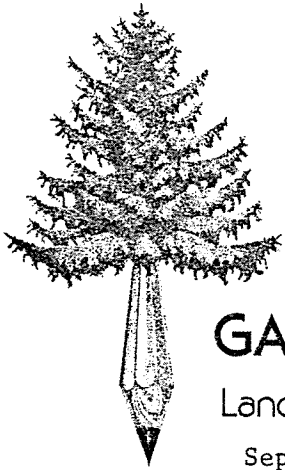


**MUNICIPALITY of RICHMOND**  
**TREE PRESERVATION FEASIBILITY STUDY**  
**PROPOSAL**



**GARDNER, PEEPRE & ASSOCIATES**  
Landscape Resources Management  
15 - 1600 W. 6th Ave., Vancouver, B.C. V6J 1R3



ROBIN GARDNER, C.FOR., M.P.M.  
JURI PEEPRE, B.L.A.  
LARRY DIAMOND, MARCH, M.L.A.  
PETER WHARTON, B.SC.(FOR.)  
LEA PRICE, B.F.A.  
TERRY SALWAY

## GARDNER, PEEPRE & ASSOCIATES

Landscape Resources Management

September 4, 1980

Mr. William Kerr  
Director of Planning  
Township of Richmond  
6911 No. 3 Road  
Richmond, B. C.

Dear Sir:

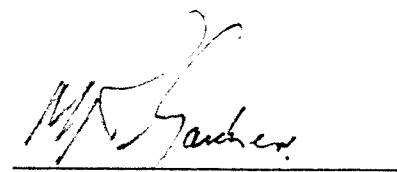
We are pleased to submit a proposal for consulting services to prepare a Tree Preservation Feasibility Study for the proposed development site at Shell Road and Francis Road in the Township of Richmond. The terms of reference indicate a requirement for a multi-disciplinary approach, and we have assembled a qualified team of professionals to address the problem. Gardner, Peepre and Associates will provide the primary expertise in the vegetation inventory, preservation, land use planning, and landscape architecture aspects of the study while Peter Hogan and Associates will address the civil engineering component. Hardy Associates Ltd. have conducted numerous soil studies in peat environments and will provide geotechnical input to the report. The collective experience of the four senior personnel will allow us to offer the necessary specialized skills, yet maintain broad flexibility to ensure a comprehensive range of options are developed for residential planning and tree preservation in the location under study.

We look forward to the opportunity to work on this important pilot study of residential development on peatlands in Richmond. We trust the proposal fulfills your requirements and objectives. Should there be any questions regarding the proposal please do not hesitate to contact us.

Yours very truly,

GARDNER, PEEPRE & ASSOCIATES

  
Juri Peepre

  
M. R. Gardner

JP:ts  
encl.

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The terms of reference for the Tree Preservation Feasibility Study as outlined by the Richmond Planning Department clearly identify the consultant's responsibility in conducting a detailed site investigation and review of literature and other documents, with a view to developing recommendations and plan modifications to maximize preservation of the vegetated peat environment.

Such a study presents the Municipality of Richmond with an unusual opportunity to assess the peat forest resources on all potential development sites.

Our approach throughout the study will be to utilize the skills of team members in a multi-disciplinary problem solving program. Peter Hogan and Associates have worked together with Gardner, Peepre and Associates on a number of tree preservation and retention projects in the Lower Mainland. We feel confident that innovative engineering solutions may be found to maximize retention of the peat environment. Peter Hogan and Associates will provide input into analysis of engineering standards, and site planning aspects of the study.

Hardy and Associates will be involved in assessing soils in relation to critical factors affecting tree retention, as well as providing advice on geotechnical and soil engineering components of the report.

Gardner, Peepre and Associates will co-ordinate the project, and act as a liaison between the Municipality of Richmond and study team members. The firm's specialized expertise in vegetation retention on development sites will be coupled with a capability in landscape architecture and land use planning to assist the synthesis of technical information provided by the sub-consultants. Throughout the study duration we hope to discuss findings and recommendations with the Richmond Planning Department.

