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Re: BURNABY LAKE SPORTS COMPLEX
PROPOSED PHASE II IMPLEMENTATION STUDY

Following is a report from the Director of Planning regarding proposals from consultants relative to development within the Burnaby Lake Sports Complex.

RECOMMENDATIONS:

1. THAT Council authorize the engagement of Team 'C' for the sum of $34,000 to work with the Planning Department in the preparation of a Phase II Implementation Report on the Burnaby Lake Sports Complex according to the terms of reference approved by Council on 1977 November 28; and

2. THAT Council resolve to pursue the Burnaby Lake Sports Complex Phase II Study at this time and make application for a grant for the study under the 1978 Municipal Planning Grant Program; and

3. THAT a copy of this report be sent to the Parks and Recreation Commission for their information.

* * * * * *

PLANNING DEPARTMENT
1978 MARCH 07

TO: MUNICIPAL MANAGER

FROM: DIRECTOR OF PLANNING

SUBJECT: BURNABY LAKE SPORTS COMPLEX
PROPOSED PHASE II IMPLEMENTATION STUDY

## 1.0 BACKGROUND

1.1 At the November 28 meeting of Council the Council received a report (Item 19, Manager's Report No. 82) dealing with the outside consultants' services that are proposed in connection with advancing the Burnaby Lake Sports Complex study. At that time, the Council adopted the following recommendations:

"1. THAT Council approve in principle the terms of reference for the study as outlined in Section 3.2(a), (b), and (c) of the Director of Planning's report; and

2. THAT Council authorize the Planning Department to secure proposals from consulting teams qualified to carry out such consulting studies in order that the Department may prepare a further report to Council recommending the retention of a consultant to do the work under the approved Budget allocation; and

3. THAT a copy of this report be sent to the Parks and Recreation Commission for information."

For convenience, the terms of reference that have been approved are as follows:

"(a) The effect of the man-made Lake shown in the Plan on the Kensington Avenue overpass in terms of foundation and hydraulics (silting).

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(b) Economic and market feasibility analysis of the 15-20,000 seat Sport Exhibition Centre as shown in the Plan. Assessment of the likelihood of private enterprise wishing to locate this facility within the Sports Complex and when this is likely to take place. If the Sport Exhibition Centre is not needed in the market place, an indication of what facilities are needed. (This will require interviews and research in the business sector.)

(c) Development and preparation of promotional material including the study report and a 5' x 8' plexiglass covered model of the whole area showing the Development Plan and building design format."

In the report that was submitted, Council was advised that upon approval by Council of the basic scope of the consulting work required, the Planning Department would advance a further report outlining proposals that had been submitted by interested consultants who are qualified to carry out the study, in order that the study be commenced with the funds approved for this purpose in the 1977 Budget.

1.2 Concurrent with the submission of Manager's Report No. 82 on 1977 November 28, the Planning Department initially requested and received proposals to complete the study from 2 consultant teams in 1977 November. In order to ensure that Council would have an opportunity to review a wider representation of proposals, 2 additional consultant groups were contacted and submitted proposals on 1978 January 25, and the others were revised.

1.3 Since the original terms of reference were approved in Managers Report No.82 on 1977 November 28, Council has decided not to proceed with the Kensington Avenue alignment and overpass and staff have been directed to reassess the need for and function of such a route, and to examine alternative locations for a road to replace the Kensington alignment. This aspect has now been taken into account in all 4 updated study proposals with a reduced emphasis on the effect of the man-made lake on the Kensington overpass. The consultants would conduct general analysis of the lake in terms of effect on a nearby road or overpass, the existing Burlington Northern Railway and the effects on hydrology and silting.

1.4 For this consulting work Council approved a $35,000.00 amount in the 1977 Annual Budget. As we were not able to receive and review the 2 additional proposals until 1978 February, the Planning Department requests that the $35,000.00 allocation be transferred to the 1978 Annual Budget.

1.5 The need to conduct an economic/implementation analysis of the study area with particular reference to the proposed multi-purpose Sports Exhibition Centre is particularly important at this time. During 1978 January and February this Department has received Preliminary Plan Approval applications from Terry Lynn Bakeries at 6229 Laurel Street and Mr. V. A. Falconer at 3331 Ardingley Avenue. Both applicants wish to pursue major expansion to their existing manufacturing buildings under the present M2 (General Industrial District) zoning. This proposed new development would be located at the site designated in the Adopted Plan as suitable for the major Sports Exhibition Centre and would thus frustrate and impede future development of the recreational facility. The study would assess the demand and economic feasibility of the Sports Exhibition Centre, locate would-be user and investor groups, examine various alternative economically viable recreation development alternatives in the area and also determine whether it is more economically practical to retain the existing manufacturing enclave and possibly adjust the Plan accordingly.

## 2.0 CONSULTANT'S PROPOSALS

The Planning Department has received detailed proposals from 4 consultant teams to carry out the study in line with the terms of reference that have been approved. All consultant teams have a considerable background of experience in the programming and design of sport and recreational facilities, including expertise in the examination of economic potential, impact analysis, and civil and traffic engineering factors.

The 4 consultant teams which have made proposals are listed below. A brief summary of the consultants' relevant past work is included within the attached Appendix 'E' for Council's information.

Team "A"

1. Architects and Planning Coordinators - Herbert Challier, Architect
2. Economic Analysis - Ward & Associates
3. Structural & Soils Engineering - R. A. Spence Engineering Inc.
   Stubbs Engineering Ltd.
4. Other consultants or resource persons would be used as required.

Estimated time for completing the study - 10-12 weeks

Total cost of consultants work (Team A) - $36,400

Fifty initial copies of the report would be submitted

Attached for Council's consideration under Appendix 'A' is the following additional data:

(a) A summary of the consultant's scope of work for this study.

(b) The consultant's organization and cost breakdown for aspects of the work.

Team "B"

1. Architects and Planning Coordinators - Downs, Archambault, Architects
2. Structural Engineers - Bush & Bohlman
3. Municipal and Civil Engineers - Associated Engineering Services Ltd.
4. Economics & Marketing - Western Realsearch Corp. Ltd.
5. Transport & Transit - N.D. Lea & Associates
6. Soils & Bearing - Golder Brawner
7. Other consultants or resource persons would be used as required.

