

ITEM 16
 MANAGER'S REPORT NO. 86
 COUNCIL MEETING Dec. 30/74

Re: Engineering Services for 1977 Storm Drainage Programme

Following is the report of the Municipal Engineer regarding proposals for the retention of consulting services for the design of the 1977 Storm Drainage Programme.

RECOMMENDATION:

1. THAT Council approve of the recommendations as contained within the report of the Municipal Engineer.

TO: MUNICIPAL MANAGER

DECEMBER 20, 1974

FROM: MUNICIPAL ENGINEER

RE: ENGINEERING SERVICES FOR 1977 STORM DRAINAGE PROGRAMME

In keeping with Corporation policy to maintain some volume of design on the "shelf" this report deals with the retention of consulting services for the design of the 1977 Storm Drainage Programme.

By our letter of December 5, 1974 a copy of which is attached (Attachment "A"), proposals for engineering services as set out in that letter were invited and received from three consultants specializing in this type of work.

The proposals, copies of which are attached (Attachments "B", "C" and "D"), offer to undertake the work of upset limits to their fees, as calculated by the Scale of Minimum Fees recommended by the Association of Professional Engineers of British Columbia (excluding disbursements), as set out in the following tabulation:

Project	Web Engineering Ltd.	Vector Engineering Services Ltd.	D. J. Ashford & Associates Ltd.
A	\$9,490.00	<u>\$9,250.00</u>	\$21,000.00
B	<u>\$4,985.00</u>	\$5,475.00	\$ 9,450.00

Study of the above tabulation shows that the lowest aggregate cost for this work in accordance with the stipulated conditions is provided by the two figures underlined namely, the proposal by Vector Engineering Services Ltd., for Project A at \$9,250.00 and the proposal by Web Engineering Ltd., for Project B at \$4,985.00. This lowest total, being \$14,235.00 or approximately 1.3% of the estimated value of the construction, is a very reasonable amount.

ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

- 2 -

Some funds have been allocated in the current 1974 Budget (Engineering 22-01-18) for this type of work and further funds to finance the balance will be made available in the 1975 Budget.

RECOMMENDATION:

THAT the Purchasing Agent be authorized to issue a purchase order under the terms of an Engineering Agreement to Vector Engineering Services Ltd., for Project A of the works listed in the Engineer's letter dated December 5, 1974 and issue a similar purchase order to Web Engineering Ltd., for Project B of the works listed in the Engineer's letter dated December 5, 1974.

The fees for these services are to be in accordance with "Outline of Services and Scale of Minimum Fees" as published by the Association of Professional Engineers of British Columbia to a maximum of \$9,250.00 plus disbursements for Project A and to a maximum of \$4,985.00 plus disbursements for Project B. In both instances the fee would be based on Scale 1 - Payroll cost plus 125%.

VNN:rlh
cc: () Municipal Treasurer
Attachments

E. E. Chen
MUNICIPAL ENGINEER

ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

"A"



THE CORPORATION OF THE DISTRICT OF BURNABY

MUNICIPAL HALL
4949 CANADA WAY
BURNABY B.C. V5G 1M2
TELEPHONE 299-7211

5 December, 1974

The Office of the Engineer

Vector Engineering Services Ltd.
3375 Norland Avenue
Burnaby 2, B.C.

Dear Sirs:

Subject: Engineering Services for 1977 Storm Drainage Program

Our 1977 storm drainage program has been divided into two projects as per attached lists.

We invite you to submit proposals for your engineering services for field survey, drafting, design and quantity take-off for either or both of the projects listed. Your proposals should indicate an upset limit to your fee for each of the projects and if you so desire, a proposal for the total program in the event that the total program is placed with your firm.

The work shall be performed in accordance with our current standards and as detailed on the attached specification sheets.

The deadline for completion of these designs will be August 1, 1975. We anticipate that consultants for this work will be appointed by the end of December.

Please submit your proposal by not later than 18 December, 1974.

Yours truly,

E. E. Olson, P. Eng.
MUNICIPAL ENGINEER

By: V. N. Wiebe, P. Eng.
DESIGN ENGINEER

VNW:cmg

Atch.

cc: Design Engineer



ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

1977 STORM DRAINAGE PROGRAM

Part A - 740040

McKee - Edson Avenue to Grey	1,100 feet
Edson - McKee to Portland	300 feet
Grey - Portland to Carson	800 feet
Portland - Royal Oak to McGregor	400 feet
Ewart - Royal Oak to McGregor	400 feet
Carson - Royal Oak to McGregor	400 feet
Patrick - Royal Oak to Ravine West of McGregor	700 feet
Watling - Willingdon to McKay	400 feet
Watling - Dow to Jubilee	1,500 feet
Hurst - McKay to Sussex	800 feet
18th Avenue - Sylvan Drive to Mary	800 feet
17th Avenue - Sylvan to 500 Feet East of Mary	1,300 feet
Bond - Sussex to Forglan	1,000 feet
19th-20th Diversion - 10th to Edmonds	4,000 feet
Winnifred - Patterson to McKay	800 feet
17th Avenue - 1st to Newcombe	600 feet
16th Avenue - Wright to Cumberland	800 feet
15th Avenue - Wright to Cumberland	800 feet
TOTAL	16,900 feet