2.0 WORK PROGRAM

The terms of reference outlined by the Richmond Planning Department call for a comprehensive study of the proposed development site including an inventory of the existing peat environment, effects of proposed engineering works and standards on the peat forest, location and size of park and buffer areas, recommendations regarding the conceptual plan of the proposed housing layout, and a model outlining the potential for preserving peat environments in other Richmond development sites.

The following work program outlines in detail the proposed study sequence and methodology which will be adopted to fulfill the stated requirements and objectives.

2.1 PART 1. REVIEW AND SITE ASSESSMENT

1. Existing literature on peat environments will be reviewed with particular emphasis on preservation of vegetation, engineering opportunities and constraints, and geotechnical considerations.
2. A preliminary site investigation with the full study team will be conducted to obtain information on environmental and land use characteristics.
3. Existing plans, documents, and other information available through the Richmond Planning Department will be reviewed and analyzed. Other sources of information outside of Richmond may include adjacent municipalities, other Government agencies and university sources.
4. The administrative constraints and policies of the Municipality of Richmond will be reviewed as they affect tree preservation.
5. A comprehensive inventory will be undertaken utilizing site visits and testing, aerial photos, and random plot establishment. The inventory will be classified under biophysical and site constraint headings, and will encompass the following:
  - (a) Biophysical Characteristics
    - growing medium and constraints
    - groundcover
    - shrubs and and forbes
    - trees
    - insects, disease, and abiotic stress
    - hydrology

Ten random plots will be examined to determine the composition of the vegetation resource, and soil tests for N,P,K, content and nutrient layering will be undertaken.

A brief aerial reconnaissance by helicopter will be conducted to establish up-to-date vegetation boundaries and land use constraints. Oblique aerial photos will be taken.

(b) Site Constraints

The inventory will focus on a variety of factors influencing the site and possible tree retention practices.

- brief visual analysis conducted through site visits and the compilation of notes and sketch diagrams.
- adjacent land use characteristics
- services
- access
- circulation
- historical element
- existing pedestrian linkages

2.2 PART 2. SYNTHESIS

The biophysical and site constraints assessment will be synthesized, and then evaluated with respect to the results of the literature review, planning documents, and existing engineering standards. The two primary components of the study will be evaluated and options discussed regarding tree preservation.

The site specific information will be channeled into the development of recommendations for the study site, while general concepts and solutions for preservation of peat environments on development sites will be evolved into a practical and realistic working model. The model may potentially serve as a guide to residential development in peat environments throughout the Richmond area, and will include engineering, planning, geotechnical and vegetation components.

2.3 PART 3. CONCEPT PLAN MODIFICATION

The site assessment and derivation of general guidelines and recommendations will be applied to the existing development concept plans, and options for plan adjustments to optimize vegetation preservation will be presented. The following factors will be considered in the schematic plan preparation:

- engineering standards to improve vegetation retention
- recommended locations for integrated underground services
- housing types and location modification within the existing planning criterion
- circulation patterns, road layout and design
- lot sizes and configuration