Estimated time for completing study - 10 weeks

Total cost of consultants work (Team B) - $30,500

Fifty copies of the report would be submitted.

Attached for Council's consideration under Appendix 'B' is the following data:

(a) A summary of the consultant's scope of work for this study.

(b) The consultant's organization and cost breakdown for aspects of the work.

Team "C"

| | |
|---|---|
| 1. Architects and Planning Coordinators | - Rhone & Iredale, Architects |
| 2. Soils & Foundation Engineering | - Klohn Leonoff (K.I. Morrison) |
| 3. Hydraulics | - Associated Engineering Ltd. |
| 4. Landscaping & land forms | - Charles Torrence |
| 5. Fish & Wildlife Conservation | - Peter Caverhill |
| 6. Market Study & Financial Analysis | - Economic Research Associates |
| 7. Property Assessment | - Grover Elliott Appraisers |
| 8. Structural Foundation Comparison Costs | - Bogue Babicki & Associates |

Estimated time for completing the study - 11-12 weeks

Total cost of consultant's work (Team C)- $34,000

Fifty copies of the report would be submitted.

Attached for Council's information under Appendix 'C' is the following additional data:

(a) A summary of the consultant's scope of work for this study.

(b) The consultant's organization and cost breakdown for aspects of the work.

Team "D"

| | |
|---|---|
| 1. Architects Planning Coordinators and Recreation Consultant | - Carlberg Jackson, Architects |
| 2. Economic and Research Consultant | - Ward & Associates |
| 3. Soil Consultant | - Klohn Leonoff |
| 4. Structural Engineers | - Read Jones Christoffersen |
| 5. Transportation Consultant | - N. D. Lea and Associates |

Estimated time for completing the study - 11-12 weeks

Total cost of consultant's work (Team D)- $35,000

Fifty copies of the report would be submitted.

Attached for Council's information under Appendix 'D' is the following additional data:

(a) A summary of the consultant's scope of work for this study.

(b) The consultant's organization and cost breakdown for aspects of the work.

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3.0 ANALYSIS OF CONSULTANTS' PROPOSALS:

3.1 In order to accurately assess the 4 consultants' proposals and select one Team which would produce a study and promotional material most relevant to the terms of reference and Municipal objectives, each proposal was evaluated on the following criteria by senior staff from the Planning Department and the Parks and Recreation Department:

(a) The identity of the study team and extent of specialized skills available.

(b) Past performance and previous experience working in the study area.

(c) Evidence of research, familiarity with work produced to date and understanding of what is required for the Study.

(d) Complete and detailed scope of work relative to important issues.

(e) Organization of tasks and ability to work with Municipal staff.

(f) Emphasis and cost allocation on components of the study and total cost for all work.

(g) Length of time required to produce the study.

3.2 Based on all information received from the consulting teams and the evaluation of the proposals in line with the above criteria, the Planning Department and Parks and Recreation Department jointly recommend retention of Team 'C' (Rhone & Iredale, Architects and Planning Co-ordinators) for the following reasons:

(a) Team C embodies a superior combination of competent team members and specialists. Rhone & Iredale are recognized for their methodology in Team problem solving as well as design skills. This firm is presently engaged in a major stadium study for Vancouver and has information on present and future stadium plans for the city.

(b) Evidence of greater initial research and familiarity with the study area, work produced to date and what is required for the study. Their proposal shows a complete understanding of the program and a well organized use of consultants within the team.

(c) Team C has submitted a more comprehensive and detailed scope of work relative to important issues. The suggestion of this group to develop alternative financial structures which would enable those involved in the decision-making process to view options and alternatives , would be valuable.

(d) General approach to the study, methodology and task organization of Team C is excellent. Their critical path method for completing the study with periodic presentation and feedback from the Municipality is logical in content and sequence.

(e) Team C's proposal would avoid duplication of work already produced to date within the study area and indicates that a practical and useable Phase II implementation study for the area would be presented for Council's consideration.

(f) Team C's proposal shows a superior emphasis and cost allocation on various components of the study.

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APPENDIX A


# Herbert Challier Architects

suite 100 - 1152 Mainland Street,
Vancouver, B.C. V6B 2T9
604/ 669-7133


January 27th, 1978

Director of Planning
The Corporation of the District
of Burnaby
4949 Canada Way
Burnaby, B.C.
V59 1M2

Attention: Mr. S. Brady

Dear Mr. Brady:

Re: Burnaby Lake Sports Complex
Proposed Consultants Study

Further to our submissions of June 2, 1977 and September 15, 1977 and our recent discussions relative to council's change of position on traffic planning in the area and the resulting changes of emphasis of the study, we wish to advise that we are still most interested in being considered as consultants and that our total costs as submitted will not change.

For your reference and use we have redrafted our submission of September 15, 1977 for your review.

Trusting you find our proposal in order and satisfying your present requirements. We look forward to working with you on this report.

Sincerely yours,

Herbert Challier, M.R.A.I.C.

Enc.
HC:pf

Herbert Challier Architects

suite 100 · 1152 Mainland Street,
Vancouver, B.C. V6B 2T9
604/ 669·7133

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Introduction

Having reviewed the various planning proposals for Burnaby Lake, Burnaby Central Valley Sports Centre and the preliminary outline draft for further assessment as prepared by Mr. S. Brady of the Burnaby Planning Department, we herewith set out the requirements and costs of this further assessment.

The review and critical accessment of the existing planning report is a logical step in its implementation. Its recommendations must be based upon sound economic and social needs to be successful. To double check these parameters is a most justified exercise.

Herbert Chalifer Architects

suite 100 · 1152 Mainland Street,
Vancouver, B.C. V6B 2T9
604/ 669-7133

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Goals of This Study

The principal task of this study will be to provide the Municipality of Burnaby a substantial Development Plan Concept for the Burnaby Lake Sports Complex.

The study will involve principally three phases:

Phase One: Analysis of the present Development Plan Concept.

