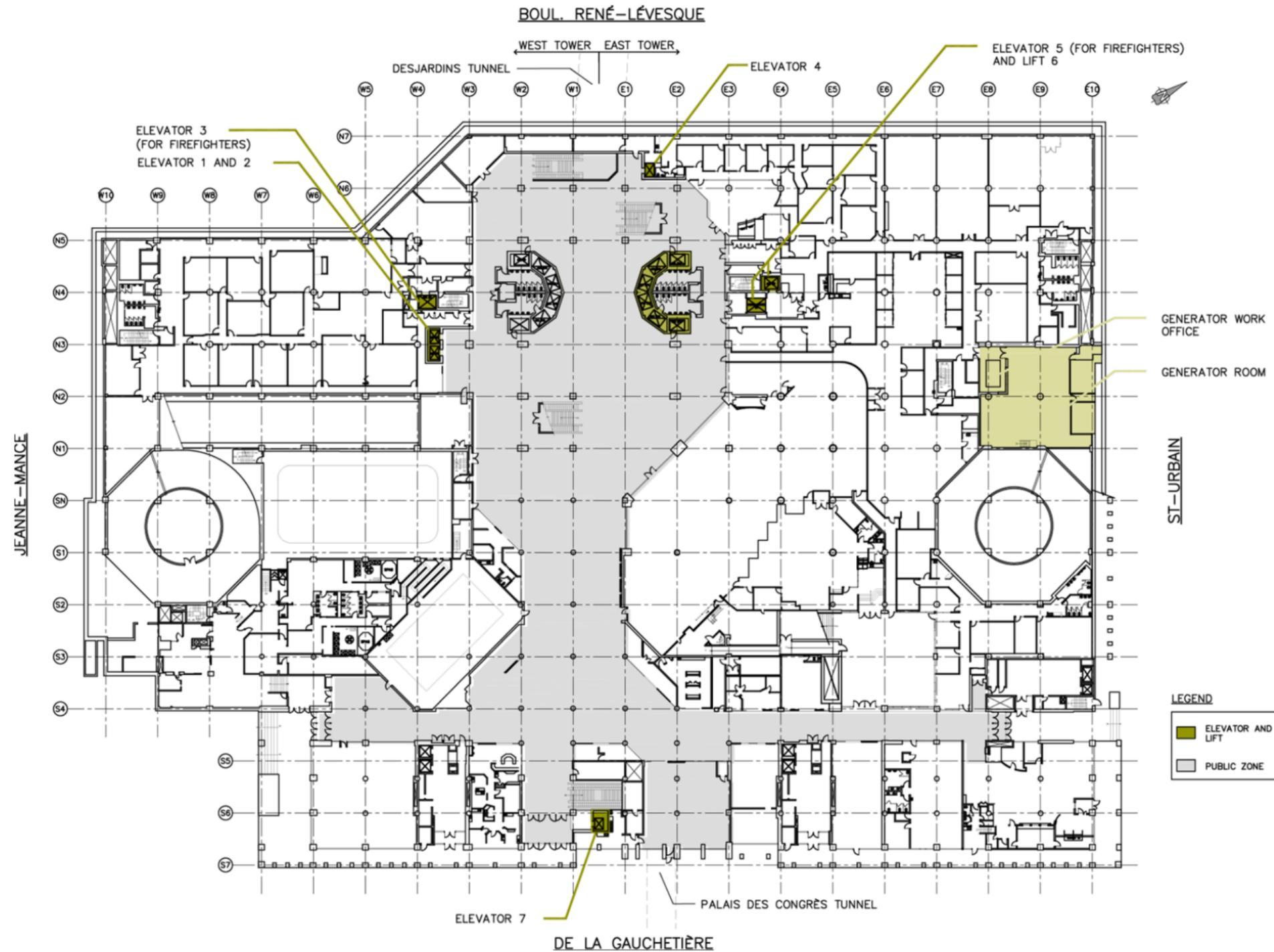
Notice : Elevator n°8 does not exist.





Below, plan of **Level 00 (Basilaire)** showing the elevators.

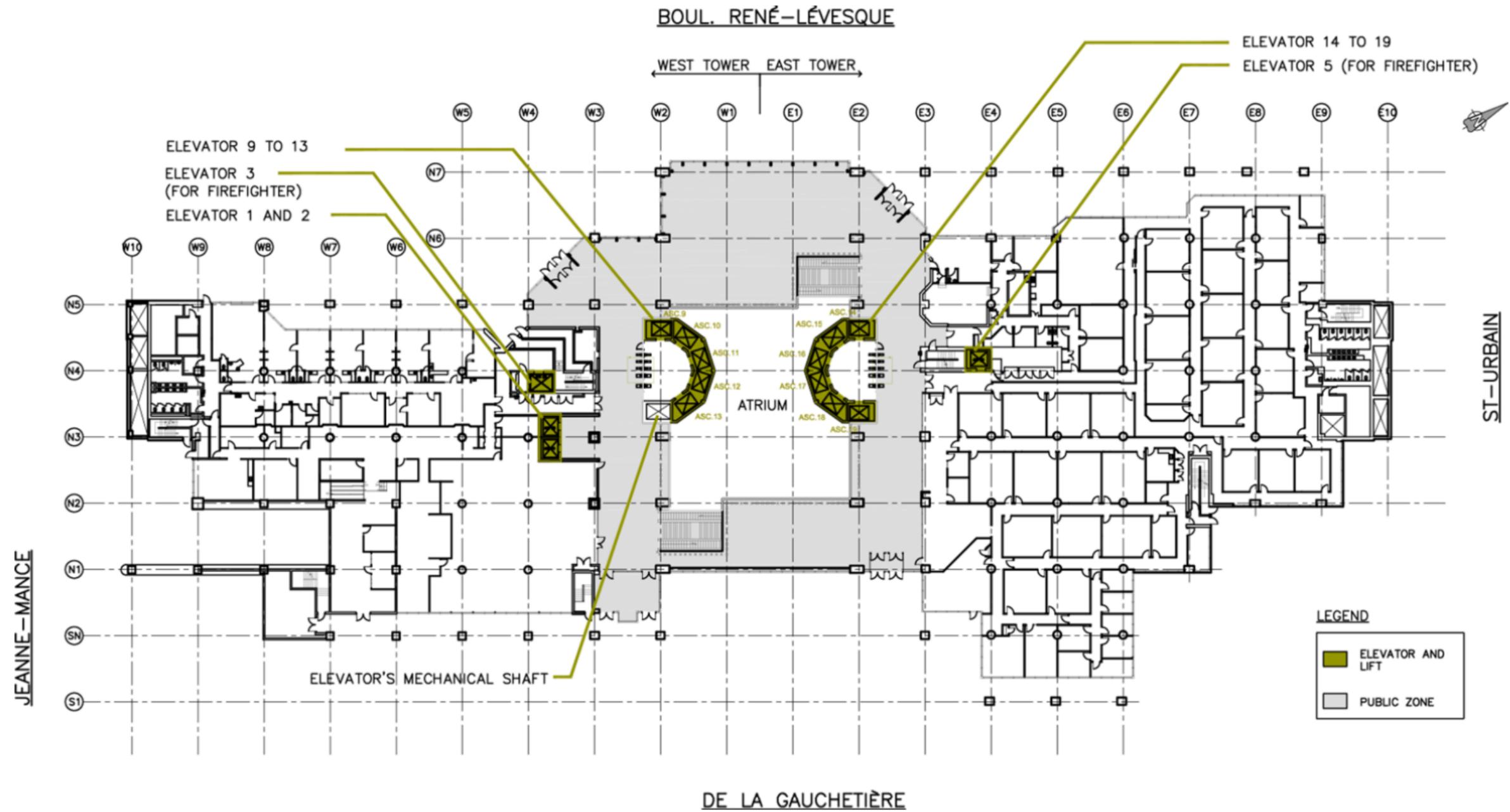
Notice : Elevator n°8 does not exist.





Below, plan of **Level 01 (Main floor)** showing the elevators.

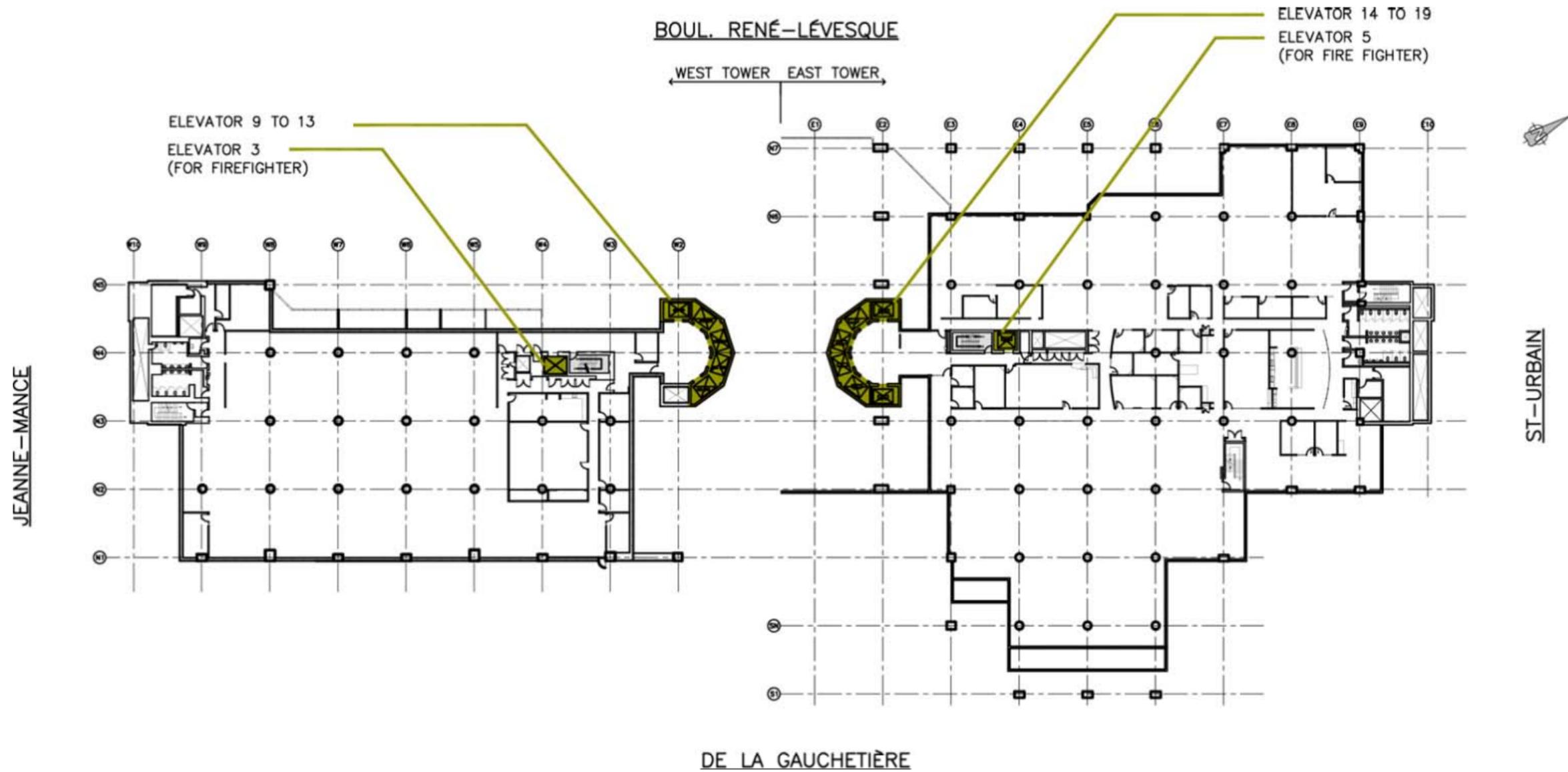
Notice : Elevator n°8 does not exist.





Below, plan of **Typical Level** showing the elevators.

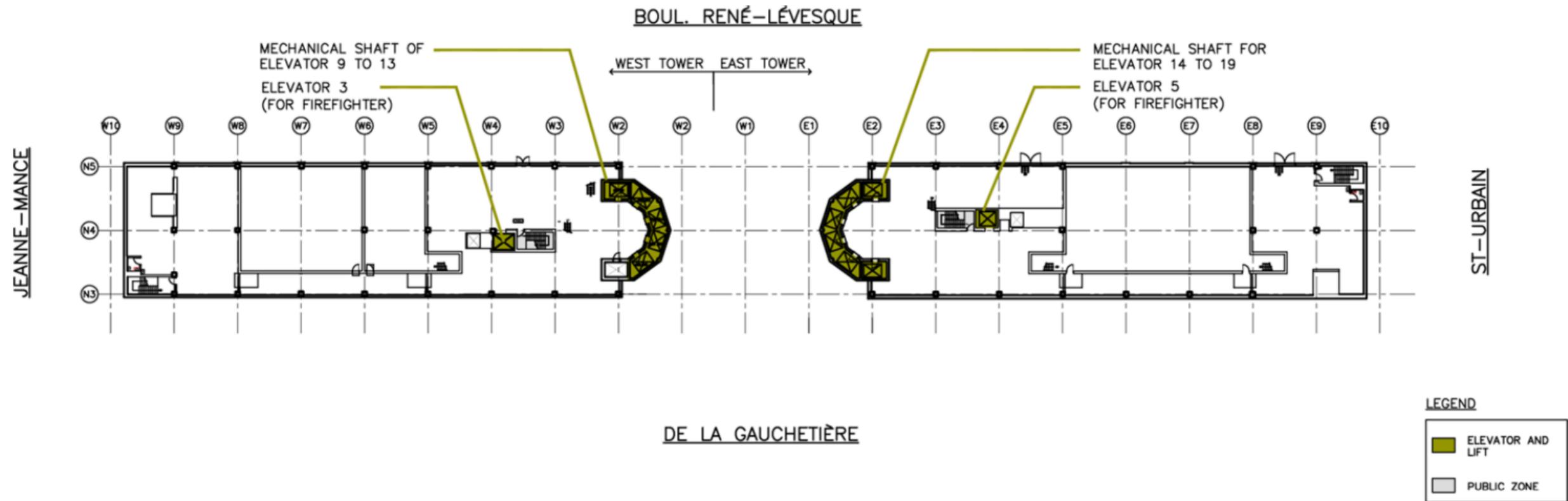
Notice : Elevator n°8 does not exist.





Below, plan of **Mechanical Level of Towers East and West** showing the elevators.

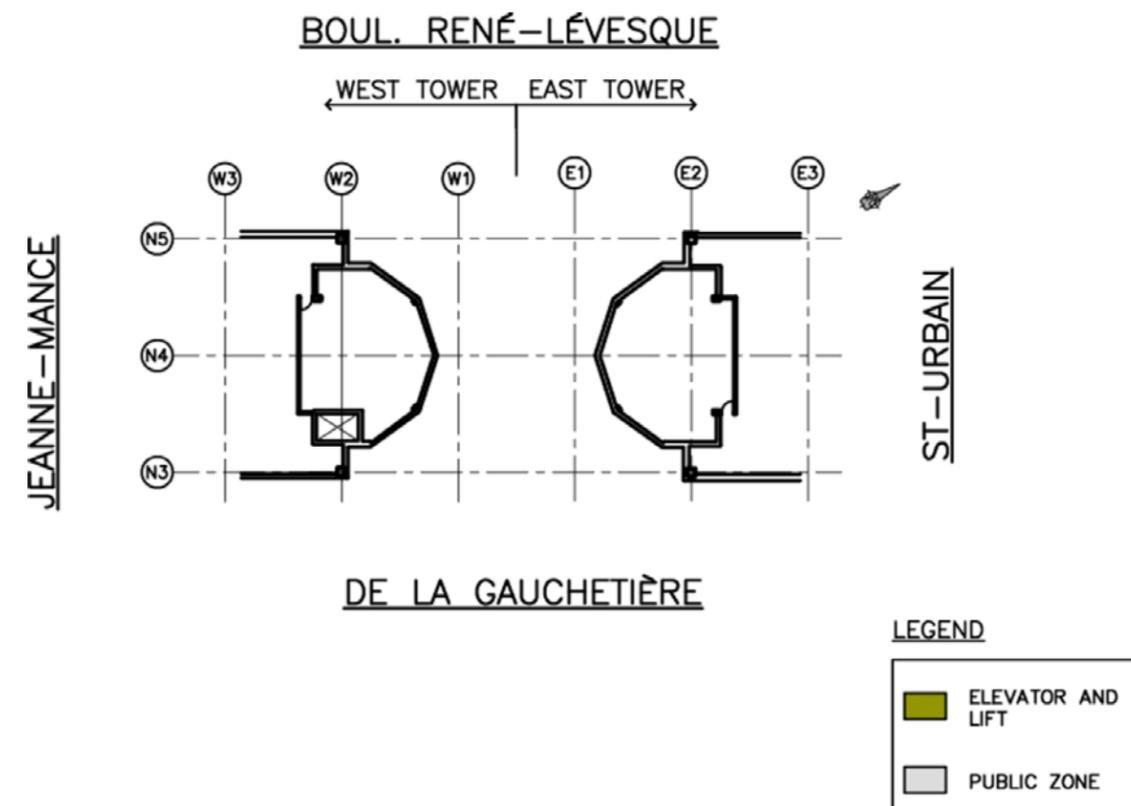
Notice : Elevators n°8 does not exist.





Below, plan of **Mechanical Room** of the elevators at **Mezzanine Level** of Towers Est and West.

Notice : Elevator n°8 does not exist.





4



#### 4. MODERNIZATION WORKS

##### Elevator consultant

	Elevators n° 1 & n° 2	Elevator n° 3 (firefighter)	Elevator n° 4	Elevator n° 5 (firefighter)	Freight n° 6	Elevator n° 7	Elevators n° 9 to n° 13	Elevators n° 14 to n° 19
<b>Machines (traction)</b>			N/A		N/A	N/A		
Hoist machine	Refurbish	Refurbish	N/A	Refurbish	N/A	N/A	Refurbish	Refurbish
Hoist ropes	Keep	Keep	N/A	Keep	N/A	N/A	Keep	Keep
Speed governer	New	New	N/A	New	N/A	N/A	New	New
Auxiliary emergency brake	Keep	Keep	N/A	Keep	N/A	N/A	Keep	Keep
<b>Machines (hydraulic)</b>	N/A	N/A	New elevator	N/A	Refurbish	Refurbish	N/A	N/A
<b>Hydraulic cylinder</b>	N/A	N/A	New elevator	N/A	New	New	N/A	N/A
<b>Hydraulic cylinder – Related works</b>	N/A	N/A	Pumping	N/A	Pumping	Pumping	N/A	N/A
<b>Control system</b>								
Controller	New	New	New elevator	New	New	New	New	New
Hoistway & travelling cable	New	New	New elevator	New	New	New	New	New
Hoistway switches	New	New	New elevator	New	New	New	New	New
Positioning device	New	New	New elevator	New	New	New	New	New
Car top control	New	New	New elevator	New	New	New	New	New
<b>Additional wirings</b>								
Card reader	Required	Required	Required	Required	Required	Required	Required	Required
Coaxial Cable	Required	Required	Required	Required	Required	Required	Required	Required
Optical fiber	Required	Required	Required	Required	Required	Required	Required	Required
<b>Access control</b>	Required	Required	Required	Required	Required	Required	Required	Required
<b>Door equipments - Car</b>					N/A			
Operator	New	New	New elevator	New	N/A	New	New	New
Clutch	New	New	New elevator	New	N/A	New	New	New
Interlock	New	New	New elevator	New	N/A	New	New	New
Roller track	New	New	New elevator	New	N/A	New	New	New
Suspension rollers	New	New	New elevator	New	N/A	New	New	New
<b>Door equipments - Hall</b>					N/A			
Roller track	clean	clean	New elevator	clean	N/A	clean	clean	clean
Suspension rollers	New	New	New elevator	New	N/A	New	New	New
Interlock	New	New	New elevator	New	N/A	New	New	New
Closing mechanisms hardware	New	New	New elevator	New	N/A	New	New	New
	Refurbish	Refurbish	New elevator	Refurbish	N/A	Refurbish	Refurbish	Refurbish
<b>Door equipments – Freight</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operator	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Door motors	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mechanisms & contacts	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Fixture</b>								
Car operation control	New	New	New elevator	New	New	New	New	New
Hall stations	New	New	New elevator	New	New	New	New	New
<b>Cab</b>								
Cab interiors	New (seer arch.)	New (seer arch.)	New elevator	New (seer arch.)	New (seer arch.)	New (seer arch.)	New (seer arch.)	New (seer arch.)
Door protection device	New	New	New elevator	New	New	New	New	New
Car top guardrail	New	New	New elevator	New	New	New	New	New
<b>Firefighters' elevator – 2h fire rated power cables</b>	N/A	To be corrected (see Mec & Elec)	N/A	To be corrected (see Mec & Elec)	N/A	N/A	N/A	N/A



Mechanical and electrical

	Elevators n°1 & n°2	Elevator n°3 (firefighter)	Elevator n°4	Elevator n°5 (firefighter)	Freight elevator n°6	Elevator n°7	Elevators n°9 to n°13	Elevators n°14 to n°19
Elevator (fire-alarm) –2 hours fire resistant	N/A	To correct	N/A	To correct	N/A	N/A	Action item	Action item
Elevators on emergency power	Connected	Connected	Connected	Connected	Connected	Connected	Connected	Connected
New power supply and disconnect switches	N/A	N/A	Action item	N/A	N/A	N/A	N/A	N/A
Smoke detectors in elevator shaft	To keep	To keep	To keep	To keep	To keep	To keep	To keep	To keep
Pre-signal on normal power recovery	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Generator signals	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Fire alarm signals	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Grounding 600V	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
120 V GFI (elevator mechanical room)	To replace	To replace	To replace	To replace	To replace	To replace	To replace	To replace
120 V GFI (pit)	To replace	To replace	To replace	To replace	To replace	To replace	To replace	To replace
120V COS emergency for consoles	Action item	Action item	Action item	Action item	Action item	Action item	Action item	Action item
Lighting (elevator mechanical room)	To keep	To keep	To keep	To keep	To keep	To keep	To keep	To keep
Ventilation (elevator mechanical room)	To replace	To keep	To keep	To keep	To replace	To replace	To keep	To keep
Filters	To replace	N/A	To keep	N/A	To replace	To replace	N/A	N/A
Fire dampers	N/A	N/A	N/A	Action item	N/A	Action item	N/A	N/A
Wall grilles	N/A	To clean	N/A	To clean	To clean	To clean	N/A	N/A
Drainage (elevator mechanical room)	Case to add	N/A	N/A	N/A	Keep funnel drain	Keep drainage pit	Keep floor grids	Keep floor grids
Drainage (elevator shaft)	N/A	Action item	N/A	Action item	Action item	N/A	N/A	N/A
Sprinklers (according to N.B.C)	To keep	To keep	To keep	To keep	To keep	To keep	To keep	To keep
Portable extinguisher	To keep	To keep	To keep	To keep	To keep	To keep	To keep	To keep

Structure

	Elevators n°18 and n°2	Elevator n°3 (firefighter)	Elevator n°4 (expansion)	Elevator n°5 (firefighter)	Freight elevator n°6	Elevator n°7	Elevators n°9 to n°13	Elevators n°14 to n°19
Structural Work	N/A	Not recommended	Reinforcement of the slab at level 14200 with the help of steel beams. New walls around the perimeter of the new opening. Demolition of a portion of the slabs located at the tunnel level and level 19070. Reinforcement of the slab at level 19070 with the help of steel beams.	N/A	N/A	N/A	N/A	N/A

Architecture

	Elevators No. 1 & No. 2	Elevator No. 3 (firefighter)	Elevator No. 4	Elevator No. 5 (firefighter)	Freight elevator No. 6	Elevator No. 7	Elevators No. 9 to No. 13	Elevators No. 14 to No. 19
Floor finishes	Replace	Replace	Replace	Replace	Keep	Replace	Replace	Replace
Wall finishes	Replace	Replace	Replace	Replace	Keep	Replace	Replace	Replace
Ceiling finishes	Replace	Replace	Replace	Replace	Keep	Replace	Replace	Replace
Cab door finishes	Replace	Replace	Replace	Replace	Keep	Replace	Replace	Replace
Handrail	Replace	Replace	Replace	Replace	Keep	Replace	Replace	Replace
Machine room, fire separation integrity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Basement airlock	Level S1 airlock, modify hardware.	Replace doors and frame and hardware	N/A	N/A	N/A	N/A	N/A	N/A

Note: Elevators Nos. 3 and 5 are firefighters' elevators compliant with current code requirements. Elevators Nos. 9, 14 and 19 could be firefighters' elevators as an option.



