BL 2664

AGREEMENT

FOR

PROFESSIONAL CONSULTING SERVICES

MEMORANDUM OF AGREEMENT dated the 6TH. **day of May**

A. D. 2005

-BETWEEN-

THE CORPORATION OF THE TOWN OF PELHAM

Hereinafter called the 'Client'
THE PARTY OF THE FIRST PART

-AND-

R.V. ANDERSON ASSOCIATES LIMITED

Hereinafter called the 'Consultant'
THE PARTY OF THE SECOND PART

WHEREAS the Client intends to update and calibrate its' water distribution system model (H_2O Net) to be used to forecast future needs as well as determine the impact of currently proposed development on the current day distribution system in the Town of Pelham,

hereinafter called the 'Project' and has requested the Consultant to furnish professional services in connection therewith;

NOW THEREFORE WITNESSETH that in consideration of the covenants contained herein, the Client and the Consultant mutually agree as follows:

ARTICLE 1 - GENERAL CONDITIONS

1.01 Retainer

The Client hereby retains the services of the Consultant in connection with the Project and the Consultant hereby agrees to provide the services described herein under the general direction and control of the Client.

In this Agreement the word Consultant shall mean professionals and other specialists engaged by the Client directly and whose names are party to this Agreement.

1.02 Services

The services to be provided by the Consultant and by the Client for the Project are set forth in Article 2 and such services as changed, altered or added to under Section 1.08 are hereinafter called the 'Services'.

1.03 Compensation

The Client shall pay the Consultant in accordance with the provisions set forth in Article 3.

1.04 Staff and Methods

The Consultant shall use current state of the art principles and shall skillfully and competently perform the Services and shall employ only skilled and competent staff who will be under the supervision of a senior member of the Consultant's staff.

1.05 Drawings and Documents

Subject to Section 3.2.4 of Article 3, drawings and documents or copies thereof required for the Project shall be exchanged between the parties on a reciprocal basis. Documents prepared by the Consultant for the Client may be used by the Client, for the Project herein described, including "as built" records. The Client has ownership of the drawings.

1.06 Patents

All concepts, products or processes produced by or resulting from the Services rendered by the Consultant in connection with the Project, or which are otherwise developed or first reduced to practice by the Consultant in the performance of his Services, and which are patentable, capable of trademark or otherwise, shall be and remain the property of the Consultant.

The Client shall have permanent non-exclusive royalty-free license to use any concept, product or process, which is patentable, capable of trademark or otherwise produced by or resulting from the Services rendered by the Consultant in connection with the Project and for no other purpose or project.

1.07 Records and Audit

(a) In order to provide data for the calculation of fees on a time basis, the Consultant shall keep a detailed record of the hours worked by and salaries paid to his staff employed for the Project.

(b) The Client may inspect and audit the books, payrolls, accounts and records of the Consultant during regular office hours with respect to any item which the Client is required to pay on a time scale or disbursement basis as a result of this Agreement.

(c) The Consultant, when requested by the Client, shall provide copies of receipts with respect to any disbursement for which the Consultant claims payment under this Agreement.

1.08 Changes and Alterations and Additional Services

With the consent of the Consultant the Client may in writing at any time after the execution of the Agreement or the commencement of the Services delete, extend, increase, vary or otherwise alter the Services forming the subject of the Agreement, and if such action by the Client necessitates additional staff or services, the Consultant shall be paid in accordance with Section 3.2.1 for such additional staff employed directly thereon, together with such expenses and disbursements as allowed under Section 3.2.4.

1.09 Suspension or Termination

The Client may at any time by notice in writing to the Consultant suspend or terminate the Services or any portion thereof at any stage of the undertaking. Upon receipt of such written notice, the Consultant shall perform no further Services other than those reasonably necessary to close out his Services. In such an event, the Consultant shall be entitled to payment in accordance with Section 3.2.1 for any of the Consultant's staff employed directly thereon together with such expenses and disbursements allowed under Section 3.2.4.

If the Consultant is practicing as an individual and dies before his Services have been completed, this Agreement shall terminate as of the date of his death, and the Client shall pay for the Services rendered and disbursements incurred by the Consultant to the date of such termination.

1.10 Indemnification

The Consultant shall indemnify and save harmless the Client from and against all claims, actions, losses, expenses, costs or damages of every nature and kind whatsoever which the Client, his employees, officers or agents may suffer as a result of the negligence of the Consultant, his employees, officers or agents in the performance of this Agreement.

The Client agrees to hold harmless, indemnify and defend the Consultant from and against any and all claim, losses, damages, liability and costs of defense arising out of or in any way connected with the presence, discharge, release or escape of contaminants of any kind, excluding only such liability as may arise out of the negligence of the Consultant in the performance of consulting services to the Client within this project.

1.11 Insurance

The Client will accept the insurance coverage specified in this clause as the limit of liability of the Consultant.

a) Comprehensive General Liability and Automobile Insurance

The Insurance Coverage shall be $1,000,000.00 for general liability and $1,000,000.00 for automobile insurance. When requested the Consultant shall provide the Client with proof of Comprehensive General Liability and Automobile Insurance (Inclusive Limits) for both owned and non-owned vehicles.

b) Professional Liability Insurance

The Insurance Coverage shall be in the amount of $1,000,000.00. When requested the Consultant shall provide to the Client proof of Professional Liability Insurance carried by the Consultant, and in accordance with APEO Act, 1984 and Regulations therein.

c) Change in Coverage

If the Client requests to have the amount of coverage increased or to obtain other special insurance for this Project then the Consultant shall endeavour forthwith to obtain such increased or special insurance at the Client's expense as a disbursement allowed under Section 3.2.4.

It is understood and agreed that the coverage provided by these policies will not be changed or amended in any way nor cancelled by the Consultant until (60) days after written notice of such change or cancellations has been personally delivered to the Client.

1.12 Contracting for Construction

Neither the Consultant nor any person, firm or corporation associated or affiliated with or subsidiary to the Consultant shall tender for the construction of the Project, or have an interest either directly or indirectly in the construction of the Project.

1.13 Assignment

Neither party may assign this Agreement without the prior consent in writing of the other.

1.14 Previous Agreements

This Agreement supersedes all previous agreements, arrangements or understandings between the parties whether written or oral in connection with or incidental to the Project.

