

AURUN MINES LTD.

823888

HAIL HARPER CREEK PROJECT

PRE-FEASIBILITY STUDY

PHILLIPS BARRATT KAISER - PROPOSAL B

1.0 INTRODUCTION

As a prelude to a pre-feasibility study, and in recognition that the presence of economically recoverable titanium is a critical item towards the economics of the Hail Harper Creek Project, this proposal is to focus geological and metallurgical efforts towards identification of the mode of occurrence, reserves, grades and recoveries of titanium which can be reasonably done at this stage of the project.

2.0 SCOPE**2.1 Geology**

The presence of titanium bearing minerals, their mode of occurrence, amounts and grades, will be quantified.

2.2 Metallurgical

Anticipated recoveries of titanium from the minerals outlined in 2.1 above will be determined.

3.0 WORK PLAN**3.1 Geology**

All geological reports made available will be carefully reviewed, and together with the examination of all available physical specimens, will form the basis of the study. Discussions with key individuals who have been involved in this project from a geological point of view will, whenever possible, be held. This will require Aurun's help.

No sections will be produced at this time with the possible exception of one per area of interest.

4.0 PBK PERSONNEL

The key personnel to be proposed for this investigation will be our Senior Geologist and Metallurgical Engineer under the direction of Mr. J. E. Dagenais.

Geology - Jean Jacques Lefebvre

Mr. Lefebvre is a **Senior Geologist** with PBK and returned to its Vancouver office in mid 1987 from a four year period in Zaire working for PBK as the Chief Geologist for a copper mine complex. His duties entailed supervision of both the mining geologists and those involved in the exploration and development of a large mining concession.

Metallurgy - Gregory Wortman

Mr. Wortman is a **Senior Metallurgical Engineer** with PBK and has had a great deal of experience in a wide variety of minerals, including copper. Recently he was responsible for a major part of the circuit for an expansion of a copper producer. He also provided startup services for this client, who was very pleased with the minimal time required to get his facilities into full production.

5.0 STUDY SCHEDULE

The study will commence immediately upon award. Assuming approval to proceed by the **15th of January, 1988**, it is anticipated the results of this step will be completed by **February 5th, 1988**.

6.0 COMPENSATION

PBK will complete this study for a lump sum of **\$10,000**. One invoice will be sent at the completion of this step. The rate for the key individuals and support staff are shown below, together with their time of involvement in the study:

	Rate	Man-hours
J. J. Lefebvre	\$46.88	40
G. Wortman	65.28	40
J. E. Dagenais	82.82	20
Designer/Draftsman	41.69	30
Word Processing	24.70	10

The compensation above is submitted to you in accordance with the attached '**Schedule of Services, Rates and Conditions of Agreement**,' Section 2 c).

JEAN-JACQUES MAURICE LEFEBVRE

Jean-Jacques Lefebvre is Senior Geologist with PHILLIPS BARRATT KAISER. He has participated in numerous projects acquiring valuable experience, mostly in the field of economic geology. He has spent five years in the Zairian copper belt as a Research Geologist. He has been deeply involved in exploration geology, acting as a Consultant Geologist in deep ocean nodule prospecting in the United States.

EDUCATION University of Brussels, Degree "Licencie en Sciences Geologiques, Mineralogiques et Geophysique", 1964 -1968

Ecole Superieure de Geologie de Nancy, France,
Degree: Engineering (Rock mechanics major), 1968 - 1970

MEMBERSHIPS Canadian Institute of Mining and Metallurgy

Mineralogical Association of Canada

Geological Association of Canada

Societe Geologique de Belgique

Societe belge de Geologie

Society of Mining Engineers of AIME

Society for Geology Applied to Mineral Deposit

Society of Economic Geologists

CAREER HISTORY

Prior to joining **PHILLIPS BARRATT KAISER**, Mr. Lefebvre was Chief Research and Exploration Geologist with **UMEX INC.** and Consultant Geologist for **UNION SEAS, INC.**

From 1975 - 1980 he was Research Geologist with **UNION MINIERE EXPLORATION AND MINING CORPORATION LTD. (UMEX)**, Canadian subsidiary of Union Miniere, S.A.