## 4.1 General Remarks

Over time elevators will require modernization as certain components become unavailable due to obsolescence. Additionally, service personnel capable of performing the many adjustments necessary to keep the elevator equipment operating properly will become increasingly difficult to find as newer designs become more predominant. Thus, in order to remain competitive with similar buildings and ensure that reliable elevator service is provided over long term, modernization of the elevators will likely be required in short term (2 to 5 years). Parts may still be available from the manufacturer but expertise in troubleshooting may eventually become scarce.

The scope of work of a global modernization should include the replacement of the controller, door equipments, fixture, the machine if necessary, cab interiors and the barrier free requirements. This work will provide a useful life expectancy of about 25 years for the vertical transport system.

The option to perform a global modernization of the equipments would improve performance and make the equipment more reliable and increase in-car comfort. We describe the work that we recommend in the following sections of this document.

We describe in this section the recommended work related to code requirements, those related to equipments obsolescence and to improve the performance levels of equipments (leveling, waiting time and passenger comfort), all following our analysis of the condition and the type of equipment. The works described in this section are based on the assumption that the preventive and corrective maintenance is performed according to the standards in force and the rules of the art.

As required by the Construction Code of Quebec, plans and specifications shall be sealed and signed by the professional architect and an engineer member of a professional order. Shop drawings shall be sealed and signed by an engineer member of the Ordre des Ingénieurs du Québec (OIQ).

The controllers shall be generic microprocessor type. The controller manufacturer shall provide the software, spare parts and all the necessary devices for preventive and corrective maintenance by other elevator contractors without restriction. No special tools or proprietary to the contractor who installed the controller devices shall be required to perform maintenance, adjustments, reprogramming or repairs. The controller manufacturer shall provide a copy of the software and any information necessary for the maintenance and adjustment of elevators so that maintenance can be carried out by companies other than the installer.

## 4.2 Passenger Elevators Nos. 1 and 2

The two passenger elevators provide service from Level S2 to Level 01, without stopping at Level S1. Their machine room is located at Level S2.

### Elevator consultant

#### Hoist machine (traction)

The machine can be kept and refurbished by reconditioning the rotating parts, replacement of seals and motor brushes as well as various other alignment works and others refurbished (pulleys). Work to refurbish the DC motor must be made by a specialist workshop certified ISO 9001-2000. Deflection pulleys will also be refurbished.

We also recommend the replacement of speed governor. The safety system under the car and auxiliary emergency brake can be cleaned and kept.

#### Control system

We recommend replacing the existing control system with a new microprocessors type system and DC SCR Drive. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured. A card reader interface shall be provided.

New elevator positioning devices coupled with a tachometer mounted on the motor shaft shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device. The traveling cable shall be designed for the installation of a card reader and a camera in the cab.

#### Additional wirings

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

#### Access Control

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

### Door equipments

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.
- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

### Fixture

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

### Cab

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

### Mechanical (elevator mechanical room)

Replace filters (air supply and return).

Replace exhaust fan.

Add a drainage pan under the drainage piping coming from the floor above.

### Sprinkler system

No actions needed.

### Electricity (elevator mechanical room)

Replace with new starter.

Replace lighting fixtures.

Redo complete grounding.

Replace 120 volts duplex electrical outlets installed on the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed on elevator's pit wall with GFI 120 volts duplex outlets.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±110m (350') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±145m (475') run between mechanical and transfer switch room.

**Structure**

Not applicable .

**Architecture**

We recommend renewing the interiors of the cab: floor, walls, ceilings and handrail, to meet flame and smoke release requirements and refresh the worn finishes. At Level S1, the doors and frames of the airlock and the hardware must be replaced to allow the doors to engage.

**4.3 Service Elevator No. 3 – Firefighters' elevator**

This service (fire) elevator provides service from Level S1 to Level 11. Its machine room is located on the mezzanine Level of the West Tower (12<sup>th</sup> floor).

**Elevator consultant**

**Hoist machine (traction)**

The machine can be kept and refurbish by reconditioning the rotating parts, replacement of seals and motor brushes as well as various other alignment works and others refurbished (pulleys). Work to refurbish the DC motor must be made by a specialist workshop certified ISO 9001-2000. Deflection pulleys will also be refurbished.

We also recommend the replacement of speed governor. The safety system under the car and auxiliary emergency brake can be cleaned and kept.

**Control system**

We recommend replacing the existing control system with a new microprocessors type system and DC SCR Drive. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured. A card reader interface shall be provided.

New elevator positioning devices coupled with a tachometer mounted on the motor shaft shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device. The traveling cable shall be designed for the installation of a card reader and a camera in the cab.

#### **Additional wirings**

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

#### **Access Control**

We recommend that the control system by provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

#### **Door equipments**

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.
- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

#### **Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

**Cab**

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

**Mechanical (elevator mechanical room)**

Clean wall grilles.

Provide a drainage system in elevator pit.

**Fire Alarm**

No actions needed.

**Electricity (elevator mechanical room)**

Redo complete grounding.

Replace 120 volts duplex electrical outlets installed on the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed on elevator’s pit wall with GFI 120 volts duplex outlets.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the “Centre des opérations de sécurité” (COS). This ±170m (550’) run is intended for the connection of access control.

Build a new 2 hours fire resistant electricity supply for the elevator #3 which is reserved for the firefighters use. Provide a ±167.5m (550’) conduit run to PUPD-1-S1-5 located at level S1 in the main electrical room.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±170m (550’) run between mechanical and transfer switch room.

**Structure**

Not applicable.

**Architecture**

We recommend renewing the cab interior: floor, walls, ceilings and handrail, to satisfy flame and smoke release requirements and refresh the cab.

Replacement of the doors and frame and hardware of the airlock at Level S1 is required (new doors and frame with 1½ hour flame-protection).

For electricity, it is recommended that a new electric power supply be provided with a 2-hour fire resistance. If such work is not approved, it would be alternatively to protect sections of unprotected electrical conduits with a gypsum wallboard installation. This work is shown as optional in the estimate.

#### 4.4 Passenger Elevator No. 4

This small elevator provides service from the Desjardins tunnel Level to Level 00 (Basilaire). Its machine room is located at the tunnel Level, adjacent to the elevator.

##### Elevator consultant

The option to enlarge the elevator having been chosen, we describe in the following table the main physical characteristics of the elevator that we recommend for the project. This option will allow barrier free transport of disabled persons between the Complexe Desjardins tunnel giving access to metro and level 00, without impeding the traffic in front of the escalators. The new cab will also allow transport of a stretcher.

Identification	4
Quantity	1
Cab type	Passenger
Operation mode	Simplex
Catégorie de chargement	A
Drive type	Hydraulic with lateral cylinder in the hoistway
Pump unit type	Dry Unit
Rated Speed.	0,5 m/s
Capacity	1361 kg
Stops - FRONT	Tunnel Desjardins, 00
Door type	Side opening One-Speed
Door dimensions (width x height)	1067 mm x 2134 mm
Cab dimensions (width x depth)	2032 mm x 1448 mm
Hoistway dimensions (width x depth)	2540 mm x 1905 mm
Cab Height	2440 mm
Pit Depth	1524 mm
Overhead	3810 mm

##### Existing elevator - dismantling

We recommend the complete dismantling of all existing equipment.

Machine Room: Dismantle the hydraulic machine, hydraulic piping, the controller cabinet, wiring and any other equipment present in the machine room. Dispose of existing hydraulic oil present in the system as required by environmental laws of the Province of Quebec.

Hoistway: Dismantle the cab, the platform and the car frame. Dismantle hoistway switches, travelling and fixed cable. Dismantle the hall entrances, landing door equipments, door

panels and sills. Dismantle the fixture (call station and indicator, etc.). Dismantle the rails (rail and brackets) and cut them in sections to remove them from the hoistway by existing entrances. Dismantle all other equipment in the hoistway.

**Pit:** Dismantle buffers, dismantle the cylinder, piston and cement base. If necessary, use water or other technique to release the cylinder if the sand is at the bottom. Dismantle the oil line. Pump all the oil in the and in oil line before carrying out the removal of the cylinder. Dispose of hydraulic oil present in existing system as required by environmental laws of the Province of Quebec. Dismantle all other equipment in the pit.

#### **Installation work of new elevator**

The new elevator shall conform to ASME A17.1-2010/CSA B44-10 code.

**Machine room:** Install a new machine and new oil, a new controller, new mobile and fixed wiring, new electric duct etc.

**Hoistway:** Install new rails (brackets and rail), new hall entrances (frame, door panel, sill, patching and new finishes around hall entrances), new hall door equipment (track, suspension rollers, interlocks, etc.), new car door equipment, a new platform and a new car frame, a new cab (enclosure, door, cab interiors, floor, ceiling), new control panels, new hall stations, a new guardrail on the car roof.

**Pit:** Install new buffers, new above ground cylinders, and a new oil line.

#### **Hoist machines (hydraulic)**

We recommend the installation of a new machine, heavy duty type with a pump unit outside the tank. Use as hydraulic fluid, oil, non-recycled whose flash point of at least 190 °C of a type known in the industry. We recommend the installation of above ground side cylinders to avoid a new drilling.

#### **Control system**

We recommend the installation of a new control system, microprocessor type, with a soft start system. The new control systems must conform to ASME A17.1-2010/CSA B44-10 code.

We recommend installing new traveling cable and fixed hoistway cables, hoistway switches and car top control device.

#### **Additional wirings**

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

### Access Control

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

### Door equipments

We recommend the installation of a door operator, robust type, designed for this building type of traffic and assuring smooth and safe operation and performance of the doors. New hall entrances should be ULC certified with a 1.5 hours fire rating. The frames and door panels shall be in stainless steel No. 4. The hall tracks must be a model easy to replace. The new hall sills shall be extruded aluminium, ASTM B221-76a, 6351-T6 with non-slip wearing surface

### Fixture

We recommend the installation of control panels in the cab (one main and one auxiliary) conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend the installation of new hall call stations and new position indicators on the main level.

All provisions meet the requirements for persons with physical disabilities listed in Appendix E of the ASME A17.1-2010/CSA B44-10 code and CSA B651-F04 norm shall be integrated in the specifications during modernization.

### Cab

We recommend installing a new cab. The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

### Mechanical (elevator mechanical room)

Remove mechanical equipment inside the architectural work zone and relocate according to the new zone arrangement.

Provide ventilation, drainage and controls (elevator mechanical room and elevator shaft) as required with the elevators code and 2010 N.B.C.

### **Sprinkler system**

Remove fire alarm equipment inside the architectural work zone and relocate according to the new zone arrangement.

Do the fire alarm related work as required with the elevators code and 2010 N.B.C.

### **Electricity (elevator mechanical room)**

Provide and install all electrical components required by the elevators code.

Remove electrical equipment related to elevator n°4 modernizations in the mechanical room.

Build a new electricity supply.

Replace disconnect switches in accordance with the elevators new motor capacity.

Replace lighting fixtures.

Separate elevators mechanical room conduits by a gypsum box with an access door.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a new complete grounding.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±46m (150') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±140m (450') run between mechanical and transfer switch room.

### **Structure**

At level S1, the structure is composed of a structural slab on beams at level 14200 on which rests a second structural slab at level 15770 (Desjardins tunnel level). The elevator pit is therefore located in the empty area located between the two structural slabs with a height of approximately 1500 mm.

In order to extend the elevator, parts of the existing walls located around the opening between levels 14200 and 15770 and a portion of the slab at level 15770 will have to be demolished. We would also have to reinforce the slab at level 14200 and build a new

concrete wall between the slab at levels 14200 and 15770. The opening of the elevator located at level 00 will have to be enlarged. In order to do this, we will have to demolish the existing concrete beams and place new steel beams around the new opening (see drawings S01 to S08 at section 5.1 of this document).

It is important to note that the existing concrete walls around the elevator pit are not part of the seismic resistance system of the building. Therefore, no seismic retrofitting will be necessary for the realization of this work.

### Architecture

We recommend enlarging Elevator No. 4 toward the E1 and N7 axes.

The cab dimensions must be sufficient to accommodate a stretcher, as required by the current code, and an enlargement will likewise facilitate access for larger wheelchairs. This option will not disrupt the flow of the escalators toward the Complexe Desjardins tunnel and the Métro. However, this option requires re-engineering the existing elevator machine room and minor adjustments at Level 01. See Design Sketch A12 in section 5.

The PWGSC agreed that it would not be necessary to add a temporary man-lift because this is a secondary access to the building.

## 4.5 Service Elevator No. 5 – Firefighters’ elevator

This service (fire) elevator provides service from Level S1 to Level 13. Its machine room is located on the mezzanine of the East Tower (14<sup>th</sup> floor).

### Elevator consultant

#### Hoist machine (traction)

The machine can be kept and refurbish by reconditioning the rotating parts, replacement of seals and motor brushes as well as various other alignment works and others refurbished (pulleys). Work to refurbish the DC motor must be made by a specialist workshop certified ISO 9001-2000. Deflection pulleys will also be refurbished.

We also recommend the replacement of speed governor. The safety system under the car and auxiliary emergency brake can be cleaned and kept.

#### Control system

We recommend replacing the existing control system with a new microprocessors type system and DC SCR Drive. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured. A card reader interface shall be provided.

New elevator positioning devices coupled with a tachometer mounted on the motor shaft shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables,

hoistway switches and car top control device. The traveling cable shall be designed for the installation of a card reader and a camera in the cab.

#### **Additional wirings**

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

#### **Access Control**

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

#### **Door equipments**

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.
- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

#### **Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

#### **Cab**

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified

depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

**Mechanical (elevator mechanical room)**

Provide fire dampers (air supply and return air).

Replace air supply and return air grilles.

Provide a drainage system for the elevators shaft.

**Sprinkler system**

No actions needed.

**Electricity (elevator mechanical room)**

Since three smoke detectors are installed and code only requires one, our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±110m (350') run is intended for the connection of access control.

Provide a new complete grounding.

Build a new 2 hours fire resistant electricity supply for the elevator #5 which is reserved for the firefighters use. Provide a ±110m (350') conduit run to PUPD-1-S1-5 located at level S1 in the main electrical room.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±140m (450') run between mechanical and transfer switch room.

**Structure**

Not applicable.

## Architecture

We recommend renewing the interior of the cab: floor, walls, ceilings and handrail, to satisfy flame and smoke release requirements and modernize it.

For its electricity, it is recommended that a new electric power supply be provided with a 2-hour fire resistance. If such work is not approved, it would be possible alternatively to protect the unprotected sections of the electrical conduits with a gypsum wallboard installation. This work is shown as optional in the estimate.

### 4.6 Freight Elevator No. 6

This freight elevator provides service from Level S1 to Level 00. Its machine room is located at Level S2.

#### Elevator consultant

##### Hoist machine (hydraulic)

We recommend replacing the hydraulic valve and Vitaulic joints.

##### Hydraulic cylinder

We recommend preventive replacement of existing cylinder to minimize an extended shutdown for emergency replacement and risk of soil contamination if a leak should occur. A PVC jacket will be installed.

##### Hydraulic cylinder – Related works

When replacing a cylinder, it is necessary to perform a pumping of existing hole in which the cylinder is installed to remove any debris or contaminated liquid in the bottom of the hole. Foresee the following conditions for pumping: drilling is now completely filled with sand, access to drilling will be very complicated.

##### Control system

We recommend replacing the existing control system with a new microprocessors and soft start type. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured.

New elevator positioning devices shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device. The traveling cable shall be designed for the installation of a card reader and a camera in the cab.

A new door controller, AC-2 speeds type must be installed and interconnected with the controller unit.

##### Additional wirings

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100%

shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

**Access Control**

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

**Door equipments**

We recommend replacing Peelle door equipment: the door operator on the cab, door motors on all floors, all the mechanisms and existing door contacts and make a complete cleaning and complete lubrication of all equipment to ensure smooth and safe operations of the doors. The new motors shall be as the existing one: the AC-2 speeds. Car gate and landing doors can be kept.

**Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

**Cab**

We recommend replacing the cab floor. The new floor will be 6mm stainless steel unpolished by sandblasting. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

**Mechanical (elevator mechanical room)**

Replace filters.

Replace exhaust fan.

Clean wall grilles.

Provide a drainage system for the elevator shaft.

### **Sprinkler system**

No actions needed.

### **Electricity (elevator mechanical room)**

Replace starter with a new one.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a new complete grounding.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±45m (150') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±110m (350') run between mechanical and transfer switch room.

### **Structure**

Not applicable.

### **Architecture**

We recommend renewing the interior of the cab, i.e. the floor, walls, ceilings and handrail, in order to provide more robust and sustainable finishes that require less maintenance. Moreover, the existing wood finish does not satisfy flame and smoke release requirements.

## **4.7 Passenger Elevator No. 7**

This small elevator provides service from the Palais des Congrès Tunnel Level to Level 00 (Basilaire). Its machine room is located at Level S1.

The Palais des Congrès tunnel is a secondary access with inadequate barrier-free access. Given the elevator configuration (entry and exit from the front, without need to change direction), adding a control panel would enable persons in wheelchairs to use the elevator comfortably. As a result, this elevator does not need to be enlarged but merely modernized.

### **Elevator consultant**

#### **Hoist machine (hydraulic)**

We recommend replacing the hydraulic valve and Vitaulic joints.

### Hydraulic cylinder

We recommend preventive replacement of existing cylinder to minimize an extended shutdown for emergency replacement and risk of soil contamination if a leak should occur. A PVC jacket will be installed.

### Hydraulic cylinder – Related works

When replacing a cylinder, it is necessary to perform a pumping of existing hole in which the cylinder is installed to remove any debris or contaminated liquid in the bottom of the hole. Foresee the following conditions for pumping: drilling is now completely filled with sand, access to drilling will be very complicated.

### Control system

We recommend replacing the existing control system with a new microprocessors and soft start type. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured.

New elevator positioning devices shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device.

### Additional wirings

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

### Access Control

We recommend that the control system by provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

### Door equipments

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.

- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

#### **Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. We recommend the installation of a main control panel at the front door and auxiliary control panel at the rear door. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

#### **Cab**

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

#### **Mechanical (elevator mechanical room)**

Replace filters.

Replace exhaust fan

Provide fire dampers (air supply and return air).

Clean all wall grilles.

#### **Sprinkler system**

No actions needed.

#### **Electricity (elevator mechanical room)**

Replace starter with a new one.

Verify starter cables.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a new complete grounding.

Provide a 50mm (2") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±145m (475') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±170m (550') run between mechanical and transfer switch room.

### **Structure**

Not applicable.

### **Architecture**

We recommend renewing the interior finish of the cab, i.e. floor, walls, ceilings and handrail, to respond to the flame and smoke-free release requirements and modernize it.

## **4.8 Passenger Elevators Nos. 9 to 13, West Tower**

This group of elevators provides service from Level 01 to Level 10. Their machine room is located on the mezzanine of the West Tower (12<sup>th</sup> floor).

Elevator No. 9, subject to the recommended upgrading, could be considered as an optional firefighter's elevator.

### **Elevator consultant**

#### **Hoist machine (traction)**

The machine can be kept and refurbish by reconditioning the rotating parts, replacement of seals and motor brushes as well as various other alignment works and others refurbished (pulleys). Work to refurbish the DC motor must be made by a specialist workshop certified ISO 9001-2000. Deflection pulleys will also be refurbished.

We also recommend the replacement of speed governor. The safety system under the car and auxiliary emergency brake can be cleaned and kept.

#### **Control system**

We recommend replacing the existing control system with a new microprocessors type system and DC SCR Drive. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured. A new dispatch controller shall be provided.

New elevator positioning devices coupled with a tachometer mounted on the motor shaft shall be installed. These new devices are much more reliable and provide better floor

levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device.

#### **Additional wirings**

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

#### **Access Control**

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

#### **Door equipments**

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.
- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

#### **Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

#### **Cab**

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified

depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

**Mechanical (elevator mechanical room)**

No actions needed.

**Sprinkler system**

No actions needed.

**Electricity (elevator mechanical room)**

All disconnect switches will have to be identified correctly with their feed points.

Since seven (7) smoke detectors are installed and code only requires six (6), our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

Removal of existing electricity supply and disconnect switches to the feed point. Provide a new electricity supply (conduit / wiring) and a new disconnect switch.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a new complete grounding.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±170m (550') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±170m (550') run between mechanical and transfer switch room.

**Structure**

Not applicable.

**Architecture**

We recommend renovation of the interior finishing of the cab; floor, walls, ceilings and handrail, in order to satisfy the requirements of the flame and smoke release requirements and modernize it.

## 4.9 Passenger Elevators Nos. 14 to 19, East Tower

This elevator group provides service from Level 01 to Level 12. Their machine room is located on the mezzanine of the East Tower (14<sup>th</sup> floor).

Elevators Nos. 14 and 19, subject to the recommended upgrading, could be considered optional firefighters' elevators.

### **Elevator consultant**

#### **Hoist machine (traction)**

The machine can be kept and refurbished by reconditioning the rotating parts, replacement of seals and motor brushes as well as various other alignment works and others refurbished (pulleys). Work to refurbish the DC motor must be made by a specialist workshop certified ISO 9001-2000. Deflection pulleys will also be refurbished.

We also recommend the replacement of speed governor. The safety system under the car and auxiliary emergency brake can be cleaned and kept.

#### **Control system**

We recommend replacing the existing control system with a new microprocessors type system and DC SCR Drive. This replacement will provide superior performance (speed and leveling) and a better reliability of the devices (breakdowns and availability of spare parts). Compatibility of new systems will also be assured. A new dispatch controller shall be provided.

New elevator positioning devices coupled with a tachometer mounted on the motor shaft shall be installed. These new devices are much more reliable and provide better floor levelling. We also recommend replacing the traveling cable and fixed hoistway cables, hoistway switches and car top control device.

#### **Additional wirings**

We recommend the installation of additional wiring in provision of the following systems: access control and IP camera type in the cab. Provide five (5) pairs of # 22 AWG 100% shielded for the card reader in the cab, a coaxial cable centered in the travelling cable and two (2) optical fibers 62.6/125 micron tight buffered multimode.

A magnetic card access control system, an Ethernet network and a optical fiber to Ethernet network converter must be supplied and installed by another contractor that the elevator contractor between the elevator machine room and COS.

#### **Access Control**

We recommend that the control system be provisioned for interfacing with an access control system between the interfaces provided by others and the elevator controller. Provide the terminal in the controller and the connection with the card reader access control system, keypads and / or keys. Provide a location and connection interfaces in the control panel in the cab for a card reader access control system and / or keypads. Provide programming

maneuvers for the following access control in the elevator controller: Commands will be provided to allow access to a specific floor from within the cab.

**Door equipments**

For each elevator, we recommend replacing the existing door operator by a robust model designed for this building type of traffic and assuring smooth and safe operation and performance of the doors.