1.15 Approval by Other Authorities

Unless otherwise provided in this Agreement, where the work of the Consultant is subject to the approval or review of an authority, department of government, or agency other than the Client, such applications for approval or review shall be the responsibility of the Consultant, but shall be submitted through the offices of the Client and unless authorized by the Client in writing, such applications for approval or review shall not be obtained by direct contact by the Consultant with such other authority, department of government or agency.

1.16 Principals and Executives

The use of Principals and Executives on a time basis by the Consultant, will be in accordance with Section 1.23.1 (c).

1.17 Specialized Services

The Consultant may engage others for specialized services provided that prior approval is obtained, in writing, from the Client and may add a mark-up of not more than 5% of the cost of such services to cover office administration costs when claiming reimbursement from the Client.

1.18 Inspection

The client, or persons authorized by the Client, shall have the right, at all reasonable times, to inspect or otherwise review the Services performed, or being performed, under the Project and the premises where they are being performed.

1.19 Publication

The Consultant agrees to obtain the consent in writing of the Client before publishing or issuing any information regarding the Project.

1.20 Confidential Data

The Consultant shall not divulge any specific information identified as confidential, communicated to or acquired by him, or disclosed by the client in the course of carrying out the Services provided for herein. No such information shall be used by the Consultant on any other project without the approval in writing of the client.

1.21 Arbitration

(a) Any dispute, difference or disagreement between the parties hereto in relation to the Agreement may, with the consent of both parties, be referred to arbitration.

(b) No person shall be appointed to act as arbitrator who is in any way interested, financially or otherwise, in the conduct of the work on the Project or in the business or other affairs of either the Client or the Consultant.

(c) The award of the arbitrator shall be final and binding upon the parties.

(d) The provisions of The Arbitrations Act, R.S.O., 1980, Chapter 25, as amended shall apply.

1.22 Time

The Consultant shall perform the Services expeditiously to meet the requirements of the Client and shall complete any portion or portions of the Services in such order as the Client may require and the Client shall have the right to take possession of and use any completed or partially completed portions of the Work notwithstanding any provisions expressed or implied to the contrary.

The Client shall give due consideration to all designs, drawings, plans, specifications, reports, tenders, proposals and other information submitted by the Consultant, and shall make any decisions which he is required to make in connection therewith within a reasonable time so as not to delay the work of the Consultant.

1.23 Estimates, Schedules and Staff List

1.23.1 Preparation of Estimate of Fees, Schedule of Progress and Staff List

When requested by the Client, the Consultant shall within fourteen days of the execution of this Agreement provide, for approval by the Client:

(a) An estimate of the total fees to be paid for the Services.

(b) A Schedule showing an estimate of the portion of the Services to be completed in each month and an estimate of the portion of the fee which will be payable for each such month.

(c) A Staff list showing the number, classifications and salary ranges of staff and/or hourly rate ranges for Principals and Executives, for which the Consultant will seek payment on a time basis. The Consultant shall relate such information to the particular type of work that such staff is to perform, while employed on the Project. Such list shall designate the member of the Consultant's staff who is to be the liaison person between the Consultant and the Client.

1.23.2 Subsequent Changes in the Estimate of Fees, Schedule of Progress and Staff List

The Consultant will require prior written approval, from the Client for any of the following changes:

(a) Any increase in the estimated fees beyond those approved under Subsection 1.23.1 (a).

(b) Any change in the schedule at progress which results in a longer period than provided in Subsection 1.23.1 (b).

(c) Any change in the number, classification and salary ranges of the staff provided under Subsection 1.23.1 (c).

1.23.3 Monthly Reporting of Progress

When requested by the Client, the Consultant shall provide the Client with a written report showing the portion of the Services completed in the preceding month.

ARTICLE 2 – SERVICES

Services included under this agreement shall be those applicable as included in Schedule A attached, and the R.V. Anderson Associates Limited proposal "Pelham Water Distribution System Model Update" dated April 2005, appended as Schedule B.

ARTICLE 3 - FEES AND DISBURSEMENTS

3.1 Definitions

For the purpose of this Agreement, the following definitions shall apply:

(a) **Payroll Cost:**

Payroll cost is defined as hourly salary plus payroll burden.

i) The following formula shall be used to calculate the hourly salary for the billing purposes. Hourly salary equals:

$$\frac{\text{Annual Salary}}{\text{Hours Per Week} \times 52 \times .85}$$

ii) Payroll burden equals fringe benefits expressed as a percentage of salary that provides for health and medical insurance, group life and disability insurance, company and Canada pension employer contribution, Workers' Compensation and Unemployment Insurance, but excludes bonuses or profit sharing. For the purposes of this agreement payroll burden is 13.43%.

(b) **Cost of the Work:**

(i) The "Cost of the Work" shall mean the total cost of the Project including all materials, equipment, sales taxes, labour and contractor's overhead and profit, necessary to complete the work for which the Consultant prepares designs, drawings or specifications, for which he is responsible. Where sales taxes are not included in the cost of the work, the fee shall be adjusted upwards by the factor equivalent to the sales taxes. The adjusted fee may be computed to the nearest one-tenth of one percent (1/10%).

(ii) Wherever the client furnishes labour or other service which is incorporated in the work, the current price of labour or other service when the work was executed shall be used to compute the Cost of the Work.

(iii) Whenever used materials or equipment is furnished by or on behalf of the Client, the fair market value of such materials or equipment, as though it was purchased new, shall be used to compute the Cost of the Work.

(iv) In computing the Cost of the Work, no deductions shall be made on account of any penalties or damages claimed by the Client from any contractor or on account of any other sum withheld from any contractor.

(v) The Cost of the Work shall not include any fees and disbursements due to the Consultant, the Client's engineering and office expenses, or cost of land.

(c) **Site:**

Site includes the actual work site and other locations where the checking of materials, equipment and workmanship is carried out.

3.2 Basis of Payment

3.2.1 Fees Calculated on a Time Basis

3.2.1.1 The Client shall pay the Consultant a fee, calculated on a time basis, for that part of the Services described in Article 2. Fees on a time and expenses basis shall be calculated in accordance with the Consultant's hourly rate schedule in force at the time the chargeable work is performed.

A copy of the R.V. Anderson Associates Limited 2005 Billing Rate Schedule and Schedule of Charges for Reimbursable Expenses has been attached to this agreement as Schedule C.

3.2.1.2 **Time Expended**

All time expended on the assignment, whether in the Consultant's office, at the Client's premises, or elsewhere, and including travel time, shall be chargeable. This also includes, but is not limited to, stenographic and clerical staff engaged in the preparation of documents such as reports and specifications.

