

FINANCIAL FEASIBILITY ANALYSIS FOR AN OFFICE BUILDING



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ABSTRACT

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This report deals with financial feasibility analysis as applied to an office building project. The emphasis is placed on development and application to a real life project. The process developed can be applied to other types of building projects, with little or no modification. The structure of the report is as follows:

- Chapters 1 and 2 identify the users and the problem types and develop methodology for the financial feasibility analysis. They contain a brief discussion on various elements of the analysis: capitalized cost, operating revenue, operating expenses and evaluation criteria.
- Chapters 3 and 4 deal with a case study of an office and garage building for a hospital in Montreal. They demonstrate application of financial feasibility analysis and sensitivity analysis to the given case study.

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v

TABLE OF CONTENTS

	PAGE	
Title Page	i	
Signature Page	ii	
Abstract	iii	
Acknowledgement	iv	
Table of Contents	v	
List of Tables	viii	
List of Figures and Illustrations	ix	
<hr/>		
Chapter 1	Introduction and General Information About the Report	1
1.1	The Purpose and Theme of the Report	2
1.2	Financial Feasibility Analysis	2
1.3	Functional Classification of Office Buildings	3
1.4	The Users and Problem Type	5
1.5	Methodology	7
1.6	Brief Description of the Chapters	8
Chapter 2	Financial Feasibility Analysis	9
2.1	Procedure	10
2.2	Capitalized Cost	12
2.3	Rental Revenue	17
2.4	Operating Expenses	23

2.5	Financing and Debt Service	31
2.6	Taxes and After Tax Cash Flow	36
2.7	Evaluation Criteria and Measures of Return	45
2.8	Sensitivity Analysis	50
2.9	Risk Analysis	50
Chapter 3	Case Study	54
3.1	Introduction	55
3.2	Objectives	57
3.3	Constraints	58
3.4	Physical Description of the Project	59
3.5	Areas and Space Use Per Floor	61
3.6	Capital Cost: Cost Estimate and Cash Flow During Construction	63
3.7	Operating Revenue	70
3.8	Operating Expenses	79
3.9	Financing	91
3.10	Income Taxes	93
3.11	Summary of Costs, Revenues, Expenses And Debt Service	94
3.12	Annual Cash Flow	95
Chapter 4	Sensitivity Analysis and Conclusions	96
4.1	Sensitivity Analysis for the Case Study	97
4.2	Break Even Rent	98
4.3	Conclusion	101

Appendix A	Architectural Plans of Ross Road Office and Garage	104
Appendix B	Calculations For the Sensitivity Analysis	114
Appendix C	Capital Cost Allowance: Prescribed Classes and Rates	126
	Income Tax Act: Costs of Disposition of Depreciable Property	129
References		133
Bibliography		135

LIST OF TABLES

	<u>PAGE</u>
1 Total Capitalized Cost	16
2 Projected Revenue Statement	22
3 Statement of Projected Expenses	28
4 Statement of Loan	34
5 Pretax Cash Flow Statement	35
6 Depreciation Statement	40
7 Tax Statement	41
8 After Tax Cash Flow	42
9 Taxes upon Termination	43
10 Net Present Value	52
11 Internal Rate of Return	53
12 Construction Schedule and Cash Flow During Construction Period: Base Case	65
13 Evaluation of Market Value of Land	69
14 Office Space Rental Evaluation	74
15 Statement of Loan	92
16 Summary of Sensitivity Analysis I	99
17 Summary of Sensitivity Analysis II	100
18 Construction Schedule and Cash Flow During Construction Period: Case No. 4	116
19 Construction Schedule and Cash Flow During Construction Period: Case No. 5	119
20 Construction Schedule and Cash Flow During Construction Period: Case No. 6	123

LIST OF FIGURES
& ILLUSTRATIONS

	<u>PAGE</u>	<u>PAGE</u>
1. Comparison of Unit Operating Costs		29
2. Project Phases & Related Cash Flow		30
3. Capital Gains Tax vs. Recapture		44
4. Location Map: Property Sales - 1981		68
5. Location Map: Office Space Rental Properties		73

CHAPTER 1

INTRODUCTION

CHAPTER 1

1.0 INTRODUCTION AND GENERAL INFORMATION ABOUT THE REPORT1.1 THE PURPOSE AND THEME OF THE REPORT

The purpose of this report is to describe an application of financial feasibility analysis to office buildings. The first part of the report identifies various parameters and variables which influence the financial feasibility analysis for an office building. It develops a standard procedure for doing the financial feasibility analysis.

The second part of the report is devoted to a case study of a proposed office building project in Montreal. This case study shows an application of financial feasibility study in the preconstruction phase.

The financial feasibility analysis procedure described in this report is meant for office buildings, but it could be applied to other types of buildings with little modification.

1.2 FINANCIAL FEASIBILITY ANALYSIS

A financial feasibility study is aimed at finding out whether or not a specific project can be carried out successfully. By success it is implied a reasonable return on the capital required to be invested. Normally in the case of office buildings the capital required to carry out development involves investment at the time

of acquisition or construction and subsequent payments are expected to come out of the revenue generated by the property.

The four principal returns generated by an office building are as follows:-

- 1) Cash flows from the operation
- 2) Increase in the equity ownership by way of loan amortization
- 3) Appreciation in the value of property
- 4) Tax shelter provided by property

It is necessary to evaluate the amount and timing of these returns and compare them with the amount and timing of the total investment required to carry out a project.

A financial feasibility study, in brief, involves detailed estimate of all costs and revenues, their future trends, terms of financial arrangements, taxes, depreciation methods, minimum attractive rate of return and application of appropriate evaluation criteria.

1.3 FUNCTIONAL CLASSIFICATION OF OFFICE BUILDINGS

Office Buildings can be classified into four groups according to their functional use.

- 1) Institutional office buildings
- 2) General commercial buildings
- 3) Medical buildings
- 4) Industrial office space

4

Institutional Office Buildings:

This category of office buildings serves banks, government, hospitals and schools, mainly for their own use. Such buildings are sometimes partially rented to tenants whose needs are compatible with those of the owner of the building.

General Commercial Buildings:

This category consists of downtown single or multiple tenant office buildings or suburban office parks. They require convenient access to transportation and potential customers. Parking for employees and visitors needs to be provided. They are occupied by professional tenants and service industries.

Medical Buildings:

These types of office buildings are meant for special purpose use for medical services, supplies, pharmacies, laboratories and other medical professions. These buildings are often in close proximity to hospitals. Parking for staff and customers is very essential to offices developed for medical professional tenants.

Industrial Office Space:

These are found in industrial parks and used by distributors and manufacturers who wish to combine manufacturing with office headquarters.

1.4 THE USERS AND PROBLEM TYPE

For this report, the users of financial feasibility analysis are assumed to be owners/developers/investors and designers.

1.4.1 INVESTOR/OWNER

The goal of an investor/owner is to maximize the return on his investment while assuming minimum risks. The return in the case of an institutional owner is in terms of service he can get from the use of buildings. Investors/owners are interested in getting answers to following types of questions (12).

- 1) What is the short and long term viability of the project?
(Will he make or lose money? During what periods?)
- 2) What is the return on the investment during the period of ownership and after sale of property?
- 3) What is the margin of safety in cash flows. Will rental income cover the expenses and debt service?
- 4) Is the return commensurate with the risk involved?
- 5) What will be the value of property after a certain number of years?

1.4.2 DESIGNER

By 'designer' is meant the professional architects, engineers and planners who are consulted to develop office building projects. The designer's pre-occupation is to develop a design to satisfy the client's needs at minimum cost to the client

both at the development/construction phase and operation phase. He can use the financial feasibility analysis to deal with the following types of problems.

Choosing an Alternative:

The designer can use the financial feasibility analysis to choose an alternative which will provide the highest return to the client.. Different alternatives can also be compared on the basis of cost incurred to achieve accommodation required in an office building. This problem types are encountered in institutional and government projects where a certain project is to be carried out at least cost.

Cost-benefit Trade-offs:

Financial feasibility analysis can be used to compare different alternatives with reference to the cost of additional accommodation or certain objectives achieved by a certain alternative under consideration, e.g. - cost of a strategic and non-strategic location for an office building.

Life Cycle Cost Analysis:

Life cycle cost analysis can be done with the help of the procedure for financial feasibility analysis. It can compare alternatives with higher initial cost and lower operating costs with the ones which require lower cost initially but higher costs in operation. With the uncertainty of rising energy prices and spiralling

inflation life cycle cost analysis has become very important to keep future costs under control. The financial analysis can show that higher capital expenditure in the initial period enables the investor to benefit from greater savings in operating and maintenance costs of a building.

Economics of Scale/Phasing:

The optimum scale of an office building development occurs when it can provide highest returns on the investment. Financial feasibility analysis can determine this point of development. Large office building complexes are developed over a span of a few years. They are divided into sections for development or into different phases. This phasing of the office building project can also be determined so that the client can derive highest return over the whole period of ownership.

1.5 METHODOLOGY

The first two chapters of the report which deal with the financial feasibility analysis for office buildings were prepared with the help of a literature survey and standard practices related to the subject. They develop a procedure for the case study.

The case study in the third and fourth chapters is based on data collected by the author from the owner, the architect and other consultants involved in the design and development of the office building project under study.

1.6 BRIEF DESCRIPTION OF STRUCTURE OF THE REPORT

Chapter two identifies the parameters and variables considered in a financial feasibility analysis of an office building. It summarizes a procedure for a financial feasibility analysis and report formats and their interpretation. Chapter three is devoted to a case study of an office/garage for the Royal Victoria Hospital. This chapter shows one application of financial feasibility analysis to a real life project. Chapter four includes sensitivity analysis and conclusions to the case study.

9

CHAPTER 2

FINANCIAL FEASIBILITY ANALYSIS

METHODOLOGY

CHAPTER 2

Financial Feasibility Analysis

2.1 PROCEDURE

There are six major steps involved in the financial feasibility analysis of an office building.

- 1) Determine all construction cost items, including fees, renting expenses and interest on construction loan.

Result: Statement of total capitalized cost.

- 2) Estimate the projected income and operating expenses for up to 'n' * years in the future, depending on the investment horizon, after the building becomes operational and determine annual debt service.

Result: 1) Projected Income Statement

2) Statement of Projected Expenses

3) Statement of Loan Details

- 3) Prepare a year by year cash flow projection for 'n' years of full operation.

Result: Pretax Cash Flow Statement

- 4) Compute annual depreciation and determine the income tax liability for each year and prepare after tax cash flow year by year for 'n' years of full operation.

Result: 1) Depreciation Statement - Building

2) After tax cash flow

* In the rest of the chapter, 10 year investment horizon is used only for illustration and it may change according to the requirements of the project under consideration.

- 5) Estimate the sale price for the project at the end of the horizon; compute the capital gains tax and the cash reversion to the owner.

Result: Cash at Sale Statement

- 6) Apply various measures of evaluation of profitability before paying income taxes, after paying income taxes, and after selling the project.

In the rest of the chapter, these six steps are discussed at length under the following section titles: Capitalized Costs, Rental Revenue, Operating Expenses, Financing and Debt Service, Taxes, After Tax Cash Flow and Evaluation Criteria/Measures Of Return. After each section, typical formats are provided to summarize the results of each step.

2.2 CAPITALIZED COST

Costs incurred during the life of an office building project fall into three major categories, as follows:

- 1) Cost incurred during the development phase
- 2) Operating expenses
- 3) Selling expenses

2.2.1 - COSTS INCURRED DURING DEVELOPMENT PHASE

The development period for the actual office building project implementation extends from project inception to the issuance of the occupancy certificate which marks the beginning of the revenue generation. These costs include land cost, construction costs and development costs. Development costs can be depreciable or non-depreciable..

Depreciable development cost includes organization costs, (e.g. feasibility study, licenses, investment promotion, rezoning and consultants), legal fees, land improvements, carrying charges (title and recording fees), developer fee, architectural, engineering and planning fees, land surveys, utility connecting and building permit fees. These depreciable costs are tax deductible from future income.

Non-depreciable development costs include real estate taxes during development, interest on all development loans, (interest on the development loans can also be a depreciable development cost), mortgage loan insurance costs, land rent and rental office and rental promotion costs. These costs are tax-deductible in the year they are incurred.

2.2.2 - LAND COST

Control of a piece of land for construction of an office building can be obtained by outright purchase or by leasing land at an annual rent. Ground leases avoid immediate cash investment in land. Term of lease is of varying length, e.g., 40 years, 50 years, 99 years, etc., sometimes with the option to renew for another term. At the end of the lease term, the whole property including improvements reverts to the owner of the land.

When the owner/developer already owns a piece of land and wants to develop an office building, the land costs can be determined by finding the market value of the land for the purpose of the financial feasibility study. One of the ways of determining the market value is by the market data approach (23).

Land value depends primarily upon supply and demand in the market and it is determined by seven types of considerations (11):

- 1) Proximity to a market for goods and services produced on the land.
- 2) Availability and cost of goods and services needed for production, (i.e., labor, finance, communication, transportation, governmental services, recreation, education and utilities.
- 3) "Status" value of location.
- 4) Legal constraints, (i.e., real estate taxes, zoning, covenants, easements and title encumbrances).

- 5) Aesthetic desirability.
- 6) Topographical characteristics of size, shape, slope, elevation, subsidence and landslides.
- 7) Cost of grading, clearing, streets and drainage.

2.2.3 BUILDING CONSTRUCTION COST

Building costs include construction materials, labor and construction overhead and profit.

In the predesign and preliminary design stages, building construction costs can be obtained on a construction cost per sq. ft., or cu. ft. basis. Many standard references on building costs give these sq. ft., or cu. ft. costs for different types and classes of buildings in different regions (18).

When the final design and working drawings are prepared, detailed construction component quantities can be worked out. Mean's cost manual (17) provides unit costs for different construction components and a detailed estimate of construction costs can be prepared. This estimated cost can serve as a building cost for the feasibility analysis. They are generally accurate to within ±15% of the actual building cost.

In the post construction period the actual cost of building construction is to be used,

2.2.4 - INTEREST ON CONSTRUCTION LOAN

Interim financing or interest on the construction loan has a considerable influence on the total cost of the office building project. Interest on the construction loan may be capitalized - or it may be treated as non-recurring expense, depending on which is more advantageous in producing cash flow and tax advantages.

Interest on the construction loan can be arrived at with the help of a project schedule and component estimates. Cash outflow can be worked out month by month over the period of development and construction. Interest is worked out to finance these cash outflows at the prevailing rate of interest for borrowing. The amount and timing of equity input must be determined.

Section 3.6 in the case study describes an example of construction loan calculations.

2.2.5 - FEEES

Fees include legal, closing, architectural, engineering and other fees incurred during development period. They can range from 10 to 20% of the cost of construction, depending upon the size, type and complexity of the office building.

2.2.6 - SITE IMPROVEMENT COSTS

These costs include the cost incurred for landscaping, parking lots, driveways, retaining walls, culverts, etc.

Table 1 summarizes capital costs incurred for an office building project.

TABLE 1

TOTAL CAPITALIZED COST

Land	\$
Site Improvements	\$
Building construction	\$
Fees	\$
Interest on Construction Loan	\$
Total capitalized cost	\$

2.3 - RENTAL REVENUE:

Rental Revenue obtained for an office building is from three major sources, namely:

- 1) Office Space
- 2) Parking
- 3) Retail space concessions, shops, restaurants, etc.

2.3.1 - OFFICE SPACE RENTAL:

Gross possible annual rental income is based on 100% occupancy at attainable rental rates. In order to estimate the annual gross revenue from the office space, it is necessary to determine three factors:

- 1) Total net rentable area
- 2) Rental rate
- 3) Vacancy rate.

2.3.1.1 - GROSS AREA/GROSS RENTABLE AREA/NET RENTABLE AREA OF OFFICE BUILDINGS:

Standard and widely accepted definitions of these areas of office buildings are contained in reference no. 2, as follows:

GROSS AREA OF ENTIRE BUILDING:

Gross square feet or meters refers to the sum of the areas of all floor levels, including cellars, basement, mezzanines, penthouses, corridors lobbies, walls, not including architectural setbacks or projections. Areas include floor surfaces with a

minimum of 6 foot, 6 inches ceiling height and exclude unroofed and unenclosed roofed over space.

GROSS RENTABLE AREA

Gross rentable area is computed by measuring the inside finish of permanent outer building walls, or by measuring from the glass line where at least 50 percent of the outer building wall is glass. The area includes outside walls, but excludes stairs, elevator shafts, flues, pipes, shafts, vertical ducts and balconies.

NET RENTABLE AREA: MULTIPLE-TENANCY FLOOR

Net rentable area of a multiple tenancy floor is the sum of all rentable areas on that floor. Net rentable area is measured from the inside finish of permanent outer building walls, or from the glass line if at least 50 percent of the outer building wall is glass, to the office side corridors to other permanent partitions and to the center of partitions that separate premises from adjoining rentable areas. No deductions are made for columns or projections supporting the building.

NET RENTABLE AREA: SINGLE TENANCY FLOOR

Net rentable area of a single-tenancy floor is measured to the inside finish of permanent outer building walls, or from the glass line where at least 50 percent of the outer building wall is glass. Rentable area includes the area within outside walls, excluding stairs, elevator shafts, flues, pipe shafts, vertical ducts,

airconditioning rooms, fan rooms, janitor closets, electrical closets, and other rooms not actually available to the tenants.

Lavatories within and exclusively serving only the floor involved are included in the rentable area. No deductions are made for columns or projections necessary to the building.

2.3.1.2. - RENTAL RATE

Rental rate for office space is market rent the office space can get from the tenants. In order to determine the market value for the office space under consideration, some market research is required. A variety of factors affect the rent that tenants will pay for office space. It depends upon the prestigious location of the building, proximity to central business district, proximity to public transportation and market which the tenants' businesses serve. Quality of space and other conveniences also affect rental rates.

High demand leads to sharp competition for a diminishing supply, leading to higher rent and causing the rate of the increase to decrease. Thus, office rents go up in a cyclical and increasing fashion from time to time.

Office rental rates can be determined with the market data approach which is used by appraisers of real estate to find out the value of a property.

In the market data approach, the appraiser puts himself in the position of a typical tenant in comparing the office building under consideration with other similar office buildings which together make up the market in the region. The basic principle is that of substitution: equal market rent will be established for office space which provides equal advantages for use. The application of this approach involves finding examples of similar commercial properties, determining the rents they charge, and adjusting these rents by comparing the office building under consideration with the example in terms of percentage to arrive at a rental rate for the building. The case study in Chapters 3 and 4 gives an example of this market data approach.

2.3.2 - PARKING RENTAL

Parking spaces are rented on a unit basis and not on a square foot basis like office space. Rental rate per parking stall can be obtained in a similar fashion as office space explained above.

2.3.3 - RETAIL SPACE RENTAL

Retail space is used by concessions - shops, restaurants, cafés, etc. Retail space is measured from the building line; in

the case of street frontages. It is measured from the inner surfaces of other outer building walls and from the inner surface of the corridor and within the center lines of partitions that separate premises from adjoining areas. Rental rate for retail space also depends upon the market forces and it can be determined in the same way as office space.

2.3.4. - VACANCY RATE

There is a certain rent loss due to vacancies and delinquencies. This has to be accounted for to get gross effective annual income which is equal to gross annual rental income minus rent loss due to vacancy or bad debt, etc. This is generally expressed in terms of percentage of the gross annual rental income. Current and past rates for the office buildings in different regions can be found in the Boma Report (2).

2.3.5. - LEASING CONVENTION

Leasing of office space is normally done on 1 year, 3 year or 5 year basis and net rent (gross rent - operating expenses) is increased according to the agreed rent escalation and operating expenses are increased in accordance with inflation.

2.3.6 - GROSS ANNUAL RENTAL INCOME

Gross annual rental income is based on the total of all rentals income from all sources with 100% occupancy at attainable rental rates. Table 2 shows the manner of arriving at the Total Effective Gross Income.

TABLE 2

PROJECTED REVENUE STATEMENT

PROJECT:
DATE:

TYPE OF SPACE	RENT/UNIT	NO. OF UNITS	YEARLY TOTAL
OFFICE SPACE	/sq. ft.	sq. ft.	\$
RETAIL SPACE	/sq. ft.	sq. ft.	\$
PARKING	/stall	stalls	\$
STORAGE SPACE	/ sq. ft.	sq. ft.	\$
TOTAL GROSS ANNUAL RENT			\$
LESS VACANCY & BAD DEBT			\$
TOTAL EFFECTIVE GROSS INCOME			\$

2.4 - OPERATING EXPENSES

These are recurring costs incurred during the operation phase of an office building. These costs are deducted in the same year they are incurred for tax purposes. Accurate prediction for future year of all of these costs is difficult, due to the uncertainty of future inflation and market forces. Unprecedented increases in energy costs and high inflation in recent years made estimation of operating expenses very important, as they can have a serious effect on the viability of a project.

Estimation of operating expenses can be done in one of the following ways:-

- 1) In case of an office building which is already operational, these expenses can be projected on the basis of the record of past expenses and current/future market trends.
- 2) In case of pre-operational phase, these expenses can be worked out on the basis of the building design and specifications. The unit cost for operating expenses are published by Building Owners And Managers Association International, 1980.

This report (2) gives various breakdowns of these unit expenses, based on square foot of office and total building space.

The data provided in this report for the Montreal region is based on small sample size and should be generalised with care. Further it is not correlated with design features (e.g., type of construction and materials used) and intensity of use. The data may require modification to take these factors into account.

- 3) In case of energy consumption, an accurate estimate could be made based on the type of system used in the building. Various simulation techniques and computer programmes are available (9). These design tools predict the performance of different systems and give fairly accurate estimates of energy consumption all year round.
- 4) Real estate taxes and other taxes can be estimated with the help of guidelines and rates set by the municipality or they may be known e.g., in the case of land or existing buildings.

Major operating expenses are as follows: (6)

2.4.1 - SUPERINTENDENT AND BUILDING CUSTODIAL SERVICES

This amount includes wages paid to the superintendent or janitor of the building, elevator operator, telephone switchboard operator or other maintenance personnel.

2.4.2 - ADMINISTRATIVE AND MANAGEMENT

This amount includes salaries of personnel in the management office paid directly by the owner. This also includes legal/auditing fees, engineering services, office supplies and telephone expenses.

2.4.3 - HYDRO

This includes the electricity bill for the whole building - tenant and public areas, lighting, airconditioning, elevators, escalators, etc. Some of these amounts are charged to the tenant in the form of operating expenses. The cost of electric heating is included into HVAC item.

2.4.4 - WATER/SEWER

This includes water/sewer charges paid to the municipality for the provision of that service.

2.4.5 - HVAC (ENERGY)

This amount includes cost of energy for heating, ventilation and air conditioning (oil, gas and electricity).

2.4.6 - HVAC (MAINTENANCE)

This includes the cost of maintaining and servicing the entire heating, airconditioning and ventilation system. It consists of wages paid to the engineer, technician and others necessary to maintain heating system, and to operate the motor in the air-conditioning and ventilating systems. It also includes all supplies and routine replacement costs.

2.4.7 - CLEANING

This is the cost of cleaning offices and public areas, lobbies, elevator cabs, corridors, toilets and the cost of all cleaning supplies. Cost of window cleaning services is also included in this amount.

2.4.8 - PAINTING & DECORATING

This amount includes the cost of labour for painting and decorating offices, varnishing floors, decorators on the building payroll. Cost of paint, wallpaper and all other supplies is also assigned to this account.