- Car: The car door clutch must be replaced. Door hardware, including track, suspension rollers and car door interlock must also be replaced after all these years of service.
- Halls: The existing track will be kept and cleaned. The following items should be replaced: the suspension rollers, door closing mechanisms and interlocks at all levels. The remaining landing door hardware must be refurbished.

**Fixture**

We recommend replacing the control panels in the car to make installations conform to ASME A17.1-2010/CSA-B44-10. As such, we recommend an emergency stop key, a digital position indicator, direction lanterns, fire recall, adding a light identifying the emergency power, braille inscriptions to identify the controls, gongs sound and voice synthesizer to make the installations compliant with the requirements relating to persons with physical disabilities. We also recommend replacing all hall call stations and installing new position indicators on the main level.

**Cab**

We recommend replacing the cab interiors (walls, floor, ceiling). The new finishes are to be determined by the architect in the development phase of plans and specifications in accordance with code requirements. The counterweight may need to be modified depending on the weight of the new finishes. New door reopening devices, proximity sensor type and a guardrail on the car roof should be installed.

**Mechanical (elevator mechanical room)**

No actions needed.

**Sprinkler system**

No actions needed.

**Electricity (elevator mechanical room)**

All disconnect switches will have to be identified correctly with their feed points.

Since seventeen (17) smoke detectors are installed and code only requires six (6), our system is overprotected. However, because it doesn't compromise the system there is no action that needs to be taken. Reducing the number of smoke detectors would generate maintenance costs without improving actual protection.

Removal of existing electricity supply and disconnect switches to the feed point. Provide a new electricity supply (conduit / wiring) and a new disconnect switch.

Replace 120 volts duplex electrical outlets installed in the machine room wall with GFI 120 volts duplex outlets.

Replace 120 volts duplex electrical outlets installed in elevator's pit wall with GFI 120 volts duplex outlets.

Provide a new complete grounding.

Provide a 50mm (2 ") diameter conduit between the mechanical room and the "Centre des opérations de sécurité" (COS). This ±110m (350') run is intended for the connection of access control.

Add an addressable interface module (AIM) for a fire alarm component signal. Plan fire alarm panel programming.

Install a 38mm (1½") conduit with the wiring needed for the generator set pre-transfer signal connections. Plan a ±140m (450') run between mechanical and transfer switch room.

**Structure**

Not applicable.

**Architecture**

We recommend renovation of the interior finishes of the cab; floor, walls, ceilings and handrail, in order to respond to the flame and smoke release requirements and modernize it.

**4.10 Control console for special operations, computerized console and communication system**

**Elevator consultant**

**Control console for special operations**

A control console for special operations will be installed in the Security Operations Centre (COS), including the following items: light signal for emergency recall (Phase I), a key switch for the emergency call, a light signal to the emergency power supply, a key switch for selecting an elevator in a group to be powered by the emergency power supply (if one operation at a time is required), a light signal indicating that the elevator is at the designated floor with the doors open, digital position indicators integrated into the control console. The console shall conform to ASME A17.1-2010/CSA B44-10 code.

**Computerized central console**

Elevators and freight shall be connected to a computerized console located in the COS via an Ethernet network. The console shall permit, from one or more computers, to modify some controller parameters, see the history and real-time information.

The system should have the following characteristics: a menu for selecting functions and displays, show devices per group (including floors served by each group on separate display) indicate the car position and the direction of travel; indicate the registered hall calls, indicate the assignment of hall calls; indicate for each device the car calls, indicate the device status (on or fault), indicate the doors status, indicate deactivation , indicate independent service, firefighters' operations (phase I & II); indicate emergency power; indicate the time and date from the group controller in real time.

The system shall enable the programming of the following maneuvers (punctual and time range): block hall & car calls by floor, limit, using access code car calls by floor; show units per group; place of car calls; parking recall at programmable floor, rendered inoperative one or more car. The system should include a historical and statistical module.

The system should also allow the management of devices on emergency power. This management should be done by software or by a PLC.

**Building communication system**

A two-way communication system shall be installed in COS. The system must be able to communicate from the COS to the car. The system shall conform to ASME A17.1-2010/CSA B44-10 code.

The system should allow the emergency personnel to communicate with each car. Communication should be established without delay and shall not require the intervention of a person who is in the car. The system must have priority over communications to the outside of the building.

A central master station connected to each car with a panel indicating the origin of calls and a keypad shall be installed in the COS.

A secondary master station connected to each car must be installed in each machine room.

**Electricity (elevator mechanical room)**

Provide an empty 50mm (2 ") diameter conduit between every elevator mechanical room and the "Centre des opérations de sécurité" (COS).

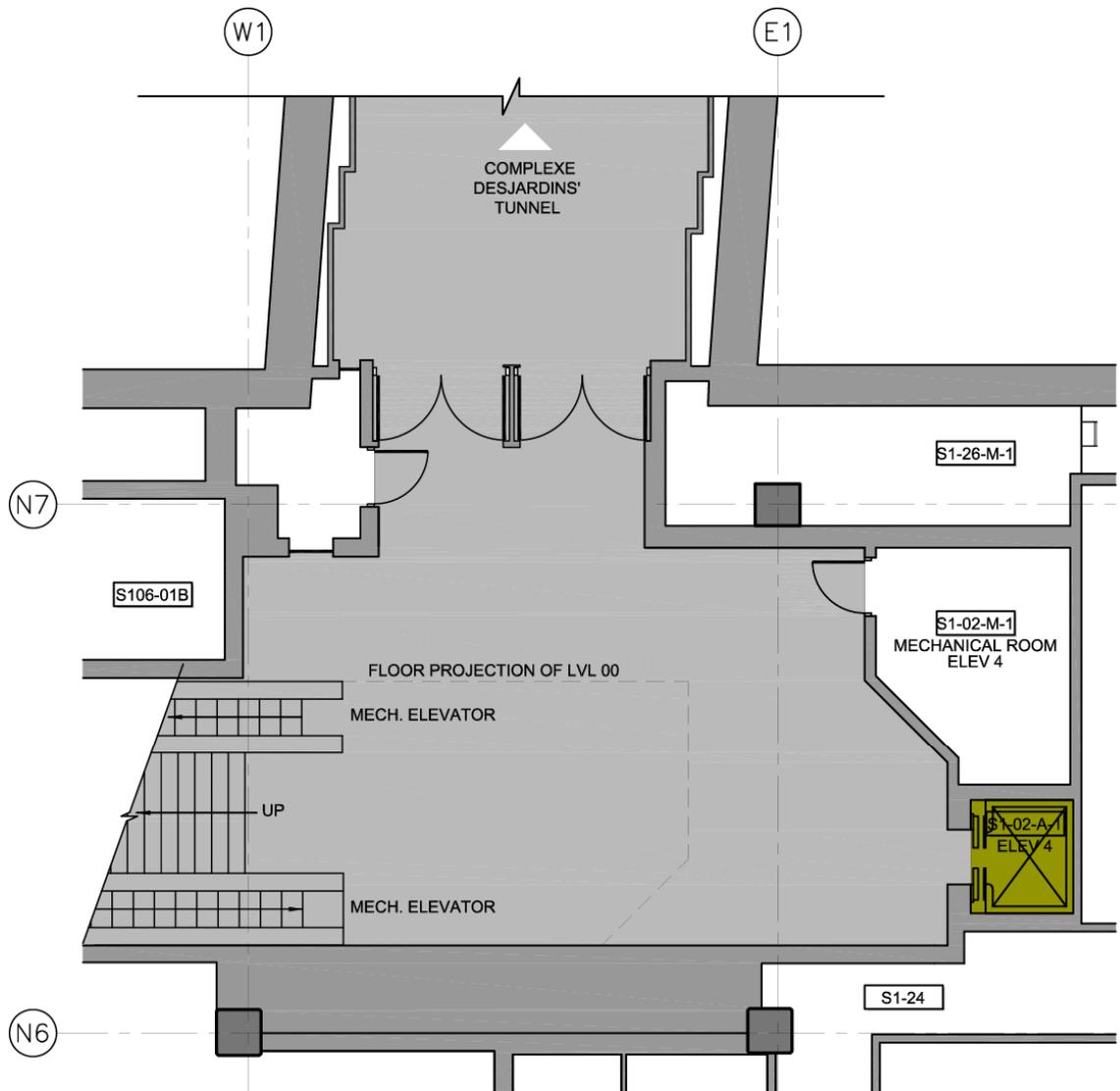


5



5. DRAWINGS OF EXISTING FACILITIES

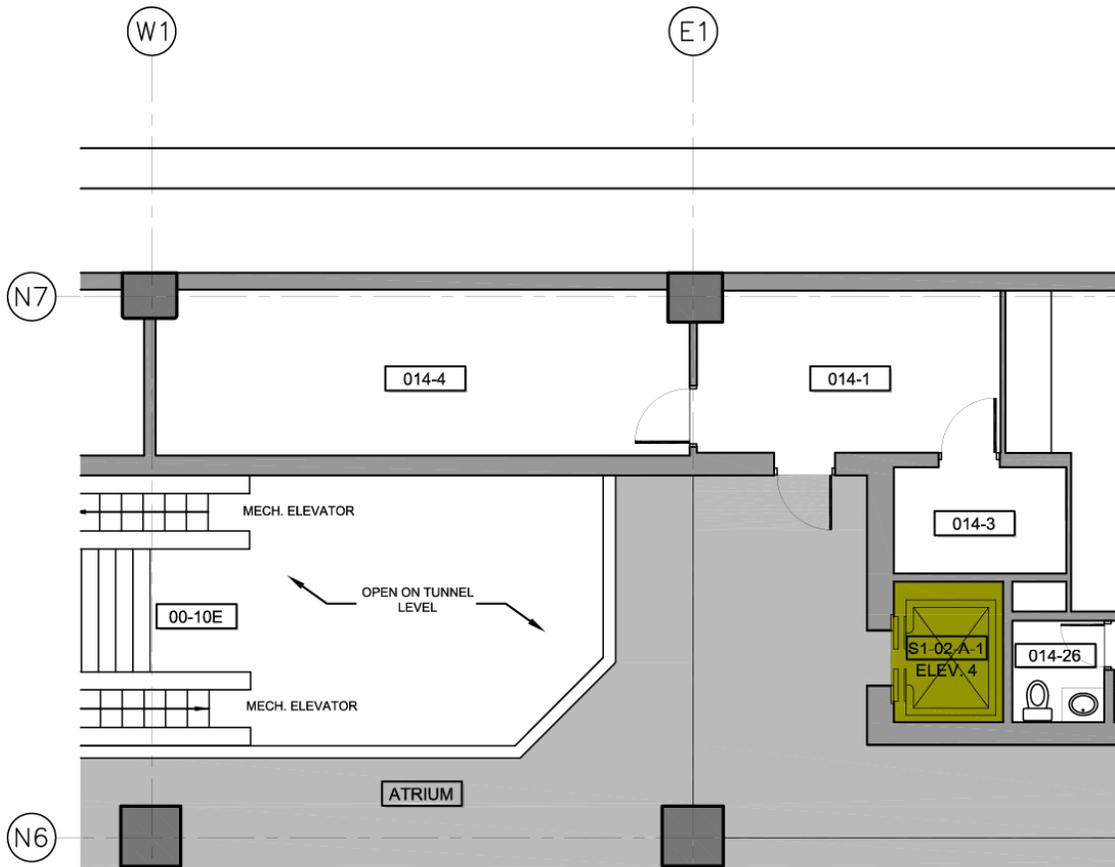
5.1 Passenger Elevator No. 4



LEGEND

- PUBLIC SPACE
- ELEVATOR
- PRIVATE SPACE

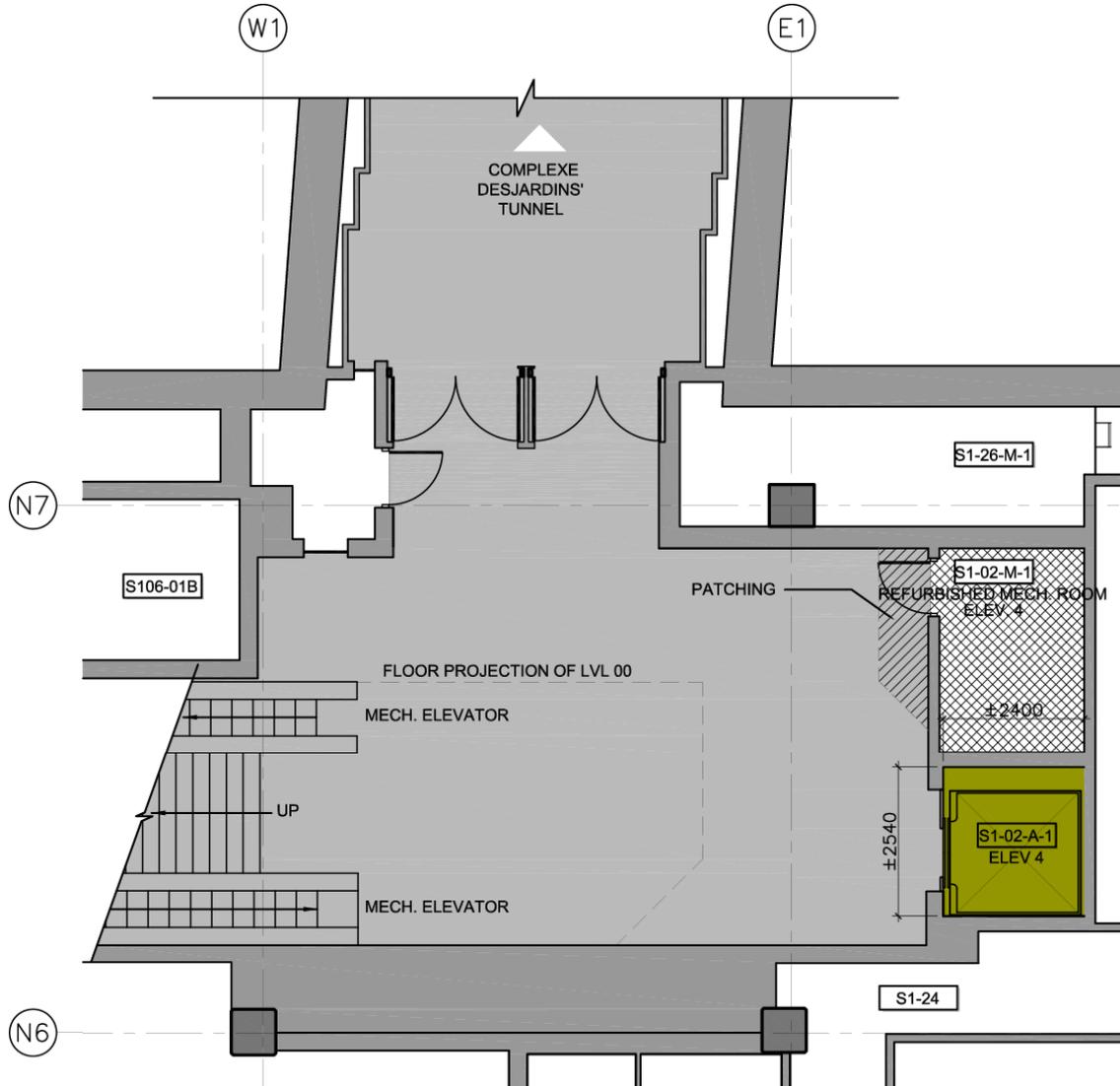




**LEGEND**

- PUBLIC SPACE
- ELEVATOR
- PRIVATE SPACE

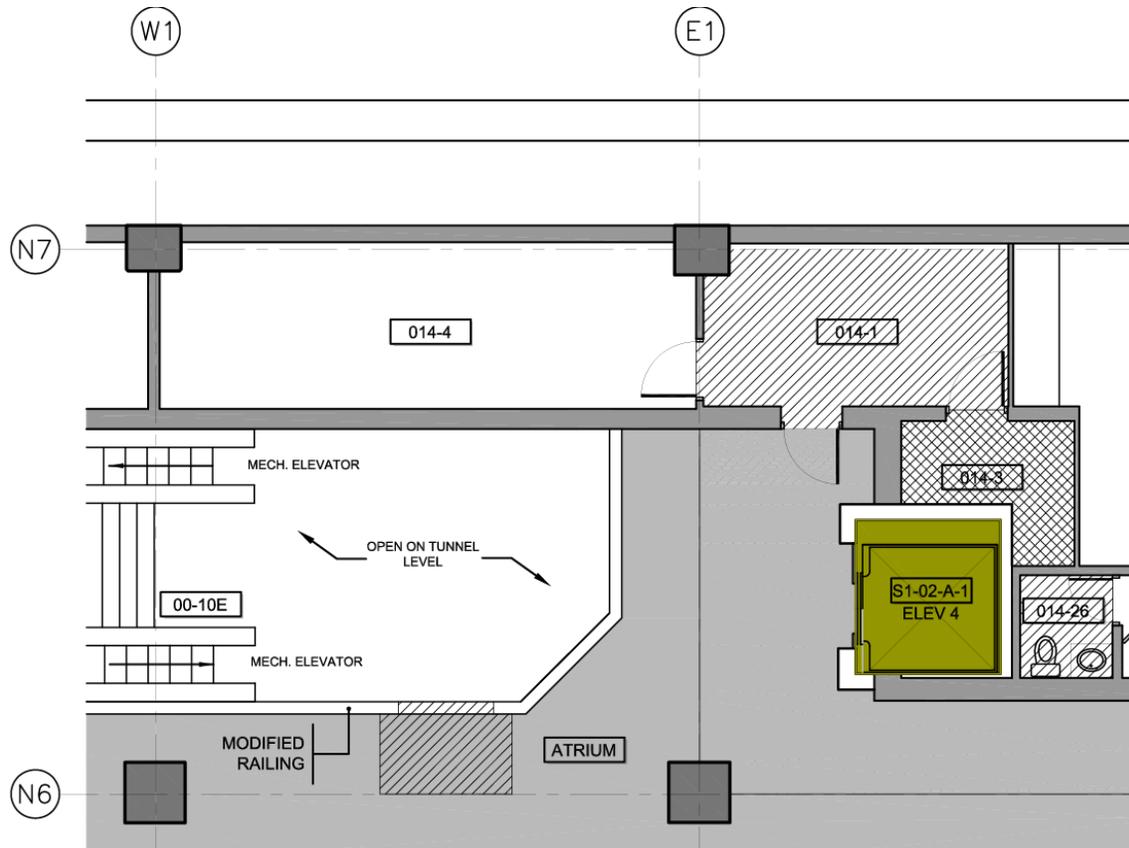




**LEGEND**

- PUBLIC SPACE
- ELEVATOR
- PRIVATE SPACE
- PATCHING ZONE
- REFURBISHING ZONE

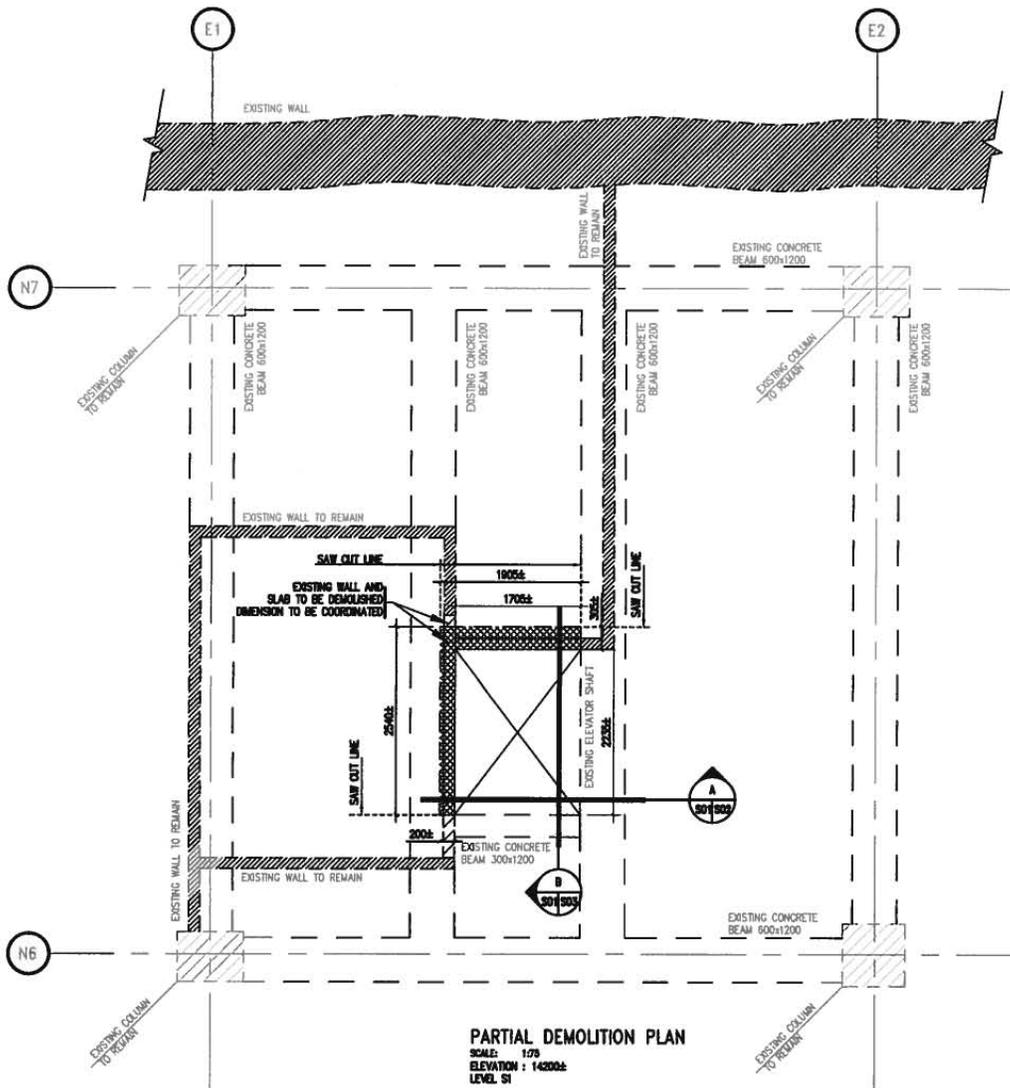




**LEGEND**

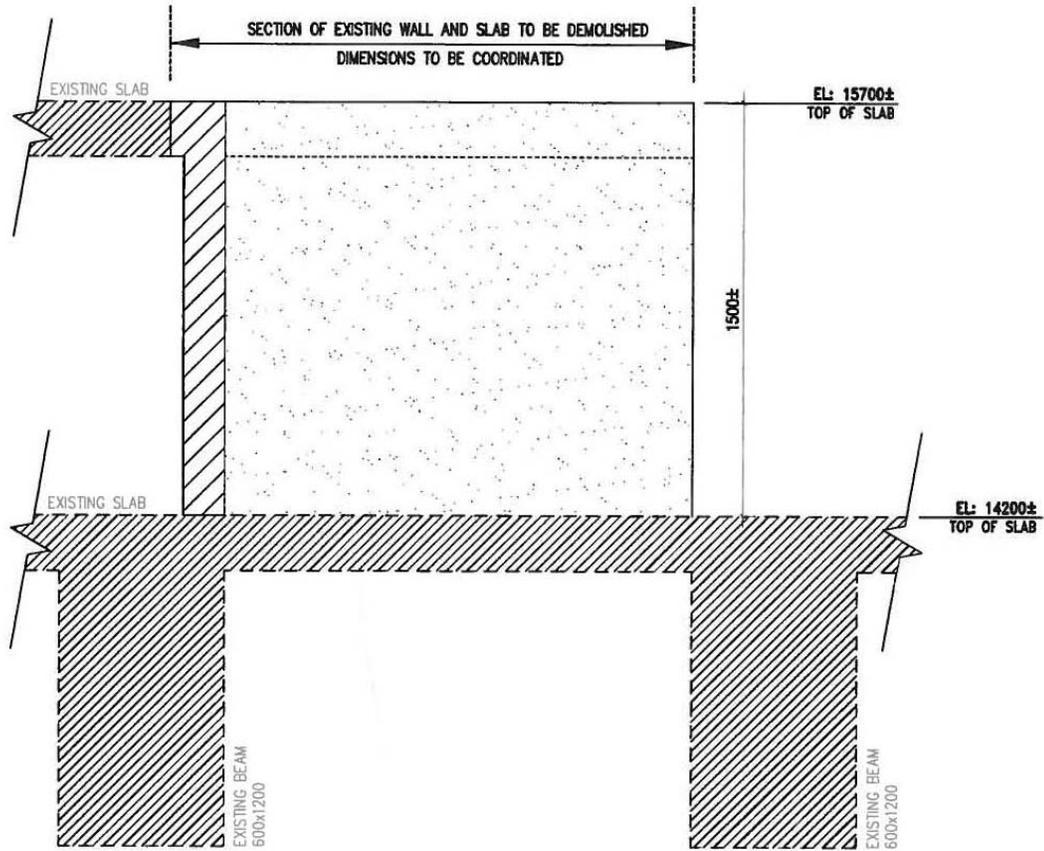
- PUBLIC SPACE
- ELEVATOR
- PRIVATE SPACE
- PATCHING ZONE
- REFURBISHING ZONE





 <p>1751, rue Richardson, bureau 2120                  Montréal (Québec) H3K 1G6                  Tél.: 514 938-5995                  Téléc.: 514 938-9470                  www.sdklbb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b>                  RECONDITIONING OF THE ELEVATORS</p>	<p>Project: 111221</p>
	<p>Date: MARCH 2013                  Issued for: PROJECT BRIEF                  Modification: -</p>	<p>Drawing ref.: S01</p>