3.2.2 **Computer Services**

Computer services, except where a computer is used for design under the percentage fee scale or for the Consultant's normal office administration, shall be considered a reimbursable expense.

3.2.3 **Reimbursable Expenses**

In addition to the fee, the Consultant shall be reimbursed at cost plus an administrative charge of 5%, plus the cost of additional insurance incurred by the Consultant, for all expenses properly incurred by him in connection with the project, including but not limited to: vehicle use charges, travelling and living expenses, long distance telephone charges, teletype and telegraph charges, printing and reproductions, progress photography, advertising for tenders, special delivery and express charges, overtime premium costs, and the cost of providing and maintaining site offices, supplies and equipment, chemical and physical tests.

3.3 **Payment**

3.3.1 **Fees Calculated on a Time Basis**

The Consultant shall submit an invoice to the Client for all Services completed in the immediately preceding month. Interest at the annual rate of 12 percent (1 percent monthly) will be paid on the total outstanding unpaid balance commencing 30 days after the Client has received the Consultant's invoice.

IN WITNESS THEREOF the parties hereto have caused to be executed those presents by their officers properly authorized in that behalf on the day and year first above written.

SIGNED, SEALED AND DELIVERED

in the presence of:

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_____

_____

_____

R.V.ANDERSON ASSOCIATES LIMITED

_____
PRESIDENT

KENNETH A. MORRISON, P.ENG.

PRESIDENT

THE CORPORATION OF TOWN OF PELHAM

_____
MAYOR

_____
CLERK

SCHEDULE A

ARTICLE 2 - SERVICES

2.1 Consultant's Services for General Municipal Project

(a) Special Services

1 Advisory services consisting of the following:

- environmental studies
- research
- soils investigation programs
- other special consultation and advice

2 Preparation of feasibility studies comparing alternate routes for services and alternative methods of construction or materials in terms of:

- capital cost
- land requirements
- operating efficiency
- environmental conservation
- energy conservation

3 Carrying out prolonged negotiations with public authorities on behalf of the Client.

Preliminary Design and Reports

1 Meet with the appropriate representatives of the municipality, including the municipal engineer, planning director, works committee or council to:

- Obtain full information on existing and proposed municipal services, roads and other facilities.
- Obtain the Client's standard criteria for design.
- Establish the extent of services to be provided and the manner of presentation.
- Obtain the Client's practice for the sharing of costs with public authorities, with private developers and with the public.

2 Conduct a physical reconnaissance and review topographical maps of the Project area to ascertain the location, topography, drainage and existing municipal services.

3 Establish the design criteria for the design of the Project.

4 Assemble existing soils data and recommend additional soils programs.

2.2 Client's Services for General Municipal Project

The Client shall provide the Consultant with the following Services, notwithstanding that, should the Client be unable to provide any of the Services hereunder, services under (1) may be assigned to the Consultant under Section 1.08.

1 Access to and, where necessary, copies of existing plans, profiles or other topographic information showing or pertaining to existing conditions within the Project area.

2 Registered land plans, legal documents and surveys, where necessary, defining the property limits of existing rights-of-way and other parcels of land affected by the Project, and as required in the acquisition of property and lands for the Project.

3 Specimen contract documents for the guidance of the Consultant in the design of the Project to the standards required by the Client.

4 General direction of the Consultant in the provision of the Services and approvals from time to time as necessary during the currency of this Agreement.

5 Soils, foundation and hydrological reports, where required, for the proper design of the Project.

6 Any information regarding utilities necessary for the preparation of the plans referred to in Section 2.1 in the possession of the Client.

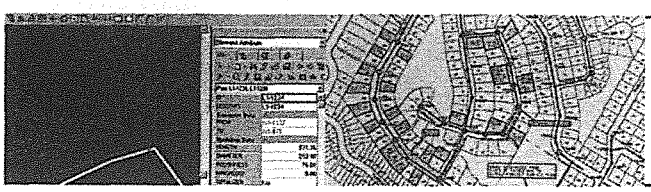
7 Any information, Functional Study or Predesign Investigation undertaken for the Project or any adjoining property.

8 Arrange and make provision for the Consultant's entry and ready access to property (public and private) as well as to the site of the Project, as necessary to enable him to perform his services.

9 Designate in writing an individual to act as his Representative who will transmit instructions to and receive information from the Consultant.

The Consultant shall be entitled to rely upon the information, direction and approvals provided by the Client pursuant to clauses 1 through 9 hereof, inclusive, as being accurate in the performance of the Consultant's Services under this Agreement.

SCHEDULE B



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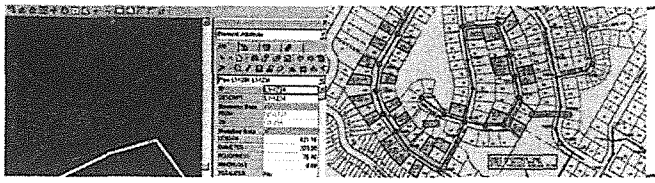


1.0 Corporate Overview

R.V. Anderson Associates Limited (RVA) has been engaged in the practice of environmental, civil, and municipal consulting engineering since 1948. We are an employee-owned Canadian company with affiliates throughout Ontario and the Atlantic provinces, providing services to the public and private sectors in Canada and internationally. RVA has a multi-disciplinary staff of over 175 professionals, and offers services in planning and management, design and construction, as well as operation and optimization of municipal infrastructure. Staff based in our Welland and Toronto offices will complete this project.

RVA's business strategy is to deliver a comprehensive menu of services to its traditional infrastructure and environmental clients, in a selected number of technical business areas. This "vertical integration" of services is intended to assist clients with a broad range of challenges, issues and problems facing their organizations in today's public works environment. A copy of our corporate brochure is included in Appendix A.

2.0 Proponent Qualifications

2.1 General Qualifications

We have provided consulting engineering services from the planning phase, through detailed design to construction on a host of municipal infrastructure projects involving water supply and distribution; wastewater collection and treatment; as well as land development and transportation.

RVA has conducted water distribution studies in numerous municipalities in recent years, including: Pelham, Bradford, Markham, Toronto, Welland, Kingston, Chatham, Wallaceburg, Tilbury, Blenheim, London, Woodstock, and Ingersoll in Ontario as well as Moncton, Riverview, Dieppe, and Sackville in New Brunswick.