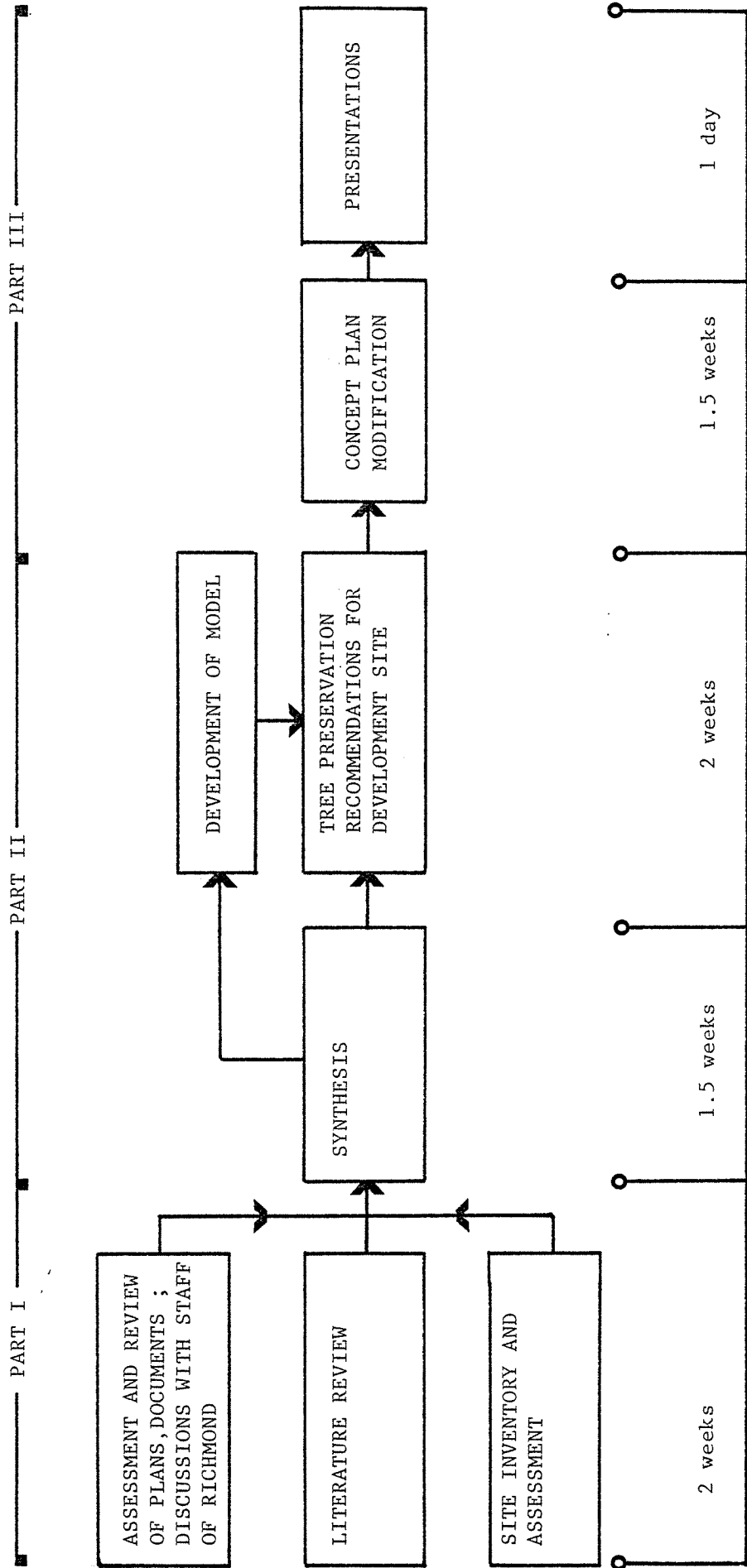
Other key issues addressed to maximize opportunities for retention of the peat environment will include:

- optimum park location size and design guidelines
- buffer strip retention opportunities; opportunities in back lot areas and cul-de-sac ends
- potential for retaining small areas of vegetation
- park utilization recommendations and anticipated pressures or impacts
- protection of retention areas
- construction techniques and water management during and after development phases
- long term management implications of the protected peat environment areas
- specifications for vegetation retention including water recharge, feeding, and other critical elements
- restoration of disturbed peat environments

#### 2.4 PRESENTATIONS

Following interim discussions regarding our draft report, including supporting plans and drawings, the final report will be formally presented to Council or staff members. The report will be prepared in an 8 1/2" by 11" format with written material supported by foldout maps. Larger scale maps may be utilized for presentation or reference in the final development site planning.

# WORK PROGRAM FLOW CHART





3.0 ITEMIZED COST ESTIMATE

The following cost estimate is based on the combined consulting services of Gardner, Peepre and Associates as principals, together with the sub-consulting of Peter Hogan and Associates, and Hardy Associates Ltd.

The estimate includes a comprehensive range of services to fulfill the requirements of the terms of reference. Should the Municipality of Richmond wish to adjust certain components of the study based on the proposal, we would be prepared to discuss modifications of the cost estimate.

The bid is organized according to the sequence of tasks outlined in the work program.