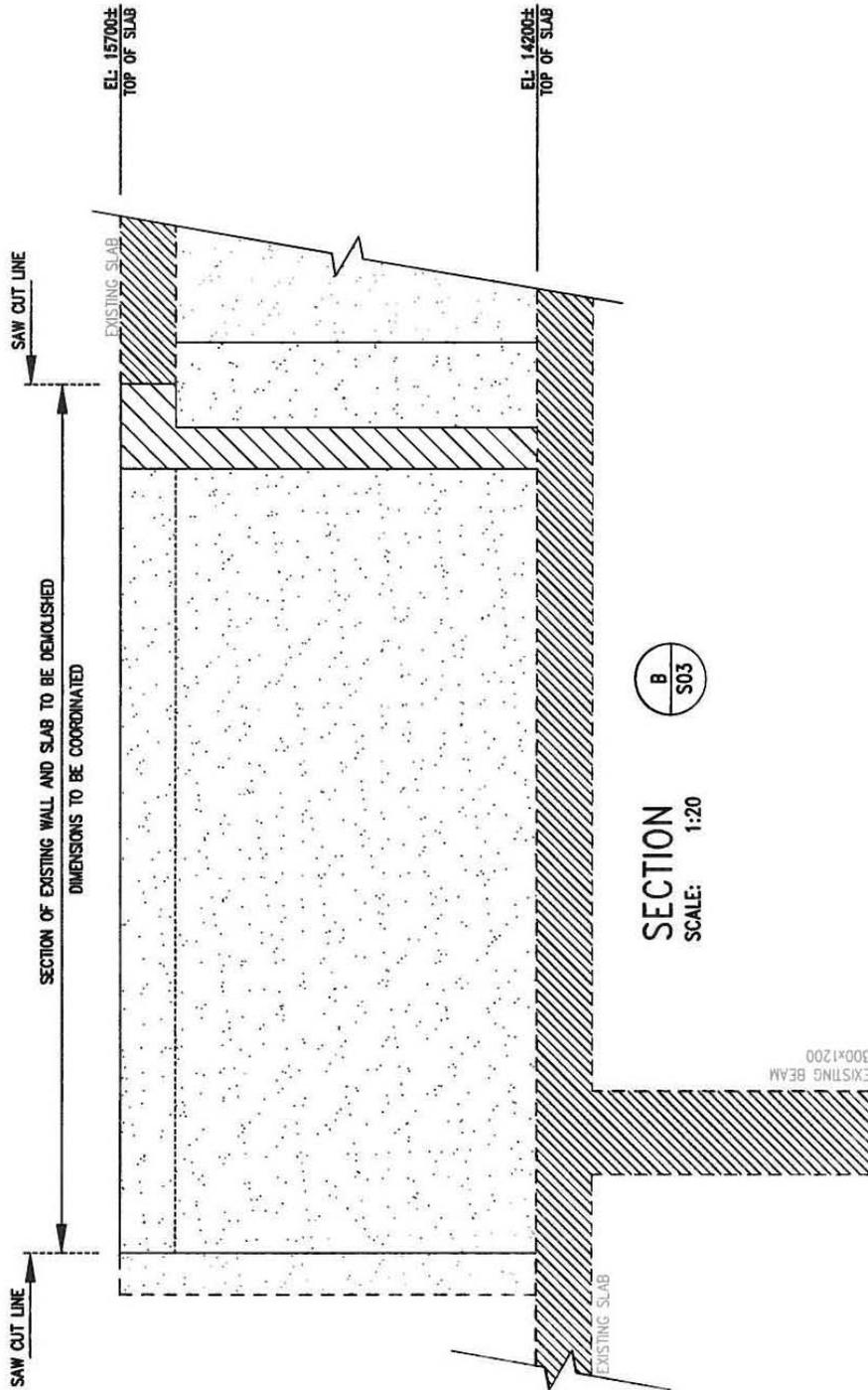


**SECTION**  
SCALE: 1:20



 <p>1751, rue Richardson, bureau 2120 Montréal (Québec) H3K 1G6 Tél.: 514 938-5995 Téloc.: 514 938-9470 www.sdkibb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b> RECONDITIONING OF THE ELEVATORS</p>	Project: 111221
	<p>Date: MARCH 2013 Issued for: PROJECT BRIEF Modification: -</p>	Drawing ref.: S02



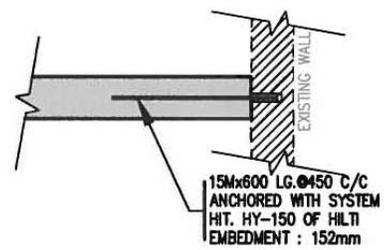
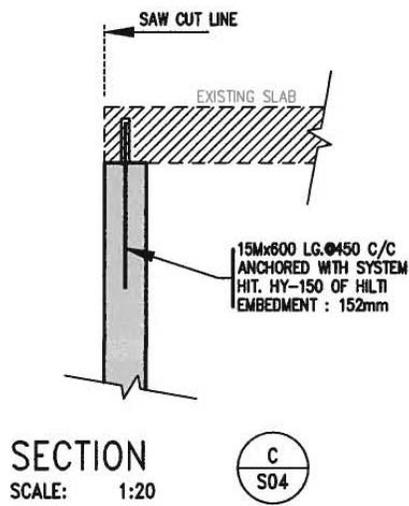


**SECTION**  
SCALE: 1:20



PR	111221	<b>COMPLEXE GUY FAVREAU</b> RECONDITIONING OF THE ELEVATORS
DR	S03	
Date:	MARCH 2013	Issued for: PROJECT BRIEF Modification: -
Issued for:	PROJECT BRIEF	
 <p>1751, rue Richardson, bureau 2120 Montréal (Québec) H3K 1G8 Tel.: 514 398-9470 www.sdkbb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRE STRUCTUREL</p>		





**TYPICAL DETAIL**  
**NEW CONCRETE WALL**  
SCALE: 1:20

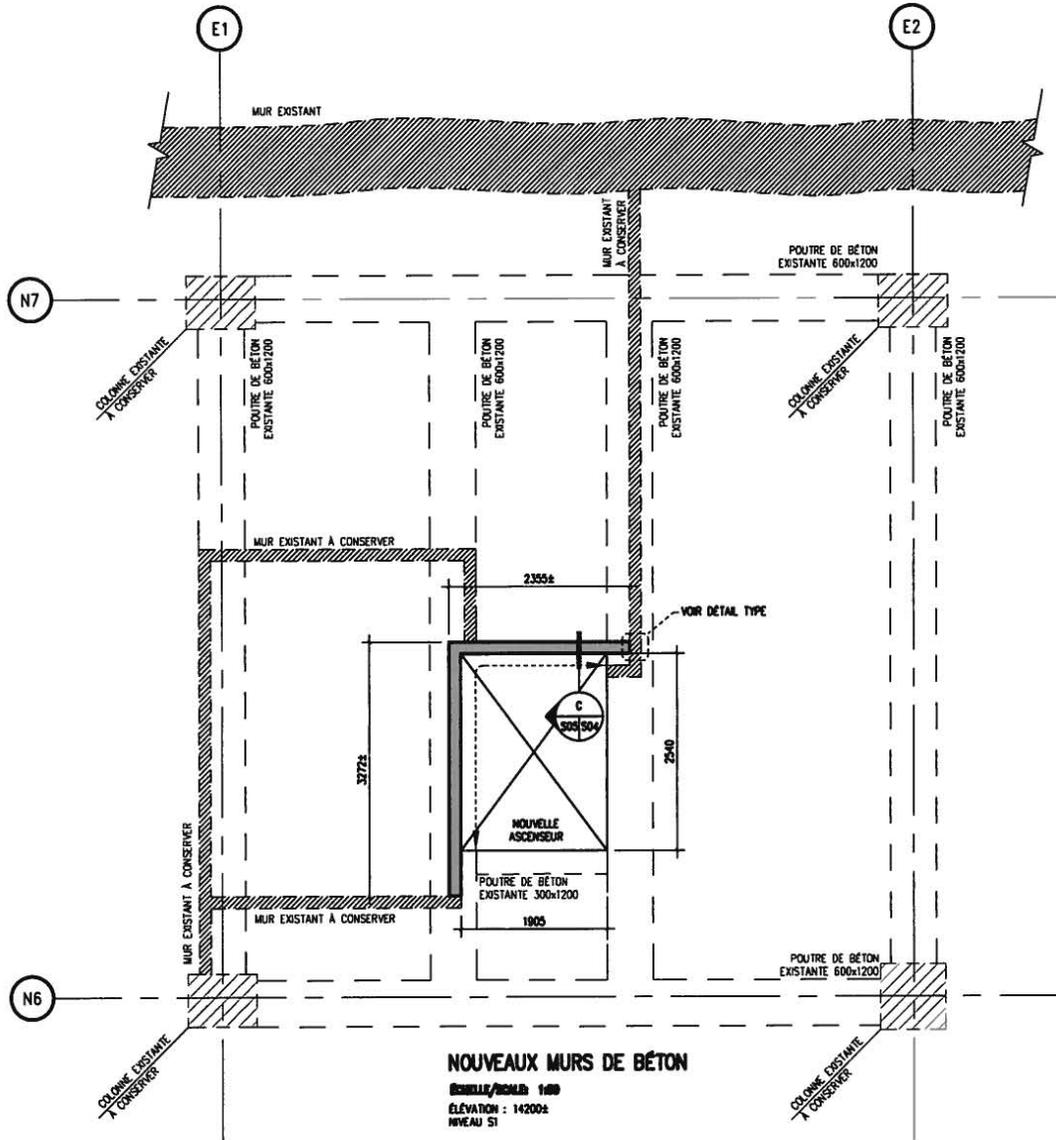


 <p>1751, rue Richardson, bureau 2120 Montréal (Québec) H3K 1G6 Tél.: 514 938-5695 Téléc.: 514 938-9470 www.edk1bb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b> <b>RECONDITIONING OF THE ELEVATORS</b></p>	<p>Project: 111221</p>
	<p>Date: MARCH 2013 Issued for: PROJECT BRIEF Modification: -</p>	<p>Drawing ref.: S04</p>



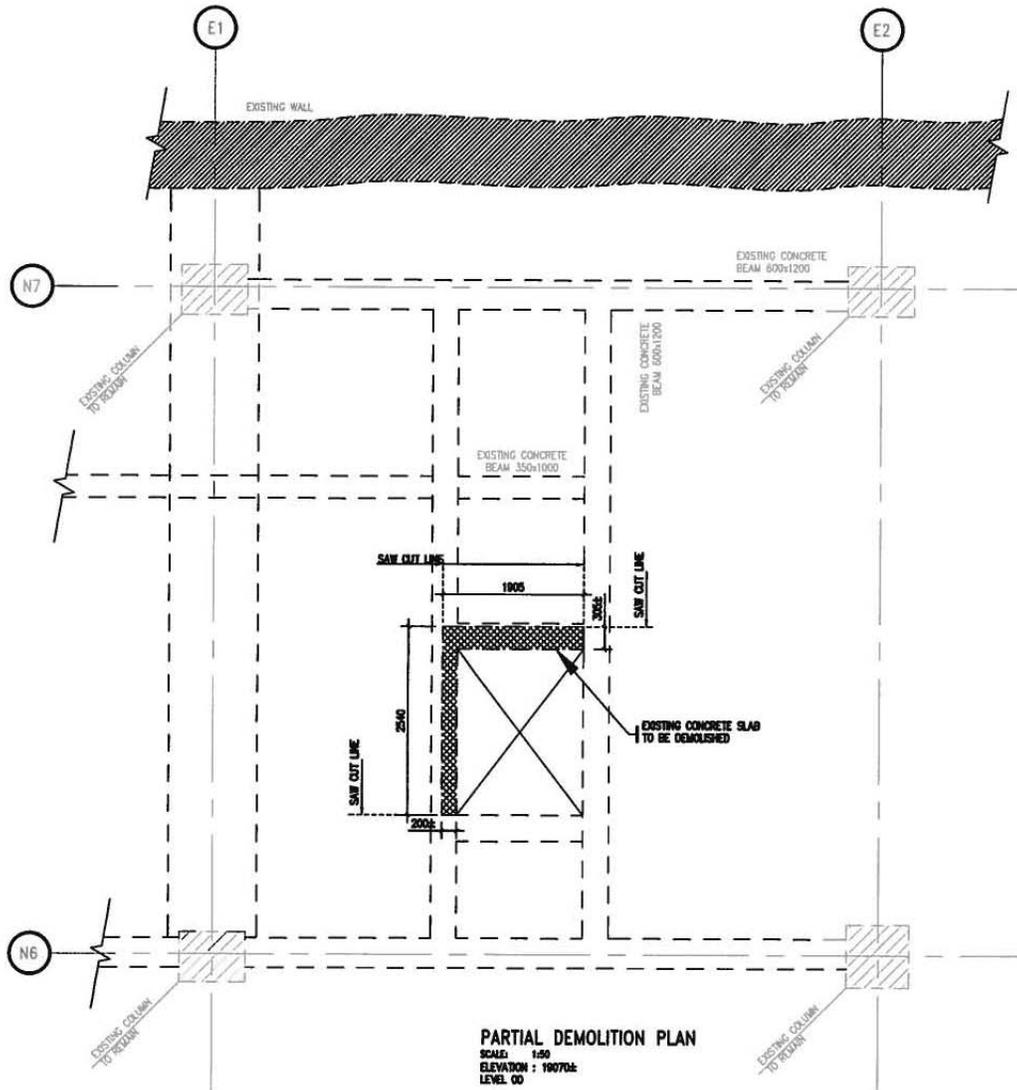






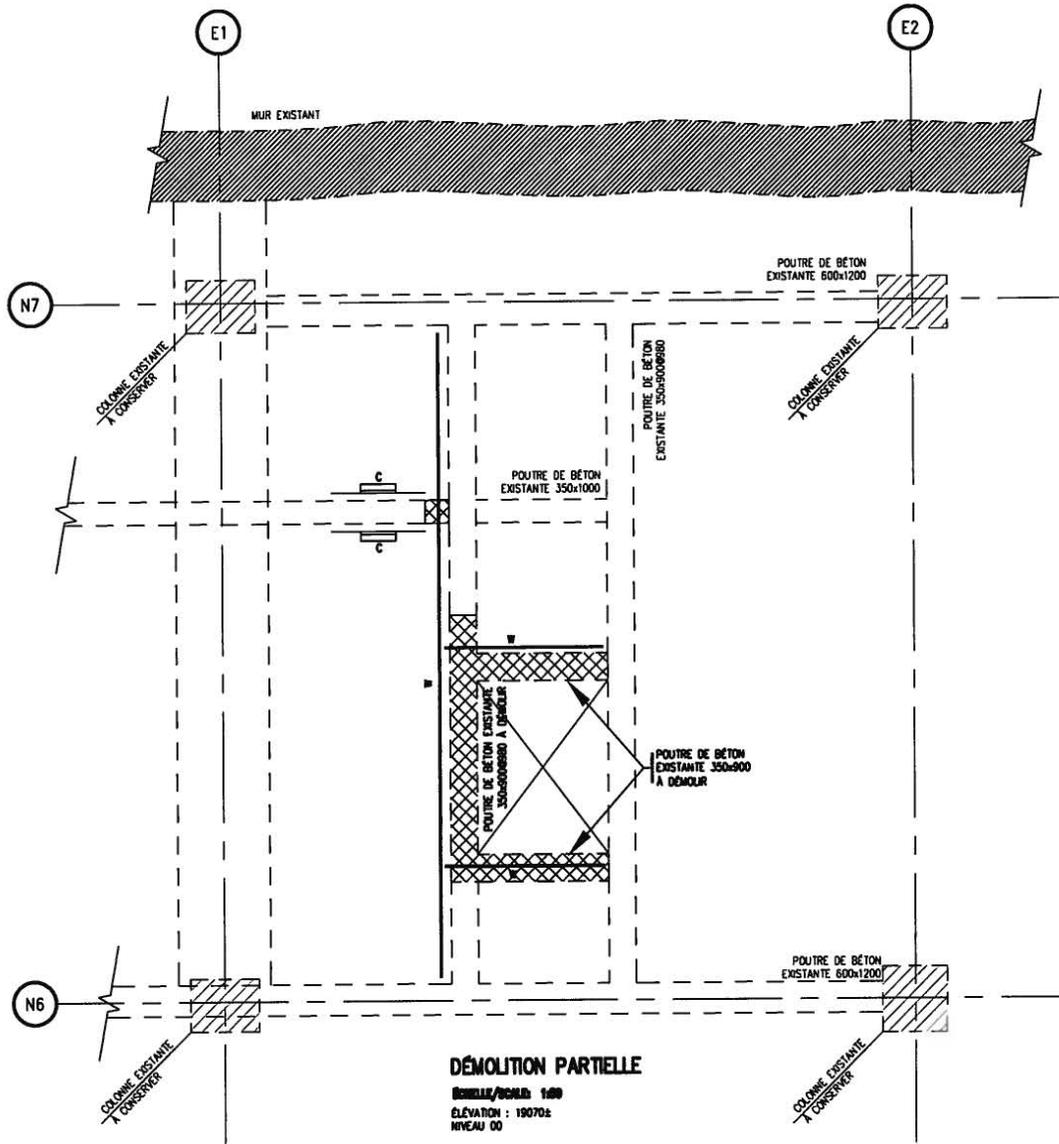
 <p>1751, rue Richardson, bureau 2120                  Montréal (Québec) H3K 1G6                  Tél.: 514 938-9995                  Téléc.: 514 938-9470                  www.sdklbb.com</p> <p>STRUCTURE • GÉNIE CIVIL • STRUCTURE INDUSTRIELLE • VERRRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b>                  AGRANDISSEMENT ASCENSEUR</p>	Dossier: 111221
	<p>Date: JUILLET 2012                  Émission pour: RAPPORT Sr-2                  Révision: -</p>	<p>Extrait du dessin:  <b>S05</b></p>





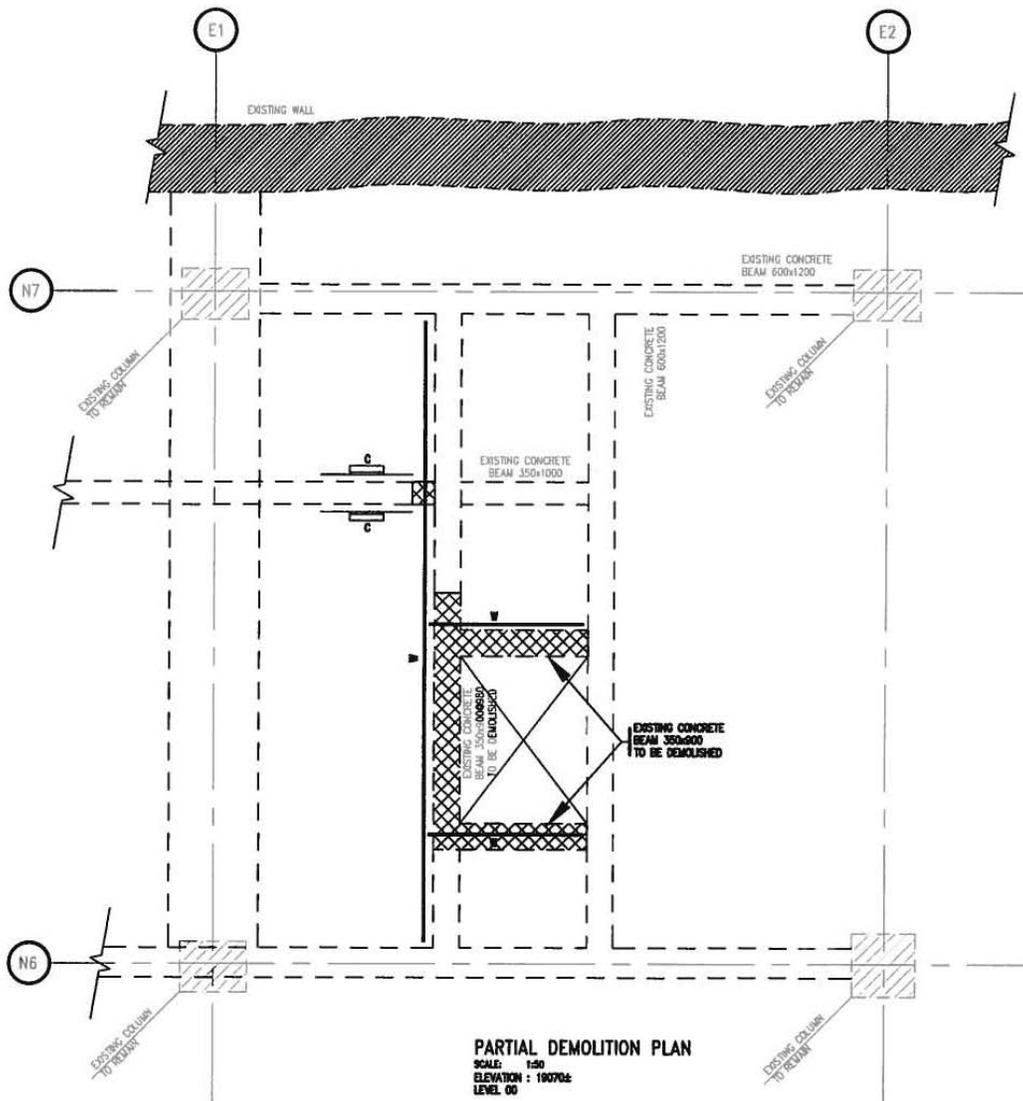
 <p>175<sup>e</sup>, rue Richardson bureau 2120                  Montréal (Québec) H3K 1G8                  Tél.: 514 938-5995                  Téléc.: 514 938-9470                  www.sdklbb.com</p>	<p><b>COMPLEXE GUY FAVREAU</b>                  RECONDITIONING OF THE ELEVATORS</p>	Project: 111221
	Date: MARCH 2013 Issued for: PROJECT BRIEF Modification: -	Drawing ref.: <p style="text-align: right;"><b>S06</b></p>





 <p>1751, rue Richardson, bureau 2120 Montréal (Québec) H3K 1G6 Tél.: 514 938-5995 Télééc.: 514 938-9470 www.sdklbb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b> <b>AGRANDISSEMENT ASCENSEUR</b></p>	Dossier : 111221
	<p>Date : JUILLET 2012 Émission pour : RAPPORT Sr-2 Révision : -</p>	<p>Extrait du dessin: <b>S07</b></p>





 <p>1751, rue Richardson, bureau 2120 Montréal (Québec) H3K 1G6 Tél.: 514 938-5995 Télex.: 514 938-9470 www.sdkfbb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU RECONDITIONING OF THE ELEVATORS</b></p>	Project: 111221
	<p>Date: MARCH 2013 Issued for: PROJECT BRIEF Modification: -</p>	<p>Drawing ref.: S07</p>



**PROCEDURE FOR NEW OPENINGS IN SLABS**

- 1- LOCATE OPENINGS ACCORDING TO INFORMATION ON ARCHITECTURAL DRAWINGS.
- 2- PROVIDE FOR ADEQUATE SHORING SYSTEM AND INSTALL REINFORCEMENT AS INDICATED.
- 3- BORE A FEW HOLES IN EACH CORNER.
- 4- SAW WALLS/SLABS BETWEEN HOLES.
- 5- NO OVERCUT.
- 6- DO NOT USE EXISTING ELEMENTS NOT INDICATED ON DRAWINGS.
- 7- EXECUTE WORK IN ACCORDANCE TO THE RECENT STANDARD CSA 350 AND SECTION 01 35 30 - HEALTH AND SAFETY SPECIFICATIONS
- 8- GET RID OF UNWANTED MATERIALS EXCEPT IF REUSED. SEE GENERALS CONDITIONS SPECIFICATIONS
- 9- EXECUTE WORK IN ACCORDANCE TO THE RECENT STANDARD S16-1 SPECIFICATIONS

**LÉGENDE:**

-  EXISTING CONCRETE BEAM OR SLAB
-  EXISTING SECTION OF CONCRETE SLAB TO BE DEMOLISHED
-  EXISTING SECTION OF CONCRETE WALL TO BE DEMOLISHED
-  EXISTING CONCRETE BEAM TO BE DEMOLISHED
-  NEW CONCRETE WALL



 <p>1751, rue Richardson bureau 2120 Montréal (Québec) H3K 1G6 Tél : 514 938-5995 Télex: 514 938-9470 www.sdk bb.com</p> <p>STRUCTURE ■ GÉNIE CIVIL ■ STRUCTURE INDUSTRIELLE ■ VERRÈRE STRUCTUREL</p>	<p><b>COMPLEXE GUY FAVREAU</b> RECONDITIONING OF THE ELEVATORS</p>	Project: 111221
	<p>Date: MARCH 2013 Issued for: PROJECT BRIEF Modification: -</p>	<p>Drawing ref.: <b>S08</b></p>



6



## 6. EVALUATION OF THE BUILDING'S LOAD-BEARING CAPACITY

### **Elevator consultant**

Several components of the existing elevators will be kept as they are still usable and efficient in the long term. They are fully compatible with the new components that will be used for the modernization.