2.2 Project Requirements

In order to successfully complete this assignment, the following project experience is required:

- Previous experience with the Town on the water system.
- Project management and cost / schedule control.
- Understanding of water system hydraulics and experience with the H_2O Net model.
- Development of water demands and fire demands.
- Field flow testing procedures and the determination of C factors and fire flows.
- Experience with the calibration of hydraulic network models and subsequent use for planning purposes.
- Understanding how changes to the hydraulic model affect the simulated results and the experience to know if the results are reasonable.

- Knowledge and experience of developing a water main rehabilitation / replacement program using life-cycle costs.

The RVA project team has all of these skills as demonstrated by our long list of related projects, and these will be applied directly to this project. This will result in a Final Report which meets all the expectations and needs of the Town for this project.

2.3 Relevant Experience

Water System Integration, Town of Pelham, 2000 – RVA was retained by the Region of Niagara to undertake a review of the requirements to integrate the two water systems in Pelham and to provide a step-by-step plan of the tasks required for both short-term and long-term needs. The study recommended that the two water systems become combined into one system with two pressure zones. Pump modifications were required at the Shoalts Drive Pumping Station to allow water to be pumped directly into each zone, with the higher zone serving as a "back-up" to the lower zone. The need for several new water mains and pressure reducing valves were also identified in the computer network analysis provided by the Town. A 13-stage implementation plan was developed to permit the interconnection of the two water systems. RVA undertook the detailed design and construction for the system proposed by this report.

Municipal Class Environmental Assessment for Proposed Water Main from The Holmedale Water Treatment Plant to the South end of Spalding Drive, City of Brantford, 2005 – RVA was retained by the City of Brantford to undertake an EA to construct a 600 mm diameter water main from the Holmedale Water Treatment Plant to the south end of Spalding Drive. The proposed water main will also provide another connection across the Grand River to increase the security of supply to the residents and businesses located south of the Grand River. Several alternative routes and scenarios were analyzed using H_2O Net.

Combining Pressure Districts 2 and 3 - Pre-Design Report, City of Brantford, 2004 – RVA was retained to identify the works required to combine Pressure Zones 2 and 3 into a single pressure zone serving an equivalent population of 100,000. The H_2O Net computer model was used to confirm the compatibility of the pumps in the Tollgate Road and Wayne Gretzky Pumping Stations. A pump control strategy was also proposed. Combining these districts would increase the fire flow capacity, reliability of water supply, and minimize storage requirements. In order to combine these districts, pumps would have to be replaced in two of the pumping stations and a new pump control system would have to be implemented. Several computer simulations were conducted to identify the pump sizes and control strategy. RVA subsequently conducted a study to identify the measures required to improve pressures in a subdivision.

Water Distribution Study - Pressure Zones 5-1, 5-2 and 6TN, Town of Markham – RVA has conducted water distribution studies for three pressure zones in Markham. These studies included fire flow tests;

calibration of computer models of the distribution systems; identification of system deficiencies (structural and hydraulic); and a prioritized renewal program. RVA also conducted an analysis of Pressure Zone 6M in Markham for York Region in order to identify the works required to integrate this zone with Zone 6 in Richmond Hill.

Water Distribution System Model - Utilities Kingston, 2002 - RVA updated the water distribution models that were previously developed for the former City of Kingston, Kingston Township and Pittsburgh Township (these municipalities were amalgamated in 1999). These models were combined into a single model using H_2O Net. This new model will be used to identify the improvements that might be required to interconnect the former City system with the former Kingston Township system as well as the site selection for a proposed elevated tank in the west end of the City.

Water Distribution Study - Pressure Zone 3E, City of Toronto, 2004 - RVA recently completed a water distribution study for Pressure Zone 3E in the City of Toronto. This zone essentially includes the former Borough of East York. This study includes several fire flow and C factor tests; calibration of a computer model of the distribution system; identification of system deficiencies (structural and hydraulic); and a prioritized renewal program.

Water System Master Plan - Municipality of Chatham-Kent, 2001 - RVA prepared a water master plan for the new municipality of Chatham-Kent. This master plan addressed water supply and storage requirements as well as the future integration of several independent systems. Water distribution models were developed for Chatham, Wallaceburg, Tilbury and Blenheim using EPANET and Cybernet.

Water Distribution Study - Pressure Zone 2 Etobicoke, City of Toronto, 1998 - As part of Etobicoke's long-term water main rehabilitation program, RVA developed a calibrated computer model of Pressure Zone 2 using EPANET. This pressure zone services a population of over 50,000 as well as large industrial and commercial areas. Extensive flow testing (fire flow and C factor tests) was completed in order to calibrate the EPANET computer model. The computer model includes 1,700 links and 1,300 nodes. Pressure and flow data was obtained from the former Metro Works for the pumping stations and reservoirs which supply Zone 2 in order to model the boundary conditions and to estimate the unaccounted-for water.

A prioritized rehabilitation/replacement program was developed based on hydraulic deficiencies and water main break records. Several alternatives were evaluated, including: cleaning and lining of the old cast iron mains; twinning of the water mains; looping of dead-ended mains; installing pressure reducing valves on the zone boundaries; and installing additional connections to the water supply mains.

3.0 Project Understanding

Based on a review of the Terms of Reference, knowledge of the Pelham system, communication with Town's staff, and a review of the Region's water Master Plan, we have a thorough understanding of the

specific needs of this project. The Town requires that the existing H_2O Net water distribution system model be reviewed for accuracy, be updated and be calibrated to current and future demand conditions. After conducting field testing, hydraulic and water quality model calibration will be performed so that the model could be used to predict deficiencies in the system based on future demands and development conditions. This tool will be used to facilitate operations, maintenance and long-term planning of the water distribution system.

This project is focused on the Town's distribution system that supplies water to the Villages of Fonthill and Fenwick. Our approach will involve the following:

- Collection and tabulation of background information regarding the physical characteristics of the water system, water demands and fire flow requirements;
- Obtain and analyse the water usage data from metering records, including consumption and Regional supply, and identify residential, commercial, institutional, recreational, and industrial components;
- Determination of the appropriate number and location for flow testing (fire flow and C factor tests); Undertake flow testing with the assistance of Town's staff to provide sufficient data for calibrating the model;
- Update of the existing H_2O Net model to reflect recently added urban areas;
- Calibration of the model using the relevant flow testing (fire flow and C factor tests) and flow monitoring results;
- Development and confirmation of fire flow requirements and future demand conditions and scenarios;
- Identification of system deficiencies using the calibrated model for both existing and future demand conditions;
- Development and assessment of rehabilitation and up-grade options for existing and future conditions considering costs, future development, capital work programs, breaks (if information available), etc.;
- Submission of Final Report including findings and recommendations for the Town water main upgrade program.