During the period 1971 - 1975, he worked in various capacities on behalf of **UNION MINIERE, S.A.** in Gecamines (Zaire), and in 1970 on a Phosphate Project at Aveta (Togo), and was involved in limestone exploration and cement industry surveys in Biskra and Zahana (Algeria) for a Swiss firm "Prospecting Engineering Gestion".

JEAN-JACQUES MAURICE LEFEBVRE**PROJECT EXPERIENCE****Umex Inc., Chief Research and Exploration Geologist, 1980 - 1983****Union Seas, Inc. Consultant Geologist**

- . Massive sulphide exploration in northern Ontario and Quebec.
- . Mn Nodule exploration: on behalf of the Union Seas Inc., (Toronto-New York) served as a consulting geologist, involved in modern deep sea technology, geostatistic reserve estimations, and strategic decisions.

Union Miniere Exploration and Mining Corporation Ltd. (UMEX), 1975**Canadian Subsidiary of Union Miniere, S.A.****Research Geologist**

- . Laboratory and field assistance with exploration, mapping and geophysical surveys of massive sulfide (Canadian Shield through Appalachians) and Mississippi Valley type deposits (Yukon).
- . Development of an original computerized lithochemical method for hydrothermal ore deposits. Application of this method to a known volcanogenic Cu-Zn deposit (research contract with Patino).
- . Geostatistic analyses of ore reserve of Cu-Ni deposits.
- . Detailed study of the UMEX Thierry Cu-Ni deposit, Pickle Lake, Ontario, involving independent studies and coordination of M.Sc. and Ph.D. theses respectively for Carleton University at Ottawa (Professor D. Watkinson) and Pennsylvania State University (Professor D. Gold).
- . Thierry deposit: study of the distribution pattern of precious metals (Au, Ag, Pt, Pd) as a guide to minerals dressing and enhanced recovery of the precious metals. This assignment is an ongoing project in close cooperation with the Thierry mill superintendent.
- . Tin placer deposits (Brazil): contract with Patino led to discovery of new tin deposit (alluvial) which is going to be mined.
- . Participation on behalf of Union Miniere, S.A. in the detailed re-evaluation of the Oracle Ridge deposit (copper-skarn) in Arizona.

Union Miniere, S.A. (Brussels, Belgium), 1971**On behalf of Union Miniere sent to Gecamines (Zaire)**

- . Responsibilities: Special projects, exploration for unusual Cu-Co occurrences in the Central part of the Shaba Copperbelt. Also mapping of large areas and geochemical surveys of stratiform copper deposits.
- . From 1974 to 1975 metallogeny and sedimentology research in the Katangan sequence. Computerization of reserve estimations.
- . Microscopic studies of mill concentrates.
- . Study of problems relating to slope stability in open pit mining operations.

JEAN-JACQUES MAURICE LEFEBVRE

Mr. Lefebvre's early experience includes:

- 1963 Geological mapping and sedimentology studies of tertiary sands and gravel deposits (Belgium).
- 1964 Field work in the sedimentary rocks of Massif Central (France).
- 1965 Graduate research in the skarn deposits of Tuscany (Italy).
- 1966 Field work and economic studies in the volcanic Eifel area (Germany).
- 1967 Sedimentology and paleomagnetic studies in the Paleozoic zone of Brabant (Belgium).
- 1969 Research in concentration processes with Professor Blazy, Nancy, France.
Hydrological and geological survey of the Gravelotte aquifer (for the French Government).

GREGORY G. WORTMAN, P.Eng.

Greg. Wortman is Senior Metallurgical Engineer with Phillips Barratt Kaiser. He has over 20 years of experience in engineering, operations and design in mineral processing.