1. <u>Review &amp; Site Assessment</u>	<u>Professional Fees</u>
Preliminary site visit	1,500.00
Literature review, review of plans & documents, discussions with Richmond staff.	1,850.00
Biophysical inventory, site constraints inventory.	1,750.00
Soil testing and nutrient analysis, review of foundation solutions employed on peat subsoil	1,100.00
SUBTOTAL	_____
	6,200.00
 2. <u>Synthesis</u>	
Design team meetings to discuss review & site assessment; evolve geotechnical and engineering parameters.	1,500.00
Development of innovative engineering solutions.	1,600.00
Development of recommendations.	1,100.00
Development of model.	1,150.00
SUBTOTAL	_____
	5,350.00

3.	<u>Concept Plan Modification</u>	
	Design team work for plan modification.	2,250.00
	Report writing and graphics.	2,200.00
	Two presentations (4 team members)	1,500.00
	SUBTOTAL	<hr/> 5,950.00
4.	<u>Expenses</u>	
	Report preparation; word processor/ typing; support staff	800.00
	Photography/development costs/ B/W prints for report.	85.00
	Helicopter time (1/2 hour)	125.00
	Mileage for four site visits and two meetings	25.00
	Report printing/photocopying (based on 8 copies)	200.00
	Blueprinting plans	<hr/> 50.00
	SUBTOTAL	1,285.00
	TOTAL	<hr/> <hr/> 18,785.00

3.1 BILL-OUT RATES FOR PRIMARY STUDY TEAM MEMBERS

Robin Gardner (Gardner, Peepre & Assoc.)	\$350.00/day
Juri Peepre (Gardner, Peepre & Assoc.)	350.00/day
Peter Hogan (Peter Hogan & Assoc.)	400.00/day
Ed Harrington (Hardy Associates Ltd.)	400.00/day

BILL-OUT RATES FOR SUPPORT STAFF AND FACILITIES

Terry Salway (Word Processor Operator)	\$ 20.00/hr
Lea Price (Graphic support staff)	35.00/hr
Peter Wharton (Technical support)	35.00/hr

4.0

APPENDIX

## SERVICES

### URBAN FORESTRY

- urban forest studies
- vegetation management
- forest conservation and tree retention studies on development sites
- street tree planning and management
- urban horticulture

### LANDSCAPE RESTORATION

- restoration and revegetation of disturbed and derelict landscapes
- right-of-way revegetation
- erosion control
- landscape development on ecologically sensitive sites
- stream enhancement, shoreline restoration

### ARBORICULTURE

- tree appraisals and valuation
- pest management
- tree surveys

### PARK AND RECREATION PLANNING AND DESIGN

- site planning
- trail planning and construction supervision
- park planning and facility design
- recreation planning
- visual analysis
- lake planning for multiple use
- plant material programming and forecasting requirement
- campground design
- specifications, construction supervision



## ENVIRONMENTAL STUDIES

- environmental policy development
- project feasibility studies
- specialized input into environmental impact studies
- linear corridor vegetation management
- visual impact analysis
- terrain analysis
- land use suitability
- research
- open space inventory and analysis
- right-of-way location and impact studies

## URBAN STUDIES

- streetscape analysis and design
- urban tree management



## REPRESENTATIVE PROJECTS

URBAN FORESTRY AND RESTORATION STUDY; Proposed Villages Development	City of Port Moody, B. C., and Carma Developments Ltd.
TREE RETENTION STUDY; Mountain Meadows Development Phase III	Carma Developments Ltd., Port Moody, B.C.
BRIDAL TRAILS SUBDIVISION FOREST RETENTION STUDY:	Block Bros. Contractors Ltd. Surrey, B. C.
Specimen Tree Assessments and Tree Appraisals	Numerous private clients
Consulting Municipal Arborist (on an ongoing basis)	Municipality of West Vancouver
The City of Vancouver Boulevard Tree Program. History, Analysis, and Recommendations for Management	City of Vancouver Parks Board

## OTHER REPRESENTATIVE PROJECTS RECENTLY COMPLETED BY MEMBERS OF THE COMPANY

Leamington Downtown Improvement Plan	Ontario
Advisor to the Co-Ordinator Northern Transmission, Stage 1 Study (various background reports)	Ian Hayward & Associates/B. C. Hydro and Power Authority
Pesticide Management Policy Formulation: A preparatory essay	Alberta Environment
Recreation Development Management Plan	Upper Qu'Appelle Special Planning Area Commission, Saskatchewan