4.0 Project Approach and Methodology

4.1 Project Initiation Meeting

The assignment will commence with an initiation meeting with the Town staff at which point the logistical and administrative procedures and protocols will be confirmed. At this meeting, we will present our proposed detailed work plan and schedule. From this, the scope of the project will be confirmed and such items as milestone dates, schedule, number and location of test locations, availability of Town staff, meeting dates, reporting and invoicing procedures will be established. If necessary, our proposed plan and schedule will be modified and resubmitted to the Town. We will prepare minutes of this and all other meetings and distribute to the Town within two weeks.

4.2 Data Collection

We will collect and review all relevant data provided by the Town for the distribution system. An inventory of the water distribution system will be compiled including pipe length and diameter. This inventory will be compatible with the H20 Net model. The inventory will also include pipe material and year of construction assuming that this information is readily available.

We will compile the land use and population data in order to compare water demands amongst the nodes in the computer model. We will review consumption records in order to identify the largest water consumers and verify them in the model.

We will review the historical pumpage records in order to determine average day, maximum day and peak hour demands in the system. This will include, but not necessarily be limited to:

- Current H_2O Net model;
- Planning and flow data;
- Physical inventory of the system including records of recently rehabilitated and replaced (new) water mains not included in the current model, as well as plans for future water mains;
- Water main break records (with Link identifiers corresponding to the H_2O Net model) if available;
- Operational data (pressures, flows, etc);
- Previous field testing results; and
- Water main rehabilitation records.

4.3 Field Testing Program

The field testing program includes eight (8) C factor tests to determine the actual C factor values for the various sizes and ages of water mains; the field testing program also includes eight (8) fire flow tests primarily used to measure the fire flow capacity of the system. Flow and pressure monitoring data in water mains, pumping stations and reservoirs will also be used to calibrate the H_2O Net model to adequately represent the behaviour of the distribution system over time.

C Factor Tests

It is expected that eight Hazen Williams C factor tests will be conducted on a representative cross section of water main ages, materials and sizes. We will also review the results of any C factor tests that have previously been conducted in the distribution system.

We will utilize the Town's water main mapping in order to select possible C factor test locations based on water main diameter, material, age and topographic location. The test locations will be selected to maximize the length of main to be tested and thereby maximize the accuracy of the C factor estimates. The location of all valves and hydrants to be used in the tests will be identified on mapping and then confirmed through discussions with the Town and a field reconnaissance.

Fire Flow Test

We will conduct eight fire flow tests at the same locations as the C factor tests. In addition, we will review the results of the Fire Department's flow testing provided by the Town and recommend additional flow testing where deemed necessary.

Since fire flow tests do not involve isolating sections of the distribution system, these tests can be done much quicker, providing additional data at minimal cost. Therefore, additional tests may prove to be invaluable for the calibration process. Additional testing will ensure there is adequate coverage in the study area and that the 'worst cast' scenarios are addressed.

Following the completion of the flow tests, we will meet the Town and present the results. Upon acceptance of these results by the Town, the data will be used to calibrate the H_2O Net model.

Flow and Pressure Monitoring

Flow and pressure will be measured at key locations throughout the system for seven days to provide insight into flow patterns and determine flow rates for calibration of the H_2O Net model. Trunk mains to be monitored will be the main to Fenwick and the connection to the Fonthill elevated tank. An additional two locations will also be monitored utilizing a total of 4 pressure/flow recorders.

Concurrent SCADA data from the Region Niagara (pumping ratio, pressures, and water levels) during this field data collection period will be reviewed. Flows and pressures into and out of the Shoalts Drive Reservoir will be determined from this data

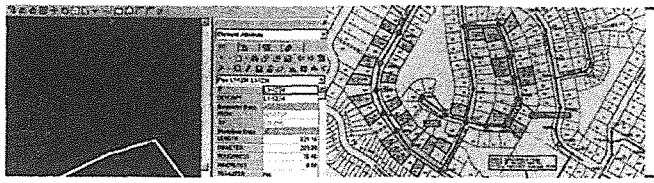
Water Quality Monitoring

Water quality calibration for water age, source tracing, disinfectants residuals (chlorine, chloramines) decay, etc., could be conducted utilizing the H_2O Net model. This task will be coordinated with the Town based on its needs. The Town is monitoring chlorine residual daily.

4.4 Update System Model and Model Calibration

Based on the data provided by the Town regarding recent water main revisions, we will update the computer model to reflect the existing current water system. Based on the C factor testing and evaluation results, we will review the C factors initially assumed and adjust the model accordingly. We will also review the flow demands assumed for the Town's model and adjust these to reflect the current flow demands based on current metering records.

We will check the calibration of the computer model using the flow tests and the flow/pressure monitoring results. It will be necessary for the Region to provide us with the SCADA data from the pumps and flow meters and reservoirs, etc., to quantify the boundary conditions at the time of each fire flow test. This SCADA data will include the following: the discharge pressure and flow at all pumping stations; the water level at the Shoalts Drive Reservoir; the Pelham Elevated Tank; the flows through the



master meters located at the boundaries of the zones; pressure at any PRV's; and other data as deemed necessary.

We will review the details of these facilities and incorporate them into the model.

4.5 Conduct Computer Simulations to Identify Needs

We will conduct computer simulations of several demand scenarios (e.g. average day, maximum day, peak hour, and fire flow) in order to identify hydraulic deficiencies in the system. We will determine the fire flow requirements for the various areas in Pelham based on guidelines published by the Fire Underwriters Survey.

Future needs based on 10 and 20 year system demands will be identified based on expected growth in Fonthill and Fenwick. A strategy will be developed to address the needs based on the future flows.

The hydraulic deficiencies will be identified on a map of the system. Contour plots will also be generated in order to illustrate the pressures and available fire flows. These contour plots provide a practical means to illustrate the extent of deficiencies.

4.6 Recommend System Upgrades

Based on the findings of Task 4.5, we will identify the upgrades that are required to improve pressures, fire flows and system reliability. These upgrades could be replacement, twinning and/or rehabilitation of existing mains. The upgrades will also account for any proposed development/redevelopment in Fonthill and Fenwick.

The computer model will be updated to include the proposed upgrades in order to demonstrate the improvement in pressures and fire flows.

Cost estimates (based on 2005 costs) will be prepared for each improvement that is recommended for current improvements as well as the 10 and 20 year growth needs. A multi-year implementation plan will be developed if required.