EDUCATION

(Bachelor of Metallurgical Engineering) Technical University of Nova Scotia, Halifax, Nova Scotia, Canada, 1967.

Professional Development Courses in:
Project and Human Resources Management, Continuous Ion Exchange Technology, Solvent Extraction Processes and Equipment, the Metallurgy of Gold and Silver and Oil Spill Response Management

MEMBERSHIPS

Association of Professional Engineers of Ontario
Association of Professional Engineers of British Columbia
Canadian Institute of Mining and Metallurgy

PROJECT EXPERIENCE**Copper****INCO Metals Company, Copper Refinery, Coppercliff, Ontario**

Process design, equipment selection, circuit design, and commissioning activities related to various modifications and modernization revisions to gold, silver, and platinum group metals concentration and refining operations.

Copper/Zinc**Phillips Barratt Kaiser Engineering Ltd., Vancouver, B.C.**

Process Consultant for process optimization review, equipment revision and upgrading, and performance assessment for a 5000 t/d sulfide/oxide copper concentrator operation at Sodimiza in Zaire, Africa. This included a detailed computer based analysis of daily production and operating data for a one year period in order to assess long term effects of overall operating parameters and mineralogical variations in feed on product grade and recovery.

Commissioning assistance engineer for Les Mines Selbaie 5000 t/d copper/zinc concentrator facility in northern Quebec as described below.

Copper/Zinc**LAVALIN - Fenco Engineers Inc., Vancouver, B.C.**

Senior process design and equipment engineer for a 5000 tpd expansion to B.P. Selco's Les Mines Selbaie copper/zinc mine and concentrator facility in northern Quebec. Project includes all facilities and infrastructure from run of

GREGORY G. WORTMAN, P.Eng.

mine ore receiving and crushing, stockpiling and reclaim through semiautogenous/ball mill and selective copper/zinc flotation concentration to final product loadout facilities.

Project management, metallurgical test program design supervision, and process design for a preliminary feasibility evaluation for a 10,000 tpd copper mill for E&B Explorations Ltd.

INCO Metals Company: Copper Refinery, Copper Cliff, Ontario
Technical Assistant to the Superintendent of Process Technology

Provided process and engineering evaluation of modifications to anode furnacing and casting, electro-refining, refined shapes casting, high pressure leaching, solution purification, electrowinning, and precious metals refining.

INCO Metals Company: Copper Refinery, Coppercliff, Ontario
General Foreman, Operations.

Full operational responsibility for the Electrowinning Department, an installation treating a mixed sulphide, high precious metals feed including pressure leaching, precipitation of sulphides/hydroxides/carbonates, solvent extraction of nickel/cobalt, copper electrowinning, and P.M. concentrate purification.

Technical Assistant to the Superintendent

Provided project engineering services during the start-up of the Electrowinning Department including preparation of flow sheets and P & I.D.'s, engineering and commissioning modifications.

INCO Metals Company: Research Stations, Port Colborne, Ontario, Canada

These include a pyrometallurgical and hydrometallurgical pilot plant to develop design data for the commercial application of new processes for copper, nickel, and precious metal ores. Experience involved integrated pilot plant testing, and development of design data for the Copper Refinery Electrowinning Department, described above.

Gold**Phillips Barratt Kaiser Engineering Ltd., Vancouver, B.C.**

Process design and equipment selection for a 50 - 500 t/d gold mill based on modular concepts around a standard shipping container size. Incorporated separate modules for crushing, grinding (including gravity circuit), flotation, leaching, CIP or Merrill-Crowe Recovery, and smelting.

GREGORY G. WORTMAN, P.Eng.**Phillips Barratt Kaiser Engineering Ltd., Vancouver, B.C.**

Project management, process design, and equipment selection for an exploration decline, ore reserves evaluation and mill modification and upgrading project for a 125 tpd. underground gold mine/mill complex for a confidential Saskatchewan client.

Phillips Barratt Kaiser Engineering Ltd., Vancouver, B.C.