1) Outline the demand for Sport, Recreation and Convention facilities.
2) Review and assessment summarizing all available soils data and correlate as related to the proposed plans.
3) Review and assessment, summarizing traffic, transportation and parking.
4) Assessment of proposed building and development patterns and their relative development costs.
5) Economic analysis summarizing the above aspects including land acquisition costs as provided by the Municipality.

Phase Two: Ammendments to the present Development Plan Concept.

1) Develop and test alternatives based upon conclusions as resolved in Phase One.
2) Coordinate any additional soils tests to substantiate analysis of proposals as expressed in Phase One or alternatives as in study in this phase.
3) Assess all plan aspects as may be altered and coordinate with the Burnaby Planning Department.
4) Summarize the economic viability of the substantiated technical aspects as concluded in Phase One or ammended in Phase Two.

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Phase Three: Presentation of substantiated Development Plan Concept.

1) Summarize study stating development policies.
2) Develop a scale site model to present the concept.

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Vancouver, B.C. V6B 2T9
604/ 669-7133

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Costs of the Study

Due to the procedure of this study the fee structure would best be approved in stages.

The conclusions arrived at after Phase One will determine the extent of the ensuing work. The folowing fee program is therefore proposed:

Phase One

1) Assembly of Data

The necessary data will be assembled from the following sources: Municipality of Burnaby, G.V.R.D., Provincial Sport and Recreation Associations, B.C. Hydro, and any other sources which may be available.

This will require imput form various consultants as it is the assembly of all information required to analize the present Development Plan Concept. The cost for this portion will be $2500.00

2) Analysis of the Present Development Plan Concept

This will involve analysis as presented under "Goals". At the conclusion of this portion there will be a summary report presenting an over view of the present plans. This over view will outline the valid or invalid aspects of the present proposals and state the study requirements and their associated costs to conclude the following phases.

The costs for this portion will be as follows:

| | |
|---|---|
| .Coordination, Planning and Economic Assessment | $ 5,000.00 |
| .Soils Engineering | 2,000.00 |
| .Other Consulting | 1,200.00 |
| | $ 8,200.00 |

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Phase Two

3) The projected work for this phase is prefixed by some general assessments we have at this time. It is our suspicion that additional test holes will be required and should be properly located by survey methods and ground surface elevations obtained at the hole locations. Probe holes to better define depth contours of the soft soils in the area between the B.C. Hydro r/w and Sperling and from around Darney to Sprott would be valuable for any foundation design, etc. However, at this stage, test holes could be located in areas of no future buildings. Something in the order of 50 probe holes would be required to provide reasonable contours around the area. Any lesser number would only provide information in specific areas.

The costs for this phase would be adjusted by updated information as concluded and summarized in Phase One. Our estimate at this time is:

| | |
|---|---|
| .Coordination, Planning and Economic Assessment | $ 4,500.00 |
| .Soils Engineering | 2,800.00 |
| .Other Consulting | 1,500.00 |
| | $ 8,700.00 |
| .Estimate for 50 probe holes, supervision, logging, surveying, identification testing of samples and preparation of contour plan. | 10,000.00 |
| | $18,700.00 |

The summary report at the conclusion of this phase would present a substantiated Development Plan Concept.

Phase Three

4) Presentation costs for this portion would best be determined at the conclusion of Phase Two. At this time we would estimate the cost as follows:

| | |
|---|---|
| .General Summary | $ 2,000.00 |
| .Site Model | 5,000.00 |
| | $ 7,000.00 |

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suite 100-1152 Mainland Street,
Vancouver, B.C. V6B 2T9
604/ 669-7133

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Summary of Costs

| | | | | |
|---|---|---|---|---|
| Phase One | 1) | Assembly of Data | $2,500.00 | |
| | 2) | Analysis and Study | 8,200.00 | $10,700.00 |
| Phase Two | 3) | Assessment Study | 8,700.00 | |
| | | Soil Testing | 10,000.00 | $18,700.00 est. |
| Phase Three | 4) | Presentation | | 7,000.00 est. |
| | | | Projected Total | $36,400.00 |

Herbert Challier Architects

suite 100 1152 Mainland Street,
Vancouver, B.C. V6B 2T9
604/ 669-7133



The Study Team

The primary consultants would be:

Architects and Planning Coordinators
Herbert Challier, Architects

Economic Analysis
Ward & Associates

Structural & Soils Engineering
R.A. Spence Engineering Inc.
Stubbs Engineering Ltd.

Other consultants would be involved as required.

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APPENDIX B

DOWNS/ARCHAMBAULT ARCHITECTS

1252 RICHARDS STREET
VANCOUVER V6B 3G3
BRITISH COLUMBIA
685-6412

February 2, 1978

Mr. A. L. Parr
Director of Planning
Burnaby Planning Department
4949 Canada Way
Burnaby, B. C.

Dear Mr. Parr: re: REVISED PROPOSAL FOR PLANNING STUDY
BURNABY LAKE SPORTS COMPLEX

We are pleased to submit our revised proposal for planning services based upon the recently modified project scope in reference to the Kensington Street bridge.

Downs/Archambault, Architects, will provide the major design and planning impetus and coordinate the work by sub-Consultants. We anticipate that the main Consultants will be Golder Brawner, Soils Engineers, and Western Realesearch, Ltd., Economics and Marketing. As required, special resource persons or firms, will be used to provide information specific to their specialty (recreation, transportation, services, etc.). The selection of such resource persons shall be with the approval of the client at the time of appointment. Downs/Archambault will liaise with the client through the City Planning Department Staff.

We have included our Task Allocation Schedule which we feel defines a basic planning study package. Our fee breakdown for this package would be as follows:

| | | |
|---|---|---|
| A.1 | Multi-use Feasibility | $ 5,200.00 |
| A.2 | Alternate Site Uses | 2,500.00 |
| B.1 | Lake Engineering Study | 1,500.00 |
| B.2 | Lake-Related Issues | 2,900.00 |
| C.1 | Review "Proposed Development Plan" | 1,400.00 |
| C.2 | Area Guidelines | 5,000.00 |
| D.1 | Model ) | 12,000.00 |
| D.2 | Report) | |
| | TOTAL | $30,500.00 |

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Item A.2, of course, might not be required if A.1 proves to be positive. We estimate that the study, as proposed above, would require approximately 10 weeks.