2.4.9 - MAINTENANCE & REPAIRING

This account includes all expenses incurred for general maintenance and repairing, excluding HVAC maintenance cost. Interior and exterior landscaping/maintenance costs, elevator maintenance, plumbing, electrical, plastering, and roofing maintenance are also included.

2.4.10 - INSURANCE

This category includes fire, earthquake, third party liability and other types of insurance paid for an office building.

2.4.11 - REAL ESTATE TAXES

This includes all real estate taxes on building and land by both local and provincial governments.

2.4.12 - OTHER TAXES

School tax, business tax, and water tax, are some of the other taxes paid for an office building. Institutional or public owners are excluded from these taxes.

All these items for the operating expenses are listed in Table 3 to arrive at Total Operating Expenses for an office building.

TABLE 3

STATEMENT OF PROJECTED EXPENSES

PROJECT:

DATE:

EXPENSES	STABILIZED*	FIRST YEAR	SECOND
		(% of stabilized year)	YEAR
1. Superintendent			
2. Management			
3. Hydro (excluding heating)			
4. Heating			
5. Combined HVAC (Maintenance)			
6. Cleaning			
7. Maintenance/Repairs			
8. Insurance			
9. Real Estate Taxes			
10. Other Taxes			
11. Miscellaneous Expenses			

TOTAL OPERATING EXPENSES

* Stabilized year: the year in which full occupancy is reached
and absorption period ends.

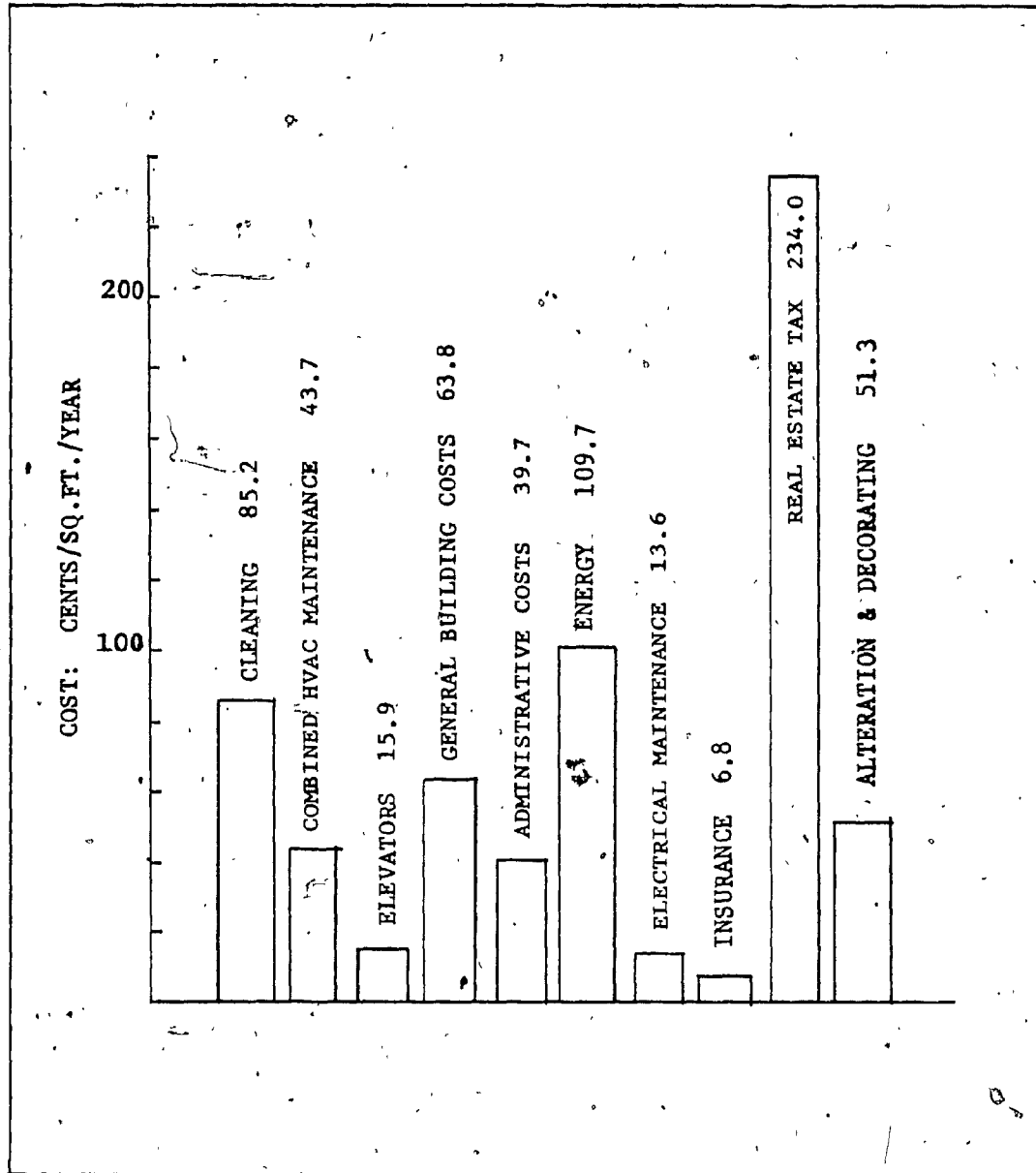


FIGURE 1: Comparison of Unit Operating Costs 1980
in Montreal (Source: BOMA, reference 2)

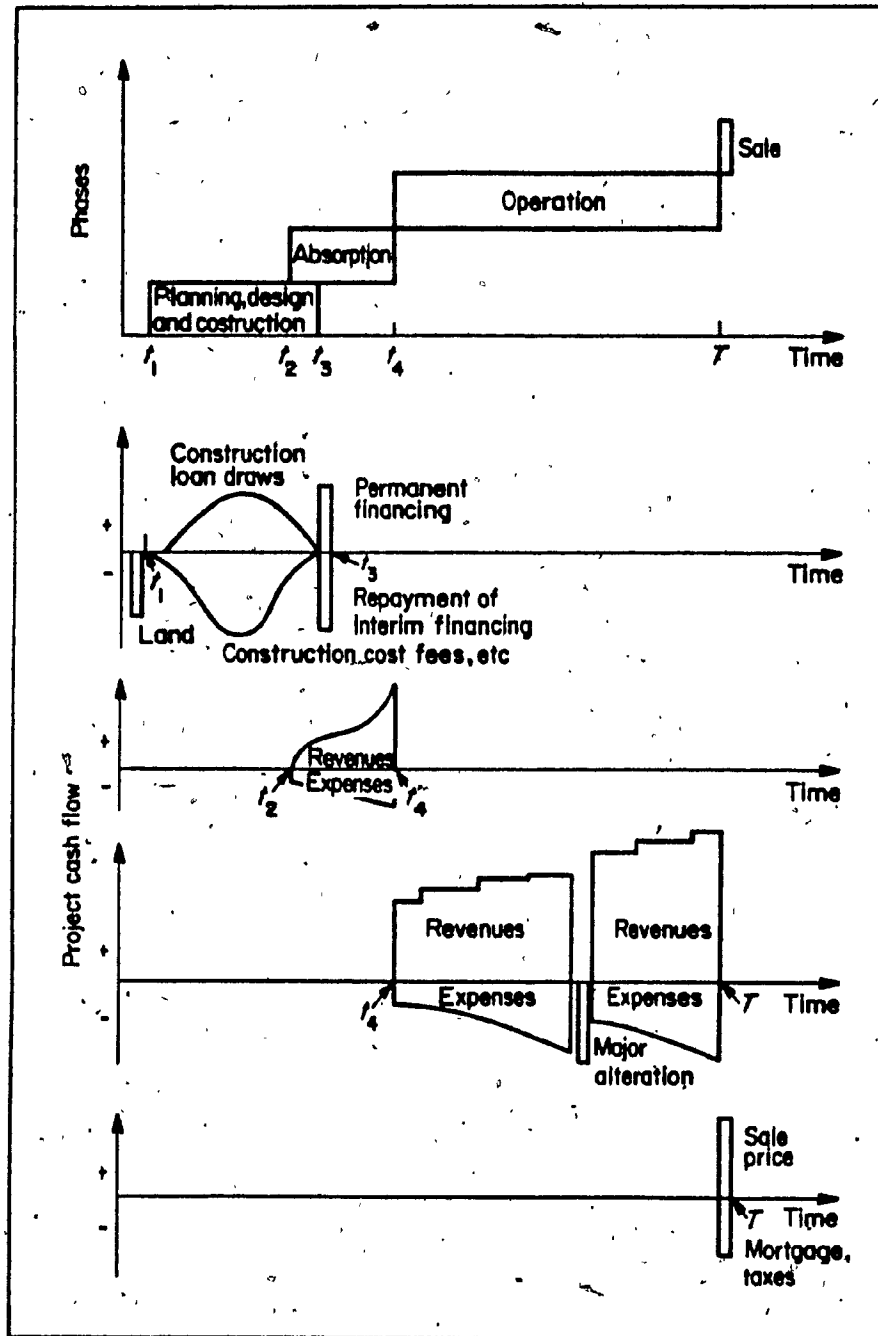


FIGURE 2: Project phases and related cash flows
 (Source: Russell, A.D. and Gholam-Ali-Arlani: ref. 19)

2.5 - FINANCING AND DEBT SERVICE (21)

An office building project generally is financed by the investors' own funds and by borrowing funds in the form of a mortgage. There are various sources for obtaining mortgages:-

corporate pension funds, mortgage loan companies, trust companies, life insurance companies, and chartered banks.

Very often there is more than one mortgage involved in financing of an office building project.

The number and cost of the periodic payments monthly or annually for debt service are based on the amount of equity and mortgage amount.

2.5.1 - EQUITY

This represents the amount of own capital invested by the owner or it can be looked upon as the difference between the value of the project and the sum of all debts. A reduction in the percentage down payment or the amount of equity increases an investor's ability to buy or build property or to buy or build more properties with a given amount of capital. This added ability to buy is called leverage.

2.5.2 - MORTGAGE AMOUNT

This is the amount loaned by the investor to develop or buy a building project. The size of the mortgage amount depends upon the credit of the owner/investor and the potential of the project itself.

2.5.3 - AMORTIZATION

The common method of amortization is called blended payment plan, where the payment of principal and interest is made in equal monthly sums during the life of the mortgage. In this method the interest is taken first and the balance of the payment is attributed to the repayment of the principal. In the initial payment a large part of it is of interest amount and a very small one is of the principal. Gradually interest amount decreases as the capital is repaid.

The period of amortization of mortgages is usually 25 to 30 years. The larger the amortization period, the smaller is the amount of yearly payment towards debt service.

2.5.4 - INTEREST RATE

This is the amount charged for the use of money. Mortgage interest rates depend upon economic and market conditions, and they are also linked to the prime interest rates. High fluctuation in the mortgage interest rates in the past months have made accurate determination of financial feasibility more difficult. Since the mortgage amount is a significant part in most office building projects, its financial feasibility depends to a large extent on the kind of interest rate paid on the loan.

2.5.5 - DETERMINATION OF ANNUAL DEBT SERVICE

Mortgage tables give various mortgage constants (annual, monthly basis) for given interest rate and amortization period for \$1,000. of loan amount. With the help of these tables total annual amount for debt service as well as the amounts of principal and interest can be computed.

(See Table 4 for debt service)

Under the present marketing conditions, the whole field of financing has changed because of volatile and high interest rates. Financial institutions are becoming reluctant to commit funds very far in the future years at pre-established fixed interest rates. These institutions are originating short term mortgages with floating interest rates to shift the interest rate risks from the lending institutions to the borrowers. The developers are then passing these interest rate risks on to the tenants or the occupants by making provisions in the leases and by selling the office space as condominiums.

TABLE 4

STATEMENT OF LOAN (20)

PROJECT:
DATE:

AMOUNT OF LOAN: \$ _____

AMORTIZATION : _____ YR.

INTEREST RATE : _____ %

Yr.	Interest	Principal	Total Payment	Ending Principal Balance
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

TABLE 5

PRETAX CASH FLOW STATEMENT (20)

PROJECT: DATE :	1	2	3	4	5	6	7	8	9	10	TOTALS
1. GROSS INCOME											
2. VACANCY & BAD DEBT											
3. EFFECTIVE GROSS INCOME											
4. OPERATING EXPENSES											
5. NET OPERATING INCOME											
6. DEBT SERVICE 1											
7. DEBT SERVICE 2											
8. PRETAX CASH FLOW											

NOTE: Escalator for rental income %/year compounded
Escalator for expenses %/year compounded

Net Operating Income = Effective Gross Income - Operating Expenses
Pretax Cash Flow = Net Operating Income - Debt Service

2.6 - TAXES AND AFTER TAX CASH FLOW

Both income tax during the operation phase and capital gains tax upon the sale of an office building play an important part in the financial feasibility of the project. The income from the office building is subjected to both federal and provincial taxes and losses can also help shelter income from other sources.

2.6.1 - DEPRECIATION: CAPITAL COST ALLOWANCE

Depreciation provides a tax shelter when current cash flow exceeds taxable income. For tax purposes, depreciation is the deduction allowed from pretax cash flows for the possible loss in value of a property from wear and tear, time and obsolescence. It serves to spread the cost of a building over its useful life. It reduces taxable income but not the cash flow. In Canada, depreciation is called Capital Cost Allowance. In accordance with current tax procedures in Canada in the case of office buildings, the capital cost allowance is applied to the declining balance of the capital worth of the asset. For this method of depreciation, period of replacement is not necessary.

2.6.2 - DECLINING BALANCE METHOD

By this method, the amount of depreciation taken each year is subtracted from the remaining or adjusted basis before computing the following year's depreciation and so the same depreciation rate applies to a smaller or declining balance each year.

Depreciable assets fall into classes or pools made up of like assets. These are grouped into 32 classes which are prescribed in the Income Tax Regulations. See Appendix C for the prescribed classes and rates. Most office buildings fall into class 3 (cement, stone, brick) category and are eligible for Capital Cost Allowance rate of 5% per year.

Some components of buildings - furniture, etc., can be depreciated at higher rates and yearly deduction for CCA can be increased to reduce taxes.

Ref: - Section 1100 and Schedule B of Income Tax Regulations.

2.6.3 - SALE OF OFFICE BUILDING PROJECT AND TAXES UPON TERMINATION

When property is sold or exchanged, it results in gain or loss. This gain or loss can be a capital gain or an ordinary gain. It is advantageous for the seller to be able to qualify his gains as capital gains, by assigning the gain to the sale of the property and not as his regular business income. As capital gains he pays less taxes.

2.6.4 - CAPITAL GAINS TAX

No special tax rate applies to taxable capital gains, they are taxed at the usual graduated tax rates. Only 50% of the capital gains are taxed, therefore, the effective tax rate is half of the tax rate applied to the ordinary gains. In the same way only half of capital losses can be deducted from other capital gains.

2.6.5 - ADJUSTED COST BASE (7)

The amount to be deducted from the proceeds at disposition of an asset for determining any capital gains or loss is referred to as the adjusted cost base. This figure is made up of a cost base adjusted as a result of certain transactions or occurrences subsequently to acquisition. The cost base may be the actual cost, deemed cost, amortized cost or Valuation Day value of the property, depending on its nature and the circumstances of acquisition. Actual cost is usually the cost base of capital property acquired after 1971 and includes the cost of additions and improvements but not maintenance and repair cost (6). The amount of the taxable gain is calculated by subtracting the adjusted basis from the net proceeds from the sale.

2.6.6 - RECAPTURE

According to Canadian Tax Law, recapture is the difference between the initial depreciable cost and the book value, or the selling price and the book value, if the initial depreciable cost is higher than the selling price. (See Table 9 for the determination of the taxes upon the sale of a property in general). Figure shows the relationship of the selling price, Adjusted Cost Base and book value of the property.

2.6.7 - AFTER TAX CASH FLOW

The after tax cash flow is obtained by subtracting income taxes from the net income (pretax cash flow). Income tax amount is computed by applying the relevant tax rate to taxable income which is the net income less Capital Cost Allowance. (See Table 8 for these calculations).

TABLE 6

DEPRECIATION STATEMENT (20)

PROJECT:

DATE:

VALUE OF BUILDING:

METHOD: DECLINING BALANCE

DEPRECIATION FACTOR: %

Yr.	Book Value Beginning Of Year	Depreciation Factor	Annual Depreciation	Cumulative Depreciation
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

TABLE 7.

TAX STATEMENT (20)

PROJECT:
DATE:

YEAR 1 2 3 4 5 6 7 8 9 10 TOTALS

1. GROSS INCOME

2. VACANCY %

3. EFFECTIVE GROSS INCOME

4. OPERATING EXPENSES

5. NET OPERATING INCOME

6. DEPRECIATION BUILDING

7. DEPRECIATION OTHER

8. NET TAXABLE INCOME (LOSS)

NOTE: Escalator for rental income, _____ %/year compounded
Escalator for expenses, _____ %/year compounded

TABLE 8

AFTER TAX CASH FLOW

1. Year	1	2	3	4	5	6	7	8	9	10
2. Gross Effective Revenue										
3. Operating Expenses										
4. Operating Profit (Item 2 - Item 3)										
5. Debt Service										
6. Principal										
7. Interest										
8. Net Income (4 - 5)										
9. CCA										
10. Taxable Income (8 - 9)										
11. Income Tax										
12. Income After Tax (8 - 11)										
13. Equity *										
14. Return on Equity, After Tax (Item 12/Item 13 x 100)										

* Equity = initial equity investment - up to date principal (Item 6)

TABLE 9

TAXES UPON TERMINATIONCAPITAL GAIN (7):

Proceeds of Disposition*	\$	
Less Adjusted Cost Base	\$	
Less Outlays and Expenses	\$	
Gain	\$	
Taxable Capital Gain (50% of Gain)	\$	

RECAPTURE

Proceeds of Disposition	\$	
Less Outlays and Expenses	\$	
Less Undepreciated Capital Cost	\$	
Excess	\$	(1)

Excess if Property Sold at Capital Cost:

Assumed Selling Price (equal to capital cost)	\$	
Less Undepreciated Capital Cost	\$	
Excess	\$	(2)

Recapture is Lesser of (1) and (2)
(see Appendix C)

* Proceeds of disposition is selling price of the asset.

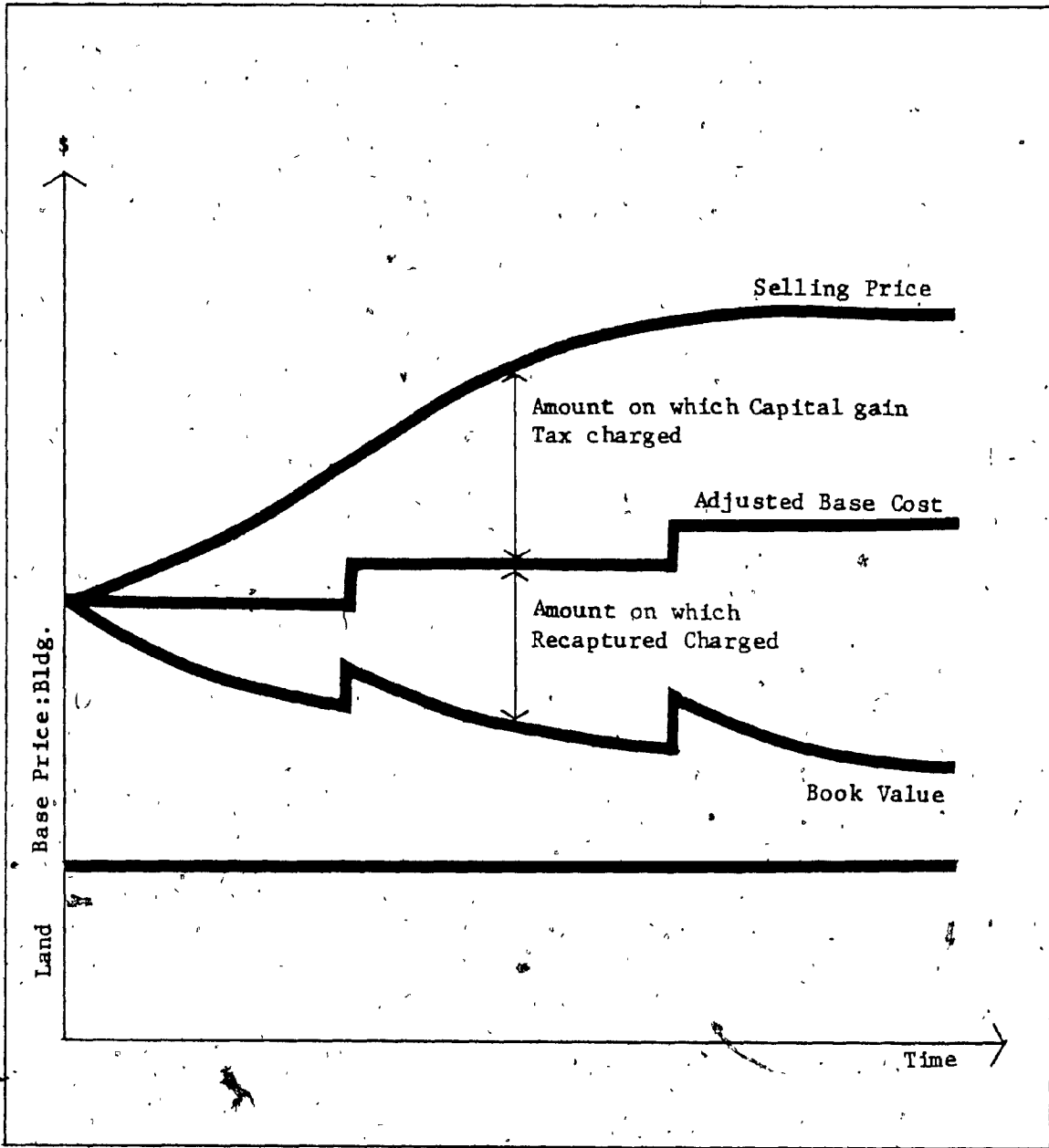


FIGURE 3: Capital Gains Tax vs. Recapture

2.7 - EVALUATION CRITERIA AND MEASURES OF RETURN

There are various evaluation criteria and measures of return in use to determine the financial feasibility of an office building project. They differ in their complexity and ease of application and accuracy to determine the return.

They represent various aspects of financial feasibility analysis. Broadly they can be grouped together in two major groups (22).

- 1) First generation techniques and rules of thumb;
- 2) Second generation techniques.

2.7.1 - FIRST GENERATION TECHNIQUES AND RULES OF THUMB

2.7.1.1 - CASH-ON-CASH RETURN

This is the simplest measurement of the return from an office building project. It states the annual cash flow from the project as a percentage of the investment required to realize the project.

$$\text{Cash-on-cash return} = \frac{\text{expected net cash flow}}{\text{total initial equity}}$$

Though this method is very simple to use, it has certain deficiencies. It involves only first year cash flow and does not reflect the tax shelter, equity buildup and the appreciation of the value of the property.

2.7.1.2 - PAYBACK PERIOD

Payback period is the period required to recover the equity invested in the project by way of annual income generated.

$$\text{Payback period} = \frac{\text{Equity Capital}}{\text{Annual cash flow}}$$

This ratio fails to account for time value of money, income taxes and tax shelter. It does not include mortgage amortization and appreciation of the project.

2.7.1.3 - EQUITY DIVIDEND RATIO

This is the ratio of annual cash flow before taxes and equity investment and has the same weaknesses as the one above.

2.7.1.4 - AFTER TAX RETURN ON EQUITY

To estimate after tax return on equity, after tax cash flow is computed on the basis of net operating revenue, depreciation and tax rate. The ratio of after tax annual cash flow and the equity investment gives the after tax return on equity of a project. Ten year average model based on annual net operating income expected from the project is used. Non revenue periods are disregarded.