1977 STORM DRAINAGE PROGRAM

ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

Part B - 740041

Williams - Boundary Road to Carleton	2,600 feet
Gamma - Parker to Union	600 feet
Alpha - Parker to Union	600 feet
Brooklyn - Union to Dunnedin	600 feet
Grove - Union to Dunnedin	600 feet
Georgia - Grove to East Property Line Lot 50, P. 28755	800 feet
Cliff - Union to Curtis	800 feet
Cliff - Aubrey to Blaine Drive	2,000 feet
Sherlock - Curtis Street to Kitchener Street	1,400 feet
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TOTAL	10,000 feet
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ITEM	16
MANAGER'S REPORT NO.	86
COUNCIL MEETING	Dec. 30/74

4 November, 1974

The Corporation of the District of Burnaby shall provide horizontal and vertical controls which will include:

- (1) Establishing base line in the field.
- (2) Establishing benchmarks in form of bolts in poles, hydrants, etc.
- (3) Supplying survey control plans showing chainages and all control points.

The survey control plan is to be returned to the Corporation at the time of presentation of the completed design for approval.

The Corporation of the District of Burnaby shall also provide street width information, underground utilities data, strip maps and contour maps.

Upon completion of design, the Consultant shall present two prints of each design to the Design Engineer for checking. When design approved the Consultant shall deliver all original tracings to the same office.

No "as constructed" plans are required.

ITEM 16

MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT

DESIGN DIVISION

ENGINEERING REQUIREMENTS

FOR

STORM SEWER LAYOUT

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1. Prepare (in green pencil) a tentative layout of storm sewer for the project in question using Survey Control Plan (Design Copy). Consult Design Requisition, Road Layout sketch, Underground Utilities sketch, Strip Map and Contour Map.
 2. Check in the field the area in question. Note edges of existing pavement. Make sure that proposed sewer line in easements shall meet no obstacles, i.e. carports, swimming pools, etc.
 3. Correct your tentative layout of storm sewer taking into consideration the field observation.
 4. Indicate on layout desirable sewer offset from the base line.
 5. Mark on layout those lots for which ground and floor elevations shall be or shall not be taken during the survey.

THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT
DESIGN DIVISIONENGINEERING REQUIREMENTS
FOR
PRELIMINARY FIELD SURVEY
OF STORM SEWERS

ITEM	16
MANAGER'S REPORT NO.	86
COUNCIL MEETING	Dec. 30/74

1. Relate crossings of services to the base line chainage.
2. Locate and take invert elevations of all culverts which cross roads (not private driveways). State material and diameter (dimensions for box culverts).
3. Take Basement floor elevations on both sides of the base line (if below road level) and mark in field book as "BF".
4. If one side of the street is considered too low to be picked up, record a few of the deeper properties to prove this point. If one side is obviously away above road level, make this notation.
5. Record distances from the far side of the existing houses to the base line.
6. Take ground elevations (in case of vacant lots) on both sides of the base line (if below the road level) in line with far side of existing houses (or in line with far side of future houses if there are no houses in the block in question, state distance).
7. Establish location of proposed house connections to each lot in the block.
8. Relate house connection locations to the nearest property corner and main distance in feet on Design copy of Survey Control plan.
9. Make notation in case of vacant lot.
10. Information described in above paragraphs (from 3 to 9) should be recorded in the field book making one line.
11. Record along base line and proposed sewer line ground elevations every 50' unless ground conditions warrant otherwise.
12. Record and locate poles and other visible obstructions which might add to cost, or make construction more difficult.
13. Record stone walls and other obstructions on road allowance near proposed sewer line.
14. Indicate the material of surface of existing road (gravel, black-top). In case of black-topped roads, indicate edges of pavement.
15. All field notes should be prepared clearly and understandably to everyone at any time.
16. All pages in field book to be numbered, names of rodmen, instrumentmen and date entered. Record Design Requisition No. on first page.
17. Contact Design Department regarding exposure of underground services which cross proposed sewer line.
18. Make detailed sketch of easements, showing all obstacles (buildings, poles, trees, etc.) tying them to the base line.

THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT
DESIGN DIVISION

ENGINEERING REQUIREMENTS
FOR
DRAUGHTING OF STORM SEWERS
(Prior to Design)

I. Preparation of Tracing
(See typical Dwg. #500000-A)

1. Use tracing plan - profile paper (23" x 36").
2. Fill out the title block including name of project, surveyor's name, draughtsman's name, scales, field book number, date and sheet number (in ink).
3. Put a scale symbol to the left of title block (in ink).
4. Put above the title block a standard filing number which corresponds to design requisition number (in ink).
5. Outline spaces where "Reduction Index Number" block will be placed later on (in pencil).
6. Draw in the right upper corner of drawing a 200' - 1" key map for the entire area under consideration and which is tributary to the proposed storm sewer. Contours should be with 5' intervals but with 25' on steep slopes. All existing storm sewers, watercourses and flumes related to the area concerned must be shown on this key map. Orient key map always with the north up. Mark lot numbers along storm sewer (within drainage area only).
7. If the key map appears to be too great to be placed in the corner of the drawing, use a separate sheet (23" x 36").
8. Plot street plan to 50' - 1" scale. Orient north up or to the right. All permanent information: lot outlines and numbers, blocks and D.L. numbers, street names, numbers of existing houses, existing sidewalks and arrows indicating north should be plotted in ink. Take into consideration Paragraph 11 (below) before inking legal descriptions and house numbers.
9. Plot a base line (in pencil).
10. Plot existing storm sewers with their profile numbers over the line. Number existing manholes (in ink). If manhole number is not available, mark so.
11. Plot on plan (in ink) the point x. This point, representing elevation spot of basement floors, crawl spaces and lot grounds should always be in the line with proposed house connection. Its position will also be in the line with far side of existing houses.
12. If a proposed storm sewer will be connected to the existing storm sewer manhole, draw on the profile (in ink) the outgoing existing storm sewer line (one inch long) and mark diameter and grade.

ITEM 16 MANAGER'S REPORT NO. 86 COUNCIL MEETING Dec. 30/74
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13. Plot on profile centre line of proposed road. If there are no immediate plans concerning road reconstruction, plot the centre line profile of existing road. Mark "proposed" road or "existing road". Mark "existing ground" in easements.
14. Elevations of basement floors, crawl spaces and lots without houses should be plotted on profile in the line with proposed house connections and marked F, S and G accordingly. For example: $\frac{F}{I}$ for lower side of street on drawing and $\frac{I}{F}$ for upper side of $\frac{I}{F}$ street on drawing (in ink).

Preparation of Transparency (all in pencil)

(See Typical Drawing No. 500000-B)

1. Prepare transparency from the Drawing No. 500000-A and file original tracing in "Preliminary Storm Sewers" drawer (vault).
2. Plot on plan all existing and proposed (designed) underground utilities, poles, ditches, edges of blacktop, stone walls. Size and offset of underground services to be marked outside construction area.
3. Plot on plan and profile existing culverts (not the private driveways). State diameter and material (in pencil).
4. Indicate on plan the surface material of existing road.
5. If there is an existing sanitary sewer on street in question, plot it on profile in form of dashed line (in pencil). See legend.
6. Plot on profile all existing and proposed (designed) underground utilities which cross the storm sewer line under design (in pencil).
7. Plot on profile ground elevations above proposed sewer line (dashed line). Mark "Ground elevations above sewer".
8. Indicate on plan at the property line by "x" the proposed by surveyor house connections and mark its distance in feet from the nearest property corner. Consult "Dear Householder" letters signed by property owner. The owner's will is the "must" to follow.
9. Plot on plan proposed curbs, if street design is available.
10. List above the key map the B.M.'s used (in ink).
11. For Leroy size see Dwg. No. 500000-E.

THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT
DESIGN DIVISION

ENGINEERING REQUIREMENTS
FOR
DESIGN OF STORM SEWERS

I. Investigation

Investigate the area under consideration in the field before design commencement. Make necessary notes.

II. Design Factors

Times of concentration and local intensity factors based on ten year rainfall curves should be used. In certain cases, pipe sizes may already be decided as part of an overall drainage system. The rational method of storm sewer design shall be used (Q - AIC). The meaning of coefficient C may range from 0.4 to 1.0, depending on surface characteristics.