### **Mechanical (elevator mechanical room)**

The existing electromechanical equipments (fans, motorized dampers, etc.) are acceptable with the modernization work project.

The existing electromechanical equipments for the mechanical room n°4 are acceptable with the modernization work project. They will have to be relocated according to the new zone arrangement.

### **Sprinkler system**

The existing fire alarm equipments are acceptable with the modernization work project.

The existing fire alarm equipments for the mechanical room n°4 are acceptable with the modernization work project. They will have to be relocated according to the new zone arrangement.

### **Electricity (elevator mechanical room)**

Except for the elevators n°4 and n°7, modernization work won't increase the electrical capacity actually supported by the normal and emergency power.

Modernization of the elevator n°4 would for example increase the motors capacity from 25 HP to 40 HP. This replacement motor would add a load that both normal and emergency power would be able to support.

### **Structure**

The structural capacity of the concrete structure of the building is sufficient to bear the loads associated with the extension of elevator No 4.

## Architecture

Option A of modernizing the existing elevators does not result in any major reengineering or additional loads and or modify any spatial organization, except for Elevator No. 4, which we propose to enlarge. The structural capacity has been inspected and is described in Part 4, Modernization Work, of this report. The architectural evaluation is conclusive, indicating that only minor re-engineering and patching are proposed on Level 01. It has been confirmed by PWGSC that the installation of a temporary man-life is not required.

7



## 7. ANALYSIS OF THE CAPACITY OF THE POWER SUPPLY UNITS

The analysis report issued in March 2008 on load's emergency power network of the CGF (N/Réf. : 05-16715, V/Réf. : PW127321) won't permit to correctly assess the load connected to the emergency network.

Therefore, we only say that all the elevators are connected to the emergency power and that despite the modernization work, load will stay constant. In fact, DC motors upgrade and modifications on the control system could slightly decrease the load.

The elevators intended for firefighters use including the expansion of the elevator n° 4 won't affect the load connected to the emergency power.

Consequently, the actual emergency power feeding the elevators is adequate.



8



## 8. SEISMIC ANALYSIS

### Seismic conformity – elevators modernization work

Regulatory requirements

ASME A17.1-2010/CSA B44-10 code states that Article 8.4 (safety requirements in seismic areas) is applies for devices installed in buildings designed and built according to the requirements of seismic level 2 or higher as defined in CNB95.

Our interpretation is that this article is aimed at the construction of new elevators in buildings designed and built according to the requirements of seismic level 2 or higher. It does not address to existing elevators modernization.

**Conclusion :**

**Renovation of elevators is not subject to the requirements of Article 8.4.**

### Building, seismic retrofitting of the structure

Regulatory requirements

Chapter 1 of the Code de construction du Québec (CCQ-c.1) which is presently in force for the territory in Quebec has adopted the modified CNB 2005 for the province of Quebec. The code includes a part 10 entitled « Existing buildings which are the object of a transformation, of maintenance work or repairs ». In the case of major transformation work, the requirements of parts 3, 4 (structure), 5 and 6 of the Code are applicable for the entire building except as provided under the requirements of part 10.

Part 4 of the Code applies to all transformation projects of a building (regardless of its' new assignment). However, article 10.4.1.3 reduces the scope or the requirements pertaining to this subject according to the transformation which is being done.

#### 10.4.1.3 Resistance to seismic loads

- 1) When a building is subject to a transformation, its ability to withstand seismic loads must meet the following requirements:
  - a) it must not be diminished by the effect of this transformation;
  - b) with the exception of buildings whose structure was designed in accordance with the requirements of paraseismic design of the CNB 1995 or chapter 1 of the Code de Construction du Québec approved by decree number 953-2000 dated July 26<sup>th</sup>, 2000, it must be increased to at least 60% of the seismic protection level which is prescribed in part 4, if the transformation has as a result, one of the following situations:

- i) in the case of a civil protection building, more than 25% of the total floor area is subject to being stripped;
  - ii) The lateral load resisting system is modified by the effect of the transformation;
  - iii) The mass of the building is increased by more than 5%.
- The modifications planned for the renovation of the elevators do not diminish the capacity to withstand seismic loads;
  - 25% of the floor area will not be stripped;
  - The resistance system to withstand seismic loads is not modified by the renovation of the elevators;
  - The mass of the building is not increased by more than 5%;

In conclusion:

The renovation of the elevators is not subject to the requirements of article 10.4.1.3 and no seismic restoration will be necessary since the repairs to the elevators are not considered as major transformation work. These conclusions are also valid for Code 2010.

9



## 9. PROJECT RESTRICTIONS

### Elevator consultant

There is no constraint relative to vertical transport equipment for the modernization project. We validated the feasibility of the recommended work. However, the plans and specification shall include the following elements:

Equipment continuity:

- The elements of vertical transport system used in this project must be new authentic parts of current production.
- Control devices must come from a single manufacturer.
- All control devices installed in this project must be of the same generation and 100% compatible with each other.
- The proposed systems shall have been installed in at least three buildings of similar size and in operation for at least two years.

Warranties:

- Work, labor and equipment parts shall be guaranteed for a period of twelve (12) months after final acceptance of the work.
- The warranty period begins from the final acceptance of the work.
- The term final acceptance of work means the recognition by the Owner of completion of the modernizing work on all elevators.
- Provide the owner a written document, signed and issued in their name stating the terms of the warranty.

Material delivery:

- Schedule the delivery of materials to the site in advance so as not to delay the installation work.
- Always have the materials for the next elevators a few weeks before the completion of the work in progress.
- Store new materials in areas designated by the Owner < a space of 10 square feet for one elevator (30 square feet for 3 elevators at a time scenario) > or in the machine room.

### Mechanical (elevator mechanical room)

Project constraints are related to commissioning / decommissioning.

During equipment addition and/or replacement (fans, grilles, fire dampers, etc.), duration of work should be minimized as we want the elevator mechanical room to respect standards as soon as possible.

### **Sprinkler system**

No predicted constraints.

### **Électricité (salle mécanique ascenseur)**

Project constraints are related to commissioning / decommissioning.

### **Structure**

There are no constraints considered.

### **Architecture**

Modernization of the elevators presents no architectural restrictions, at least in spatial terms.

However, during the work to enlarge Elevator No. 4, users with reduced mobility coming from the Métro and Complexe Desjardins will be deprived of the elevator that gives them access to Complexe Guy-Favreau for a period of at least 6 months. Given the first-line services offered there (Service Canada, Passports Canada, Immigration Service, etc.), access for people with reduced mobility will continue to be available from the public parking area on Level S2 and from the main entrance on René-Lévesque Blvd. It has been agreed with PWGSC that installation of a temporary man-lift will not be required during the work to enlarge Elevator No. 4.

10



## 10. SCHEDULING OF WORK

A strategy for the schedule was developed from the recommended option "A", which suggests the modernization of existing elevators according to the scope identified by the team of professionals. Consequently, we have established the following schedule strategy as per the following premises:

- Award of contract to professionals (plans and specifications) in 2013.
- Award of the construction contract dated 1 October 2014.
- Elimination of the optimal schedule and of the replacement schedule that had been offered in step SR1 (these were not retained).
- The sequences of work are those established by EXIM the elevator consultant in collaboration with SNC Lavalin O&M to take into account the specific technical, organizational and operational constraints.
- PWGSC's concern to maintain service capacity of vertical transport at the most optimal level for each tower.
- The scope of the interventions identified in this chapter reflect the technical recommendations for each discipline.
- Intervention by a single contractor to allow PWGSC to have one stop source for guarantees.
- Reducing wherever possible accessory interventions:
  - Temporary protection and partitions for shafts.
  - Costs of bypassing existing services to maintain elevators pending renovations.
  - Separation of supply from physical interventions on site, allowing for continuity of work on the site.
  - Reduction of time for site work.
  - Reducing the cost of mobilization and demobilization.
  - No seismic structural intervention.

Supply is spread out so as to reduce the advance payment of large sums by PWGSC and avoid clutter with materials on site.

This approach in supply would also reduce any costs of changes to the site by integrating shop drawings in one step.

The schedule includes the option of expanding the existing elevator no.4.

**Schedule No. 1 (option 1 – without acceleration in the summer)** : Scenario not considered for this proposal.

**Schedule No. 2 (option 2 – without acceleration in the summer)** : Scenario not considered for this proposal.

**Schedule No. 3 (option 3 - 3 lifts at a time)** : Sequences established by EXIM in collaboration with SNC Lavalin O&M in order to take into account technical and operational conditions. The proposed intervention to modernize three elevators at one time is one that best answers the requirement of saving time for the execution of the work. The staggering of work in time reflects a calendar including holidays as well as those of the construction industry in Québec. With this option, we have a schedule of 96 weeks of work.

Sequences	Comments
Elevators Nos. 13, 15, 5	The upgrades must begin with elevator No. 13 in the West tower and elevator No. 15 in the East tower
Elevators Nos. 14, 12, 3	These elevators executed concurrently
Elevators Nos. 16, 11, 6	These elevators executed concurrently
Elevators Nos. 17, 9, 7	These elevators executed concurrently
Elevators Nos. 19, 10, 1	These elevators executed concurrently
Elevators Nos. 18, 2, 4	These elevators executed concurrently
Other work (column No. 20 estimate)	This work can be done at the beginning or at any time without affecting the achievement of groups of elevators. These works are not on the critical path, which is why they do not appear on the schedule.

Notes:

1. All sequences were developed by the elevator consultant Exim in conjunction with the property manager, and take into account technical and operational constraints during the execution of the work.
2. In the first two sequences we could reverse the order of execution of the two firefighters' elevators. 3 and 5 according to the client's or administrators wishes.
3. Replacing the power electric supply with fire resistance of two hours for firefighters' elevators 3 and 5 may be performed simultaneously with the work of the first sequence (elevators nos. 13, 15 and 5). The work of upgrading will not affect the work of modernizing the two firefighters' elevators nor the duration of these works.
4. In schedules and estimates : only architectural work on changes to adjacent rooms or elevator shafts are shown in the schedule and budget. The replacement of the cabins is integrated in the schedules and the budget under the heading *Intervention vertical transport*.
5. We plan delivery of a group of elevators to the site two weeks before the end of the previous group.













11



## 11. BUDGET ESTIMATE

The estimate of category C is based on work scope described for each discipline in this document. Considering that the scope for certain elements of the intervention is to be further defined, we integrated a design contingency according to the usual levels provided in an estimate of the category C ( $\pm 15\%$  accuracy).

Estimated costs primarily cover the work described in all disciplines of this document, and inherent expenses as follows:

### General conditions:

- Supervision
- Cleaning and protection.
- Insurance
- Guarantees
- Permits
- Miscellaneous
- Administration and profits
- Other

We took into account the specific nature of the building as to access and security requirement relating to the execution of work. Indexing in each budget is still a function of the duration of the work based on the different timelines.

### Structural Interventions:

- Structural interventions for the integration of the expansion of the elevator no. 4

Seismic structural interventions are not covered in this estimate, since such standards are not required. However, we estimate more than \$357 000 (order of magnitude) for the work of such upgrading.

### Architectural Interventions:

- Work required for the expansion of the elevator no. 4.
- Work for upgrade, sealing and closing up following various interventions

### Electromechanical Interventions:

- Upgrading of electrical capacity for firefighters' elevators nos. 3 and 5.
- Presignal to the generator for each elevator.
- Fire alarm signal and programmable module.
- Review of mechanical services for elevator mechanical rooms.
- Adding drainage for elevator pits nos. 3, 5 and 6.

**Interventions in Vertical Transport:**

- Modernization of elevators according to the scope of work described in this document, including the replacement of finishes in cabins.
- Expansion of elevator no. 4.

This estimate is based on allocations. This budget does not include loss of earnings, etc.

The estimated cost for the modernization on schedule no.3 are: **\$6 109 734.00** excluding taxes.

**Firefighters' elevators – Optional Work:**

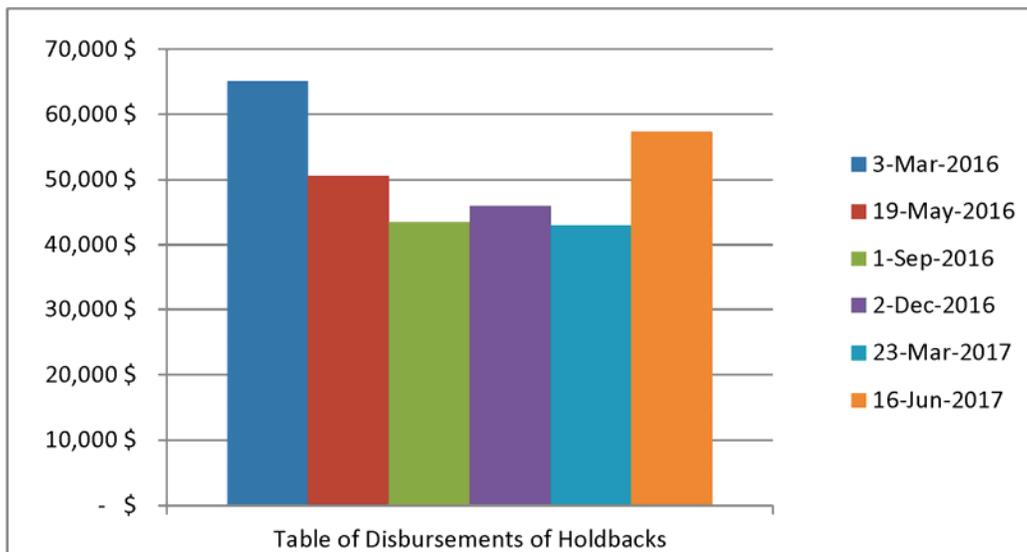
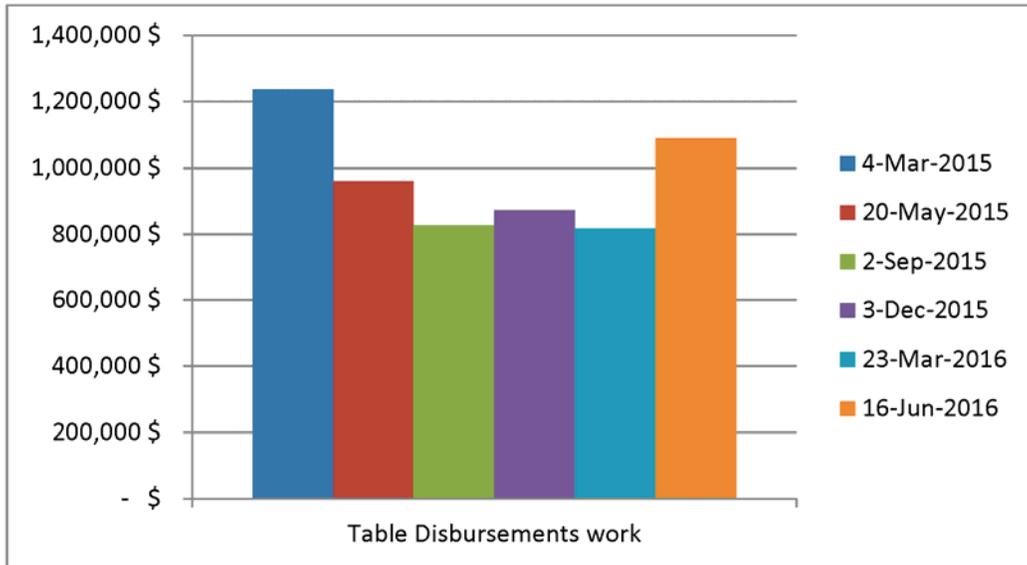
In the event that the replacement of electrical power cables by 2hr RF ducts cannot be approved, alternative work is considered for the protection of sections of unprotected electrical conduits:

Costs for the protection of existing power cables with a combination of gypsum with a fire resistance of 2 hours for the firefighters' elevator no. 3 (and the West tower elevators) are \$40,000, and for firefighters' elevator no. 5 (and elevators of the East tower) of \$25,000, plus \$25,946 for inherent costs, for a total of \$90 946. These costs are excluded from the budget and are presented as indicative and as an option.

**Amounts Paid and Holdbacks:**

We present in the form of tables and graphs disbursements and holdbacks provided for the project according to schedule No. 3. The amounts shown exclude taxes.

<b>Timeline no. 3-3 lifts at a time (before taxes)</b>					
<b>Elevators</b>	<b>Upgrades</b>		<b>Deductions work</b>		
	<b>Date</b>	<b>95%</b>	<b>Date</b>	<b>5%</b>	<b>Total 100%</b>
<b>Séquence</b>	<b>Total</b>	<b>5,804,248 \$</b>	<b>Total</b>	<b>305,487 \$</b>	<b>6,109,735 \$</b>
13, 15, 5, autres	4-Mar-2015	1,237,370 \$	3-Mar-2016	65,125 \$	1,302,495 \$
14, 12, 3	20-May-2015	961,217 \$	19-May-2016	50,590 \$	1,011,807 \$
16, 11, 6	2-Sep-2015	826,910 \$	1-Sep-2016	43,522 \$	870,432 \$
17, 9, 7	3-Dec-2015	873,115 \$	2-Dec-2016	45,953 \$	919,068 \$
19,10, 1	23-Mar-2016	816,937 \$	23-Mar-2017	42,997 \$	859,934 \$
18, 2, 4	16-Jun-2016	1,088,699 \$	16-Jun-2017	57,300 \$	1,145,999 \$



**Explanatory Notes on Tables of Estimation of Costs:**

- OTHER column of the overall estimate (column # 20):

This column includes the cost of work other than those directly attributable to a specific elevator. It includes the following elements:

- (1) The steel bulkheads to separate the common elevator shafts to protect workers during construction;
- (2) The drainage work of certain pits or some mechanical rooms;
- (3) Ventilation of some mechanical rooms.

- **Related work (Excluding - D10 – Transport System):**

Related work is the work other than those made by the elevator subcontractor. These are works of architecture, structure and electromechanical when they are applicable.

- **Inherent Expenses (Z10, Z20 and Z40)**

These are all costs other than direct costs of work. They include the administration and profit, indexing and applicable taxes.

- **Professional Fees (outside budget)**

Professional fees are not part of the estimate; these shall be administered by PWGSC in a separate budget.

- **Risk management and construction contingencies (Z3010)**

Contingency in construction is a way to control the risk of cost overruns during construction. In a budget relative to the concept, we always foresee a certain amount or percentage to address the potential risk. Normally in a project like this, we should have a reserve of 5%. For a new construction project, we would have estimated it at 10%. As agreed with PWGSC, no construction contingency is included in the estimate.

- **Contingency design (Z10)**

Contingency for design serves to manage the risk for the preparation of a file (from concept of plans and specifications to the issuance of final plans). This contingency varies and decreases as documents are prepared. For an estimate of C class, we can foresee a 15% deviation more or less.

During the preparation of plans and specifications, this percentage will decrease as documents are prepared, to finish at 0% for the last estimate before bids from general contractors.

The remainder will serve to reduce the construction cost of the project.

- **Interpretation of the details of the estimate (Details Level V)**

Column *Uniformat II*: these are the codes of the sections of the Uniformat II presentation system from level 1 to level 4 and 5.

Column *Description*: brief description of the work to be done.

Column *Length, Depth, and Height* as well as *Units or Factor* are needed for calculations of quantities.

Column *PROF* (Professional) is the discipline of concerned professionals:

- A: Architecture
- S: Structure
- M: Mechanical
- E: Electricitrical.
- C: Civil (not used in this case).

*LOT* column: Refers to the numbering of elevators and freight elevators.

*Qts* Column: Refers to the quantity of materials.

*UNIT* Column: Identifies the unit of measure used.

*\$/UNIT* Column: Indicates the unit price of material per unit.

*TOTAL* Column is the result of multiplying the quantity by the unit price.

The last column corresponds to the translation into *Masterformat* of elements of Uniformat II.

Control Table: This table is the control and validation of calculation formulas in different sheets of the presentation of the estimate.