2.7.1.5 - PROFITABILITY INDEX

In this technique, total initial investment in land and building is determined, then 10 year average annual income is computed before taxes and depreciation. The value of the project is estimated by dividing the average annual income by a market capitalization rate (1½ percentage points higher than the current mortgage rate).

$$\text{Profitability index} = \frac{\text{estimated value project}}{\text{total investment required}}$$

Profitability Index of more than one indicates a positive venture.

Important deficiencies of the first generation techniques are:

- 1) All types of financial benefits are not included in the computation;
- 2) Capital gains tax consequences, buildup of equity and property appreciation are not considered; and
- 3) These techniques ignore the time value of money.

Due to these deficiencies these techniques may lead to inaccurate decisions.

2.7.2 - SECOND GENERATION TECHNIQUES

These techniques take into account the timings of the investment and returns generated by it. They are based on the application of the present value theory to the cash flows generated by a project over its life cycle from the inception of the project to the selling of it or up to the end of the horizon of the investment.

The present value theory considers the effect of compound interest on the cash flows (11). Because of the compound interest principle money earned today is more valuable than money earned at a future date. In the similar way the next year's cash flows are less valuable than the same cash flows generated this year. The future cash flows need to be discounted to bring them to their present value according to their timing and with an appropriate discount rate depending upon market conditions.

2.7.2.1 - NET PRESENT VALUE

The Net Present Value of a project can be obtained by subtracting the present value of all the cash outflows (the initial cost, operating expenses, etc.) from the present value of all the cash flows (income generated by the project).

The discount rate used to obtain the present value of the future cash flows represent an expected rate of return for the investor. A positive net present value represents an additional profit over the expected rate of return on the investment (see Table 10).

Net Present Value not only can be used for the viability analysis of a project but also it can compare two alternatives. The alternative with higher positive NPV is the one to be chosen. The optimum scale of a project is represented by the highest Net Present Value of the scale of project can develop.

2.7.2.2 - INTERNAL RATE OF RETURN (8)

The internal rate of return technique is closely related to the Net Present Value technique. The Internal Rate of Return is an interest rate, used to discount all the cash flows generated by a project over its lifetime or horizon, so that the Net Present Value becomes zero. For the Internal Rate of Return technique one does not need a prescribed discount rate.

The Internal Rate of Return formula in its simplest form is as follows:

$$\frac{C_1}{(1-R)^1} + \frac{C_2}{(1-R)^2} + \frac{C_3}{(1-R)^3} + \dots + \frac{C_n}{(1-R)^n} - C_0 = 0$$

R = The Internal Rate of Return

C_n = Annual Cash Flows

C_0 = Original Investment

n = Number of Years

Manual computation of the IRR can be done by trial and error. Each trial uses different discount rates close to the expected IRR to get Net Present Value of the Project. The two discount rates giving the Net Present Values closest to zero, one being positive and the other being negative, are chosen and the actual IRR is then interpolated (see Table 11).

The IRR of a project can be compared with the Rate of Return expected by the owner and with the risk factor involved in the project to determine viability of the project. The IRR must be greater or at worst equal to the desired minimum threshold return value.

2.8 - SENSITIVITY ANALYSIS (10)

The financial feasibility analysis for a project involves a number of variables affecting the returns from the project investment. Sensitivity variable affecting these returns (e.g., pretax cash flow, IRR, etc.), or a specific financial decision. By the successive application of differing values to the variable chosen, it is possible to find out how sensitive the financial outcome is to the degree of change of the variable.

Sensitivity analysis is a useful technique to judge the amount of risk involved in the project returns because of the uncertainty of the variables.

2.9 - RISK ANALYSIS

Monte Carlo simulation analysis is a technique generally used for risk analysis (19). To use this technique, a probability distribution is estimated for each of the random variables affecting the financial performance. In executing a simulation, values for each of the random variables are generated using random numbers and for the probability distributions developed for each variable. The process of computing a specific financial performance criteria like the IRR is repeated several

times with the different values of the variable. The repetitious calculations can be performed with the help of a computer program. The outcome of this exercise is a frequency distribution of the IRR. With the help of this frequency distribution the risk involved in the project can be assessed.

TABLE 10

NET PRESENT VALUE (20)

Year	Cash Flow	Present Value Factor %	Present Value Of Future Cash Flow
1	\$ _____	_____	\$ _____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____
9	_____	_____	_____
10	_____	_____	_____
	Total Present Value		\$ _____
	Less Present Value of Investment		\$ _____
	Net Present Value		\$ _____

TABLE 11

INTERNAL RATE OF RETURN (20)

YEAR	Trial 1: Rate of Return _____ %		Trial 2: Rate of Return _____ %	
	CASH FLOW	P.V.F.	CASH FLOW	P.V.F.
1	\$ _____	_____	\$ _____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____
Total present value of Future Cash Flows		\$ _____	Total Present Value \$ of Future Cash Flows	

CHAPTER 3

CASE STUDY

CHAPTER 3

CASE STUDY: ROSS ROAD OFFICE AND GARAGE BUILDING PROJECT3.1 - INTRODUCTION

In August 1980, a study(4) was undertaken to develop recommendations for improvement of parking and circulation problems for the Royal Victoria Hospital in Montreal, Quebec. Both short term and long term improvements were recommended. Short term or immediate improvements were suggested to encourage better use of the existing parking capacity and improve traffic flow. The long term improvements were intended to increase the parking capacity to meet the current and future demand. It was estimated that an additional supply of 314 parking spaces was necessary and the demand would continue to grow at the rate of 2% per year.

As one of the long term measures to solve parking problems at the Royal Victoria Hospital, a multiple level parking structure was recommended. The structure would be equipped with elevators and indoor walkways connecting to the Allen Memorial Institute and the main building via Nurses' Residence. (See Appendix A, Plan 1). The suggested location was conveniently situated with respect to the Hospital core, the Ross Pavilion and the Allen Memorial Institute. The location and the geometry of the area was suitable for construction and would cause a minimum amount of encroachment on the surrounding green spaces. A parking structure large enough to accommodate 378 cars would be built. The structure would have five stories of parking space.

It was also felt that there is a definite demand for office space for doctors who are affiliated to the Royal Victoria Hospital. The office space in the vicinity of the Hospital would be very convenient and advantageous to the doctors. Incorporation of office space for doctors in the proposed parking structure would serve a dual purpose- i.e., to provide for offices for the doctors and it can subsidize the financial burden of the parking structure. This requirement for office space was realized by adding two additional floors to the parking garage. This space could be rented out and would serve as an additional source of income to offset operating costs of the whole structure of Ross Road Office and Garage.

3.2 - OBJECTIVES

The major objectives of the Royal Victoria Hospital officials for construction of the Ross Road Office and Garage structure are summarized below in order of priority:

- 1) The project will provide additional parking space needed currently and in the future to meet an increasing demand.
- 2) It should provide office space needed for the doctors affiliated with the Hospital and this office space can also subsidize the parking garage.
- 3) This building along with a tunnel should serve as an indoor connection between the main building and the Allen Memorial Institute for transporting patients and add to the convenience of the staff and visitors. Presently the patients are transported from the main building to the Allen Memorial Institute by ambulance. This indoor link should result in savings to the hospital in terms of the money spent yearly in the ambulance cost for transportation of the patients.
- 4) This project is also to serve as an investment and some returns are expected in the future.

3.3 - CONSTRAINTS

- 1) The major constraint is a financial one. The Hospital, due to increasing expenses and budget cuts, has limited financial resources to commit to this project. This limit is not well defined at this stage but equity and carrying charges are to be kept to a minimum.
- 2) The office and garage structure falls into the area zoned as a park by the Municipal Zoning By-law. Such a project shall be approved by the Municipality on its individual merits and the purpose it serves. Any encroachment of green space or construction of a dominant mass in the landscape is discouraged. The height of the building may not exceed the height of the existing surrounding buildings. Thereby the height of the structure and extent of the built up area is a definite constraint.
- 3) The office and garage structure shall be built on the sloping land and it limits design solutions and also increases cost of construction.
- 4) The fourth constraint is an operational one. The Hospital would like to have limited interference in its operations while construction is going on for the project. This may lead to an increase in the length of the normal construction period for the project of this type.

3.4 - PHYSICAL DESCRIPTION OF THE PROJECT

The site plan and floor plans in Appendix A depict the location and layout of each floor.

The basic concept consists of a seven storey structure situated between Allen Memorial Institute and the Nurses' Residence Wing of the main building. The structure will be constructed partially over Ross Road and the piece of land sloping considerably towards Ross Road. The design required some amount of cut in the slopes but thereby hides a large part of the garage from the view on the office entrance side.

The lower five storeys are designed as a garage. They also include space for electrical substation and mechanical room used principally for this structure. The entrance and exit to the garage will be from Ross Road. Parking spaces in the garage will be controlled from the main gate of the Hospital. There is no provision for a control booth in the garage.

The upper two storeys are designed as an office space. The entrance to the office and garage is completely independent and the garage is not visible from the office entrance side. Thus the presence of the garage structure will not affect rentability of the office space. Car access to the office entrance will be from Pine and Peel Street crossing. The office floor is designed around a landscaped court yard on the east side of the building.

The office will be airconditioned and will have a sprinkler system. The office space can be rented out to one tenant or to multiple tenants. The floor will be divided and partitioned according to the tenants' needs.

The whole structure of the office and garage will be built with reinforced concrete flat slab construction. Enclosure wall of the office will be precast concrete panels with double glazed windows. The office floors will be carpeted and have wooden and glazed partitions. The main lobby of the office will have a marble finish.

The garage space shall not be heated in the winter.

3.5 - AREA AND SPACE USE PER FLOOR3.5.1 OFFICE

	Rentable Area (s.ft.)	Non- Rentable Area (s.ft.)	Gross Area (s.ft.)
<u>First Floor</u>			18,500
Office	15,000		
Entrance lobby, Reception, Electrical Room, Toilets, Stairs/elevators & Telephones, etc.		3,500	
<u>Second Floor</u>			18,500
Office	15,000		
Entrance lobby, Electrical Room, Toilets, Stairs/elev. Telephone, etc.		3,500	
Total Gross Area			37,000 s.ft
Total Rentable Area	30,000 s.ft.		
Total Non-Rentable Area		7,000 s.ft.	

3.5.2 - GARAGE

	Rentable Spaces (Nos.)	Non- Rentable Area (s.ft.)	Gross Area s.ft
<u>Level 5</u>			22,320
Parking stalls	33		
Electrical substation		2,900	
Tunnel		4,700	
Stairs/elevators		700	
<u>Level 4</u>			21,800
Parking stalls	50		
Electrical substation		2,600	
Stairs/elevators		850	
<u>Level 3</u>			24,000
Parking stalls	64		
Stairs/elevators		850	
<u>Level 2</u>			26,000
Parking stalls	76		
Stairs/elevators		850	
<u>Level 1</u>			26,800
Parking stalls	61		
Mechanical Room		3,100	
Telephone		100	
Stairs/elevators		850	
Total Gross Area			120,920 s.ft.
Total no. of parking stalls	284 nos.		
Total non-rentable area		17,500 s.ft.	

3.6 - CAPITALIZED COST: COST ESTIMATE AND CASH FLOW DURING CONSTRUCTION

In the case of the Ross Road Office Garage, the capitalized cost of the project is made up of the construction cost and the interest on the construction loan. Land cost is not included in the Analysis as the Royal Victoria Hospital will provide the land free of cost.

Estimated project cost and cash flows during construction were prepared and they are based on the following data:

- 1) Architectural items estimate prepared by Leroux & Associates Limited, in 1981;
- 2) Mechanical, electrical and structural items estimate prepared by Beauchemin-Beaton-Lapointe Inc., in December 1981;
- 3) Design and construction period is eight months;
- 4) Schedule is developed on the basis of 2 months design and tendering period and 6 months construction period; and
- 5) Cost estimate is brought to end of 1982 prices by multiplying by a 10% inflation factor to take into account the average inflation during the construction period. The estimate is further adjusted to include contractor's profit, supervision and project management fees.

A schedule based on an eight month construction period for the project is presented in Table 12. The cash flow for each month is developed with the help of the schedule. Then the interest on the construction loan is calculated in Section 3.6.1 for financing these cash flows. An equity of 15% of the total construction and development cost is used.

TABLE 12 CONSTRUCTION SCHEDULE & CASH FLOWS DURING CONSTRUCTION PERIOD

ITEM	ESTIMATED CONSTRUCTION COSTS \$	PERIOD		AFC.	
		JUNE 1982	JULY		
Design & Tendering	815,000.				
Excavation	815,100.				
Foundation	417,650.				
LEVEL 5					
Conc. Slab/Columns/Walls, etc.	518,885.				
Partitions/Doors	20,027.				
Electrical & Plumbing	253,510.				
Finishes	63,253.				
LEVEL 4					
Conc. Slab/Columns/Walls, etc.	374,107.				
Partitions/Doors	10,543.				
Electrical & Plumbing	227,920.				
Finishes	61,603.				
LEVEL 3					
Conc. Slab/Columns/Walls, etc.	373,107.				
Partitions/Doors	10,938.				
Electrical & Plumbing	184,320.				
Finishes	71,772.				
LEVEL 2					
Conc. Slab/Columns/Walls, etc.	373,091.				
Partitions/Doors	10,422.				
Electrical & Plumbing	184,320.				
Finishes	77,343.				
LEVEL 1					
Conc. Slab/Columns/Walls, etc.	438,438.				
Partitions/Doors	16,007.				
Electrical & Plumbing	209,920.				
Finishes	146,628.				
GROUND FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	137,388.				
Partitions/Doors	101,080.				
Electrical & Plumbing	416,450.				
Finishes	127,746.				
FIRST FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	79,860.				
Partitions/Doors	107,864.				
Electrical & Plumbing	371,450.				
Finishes	133,858.				
ROOF					
Roof Slab	190,000.				
Roof Finish	62,944.				
SITE WORKS					
Landscaping, etc.	147,522.				
TOTAL	7,086,696	75,000	75,000	815,100	936.
Adjustment For Inflation (10% Average)				896,610	1,030.
Cash Flow (Including Contracting Profit Supervision/Project Management) \$X	8,390,794	75,000	75,000	968,339	1,112.

CONSTRUCTION AND DEVELOPMENT COST: \$8,391,000

108

3.6.1 - INTEREST ON CONSTRUCTION LOAN

Assumptions:

- 1) Mortgage money will be received and loan is repaid at the end of the construction period;
- 2) All expenditures are incurred at the end of each month;
- 3) Period between actual construction and payment to the contractor is not taken into consideration; and
- 4) Interest rate is assumed to be 20% (simple interest).

Total interest charges are:

$\$75,000 \times 10/12 \times 20/100$	= \$12,500.
$75,000 \times 9/12 \times 0.2$	= 11,250.
$968,339 \times 8/12 \times 0.2$	= 129,122.
$1,112,603 \times 7/12 \times 0.2$	= 129,804.
$899,586 \times 6/12 \times 0.2$	= 89,958.
$1,721,816 \times 5/12 \times 0.2$	= 143,485.
$885,991 \times 4/12 \times 0.2$	= 59,066
$1,512,351 \times 3/12 \times 0.2$	= 75,617
$814,775 \times 2/12 \times 0.2$	= 27,159
$325,333 \times 1/12 \times 0.2$	= <u>5,422</u>

Total interest on construction \$683,383

85% of interest of (15% Equity)* = \$580,875

Capitalized cost = \$8,972,000 (8,391,000 + 581,000)

* For the construction loan calculations the equity is 15% of the construction and development cost. The permanent mortgage is 85% of the total capitalized cost.

3.6.2 - MARKET VALUE OF LAND

Land is owned by the Royal Victoria Hospital and its cost will not be added to the total project cost. Evaluation of market value of land is made to arrive at the assessment of land for real estate tax purposes. Evaluation of market value of land is based on the following:-

- 1) Market data approach (23);
- 2) Four properties sold in mid 1981 and which are within one mile radius are considered for determining market value of land;
- 3) Portion of selling price assigned to the land is based on City assessment of the land and building;
- 4) Adjustment to the selling prices of the properties are based on the following factors:
 - 1) Location - Prestige
 - 2) Proximity to Metro and public transport
 - 3) Existence of building: constraints on development
 - 4) Site characteristics
 - 5) Zoning and legal constraints

The map in figure 4 shows locations of the above properties in relation to the Ross Road Office and Garage building. Table 13 summarizes the land value calculations.

TABLE 13 EVALUATION OF MARKET VALUE OF LAND

ADDRESS	ASSESSMENT		RATIO		TOTAL PRICE %	SELLING PRICE ATTRIBUTED TO LAND	SELLING PRICE OF LAND / SQ. FT.	LC
	LAND/AREA	BLDG.	LAND %	BLDG. %				
3559 University	\$24,900. /2,569 ft. ²	\$66,100.	27.36	72.63	\$76,000.	\$20,794. /2,569 ft. ²	\$8.09	
3507 University	26,750. /3,225	30,250.	46.92	53.08	65,000.	30,498. /3,225	9.45	
3437 Peel	60,800. /3,380	39,400.	60.67	39.33	125,000.	75,838. /3,380	22.43	
60 Pine W.	71,200. /7,790	473,350	13.07	86.93	450,000.	58,815. /7,790	7.55	

Note: 1) 100% value in adjustment factor corresponds to the value of the land used for the proposed Ross Road office and garage. The factors are given equal weighting. The values were arrived at through comparison with the recent sale prices of the above four properties.

2) Adjusted price = $\frac{\text{Actual cost} \times 100}{\text{Aggregate}}$

102

ADJUSTMENTS

SELLING PRICE LAND Q. FT.	LOCATION	PROXIMITY TO METRO & TRANSPORT	EXISTING BUILDING CONSTRAINTS	VISUAL & SITE CHARACTERISTICS	ZONING & LEGAL CONSTRAINTS	AGGREGATE	ADJUSTED PRICE	AVERAGE PRICE
09	150	120	85	150	130	127.00	6.37	
45	150	120	85	150	130	127.00	7.44	
43	300	200	80	145	200	185.00	12.12	\$8.16 (1981)
55	90	100	70	140	160	112.00	6.74	

3.7 - OPERATING REVENUE

The Ross Road Office and Garage building will have operating revenue from two sources.

- 1 - OFFICE SPACE
- 2 - GARAGE

ASSUMPTIONS:

Considering the current very low vacancy rate for office space in the downtown Montreal area, and from the demand for parking space indicated in the traffic and parking study (4):

- 1) It is assumed that two floors of office space will have a 95% occupancy rate when the building becomes operational. Due to a strong demand, the rent up period can coincide with the last months of the construction period.
- 2) The garage is assumed to have a 90% average occupancy rate when it becomes operational after the construction period is over.

3.7.1 - RENTABLE AREA

Plan No. 2 shows an example of division of office floor for multiple tenants. Floor can be divided in variety of ways in accordance with requirements of tenants.

A breakdown of typical office floor is estimated to be as follows:

	NOS.	AREA
Doctors Offices	33	5,200 s.ft.
Examination Rooms	46	3,700 s.ft.
Waiting Area		2,100 s.ft.
Reception/Secretary		1,000 s.ft.
Records		500 s.ft.
Miscel/Circulation		2,500 s.ft.
Total rentable space		15,000 s.ft.

3.7.2 -- OFFICE SPACE RENT

Rent for the office space is determined with the help of market data.

Six comparable office building rents were considered. These office buildings are within one mile radius of the proposed building. They are as follows:-

- 1) La Cité
- 2) 2001 University
- 3) 1155 Sherbrooke Street West
- 4) 2000 Peel
- 5) 2040 Peel (under construction)
- 6) 1500 de Maisonneuve West.

The rent is then adjusted on the basis of the following factors to arrive at the rent of the proposed building.

- 1) Prestige of location
- 2) Quality of space
- 3) Proximity to Metro and public transport
- 4) Proximity to market

The map in figure 5 shows the locations of the six office buildings considered for the determination of the rent.

TABLE 14 OFFICE

ADJUSTED

ADDRESS	LOCATION	QUALITY OF SPACE	PROXIMITY TO METRO & PUBLIC TRANSPORT	PR TO
La Cité	110	125	100	
2001 University	150	130	150	
1155 Sherbrooke	140	120	130	
2000 Peel	170	125	150	
2040 Peel	150	80	140	
1500 de Maisonneuve	110	100	120	

Adjusted rent \$13.60/sq. ft. (triple net and maintenance expenses).

Rent for year 1983 = \$15.25/sq. ft. net

- NOTE: 1) 100% Value in adjustment factor Office and Garage and the fact
2) Average operating expenses cha

TABLE 14 OFFICE SPACE RENTAL EVALUATION

ADJUSTMENTS					
C	PROXIMITY TO MARKET	AGGREGATE	NET RENTAL RATE (82)	ADJUSTED RATE	AVERAGE
	90	106.25	\$12.40	11.67	
	85	128.75	\$15.00	11.65	
	90	120.00	\$17.50	14.58	\$13.60
	85	132.50	\$16.50	12.45	
	85	113.75	\$18.00	15.82	
	90	105.00	\$16.25	15.47	

t. triple net basis for 1982 (exclusive of operating
 5/sq. ft. net (12% inflation)

djustment factors corresponds to proposed Ross Road
 ge and the factors have equal weighting.

ng expenses charged to tenants \$9.00 (1983)

3.7.3 - GROSS ANNUAL REVENUE FOR OFFICE SPACE (1983)

Total rentable space	30,000 sq. ft.
Rental Rate	\$15.25/sq.ft./year
Total revenue (yearly)	\$457,500.
5% Vacancy rate	\$22,875.
	<hr/>
Total yearly revenue	\$434,625.
Adjusted for vacancy rate	
say	\$435,000.
Add operating expenses and taxes charged to tenant @ \$9/sq.ft. for office space	\$270,000.

3.7.4 - PARKING GARAGE REVENUE (GROSS)

Parking revenue can be split into two categories

- 1) Revenue from visitors' parking
- 2) Revenue from employees' parking

The following figures on revenue are taken from the parking and circulation study of 1980. They were based on the analysis of parking receipts and sale of parking stickers to the employees: (4)

Visitors' Parking - (1980)

\$2.30 per car - with turnover ratio of 3.8/ day.

\$8.74 per car parking stall per day -

Employee Parking - (1980)

\$16.00 per stall per month. (This rent is maximum existing rent charged)

1983 figures of revenue shall be:

Rate of inflation - 12%

Visitors' Parking:

$\$8.75 \times 1.12 \times 1.12 = 10.98$

Say \$11.00 per stall per day.

Employees' Parking:

$\$16.00 \times 1.12 \times 1.12 = 20.07$

Say \$20.00 per stall per month.

Annual Gross Revenue from Parking Garage

No. of stalls reserved for employees of the hospital 60

No. of stalls for visitors 224

Total no. of stalls 284

Annual Income From Employee Parking

60 x 20 x 12 = \$14,400.

Annual Income From Visitors' Parking

224 x 11 x 365 = \$899,360.

 Total Parking Revenue (1983) \$913,760.

Deduct

10% Vacancy = \$822,384.

Say \$822,000.

3.7\5 - TOTAL EFFECTIVE GROSS INCOME

REVENUE FROM OFFICE SPACE: \$435,000.

Add

REVENUE FROM GARAGE: \$822,000.

TOTAL GROSS REVENUE: \$1,257,880.

THRU-PUT EXPENSES:
(OPERATING EXPENSES & TAXES CHARGED
TO TENANTS)

\$270,000.