We look forward to hearing from you on this matter, and thank you for the opportunity of putting this proposal forward.

Sincerely,

R. B. Archambault
DOWNS/ARCHAMBAULT . ARCHITECTS
RBA:sm

Encl.

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APPENDIX C

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# Rhone + Iredale

PROPOSAL FOR

CONSULTING STUDY

FOR BURNABY LAKE SPORTS COMPLEX

based on "Burnaby Lake Sports Complex Development Plan Concept"
prepared by Burnaby Planning Department, August 1976.

January 25th, 1978

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BURNABY LAKE SPORTS COMPLEX
PROPOSAL FOR CONSULTING SERVICES

# Scope of Work

PROPOSAL FOR CONSULTING SERVICES,
BURNABY LAKE SPORTS COMPLEX

SCOPE OF WORK

The following Critical Path Method schedule indicates the resources and timing that the consulting team would bring to bear in carrying the Burnaby Lake Sports Complex through its next stage of development.

The processes laid out in the schedule involve the creative participation of many specialists. Our experience in creative problem solving has made us aware of the need for an interactive design process in which the creative input of the many specialists, including Municipal authorities, is nurtured to bring forth innovative solutions. This process involves the use of a decision making tree allowing incremental decisions to co-ordinate the work of the consulting team with the municipal staff and council.

On the basis of our discussions with Mr Stewart Brady of the Burnaby Planning Department, a study of the reports, council minutes, terms of reference, etc., we propose a twelve week study with three phases:

1. The first phase and issue resolution, provides reports directed to resolving current issues. These reports provide the hard data on which the municipal staff and council can base decisions with regard to current issues. The issues that have been identified are those laid out in the consultants terms of reference. These are:

   a) The first study will assess the effect of the man-made lake shown on the plan of the Kensington Avenue overpass, the Burlington and Northern Railroad, the use of Still Creek by the Greater Vancouver Regional Water and Drainage District, and the opportunities offered for unique development in relation to the proposed lake.

      The specialist consultants involved in this study would be K.I. Morrison of Klohn Leonoff, the internationally known Vancouver based Soils Consultants, who have an intimate knowledge of the unique soils and foundation problems surrounding Burnaby Lake, based upon many previous studies of the area. For advice for foundations conditions with relation to the railroad and the proposed Kensington overpass, we have retained Associated Engineering Services Limited, one of Western Canada's largest Engineering Consulting firms who are the prime consultants for the Kensington overpass and have world wide experience in railroad design.

      Landscape design elements of this study will be provided by Charles Torrence, a well recognized local landscape architect who has provided

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# Scope of Work

Scope of Work (cont'd)

imaginative solutions for the Municipal Development of Deer Lake. Related to the ecological concerns of landscape design will be advice with regard to fish and wildlife requirements, in particular, the salmon enhancement programme by Peter Caverhill of the Provincial Fish and Wildlife Department.

This study will allow a decision by the Municipal Staff and other concerned authorities (G.V.W. & D.D., etc.) required to improve or recommend modifications to the Still Creek portion of the plan.

b) The second study in the issue resolution phase of the work will be a Market Demand Study related to the proposed 15,000 - 20,000 seat sports exhibition facility. After discussions with Mr Ray Peters, President of Western Sports, John Chessman, Controller of the Vancouver Canucks, and local economic consultants, it was determined that economic studies with regard to commercial and public sports are of such a specialized nature, that it is necessary to retain consultants out of Vancouver. The San Francisco office of Economic Research Associates, a California based consulting firm, specializes in the feasibility and financial structuring of sports and recreation facilities. They are consultants to such major sports facilities as; the New Orleans Superdome, and have completed studies for sports exhibition facilities, similar to the Burnaby proposal, in Portland, Oregon; Annaheim, California; Santa Clara, California; Boston, Mass.; and Nassau, New York, in the past three years.

Local surveys and special data collection for the market demand study will be undertaken as required by local marketing research specialists working in association with Tom Feeney of Economic Research Associates, San Francisco. The local contacts of the full consulting team in the area of sports and recreation, together with interest expressed to the municipality with regard to the facilities, will be integrated into the market demand study.

This study will then allow municipal staff and council to select facilities suited to the local market, based on survey data analysed in the light of experience from sports exhibition facilities throughout the continent.

c) The third study in the issue resolution phase will undertake to confirm the choice of site proposed for the sports exhibition facility. This study has three major elements. First, the establishment of existing land values by the well recognized appraisal firm Grover Elliott Ltd.; second, the establishment of the difference of foundation costs for the proposed site or alternate sites requiring construction on peat. This study will be undertaken by Bogue Babicki & Associates, Structural Engineers who have experience in the design of many similar facilities, work-

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# Scope of Work



ing together with the soils information provided by Klohn Leonoff; and third, an assessment of the cost benefit that can be ascribed to the intrusion of industrial uses into the recreational area prepared by the architects and economic consultants with the guidance of the planning staff.

This study will allow a decision by the Municipal Staff and Council to confirm the acquisition of the site or consider alternatives.

These first three studies will be undertaken concurrently and allow the first level of decisions to be made four weeks after the studies are authorized.

II. On the basis of the decisions taken, the second phase of the work can begin. This "Concept Development Phase" will involve two studies.

a) The first of these will provide a report on alternate financial structures possible for the development of the sports exhibition complex. This study headed by the economic consultants will lay out options for public and private financing and operation as well as mixed schemes based upon experience of other cities for similar facilities.

This study will provide the information required for municipal staff and council to select an optimum financial structure as the basis for future planning.

b) The second study in the "Concept Development" phase will develop the physical plan of the Burnaby Lake Sports Complex in the light of the previous decisions. This is an architectural and planning study headed by RIA architects and involving the advice of the consulting team and municipal in developing the most useful and imaginative facility within the financial constraints. This study will also provide an architectural vocabulary of form, material, and urban design that will direct the growth of the total sports complex to create an area of pleasure and character as it fulfills the vision of the current plan.