4.7 Prepare Summary Report

A report will be prepared to summarize the tasks described previously. A draft report will be submitted to the Town for review prior to finalization.

4.8 H_2O Net Model Demonstrations

There will be two demonstrations of the H_2O Net model to Town staff running various scenarios.

4.9 Meetings With Town

We have allowed for a project start-up meeting, three project progress meetings, two model demonstrations and a final meeting. We would also be available for additional meetings as required, as well as to present the results of the study to the Town Council if deemed necessary.

4.10 Develop External Resource to Assist Town

RVA will meet one of the main objectives of the project by developing a local resource capable of assisting the Town when the model needs to be updated to predict current or future demand needs.

Vincent Grande has been assigned as the key resource staff to assist the Town. Some of the advantages of assigning him as the external resource for the Town are:

- He has a familiarity with the use of water distribution modelling. This capability will be further developed, particularly with H2O Net during the study with support from the Toronto office.
- The convenient location of the RVA offices in Welland will allow him to assist the Town on a fast-response basis.
- He is familiar with the Town's water system and providers since he completed four work terms at the Town of Pelham as an engineering student.

5.0 Deliverables

The project deliverables include the following:

- Minutes of all meetings;
- The calibrated water distribution model in H_2O Net;
- Develop the external resource capable of maintaining the Town's water model on a demand basis;
- Draft report (two copies); and
- Final report (five copies).

6.0 Project Team

For this assignment, we propose a small but experienced team. The following paragraphs summarize the experience and expertise of the key members of our Project Team. Figure 1 shows the organization chart with the staff assigned to this project. A detailed resume for each of these individuals is provided in Appendix B.

Vaino Raun, B.A.Sc., P.Eng. - Project Director - Vaino Raun is a principal of RVA and is responsible for managing the company's regional office in Welland serving the Niagara Peninsula. He has over 34 years of broad experience in the provision of consulting services related to municipal infrastructure and environmental engineering, including international work. He has been involved in all aspects of professional engineering services to various levels of government, industry and private development.

His experience includes studies, master plans, preliminary and final design, construction administration and operations assistance for water, wastewater, transportation, urban development and municipal servicing projects for the Regional Municipality of Niagara and area municipalities, including Pelham, Welland, Niagara Falls, Fort Erie, Port Colborne, Niagara-on-the-Lake, Lincoln and the Niagara Parks Commission. His involvement and experience in the area since 1972 provides him with an extensive knowledge of the local infrastructure systems and a well-developed network of contacts at the various local agencies.

J.F. (Jim) Leppard, P. Eng. - Project Manager – Mr. Leppard is a Senior Engineer and Associate with R. V. Anderson Associates Limited and has over 26 years of experience in the field of Municipal Engineering and Public works across Canada and abroad. He has acted as project manager for the co-ordination and direction of multi-disciplinary project teams for the planning, design, approvals, tendering and construction of numerous capital works projects.

Mr. Leppard has extensive project management experience and has undertaken several hydraulic network analysis assignments. These include the development and calibration of hydraulic models in the Town of Pelham, the City of Swift Current, Saskatchewan, the City of Kelowna, B.C. and the Town of Watson Lake, Yukon, and subsequent analysis for system improvements. He has also been involved in the analysis of several other water systems including the City of Stratford, and several other communities. Mr. Leppard was also responsible for the development and analysis of computer models for the York Water System, an extension of the Metro Toronto System and a Water Distribution Study (Pressure Zone 3E) for the City of Toronto.

As a result of his extensive project management background, and technical experience in hydraulic modeling, Mr. Leppard is well suited to act as Project Manager for this project. He will manage the day-to-day activities for this project and will be the primary contact with the Town.

Andy Perreault, P.Eng. – Project Engineer – Mr. Perreault is a project engineer with 14 years of experience in the field of the consulting field, providing services related to municipal and land development projects. He has been involved in numerous projects related to water distribution systems. Responsibilities have included calibration of existing models and creation of new models, evaluation of existing distribution systems, simulation of various scenarios reflective of future growth and fire occurrence, recommendations for improvements and new construction. Mr. Perreault is proficient in using EPANET, KYPipe and H_2O Net software programs.

Mr. Perreault is designated as Project Engineer for this project and will assist Mr. Leppard in all aspects of the project. Specifically, he will be responsible for undertaking the C factor and flow testing, updating the Town's H_2O Net model and calibration of the computer model. He will also undertake the computer model analysis and will assist with the report preparation.

Vincent Grande, EIT – Project Coordinator – Mr. Grande is a junior member of the firm with over three years of experience in providing planning, management, design, and construction administration for projects related to wastewater systems, water supply, and municipal infrastructure. A candidate for licensure as a Registered Professional Engineer, his responsibilities typically include data collection, design calculations, preparation of specifications and tender documents, field inspections, and coordination with outside agencies, contractors, and clients. Mr. Grande is also experienced at conducting and leading Municipal Class EA studies and liaising with government and public agencies to acquire permitting for new infrastructure projects. He also completed four work terms at the Town of Pelham as an engineering student. He is thus familiar with the Town's water system and staff. Mr. Grande will actively participate in the development and calibration of the H_2O Net model.

Flowmetrix Technical Services Inc. – Pressure and Flow Monitoring

Flowmetrix staff has over 25 years combined experience related to flow measurement standards, flow metering technologies, calibration services, field service studies, project management and data reporting relating to the water and wastewater markets. Flowmetrix has participated in local, national and international projects of various sizes. Flowmetrix positions itself as a "flow service provider" supporting engineering firms delivering field related data to assist in engineering for design, modeling and studies.

Flowmetrix will install two sets of flow/pressure monitoring recorders in each pressure zone, four total, within the Town's distribution system for a period of one week. They will setup recorders for a specified recording interval and appropriate sampling rate. Then they will remove the equipment and supply all data at the end of the testing period.

7.0 Project Schedule

Figure 2 illustrates a proposed schedule for completion of the tasks. The final report can be completed within four (4) months of receiving your approval to proceed. We are prepared to start the project immediately.

We proposed to meet with Town staff at the start of the project and three times more thereafter.

8.0 Professional Fees

A time-task breakdown including fees and disbursements is included in a separate envelope in accordance with the RFP.

Our fee for this study will be based on time and expenses. Copies of our 2005 Billing Rate Schedule and Schedule of Charges for Reimbursable Expenses are included with the fee breakdown in the separate envelope. Invoices will be submitted monthly and payment would be due within 30 days.