Summary - Without options																				
Estimation Class C																				
Title: Project brief for Elevators Reconditioning at CGF																				
Revision 0 - 2012-12-20																				
Prepared by: Claude Gagnon																				
Approved by: Roberto Bianchini																				
Eléments	TOTAL (1@20)	ELEVATOR NO 1	ELEVATOR NO 2	ELEVATOR NO 3 Modernization	ELEVATOR NO 4 EXPANSION	ELEVATOR NO 5	ELEVATOR NO 6	ELEVATOR NO 7 Modernization	ELEVATOR NO 9	ELEVATOR NO 10	ELEVATOR NO 11	ELEVATOR NO 12	ELEVATOR NO 13	ELEVATOR NO 14	ELEVATOR NO 16	ELEVATOR NO 17	ELEVATOR NO 18	ELEVATOR NO 1	ELEVATOR NO 1	OTHERS NO 20
<b>A SUBSTRUCTURE</b>	80,490 \$	- \$	- \$	- \$	80,490 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>A10 Foundations</b>	80,490 \$	- \$	- \$	- \$	80,490 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
A101) Standard foundations	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
A102) Spécial foundation	80,490 \$	- \$	- \$	- \$	80,490 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
A103) Slab on grade	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>A20 Basement construction</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
A201) Basement excavation	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
A202) Basement walls	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>B SHELL</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>B10 Superstructure</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
B101) Floor construction	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>B20 Exterior closure</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>B30 Roofing</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>C INTERIORS</b>	216,026 \$	- \$	- \$	- \$	27,900 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	188,126 \$
<b>C10 Construction intérieure</b>	209,526 \$	- \$	- \$	- \$	21,400 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	188,126 \$
C101) Partitions	204,026 \$	- \$	- \$	- \$	15,900 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	188,126 \$
C102) Interior door	5,500 \$	- \$	- \$	- \$	5,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
C103) Fitting / specialties	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>C20 Staircases</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>C30 Interior finishes</b>	6,500 \$	- \$	- \$	- \$	6,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
C301) Wall finishes	1,500 \$	- \$	- \$	- \$	1,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
C302) Floor finishes	2,500 \$	- \$	- \$	- \$	2,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
C303) Ceiling finishes	2,500 \$	- \$	- \$	- \$	2,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>D SERVICES</b>	3,493,475 \$	162,475 \$	146,975 \$	248,850 \$	192,300 \$	253,225 \$	177,825 \$	183,325 \$	186,500 \$	166,500 \$	166,500 \$	166,500 \$	166,500 \$	225,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	23,750 \$
<b>D10 Covering systems</b>	2,820,000 \$	130,000 \$	135,000 \$	150,000 \$	145,000 \$	150,000 \$	155,000 \$	155,000 \$	180,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	180,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$
D101) Elevators & lifts	2,820,000 \$	130,000 \$	135,000 \$	150,000 \$	145,000 \$	150,000 \$	155,000 \$	155,000 \$	180,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	180,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$	160,000 \$
D102) Monte person permanent	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>D20 Plumbing</b>	16,000 \$	- \$	- \$	- \$	- \$	3,500 \$	6,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	6,000 \$
D201) Plumbing fixtures	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
D202) Domestic water distribution	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
D203) Sanitary waste	16,000 \$	- \$	- \$	- \$	- \$	3,500 \$	6,500 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	6,000 \$
D204) Rain water drainage	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>D30 HVAC</b>	61,200 \$	7,750 \$	2,850 \$	350 \$	25,000 \$	1,350 \$	5,700 \$	1,700 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	16,500 \$
D304) HVAC	61,200 \$	7,750 \$	2,850 \$	350 \$	25,000 \$	1,350 \$	5,700 \$	1,700 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	16,500 \$
<b>D40 Fire protection</b>	2,550 \$	- \$	- \$	- \$	1,300 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	1,250 \$
D401) Fire protection sprinkler system	2,550 \$	- \$	- \$	- \$	1,300 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	1,250 \$
<b>D50 Electrical</b>	993,725 \$	24,725 \$	9,125 \$	98,500 \$	21,000 \$	98,375 \$	10,625 \$	26,625 \$	6,500 \$	6,500 \$	6,500 \$	6,500 \$	6,500 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	- \$
D501) Electrical service & distribution	578,725 \$	24,725 \$	9,125 \$	98,500 \$	6,000 \$	98,375 \$	10,625 \$	26,625 \$	6,500 \$	6,500 \$	6,500 \$	6,500 \$	6,500 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	45,375 \$	- \$
D502) Lighting & branch wiring	15,000 \$	- \$	- \$	- \$	15,000 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>E EQUIPEMENT &amp; FURNISHINGS</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>F SPECIAL CONSTRUCTION &amp; DEMOLITION</b>	51,525 \$	- \$	- \$	- \$	51,525 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>F10 Special construction</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>F20 Selective building demolition</b>	51,525 \$	- \$	- \$	- \$	51,525 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
F201) Building elements demolition	51,525 \$	- \$	- \$	- \$	51,525 \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
F202) Temporary adjustment Lift No. 8	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$
<b>G BUILDING SITE WORK</b>	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$	- \$



Summary - Without options Estimation Class C Title: Project brief for Elevators Reconditioning at CGF Revision 0 - 2012-12-20 Prepared by: Claude Gagnon Approved by: Roberto Bianchini																				
Eléments	TOTAL (1@20)	ELEVATOR NO 1	ELEVATOR NO 2	ELEVATOR NO 3 Modernization	ELEVATOR NO 4 EXPANSION	ELEVATOR NO 5	ELEVATOR NO 6	ELEVATOR NO 7 Modernization	ELEVATOR NO 9	ELEVATOR NO 10	ELEVATOR NO 11	ELEVATOR NO 12	ELEVATOR NO 13	ELEVATOR NO 14	ELEVATOR NO 16	ELEVATOR NO 17	ELEVATOR NO 18	ELEVATOR NO 1	ELEVATOR NO 1	OTHERS NO 20
<b>BUDGET ACCORDING TO SCHEDULE NO. 3 (3 at a time)</b>																				
Direct costs for the project (before contingency design)	3,841,516 \$	162,475 \$	146,975 \$	248,850 \$	352,215 \$	253,225 \$	177,825 \$	183,325 \$	186,500 \$	166,500 \$	166,500 \$	166,500 \$	225,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	211,876 \$
Z10 Contingency design (estimate - Class C) 15.0%	576,227 \$	24,371 \$	22,046 \$	37,328 \$	52,832 \$	37,984 \$	26,674 \$	27,499 \$	27,975 \$	24,975 \$	24,975 \$	24,975 \$	24,975 \$	33,806 \$	30,806 \$	30,806 \$	30,806 \$	30,806 \$	30,806 \$	31,781 \$
Z15 Maintenance and repair work for	312,000 \$	13,199 \$	11,937 \$	20,211 \$	28,606 \$	20,566 \$	14,443 \$	14,889 \$	15,147 \$	13,523 \$	13,523 \$	13,523 \$	13,523 \$	18,304 \$	16,680 \$	16,680 \$	16,680 \$	16,680 \$	16,680 \$	17,208 \$
Direct costs for the project	4,729,743 \$	200,042 \$	180,958 \$	306,389 \$	433,653 \$	311,775 \$	218,941 \$	225,713 \$	229,622 \$	204,998 \$	204,998 \$	204,998 \$	204,998 \$	277,486 \$	252,861 \$	252,861 \$	252,861 \$	252,861 \$	252,861 \$	260,866 \$
Z20 OVERHEAD - PROFIT ADMINISTRATION																				
Z2010 Overhead costs 10.0%	472,974 \$	20,064 \$	18,096 \$	30,639 \$	43,365 \$	31,178 \$	21,894 \$	22,571 \$	22,962 \$	20,500 \$	20,500 \$	20,500 \$	20,500 \$	27,749 \$	25,286 \$	25,286 \$	25,286 \$	25,286 \$	25,286 \$	26,087 \$
Z2020 Administration and profit Indexation% 6.0%	312,163 \$	13,203 \$	11,943 \$	20,222 \$	28,621 \$	20,577 \$	14,450 \$	14,897 \$	15,155 \$	13,530 \$	13,530 \$	13,530 \$	13,530 \$	18,314 \$	16,689 \$	16,689 \$	16,689 \$	16,689 \$	16,689 \$	17,217 \$
Z2030 Indexing (Varies according to schedule)	594,853 \$	28,223 \$	28,063 \$	35,725 \$	67,250 \$	30,537 \$	26,294 \$	29,739 \$	30,255 \$	28,922 \$	24,620 \$	23,903 \$	20,078 \$	32,355 \$	24,766 \$	30,368 \$	33,317 \$	39,213 \$	35,675 \$	25,550 \$
Total project cost (before taxes)	6,109,734 \$	261,472 \$	239,060 \$	392,974 \$	572,889 \$	394,066 \$	281,580 \$	292,921 \$	297,994 \$	267,950 \$	263,647 \$	262,930 \$	259,106 \$	355,903 \$	319,603 \$	325,205 \$	328,153 \$	334,050 \$	330,512 \$	329,720 \$
Z40 Z4010 GST taxes 5.0%	305,487 \$	13,074 \$	11,953 \$	19,649 \$	28,644 \$	19,703 \$	14,079 \$	14,646 \$	14,900 \$	13,397 \$	13,182 \$	13,147 \$	12,955 \$	17,795 \$	16,260 \$	16,260 \$	16,260 \$	16,260 \$	16,260 \$	16,486 \$
Z4020 GST taxes 9.975%	609,446 \$	26,082 \$	23,846 \$	39,199 \$	57,146 \$	39,398 \$	28,088 \$	29,219 \$	29,725 \$	26,728 \$	26,299 \$	26,227 \$	25,846 \$	35,501 \$	31,880 \$	32,439 \$	32,733 \$	33,321 \$	32,969 \$	32,890 \$
Construction costs of the project (after taxes)	7,024,666 \$	300,628 \$	274,859 \$	451,822 \$	658,679 \$	453,078 \$	323,747 \$	336,786 \$	342,619 \$	308,075 \$	303,128 \$	302,304 \$	297,907 \$	409,200 \$	367,463 \$	373,904 \$	377,294 \$	384,074 \$	380,006 \$	379,095 \$

Note 1: OTHERS column includes items: non-specific to elevator number, see details of level 5 on the following document.

Note 2: The manlift temporary work proposed for the elevator no4 is not retained in the project. It represents a purchase price of \$ 125,000 and \$ 22,000 related work for a sub-total of \$ 147,000 + expenses inherent \$ 55,982 \$ 202,982 = Total before taxes. This amount is excluded from the total lift 4 expansion.

Note 3: Costs for upgrading Firefighter's Elevators No. 3 and No. 5 amounted to \$ 150,000 for two elevators, plus costs inherent (ie \$ 75,000 per lift). These costs are included in each of the two elevators in Section D5010. (Changing the power cable)

Note 4: For the upgrading of Firefighter's Elevators, alternative recovery gypsum sections of electrical power unprotected cables represent a cost of \$ 90,946 for the two Firefighter's Elevators 3 and 5 (compared to a cost of 150,000 \$ + inherent fees to replace the power cable). Note that the latter cost is included in the estimate.

Note 5: Note: Correcting the electrical power cables of elevators 3 and 5 will also corrects the other Firefighter's Elevators (9, 14 and 19) regardless of the solution (see Notes 4 and 5 above).



<b>Estimation Class C</b> Title: Project brief for Elevators Reconditioning at CGF Project Number: PWSCG-R.002079.036 0 Revision 0 - 2012-12-20 Prepared by: Claude Gagnon Approved by: Roberto Bianchini																				
Éléments	TOTAL (1@20)	ELEVATOR NO 1	ELEVATOR NO 2	ELEVATOR NO 3 Modernization	ELEVATOR NO 4 EXPANSION	ELEVATOR NO 5	ELEVATOR NO 6	ELEVATOR NO 7 Modernization	ELEVATOR NO 9	ELEVATOR NO 10	ELEVATOR NO 11	ELEVATOR NO 12	ELEVATOR NO 13	ELEVATOR NO 14	ELEVATOR NO 16	ELEVATOR NO 17	ELEVATOR NO 18	ELEVATOR NO 1	ELEVATOR NO 1	NO 20 OTHERS

**BUDGET ACCORDING TO SCHEDULE NO. 3 (3 at a time)**

Direct costs for the project (before contingency design)		3,841,516 \$	162,475 \$	146,975 \$	248,850 \$	352,215 \$	256,225 \$	174,825 \$	183,325 \$	186,500 \$	166,500 \$	166,500 \$	166,500 \$	225,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	205,375 \$	211,876 \$
Z10	Contingency design (estimate - Class C) 15.0%	576,227 \$	24,371 \$	22,046 \$	37,328 \$	52,832 \$	38,434 \$	26,224 \$	27,499 \$	27,975 \$	24,975 \$	24,975 \$	24,975 \$	33,806 \$	30,806 \$	30,806 \$	30,806 \$	30,806 \$	30,806 \$	31,781 \$
<b>Direct costs for the project</b>		<b>4,417,743 \$</b>	<b>186,846 \$</b>	<b>169,021 \$</b>	<b>286,178 \$</b>	<b>405,047 \$</b>	<b>294,659 \$</b>	<b>201,049 \$</b>	<b>210,824 \$</b>	<b>214,475 \$</b>	<b>191,475 \$</b>	<b>191,475 \$</b>	<b>191,475 \$</b>	<b>259,181 \$</b>	<b>236,181 \$</b>	<b>243,658 \$</b>				
Z20	<b>OVERHEAD - PROFIT ADMINISTRATION</b>																			
Z2010	Overhead costs 10.0%	441,774 \$	18,685 \$	16,902 \$	28,618 \$	40,505 \$	29,466 \$	20,105 \$	21,082 \$	21,448 \$	19,148 \$	19,148 \$	19,148 \$	25,918 \$	23,618 \$	23,618 \$	23,618 \$	23,618 \$	23,618 \$	24,366 \$
Z2020	Administration and profit 6.0%	291,571 \$	12,332 \$	11,155 \$	18,888 \$	26,733 \$	19,447 \$	13,269 \$	13,914 \$	14,155 \$	12,637 \$	12,637 \$	12,637 \$	17,106 \$	15,588 \$	15,588 \$	15,588 \$	15,588 \$	15,588 \$	16,081 \$
Z2030	Indexation% Indexing (Varies according to schedule)	555,537 \$	26,361 \$	26,211 \$	33,368 \$	62,814 \$	28,860 \$	24,146 \$	27,778 \$	28,259 \$	27,014 \$	22,996 \$	22,326 \$	18,754 \$	30,221 \$	23,133 \$	28,365 \$	31,119 \$	36,627 \$	23,865 \$
<b>Total project cost (before taxes)</b>		<b>5,706,626 \$</b>	<b>244,224 \$</b>	<b>223,290 \$</b>	<b>367,051 \$</b>	<b>535,099 \$</b>	<b>372,432 \$</b>	<b>258,568 \$</b>	<b>273,598 \$</b>	<b>278,337 \$</b>	<b>250,274 \$</b>	<b>246,256 \$</b>	<b>245,586 \$</b>	<b>242,014 \$</b>	<b>332,426 \$</b>	<b>298,520 \$</b>	<b>303,752 \$</b>	<b>306,506 \$</b>	<b>312,014 \$</b>	<b>308,709 \$</b>
Z40	Z4010 GST taxes 5.0%	305,487 \$	13,074 \$	11,953 \$	18,353 \$	26,755 \$	18,622 \$	12,928 \$	13,680 \$	13,917 \$	12,514 \$	12,313 \$	12,279 \$	12,101 \$	16,621 \$	14,926 \$	15,188 \$	15,325 \$	15,601 \$	15,398 \$
Z4020	OST taxes 9.975%	609,446 \$	26,082 \$	23,846 \$	36,613 \$	53,376 \$	37,150 \$	25,792 \$	27,291 \$	27,764 \$	24,965 \$	24,564 \$	24,497 \$	24,141 \$	33,159 \$	29,777 \$	30,299 \$	30,574 \$	31,123 \$	30,794 \$
<b>Construction costs of the project (after taxes)</b>		<b>6,566,138 \$</b>	<b>283,360 \$</b>	<b>259,089 \$</b>	<b>422,017 \$</b>	<b>615,230 \$</b>	<b>428,204 \$</b>	<b>297,269 \$</b>	<b>314,570 \$</b>	<b>320,018 \$</b>	<b>287,753 \$</b>	<b>283,132 \$</b>	<b>282,362 \$</b>	<b>278,255 \$</b>	<b>382,207 \$</b>	<b>343,223 \$</b>	<b>349,239 \$</b>	<b>352,405 \$</b>	<b>358,738 \$</b>	<b>354,938 \$</b>

Note 1: OTHERS column includes items: non-specific to elevator number, see details of level 5 on the following document.

Note 2: The manlift temporary work proposed for the elevator no4 is not retained in the project. It represents a purchase price of \$ 125,000 and \$ 22,000 related work for a sub-total of \$ 147,000 + expenses inherent \$ 55,982 \$ 202,982 = Total before taxes. This amount is excluded from the total lift 4 expansion.

Note 3: Costs for upgrading Firefighter's Elevators No. 3 and No. 5 amounted to \$ 150,000 for two elevators, plus costs inherent (ie \$ 75,000 per lift). These costs are included in each of the two elevators in Section D5010. (Changing the power cable)

Note 4: For the upgrading of Firefighter's Elevators, alternative recovery gypsum sections of electrical power unprotected cables represent a cost of \$ 90,946 for the two Firefighter's Elevators 3 and 5 (compared to a cost of 150, 000 \$ + inherent fees to replace the power cable). Note that the latter cost is included in the estimate.

Note 5: Note: Correcting the electrical power cables of elevators 3 and 5 will also corrects the other Firefighter's Elevators (9, 14 and 19) regardless of the solution (see Notes 4 and 5 above).



DETAILS OF LEVEL V - WITHOUT OPTIONS										Calculs Controls		
Estimation Class C										MASTERFORMAT - \$		
Title: Project brief for Elevators Reconditioning at CGF										CONTROLE - \$		
Project Number: PWS-CG-R.002079.036										LOT - \$		
Revision 0 - 2012-12-20										DISCIPLINES - \$		
Prepared by: Claude Gagnon										SUMMARY - \$		
Approved by: Roberto Bianchini										DETAILS		
TOTAL A + B + C + D + E + F + G												
		Length	Depth	Height	Units of factor							
UNIFORMAT II	DESCRIPTION					PROF	LOT	Qt	UNITS	\$ / UNIT	TOTAL	MASTERFORMAT
<b>A</b>	<b>SUBSTRUCTURE</b>										<b>90,490 \$</b>	
<b>A10</b>	<b>FOUNDATIONS</b>										<b>90,490 \$</b>	
<b>A1020</b>	<b>SPECIAL FOUNDATIONS</b>							<b>23</b>	<b>UN</b>	<b>3,899.64 \$</b>	<b>80,490 \$</b>	
<b>A102099</b>	<b>OTHERS SPECIAL FOUNDATIONS</b>							<b>23</b>	<b>UN</b>	<b>3,500 \$</b>	<b>80,490 \$</b>	
	<b>CANALAIIX 610 x 610 x 1.2m</b>	0.60	0.60	1.20	1	*	*	1	UN	4,917 \$	4,917 \$	*
	- EXCAVATION	2	2.00	1.00		S	4	4.0	m3	150.00 \$	600 \$	2200
	- BOTTOM CASING RADIER		0.20			S	4	0.5	m2	250.00 \$	120 \$	3150
	- THE CONCRETE FOR RADIER					S	4	0.1	m3	140.00 \$	10 \$	2000
	- FRAMES OF RADIER				900 Kgm3	S	4	21.6	Kg	20.00 \$	432 \$	3200
	- FORM WALL					S	4	5.8	m2	100.00 \$	578 \$	3190
	- FRAME OF WALL				200 Kgm3	S	4	116.2	Kg	20.00 \$	2,304 \$	3200
	- THE CONCRETE FOR WALL FOUNDATION					S	4	0.6	m3	140.00 \$	81 \$	2000
	- FILL					S	4	2.0	m3	200.00 \$	400 \$	2200
	- SCALE					S	4	1.0	LOT	250.00 \$	250 \$	6500
	- SEALING MEMBRANE					S	4	2.9	m2	60.00 \$	144 \$	7100
	<b>WALL ELEVATOR No 4</b>					*	*	<b>22</b>	<b>NV</b>	<b>3,435.13 \$</b>	<b>75,573 \$</b>	*
	<b>WALLS DE TWING LEVEL 14200 &amp; 15770</b>					S	4					
	- FORM OF RADIER	0	1.57	0.90	1	S	4	25	m2	250.00 \$	6,250 \$	2200
	- CONCRETE					S	4	4	m3	360.00 \$	1,319 \$	2200
	- PUMP					S	4	1	J	1,200.00 \$	1,200 \$	2200
	- LOST IN CONCRETE PUMP					S	4	3	m3	350.00 \$	1,050 \$	3300
	- FRAMES OF RADIER				110 Kgm2	S	4	414	Kg	50.00 \$	20,704 \$	3150
	<b>ELEVATOR No 4</b>			13.00		S	4					
	- NEW STEEL BEAM UNDER CONCRETE WALL				0	S	4	1.00	LOT	10,000.00 \$	10,000 \$	6100
	- NEW STEEL BEAM surrounding OPENING					S	4	1.00	m3	15,000.00 \$	15,000 \$	6100
	- FRAMES					S	4	1	LOT	20,000.00 \$	20,000 \$	3200
<b>C</b>	<b>INTERIORS</b>										<b>1,116,130 \$</b>	
<b>C10</b>	<b>INTERIOR CONSTRUCTION</b>										<b>2,094,250 \$</b>	
<b>C1010</b>	<b>PARTITIONS</b>							<b>100</b>	<b>m2</b>	<b>2,094.25 \$</b>	<b>209,425 \$</b>	*
<b>C101001</b>	<b>FIXED PARTITIONS WALL</b>							<b>100</b>	<b>m2</b>	<b>2,040.26 \$</b>	<b>204,026 \$</b>	*
	<b>SAFE WALL BETWEEN A GROUP OF LIFTS</b>				120	A	20	120	un	300.00 \$	36,000 \$	6500
	Partition by module 2000 x 2000mm installation					A	20	960	m2	50.00 \$	48,000 \$	6500
	Full angle steel 25mm	8				A	20	480	m2	160.00 \$	76,800 \$	6500
	Filling with welded mesh fence	4				A	20	6	un	25.00 \$	150 \$	6500
	Fixing and anchoring	6				A	20	210	tree	129.41 \$	27,176 \$	6500
	Elevator operator for installation	0						<b>100</b>	<b>m2</b>	<b>159.00 \$</b>	<b>15,900 \$</b>	*
	<b>CONCRETE BLOCK WALL IN</b>					A	4	50	m2	300.00 \$	15,000 \$	4050
	Full 250mm concrete block fire 2hr					A	4	100	m2	9.00 \$	900 \$	9900
	Fur on concrete block											
<b>C1020</b>	<b>INTERIOR DOORS</b>							<b>2</b>	<b>un</b>	<b>2,750.00 \$</b>	<b>5,500 \$</b>	*
<b>C102001</b>	<b>INTERIORS DOOR</b>							<b>2</b>	<b>un</b>	<b>2,375.00 \$</b>	<b>4,750 \$</b>	*
	<b>STEEL INTERIOR DOORS AND FRAMES</b>							<b>2</b>	<b>un</b>	<b>2,375.00 \$</b>	<b>4,750 \$</b>	*
	STEEL INTERIOR DOORS AND FRAMES					A	4	2	UN	2,200.00 \$	4,400 \$	6100
	PAINT DOORS AND FRAMES					A	4	1	UN	350.00 \$	350 \$	6900
	<b>TERMS OF CONCRETE FILLED</b>					*	*	<b>1</b>	<b>un</b>	<b>750.00 \$</b>	<b>750 \$</b>	*
	- TERMS OF CONCRETE FILLED					A	4	1	UN	750.00 \$	750 \$	6100
<b>C30</b>	<b>INTERIOR FINISHES</b>							<b>0</b>	<b>m2</b>	<b>FDV/00</b>	<b>6,500 \$</b>	*
<b>C3010</b>	<b>WALL FINISHED</b>							<b>0</b>	<b>m2</b>	<b>FDV/00</b>	<b>1,500 \$</b>	*
<b>C301002</b>	<b>WALL FINISHED</b>							<b>1</b>	<b>m2</b>	<b>1,500.00 \$</b>	<b>1,500 \$</b>	*
	PAINT WALL					A	4	1	LOT	1,500.00 \$	1,500 \$	9900
<b>C3020</b>	<b>FLOOR FINISHES</b>							<b>1</b>	<b>m2</b>	<b>2,000.00 \$</b>	<b>2,000 \$</b>	*
	<b>FLOOR FINISHES</b>					*	*	<b>1</b>	<b>m2</b>	<b>2,000.00 \$</b>	<b>2,000 \$</b>	*
	REPAIR					A	4	1	LOT	2,000.00 \$	2,000 \$	9200
<b>C3030</b>	<b>CEILING FINISHES</b>							<b>1</b>	<b>LOT</b>	<b>2,000.00 \$</b>	<b>2,000 \$</b>	*
<b>C303001</b>	<b>CEILING FINISHES WITH SUSPENDED GYPSUM BOARD</b>					*	*	<b>1</b>	<b>LOT</b>	<b>2,000.00 \$</b>	<b>2,000 \$</b>	*
	REPAIR					A	4	1	LOT	2,000.00 \$	2,000 \$	9250
<b>D</b>	<b>SERVICES</b>										<b>3,820,000 \$</b>	
<b>D10</b>	<b>CONVEYING SYSTEMS</b>										<b>2,820,000 \$</b>	*
<b>D1010</b>	<b>ELEVATORS &amp; LIFTS</b>										<b>2,820,000 \$</b>	*
<b>D101001</b>	<b>ELEVATORS</b>							<b>20</b>			<b>2,820,000 \$</b>	*
	<b>ELEVATOR No 1</b>					A	*					
	- MACHINE	120,000 \$				A	1	1	LOT	20,000 \$	20,000 \$	14200
	- CONTROLLER					A	1	1	LOT	65,000 \$	65,000 \$	14200
	- CONTROLLER GROUP					A	1	1	LOT		- \$	14200
	- EQUIPMENT BACK					A	1	1	LOT	15,000 \$	15,000 \$	14200
	- SIGNALLING					A	1	1	LOT	15,000 \$	15,000 \$	14200
	- CAB					A	1	1	LOT	25,000 \$	25,000 \$	14200