III. Approval of the planning and financial studies of the "Concept Development" phase by municipal staff and council will allow the consulting team to proceed to the final phase of the work, the assembly of a complete "promotional package" for distribution to interested groups. This promotional package will include summaries of the previous reports showing how the various issues hav been resolved and the concept developed in both physical and financial terms. The package will include a 5' x 8' model and will be directed at obtaining from both public and private bodies a positive response to the development of further facilities in the Burnaby Lake Sports Complex.

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# Biographies

W. RANDLE IREDALE, FRAIC

Architect

Born: Calgary, Alberta
June 1, 1929

EDUCATION:

University of British Columbia, B. Arch., 1955
University of Washington, Special Computer Sciences Course, 1968
University of British Columbia, International Programme, 1969

PROFESSIONAL AFFILIATIONS:

Fellow, Royal Architectural Institute of Canada
Registered Architect in British Columbia
Member, National Institute of University Planners

EXPERIENCE:

As a principal of Rhone & Iredale he has been responsible for such award-winning projects as Portage Mountain Hydro-Electric Development, Simon Fraser University Science Complex, and the University of British Columbia Sedgewick Library.

He has also been responsible for the development of the firm's design management systems. These systems have been recognized in publications and invitations to speak to American Institute of Architects' seminars in Seattle, Sun Valley and Chicago, and as visiting lecturer at Pennsylvania State and Wisconsin Universities. Mr Iredale is also a visiting lecturer at the University of British Columbia, Vancouver.

In 1963 Mr Iredale founded Tecton Structures (Fabtec Structures). Until selling the company in 1971, he was Chairman of the Board and manufacturer of schools, hospitals, and industrial camp buildings in British Columbia.

In 1968 he established Canadian Environmental Sciences as the Planning and Engineering group of Rhone & Iredale. Through his experience in inter-disciplinary problem-solving techniques, he played a significant role in this organization.

Mr Iredale has been partner-in-charge for many planning and urban design projects for the firm. These include Campus Planning (U.B.C., S.F.U., U. of Vic., B.C.I.T.) New Community Planning (Canadian Forces Base, Masset, B.C.), Inner City Planning (False Creek Area 10-B) and Planning for Chilcoot Trail National Historic Park.

'Contributor Symposium '67' - 1967
The Canadian Architect Yearbook, Southem Business Publications, Toronto

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# Biographies

PAUL A. BRIDGER

Architect

Born: 11 January, 1949

EDUCATION:

Latymer Upper School, Hammersmith, London
Bartlett School of Architecture, University College, London B.Sc(Hons.)
School of Environmental Studies, University College, London Dip. Arch.

PROFESSIONAL AFFILIATIONS:

Registered, Architects Registration Council of United Kingdom
Corporate Member, Royal Institute of British Architects

EXPERIENCE:

Mr Bridger joined RIA in October 1977 as Project Architect for a large-scale planning and research project which comprised a transport interchange complex, trade fair and exposition facilities, a convention centre and a multi-purpose sports stadium. He is currently Project Architect for a restaurant, pub, shops and marina development in Vancouver.

Prior experience:

- Department of Architecture & Civic Design, Greater London Council: Student architect in the Landscape Design Group.

- J. Jarvis & Sons Lrd., Building & Civil Engineering Contractors: Assistant to site managers on two projects in London.

- Vollner Associates, Architects, Planners & Engineers, New York City. Student architect.

- Shepheard, Epstein & Hunter, Architects & Planners & Landscape Architects, London. Assistant architect for additions to Teachers' Training College in Leicester. Assistant Architect for a student residence at Hertford College, Oxford. Project Architect for a concentration area housing development at Woburn, Bedfordshire.

- J.H. Cooh, Architects & Engineers, Calgary, Alberta. Assistant architect on three major hospital projects. Project architect for buildings in a mining comolex at Thunder Bay, Ontario. Project architect for a senior citizen's home at Blairmore, Alberta.

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K. IAN MORRISON, P. ENG.
DIRECTOR GEOTECHNICAL ENGINEERING

## EDUCATION

- B.Sc. in Civil Engineering, University of Alberta, 1955.
- Post Graduate Studies, (Soil Mechanics and Foundation Engineering), Harvard University, 1963.

## PROFESSIONAL AFFILIATIONS

- Association of Professional Engineers of British Columbia

## SUMMARY OF EXPERIENCE

Mr. Morrison is a geotechnical engineer with over 20 years experience in all aspects of foundation engineering and industrial site development, 10 years at project management level. His broad experience covers foundation footings and pile design on virtually all soil types including tropical lateritic soils, soft alluvial soils and marine deposits.

## PROFESSIONAL RECORD

1957/present - Klohn Leonoff Consultants Ltd. Positions held: Senior Engineer; Chief Engineer; Senior Executive Engineer; and Director, Geotechnical Engineering.
1956 - Site Engineer, Northern Construction and J.W. Stewart, DEW Radar Line.
1955/56 - Associated Engineering Services Ltd.

## KEY PROJECT EXPERIENCE

1957-present
- Geotechnical Investigations and Designs, ranging from lagoons to paper machine foundations to foreshore structures, for the pulp and paper industry in North America including:

  - B.C. Forest Products at MacKenzie, B.C.
  - Crown Zellerbach at Elk Falls, B.C.
  - Eurocan at Kitimat, B.C.
  - International Paper at Androscoggin, New York; Ticonderoga, New York; Fort Francis, Ontario
  - MacMillan Bloedel at Port Alberni, B.C.
  - Northwood at Prince George, B.C.
  - Weldwood at Quesnel, B.C.

KLOHN LEONOFF CONSULTANTS LTD.

- Mine Millsites, British Columbia. Involved in geotechnical aspects of investigations and design for numerous mine millsites including: Boss Mountain, Brenda, B.C. Molybdenum, Gibraltar, Granduc, Granisle, and Lornex.