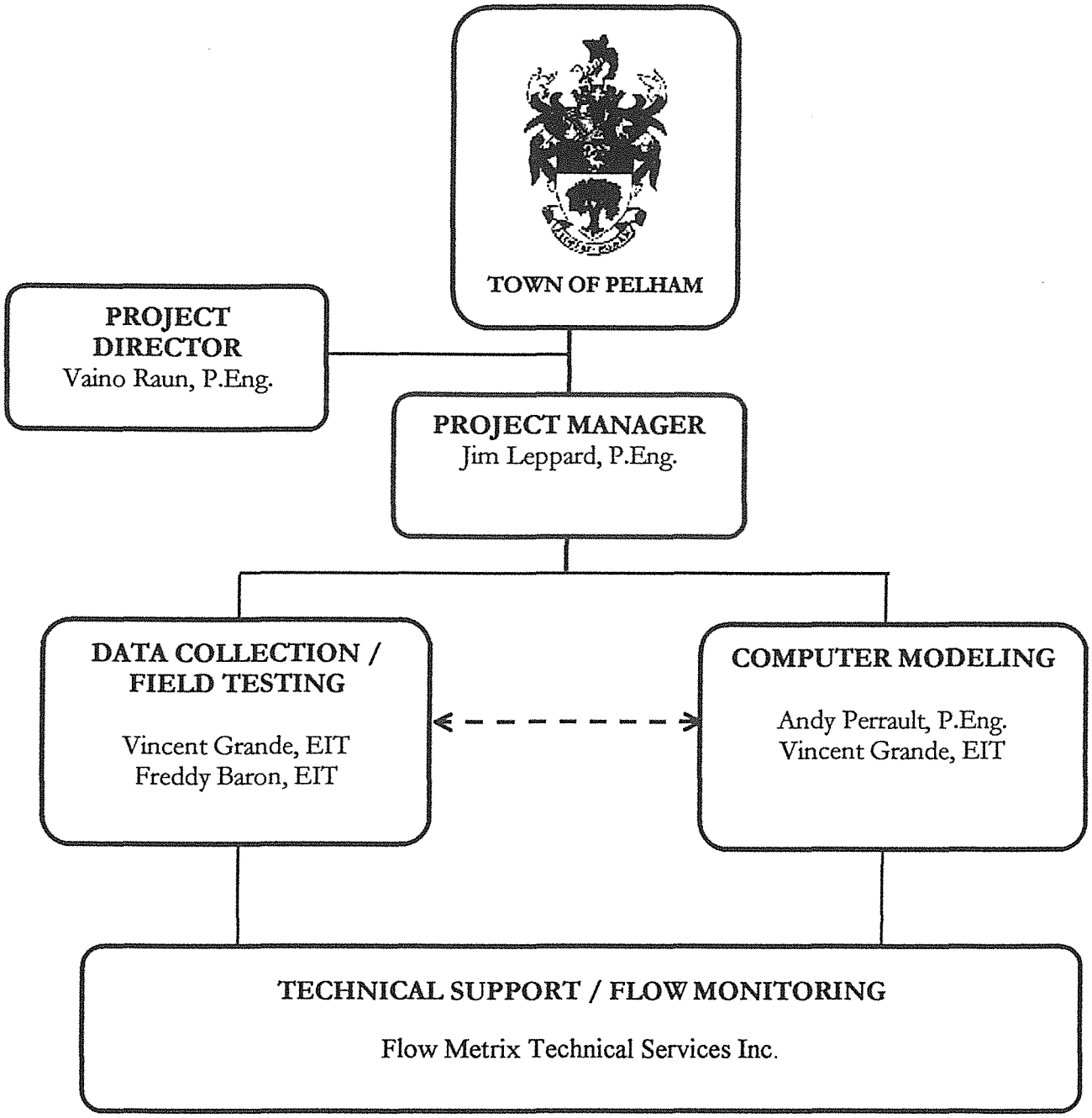
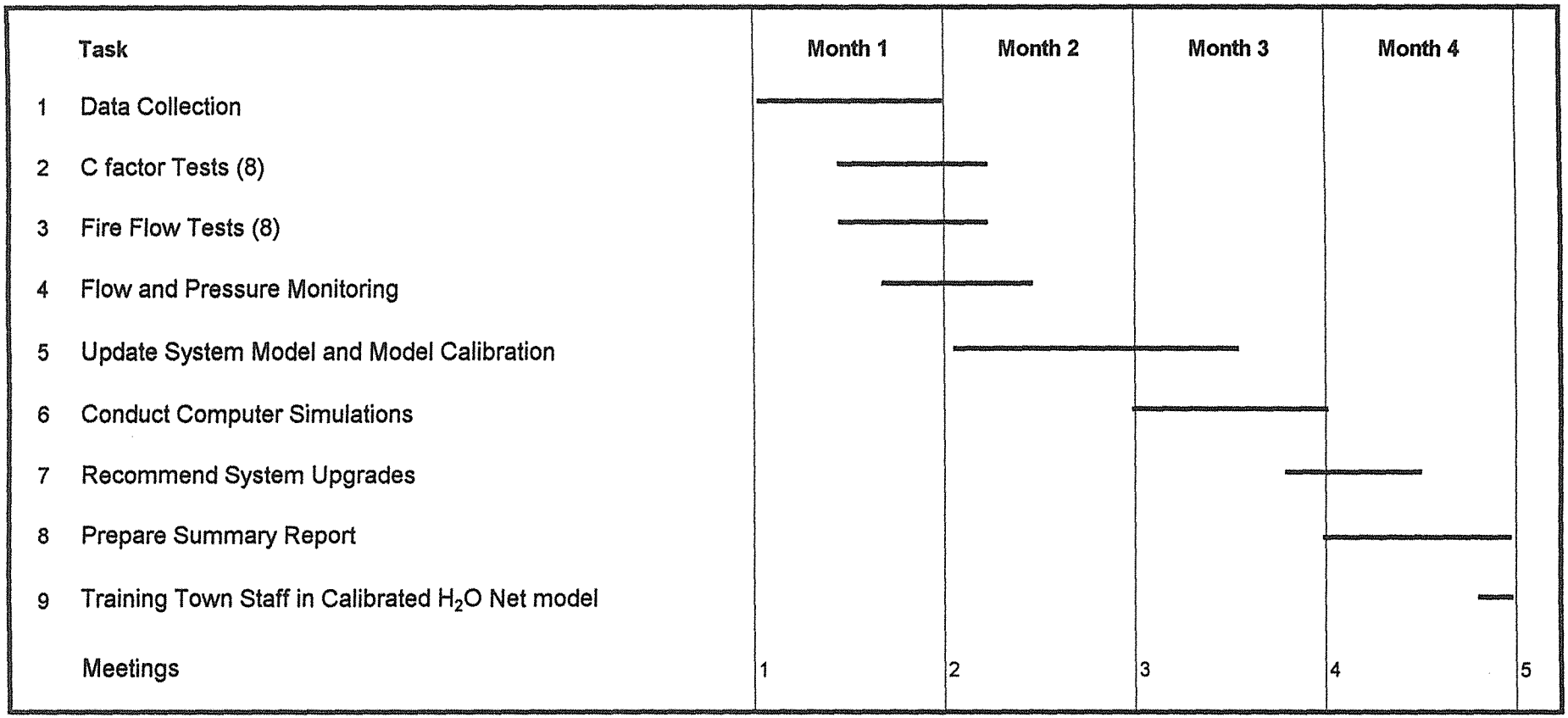