3.8 - OPERATING EXPENSES

The operating expenses for the year 1983 are developed with the help of the following:

- 1) Discussion with Royal Victoria Hospital Engineering Department;
- 2) Consulting engineers and architects who worked on the project;
- 3) 1981 Downtown and Suburban Office Building Experience Exchange Report: BOMA (2); and
- 4) Comparing with other office building budgets in the downtown region.

The categories of the operating expenses for the Ross Road Office and Garage building are Superintendent and Management, Hydro (excluding HVAC), HVAC, Water, Maintenance and Repairs Services, Insurance and Real Estate Taxes. These annual operating expenses are estimated in the following pages. Part of these expenses are passed directly through to the tenants.

3.8.1 - SUPERINTENDENT AND MANAGEMENT

Garage and office building will require only a limited amount of this service. This building shall be managed by a department of the hospital which looks after the other buildings of the hospital.

Allowance for one janitor/superintendent half year salary is considered enough to cover this cost.

\$20,000.

3.8.2. -- HYDRO (EXCLUDING HVAC)

This item covers cost of energy consumed for lighting, elevators, etc. The operating expense is based on estimated energy consumption.

OFFICE LIGHTING

Office shall have fluorescent lighting with average intensity of 75 foot candles. This represents electrical consumption of about 3 Watts/sq. ft.

Office area: 3,7000 sq. ft.

Operation time: 12 hours daily

Total consumption for office lighting:

= (37,000 x 3 Watts x 12 hrs. x 260 days/1000) kwh

= 346,320 kwh

GARAGE LIGHTING

Garage shall have fluorescent lighting with intensity of 5 foot candle or approximately 1 watt/sq. ft.

Garage Area: 120,920 sq. ft.

Operation time: 24 hrs. daily

Total consumption for garage lighting -

= 120920 sq.ft. x 1 Watt x 24 hrs x 365 days/1000) kwh.

= 529,630 kwh.

ELEVATORS

2 nos 20 horsepower motors

Operation time = 40% per day

Taking 1 horsepower = 1 kwh.

Total consumption for Elevator operation

= $(2 \times 20 \text{ hp} \times 24 \text{ hrs.} \times 365 \text{ days} \times .4)$ kwh

= 140,160 kwh.

Total electrical consumption

= $346,320 + 529,630 + 140,160$

= 1,016,110 kwh.

Total annual expense for Hydro (excluding HVAC)

= $1,016,110 \times \$.05/\text{kwh}$

= \$50,805

Say \$51,000.

3.8.3 - HEATING, VENTILATION & AIR CONDITIONING

GARAGE VENTILATIONS

- The ventilation of the garage will be done with 2 fans of 45,000 cfm. capacity (motor 40 hp.)
- Energy consumption for garage:
 - = (80 hp. x 24 hrs. x 365 days) kwh.
 - = 700,800 kwh.

OFFICE HEATING AND VENTILATION

A variable volume type AC system will be used with air diffusers for heating. The capacity of the system for two office floors is estimated to be 100 tons.

Energy consumption for Heating/Air Conditioning:

$$\begin{aligned}
 &= (200 \text{ hp} \times 12 \text{ hrs} \times 260 \text{ days} \times 1/3 \text{ yr.}) * \text{kwh.} \\
 &+ (75 \text{ hp} \times 12 \text{ hrs} \times 260 \text{ days} \times 2/3 \text{ yr.}) \text{ kwh.} \\
 &= 208,000 + 156,780 \\
 &= 364,780 \text{ kwh.}
 \end{aligned}$$

* 200 hp. for 4 months and 75 hp. for 8 months average.

Total energy consumption for HVAC:

= 700,800 + 364,780

= 1,065,580 kwh.

Total annual expenses for HVAC:

= 1,065,580 x \$.05/kwh

= \$53,279.

say \$53,500.

3,8.4 - WATER

GARAGE

Total water consumption

Parking 2.5 litre/m² x per day

$$\text{Total for parking} = \frac{2.5 \times 12000 \times 365}{1000} = 10950 \text{ m}^3$$

@ 10 cent/m³

= \$1095.

OFFICE

120 litre/m²/ per day

$$\text{Total for office} = \frac{120 \times 3700 \times 260}{1000} = 115440 \text{ m}^3$$

@ 10 cent/m³ = \$11544.

Total - \$11,544.

\$ 1,095.

\$12,639.

Say \$13,000.

NOTE: 1 litre = .22 gallons

3.8.5 - MAINTENANCE AND REPAIRS/PAINTING AND DECORATING.

The amount is developed with the help of BOMA Report 1981 (2)

Total maintenance and repairs/painting and decorating	
costs per square foot per year:	
Alteration and decorating:	51.3 cents
Electrical System	13.3 cents
Combined HVAC maintenance:	43.7 cents
Elevators	<u>15.9 cents</u>
Total (1980)*	124.2 cents

Office maintenance and repairs/painting and decorating:

= 37,000 sq. ft. x 1.242 per sq. ft.

= \$45,954

Garage maintenance and repairs/

= 120,920 sq. ft. x .12 per sq. ft.

= \$14,500.

Total maintenance/repairs and painting and decorating:

Office = \$45,954.

Garage = \$14,500.

Total \$59,954.

say \$60,000.

* 1980 prices are used for 1983 without applying inflation factor as repairs and maintenance cost for the new building will be less than average office buildings.

3.8.6 - SERVICES

This will include cleaning service for the offices and garage.

Cleaning expense (based on BOMA Report 1981):
97.9 cents per sq. ft. per year

Cleaning cost for office.

= 37,000 sq.ft. x 97.9 x 1.33 (inflation @ 10%)

= \$48,176.

say \$48,000.

Allowance for garage cleaning:

(assuming once every two weeks @ \$400.)

26 x 400 = 10,400.

say \$10,000 = per year

Total cleaning cost

= \$58,000.

3.8.7 -- INSURANCE

This is an estimate of all risk insurance and third party liability.

Insurance (based on BOMA Report 1981):

6.8 cents per square foot per year. (Building total rate)

GROSS AREA OF BUILDING: 157,920 sq.ft.

Total insurance expense:

=(157,920 sq.ft. x 6.8 cents)

= \$10,738. *

say \$10,800.

*Insurance rate has been observed to be fairly steady over the last five years and no inflation factor is applied to this figure.

3.8.8 - REAL ESTATE TAXES

Ross Road Office and Garage project will be subjected only to real estate taxes. School and business taxes do not apply to institutional owners, according to the City of Montreal tax regulations.

Existing assessment of land:

= \$4.32/sq. ft.

Market value of land, estimated in Section 3.6.1

= \$6.53/sq. ft.

Assessment based on market value of land estimate

= \$6.53 x .9*

= \$5.88

Based on the average of the above figures the assessed value for 1983 is fixed at \$6/sq. ft.

Area of land needed for construction

= 45,000 sq. ft.

Assessed value of land (1983)

= \$270,000.

* Municipal assessment in Montreal is generally 90% of market value.

3.8.8.1 - REAL ESTATE TAXES: LAND AND BUILDING

Total capitalized cost of the project (excluding land)

= \$8,921,600.

Assessed value of building -

= \$8,921,600. x .9

= \$8,029,440.

Assessed value of land and building -

= \$8,029,440. + 270,000.

= \$8,299,440.

4 Say \$8,300,000.

Real Estate Taxes

= \$66,400. (rate 80 cents for \$100. evaluation,

maximum charged by the City of

Montreal to an institutional owner)

3.9 - FINANCING:

For this case study the financing of the project is considered to be done in the following manner:

Equity 15%	=	\$1,345,800
Mortgage Loan 85%	=	<u>\$7,626,200</u>
TOTAL		\$8,972,000

Due to the presently fluctuating mortgage rates, and the uncertainty of future rates, the actual mortgage rate may vary over the total amortization period. For the purpose of this study, based on the current mortgage rates, an average rate of 18% per year is assumed for 30 years amortization period.

Based on the above data, the total blended monthly payment -

= \$110,955.

Total annual debt service -

= \$1,331,465.

TABLE 15

STATEMENT OF LOAN

PROJECT: ROSS ROAD OFFICE AND GARAGE

DATE : MARCH 1982

AMOUNT OF LOAN: \$7,626,200.

AMORTIZATION : 30 YEARS

INTEREST RATE : 18% (AVERAGE)

YEAR	INTEREST	PRINCIPAL	TOTAL PAYMENT	ENDING BALANCE
1	\$1,330,133.	\$1,331.	\$1,331,465.	\$7,624,869.
2	1,328,802.	2,662.	1,331,465.	7,622,207.
3	1,326,139.	5,325.	1,331,465.	7,616,882.
4	1,323,476.	7,988.	1,331,465.	7,608,894.
5	1,320,813.	10,651.	1,331,465.	7,598,243.
6	1,318,150.	13,314.	1,331,465.	7,584,929.
7	1,314,156.	17,309.	1,331,465.	7,567,620.
8	1,308,830.	22,634.	1,331,465.	7,544,986.
9	1,303,504.	27,960.	1,331,465.	7,517,026.
10	1,296,846.	34,618.	1,331,465.	7,482,408.

3.10 - INCOME TAXES

The owner, being an institution and non-profit organization, is exempt from income taxes. Thus a before tax cash flow analysis is performed.

3.11 - SUMMARY OF COST, REVENUES, EXPENSES AND DEBT SERVICE

<u>VARIABLES</u>	<u>BASE CASE</u>
1. Construction & Development Costs & Fees	\$8,391,000.
2. Interest on Construction Loan	581,000.
3. Total Capitalized Cost	8,972,000.
4. Effective Gross Income: Office	435,000.
5. Effective Gross Income: Garage	822,000.
6. Total Effective Gross Income	1,257,000.
7. Superintendent	20,000.
8. Hydro Excluding HVAC	51,000.
9. HVAC	53,500.
10. Water	13,000.
11. Maintenance	60,000.
12. Services	58,000.
13. Insurance	10,800.
14. Real Estate Taxes	66,400.
15. Total Operating Expenses	332,700.
16. Thru-put Expenses (Charged to Tenants)	270,000.
17. Operating Expenses Paid by Owner	62,700.
18. Equity 15%	1,345,800.
19. Loan 85%	7,626,200.
20. Interest Rate	18%/30 Year
21. Monthly Blended Payment	110,955.
22. Annual Debt Service	1,331,465.

3.12 - ANNUAL CASH FLOW

Total effective gross income:	\$1,257,000.
deduct	
Total operating expenses: (Paid by Owner)	\$ 62,700.
	<hr/>
Net operating income:	\$1,194,300.
deduct	
Debt Service	\$1,331,465.
	<hr/>
Cash flow	- \$137,165.

The calculations for the cash flow for the first stabilized year shows a net loss. If the operating income and operating expenses continue to go up at approximately the same rate in the following years and the debt service remains constant, the loss shall go on reducing. But such an assumption about the fixed cost of future financing may not be appropriate, given today's fluctuations in the mortgage rates. So, no attempt is made to predict future cash flows.

CHAPTER 4
SENSITIVITY ANALYSIS
AND CONCLUSION

CHAPTER 4

SENSITIVITY ANALYSIS AND CONCLUSIONS4.1 SENSITIVITY ANALYSIS FOR THE CASE STUDY

For the sensitivity analysis of the Ross Road office and garage project the following input variables are chosen for change with reference to the base case:

1. Construction Cost
2. Mortgage Interest Rate
3. Construction Period
4. Amount of Office Space

Six different cases are considered to arrive at a net increase or decrease in Pretax Cash Flow. Some of these cases also represent different alternatives considered by the Architects.

The six cases are:

1. 15% reduction in construction cost:
2. 15% interest rate (Average):
3% point decrease in the average mortgage interest rate.
3. 21% interest rate (Average):
3% point increase in the average mortgage interest rate.
4. 6 months construction period:
2 months decrease in the construction period and design period remains the same.

5. One additional office floor
6. Only garage to be built
no office space

Tables 16 and 17 show the results of this analysis and actual calculations can be found in Appendix A.

4.2 - BREAK EVEN RENT

Break Even Rent is the rental rate which gives net income equal to zero. In other words, total gross effective revenue is the same as total of operating expenses and debt service. In the following lines, a percentage increase necessary in the rental rate (the Case Study) to arrive at Break Even Rent is determined.

Total Gross Effective Income: \$1,257,000.

Operating Expense Paid by Owner: \$ 62,700.

Annual Debt Service: \$1,331,465.

Percentage Increase Necessary
to Get Break Even Rent: 'x'

$$\$1,257,000 (100 + x/100) = \$62,700 + \$1,331,465$$

$$x = 11\%$$

11% increase in the Rental Rate for Office and Garage will give the Break Even Rent for the Case Study and the cash flow will be zero.

TABLE 16: SUMMARY OF SENSITIVITY ANALYSIS 1

	BASE CASE	CASE 1 85% CONST. COST
1. Construction & Development Costs & Fees	\$8,391,000.	\$7,132,400.
2. Interest on Construction Loan	581,000.	493,900.
3. Total Capitalized Cost	8,972,000.	7,626,300.
4. Effective Gross Income: Office	435,000.	435,000.
5. Effective Gross Income: Garage	822,000.	822,000.
6. Total Effective Gross Income	1,257,000.	1,257,000.
7. Superintendent	20,000.	20,000.
8. Hydro Excluding HVAC	51,000.	51,000.
9. HVAC	53,500.	53,500.
10. Water	13,000.	13,000.
11. Maintenance	60,000.	60,000.
12. Services	58,000.	58,000.
13. Insurance	10,800.	10,800.
14. Real Estate Taxes	66,400.	66,400.
15. Total Operating Expenses	332,700.	332,700.
16. Thru-put Expenses Paid By Tenant	270,000.	270,000.
17. Operating Expenses Paid By Owner	62,700.	62,700.
18. Equity 15%	1,345,800.	1,143,945.
19. Loan 85%	7,626,200.	6,482,355.
20. Interest Rate	18%/30 Year	18%/30 Year
21. Monthly Blended Payment	110,955.	94,313.
22. Annual Debt Service	1,331,465.	1,131,760.

SE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6
% NST. COST	15% INTEREST (AVERAGE)	21% INTEREST (AVERAGE)	6 MONTH CONST. PERIOD	1 ADDITIONAL OFFICE FLOOR	GARAGE ONLY NO. OFFICE FLOOR
,132,400.	\$8,391,000.	\$8,391,000.	\$8,391,000.	\$9,349,000.	\$6,325,800.
493,900.	581,000.	581,000.	407,000.	542,100.	322,000.
,626,300.	8,972,000.	8,972,000.	8,978,000.	9,891,100.	
435,000.	435,000.	435,000.	435,000.	652,500.	-
822,000.	822,000.	822,000.	822,000.	822,000.	1,079,000.
,257,000.	1,257,000.	1,257,000.	1,257,000.	1,517,500.	1,079,000.
20,000.	20,000.	20,000.	20,000.	25,000.	15,000.
51,000.	51,000.	51,000.	51,000.	59,700.	35,500.
53,500.	53,500.	53,500.	53,500.	62,600.	35,000.
13,000.	13,000.	13,000.	13,000.	18,800.	1,100.
60,000.	60,000.	60,000.	60,000.	83,000.	14,500.
58,000.	58,000.	58,000.	58,000.	82,000.	14,000.
10,800.	10,800.	10,800.	10,800.	12,100.	8,200.
66,400.	66,400.	66,400.	66,400.	69,500.	50,000.
332,700.	332,700.	332,700.	332,700.	412,700.	173,300.
270,000.	270,000.	270,000.	270,000.	335,000.	-
62,700.	62,700.	62,700.	62,700.	77,700.	173,300.
143,945.	1,345,800.	1,345,800.	1,319,700.	1,483,665.	997,170.
482,355.	7,626,200.	7,626,200.	7,478,300.	8,407,435.	5,650,630.
%/30 Year	15%/30 Year	21%/30 Year	18%/30 Year	18%/30 Year	18%/30 Year
94,313	93,700.	128,288.	108,803.	122,321.	82,210.
131,760.	1,124,400.	1,539,456.	1,305,640.	1,467,862.	986,500.

TABLE 17 : SUMMARY OF SENSITIVITY ANALYSIS 2

	BASE CASE	CASE 1 85% CONST. COST	CASE 2 15% INTER (AVERAGE)
1. Total Effective Gross Income	\$1,257,000.	\$1,257,000.	\$1,257,000.
2. Total Operating Expenses Paid By Owner	62,700.	62,700.	62,700.
3. Net Operating Income	1,194,300.	1,194,300.	1,194,300.
4. Debt Service	1,331,465.	1,131,760.	1,124,400.
5. Pre Tax Cash Flow	-137,164.	62,540.	69,900.
6. Variation Of Cash Flow With Respect To Base	0	199,705.	207,065.

CASE 2	CASE 3	CASE 4	CASE 5	CASE 6
15% INTEREST (AVERAGE)	21% INTEREST AVERAGE	6 MONTH CONST. PERIOD	1 ADDITIONAL OFFICE FLOOR	GARAGE ONLY NO OFFICE FLOOR
\$1,257,000.	\$1,257,000.	\$1,257,000.	\$1,517,500.	\$1,079,400.
62,700.	62,700.	62,700.	77,700.	173,300.
1,194,300.	1,194,300.	1,194,300.	1,439,800.	906,100.
1,124,400.	1,539,456.	1,305,640.	1,467,862.	986,500.
69,900.	-345,155.	-111,340.	-28,062.	-80,400.
207,065.	-207,991.	25,825.	109,103.	56,765.

4.3 CONCLUSION

The conclusions of the Feasibility Analysis are based on the data and the assumptions incorporated in the analysis. The conclusions of the Road Office and Garage Project are given under two headings:

1. Base Case
2. Sensitivity Analysis

4.3.1 Base Case

The Financial Feasibility Analysis of the Base Case Study results in a pretax negative cash flow of \$137,165 in the first full year operation. This is primarily because of the amount of the debt service required.

By going ahead with the project, the Hospital's first three objectives: the provision of parking space, office space for the doctors and indoor link to the Allen Memorial Institute, will be realized at an annual cost of \$137,165 and an equity investment of \$1,345,800. This annual cost can decrease or go up in accordance with the rate at which operating revenue and expenses vary in relation to the cost of financing.

The objective No. 4, earning a return on the investment, will not be realized based on the values of input variables in the analysis, if the Hospital wishes to subsidize the rent of its employees.

4.2.2 SENSITIVITY ANALYSIS

The conclusions derived from the Sensitivity Analysis of The Ross Road Office and Garage Projects are as follows:-

1. The 15% reduction in the construction cost causes the pretax cash flow of -\$137,200. to become \$62,540., a total change of about \$200,000. and equity goes down by about \$201,855..
2. The 3% point decrease in the Average Mortgage Rate results into a positive cash flow of \$69,900., a change of \$207,065. in the pretax cash flow with reference to the base case.
3. The 3% point increase in the Average Mortgage Rate increases the pretax negative cash flow to \$345,156., a change of \$208,000.
4. The reduction of the construction period from 8 months to 6 months makes a difference of \$25,825.
5. An addition of one more floor of office space requires an increase in equity of \$137,865. but it reduces the negative cash flow of the base case by an amount of \$28,100. annually.
6. Building no office space reduces the negative cash flow in the year by \$56,765. and equity by first full operating year \$348,600.

The pretax cash flows are very sensitive to the average mortgage rate and total construction costs. The reduction in the construction cost and the interest rate charged for financing will be required to decrease the negative pretax cash flow.

The compression of the construction period has very little effect on the annual pretax cash flow and the construction period may be adapted to suit other criteria more than that of financing.

The increase in the office space has a positive effect on the annual pretax cash flow but the demands for it needs further study. Finally by providing no office space, the equity and the negative cash flows are reduced, but Objective No. 2, provision of office space for the doctors' use, is not achieved.

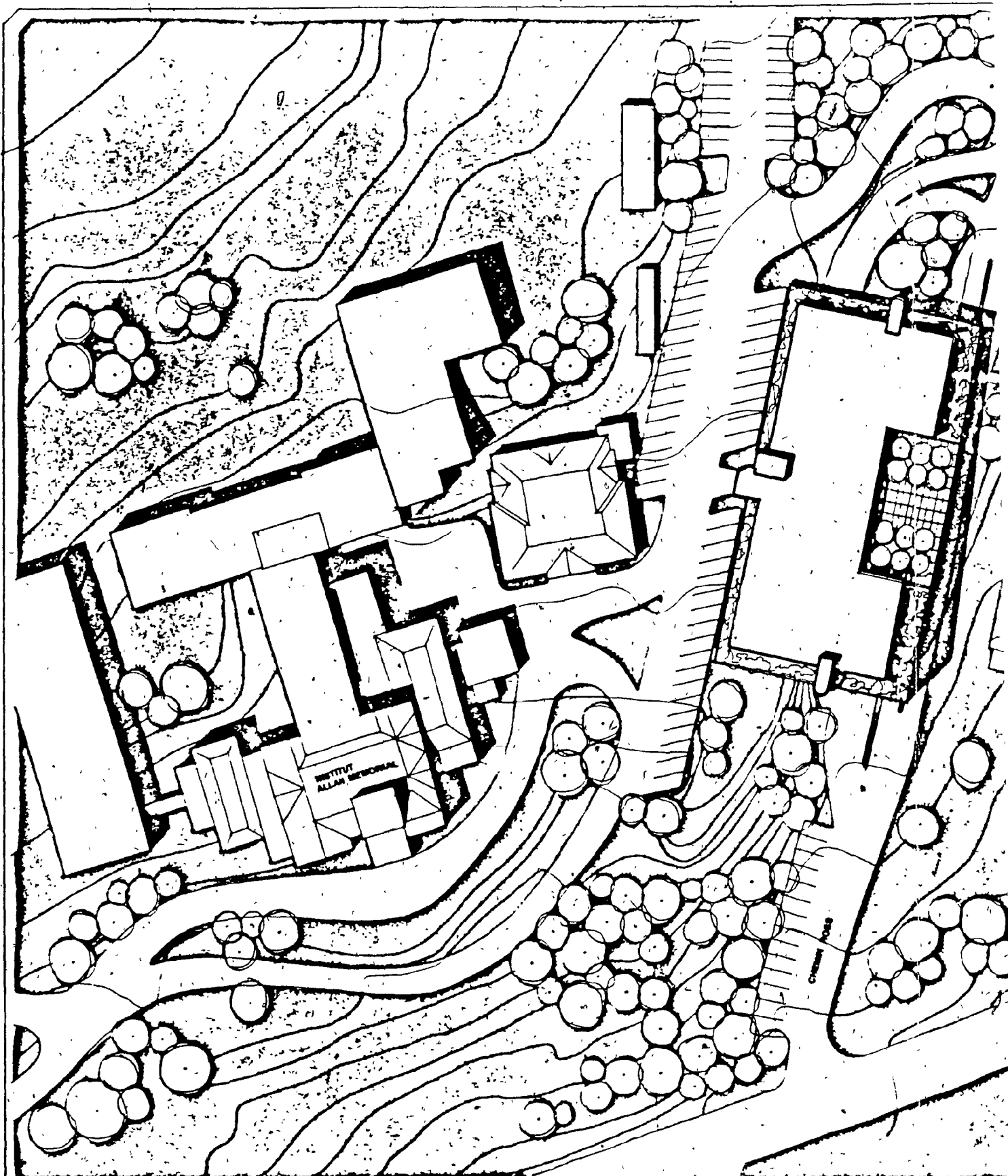
Recommendations:

On the basis of this study, the following recommendations are made:

1. Attempts to reduce construction costs should be pursued. The higher cost of the garage is principally because of the site conditions which involve cutting into rock and concrete retaining walls. The relocation of the building may be studied as it may help to make the building a positive proposition.
2. As an institutional building, subsidized financing may be obtained to make the project "financially feasible".
3. Explore the subsidy the Hospital wishes to give.