DETAILS OF LEVEL V - WITHOUT OPTIONS										Calculs Controls		
Estimation Class C										MASTERFORMAT		
Title: Project brief for Elevators Reconditioning at CGF										CONTROLE		
Project Number: PWSG-R.002079.036										LOT		
Revision 0 - 2012-12-20										DISCIPLINES		
Prepared by: Claude Gagnon										SUMMARY		
Approved by: Roberto Bianchini										DETAILS		
TOTAL A + B + C + D + E + F + G												
UNIFORMAT #	DESCRIPTION	Unit	QTY	Height	UNITS OF MEAS	PROF	LOT	Qt	UNITS	\$ / UNIT	TOTAL	MASTERFOR
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	1	1	LOT				- \$	- \$	14200
	<b>ELEVATOR No 2</b>	135,000 \$	A	*								
	- MACHINE		A	2	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	2	1	LOT				55,000 \$	55,000 \$	14200
	- CONTROLLER GROUP		A	2	1	LOT				5,000 \$	5,000 \$	14200
	- EQUIPMENT RACK		A	2	1	LOT				15,000 \$	15,000 \$	14200
	- SIGNALLING		A	2	1	LOT				15,000 \$	15,000 \$	14200
	- CAB		A	2	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	2	1	LOT				- \$	- \$	14200
	<b>ELEVATOR No 3</b>	150,000 \$	A	*								
	- MACHINE		A	3	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	3	1	LOT				55,000 \$	55,000 \$	14200
	- CONTROLLER GROUP		A	3	1	NIA				- \$	- \$	14200
	- EQUIPMENT RACK		A	3	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	3	1	LOT				25,000 \$	25,000 \$	14200
	- CAB		A	3	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	3	1	INCLUDED				- \$	- \$	14200
	<b>NEW ELEVATOR No 4</b>	145,000 \$	A	*								
	- NOUVELLE ASCENSEUR NO 4		A	4	1	LOT				145,000 \$	145,000 \$	14200
	<b>ELEVATOR No 5</b>	150,000 \$	A	*								
	- MACHINE		A	5	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	5	1	LOT				55,000 \$	55,000 \$	14200
	- EQUIPMENT RACK		A	5	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	5	1	LOT				25,000 \$	25,000 \$	14200
	- CAB		A	5	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	5	1	LOT				- \$	- \$	14200
	<b>ELEVATOR No 6</b>	150,000 \$	A	*								
	- MACHINE		A	6	1	LOT				10,000 \$	10,000 \$	14200
	- HYDRAULIC CYLINDER		A	6	1	LOT				20,000 \$	20,000 \$	14200
	- HYDRAULIC CYLINDER -RELATED WORK (PUMP)		A	6	1	LOT				35,000 \$	35,000 \$	14200
	- CONTROLLER		A	6	1	LOT				35,000 \$	35,000 \$	14200
	- CONTROLLER GROUP		A	6	1	LOT				10,000 \$	10,000 \$	14200
	- EQUIPMENT RACK		A	6	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	6	1	LOT				15,000 \$	15,000 \$	14200
	- CAB		A	6	1	LOT				5,000 \$	5,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	6	1	LOT				- \$	- \$	14200
	<b>ELEVATOR No 7</b>	155,000 \$	A	*								
	- MACHINE		A	7	1	LOT				10,000 \$	10,000 \$	14200
	- HYDRAULIC CYLINDER		A	7	1	LOT				20,000 \$	20,000 \$	14200
	- HYDRAULIC CYLINDER -RELATED WORK (PUMP)		A	7	1	LOT				35,000 \$	35,000 \$	14200
	- CONTROLLER		A	7	1	LOT				35,000 \$	35,000 \$	14200
	- EQUIPMENT RACK		A	7	1	LOT				20,000 \$	20,000 \$	14200
	- SIGNALLING		A	7	1	LOT				15,000 \$	15,000 \$	14200
	- CAB		A	7	1	LOT				20,000 \$	20,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	7	1	LOT				- \$	- \$	14200
	<b>ELEVATOR No 8</b>	180,000 \$	A	*								
	- MACHINE		A	9	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	9	1	LOT				65,000 \$	65,000 \$	14200
	- CONTROLLER GROUP		A	9	1	LOT				20,000 \$	20,000 \$	14200
	- EQUIPMENT RACK		A	9	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	9	1	LOT				25,000 \$	25,000 \$	14200
	- CAB		A	9	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	9	1	INCLUDED				- \$	- \$	14200
	<b>ELEVATOR No 10</b>	180,000 \$	A	*								
	- MACHINE		A	10	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	10	1	LOT				65,000 \$	65,000 \$	14200
	- CONTROLLER GROUP		A	10	1	LOT				- \$	- \$	14200
	- EQUIPMENT RACK		A	10	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	10	1	LOT				25,000 \$	25,000 \$	14200
	- CAB		A	10	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	10	1	INCLUDED				- \$	- \$	14200
	<b>ELEVATOR No 11</b>	180,000 \$	A	*								
	- MACHINE		A	11	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	11	1	LOT				65,000 \$	65,000 \$	14200
	- CONTROLLER GROUP		A	11	1	LOT				- \$	- \$	14200
	- EQUIPMENT RACK		A	11	1	LOT				25,000 \$	25,000 \$	14200
	- SIGNALLING		A	11	1	LOT				25,000 \$	25,000 \$	14200
	- CAB		A	11	1	LOT				25,000 \$	25,000 \$	14200
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	11	1	INCLUDED				- \$	- \$	14200
	<b>ELEVATOR No 12</b>	160,000 \$	A	*								
	- MACHINE		A	12	1	LOT				20,000 \$	20,000 \$	14200
	- CONTROLLER		A	12	1	LOT				65,000 \$	65,000 \$	14200
	- CONTROLLER GROUP		A	12	1	LOT				- \$	- \$	14200
	- EQUIPMENT RACK		A	12	1	LOT				25,000 \$	25,000 \$	2/5 14200



DETAILS OF LEVEL V - WITHOUT OPTIONS										Calculs Controls		
Estimation Class C										MASTERFORMAT - \$		
Title: Project brief for Elevators Reconditioning at CGF										CONTROLE - \$		
Project Number: PWS-CG-R-002079.036										LOT - \$		
Revision 0 - 2012-12-20										DISCIPLINES - \$		
Prepared by: Claude Gagnon										SUMMARY - \$		
Approved by: Roberto Bianchini										DETAILS		
TOTAL A + B + C + D + E + F + G												
UNIFORMAT #	DESCRIPTION	UNIT	QTY	UNIT PRICE	PRICE	LOT	QTY	UNIT PRICE	TOTAL	MASTERFORMAT		
	- SIGNALLING		A	12	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	12	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	12	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 13</b>		A	*								
	- MACHINE		A	13	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	13	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	13	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	13	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	13	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	13	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	13	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 14</b>		A	*								
	- MACHINE		A	14	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	14	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	14	1	LOT		20,000 \$	20,000 \$	14200		
	- EQUIPMENT RACK		A	14	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	14	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	14	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	14	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 15</b>		A	*								
	- MACHINE		A	15	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	15	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	15	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	15	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	15	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	15	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	15	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 16</b>		A	*								
	- MACHINE		A	16	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	16	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	16	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	16	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	16	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	16	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	16	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 17</b>		A	*								
	- MACHINE		A	17	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	17	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	17	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	17	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	17	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	17	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	17	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 18</b>		A	*								
	- MACHINE		A	18	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	18	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	18	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	18	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	18	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	18	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	18	1	INCLUDED		- \$	- \$	14200		
	<b>ELEVATOR No 19</b>		A	*								
	- MACHINE		A	19	1	LOT		20,000 \$	20,000 \$	14200		
	- CONTROLLER		A	19	1	LOT		65,000 \$	65,000 \$	14200		
	- CONTROLLER GROUP		A	19	1	LOT		- \$	- \$	14200		
	- EQUIPMENT RACK		A	19	1	LOT		25,000 \$	25,000 \$	14200		
	- SIGNALLING		A	19	1	LOT		25,000 \$	25,000 \$	14200		
	- CAB		A	19	1	LOT		25,000 \$	25,000 \$	14200		
	- COMPLIANCE / UNIVERSAL ACCESS / CODE ELEVATOR	INCLUDED	A	19	1	INCLUDED		- \$	- \$	14200		
D20	<b>PLUMBING</b>		*	*	0	m2			16,000 \$	*		
D2030	<b>SANITARY WASTE</b>		*	*	3	LOT		6,203.33 \$	16,000 \$	*		
D203001	<b>SANITARY WASTE</b>		*	*	9	LOT		4,500.00 \$	13,500 \$	*		
	DRAINAGE WELL LIFT No. 3 and 5 - PUMP AND PIPES		M	5	1	lot		6,500.00 \$	6,500 \$	15400		
	DRAINAGE WELL ELEVATOR # 6 - PUMP AND PIPES		M	6	1	lot		3,500.00 \$	3,500 \$	15400		
	PROTECTION FAULT WITH DRAIN UPPER ROOM - ELEVATOR MECHANICS 1 & 2		M	20	1	lot		3,500.00 \$	3,500 \$	15400		
D203005	<b>CALORIFUGAGE</b>		*	*	1	LOT		2,500.00 \$	2,500 \$	*		
	- INSULATION NEW FANS		M	20	1	LOT		2,500.00 \$	2,500 \$	15400		
D3040	<b>HAVAC</b>		*	*	0	m2			61,200 \$	*		
D304001	<b>AIR DISTRIBUTION SYSTEM</b>		*	*	0	m2			61,200 \$	*		
	- ALLOWANCE FOR CHANGE OF VENTILATION LOCAL ADJACENT		M	4	1	LOT		25,000.00 \$	25,000 \$	15800		
	- HEATING AND VENTILATION CONTROL ROOM		M	20	9	LOT		5,500.00 \$	16,500 \$	15800		



DETAILS OF LEVEL V - WITHOUT OPTIONS										Calculs Controls		
Estimation Class C										MASTERFORMAT		
Title: Project brief for Elevators Reconditioning at CGF										CONTROL		
Project Number: PWS-CG-R-002079.036										LOT		
Revision 0 - 2012-12-20										DISCIPLINES		
Prepared by: Claude Gagnon										SUMMARY		
Approved by: Roberto Bianchini										DETAILS		
TOTAL A + B + C + D + E + F + G												
UNIFORMAT #	DESCRIPTION	Length	sq ft	sq ft	UNITS	PROF	LOT	Gr	UNITS	\$ / UNIT	TOTAL	MASTERFOR
	- SHUTTER FIRE NO ELEVATOR 5				UN	M	5	1	UN	1,000.00 \$	1,000 \$	15000
	- SHUTTER FIRE NO ELEVATOR 7				UN	M	7	1	UN	1,000.00 \$	1,000 \$	15000
	- FILTER CHANGE ROOM MECHANICAL - ELEVATOR 1				UN	M	1	1	UN	250.00 \$	250 \$	15000
	- FILTER CHANGE ROOM MECHANICAL - ELEVATOR 2				UN	M	2	1	UN	350.00 \$	350 \$	15000
	- FILTER CHANGE ROOM MECHANICAL - ELEVATOR 7				UN	M	7	1	UN	350.00 \$	350 \$	15000
	- FAN TO CHANGE ROOM - ELEVATOR MECHANICAL 1 CONTROL INCLUDED, CONNECTION				UN	M	1	1.0	UN	5,000.00 \$	5,000 \$	15000
	- FAN TO CHANGE ROOM - ELEVATOR MECHANICAL 2 CONTROL INCLUDED, CONNECTION				UN	M	1	0.5	UN	5,000.00 \$	2,500 \$	15000
	- FAN TO CHANGE ROOM - ELEVATOR MECHANICAL 2 CONTROL INCLUDED, CONNECTION				UN	M	2	0.5	UN	5,000.00 \$	2,500 \$	15000
	- CLEAN VENTS - ELEVATOR MECHANICAL ROOM NO 3				LOT	M	3	1	LOT	350.00 \$	350 \$	15000
	- CLEAN VENTS - ELEVATOR MECHANICAL ROOM NO 5				LOT	M	5	1	LOT	350.00 \$	350 \$	15000
	- CLEAN VENTS - ELEVATOR MECHANICAL ROOM NO 6				LOT	M	6	1	LOT	350.00 \$	350 \$	15000
	- CLEAN VENTS - ELEVATOR MECHANICAL ROOM NO 7				LOT	M	7	1	LOT	350.00 \$	350 \$	15000
	- FILTER CHANGE ROOM MECHANICAL - LIFT NO 6				UN	M	6	1	UN	350.00 \$	350 \$	15000
	- CHANGING ROOM MECHANICAL FAN - NO LIFT 6				UN	M	6	1	UN	5,000.00 \$	5,000 \$	15000
D40	<b>FIRE PROTECTION</b>					*	*	27	sq2	94.44 \$	2,550 \$	*
D4010	<b>FIRE PROTECTION SPRINKLER SYSTEM</b>					*	*	27	sq2	94.44 \$	2,550 \$	*
D401001	<b>FIRE PROTECTION SPRINKLER SYSTEM</b>					*	*	27	m2	94.44 \$	2,550 \$	*
	- ADD A CAPTION ALL SPRINKLER HEADS IN ALL ROOMS OF MECHANICAL				UN	M	20	25	UN	50.00 \$	1,250 \$	15000
	- MODIFICATION FOR EXPANSION OF SPRINKLER WELL FOR PARTS ADJACENT				UN	M	4	2	UN	650.00 \$	1,300 \$	15000
D50	<b>ELECTRICAL</b>					*	*	1	sq2	693,725.00 \$	593,725 \$	*
D5010	<b>ELECTRICAL SERVICE &amp; DISTRIBUTION</b>					*	*	1	sq2	678,725.00 \$	578,725 \$	*
D501001	<b>ELECTRICAL SERVICE &amp; DISTRIBUTION</b>					*	*	1	m2	578,725.00 \$	578,725 \$	*
	- AMENDMENT OF LIGHT WELL ASC No. 4				LOT	E	4	1	LOT	4,500.00 \$	4,500 \$	16400
	- TAKEN TO UTILITIES RELOCALISER ASC No. 4				LOT	E	4	1	LOT	1,250.00 \$	1,250 \$	16400
	- CHANGE POWER HOUR FIRE 2 S.ELECT AND BETWEEN S. MECH. ASC. 3				sq	E	3	300	sq	25.00 \$	75,000 \$	16400
	- CHANGE POWER HOUR FIRE 2 S.ELECT AND BETWEEN S. MECH. ASC. 6				sq	E	5	300	sq	25.00 \$	75,000 \$	16400
	- GROUNDING AND DISCONNECT No. 5				LOT	E	5	1	LOT	5,500.00 \$	5,500 \$	16400
	- NEW START FOR ELEVATOR No. 6				UN	E	6	1	UN	1,500.00 \$	1,500 \$	16400
	<b>30mm CONDUIT FOR GENERATOR OF pesignal</b>					E						*
	- TWO CONDUCTORS IN PIPES ASC No1				sq	E	1	50	sq	75.00 \$	3,750 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No2				sq	E	2	50	sq	75.00 \$	3,750 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No3				sq	E	3	175	sq	75.00 \$	13,125 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No4				sq	E	4	50	sq	75.00 \$	3,750 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No5				sq	E	5	100	sq	75.00 \$	7,500 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No6				sq	E	6	50	sq	75.00 \$	3,750 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No7				sq	E	7	150	sq	75.00 \$	11,250 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No9				sq	E	9	35	sq	75.00 \$	2,625 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No10				sq	E	10	35	sq	75.00 \$	2,625 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No11				sq	E	11	35	sq	75.00 \$	2,625 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No12				sq	E	12	35	sq	75.00 \$	2,625 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No13				sq	E	13	35	sq	75.00 \$	2,625 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No14				sq	E	14	350	sq	75.00 \$	28,250 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No15				sq	E	15	400	sq	75.00 \$	30,000 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No16				sq	E	16	400	sq	75.00 \$	30,000 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No17				sq	E	17	400	sq	75.00 \$	30,000 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No18				sq	E	18	400	sq	75.00 \$	30,000 \$	16400
	- TWO CONDUCTORS IN PIPES ASC No19				sq	E	19	400	sq	75.00 \$	30,000 \$	16400
	<b>ADRESSABLE MODULE FOR EACH OF LIFTS</b>					E						*
	- ELEVATOR MODULE ADDRESSABLE No1				UN	E	1	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No2				UN	E	2	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No3				UN	E	3	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No4				UN	E	4	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No5				UN	E	5	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No6				UN	E	6	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No7				UN	E	7	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No9				UN	E	9	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No10				UN	E	10	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No11				UN	E	11	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No12				UN	E	12	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No13				UN	E	13	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No14				UN	E	14	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No15				UN	E	15	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No16				UN	E	16	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No17				UN	E	17	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No18				UN	E	18	1	UN	250.00 \$	250 \$	16400
	- ELEVATOR MODULE ADDRESSABLE No19				UN	E	19	1	UN	250.00 \$	250 \$	16400
	<b>CHANGE MANAGEMENT UTILITY IN THE WELL EACH ELEVATOR</b>					E						*
	- CHANGE DECISIONMAKING REGULAR PROTECT FOR ASC No. 1				UN	E	1	1	UN	125.00 \$	125 \$	16400
	- CHANGE DECISIONMAKING REGULAR PROTECT FOR ASC No. 2				UN	E	2	1	UN	125.00 \$	125 \$	16400
	- CHANGE DECISIONMAKING REGULAR PROTECT FOR ASC No. 3				UN	E	3	1	UN	125.00 \$	125 \$	16400



DETAILS OF LEVEL V - WITHOUT OPTIONS										Calculs Controls		
Estimation Class C										MASTERFORMAT - \$		
Title: Project brief for Elevators Reconditioning at CGF										CONTROLE - \$		
Project Number: PWS-G-R.002079.036										LOT - \$		
Revision 0 - 2012-12-20										DISCIPLINES - \$		
Prepared by: Claude Gagnon										SUMMARY - \$		
Approved by: Roberto Bianchini										DETAILS		
TOTAL A + B + C + D + E + F + G												
UNIFORMAT #	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL PRICE	PROF	LOT	QTY	UNITS	\$ / UNIT	TOTAL	MASTERFORMAT
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 5	E	5	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 6	E	6	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 7	E	7	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 9	E	9	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 10	E	10	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 11	E	11	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 12	E	12	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 13	E	13	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 14	E	14	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 15	E	15	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 16	E	16	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 17	E	17	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 18	E	18	1	UN					125.00 \$	125 \$	16400
	- CHANGE DECISION MAKING REGULAR PROTECT FOR ASC No. 19	E	19	1	UN					125.00 \$	125 \$	16400
	<b>GROUND LIFT 14 @ 19 + MECHANICAL ROOM</b>	E										*
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 1 & 2	E	1	180	mi					20.00 \$	3,200 \$	16400
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 3, 9 @ 10	E	1	210	mi					20.00 \$	4,200 \$	16400
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 4	E	1	80	mi					20.00 \$	1,600 \$	16400
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 7	E	1	100	mi					20.00 \$	2,000 \$	16400
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 6	E	1	80	mi					20.00 \$	1,600 \$	16400
	- GROUNDING AND ELEVATOR MECHANICAL ROOM 5, 14 @ 19	E	1	150	mi					20.00 \$	3,000 \$	16400
	<b>50mm CONDUIT FOR ACCESS CONTROL</b>	E										*
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No1	E	1	50	mi					100.00 \$	5,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No2	E	2	50	mi					100.00 \$	5,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No3	E	3	100	mi					100.00 \$	10,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No5	E	5	100	mi					100.00 \$	10,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No6	E	6	50	mi					100.00 \$	5,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No7	E	7	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No9	E	9	35	mi					100.00 \$	3,500 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No10	E	10	35	mi					100.00 \$	3,500 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No11	E	11	35	mi					100.00 \$	3,500 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No19	E	19	35	mi					100.00 \$	3,500 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No13	E	13	35	mi					100.00 \$	3,500 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No14	E	14	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No15	E	15	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No16	E	16	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No17	E	17	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No18	E	18	150	mi					100.00 \$	15,000 \$	16400
	- TWO CONDUCTORS IN PIPES FOR ELEVATOR No19	E	19	150	mi					100.00 \$	15,000 \$	16400
D02002	<b>DECORATIVE LIGHTING EQUIPMENT</b>	E	*	*	m2						15,000 \$	*
	ELEVATOR # 4 - ADD LIGHTING AND interrupter	E	4	1	UN					15,000.00 \$	15,000 \$	16400
		E	*	*								*
F	<b>SPECIAL CONSTRUCTION AND DEMOLITION</b>										51,525 \$	*
F20	<b>BUILDING ELEMENTS DEMOLITION</b>									393.32 \$	51,525 \$	*
F2010	<b>BUILDING ELEMENTS DEMOLITION</b>									393.32 \$	51,525 \$	*
F201001	<b>BUILDING ELEMENTS DEMOLITION</b>									393.32 \$	51,525 \$	*
	<b>2 - DEMOLITION FOR NEW ELEVATOR No. 7</b>									1,717.50 \$	51,525 \$	*
	- CONCRETE WALL TO REMOVE	S	4	30	HRES					382.50 \$	11,475 \$	2050
	- TEMPORARY SUPPORT	S	4	1	LOT					5,000.00 \$	5,000 \$	2050
	- BREAK WALL	S	4	60	HRES					382.50 \$	22,560 \$	2050
	- CONTAINER	S	4	2	LOT					650.00 \$	1,300 \$	2050
	- TEMPORARY PARTITION	S	4	1	LOT					10,000.00 \$	10,000 \$	2050



12



**12. MAINTENANCE PROGRAM**

**12.1 Analysis of Current Maintenance Contract**

The existing maintenance contract is in force since the original installation. It's a full maintenance type of contract. The frequency of inspections is as follows: Group 1 elevators: Weekly / Group 2 elevators: every 2 weeks. The groups are defined as follows:

- Group 1: Elevators No. 3, 5, 9 à 19.
- Group 2: Elevators No. 1, 2, 4, 7 and Freight No. 6.