OTHER REPRESENTATIVE PROJECTS  
RECENTLY COMPLETED BY MEMBERS OF THE COMPANY CONTINUED

Water-Based  
Recreational Planning

Chandos Township,  
Ontario

Long Beach North Day Use  
Area Environmental Design  
and Restoration

Pacific Rim National  
Parks Canada

Cheekye Dunsmuir - Vegetation  
Management

B.C. Hydro and  
Power Authority

Management Models for  
Vegetation Management  
on Electrical Utility  
Rights-of-way

Pest Management  
Paper #15  
Simon Fraser  
University

Banff-Windermere Highway  
Landscape Development and  
Restoration

Kootenay National  
Parks Canada

Waste Resources  
Management Study

Env. Protection  
Service. Alberta  
Environment



RESUME

NAME M. ROBIN GARDNER

EDUCATION

1980 PhD (candidate) Plant Science, University of British Columbia.

1977 Master of Pest Management (M.P.M.) Simon Fraser University British Columbia

1965 Certified Forester (C.For.), Faskally Forester College Scotland

AWARDS

Graduate Student Stipend, Simon Fraser University President's Research Fund 1977

Graduate Student Fellowship, University of British Columbia 1977/1978

Leonard Klinck (H.R. Macmillan) Fellowship, University of British Columbia 1978-1980

REGISTERED MEMBERSHIPS

Canadian Institute of Forestry  
International Society of Arboriculture  
Alberta Society of Professional Biologists  
Canadian Association for Land Reclamation  
American Society for Horticultural Science  
Pest Management Society of Canada

WORK EXPERIENCE

1980 PRINCIPAL - Gardner, Peepre & Associates Ltd.

1978-1979 Managing Director, Urban Forestree Ltd., Vancouver, B.C.

1976-1977 Managing Director, Environmental Consulting Services Vancouver, B. C.

1973-1976 Environmental Advisor, British Columbia Hydro & Power Authority, Vancouver, B. C.

1972 Director Scotland, KBT Group, Department of Environment attached to Secretary of State's office, St. Andrews House, Edinburgh, Scotland.

1967-1970 Assistant District Forester Vegetation Control Ontario Hydro & Power Authority, Toronto, Ontario.

1965 Assistant to Development Engineer, K.V.P. Pulp & Paper Co., Espanola, Ontario.



## PUBLICATIONS

Gardner, M. R. 1979. Vegetation Management in Cheekye to Dunsmuir 500 KV Transmission Line Route Selection Study Phases I and II. Beak Consultants Ltd. & B. C. Hydro.

Gardner, M. R., 1980. A Report on the City of Vancouver Boulevard Tree Program with Recommendations for Present and Future Management.

Gardner, M. R. 1978. A Management Model for Vegetation Pest Management on Electrical Utility High Voltage and Extra High Voltage Rights-of-Way. Master of Pest Management Thesis, Simon Fraser University.

Gardner, M. R. et al, 1980. Urban Forestry Study, The Villages, Port Moody, B. C. Urban Forestree Ltd.

Gardner, M. R. 1975. Central Interior Division Vegetation Management Workload Analysis - Distribution. British Columbia Hydro and Power Authority.

Gardner, M. R., 1971. Growth Control in Plants - Evaluation of, and research requirements for, the application of growth regulators in plant management. Invitational paper presented at symposium on growth regulators. Dow Chemical Company, Midland, U.S.A.

Gardner, M. R., 1974. Brief to the British Columbia Royal Commission into the Use of Pesticide and Herbicides. British Columbia Hydro and Power Authority.

Gardner, M. R., 1976. Basic Principles for Right-of-Way Management in Urban Environment in Trees and Forests for Human Settlements. Centre for Urban Forest Studies University of Toronto, 234-244

## TEACHING

Lecturer, Ontario Hydro Trades Training Centre Orangeville, Ontario. Plant Taxonomy and Physiology, Pesticide use and safety.

Guest Instructor, Simon Fraser University British Columbia Management Principles for Rights-of-Way

Lecturer, Vancouver and Burnaby School District Adult Education Programs. Gardening - Trees and Shrubs in the Urban Environment. Garding - Design, Establishment and Culture. Gardening - Vegetables in the garden.

NAME JURI PEEPRE

EDUCATION

1980 Msc. (Plant Science) candidate, University of British Columbia;

Thesis: Rehabilitation and environmental management of disturbed landscapes.