- Foundation Investigations and Designs for office, commercial, industrial and municipal structures including:

Annacis, Iona and Lulu Island Sewage Plant, Greater Vancouver Regional District
Columbia Centre, Vancouver
Board of Trade Building, Vancouver
Consumer Glass Plant, Lavington
Denman Place Tower, Vancouver
Federal Building, Kelowna
Hiram Walker Distillery, Winfield
Holiday Inn Downtown, Vancouver
Hotel, Penticton
Royal Bank, Kamloops
Saskatchewan Wheat Pool Elevator, North Vancouver
Super Valu Store, Kitimat
Swimming Pool, Kitimat
Treatment Plant & Reservoir, Vernon

- Consultant for investigation of subsoil conditions and foundation studies at Kwidzyn, Poland on a pulp and paper project, for H.A. Simons (International) Ltd.

- Consultant to Stothert Management Ltd for foundation aspects of pulp and paper project at Iwopin, Nigeria.

- Consultant to Wright Engineers Ltd for foundation studies of millsite at La Verde Copper Mine, Mexico.

- Review Consultant to Wright Engineers Ltd for foundation aspect of millsite structures at Aznalcallar Millsite, Seville, Spain.

- Consultant to Wright Engineers Ltd for preliminary geotechnical evaluation of millsite and auxilliary facilities of Cerro Colorado Project, Panama.

- Consultant to Wright Engineers Ltd for geotechnical investigations of Marcopper Millsite, Phillipines.

- Consultant to Stanley Associates for investigations, design, and field supervision of geotechnical aspects of treatment plant additions and dykes containing large effluent holding pond for the Vernon Spray Irrigation District, B.C.

1956
- Site Engineer, Northern Construction and J.W. Stewart Ltd., DEW Radar Line, Northwest Territories.

1965-56
- Various Municipal Engineering Projects in Canada for Associated Engineering Services Ltd.

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# P.F. Backhouse, P. Eng.

Associate

**EDUCATION:**

Royal Technical College, Salford, England, 1954-57
Manchester Faculty of Science & Technology, England, 1952-54
Ordinary National Certificate, Municipal Engineering, 1954
Higher National Certificate, Civil Engineering, 1957

**EXPERIENCE:**

**1975 to date:**
Associated Engineering Services Ltd. Senior Section Engineer, Structural, responsible for the control and coordination of all structural design work throughout British Columbia.

**1972-75:**
Robco Construction Ltd., Builders and Developers, Vancouver, B.C. Design and Construction Manager for industrial and commercial buildings.

**1967-72:**
Hansed Allott & Associates Ltd., Consulting Engineers, Vancouver, B.C. Associate, responsible for civil and structural design, including feasibility studies and design of industrial and commercial projects, such as paint manufacturing, food processing, cold storage and steel fabrication plants, animal feed mills, warehouses, offices, shopping centres, marine works, and marsh land reclamation.

**1965-67:**
International Power & Engineering Consultants, Consulting Engineers, Vancouver, B.C. Senior Engineer responsible for the design of intake works and underground power house structures for the Peace River project.

**1961-65:**
C.S. Allott & Sons, Consulting Engineers, England. Senior Engineer, in charge of foundations design team for 2,000 M.W. thermal power station. Other work included the design of wharf, rail bridge and rail unloading loop, station roads, and surface water and oil drainage.

ASSOCIATED ENGINEERING SERVICES LTD

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EXPERIENCE, Cont'd.

1959-61:
Foundation of Canada Engineering Corporation Limited, Consulting Engineers, Toronto, Ontario. Senior Engineer responsible for the design and construction supervision of grain silo underpinning and wharf construction in Fort William and oil tanker wharf on Cape Breton Island.

1957-59:
Government of Canada, Department of Technical Surveys, Geodetic Survey Branch, Ottawa, Ontario (Astronomy Section). Engineer engaged in precise field work and advanced mathematical calculation for astronomic control of survey networks.

1952-57:
North Western Gas Board, Technical and Planning Division, England. Engineer-in-training, articled to Chief Civil Engineer and involved in design and construction supervision of civil and structural aspects of a gas production plant.

PROFESSIONAL SOCIETIES:

Association of Professional Engineers, British Columbia
Member, Institution of Civil Engineers, United Kingdom

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Carlberg Jackson Partners

APPENDIX D

January 24, 1978

The Corporation of the
District of Burnaby
4949 Canada Way
Burnaby, B. C.
V5G 1M2

Attention: Mr. Stewart J. Brady
Planning Department

Re: Burnaby Lake Sports Complex
Proposed Phase II Implementation Study

Dear Sirs:

Enclosed are three copies of our proposal for consulting services relative to the above mentioned project.

Because of our background in planning of recreation facilities and my personal interest in the development of this area, we are confident that our consulting team can provide the expertise necessary to complete this stage to your satisfaction.

Should you have any questions regarding the services outlined in our terms of reference, we would be pleased to clarify same.

We are hopeful that the above proposal meets with your approval.

Yours very truly,

James A. Carlberg
Architect

JAC:mm
Encl.

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PROPOSAL TO THE

CORPORATION OF THE DISTRICT OF BURNABY

RE: BURNABY LAKE SPORTS COMPLEX
PROPOSED PHASE II IMPLEMENTATION STUDY

SUBMITTED BY:

CARLBERG JACKSON PARTNERS
313 SIXTH STREET
NEW WESTMINSTER, B. C.
V3L 3A7

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## STUDY TEAM

| | | |
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| CO-ORDINATOR | - | Carlberg Jackson Partners<br>Architects<br>313 Sixth Street<br>New Westminster, B. C. V3L 3A7<br>526-2764 |
| ECONOMIC & RESEARCH CONSULTANT | - | Ward & Associates<br>Applied Economics & Research Consultants<br>930-470 Granville Mall<br>Vancouver, B. C. V6C 1V5<br>688-4531 |
| RECREATION CONSULTANT | - | Carlberg Jackson Partners |
| SOIL CONSULTANT | - | Klohn Leonoff Consultants Ltd.<br>Civil & Geotechnical Engineers<br>1010K Shellbridge Way<br>Richmond, B. C. V6X 2W7<br>273-0311 |
| STRUCTURAL ENGINEERS | - | Read Jones Christoffersen Ltd.<br>Consulting Structural Engineers<br>1161 Melville Street<br>Vancouver, B. C. V6E 2X7<br>684-8594 |
| TRANSPORTATION CONSULTANT | - | N. D. Lea & Associates Ltd.<br>Transportation Engineers<br>1455 West Georgia Street<br>Vancouver, B. C. V6G 2T3<br>685-9381 |

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## RESUMES OF STUDY TEAM

CARLBERG JACKSON PARTNERS - Refer to enclosed Book "1"

WARD & ASSOCIATES - Refer to enclosed Book "2"

KLOHN LEONOFF CONSULTANTS - Refer to enclosed Book "3"

READ JONES CHRISTOFFERSEN LTD. - Refer to enclosed Book "4"

N. D. LEA & ASSOCIATES LTD. - Refer to enclosed Book "5"

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TERMS OF REFERENCE

TASK A: The effect of the man-made lake shown in the Plan on the Kensington Avenue overpass in terms of foundation and hydraulics (silting).