The current maintenance contract costs, as provided by the operator, are as follows:

- Monthly maintenance: 14 500,34\$ X 12 months = 174 004,08\$
- Quarterly maintenance: 1 746,50\$ X 4 months = 6 986,00\$
- Monthly maintenance 3 et 5: 402.58\$ X 12 months = 4 830,96\$
- The estimated cost for the complete elevator maintenance service after modernization would be as follows:

Elevator		Monthly cost
1 & 2	375 \$ x 2	750 \$
3	625 \$	625 \$
4	375 \$	375 \$
5	625 \$	625 \$
6	375 \$	375 \$
7	375 \$	375 \$
9 @ 19	625 \$ x 11	6 878 \$
	Total (monthly):	10 000 \$
	<b>Total (annual) :</b>	<b>120 000 \$</b>

- The estimated cost for the complete elevator maintenance service during modernization work would be similar to the cost after modernization increased by 5%. These maintenance costs should however be included in the modernization contract to facilitate its management
- The following table summarizes the maintenance costs before and after modernization

	BEFORE modernization	AFTER modernization
<b>Total (annual):</b>	<b>185 821 \$</b>	<b>120 000 \$</b>

## 12.2 PROPOSED MAINTENANCE PROGRAM

The maintenance program shall be prepared and sealed by an engineer member of the Ordre des Ingénieurs du Québec (OIQ).

We recommend removing the responsibility for the maintenance of existing elevators to the current contractor at the beginning of the modernization work, or some months before. The elevator maintenance during the period of modernization should be done by the contractor responsible of the elevators modernization.

Provide a full maintenance service including periodic preventive inspections, callback and repair service in case of breakdowns as well as parts and labour for repairs or replacements. At a minimum, the maintenance service must comply with the requirements of Section 8.6 of ASME A17.1-2010/CSA B44-10 code and the requirements and intervals for elevators, dumbwaiter, escalators and moving walkway CSA B44.2-10.

Provide inspection frequencies for each following groups: Group 1 elevators: Weekly / Group 2 elevators: every 2 weeks. Groups being defined as follow:

- Group 1: Elevators No. 3, 5, 9 to 19.
- Group 2 : Elevators No. 1, 2, 4, 7 and Freight No. 6.

Maintenance logbook clean and up to date should be stored in machine rooms, comprising for each visits of the date and time of arrival, purpose and a brief description of the work undertaken, details of tests and inspections. Always keep the activities of the last five years in the registry. Include in the maintenance logbook schedules routine work required as part of preventive maintenance.

A detailed monthly report on service calls and other interventions on the equipment should be presented to the operator. Schedule a meeting with the operator as needed to discuss the report and activities that relate to maintenance.

A detailed annual report on the condition of the main components of the equipment must be presented to the operator. Schedule an annual meeting with the operator to discuss the report and activities that relate to maintenance.

The items covered by the maintenance program should include, but not limited to, the following components:

- Controller including all the relays, semiconductors, resistances, condensers, transformers, contacts, conductors, control potentiometers, computer components and traveling cable.
- Selector and dispatch equipment including selector steel tape and the mechanical and electric driving equipment.
- Hoistway equipments including platform and counterweights, buffers, guide rails, superior and inferior terminal stopping devices.

- Hall and car fixtures including pushbutton, key-operated switches and direction & position lantern indicators.
- Hall door equipments including locks, door suspension, door guides and door closing devices as well as all the door open safety devices.
- Car door equipments including door operator, door suspension, door guides, keys, motors, coupling arms, cams and contacts.
- Platform equipments including the frame, weight detector, safeties, shoe or roller guides.
- Speed governor and ropes including sheave, shaft, bearings, contacts and jaws.
- Return sheaves, secondary sheave, governor tension pulley, compensation sheave and related bearings.
- Machines and ropes including traction sheave, worms, gears, reducer, driving shaft and enclosure
- Brake including brake pad and drum, brake coils and brake contacts.
- Motor and generator including motor winding, rotating parts, commutator, brushes, brush holders and bearings.
- Auxiliary brake system
- Cab fan and emergency lighting system.
- Communication system.
- Computerized central console, control console for special operations and building communication system.

The following components should be the responsibility of the owner:

- Cab enclosure including floor covering, suspended ceiling, lighting, handrails, removable panels, door panels, mirrors or any other ornamental elements and car door sill.
- Hoistway enclosure including doors and hall barriers, door frame and hall door sill.
- Main disconnects and fuses, secondary disconnect, building emergency power and emergency power inverters.
- Any damages due to vandalism acknowledged by the owner

Callback and repair service in case of breakdowns must be included in the maintenance program. A telephone service for incoming calls must be ensured at all times. Include service calls during regular hours. Include emergency services calls in the following cases: Ensure emergency service 24/24 in the case, but without limitation, if a person is trapped in an elevator, a simplex elevator is out of service or a simultaneous breakdowns of the elevators within a group.



# Annexe A



## **Appendix A**

### Technical Data Sheets of Existing Elevators and Photographs



**ELEVATORS # 1-2**

Car number :	1, 2
Elevator type :	Passenger
Installation date :	1982
Modernization date :	NA
Floor served :	3 stops : S2, 00, 01
Rated speed :	1.0 m / s
Capacity :	1135 kg
Machine manufacturer :	DOVER
Machine type :	Geared traction machine (basement)
Machine model :	GD-105
Motor manufacturer :	BULL
Motor type :	DC, 15HP, 1150 RPM, 240 V, 53.3 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Duplex
Controller model :	XA-VVG
Hoisting ropes :	3 of 12.7 mm
Other device :	Auxiliary emergency brake
Door type :	Central opening / (1) speed
Door dimensions :	42" X 84"
Hall entrances fire rating :	ULC 1h1/2

**Car equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided

**Equipment**

Emergency light	Provided
Door protection system	Infrared
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	Slide
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided

**Equipment**

Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided – S2
Electrical access	Provided – 00

PICTURES – ELVEVATORS 1-2



Machine



Machine



Machine



Machine



Generator



Car bottom



Controller



Car top controller

PICTURES – ELVEVATORS 1-2



Door equipments



Door equipments



Control panel



Control panel



Cab interiors



Cab interiors



Hall entrance



Hall fixtures

**ELEVATOR # 3**

Car number :	3
Elevator type :	Passenger / services
Installation date :	1982
Modernization date :	NA
Floor served :	13 stops : S1, 00, 1 @ 11
Rated speed :	1.75 m / s
Capacity :	1800 kg
Machine manufacturer :	DOVER
Machine type :	Geared traction machine (on the side)
Machine model :	3C
Motor manufacturer :	BULL
Motor type :	DC, 30KW, 1770 RPM, 240 V, 125 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Simplex
Controller model :	XA-VVG
Hoisting ropes :	4 of 12.7 mm
Other device :	Auxiliary emergency brake
Door type :	Central opening / (2) speeds
Door dimensions :	48" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	Provided
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided

**Equipment**

Emergency light	Provided
Door protection system	Infrared
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	Rollers
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

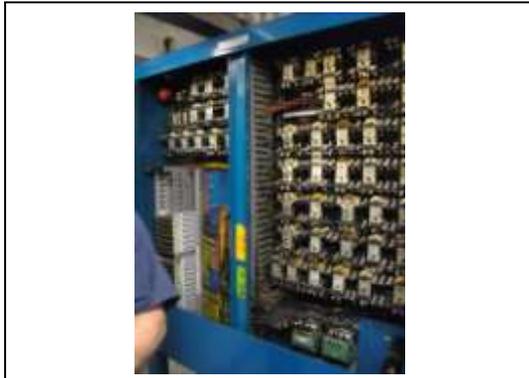
**Fixture**

Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided

**Equipment**

Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided – S1
Electrical access	Provided – 00

PICTURES – ELVEVATOR 3



Controller



Controller



Machine



Machine



Auxiliary emergency brake



Hoistway top sheave



Machine room



Machine room

PICTURES – ELVEVATOR 3



Control panel



Cab interiors



Cab interiors



Cab interiors (plafond)



Hall entrance



Hall fixtures



Pit



Level S2

**ELEVATOR # 4**

Car number :	4
Elevator type :	Passenger
Installation date :	1982
Modernization date :	NA
Floor served :	2 stops : tunnel (S1), 00
Rated speed :	0.625 m / s
Capacity :	900 kg
Machine manufacturer :	DOVER
Machine type :	Hydraulic
Manufacturier de l'unité de pompage :	DOVER
Type de l'unité de pompage :	Dry unit
Modèle de valve :	DOVER
Motor manufacturer :	US Motor
Motor type :	AC, 25 HP, 2000 RPM, 575 V, 34.5A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Simplex
Controller model :	
Door type :	Central opening / (1) speed
Door dimensions :	36" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided

**Equipment**

Emergency light	Provided
Door protection system	Infrared
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	slide
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided

**Equipment**

Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided
Electrical access	

PICTURES – ELVEVATOR 4



Controller



Machine



Valve



Door equipments



Door equipments



Door equipments



Car top



Door operator

PICTURES – ELVEVATOR 4



Control panel



Control panel



Cab interiors



Cab interiors



Hall entrance



Hall entrance



Hall fixtures



Pit

**ELEVATOR # 5**

Car number :	5
Elevator type :	Passenger / services
Installation date :	1982
Modernization date :	NA
Floor served :	15 stops : S1, 00, 1 @ 13
Rated speed :	1.75 m / s
Capacity :	1800 kg
Machine manufacturer :	DOVER
Machine type :	Geared traction machine (on the side)
Machine model :	3C
Motor manufacturer :	BULL
Motor type :	DC, 30KW, 1770 RPM, 240 V, 125 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Simplex
Controller model :	XA-VVG
Hoisting ropes :	4 of 12.7 mm
Other device :	Auxiliary emergency brake
Door type :	Central opening / (2) speeds
Door dimensions :	48" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	Provided
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided

**Equipment**

Emergency light	Provided
Door protection system	Infrared
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	Rollers
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

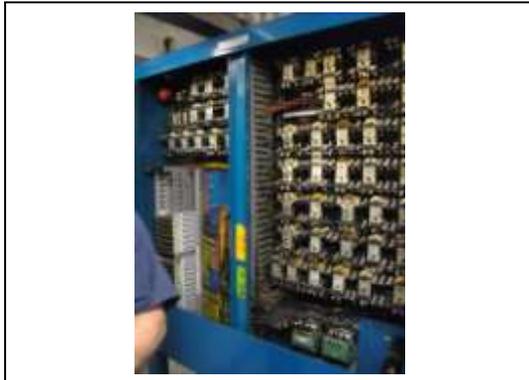
**Fixture**

Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided

**Equipment**

Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided – S1
Electrical access	Provided – 00

PICTURES – ELVEVATOR 5



Controller



Controller



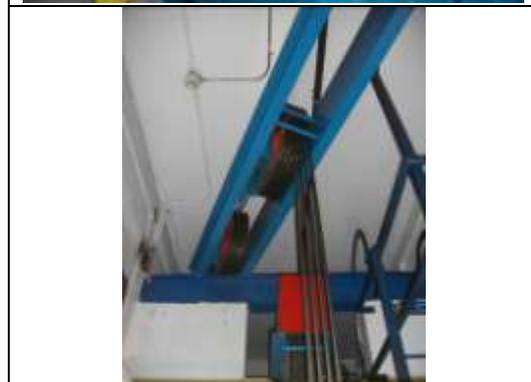
Machine



Machine



Auxiliary emergency brake



Hoistway top sheave



Machine room



Machine room

PICTURES – ELVEVATOR 5



Control panel



Cab interiors



Cab interiors



Cab interiors



Hall entrance



Hall fixtures

**ELEVATOR # 6**

Car number :	6
Elevator type :	Monte-charge
Installation date :	1982
Modernization date :	NA
Floor served :	Front : 2 stops : S1, 00 Rear : 1 stop : 00
Rated speed :	0.4 m / s
Capacity :	2720 kg
Machine manufacturer :	DOVER
Machine type :	Hydraulic
Manufacturier de l'unité de pompage :	DOVER
Type de l'unité de pompage :	Dry unit
Modèle de valve :	DOVER
Motor manufacturer :	US Motor
Motor type :	AC, 40 HP, 575 V, 40.4 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Simplex
Controller model :	
Porte de cabine :	Vertical opening (1 section) wire mesh
Portes palières :	Bi-parting vertical opening
Door dimensions :	+/- 80" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Témoin Analog
Communication system	Provided
<b><u>Equipment</u></b>	
Emergency light	Provided
Door protection system	Infrared
Handrail	2 sides
Handrail height	Conform
Door operators	Peelle
Interlock	Peelle
Car guides	slide
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided
<b><u>Equipment</u></b>	
Interlock	Peelle
Hall door track	Peelle
Mechanical access	Provided
Electrical access	

PICTURES – ELVEVATOR 6



Controller



Door controller



Machine



Valve



Door equipments



Car top



Control panel



Cab interiors

PICTURES – ELVEVATOR 6



Cab interiors



Cab interiors



Hall fixtures



Hall fixtures



Hall entrance



Pit

**ELEVATOR # 7**

Car number :	7
Elevator type :	Passenger
Installation date :	1982
Modernization date :	NA
Floor served :	2 stops : tunnel (S1), 00
Rated speed :	0.625 m / s
Capacity :	900 kg
Machine manufacturer :	DOVER
Machine type :	Hydraulic
Manufacturier de l'unité de pompage :	DOVER
Type de l'unité de pompage :	Dry unit
Modèle de valve :	DOVER
Motor manufacturer :	US Motor
Motor type :	AC, 25 HP, 2000 RPM, 575 V, 34.5A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	Simplex
Controller model :	
Door type :	Central opening / (1) speed
Door dimensions :	36" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

**Fixture**

Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided

**Equipment**

Emergency light	Provided
Door protection system	Infrared
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	slide
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

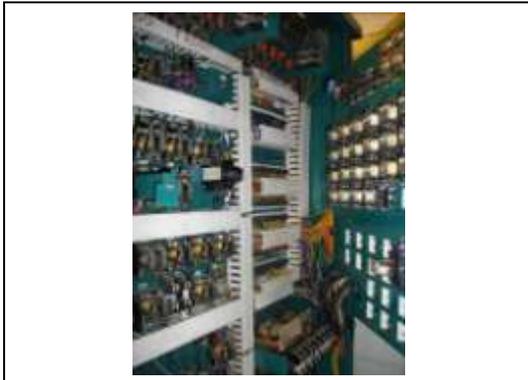
**Fixture**

Position indicator	Analog
Direction lantern	
Gong	
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided

**Equipment**

Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided
Electrical access	

PICTURES – ELVEVATOR 7



Controller



Machine



Motor



Valve



Door equipments



Door operator



Door operator



Inspection unit

PICTURES – ELVEVATOR 7



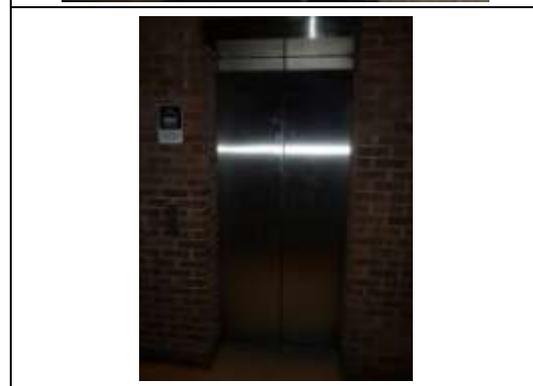
Control panel



Control panel



Cab interiors



Hall entrance



Hall fixtures



Pit

**ELEVATORS # 9-10-11-12-13 (TOWER OUEST)**

Car number :	9, 10, 11, 12, 13
Elevator type :	Passenger
Installation date :	1982
Modernization date :	NA
Floor served :	10 stops : 1 to 10
Rated speed :	2.5 m / s
Capacity :	1815 kg
Machine manufacturer :	DOVER
Machine type :	Gearless traction machine
Machine model :	D405
Motor manufacturer :	BULL
Motor type :	DC, 42.4 HP, 174 RPM, 203 V, 127 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	5-plex
Controller model :	T2000-1C
Hoisting ropes :	6 of 12.7 mm
Other device :	Auxiliary emergency brake
Door type :	Central opening / (1) speed
Door dimensions :	48" X 84"
Hall entrances fire rating :	ULC 1h/2

**Car equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided
<b><u>Equipment</u></b>	
Emergency light	Provided
Door protection system	Safety edge with photo cell
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	Rollers
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	Provided
Gong	Provided
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided
<b><u>Equipment</u></b>	
Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided
Electrical access	Provided

PICTURES – ELVEVATORS 9-10-11-12-13 (WEST TOWER)



Controller



Controller / machine



Machine



Controller



Controller



Dispatch



Machine



Governor

PICTURES – ELVEVATOR 9-10-11-12-13 (WEST TOWER)



Door operator



Door equipments



Door equipments



Door equipments



Door equipments



Door equipments

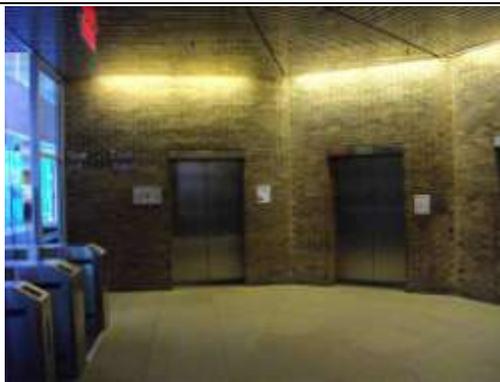


Door equipments



Car top

PICTURES – ELVEVATOR 9-10-11-12-13 (WEST TOWER)

	<p>Control panel</p>		<p>Control panel</p>
	<p>Cab interiors</p>		<p>Hall entrance</p>
	<p>Hall entrance</p>		<p>Hall fixtures</p>
	<p>Pit</p>		<p>Pit</p>

**ELEVATORS # 14-15-16-17-18-19 (TOWER EST)**

Car number :	14, 15, 16, 17, 18, 19
Elevator type :	Passenger
Installation date :	1982
Modernization date :	NA
Floor served :	12 stops : 1 to 12
Rated speed :	2.5 m / s
Capacity :	1815 kg
Machine manufacturer :	DOVER
Machine type :	Gearless traction machine
Machine model :	D405
Motor manufacturer :	BULL
Motor type :	DC, 42.4 HP, 174 RPM, 203 V, 127 A
Controller manufacturer :	DOVER
Controller type :	solid state
Dispatch :	6-plex
Controller model :	T2000-1C
Hoisting ropes :	6 of 12.7 mm
Other device :	Auxiliary emergency brake
Door type :	Central opening / (1) speed
Door dimensions :	48" X 84"
Hall entrances fire rating :	ULC 1h1/2

**Car equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	
Arrival gong	Provided
Floor gong	
Voice synthesizer	
Car station height	Conform
Car station pushbuttons	Dover
Braille	Not provided
Independant service	Provided
Emergency In-Car Operation	Provided (B44-85)
Communication system	Provided
<b><u>Equipment</u></b>	
Emergency light	Provided
Door protection system	Safety edge with photo cell
Handrail	3 sides
Handrail height	Conform
Door operators	Dover
Interlock	Dover
Car guides	Rollers
Inspection unit (top of car)	Conform
Refuge area	Provided

**Hall equipment description**

<b><u>Fixture</u></b>	
Position indicator	Analog
Direction lantern	Provided
Gong	Provided
Car station height	Conform
Car station pushbuttons	Dover
Braille	
Fire recall	Provided (B44-85)
Emergency power	Provided
<b><u>Equipment</u></b>	
Interlock	Dover
Hall door track	Dover / integral
Door closer	Weight
Door fire pin	Bottom & top
Mechanical access	Provided
Electrical access	Provided

PICTURES – ELVEVATORS 14-15-16-17-18-19 (EAST Tower)



Controller



Controller / machine



Machine



Controller



Controller



Dispatch



Machine



Machine

PICTURES – ELVEVATORS 14-15-16-17-18-19 (EAST Tower)



Door operator



Door equipments



Door equipments



Door equipments



Door equipments



Door equipments



Door equipments

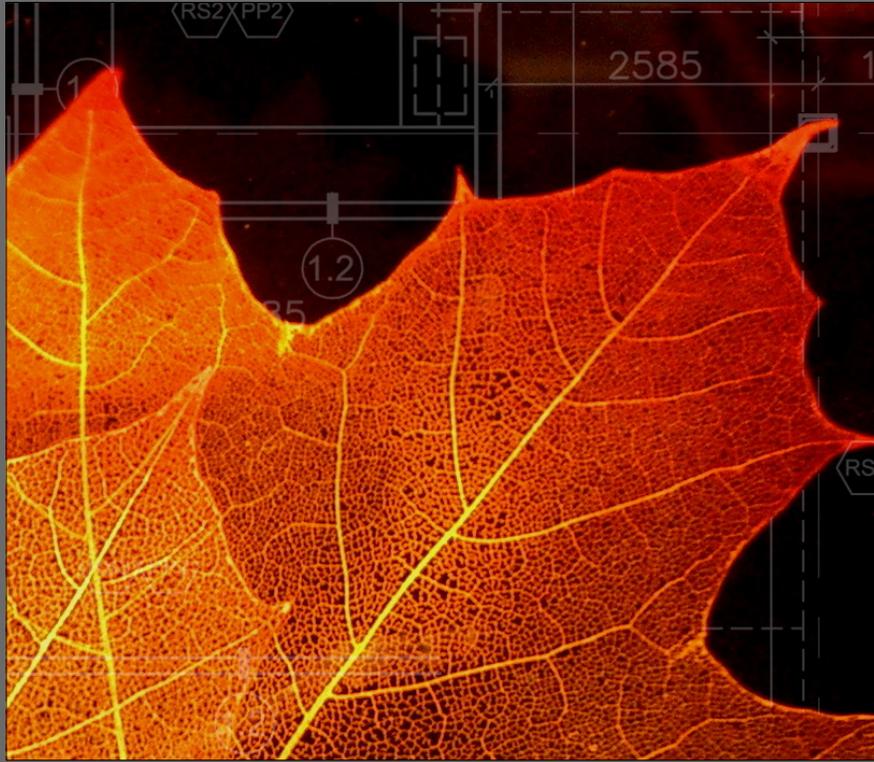


Car top

PICTURES – ELVEVATORS 14-15-16-17-18-19 (EAST Tower)

	<p>Control panel</p>		<p>Control panel</p>
	<p>Cab interiors</p>		<p>Hall entrance</p>
	<p>Hall entrance</p>		<p>Hall fixtures</p>
	<p>Pit</p>		<p>Pit</p>





n/d 111212

# BISSON\_FORTIN

ARCHITECTURE + DESIGN

2555, Le Corbusier Blvd., suite 200 | Laval | Quebec | H7S 1Z4

T 450.682.6360

F 450.682.1751

[www.bissonfortin.ca](http://www.bissonfortin.ca)