Associated Studies: Landscape assessment, wildland recreation planning, resource management, environmental sciences.

1976 B.L.A. (Honours), University of Guelph

1971 Geography/English, (1 year), University of Guelph

AWARDS Graduate Summer Scholarship, U.B.C. - 1980  
 Graduate Teaching Assistantship, U.B.C. - 1979, 1980  
 Federal Athletic Grants-in-Aid 1971, 1972.

REGISTERED MEMBERSHIPS Canadian Society of Landscape Architects. (C.S.L.A.)  
 Alberta Association of Landscape Architects. (A.A.L.A.)

WORK EXPERIENCE

March 1980 PRINCIPAL - Gardner, Peepre & Associates Ltd.

Consultants in landscape resources management, with special interests in landscape restoration, environmental design, landscape planning and management, urban forestry, and arboriculture.

1976-1979 LANDSCAPE ARCHITECT

Parks Canada, Western Regional Office

Duties Project management, including site analysis, design, tendering, construction supervision, and financial management.

Design projects included park day-use areas, highway landscape restoration, trail developments, theatre and information centre, and related park facilities.

Plan development reports included facility feasibility studies, design requirement reports, and project assessment studies.

LANDSCAPE ARCHITECT

1978-1980 Eikos Design Group, Vancouver. Contract work for planning and design firm.

SUPERVISOR

1976 Parks Canada, Conservation Corps Program, Wood Buffalo National Park.

Duties

Program development, scheduling, supervision of all aspects of seven week outdoor learn-work program for northern youth.

Development of trail systems, design and construction of foot-bridges and bank stabilization structures, wildlife surveys, biophysical inventory data gathering.

LANDSCAPE ARCHITECT

1975 Parks Canada, Wood Buffalo National Park.

Duties

Biophysical inventory, and terrain analysis followed by the design and construction of trail systems for interpretive, hiking and skiing purposes.

PUBLICATIONS

1979 "Interim report on selected rehabilitation projects in Parks Canada, Western Region", In Proceedings: "Workshop on Native Shrubs in Reclamation, Alberta Land Conservation and Reclamation Council.

1976 "Plant Materials in Urban Areas", In "The Use of Woody Plants in the Contemporary Landscape", Office of Continuing Education, University of Guelph.

NAME A. PETER WHARTON

EDUCATION

1970-1973 B. Sc., Forestry. University College of North Wales, Bangor, U.K.

Research Project "Natural Regeneration Pattern in Mature Sitka Spruce Plantations of northeast Yorkshire".

Merrist Wood Agricultural College, Guildford, Surrey, Great Britain

1973 City Guild's Certificate in Tree Surgery (with distinction)

MEMBERSHIPS Royal Scottish Forestry Society  
Arboricultural Association  
Royal Horticultural Society  
American Association of Botanic Gardens and Arboreta  
International Society of Arboriculture  
American Rhododendron Society  
Canadian Institute of Forestry

WORK EXPERIENCE

Jan.-Apr. 1974 TREE SURGEON  
Northern Tree Surgeons, Keighley, North Yorkshire

Duties Practical and supervisory experience in removing dangerous trees in urban communities.

Apr/74-Jan/75 TREE SURGEON/ARBORICULTURAL ADVISOR  
Selby and Urban District Council, North Yorkshire

July 1975 ARBORICULTURIST-HORTICULTURIST  
U. B. C. Botanical Garden

1980 Gardner, Peepre & Associates  
Associate of firm contributing to arboricultural and urban forestry aspects of the firm.

# Peter Hogan & Associates Ltd.

Consulting Engineers

North Vancouver (604) 980-4521

1409 Bewicke Avenue  
North Vancouver, B.C.  
V7M 3C7

Our File No. 1170

September 4th, 1980

Gardner, Peepre & Associates  
#15 - 1600 West 6th Avenue  
Vancouver, B.C. V6J 1R3

Attn: Juri Peepre

Dear Sirs:

Tree Preservation Study Proposal  
Township of Richmond, B.C.

As discussed at our two preliminary meetings, we should be pleased to join your Company and Hardy Associates in addressing the terms of reference included in the Township of Richmond's letter dated August 15th, 1980.