Project Manager and process design engineer for a feasibility assessment and metallurgical testing program for a mill relocation and upgrading project for a potential 200 tpd gold/silver project in South Central B.C. for Ark Energy Ltd.

LAVALIN - Fenco Engineers Inc., Vancouver, B.C.

Metallurgical test program design and supervision, process design and project management for a feasibility study of a 500 to 1000 tpd gold mill for E&B Explorations Ltd. from R.O.M. receiving through finished product, for both conventional and heap leaching processes. This led to a commercial heap leaching operation at the property.

Process design for a preliminary feasibility study for a proposed 500 tpd gold/silver ore operation, from R.O.M. receiving through finished product.

Project management and process co-ordination, feasibility evaluation and test program design and supervision for a roaster/acid plant system for a 10,000 tpd gold mill for the Cinola Operating Company.

Uranium**Rio Algom Ltd., Toronto, Ontario, Canada**

Metallurgist, Central Engineering

Process design engineer and mill area project engineer for the Stanleigh project, redesigning and re-equipping the uranium mine-mill complex to increase capacity from 3,300 tpd to 5,000 tpd. Involvement included design review in all areas from underground crushing and conveying through product drying and packaging and tailings disposal.

Specific design innovations included large mill semi-autogenous grinding, horizontal belt filtration dewatering, continuous up-flow ion exchange and centralized process control and monitoring.

Also during this period, metallurgical evaluation of new projects for Rio Algom Ltd., and participation in various projects for optimizing existing operations.

GREGORY G. WORTMAN, P.Eng.

Other Minerals

LAVALIN - Fenco Engineers Inc., Vancouver, B.C.

Project Management for a magnetite stockpile and processing system evaluation for Joy Industries Ltd., at Craigmont Mines Ltd., Merritt, B.C.

Simon-Carves of Canada Ltd., British Columbia

Senior Process Engineer

Process and mechanical equipment design for a new electro-cobalt refinery for INCO Metals Company.

INCO Metals Company: EXMIBAL Smelter, Guatemala, G.A.

EXMIBAL is a new smelter, located in Guatemala, designed to process laterite nickel ores to produce a sulphide matte. It was commissioned in 1977.

Superintendent of Process Technology

Responsible for process control and development and for environmental control programs for the nickel smelter which included wet ore receiving, crushing, stockpiling, blending, kiln drying, kiln selective reduction and sulphiding, electric furnace smelting, and converting.

Supervisor of Process Development

Responsible for the evaluation of process P & I.D.'s, implementation of plant-wide maintenance and operator training programs, extensively involved in pre-operational testing and inspection of process systems.

INCO Metals Company: Research Stations

Senior Project Engineer

As part of a three man team, during the start-up for the Copper Refinery Electrowinning Department (one from the constructor, two from INCO) responsible for the supervision of acceptance procedures, and for commissioning and pre-operational testing of all plant systems.

Responsible for the planning and operation of hydrometallurgical pilot plant tests, including specification, bid evaluation, and performance evaluation of equipment. Processes included grinding and flotation, high pressure continuous leaching and solvent extraction systems, integrated into complete process circuits for treating both oxide and sulphide base metal, and precious metal ores.

Project Engineer

Participated extensively in the design, procurement, installation and optimization of pressure leaching, solvent extraction, and precipitation integrated pilot plant systems.

GREGORY G. WORTMAN, P.Eng.**Senior Test Engineer**

Carried out a variety of assignments related to the operation of hydro-metallurgical pilot plant test programs.

Junior Test Engineer

Carried out various assignments in a multi-purpose pyrometallurgical pilot plant, including kiln refractory specification, dust collection systems, heat and mass balances for kilns, electric furnaces, and converters.

Sulphur**Phillips Barratt Kaiser Engineering Ltd., Vancouver, B.C.**

Senior Process and Equipment Engineer for detailed design of a 30 t/h washing plant for recovery of elemental sulphur from sour natural gas treatment plant sulphur stockpiles. Operations included trommel and screen washing, cyclone desliming, flotation, centrifuge and filter dewatering, tailings thickening, and atmospheric and elevated pressure melting circuits, molten sulphur filtration, storage, and loadout.