APPENDIX A

ARCHITECTURAL PLANS OF
ROSS ROAD OFFICE AND GARAGE

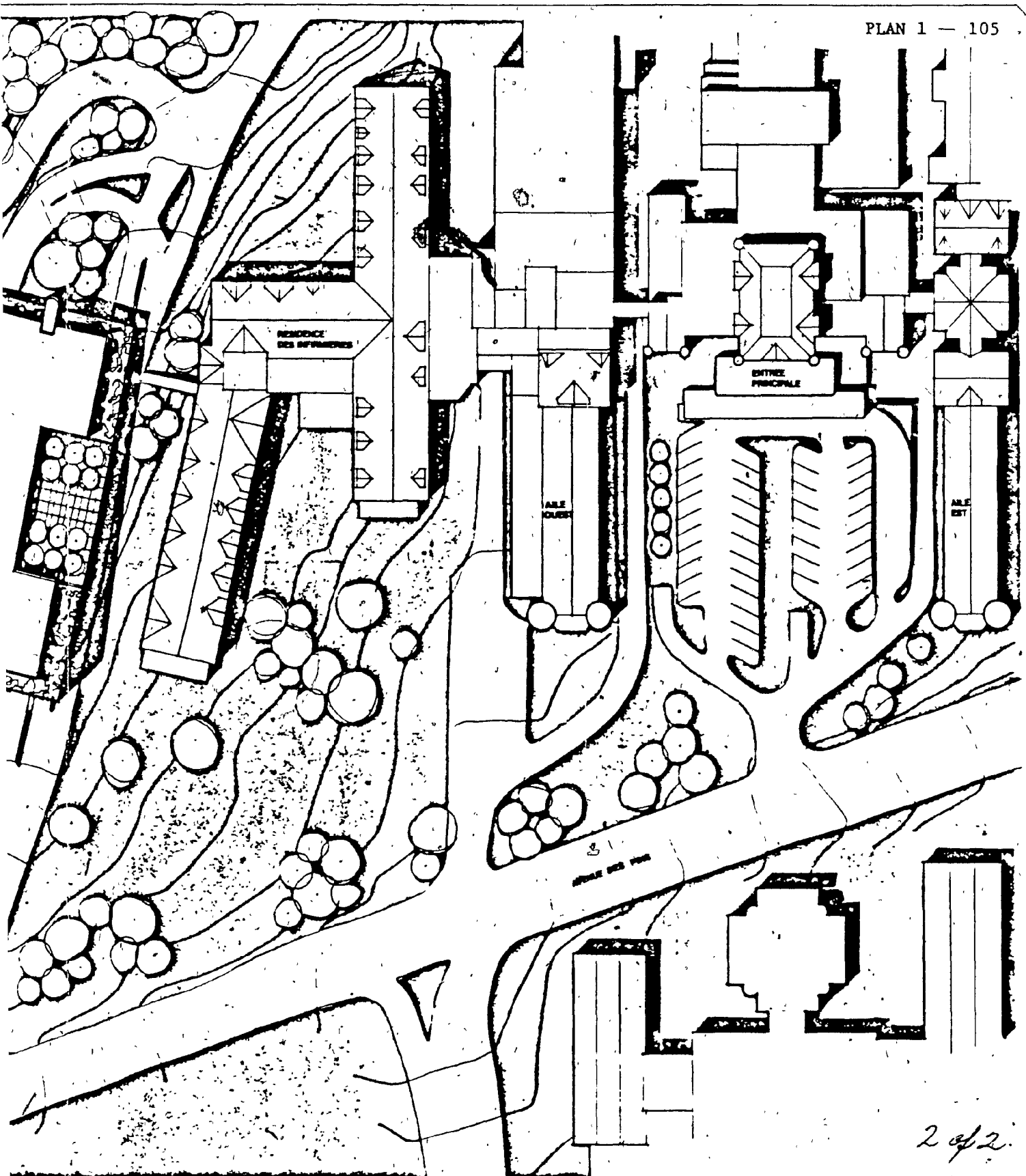


1

HOPITAL ROYAL VICTORIA
GARAGE ET BUREAUX · CHEMIN ROSS

IMPL

1 of



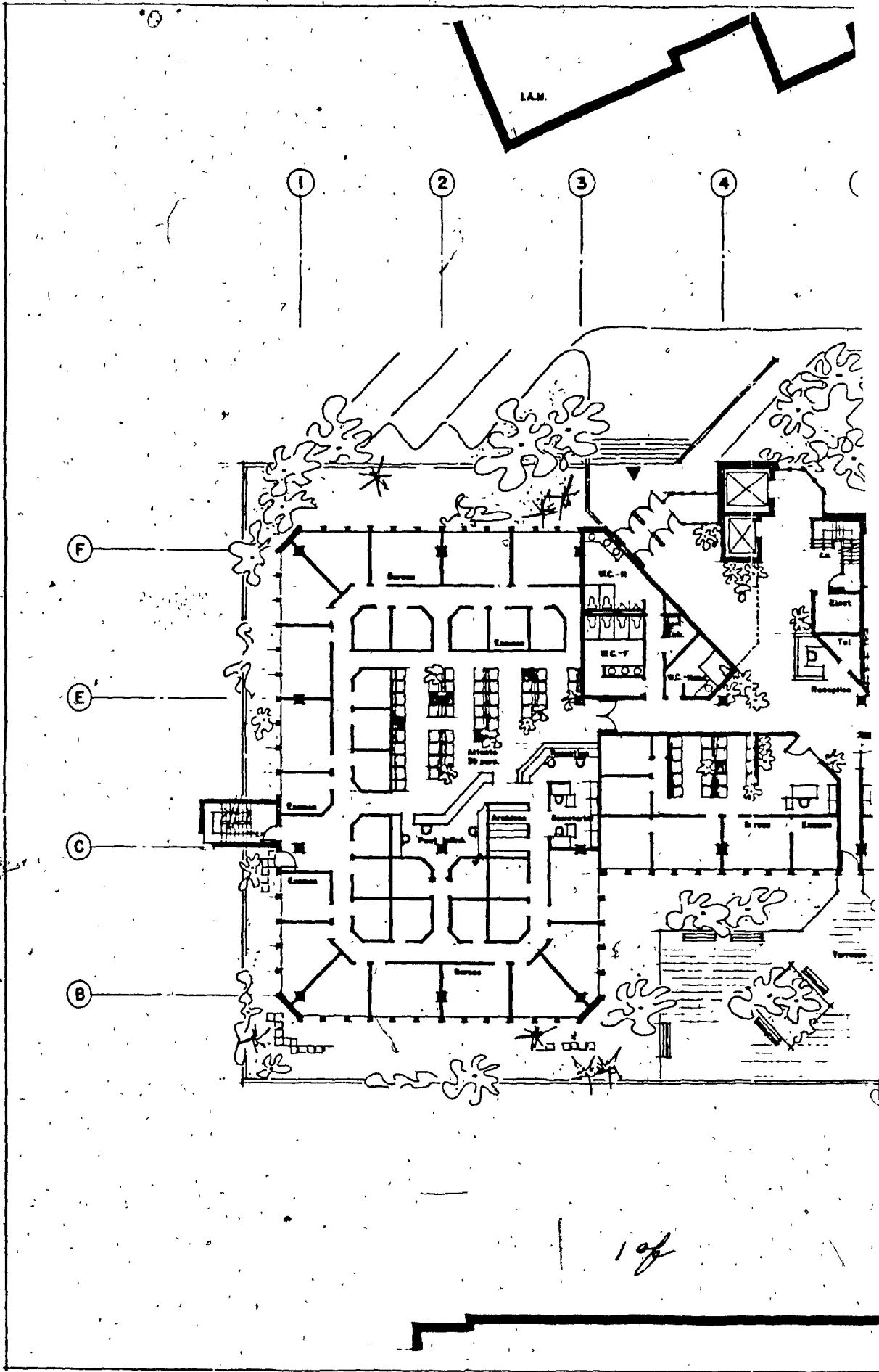
2 of 2

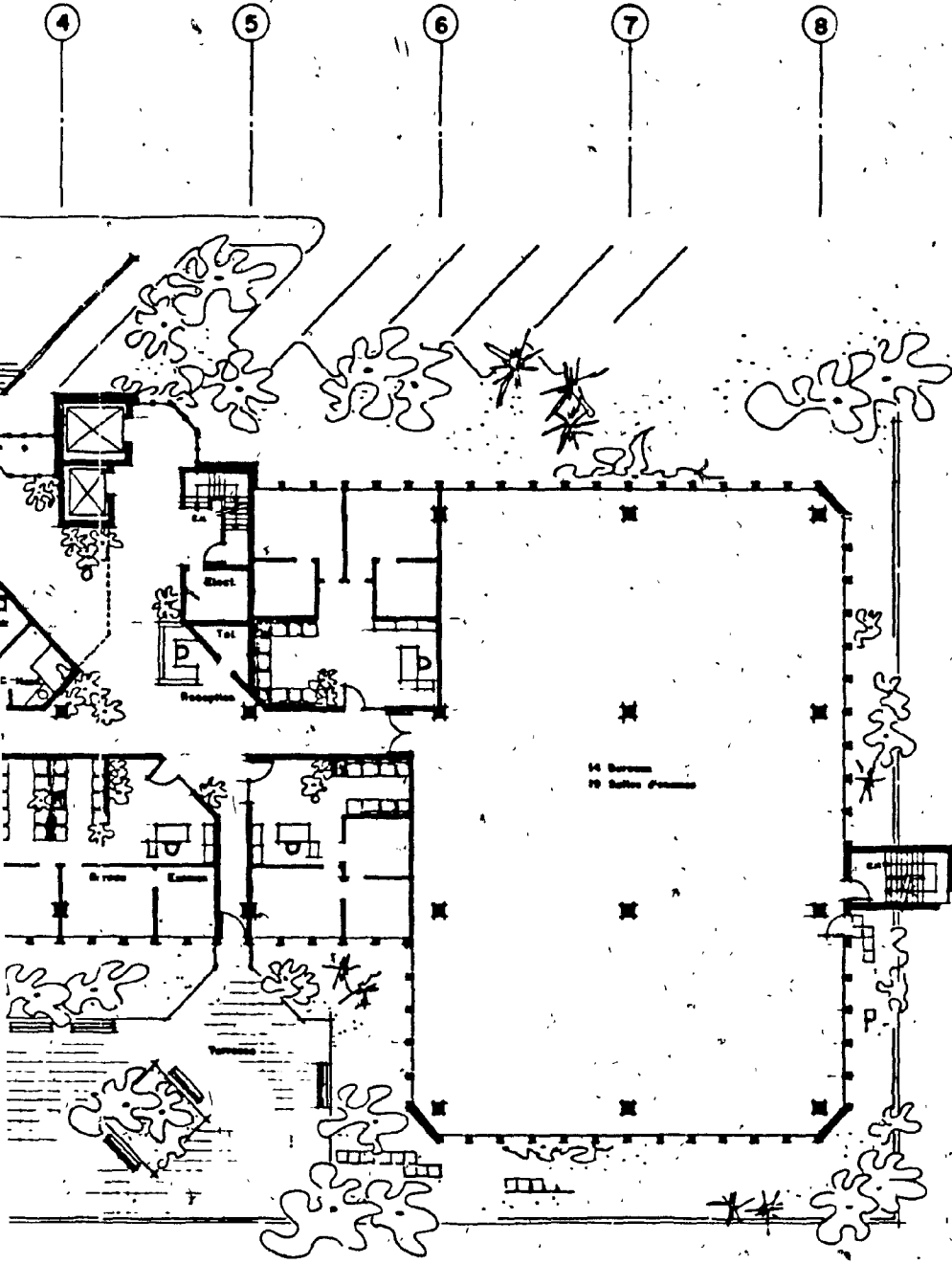
IMPLANTATION

ARCHITECTES
Côté, Glouberman Architectes
INGÉNIEURS
BBL Inc.

OCTOBRE, 1981
ECHELLE 1/400



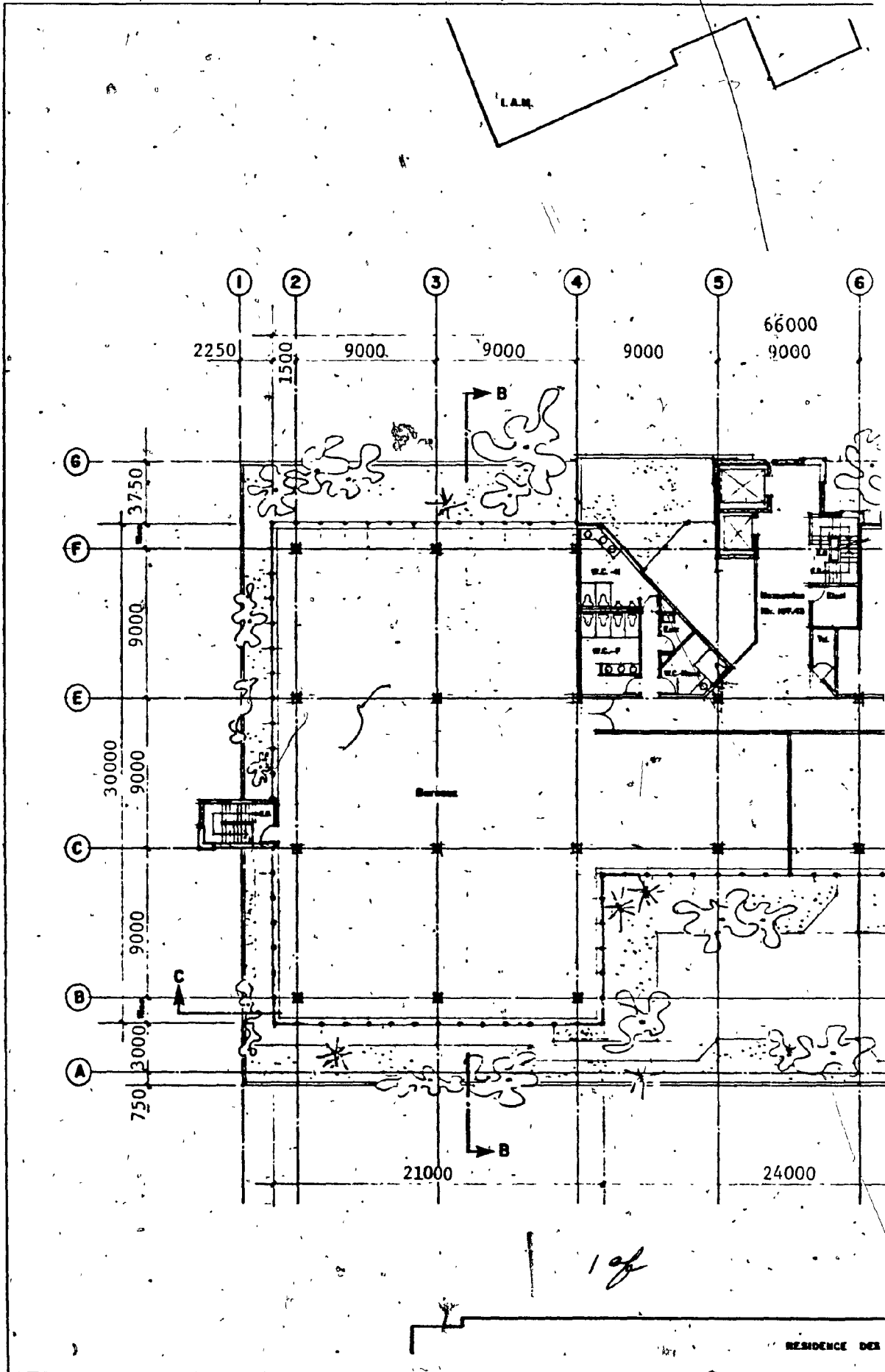




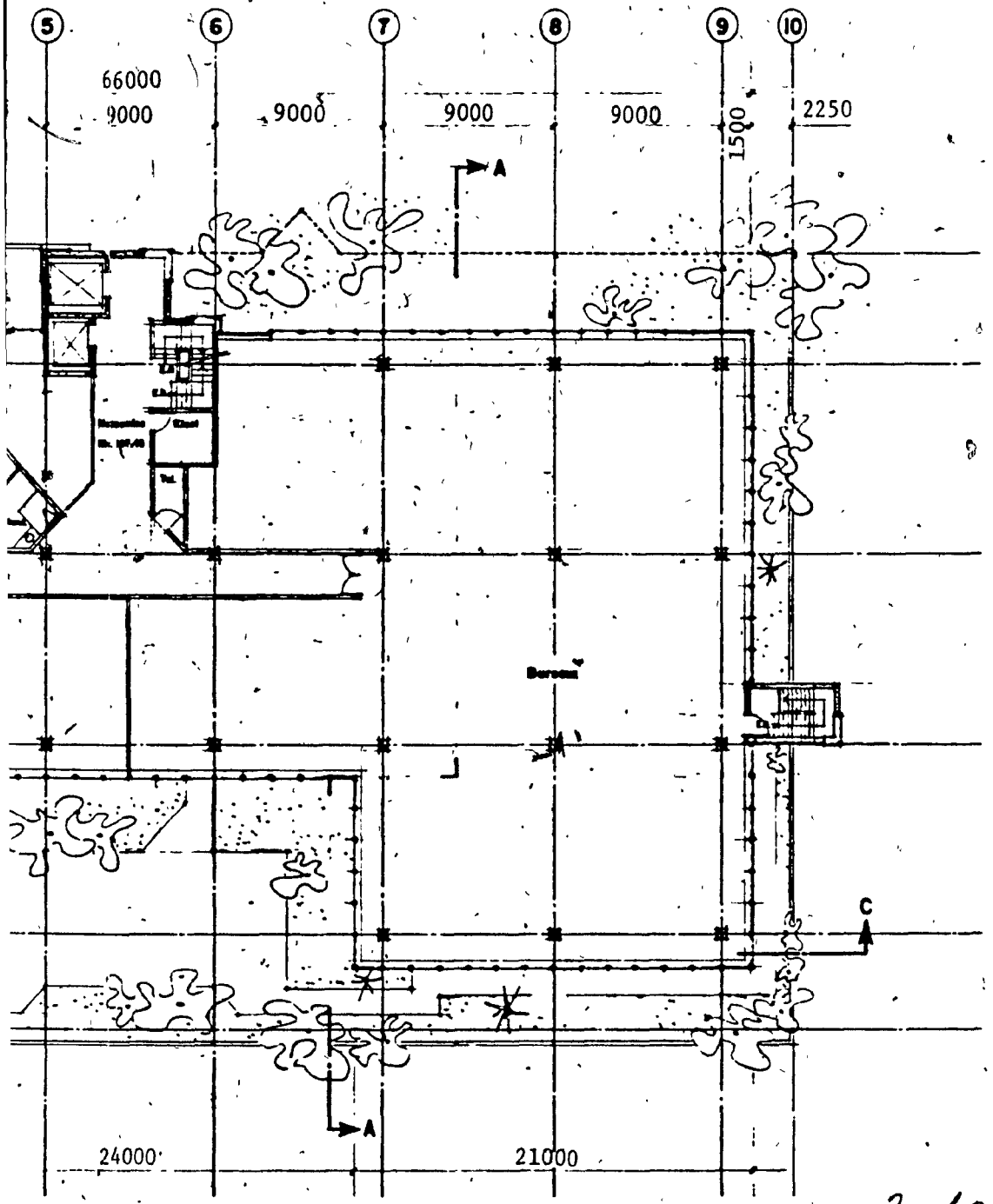
2 of 2

RESIDENCE DES INFIRMIERES

Côté Gloubertman	
HÔPITAL ROYAL VICTORIA GARAGE ET BUREAUX CHEMIN ROSS	
Bureaux Rez-de-chaussée	
Échelle	1:100
Projeté par	O.S.
Approuvé par	O.S.
81-63	



No.	Date	Modification



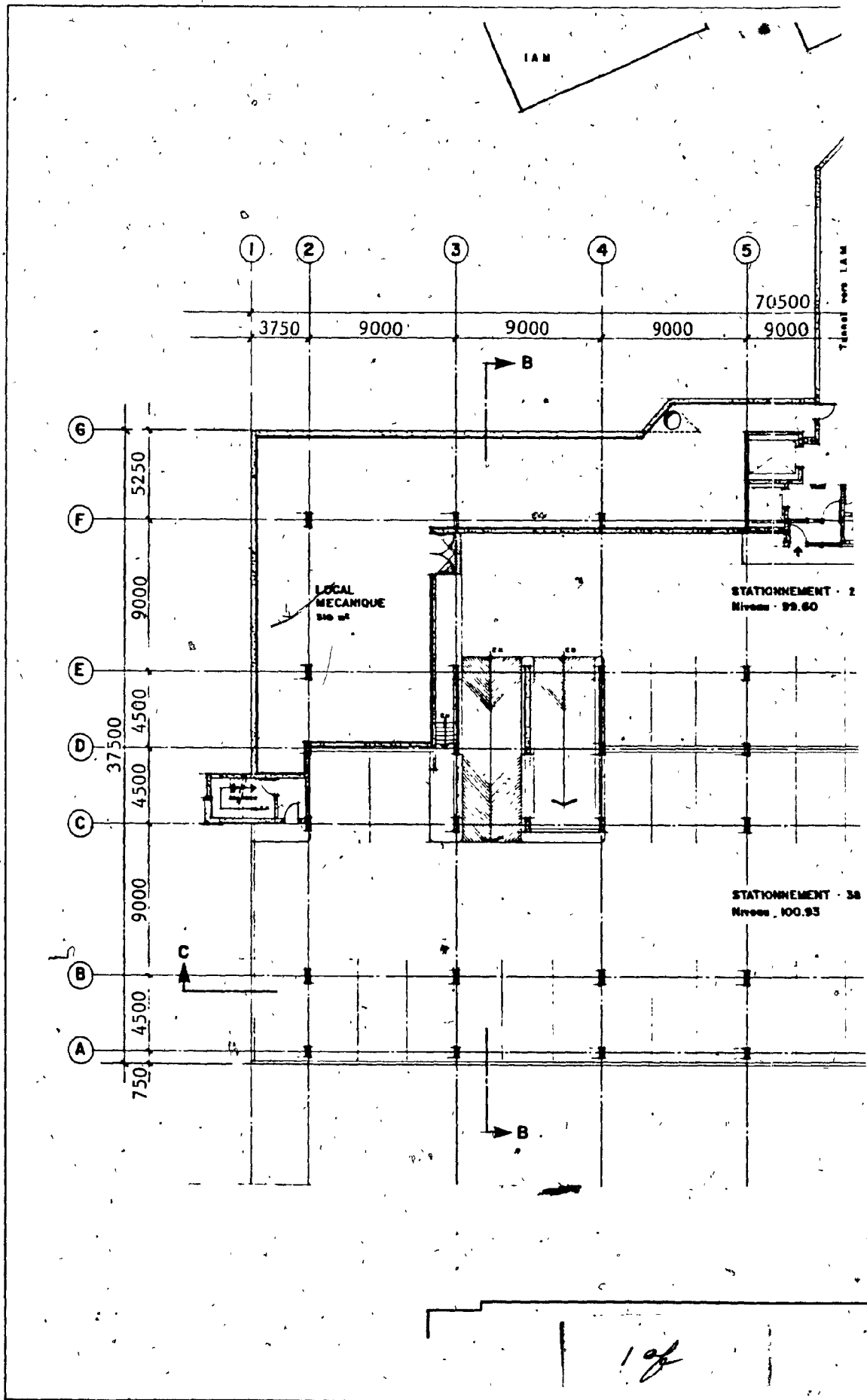
2 of 2

COM. Glouberman
ARCHITECTS
1000 Ave. de la Courbe, Suite 200
Montreal, P.Q.