We can recognize the necessity in this evaluation to have a civil engineering company experienced in land development to provide technical support and to communicate with the Municipal engineering department. Because of our ten years' land development experience in the Lower Mainland, we feel confident that our staff can work with the project team to meet the requirements of The Corporation of the Township of Richmond.

From a preliminary evaluation of our assignments, we estimate that our maximum fee would not exceed \$4,000.00.

If you require additional information to complete your proposal tomorrow, please telephone.

Yours very truly,

Peter Hogan & Associates Ltd.

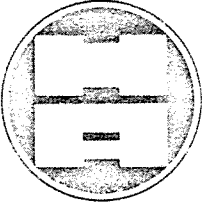
Per:



P. F. Hogan, P.Eng.

PFH:se

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# HARDY ASSOCIATES (1978) LTD.

CONSULTING ENGINEERING & PROFESSIONAL SERVICES

File No. Q-2400-77

September 4, 1980.

**BURNABY OFFICE**  
4052 GRAVELEY STREET  
BURNABY, B.C.  
V5C 3T6  
TELEPHONE: (604) 294-3311  
TELEX NO.: 04-354841

Gardner, Peepre & Associates,  
Landscape Resources Management,  
Suite 15, 1600 West 6th Avenue,  
VANCOUVER, B. C.  
V6J 1R8

Attention: Mr. Juri Peepre, C.S.L.A.

Dear Sirs:

Re: Tree Preservation Study Proposal,  
Township of Richmond.

Further to our recent meetings concerning the Tree Preservation Study required by the Township of Richmond, we are pleased to outline our contribution and present an estimate of our costs.

We understand that the intention is to produce guidelines for developments in peat areas to ensure that the trees and character of the bog forests are preserved.

Our main involvement would be a review of the effects on the tree environment of conventional foundation solutions on peat subsoils. We would also give some thought to innovative yet economical solutions.

In addition, we can organize and supervise the drilling of a few shallow holes in the peat, obtain samples of peat and test them for chemical composition and water content.

Thank you for the opportunity to present our proposal for this very interesting study.

Yours truly,

HARDY ASSOCIATES (1978) LTD.

Per: *E Harrington*

E. J. Harrington, P. Eng.,  
Geotechnical Project Engineer.

EJH:cm  
Enclosures

20



EDWIN JOHN HARRINGTON

Geotechnical Engineer, Geotechnical Division, Vancouver

EDUCATION

- 1975 D.M.S., Diploma in Management Studies, Newcastle Upon Tyne Polytechnic
- 1968 M. Sc., Soil Mechanics, Imperial College, London, England
- 1966 B. Sc., Civil Engineering, University of Aston, Birmingham, England

PROFESSIONAL AFFILIATIONS

- Member, Association of Professional Engineers of the Province of British Columbia
- Member, Institute of Civil Engineers, England
- Associate Member, British Institute of Management

EMPLOYMENT RECORD

- 1978 - Present Hardy Associates (1978) Ltd.
- 1978 Howard Humphreys & Partners, Surrey, England; Senior Geotechnical Engineer
- 1976 - 1978 GKN Keller (Canada) Ltd., Vancouver, B. C.; Western Area Manager
- 1975 - 1976 R. M. Hardy & Associates Ltd., Calgary, Alta.; Senior Geotechnical Engineer
- 1972 - 1975 Northumburan Water Authority, Newcastle upon Tyne, England; Materials and Geotechnics Engineer
- 1968 - 1972 Ove Arup & Partners, London and Newcastle, England; Senior Geotechnical Engineer
- 1966 - 1967 William Coulson Ltd., Wolverhampton, England; Soils Engineer

PERTINENT EXPERIENCE

- 1978 - Present Large site development. Site underlain by peats and soft normally consolidated soils. Area previously extensively slipped. Settlement and stability analysis; Creek re-instatement, piling problems, instrumentation,



Edwin John Harrington (Continued)

- methane gas venting.
- 1978 Major roadworks. Soil and rock slope instability and remedial works, rock tunnel design.
- 1976 - 1978 Marketing, design, tendering, organization and control of vibro-compaction and vibro-replacement and dewatering contracts.
- 1975 - 1976 Wide range of building foundation investigations, slope stability. Major coal handling facility, sugar silo foundations, mining subsidence investigation, gravel anchored snow sheds.
- 1972 - 1975 Laboratory management; geotechnical and materials testing services. Slope stability and heave of excavations. Soft ground tunnels. Ground freezing compressed air working.
- 1968 - 1972 Wide range of foundation investigations. Major roadworks instrumentation, grouting of old mine workings, piling, sand drains.
- 1966 - 1967 Drilling, grouting, piling. Major road and bridge works. Site investigations.