LAVALIN - Fenco Engineers Inc., Vancouver, B.C.**Senior Metallurgical Engineer**

Senior Metallurgical Engineer in charge of the review of all available data (assays, laboratory work etc.) of the sulphur deposits on North Island, New Zealand prior to undertaking a Project Feasibility Study.

Senior Metallurgical Engineer in charge of the metallurgical test work, process evaluations and environmental concerns for the preliminary study of the sulphur deposits at Sulphurdale, Utah.

Materials Handling**LAVALIN - Fenco Engineers Inc., Vancouver, B.C.****Senior Metallurgical Engineer**

Project Engineer for an ongoing prefeasibility study for development of a bulk liquids and solids marine terminal for a confidential B.C. client.

Project Engineer for a proposed marine receiving, bulk storage, and rail shipping terminal for lead/zinc concentrates for a confidential B.C. client.

Project evaluation consultant to the Toronto Dominion Bank on the \$220 million Ridley Island Coal Terminal Project.

GREGORY G. WORTMAN, P.Eng.

Simon-Carves of Canada Ltd., Vancouver, B.C.
Senior Process Engineer

Project management for design, B.C. fabrication and procurement, and erection of a railcar unloading system for Strachan and Henshaw Inc. at Ridley Terminals Inc., Prince Rupert, B.C.

INCO Metals Company: EXMIBAL Smelter, Guatemala, C.A.

Responsible for the development of an oil spill response plan for ship unloading and barge transportation of Bunker "C" oil and Diesel for the plant and mine.

JED E. DAGENAIS, B.Sc.

Jed Dagenais has over 23 years of mining experience including exploration and development of ore deposits, mining and milling operations, engineering, feasibility studies, capital and operating estimating of potential and existing projects. Most of the experience has been in open pit and strip mining operations for iron ore, coal, copper, oil sands and perlite. Underground experience has been in gold and copper mines. Duties ranged from those associated at the direct, hourly employee level, through supervisory and administrative positions including Mine Manager and President. A period of consulting is also included.

EDUCATION University of British Columbia, B.Sc. Degree (Geology-Geophysics Majors), 1965
 50 hr. Certificate: American Management Association (AMA)
 2 yr. course: Canadian Business, Law, Finance - ICS Diploma
 Canadian Securities Course: Investment Dealers Association of Canada, Diploma

MEMBERSHIPS Fellow, Geological Association of Canada
 Member, American Institute of Mining Engineers
 Member, Canadian Institute of Mining and Metallurgy (National)
 Member, Canadian Institute of Mining and Metallurgy (Vancouver Branch)
 Past Chairman, Calgary and Knob Lake Branches of Canadian Institute of Mining and Metallurgy
 Past Vice President, District 5 - CIM
 Past Advisor, University of Alberta, Department of Mineral Engineering Advisory Board

PROFESSIONAL AWARD CIM District Distinguished Service Award

CAREER HISTORY

Jed Dagenais is Vice President, Mines with the firm. Prior to joining Phillips Barratt Kaiser, Mr. Dagenais was President of Aurun Mines Ltd., Calgary, Alberta.

JED E. DAGENAIS, B.Sc.

From 1979 to 1982 he was Manager of Mining with Alsands Energy Company, Calgary, Alberta where he was directly responsible for the planning of the mining operations part of the Alsands Project, from exploration and development to delivering of oil sands to the extraction plant wall.

During the period 1975 - 1979 Mr. Dagenais was Manager of Mines at Transalta Utilities Ltd., and from 1974 - 1975 he was employed by Fluor Canada, Calgary, Alberta as Mining Manager (Principal Project Engineer). Consulting engineering duties involved the direction and coordination of mining aspects of all studies related to mining on behalf of clients in developing mining fields (Oil Sands, coal feasibility studies, gold mines).