TEAM: Co-Ordinator - Carlberg Jackson Partners

Soils Consultant - Klohn Leonoff Consultants Ltd.

Structural Engineer - Read Jones Christoffersen Ltd.

We are assuming that adequate soils tests have been taken in this general area through the 1960 Fenco Report, and that further soils information in the area of the 4-Rinks is also available through the Planning or Engineering Departments, so that new testing will not be a part of this study.

We are also assuming that all information relative to location and dimensions of existing roads, railway lines, proposed roads and overpass locations, is also readily available from the Municipal Planning Department.

This study will then deal with the following:

a) Feasibility of constructing the man-made lake and surrounding parkland as noted on "Proposed Development Plan (Conceptual) Figure II).

b) The effect this man-made lake will have on adjacent roads, services and railway line.

c) The effect this man-made lake will have on the proposed Kensington overpass should it be located as shown on the Proposed Development Plan.

d) Feasibility of constructing light structures near the perimeter of the lake.

e) This study will include some field work with hand auger tests by our Soils Consultant, to complement the existing soils test material available from the Municipality.

TASK B: Economic and market feasibility analysis of the 15 - 20,000 seat Sport Exhibition Centre as shown in the Plan. Assessment of the likelihood of private enterprise wishing to locate this facility within the Sports Complex and when this is likely to take place. If the Sport Exhibition Centre is not needed in the market place, an indication of what facilities are needed. (This will require interviews and research in the business sector.)

TEAM: Co-Ordinator - Carlberg Jackson Partners

Economic & Research Consultant - Ward & Associates

Recreation Consultant - Carlberg Jackson Partners

Soil Consultant - Klohn Leonoff Consultants Ltd.

Structural Engineer - Read Jones Christoffersen Ltd.

Transportation Consultant - N. D. Lea & Associates Ltd.

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The study will consist of three parts:

a) Determination of optimum size.

b) Income and expenditures.

c) Financing and operation.

A) DETERMINATION OF OPTIMUM SIZE

1. An analysis of competing facilities and possible future competing facilities in the Greater Vancouver Area will be made and the need for and type of facility which may be best constructed, to complement or replace facilities elsewhere, as part of the Burnaby Lake Sports Complex will be determined.
2. An analysis will be prepared of those events, be they sports or entertainment, which can be expected to take place in the proposed facility.
3. On the basis of the events list determined above, the size of the field to accommodate those events will be determined as well as the most desirable seating capacity.
4. Basic information regarding shape of the field, required support facilities, etc., will be provided.

B) INCOME AND EXPENDITURES

1. Income of the facility will be determined by estimating attendance at the different events based upon experience in other similar operations.

2. Additional income from other operations such as souvenir sales, programme sales, concession sales, etc., will be determined.

3. Operating costs will be determined, i.e., those operating costs that are not directly chargeable to events, and profit and loss statements prepared.

Note: It is realized, of course, that the economic feasibility of the project depends to a large degree upon its profitability and that financial considerations may very well dictate some variations of the findings under A) 1, 2 and 3.

C) FINANCING AND OPERATION

Once the economic feasibility of the project has been established, meetings will be organized with interested groups and interviews with businessmen and entrepreneurs will be conducted to determine the feasibility, advisability and likelihood of individuals or groups wanting to finance and operate the facility, and if so, under what conditions.

Also, included in the above task will be a review of parking, transportation and access relative to the type of facility proposed.

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TASK C: Development and preparation of promotional material including the study report and a 5' x 8' plexiglass covered model of the whole area, showing the Development Plan and building design format.

TEAM: Co-Ordinator - Carlberg Jackson Partners

Recreation Consultant - Carlberg Jackson Partners

Preparation of Model - B & B Scale Models Ltd.

This part of the study will include the following:

a) Complete review of Proposed Development Plan (Conceptual) Figure II, relative to the current status of all proposed and existing facilities.

b) Refine (Conceptual) plan to include any changes to proposed recreation facilities.

c) Refine (Conceptual) plan to coincide with recommendations of consultants' studies, listed under Tasks A and B.

d) Prepare 5' x 8' plexiglass covered model of the whole area showing the Development Plan and building design format.

# TIME AND COST SCHEDULE

Based on the request for Consultants' Study - Burnaby Planning Department, dated January 4, 1978, together with our Terms of Reference, the following is a breakdown of the time and costs involved in Tasks A, B and C.

TASK A: Time - 5 weeks from starting date.

Cost - $10,000.00

TASK B: Time - 8 weeks from starting date.

Cost - $17,000.00

TASK C: Time - 4 weeks after completion of Task B.

Cost - $8,000.00

Total Time - 12 weeks for study.

Total Cost - $35,000.00

Should we be awarded the above commission, we are prepared to begin the study immediately and adhere to the completion times noted.

A P P E N D I X "E"

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Team 'A'

1. Architects & Planning Co-ordinators - Herbert Challier, Architect

   - Summary of relevant work - preliminary studies for PNE major stadium
   - traffic Park and Ride system to PNE
   - facility consultation - Burnaby Lake Rowing course
   - consultant to B.C. Sports Federation

2. Economic Analysis - Ward & Associates

   - Summary of relevant work - financial feasibility of Seattle Kingdome
   - financial feasibility of multipurpose stadium PNE
   - analysis of convention facility Edmonton

3. Structural & Soil Engineering - R.A. Spence & Stubbs Engineering

   - Summary of relevant work - some Lake City Industrial projects
   - Burnaby Thruway Study (1956-1962)
   - Port Mann Bridge foundations

Attached for Council's information under Appendix "A" is the following additional data:

(a) A summary of the consultants' scope of work for this study.