III. Design Requirements

1. A detailed construction drawing on transparency shall be prepared showing route of proposed storm sewer (on plan), manholes, catch basin leads (indicate diameter), house connections (indicate diameter), schematic position of wyes and other details as shown on typical drawing #500000-C. Storm sewer design sheets must be completed at this stage.
2. Catch basin's type shall be chosen according to standard drawings L-415, L-416, L-419, L-421, L-428A and L-428B (see construction specifications). Lead size shall not be less than 8" diameter for a ditch type CB's and 6" for a curb type CB's. Mark on construction drawing type of CB used and lead size.
3. For design purposes allow two feet under B.F.'s (basement floors) plus two percent grade from the rear of houses to the storm sewer. A computed elevation of the proposed house drain connection should be marked on profile as a dot in circle matching the point of elevation taken in the field. For vacant lots and crawl spaces allow four feet below ground at the rear of houses line and two percent grade to sewer.
4. When establishing invert in a manhole, the following relationship must be maintained:
 - (a) For junctions of two or more pipes, where the latest pipe involved is 12" diameter or less, the spring lines shall be coincident.
 - (b) For junctions of two or more pipes, where at least one of the pipes is 15" diameter or more, the crowns shall be coincident.
5. If the offset of proposed storm sewer departed considerably during design from the original anticipated offset, check the new locations of underground services which storm sewer will cross and order exposure in the field.
6. The size of pipe for storm sewer connections in single family area shall be 6" in diameter. Every lot capable of being served, whether it is vacant or not, has the connection made available.
7. Location of storm sewer in the street shall be in accord with the Corporation standard street cross-section where feasible and depends on type of street, as well as on location of existing underground services.

ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

- 2 -

8. Profile shall show finished grades of proposed streets.
9. Use Storm Sewer Design Legend.
10. Plot the proposed storm sewer on key map as a dashed line and make revisions (if any) in outline of drainage areas.
11. Mark on plan poles and hydrants to be relocated. State new locations, if possible.
12. Mark on profile underground services to be lowered or raised if they cannot be avoided.
13. Mark on profile extent of construction according to Design Requisition and Work Order.
14. The completed design shall show details in accordance with typical drawing #500000-C.
15. Houses or lots, which are not to be connected to the sewer should have notes in that effect.

ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

"B"

WEB Engineering Ltd.

101 - 1861 Welch Street
North Vancouver, B.C. V7P 1B7
Telephone 985-9556

December 16, 1974.

The Corporation of the District of Burnaby
4949 Canada Way
BURNABY, B.C.
Y5G 1M2

Attention: Mr. V.N. Wiebe, P. Eng.
Design Engineer

RECEIVED IN
ENGINEERING DEPT.

DEC 16 1974

REFER TO	PKT. NO.	DATE
VN	111	

ACT. DATE

Dear Sirs:

We are pleased to offer engineering services for storm sewer designs (1977 Storm Drainage Program) for the following projects.

Part A - 740040 Total length approximately 16,900 feet
Part B - 740041 Total length approximately 10,000 feet

Basis for payment would be the rates recommended by the Association of Professional Engineers of British Columbia in the latest "Outline of Services and Scale of Minimum Fees" with a maximum sum not to be exceeded. All designs will be completed by August 1, 1975. Designs will conform to the current District of Burnaby's standards and details.

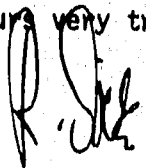
The maximum sums not to be exceeded will be as follows:

Part A - 740040	\$9,490.00
Part B - 740041	\$4,985.00

Travelling and out-of-pocket expenses will be charged separately.

We thank you for the opportunity to present this proposal, and remain,

Yours very truly,



R. Dick, P. Eng.

RD:wh
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ITEM 16
MANAGER'S REPORT NO. 86
COUNCIL MEETING Dec. 30/74

Vector engineering services ltd.

3375 NORLAND AVENUE - BURNABY, B.C. V5B 3A8

TELEPHONE 298-2333

RECEIVED IN
ENGINEERING
DEC 18 1974

REFER	DATE
VCA mm	

December 18, 1974

The Corporation of Burnaby
4949 Canada Way
Burnaby, B. C.

Attention: Mr. V. N. Wiebe

Dear Sir:

Re: Engineering Services for 1977 Storm Drainage Program
Our File No. 47-28

We are pleased to submit our proposal for engineering services for field survey, drafting, design and quantity take-off for each of the projects listed in you letter of Dec. 5, 1974.

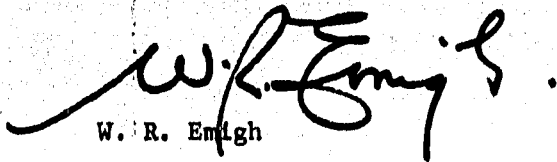
Our fee would be in accordance with Section III - Schedule of Fees as published by the Association of Professional Engineers of B. C., and using Scale I - Payroll Cost plus 125%. Our upset limit for each of the projects is as follows:

- Part A. 740040 (approx. 16,900') \$9,250.00
- Part B. 740041 (approx. 10,000') \$5,475.00

Our upset fee does not include any allowance for disbursements as covered by Section V of the Scale of Minimum Fees and these would be charged as an expense additional to the maximum fee. The use of survey vans would be considered a disbursement.

Yours very truly,

VECTOR ENGINEERING SERVICES LTD.



W. R. Emigh

WRE/nk