Mr. Dagenais was with Iron Ore Company of Canada, Seven Islands, Quebec from 1970 - 1974 where he was responsible for capital and operating feasibility studies and cost estimates on a corporate basis for projects exceeding \$50,000. The scope of work ranged from mining to concentrator and pellet plant projects.

Jed Dagenais held various positions with Iron Ore Company of Canada, Schefferville, Quebec. As Chief Geologist from 1968 - 1970 he was responsible for the exploration and development of iron ore at the Schefferville Project. From 1967 - 1968 he was Supervising Engineer (Exploration) responsible for exploration of iron ore deposits in the Schefferville area. From May 1967 to September 1967 he held the position of Ore Grading Engineer responsible for ore grading for five iron ore open pit mines. He joined the company as a Geologist in 1965. At varying periods until 1967 field responsibility included geological mapping, drilling, trenching, test pitting, and office evaluations (plans and cross sections of this geological data).

Mr. Dagenais held various summer jobs from 1955 through 1965, some for up to ten months. They included Assistant Geologist (exploration for copper in Southern British Columbia, oil exploration in Alaska, base metal exploration in Northern British Columbia), stope mining, (cut and fill stopes at a B.C. copper mine), tram operator (underground gold mine in Yellowknife, N.W.T.), Assistant Processing Engineer (Gold mill at Yellowknife, N.W.T.), mill attendant (ball mill, flotation circuit, tailings and hydraulic back fill circuits). Included in the above diverse types of work was an extensive practical knowledge of production blasting and drilling procedures for open pit and underground operations.

JED E. DAGENAIS, B.Sc.

PROJECT EXPERIENCE

Minerals

Aurun Mines Ltd., Calgary, Alberta

President

Started up a junior mining company, initially with private status, converted to public status in 1983 and listed on a Canadian stock exchange. Opened up Canada's first perlite mine, built a test plant and developed markets for the product. Expanded to a full size commercial plant, acquired the only adhesive extender plant on Canada's west coast, relocated it and brought it back to production in late 1985. Acquired precious metal properties from Nevada to the N.W.T. for future development.

Alsands Energy Company, Calgary, Alberta

Manager of Mining

Duties included the design of the mine plan (400,000 tonnes of ore and waste per day) equipment selection using the largest existing draglines (110 cubic yard capacity) and bucket wheel excavators and reclaimers, tailings pond design, ore reserve and grade evaluation and mining infrastructure.

Transalta Utilities Ltd., Calgary, Alberta

Manager of Mines

Directly responsible for operations of existing company's mines (Whitewood and Highvale Mines). Annual coal production was 8 million tons, expanding to 12 million by 1983. Overburden removal was done by large draglines (12 - 60 cubic yard bucket capacity). Coal loading and hauling was done by 15 yard electric shovels and front end loaders and 60 to 100 ton bottom dump trucks.

Indirectly responsible for future mining developments, acting in an advisory capacity to the company's planning group. Duties included coordination of the operation and maintenance functions of mines through the mine operators, insuring through the on-site mining personnel that the mines were being developed in a professional manner. Surveillance of the mining operations was done to ensure mining was carried out in a manner consistent with environmental legislation, safety procedures, and with the intent of maximizing coal recovery, all within costs.

Fluor Canada, Calgary, Alberta

Mining Manager (Principal Project Engineer)

- The scope of this position was all inclusive, from ore reserve and grade determination to pit engineering, equipment selection, drilling and blasting procedures, operating and maintenance procedures, operating and capital cost estimating and financial evaluations.
- Developed and directed geological and geotechnical field programs for Oil Sands operators and developers and coal operators.

JED E. DAGENAIS, B.Sc.