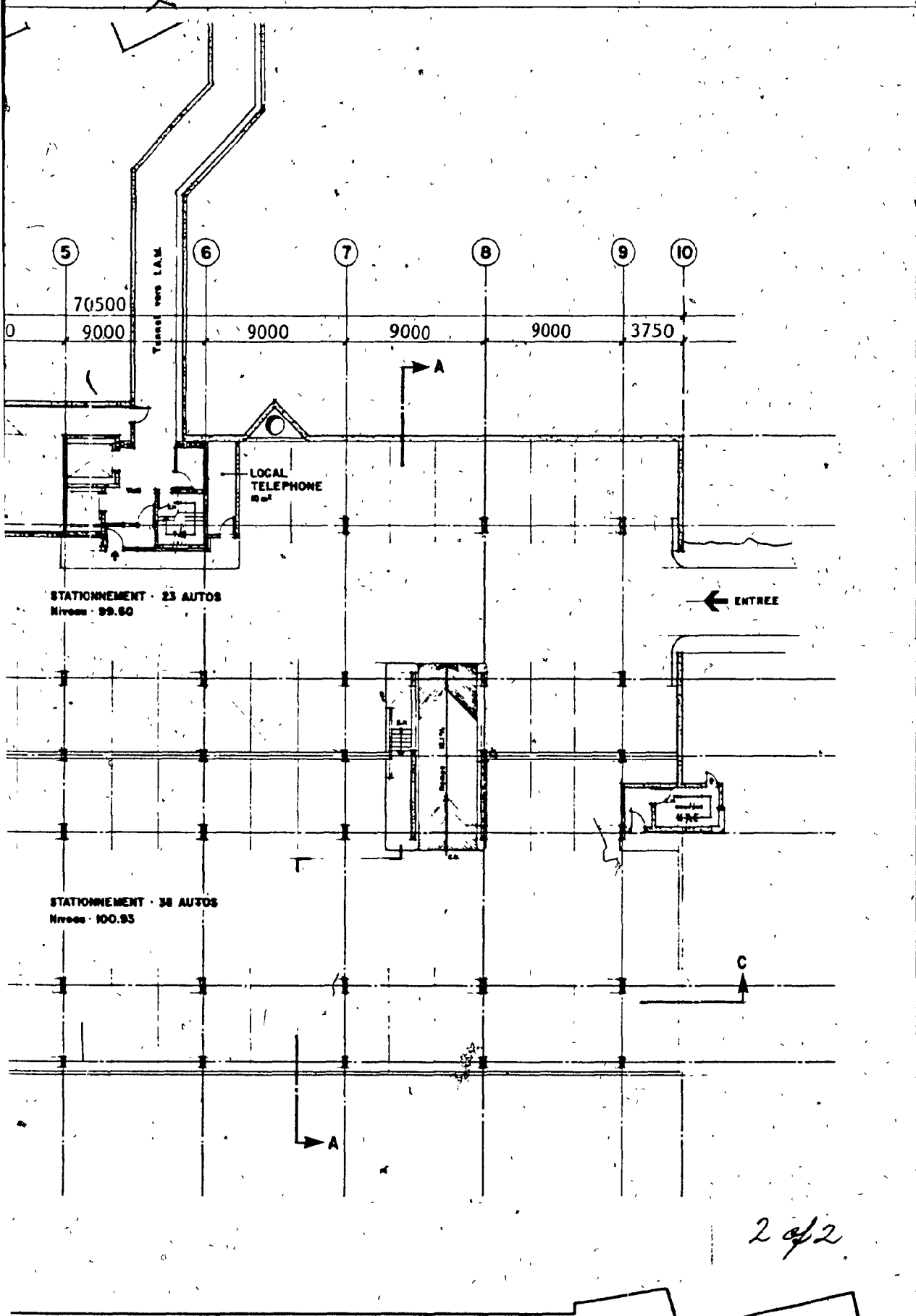
HOPITAL ROYAL VICTORIA
GARAGE ET BUREAUX
CHEMIN ROSS

Bureaux
1^{er} étage

Scale: 1:100
Date: 1964/10/22
Author: G.S.
Checker: G.S.



No.	Date	Description	Par
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10			



RÉSIDENCE DES INFIRMIERES

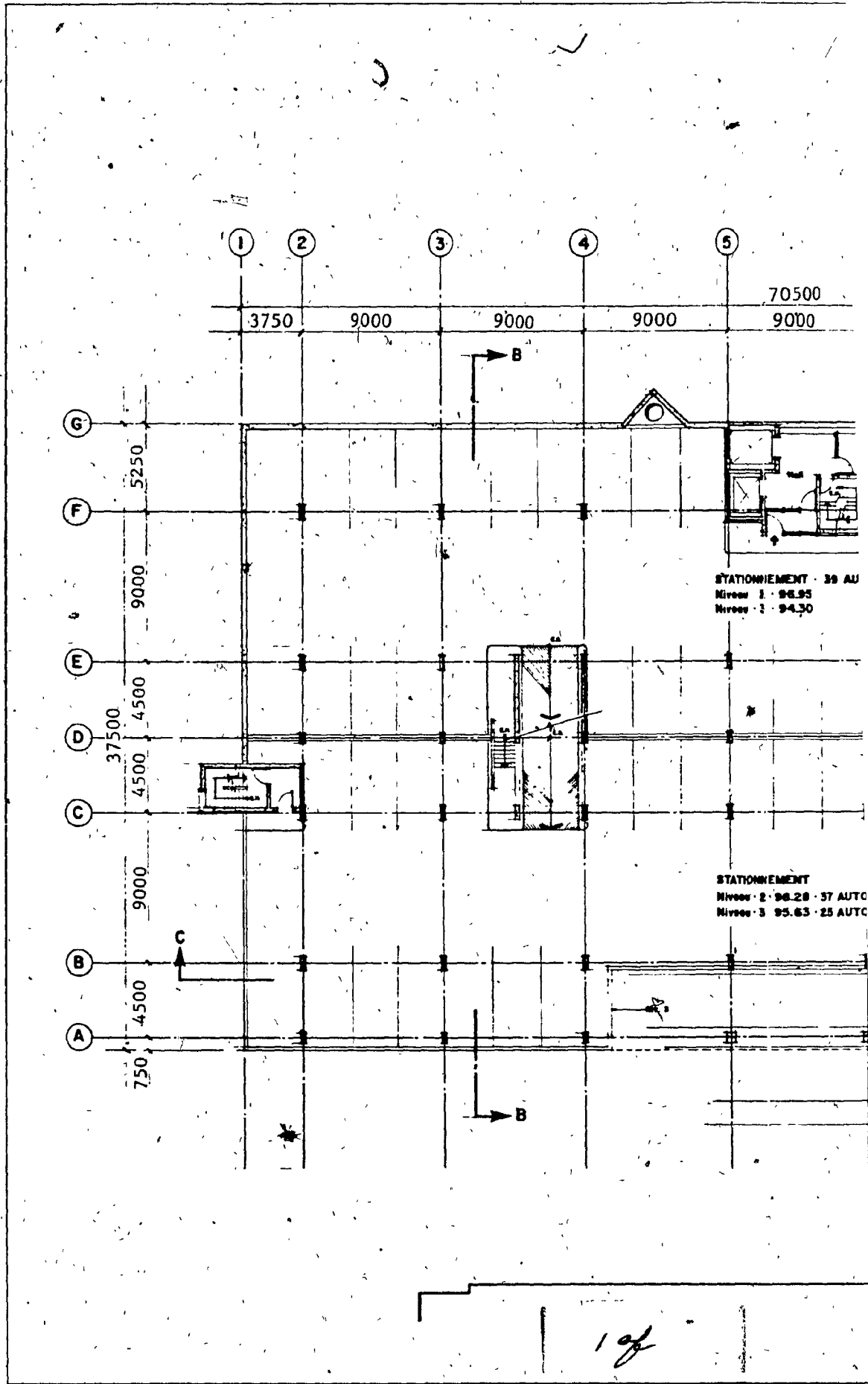
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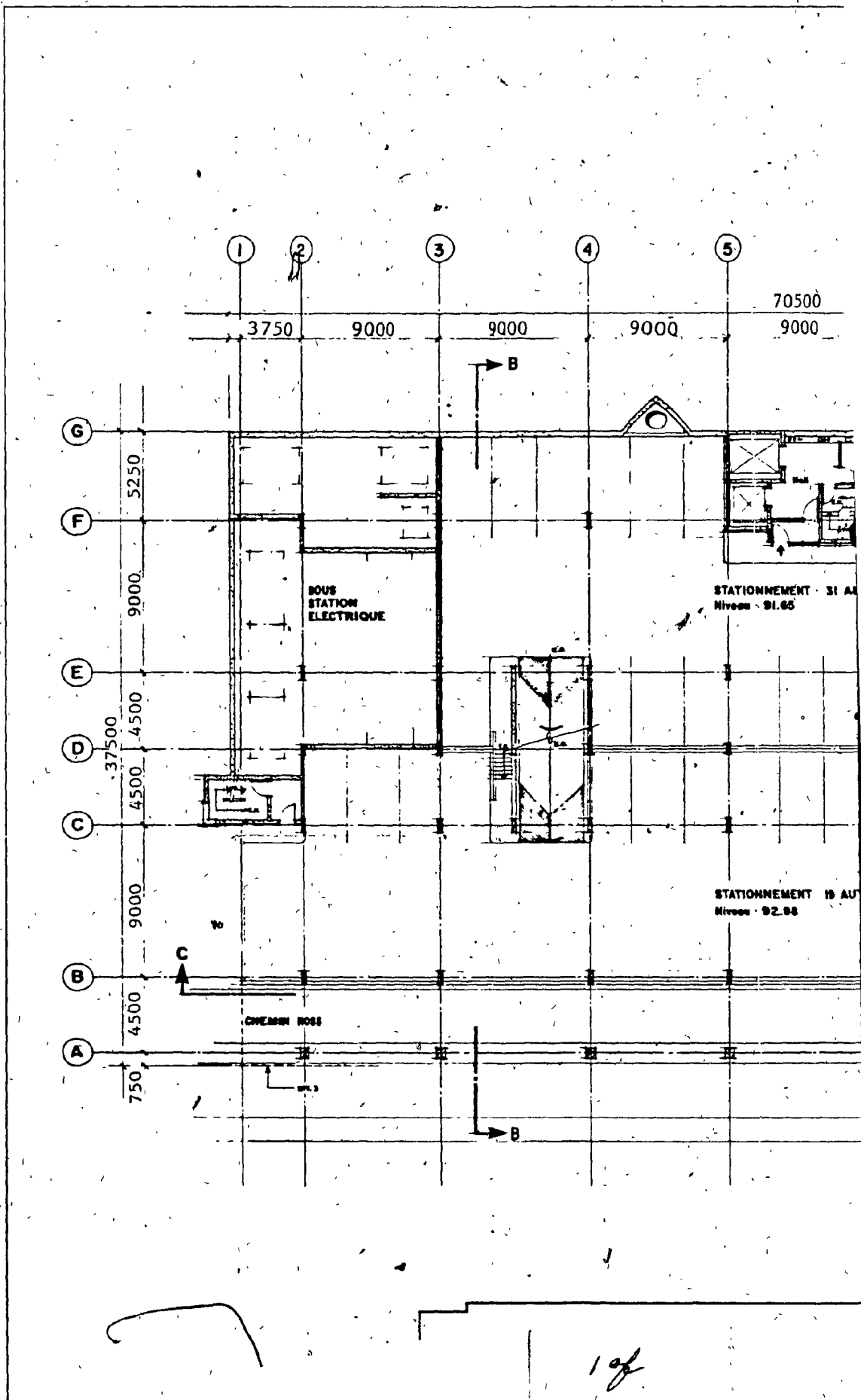
CON. Glauberman

HOPITAL ROYAL VICTORIA
GARAGE ET BUREAUX
CHEMIN ROSS

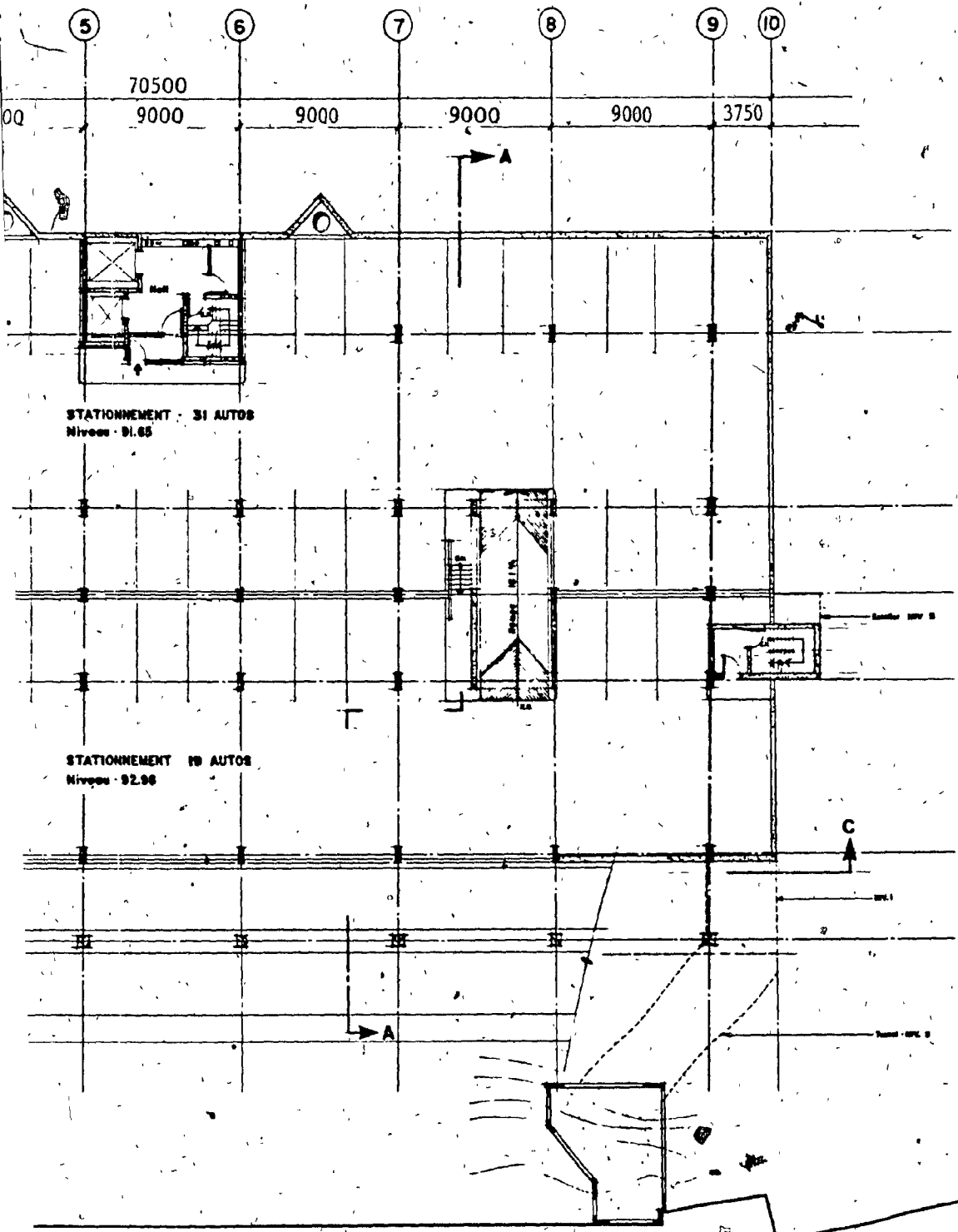
Garage - Niveau 1

Scale	1:200	Date	7/51
Author			
Checked by			
Approved by			





No.	Date	Description	Revisé
1		PROJ. SÉLÉCTION	02.2



CON. Gouberman

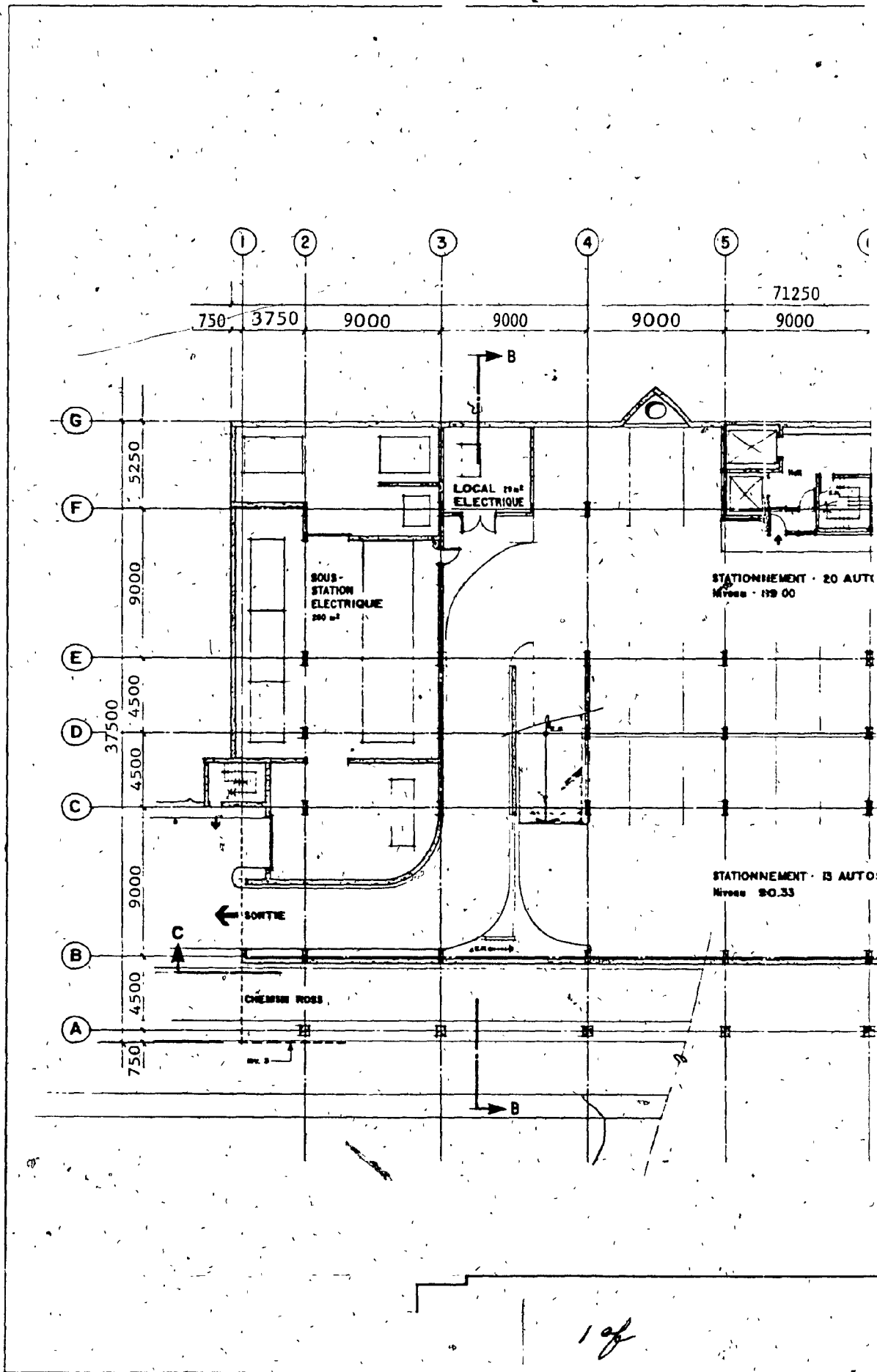
1100 Ave. de l'Industrie, Montréal, Qué.
 514 382-1111

**HOPITAL ROYAL VICTORIA
 GARAGE ET BUREAUX
 CHEMIN ROSS**

Garage - Niveau 4

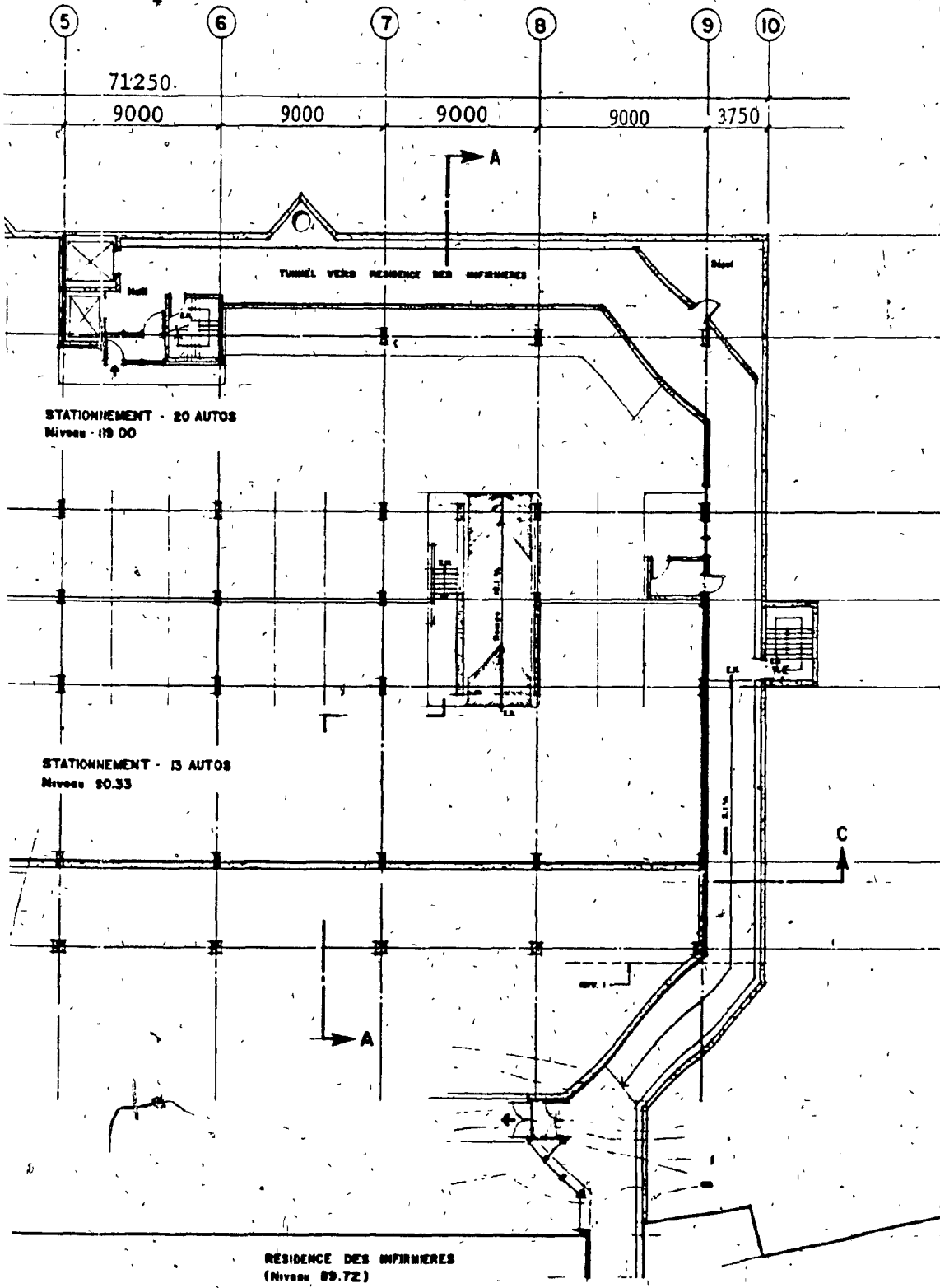
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Author	G.S.		
Checked by	G.S.		