(b) The consultants' organization and cost breakdown for aspects of the work.

A more detailed resume of the members of Team 'A' is available for Council's information at the Planning Department.

Team 'B'

1. Architects & Planning Co-ordinators - - Downs, Archambault, Architects

   - Summary of relevant work - major planning study - Champlain Heights, Vancouver
   - False Creek Area 6, Vancouver
   - Burke Mountain Planning Study
   - Britannia Community Services Centre, Vancouver.

2. Structural Engineers - Bush & Bohlman

   - Summary of relevant work - Western Provincial Pavilion Expo '67
   - Pan Am Stadium, Winnipeg

3. Municipal & Civil Engineers- Associated Engineering Services Limited

   - Summary of relevant work - Kensington Overpass Report and presentation to CTC
   - Development of Burnaby Lake Report - 1966

4. Economics & Marketing - Western Realsearch Corp. Ltd.

5. Transportation & Transit - N.D. Lea & Associates (has prepared Transportation impact study on Sports Complex for B.C. Ministry of Highways)

6. Soils & Bearing - Golder Brawner (considerable experience in peatlands)

7. Other consultants or resource personal would be used to provide information specific to their specialty (ie. recreational facilities etc.).

Attached for Council's information under Appendix "B" is the following additional data:

(a) A summary of the consultants' scope of work.

(b) The consultants' organization and cost breakdown for aspects of the work.

A detailed resume pertaining to each consultant is available in the Planning Department offices for the information of Council.

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Team 'C'

1. Architects and Planning Co-ordinators - Rhone & Iredale, Architects

   - Summary of relevant work - currently involved in major stadium/convention centre study False Creek area, Vancouver

   - has designed buildings: SFU Science Complex, West Coast Transmission offices and many others in B. C.

   - established Canadian Environmental Sciences, interdisciplinary problem solving group.

   - involved in campus planning for UBC, SFU, U of Vic and BCIT. Inner city planning (False Creek Area 10-B), New Community Planning (Canadian Forces Base, Masset, B. C.)

2. Soils and Foundation Engineering - Klohn Leonoff (K.I. Morrison)

   - Summary of relevant work - soil input study and analysis for "Development of Burnaby Lake" report - 1966

   - Buildings at these universities: UBC, U. of Manitoba, U of Lethbridge; Canada Safeway buildings, B. C. Hydro building; Pan Am Swimming Pool, Winnipeg and others.

   - Extensive engineering projects throughout B. C. including analysis of unstable soils and permafrost.

3. Hydraulics - Associated Engineering Services Ltd.

   - Summary of relevant work - Kensington Overpass Report and presentation to CTC

   - hydraulics and soils input for "Development of Burnaby Lake" report - 1966

4. Landscape Architect - Charles Torrence

   - Summary of relevant work - Deer Lake Park Study for Burnaby Municipality - 1977

5. Fish and Wildlife Conservation - Peter Caverhill of Provincial Fish and Wildlife Branch - (necessitated by modification to a watercourse)

6. Market Study and Financial Analysis - Economics Research Associates (ERA) (Thomas A. Feeney)

- Summary of relevant work - economic feasibility analysis of mass attendance events - Disney World, Expo 74 Spokane, Sea World and others

- economic feasibility analysis of major sports and spectator facilities including New Orleans Stadium and others

A recommended specialist in this field.

7. Property Assessment - Grover Elliott Appraisers (Mike Grover)

- involved extensively in Greater Vancouver area.

8. Structural Foundations -Cost Comparison - Bogue Babicki Associates (Bogue Babicki)

- Summary of relevant work - pedestrian overpass Canada Way/Ledger

- buildings at SFU (Science and classroom blocks), UBC - Thunderbird Stadium, Notre Dame University - Multi-purpose Complex, University of Lethbridge and BCIT, Delta Municipal Hall, Minoru Sports Arena, Richmond and others.

Attached for Council's information under Appendix 'C' is the following additional data:

(a) A summary of the consultants' scope of work.

(b) The consultants' organization and cost breakdown for aspects of the work.

A detailed resume of the members of Team 'C' is available for Council's information at the Planning Department.

Team 'D'

1. Architects , Planning Co-ordinators & Recreation Consultant - Carlberg Jackson, Architects

- Summary of relevant work - recreational buildings including Canada Summer Games, Rowing Course facilities, Kensington Park Arena, Bonsor Pool, UBC Aquatic Centre, Moody Park Arena, Oak Bay Recreation Centre and others.

- Planning study for Maple Ridge

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2. Economic and Research Consultant - Ward and Associates

- Summary of relevant work - financial feasibility of Seattle Kingdome
- financial feasibility of Multipurpose Stadium, PNE
- analysis of convention facility in Edmonton

3. Soil Consultant - Klohn Leonoff

- Summary of relevant work - soil input study and analysis for "Development of Burnaby Lake" report - 1966
- Buildings at these universities: U.B.C., U. of Manitoba, U. of Lethbridge, Canada Safeway Buildings, B. C. Hydro building, Pan Am Swimming Pool, Winnipeg and others.
- extensive engineering projects throughout B. C. including analysis of unstable soils and permafrost.

4. Structural Engineers - Read Jones Christoffersen

- Summary of relevant work - buildings including Granville Square, Vancouver Centre, and Royal Centre, Vancouver, Coronation Pool, Edmonton, North Vancouver Recreation Centre and others.
- bridge design - Capilano River Highway Bridge, Park Royal pedestrian overpass
- many parking structures

5. Transportation Consultant - N.D. Lea and Associates

- Summary of relevant work - report on the transportation and impact analysis of the proposed 15-20,000 seat Coliseum in the Burnaby Lake Sports Complex for the Ministry of Highways.
- involved in many transportation studies in B. C.

Attached for Council's information under Appendix 'D' is the following additional data:

(a) A summary of the consultant's work.

(b) The consultant's organization and cost breakdown for aspects of the work.

A detailed resume of the members of Team 'D' is available for Council's information at the Planning Department.