**Iron Ore Company of Canada, Seven Islands, Quebec
Supervisor of Corporate Cost Estimating**

Scope of work ranged from mining to concentrator and pellet plant projects. Located in head office, the coordination of these studies was made in and between three project locations separated by 220 miles and 360 miles from head office. Some studies were made for other companies in the area and in these cases were all inclusive from geological and pit engineering, equipment selection for mines, plants and terminal shipping facilities. Most of these studies were related to iron ore mines. The iron ore was grouped into three categories namely, direct shipping, specular hematite, amenable to beneficiation, and magnetic taconite. Other mining studies were related to limestone, magnetic beach sands, ilmenite deposits, nepheline syenite, and coal.

**Iron Ore Company of Canada, Schefferville, Quebec
Chief Geologist**

Duties included drilling evaluations, geological field mapping (plane tabling and aerial photos) surveying, sample analysis, trenching and test pitting, extensive field operations (tents and/or mobile bunkhouses) geophysical and hydrological studies, environmental studies and all the related auxiliary and supporting operations.

Ore Grading Engineer

Duties included daily, weekly, monthly, yearly and long term ore grading. In the short term, responsibility was for quality of all ore mined in Schefferville. Ore categories included 13 ore types. In the long term, responsibility was for ore grading schedules for 42 iron ore deposits owned by the company, so as to ensure the orderly development of them.

PAPERS PUBLISHED:

Co-author "Ore Reserve and Grade Estimation" - Iron Ore Co. of Canada - presented orally at Ore Reserve and Grade Estimate Symposium held at L'Estereel, Quebec (Sept. 1967) - included in a special volume published by Canadian Institute of Mining and Metallurgy (classed as reference book).

UNPUBLISHED PAPERS:

"Alsands Mine Plan" - oral presentation at CIM Annual General Meeting, Calgary, 1983.

"Starting Up A Mining Company in the Early Eighties" - oral presentation at CIM District 5 Meeting - Hinton, 1985.

PHILLIPS BARRATT KAISER ENGINEERING LTD.**VANCOUVER, B. C.****SCHEDULE OF SERVICES, RATES
AND CONDITIONS OF AGREEMENT****August, 1987****1. General Services**

Phillips Barratt Kaiser Engineering Ltd., hereinafter called "PBK" provides professional engineering services. Based on a mutually agreed scope of assignment, PBK undertakes to render its services to the Client with that degree of care, skill and diligence normally provided in the performance of services in respect of projects of a similar nature at the time that such services are rendered.

2. Professional Fees

Charges to the Client for consulting engineering services shall be on a **Time Rate** basis, on a **Percentage of Cost of Construction** basis or a **Fixed Fee**, as specified in the proposal and as described hereunder.

a) Time Rate Basis

Charges to the Client are based on the actual number of hours worked on the project by professional, technical and clerical staff as taken from time sheets.

The fees for time worked are computed on the basis of salary costs for each staff member plus a percentage of the salary costs to cover employee benefits, overheads and profit. The percentage to be added to the salary costs is stipulated in the proposal.

The salary cost for each staff member is determined by dividing his annual salary by **1950**.

b) Percentage of Cost of Construction Basis

Where fees are based on a percentage of construction costs, the cost of construction is the total cost to the Client of all material and labour (including taxes and the contractor's overhead and profit) necessary to complete the work for which the consultant is responsible.

Whenever the Client furnishes material or equipment, labour or other services that are incorporated in the work, the fair market value of the material or equipment as though they were purchased new, and current prices of labour or other services when the work was executed, shall be included in the total cost of construction.

The cost of construction shall not include professional fees and reimbursements due to the consultant.

The percentage fee to be applied to the cost of the work shall be as stipulated in the proposal.

c) Fixed Fee

PBK may agree upon a fixed fee for the services involved where the scope and schedule of the work are sufficiently defined to allow PBK to calculate expected costs with reasonable accuracy.

3. Disbursements

The following disbursements are chargeable at cost: reproduction of drawings and documents, travelling and subsistence away from office, long distance telecommunications, specialist consultants approved by the Client, tender advertisements, permits, licenses, customs and shipping charges, computer services, word processing, highly specialized equipment and other special out-of-pocket expenses required for the proper execution of the Work.