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1 of

No.	Description	Quantité	Unité
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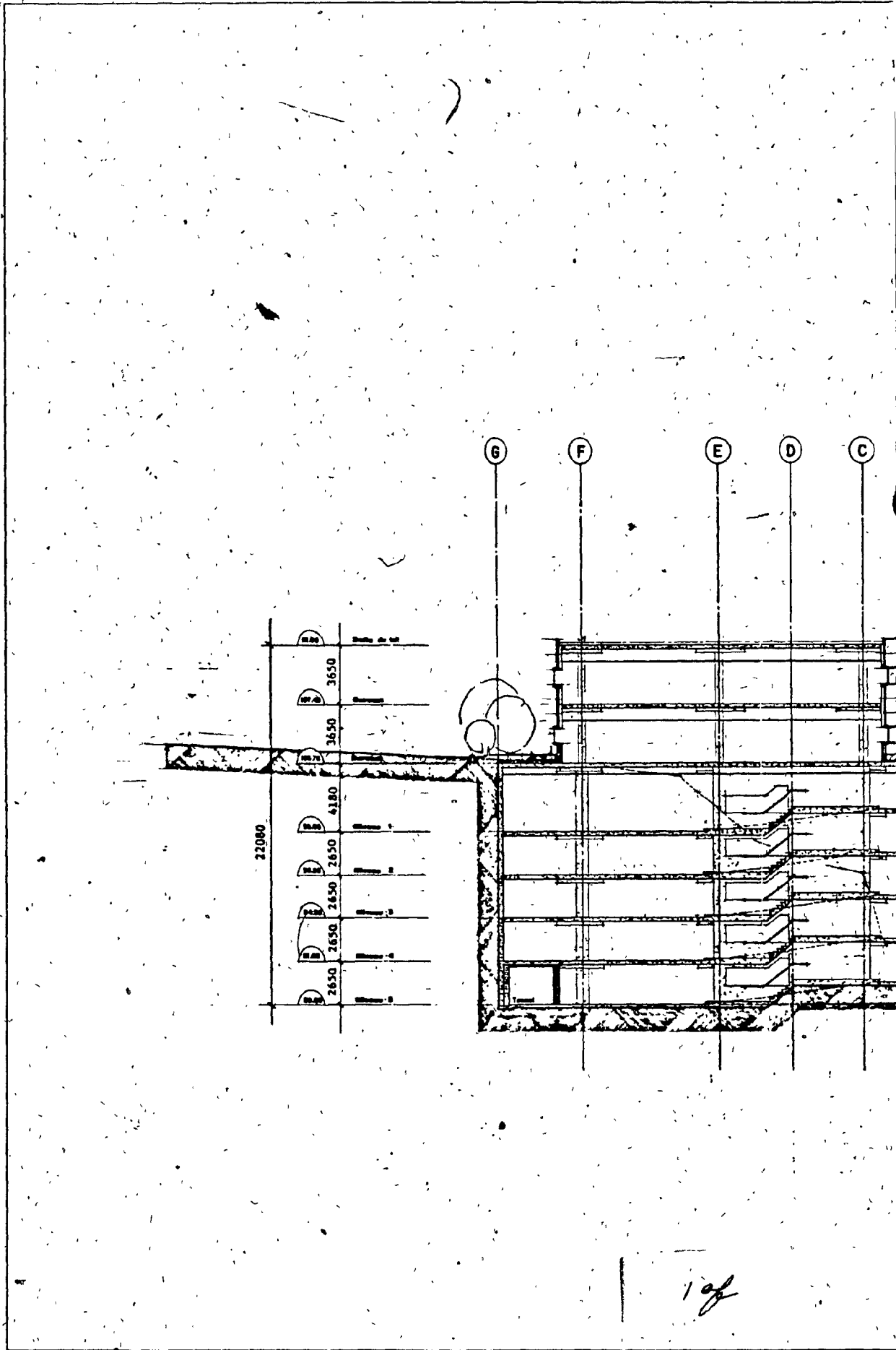


CÔM. Glouberman
1000 Avenue de l'Industrie, Montréal, Québec H3C 2G4
 Tel. 346-8710

HOPITAL ROYAL VICTORIA
 GARAGE ET BUREAUX
 CHEMIN ROSS

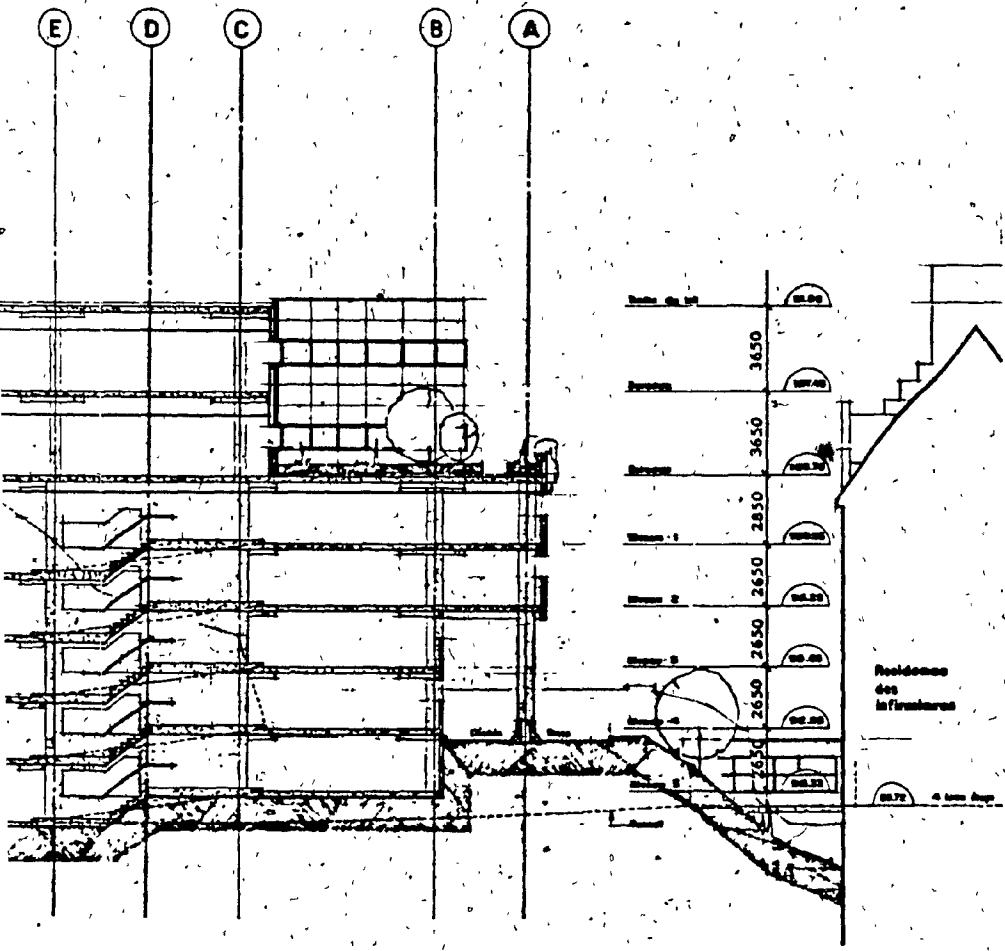
Garage - Niveau 5

Échelle	1:500	Projet	
Approuvé par	G.Z.	Date	
Dessiné par	G.Z.		



PLAN 8 — 112

No.	Date	Description	Par
1			



C.M. Glouberman
 100 rue St-Jacques, 1000
 1000

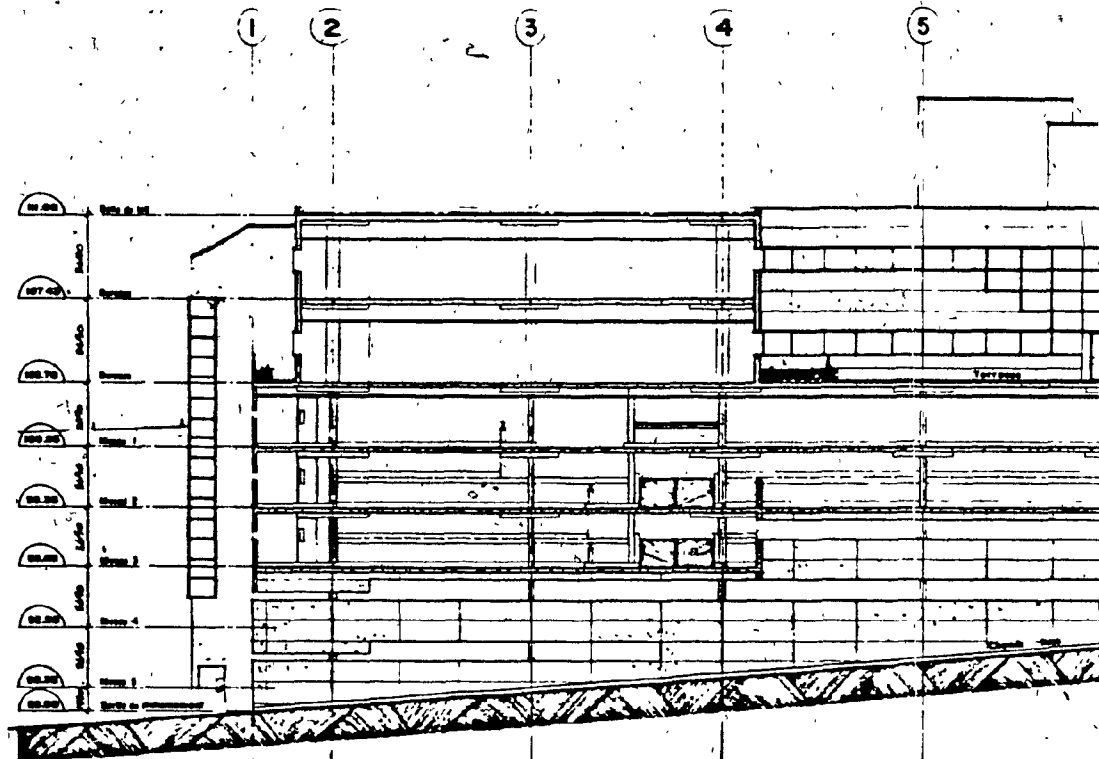
HOPITAL ROYAL VICTORIA
 GARAGE ET BUREAUX
 CHEMIN ROSS

Coupe A-A

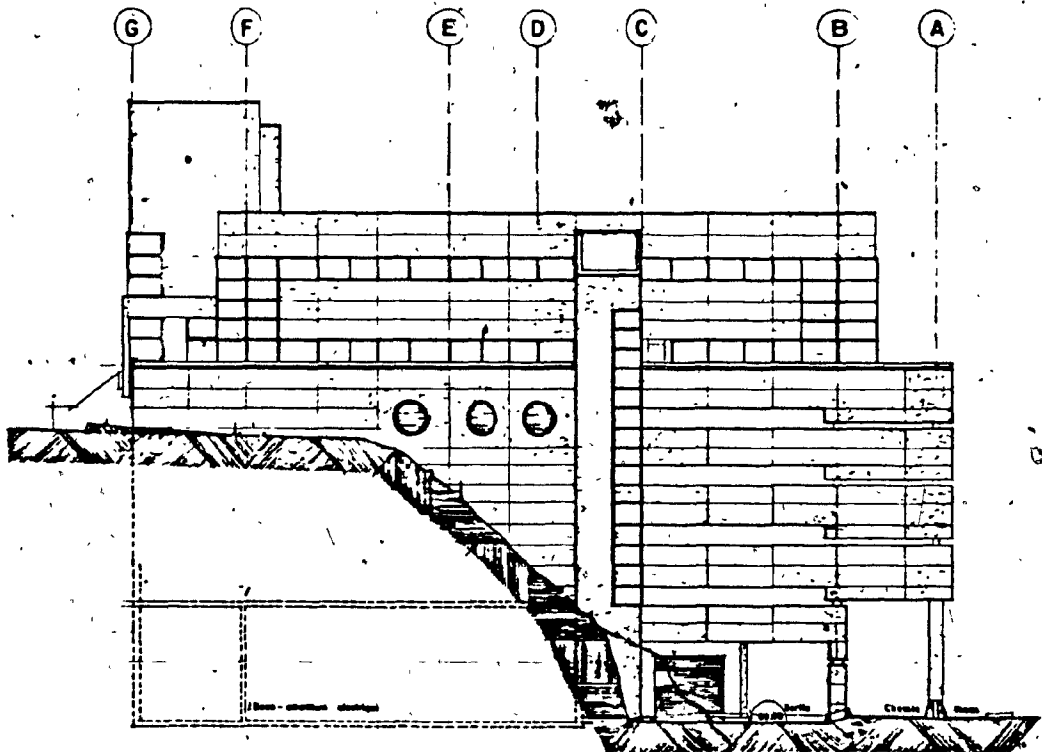
Scale: 1/8" = 1'-0" 1/4" = 3'-0"

Author: C.M. Glouberman
 Date: 1952
 Project: H.R.V. Garage et Bureaux
 Drawing No: 21 52

2/2

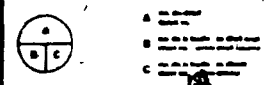
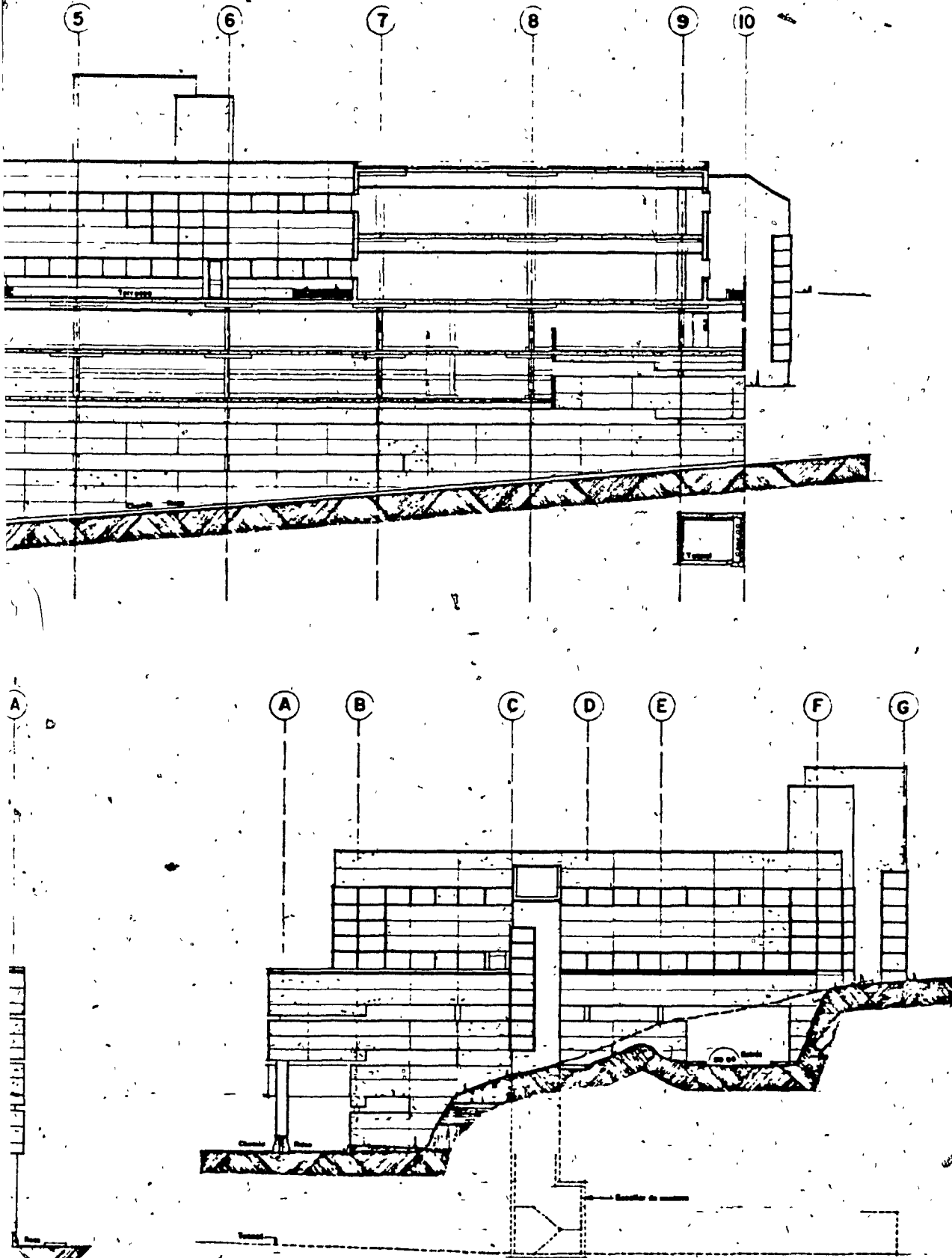


COUPE C-C



ELEVATION SUD

102



COÛT. GLOBERMAN

HOPITAL ROYAL VICTORIA
GARAGE ET BUREAUX
CHEMIN ROSS

Coupe C-C et Elevations

Scale	1/8" = 1'-0"	Sheet	Plan / 02
Project No.		Client	
Architect		Engineer	
Structural		Electrical	
Mechanical		Plumbing	
Sanitary		Other	

2 of 2

ELEVATION NORD

APPENDIX B

CALCULATIONS FOR
THE SENSITIVITY ANALYSIS

Calculation for Sensitivity Analysis:Case No. 1: 15% reduction in construction cost

- 1) Construction cost
 - = \$8,391,000. x .85
 - = \$7,132,350.
- 2) Interest on construction loan
 - = \$581,000. x .85
 - = \$493,850.

Case No. 2: Mortgage rate lowered by 3% point

- 1) Monthly blended payment
 - = \$7,626,200. x 12.28668 (15%; 30 Yr.)/1000
 - = \$93,700.
- 2) Annual debt service
 - = \$1,124,400.

Case No. 3: Mortgage rate increased by 3% point

- 1) Monthly blended payment
 - = \$7,626,200. x 16.82221 (21%; 30 Yr.)/1000
 - = \$128,288.
- 2) Annual debt service
 - = \$1,539,456.

TABLE 6 CONSTRUCTION SCHEDULE & CASH FLOWS DURING CONSTRUCTION PERIOD CASE 4 : 6

ITEMS	ESTIMATED CONSTRUCTION COSTS \$	MONTH		AFC.	S
		JUNE 1982	JULY		
Design & Tendering	8150,000.				
Excavation	815,100.				
Foundation	417,650.				
LEVEL 5					
Conc. Slab/Columns/Walls, etc.	518,885.				
Partitions/Doors	20,027.				
Electrical & Plumbing	255,520.				
Finishes	63,253.				
LEVEL 4					
Conc. Slab/Columns/Walls, etc.	374,107.				
Partitions/Doors	10,563.				
Electrical & Plumbing	227,920.				
Finishes	61,603.				
LEVEL 3					
Conc. Slab/Columns/Walls, etc.	373,107.				
Partitions/Doors	10,938.				
Electrical & Plumbing	184,320.				
Finishes	71,772.				
LEVEL 2					
Conc. Slab/Columns/Walls, etc.	373,091.				
Partitions/Doors	10,422.				
Electrical & Plumbing	184,320.				
Finishes	77,343.				
LEVEL 1					
Conc. Slab/Columns/Walls, etc.	438,438.				
Partitions/Doors	16,007.				
Electrical & Plumbing	209,920.				
Finishes	146,628.				
GROUND FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	137,388.				
Partitions/Doors	101,080.				
Electrical & Plumbing	414,450.				
Finishes	127,744.				
FIRST FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	79,860.				
Partitions/Doors	107,864.				
Electrical & Plumbing	371,450.				
Finishes	131,858.				
ROOF					
Roof Slab	190,000.				
Roof Finish	42,944.				
SITE WORKS					
Landscaping, etc.	147,522.				
TOTAL	7,086,696	75,000	75,000	1,023,925	914
Adjustment For Inflation (10% Average)				1,126,318	1,006
Cash Flow (Including Contracting Profit Supervision/Project Management) 8%	8,390,793	75,000	75,000	1,216,423	1,086

CONSTRUCTION AND DEVELOPMENT COST: \$8,391,000

1 of 1

CASE 4 : 6 MONTH CONSTRUCTION PERIOD

CONSTRUCTION							
	SEPT.	OCT.	NOV.	DEC.	JAN. 1963	FEB.	MARCH
25	914,763	1,202,747	1,271,029	1,377,026	1,147,205		
18	1,006,239	1,323,022	1,398,132	1,514,729	1,261,925		
23	1,086,738	1,428,863	1,509,882	1,635,907	1,362,880		

INTEREST ON CONSTRUCTION LOAN:Case No. 4:- 6 Months construction period

\$75,000.	x 8/12	x 0.2	=	\$10,000.
75,000.	x 7/12	x 0.2	=	8,750.
1,216,423.	x 6/12	x 0.2	=	121,642.
1,086,738.	x 5/12	x 0.2	=	90,561.
1,428,863.	x 4/12	x 0.2	=	95,257.
1,509,982.	x 3/12	x 0.2	=	75,499.
1,635,907.	x 2/12	x 0.2	=	54,530.
1,362,880.	x 1/12	x 0.2	=	22,715.

Total interest = \$478,954.

85% of interest
(15% equity) = \$407,110.

Say \$407,000.

Case No. 4: Reduction of construction period by 2 months

Assumption:

The construction period is compressed to 6 months on the basis of increased manpower by contractors without any impact on the total cost.

1) See attached schedule for six months construction period.

The cash flows during construction are developed on the basis of this construction period.

Case No. 5: One additional office floor

1) Schedule and cash flow during construction period are developed based on adding 1 floor to 6 month schedule in Case No. 4.