GLEN A. SINGLETON

Reclamation Planning & Research, Environmental Division, Vancouver, B. C.

EDUCATION

- 1978 Ph.D., Soil Science, University of British Columbia
- 1974 B.Sc. (Hons.), Agriculture, University of British Columbia

PROFESSIONAL AFFILIATIONS

- Member, Agrologist Institute of Canada
- Member, Soil Science Society of America
- Member, Alberta Institute of Agrologists
- Member, Canadian Society of Soil Science
- Member, International Society of Soil Science

EMPLOYMENT RECORD

- 1978 Hardy Associates Ltd.
- 1977 (contract) McAllister and Associates
- 1976 (contract) Resource Analysis Branch,  
Government of British Columbia
- 1973 - 1974  
(contract) Grouse Mountain Resorts Ltd.
- 1972  
(summer employment) Similkameen Mining Co. Ltd.
- 1970 - 1971  
(summer employment) B.C. Hydro and Power Authority

PERTINENT EXPERIENCE

Experience with Hardy Associates Ltd. involves reclamation planning and soils-related research associated with oil sand and heavy oil extraction developments. This includes studies relating to effects of fly ash on terrestrial systems, design and implementation of soil monitoring programs, and collection and interpretation of soil survey information. Other areas of involvement are in: 1) research projects which address specific soil chemistry or soil genesis problems, as in reclamation of saline soils and sulphur-affected soils; and 2) the use of soils information in land use planning.

Working with L. Farstad (McAllister and Associates, British Columbia), investigated potential effects of sewage effluent disposal on Tappen Clay soils near Salmon Arm, B.C. Conducted a study to evaluate the soil and vegetation effects when urea is used as a runway de-icer at Penticton airport.

GLEN A. SINGLETON - Page 2

With the Resource Analysis Branch, Government of British Columbia, conducted aerial photo interpretation and field programs to evaluate the potential of four areas selected as possible expansion townsites in the Northeast Coal Block area near Dawson Creek, B.C. The study included formulation of interpretative criteria for townsite evaluation based on soils and vegetation information.

At Grouse Mountain Resorts Ltd., conducted revegetation research for recreational areas. This included aerial photo interpretation, soil survey, and soil data interpretation.

With Similkameen Mining Co. Ltd., conducted field plot experiments and supervised mine reclamation project.

PUBLICATIONS

- Singleton, G.A. 1973. Grouse Mountain revegetation study and soil survey. Grouse Mountain Resorts Ltd., Vancouver, B.C.
- Singleton, G.A. 1974. The stability of the soils of Grouse Mountain. Grouse Mountain Resorts Ltd., Vancouver, B.C.
- Singleton, G.A., D. Parsons and M.E. Walmsley. 1976. Townsite investigation for Northeast Coal Study. B.C. Government Publication, Victoria, B.C.
- Singleton, G.A. 1978. Weathering in a soil chronosequence. Ph.D. Thesis, University of British Columbia, December, 1978.
- Singleton, G.A. and L.M. Lavkulich. 1978. Adaption of the soxhlet extractor for pedologic studies. SSSAJ 42, No. 6, 984-986.
- Singleton, G.A., W.H. Hendershot and L.M. Lavkulick. 1978. Integration of soil chronosequence into experimental pedology (accepted for presentation - 11th I.S.S.S. Congress, Edmonton, Canada).
- Valentine, K.W.G., N. Alley, A. Green, G.A. Singleton and R.K. Jones. 1977. Complex soil history on Holocene moraine in British Columbia. 10th INQUA Congress, Birmingham, England.
- Hendershot, W.H., G.A. Singleton and L.M. Lavkulich. 1979. Variation in surface charge characteristics in a soil chronosequence. SSAJ 43, No. 2, 387-389.