When approved by the Client, overtime will be worked and will be chargeable at the above Time Rates, plus the cost of the extra overtime salary paid to the employee.

4. Construction Insurance And Performance Bonds

It is expressly understood and agreed that the Client will obtain the necessary insurance counselling services and make decisions on all insurance and performance bond requirements for construction contracts.

5. Field Services

When field services are included in the scope of work, it shall mean applying such selective sampling at the project site as PBK, in its sole professional discretion, considers necessary to ascertain that the work of the contractors is in general conformity with the construction contract documents.

When field services as described above are not included in the scope of work, PBK may attend at the site at the Client's request, but in that case PBK will not be liable to the Client for its subsequent inability to observe defects or deviations in the contractor's work from the contract documents.

6. Cost And Time Estimates

Cost and time estimates prepared for the Client are based on PBK's past and current experience, and represent its best judgements as engineers familiar with the construction industry. It is understood and agreed by the Client that such estimates are subject to change and are contingent upon factors over which PBK has no control such as labour efficiency, market conditions, contractors' methods of determining prices, changing costs of labour, materials and equipment, etc.

7. Building Codes And By-Laws

PBK, to the best of its ability, interprets building codes and by-laws as they apply to a project. It is expressly acknowledged and agreed by the Client that these codes and by-laws are subject to differing interpretations by public regulatory bodies, and that the cost of changes to the work to conform to such differing interpretations will be paid by the Client.

8. Termination Of Services

The Client may terminate PBK's services by giving 15 days prior written notice. Any termination or wind-down expenses reasonably and necessarily incurred by PBK which result from such termination by the Client shall be payable to PBK in the event of a termination of services for reasons beyond the control of PBK.

9. Invoices

Invoices for services performed will be submitted to the Client monthly and shall be payable within 30 days thereafter. Invoices which are unpaid after 30 days shall bear interest at an annual rate of 1% over the prime rate charged by the Bank of Montreal at the time that any arrears occur.

10. Limit Of Liability

PBK carries Public Liability Insurance for bodily injury and property damage in the amount of \$5,000,000.00, and Professional Liability Insurance in the amount of \$5,000,000.00. The Client agrees that any claim which he has or may have against PBK, its servants, employees and representatives in respect of its services shall be absolutely limited to the amount of the foregoing insurance coverages, and shall only be in respect of loss or damage which is directly attributable to negligent acts by PBK or omissions to provide the standards of care, skill and diligence normally provided in the performance of such services. In no event shall PBK be liable for loss or damage occasioned by delays to the project or for loss of earnings or other consequential damages incurred by the Client, howsoever caused.

In the event that the Client wishes additional insurance coverages to those set forth above, PBK will co-operate with the Client to obtain such insurance at the Client's expense provided such additional insurance is available.

11. Additional Services

The following additional services may be provided at the request of the Client and for which PBK shall receive additional payments on the time rate basis as set out above or as negotiated separately. PBK shall perform such additional services on the receipt of the Client's written authorization to that effect.

- a) Making revisions to the drawings and specifications when such revisions are requested by the Client after approvals or instructions have previously been given by the Client.
- b) Preparing drawings and specifications in connection with Change Orders to construction contracts when the adjustment to the fee resulting from the adjustment to the Cost of Construction resulting from the Change Order does not fairly compensate PBK for their services in making the changes, or when the Change Order results in a reduction of the Cost of Construction, provided such changes are required for reasons not within the control of PBK.
- c) Services related to future facilities which are not intended to be constructed during the time of these services.
- d) Preparation of designs for alternative building systems.
- e) Services made necessary by the default of contractors or by major defects or deficiencies in the work of contractors.

12. Certification

PBK's certifications of the Contractor's substantial or total performance of the work as well as the Contractor's applications for payment are subject to the standard of field services provided, and unqualified certificates will only be issued when the level of field services are left to PBK's professional discretion.