FIGURE 1
ORGANIZATION CHART

FIGURE 2 - PROPOSED SCHEDULE
PELHAM WATER DISTRIBUTION SYSTEM
UPDATE AND CALIBRATION OF H2O NET MODEL



R.V. Anderson Associates Limited
environment · infrastructure

Schedule 2

Date: April 7, 2005

Project Number: 2005-0

Project Title: Pelham Distribution System Water Model Update

Name on Corporate Seal: R.V. Anderson Associates Limited

Amount of Professional Liability Insurance: $1,000,000.00

Expiry Date: December 31, 2005

PEO License Number: 1102 3274

G.S.T. Registration Number: 10467 4858 RT001

Schedule 1

I. Charges for Disbursements

A. Long distance telephone	=	$ 40.00
B. Cellular telephone	=	$ 25.00
C. Telefax	=	$ 40.00
D. Mileage	=	$ 800.00
E. White prints		$ 50.00
F. Photocopies	=	$ 35.00
G. Photographs	=	$ 25.00
H. Survey Supplies	=	$ 30.00
I. Subconsultant	=	$ 6,878.00
J. Other (Courier)	=	$ 75.00
K. Total Disbursement Cost	=	$ 7,998.00

II. Engineering Fees

A. Meetings	=	$ 4,920.00
B. Field Work	=	$ 6,580.00
C. Modeling	=	$ 14,280.00
D. Total Fee Cost	=	$ 25,780.00

- Fees shall not include the Goods and Services Tax (G.S.T.)

III. Total Project Cost

I + II	=	**$ 33,778.00**

SCHEDULE C

R.V. ANDERSON ASSOCIATES LIMITED

SCHEDULE OF CHARGES FOR REIMBURSABLE EXPENSES

EFFECTIVE JANUARY 1, 2005

1.	COMMUNICATIONS	• Long distance telephone • Advertising • Special Delivery • Telefax	))))	cost + 5% $0.50/page
2.	TRAVEL	• Air line tickets • Automobile rental • Automobile travel	)) (currently	cost + 5% Prevailing Rate $0.38/km - office staff $0.42/km - field staff)
3.	LIVING EXPENSES	• Accommodation • Meals	))	cost + 5%
4.	REPRODUCTIONS	Engineering Copies (in house) • Plain Paper • Clear Vellum • Mylar Film	 $0.40/sq. ft. $1.50/sq. ft. $2.50/sq. ft.	
		Plotting (in house) • Bond paper • Vellum • Mylar Film	Black & White $2.00/sq. ft. $3.00/sq. ft. $4.00/sq. ft.	Colour $4.25/sq. ft. $4.75/sq. ft. $6.75/sq. ft.
		Photocopies 8-1/2 x 11 8-1/2 x 14 11 x 17	Black & White $0.15/copy $0.15/copy $0.15/copy	Colour $1.50/copy $2.00/copy $3.00/copy
		Other • Photographs (in house • Outside printing		 cost + 5% cost + 5%
5.	SURVEY SUPPLIES	• Expendable Items (stakes, paint, etc.)		cost + 5%
6.	SPECIAL SERVICES	• Special Consultations • Sub-surface investigations • Testing services • Legal surveys • Sub-consultants	)))))	cost + 5%
7.	ELECTRONIC EQUIPMENT	• CAD time • Computer time • Total Station including E.F.B. • Video editing • Computer scanning		$25.00/hour $10.00/hour $20.00/hour $ 5.00/hour $ 2.00/page + labour

(NOTE: G.S.T. NOT INCLUDED IN ABOVE RATES)

R.V. ANDERSON ASSOCIATES LIMITED
BILLING RATE SCHEDULE
EFFECTIVE JANUARY 1, 2005

CLASSIFICATION LEVEL			BILLING RATE
Principals			$155.00/hour
Senior Specialists			$140.00/hour
Specialists			$135.00/hour
Professionals			
	Level IX		$125.00/hour
	Level VIII		$115.00/hour
	Level VII		$110.00/hour
	Level VI		$100.00/hour
	Level V		$90.00/hour
	Level IV		$80.00/hour
	Level III		$75.00/hour
	Level II		$70.00/hour
	Level I		$60.00/hour
	Engineering Intern (Students) Level II		$30.00/hour
	Engineering Intern (Students) Level I		$20.00/hour
Technologists/Technicians			
	Level VII		$80.00/hour
	Level VI		$75.00/hour
	Level V		$70.00/hour
	Level IV		$65.00/hour
	Level III		$60.00/hour
	Level II		$55.00/hour
	Level I		$50.00/hour
Inspectors			
	Level VI	- Resident	$72.00/hour
		- Non-Resident	$80.00/hour
	Level V	- Resident	$68.00/hour
		- Non-Resident	$75.00/hour
	Level IV	- Resident	$63.00/hour
		- Non-Resident	$70.00/hour
	Level III	- Resident	$59.00/hour
		- Non-Resident	$65.00/hour
	Level II	- Resident	$54.00/hour
		- Non-Resident	$60.00/hour
	Level I	- Resident	$50.00/hour
		- Non-Resident	$56.00/hour
Survey			
	Level IV		$65.00/hour
	Level III		$60.00/hour
	Level II		$56.00/hour
	Level I		$45.00/hour
Word Processor			$55.00/hour
Librarian			$55.00/hour
Graphics Technician			$55.00/hour

January, 2005