2) Construction and development cost

= \$9,349,000. (See table 19)

TABLE 19 CONSTRUCTION SCHEDULE & CASH FLOWS DURING CONSTRUCTION PERIOD, CASE 5 : AI

ITEMS	ESTIMATED CONSTRUCTION COSTS \$	DESIGN			
		JUNE 1982	JULY	AUG.	SEP.
Design & Tendering	\$165,000.				
Excavation	815,100.				
Foundation	417,650.				
LEVEL 5					
Conc. Slab/Columns/Walls, etc.	518,885.				
Partitions/Doors	20,027.				
Electrical & Plumbing	253,520.				
Finishes	63,233.				
LEVEL 4					
Conc. Slab/Columns/Walls, etc.	374,107.				
Partitions/Doors	10,563.				
Electrical & Plumbing	227,920.				
Finishes	61,603.				
LEVEL 3					
Conc. Slab/Columns/Walls, etc.	373,107.				
Partitions/Doors	10,938.				
Electrical & Plumbing	184,320.				
Finishes	71,772.				
LEVEL 2					
Conc. Slab/Columns/Walls, etc.	373,091.				
Partitions/Doors	10,422.				
Electrical & Plumbing	184,320.				
Finishes	77,343.				
LEVEL 1					
Conc. Slab/Columns/Walls, etc.	438,438.				
Partitions/Doors	16,007.				
Electrical & Plumbing	209,920.				
Finishes	146,628.				
GROUND FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	137,388.				
Partitions/Doors	101,080.				
Electrical & Plumbing	416,450.				
Finishes	127,746.				
FIRST FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	79,860.				
Partitions/Doors	107,864.				
Electrical & Plumbing	371,450.				
Finishes	133,858.				
SECOND FLOOR					
Conc. Slab/Columns/Walls, etc.	100,800.				
Enclosure	79,860.				
Partitions/Doors	107,864.				
Electrical & Plumbing	371,450.				
Finishes	133,858.				
ROOF					
Roof Slab	190,000.				
Roof Finish	62,944.				
SITE WORKS					
Landscaping, etc.	147,522.				
TOTAL	7,895,528	82,500	82,500	1,023,923	914,7
Adjustment For Inflation (10% Average)				112,558	1,006,2
Cash Flow (Including Contracting Profit Supervision/Project Management) 8%	9,348,865	82,500	82,500	1,216,421	1,086,7

CONSTRUCTION AND DEVELOPMENT COST: \$9,349,000

108

MOD CASE 5 : ADDITIONAL OFFICE FLOOR

CONSTRUCTION							
AUG.	SEPT.	OCT.	NOV.	DEC.	JAN. 1963	FEB.	MARCH
██████████	██████████						
	██████████	██████████					
		██████████	██████████				
	██████████	██████████	██████████				
		██████████	██████████	██████████			
			██████████	██████████			
			██████████	██████████	██████████		
				██████████	██████████		
				██████████	██████████	██████████	
					██████████	██████████	
					██████████	██████████	
						██████████	
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						██████████	
						██████████	
1,023,925	914,763	1,202,747	1,271,029	1,224,882	1,509,200	583,981	
112,558	1,006,239	1,523,022	1,398,132	1,347,370	1,660,120	642,379	
1,216,421	1,086,738	1,428,863	1,509,982	1,455,160	1,792,930	693,769	

3) Interest on construction Loan:
 Case No. 5 - one additional office floor

\$82,500. x 9/12 x 0.2	=	\$12,375.
82,500. x 8/12 x 0.2	=	11,000.
1,216,423. x 7/12 x 0.2	=	141,916.
1,086,738. x 6/12 x 0.2	=	108,674.
1,428,863. x 5/12 x 0.2	=	119,072.
1,509,982. x 4/12 x 0.2	=	100,665.
1,455,160. x 3/12 x 0.2	=	72,758.
1,792,930. x 2/12 x 0.2	=	59,764.
693,769. x 1/12 x 0.2	=	<u>11,563.</u>
Total interest on loan	=	\$637,787.
85% interest (15% equity)	=	\$542,119.

4) Office revenue up by 50%

= \$652,500.

5) Hydro

= 18,500 sq.ft. x 3 watts x 12 hrs. x 260 days/1000

= 173,150 kwh.

Increased cost

\$8,657.

Say \$8,700. additional

6) HVAC

= 50% of base case consumption
= 182,400 kwh. @ 5 cents/kwh.
\$9,100. additional.

7) Water

50% of office floor expense
= \$5,772.
Say \$5,800 additional

8) Maintenance

Rate is \$1.242/sq. ft. (base case)
Maintenance cost
= 18,500 sq. ft. x 1.242
= \$22,977.
Say \$23,000. additional.

9) Services

= 50% of \$48,000. (office in base case)
= \$24,000.

10) Insurance

= 18,500 sq. ft. x .068
= \$1258.
Say \$1300. additional

11) Real estate taxes

Additional cost = \$958,100.

Assessed value of additional cost

= \$958,100. x .90

= \$862,290.

Say \$862,300.

Additional Real estate taxes

= \$6,898 (@ 80¢/\$100, evaluation)

Say \$6,900. extra

Case No. 6: Garage only no office floor

1) Increased revenue because of using roof to park 74 more cars.

Additional revenue

= 74 cars x \$11. x 365 days

= \$297,110.

less 10% vacancy.

Increased effective gross revenue for garage

= \$267,400.

No revenue from office space.

TABLE 20 CONSTRUCTION SCHEDULE & CASH FLOWS DURING CONSTRUCTION PERIOD CASE 6 :

ITEMS	ESTIMATED CONSTRUCTION COSTS \$	DESIGN		ADC.	
		JUNE 1961	JULY		
Design & Tendering	\$ 80,000.				
Excavation	815,100.				
Foundation	417,650.				
LEVEL 5					
Conc. Slab/Columns/Walls, etc.	518,885				
Partitions/Doors	20,027.				
Electrical & Plumbing	253,520.				
Finishes	63,253.				
LEVEL 4					
Conc. Slab/Columns/Walls, etc.	374,107.				
Partitions/Doors	10,563				
Electrical & Plumbing	227,920.				
Finishes	61,603.				
LEVEL 3					
Conc. Slab/Columns/Walls, etc.	373,107.				
Partitions/Doors	10,938.				
Electrical & Plumbing	184,320.				
Finishes	71,772.				
LEVEL 2					
Conc. Slab/Columns/Walls, etc.	373,091				
Partitions/Doors	10,422.				
Electrical & Plumbing	184,320				
Finishes	77,343.				
LEVEL 1					
Conc. Slab/Columns/Walls, etc.	438,438				
Partitions/Doors	16,007.				
Electrical & Plumbing	209,920.				
Finishes	146,628				
ROOF					
Roof Slab	190,000.				
Roof Finish	62,944.				
SITE-WORKS					
Landscaping, etc.	147,522				
TOTAL	5,337,400	40,000	40,000	815,100	936
Adjustment For Inflation (10% Average)				896,610	1,030
Cash Flow (Including Contracting Profit Supervision/Project Management) 8%	6,325,791	40,000	40,000	968,339	1,112

CONSTRUCTION AND DEVELOPMENT COST: \$6,325,800

108

CASE 6 : GARAGE ONLY, NO OFFICE SPACE

CONSTRUCTION							
AUG.	SEPT.	OCT.	NOV.	DEC.	JAN. 1963	FEB.	MARCH
5,100	936,535	757,288	1,208,619	860,944	678,974		
6,610	1,030,188	832,950	1,329,481	947,038	746,871		
8,339	1,112,603	899,586	1,435,839	1,022,801	806,621		

2) Interest on Construction Loan:
Case No. 6 - garage only - no office space

\$40,000. x 8/12 x 0.2	=	\$5,330.
\$40,000. x 7/12 x 0.2	=	4,670.
968,339. x 6/12 x 0.2	=	96,834.
1,112,603. x 5/12 x 0.2	=	92,717.
899,586. x 4/12 x 0.2	=	59,972.
1,435,839. x 3/12 x 0.2	=	71,792.
1,022,801. x 2/12 x 0.2	=	34,093.
806,621. x 1/12 x 0.2	=	<u>13,443.</u>
Total interest on loan	=	378,851.
85% interest (15% equity)	=	322,023.

3) Hydro:

Roof consumption

$$= 26,800 \text{ sq. ft.} \times .5 \text{ watt} \times 12 \text{ hrs.} \times 365 \text{ days}/1000$$

$$= 58,690 \text{ kwh.}$$

add

$$\text{Garage light} = 529,630 \text{ kwh.}$$

$$\text{Elevator} = \underline{140,480 \text{ kwh.}}$$

$$\text{Total} = 728,480 \text{ kwh.}$$

$$\text{Cost} = \$36,425 @ 4 \text{ cents/kwh.}$$

Say \$36,500.

4) HVAC

Garage consumption = 700,800 kwh.

Cost = \$35,040 @ 5 cents/kwh.

Say \$35,000.

5) Service

Add \$4,000 to garage service amount for spring/summer
cleaning and snow clearance in winter on the roof.

6) Insurance: Garage only

= 120,920 sq. ft. x \$0.68

= \$8,222.

Say \$8,200.

7) Real Estate Taxes

Assessed value of building

= 6,647,600 x .90

= \$5,982,840.

Say \$6,000,000.

Assessed value of building = \$6,000,000.

Add land assessed value 270,000.

Total assessed value of
the property \$6,270,000.

Real Estate Taxes - \$50,160. (80 cents/\$100. evaluation)

Say \$50,000.

APPENDIX C

CAPITAL COST ALLOWANCE
 PRESCRIBED CLASSES AND RATES

(Source: Scace, Arthur R.A.: bibliography 9)

The following is a list of the capital cost allowance classes and the assets included therein as prescribed in section 1100 and Schedule B of the *Income Tax Regulations*. Where a percentage rate is indicated, that is the maximum amount of capital cost allowance that may be claimed for the year. It is computed as a percentage of the undepreciated capital cost of the property of that class at the end of the year prior to the determination of the allowance available. In a number of classes the allowance is computed on a separate straight line basis. Only a partial description is given of the assets in each class; reference should be made to the regulations for a complete description of the assets contained in each class.

- Class 1—4% —bridges, canals, dams, roads, sidewalks, parking or storage areas and similar surface construction,
- Class 2—6% —electrical generating equipment, gas, oil or water pipeline, and gas, water and heat distribution equipment,
- Class 3—5% —buildings, including component parts such as electrical wiring, plumbing, air conditioning, heat equipment, lighting fixtures and elevators. Class 3 includes all buildings not otherwise prescribed in Class 6 (frame, galvanized iron, etc.) and generally represent buildings of concrete or structural steel,
 —also includes buildings erected by the taxpayer on leased land, (section 1102(5)),
 —(IT-79R entitled "Buildings or Other Structures", discusses the classification of such assets among Classes 3, 6 and 8.)
- Class 4—6% —a railway system,
- Class 5—10% —pulp and paper mills,
- Class 6—10% —buildings of frame, log, stucco, galvanized iron or corrugated iron construction, fences, oil and water storage tanks, railway tank cars,
- Class 7—15% —boats and ships,
- Class 8—20% —tangible assets not specifically included in another class and also excepting certain specific items. This class is a catch-all; the most common assets are machinery and equipment and office furniture,
- Class 9—25% —electrical generating equipment, radar and radio equipment,
- Class 10—30% —automotive equipment, trailers, wagons, contractor's moveable equipment, assets used in mining and logging operations,
- Class 11—35% —rental signs and billboards used in advertising,
- Class 12—100% —tools costing less than \$100, jigs, dies, moulds, patterns, uniforms, dishes, cutlery, etc.; mine shafts, haulage ways,
- Class 13 —leasehold improvements—amortized over the life of the lease plus first renewal period (minimum five years, maximum 40 years)
 —Schedule H of the Regulations,
- Class 14 —patent, franchise, concession or licence for a limited period—amortized over the life of the asset.

- Class 15 —woods assets—depreciated under Schedule D on the basis of timber cut during the year,
- Class 16—40% —aircraft, including furnishings and parts,
- Class 17—8% —telephone and telegraph systems,
- Class 18—60% —motion picture films,
- Class 19 —new machinery and equipment acquired between June 13, 1963 and January 1, 1967 by a manufacturing or processing business having a prescribed degree of Canadian ownership—maximum claim 50% of cost.
- Class 20 —new building or addition located in designated areas of slow growth acquired between December 5, 1963-April 1, 1967 or subject to an Area Development grant —straight line 20% of cost per year,
- Class 21 —new equipment for use in manufacturing in designated areas—similar qualifications as Class 20—50% of cost.
- Class 22—50% —power operated movable equipment designed for excavating, moving, placing or compacting earth, rock, concrete or asphalt,
- Class 23 —assets for use at 1967 World Exhibition in Montreal,
- Class 24 —water pollution control equipment—50% of cost,
- Class 25—100% —certain property acquired before 1974 by a municipal or provincial corporation where income not exempt from tax because of subparagraph 149(1)(d)(i) or (ii) of the Act,
- Class 26—1% —a catalyst,
- Class 27 —air pollution control equipment acquired before 1977 —50% of cost,
- Class 28—30% —assets of a new mine or major expansion of an existing mine—after November 7, 1969; normal allowance 30% but taxpayer may claim 100% from income of the new mine,
- Class 29 —two-year write-off available for machinery and equipment purchased from arm's length parties after May 8, 1972 for use in a manufacturing or processing operation in Canada,
- Class 30—40% —property that is an unmanned telecommunications spacecraft designed to orbit above the earth,
- Class 31—5% —multiple-unit residential building that would otherwise be included in Class 3 where CMHC certifies that construction commenced after November 18, 1974 and before 1978,
- Class 32—10% —multiple-unit residential building that would otherwise be included in Class 6 subject to same restrictions as Class 31.

REVENU CANADA, TAXATION **BULLETIN** REVENU CANADA, IMPÔT
INTERPRÉTATION D'INTERPRÉTATION

SUBJECT INCOME TAX ACT
 Costs of Disposition of Depreciable Property

OBJET LOI DE L'IMPÔT SUR LE REVENU
 Coûts de la disposition de biens
 amortissables

SERIAL NO. IT-108R **DATE** March 21, 1977
REFERENCE. Paragraph 54(h) (also subsection 13(1),
 paragraph 13(21)(d) and subsection 40(1),
 and paragraph 20(1)(a) of the ITAR)

N° DE SÉRIE IT-108R **DATE** le 21 mars 1977
RENVOI Alinéa 54h (également le paragraphe 13(1), l'alinéa
 13(21)d), le paragraphe 40(1) et l'alinéa 20(1)a
 des RAIR)

*This bulletin cancels and replaces Interpretation Bulletin
 IT-108 dated June 14, 1973.*

*Ce bulletin annule et remplace le bulletin d'interprétation
 IT-108 du 14 juin 1973.*

1. The term "proceeds of disposition" in paragraph 54(h) of the Act means gross proceeds before deduction of any outlays and expenses in connection with the disposition such as commission and brokerage. However, in calculating gains and losses under subsection 40(1), the gross proceeds are compared with the aggregate of the adjusted cost base (or, if a part disposition, the appropriate portion thereof) and such outlays and expenses.

1. L'expression «produit de la disposition» à l'alinéa 54h de la Loi désigne le produit brut avant déduction de tous débours et dépenses en rapport avec la disposition, comme les commissions et les frais de courtage. Toutefois, lors du calcul des gains et des pertes en vertu du paragraphe 40(1), le produit brut est comparé au total du prix de base rajusté (ou, s'il s'agit d'une disposition partielle, de la fraction pertinente) et des débours et des dépenses susmentionnées.

2. While the definition of the term "proceeds of disposition" in paragraph 13(21)(d) is substantially the same as that in paragraph 54(h), the Department will accept the interpretation that, in paragraph 13(21)(d), it means the amount of the proceeds net of all charges necessarily incurred in the disposition. On the other hand, the words in paragraph 13(1)(b), "if the property had been disposed of for the capital cost thereof", are interpreted as not contemplating any reduction for costs involved in the disposition of the property. The effect of the foregoing is illustrated by the following two examples (it should be noted that pursuant to paragraph 39(1)(b) a capital loss cannot be claimed in respect of depreciable property).

2. Bien que la définition de «produit de la disposition» donnée à l'alinéa 13(21)d soit à peu près la même que celle de l'alinéa 54h, le Ministère accepte l'interprétation selon laquelle il s'agit, à l'alinéa 13(21)d, du montant du produit après déduction de tous frais nécessairement engagés aux fins de la disposition. D'autre part, la locution «si le contribuable avait disposé des biens à un prix représentant leur coût en capital supporté par lui», à l'alinéa 13(1)b, est interprétée comme ne comprenant aucune réduction pour les coûts engagés lors de la disposition desdits biens. L'effet de cette interprétation est illustré par les deux exemples suivants (à remarquer qu'en conformité de l'alinéa 39(1)b une perte en capital ne peut être réclamée à l'égard d'un bien amortissable).

Example 1

Disposition of Depreciable Property

Assumptions

Sale Price	\$100,000
Capital Cost	80,000
Undepreciated Capital Cost	50,000
Outlays and Expenses re Sale of Property	2,000

Capital Gain

Proceeds of Disposition	\$100,000
Adjusted Cost Base	80,000
Add: Outlays and Expenses	2,000
	82,000

Capital Gain \$18,000

PUBLISHED UNDER THE AUTHORITY OF THE DEPUTY
 MINISTER OF NATIONAL REVENUE FOR TAXATION

Exemple 1

Disposition d'un bien amortissable

Hypothèses

Prix de vente	\$100,000
Coût en capital	80,000
Fraction non amortie du coût en capital	50,000
Débours et dépenses engagés pour la vente du bien	2,000

Gain en capital

Produit de la disposition	\$100,000
Prix de base rajusté	80,000
Plus: débours et dépenses	2,000
	82,000

Gain en capital \$18,000

PUBLIÉ AVEC L'AUTORISATION DU SOUS-MINISTRE
 DU REVENU NATIONAL POUR L'IMPÔT

2

Recapture

Proceeds of Disposition	\$100,000	
Less: Outlays and Expenses	2,000	\$98,000
Undepreciated Capital Cost		50,000
Excess Paragraph 13(1)(a)		<u>\$48,000 (i)</u>
Excess If Property Sold at Capital Cost:		
Assumed Selling Price	\$80,000	
Undepreciated Capital Cost		50,000
Paragraph 13(1)(b)		<u>\$30,000 (ii)</u>
Recapture - Lesser of (i) and (ii)		<u>\$30,000</u>

Example II**Assumptions**

Sale Price	\$81,000
Capital Cost	80,000
Undepreciated Capital Cost	50,000
Outlays and Expenses re Sale of Property	2,000

Capital Gain

Proceeds of Disposition	\$81,000
Adjusted Cost Base	\$80,000
Add. Outlays and Expenses	2,000
	82,000
Capital Loss (not allowable - paragraph 39(1)(b))	\$ 1,000

Recapture

Proceeds of Disposition	\$81,000	
Less: Outlays and Expenses	2,000	\$79,000
Undepreciated Capital Cost		50,000
Excess - paragraph 13(1)(a)		<u>\$29,000 (i)</u>
Excess If Property Sold at Capital Cost:		
Assumed Selling Price	\$80,000	
Undepreciated Capital Cost		50,000
Paragraph 13(1)(b)		<u>\$30,000 (ii)</u>
Recapture - Lesser of (i) and (ii)		<u>\$29,000</u>

IT-108R

Récupération

Produit de la disposition	\$100,000	
Moins: débours et dépenses	2,000	\$98,000
Fraction non amortie du coût en capital		50,000
Excédent Alinéa 13(1)(a)		<u>\$48,000 (i)</u>
Excédent si le bien est vendu au prix du coût en capital:		
Prix de vente supposé	\$80,000	
Fraction non amortie du coût en capital		50,000
Alinéa 13(1)(b)		<u>\$30,000 (ii)</u>
Récupération - Le moindre de (i) et (ii)		<u>\$30,000</u>

Exemple II**Hypothèses**

Prix de vente	\$81,000
Coût en capital	80,000
Fraction non amortie du coût en capital	50,000
Débours et dépenses engagés pour la vente du bien	2,000

Gain en capital

Produit de la disposition	\$81,000
Prix de base rajusté	\$80,000
Plus: débours et dépenses	2,000
	82,000
Perte en capital (non déductible - alinéa 39(1)(b))	\$ 1,000

Récupération

Produit de la disposition	\$81,000	
Moins: débours et dépenses	2,000	\$79,000
Fraction non amortie du coût en capital		50,000
Excédent - Alinéa 13(1)(a)		<u>\$29,000 (i)</u>
Excédent si le bien est vendu au prix du coût en capital:		
Prix de vente supposé	\$80,000	
Fraction non amortie du coût en capital		50,000
Alinéa 13(1)(b)		<u>\$30,000 (ii)</u>
Récupération - Le moindre de (i) et (ii)		<u>\$29,000</u>

IT-108R

3

3. Where the transitional provisions of paragraph 20(1)(a) of the Income Tax Application Rules (ITAR) apply on a disposition of depreciable property to compute deemed proceeds of disposition thereof, the Department considers that "proceeds of disposition" in paragraph 13(21)(d) means the proceeds of disposition computed under paragraph 20(1)(a) of the ITAR less the portion of outlays and expenses incurred in the disposition which exceeds the pre-1972 gain realized on the disposition of the property. (Refer to IT-217 entitled "Capital Property Owned on December 31, 1971 - Depreciable Property" for a discussion of the transitional rules governing the disposition of depreciable property owned by a taxpayer on December 31, 1971.) The following example illustrates the application of the foregoing.

3. Lorsque les dispositions transitoires de l'alinéa 20(1)a) des Règles de 1971 concernant l'application de l'impôt sur le revenu (RAIR) s'appliquent à la disposition d'un bien amortissable aux fins du calcul du produit réputé de la disposition de ce bien, le Ministère estime que l'expression « produit de la disposition » à l'alinéa 13(21)d) désigne le produit de la disposition calculé selon l'alinéa 20(1)a) des RAIR moins la fraction, des débours et des dépenses engagés aux fins de la disposition qui est en sus du gain réalisé avant 1972 lors de la disposition du bien. Le Bulletin IT-217, « Biens en immobilisations possédés le 31 décembre 1971 - Biens amortissables », traite des règles transitoires qui régissent la disposition d'un bien amortissable possédé par un contribuable le 31 décembre 1971. L'exemple suivant illustre l'application de ce qui précède.

Disposition of Depreciable Property
to Which Paragraph 20(1)(a) of the
ITAR Applies:

Assumptions	
Sale Price	<u>\$100,000</u>
Fair Market Value on Valuation Day	<u>96,000</u>
Capital Cost	<u>90,000</u>
Undepreciated Capital Cost	<u>80,000</u>
Outlays and Expenses re Sale of Property	<u>12,000</u>
Capital Gain	
Proceeds of Disposition under Paragraph 20(1)(a) of the ITAR	\$ 94,000
Adjusted Cost Base	\$90,000
Add: Outlays and Expenses	<u>12,000</u> <u>102,000</u>
Capital Loss (not allowable - paragraph 39(1)(b))	<u>\$ 8,000</u>
Recapture	
Proceeds of Disposition under Paragraph 20(1)(a) of the ITAR	\$ 94,000
Outlays and Expenses	\$12,000

Disposition de biens amortissables visés par
l'alinéa 20(1)a) des RAIR.

Hypothèses	
Prix de vente	<u>\$100,000</u>
Juste valeur marchande au jour de l'évaluation	<u>96,000</u>
Coût en capital	<u>90,000</u>
Fraction non amortie du coût en capital	<u>80,000</u>
Débours et dépenses engagés pour la vente du bien	<u>12,000</u>
Gain en capital	
Produit de la disposition selon l'alinéa 20(1)a) des RAIR	\$ 94,000
Prix de base rajusté	\$90,000
Plus: Débours et dépenses	<u>12,000</u> <u>102,000</u>
Perte en capital (non déductible - alinéa 39(1)(b))	<u>\$ 8,000</u>
Récupération	
Produit de la disposition selon l'alinéa 20(1)a) des RAIR	\$ 94,000
Débours et dépenses	\$12,000

4		
Less Pre-1972		
Gain on Disposition (96,000-90,000)	<u>6,000</u>	<u>6,000</u>
		88,000
Undepreciated Capital Cost		<u>80,000</u>
Excess - Paragraph 13(1)(a)	\$	<u>8,000(i)</u>
Excess If Property Sold at Capital Cost:		
Assumed Selling Price	\$	90,000
Undepreciated Capital Cost		<u>80,000</u>
Excess - Paragraph 13(1)(b)	\$	<u>10,000(ii)</u>
Recapture - Lesser of (i) and (ii)		<u>\$ 8,000</u>

IT-108R

Moins: Gain réalisé avant 1972 lors de la disposition (\$96,000 - \$90,000)		
<u>6,000</u>	<u>6,000</u>	
		88,000
Fraction non amortie du coût en capital		<u>80,000</u>
Excédent - alinéa 13(1)a)	\$	<u>8,000(i)</u>
Excédent si le bien est vendu au prix du coût en capital:		
Prix de vente supposé	\$	90,000
Fraction non amortie du coût en capital		<u>80,000</u>
Excédent non amortie du coût en capital - alinéa 13(1)b)	\$	<u>10,000(ii)</u>
Récupération - le moins de (i) et (ii)		<u>\$ 8,000</u>

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