

Re: Engineering Services for 1977 Street Local Improvement Program

Following is a report from the Municipal Engineer regarding engineering services for the 1977 Street Local Improvement Program.

RECOMMENDATION:

THAT an agreement for engineering services as stipulated in the Engineer's letter dated September 5, 1974 be entered into for Projects 1 and 2 with R.F. Binnie Limited, for the upset limits to their fees (excluding disbursements) as tabulated in the Engineer's report and contained in the letter of proposal from Mr. R.F. Binnie dated September 19, 1974, with fees to be based on the scale of minimum fees recommended by the Association of Professional Engineers of British Columbia.

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TO: MUNICIPAL MANAGER SEPTEMBER 23, 1974  
 FROM: MUNICIPAL ENGINEER  
 RE: ENGINEERING SERVICES FOR 1977 STREET LOCAL IMPROVEMENT PROGRAM

In keeping with Councils' philosophy to continue to develop a "shelf" of engineering design on street improvement projects, we have established a program for construction in 1977. This program is estimated to cost approximately \$5.2 million (1974 unit prices) and was originally planned for construction in 1975.

This program has been divided into four approximately equal projects. By our letter dated September 5, 1974, a copy of which is attached (Attachment "A"), proposals for engineering services for Projects 1 and 2 as set out in that letter were invited and have now been received from three consultants specializing in this type of work, namely, R. F. Binnie Ltd., Vector Engineering Services Ltd., and McElhanney Surveying and Engineering Ltd.

The proposals, copies of which are attached (Attachments "B", "C" and "D"), offer to undertake the work for 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	R. F. Binnie Ltd.	Vector Engineering Services Ltd.	McElhanney Surveying & Engineering Ltd.
1	<u>\$ 17,941.00</u>	\$ 30,750.00	\$ 19,430.00
2	<u>\$ 18,400.00</u>	\$ 36,200.00	\$ 20,600.00

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 proposals by R. F. Binnie for Project 1 at \$17,941. and Project 2 at \$18,400. This lowest total, being \$36,341., or approximately 1.4% of the estimated value of the construction, is a reasonable amount.

Some funds have been allocated in the current 1974 Budget (Eng. 22-01-19) for this type of work and further funds to finance the balance will be made available in the 1975 Budget.

RECOMMENDATION:

THAT agreement for engineering services as stipulated in our letter dated 5 September, 1974, be entered into for Projects 1 & 2 with R. F. Binnie Ltd., for the upset limits to their fees (excluding disbursements) as tabulated above and contained in his letter of proposal dated 19 September, 1974. Fees to be based on the scale of minimum fees recommended by the Association of Professional Engineers of British Columbia.

VNW:rl  
 Atts.  
 cc: ( ) Municipal Solicitor  
 ( ) Municipal Treasurer

*E.E. Jones*  
 MUNICIPAL ENGINEER

ITEM 8

MANAGER'S REPORT NO. 63

COUNCIL MEETING Sept. 30/74

"A"

September 5, 1974

Office of the Engineer

R. P. Binnie Ltd. - 630 Clyde Ave. - West Vancouver, B.C. V7T 1E2

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

McElhanney Surveying & Engineering Ltd. - 7832 120th St. - Surrey, B.C.

Dear Sirs:

Re: Engineering Services for 1977 Street  
Local Improvement Program.

Our 1977 Street Local Improvement Program has been divided into four approximately equal projects two of which are attached. The remaining two projects will be finalized within the next two weeks.

We invite you to submit proposals for your engineering services for field survey, drafting, design and quantity take-off for any or all 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. Please note that the "Improvements" are subject to confirmation prior to the successful consultant commencing design work.

The deadline for completion of these designs shall be February 28, 1975. We anticipate that consultants for this work will be appointed by the end of September.

Please submit your proposals by not later than September 19, 1974.

Yours truly,

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

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

VNW:pkm  
Attch.

cc: ( ) Design Engineer

## THE CORPORATION OF THE DISTRICT OF BURNABY

## ENGINEERING DEPARTMENT

## Design Division

## Engineering Requirements for Preliminary Field Survey of Streets

It is intended that all topographical details and variations in grades within the street allowance, together with details on abutting properties which may be affected by the proposed works shall be recorded for plotting on the design plans.

The following is intended to indicate general requirements for this work. It should be recognized that any block may have special features, other than those indicated below which must be included in the survey. It is the responsibility of the Engineer in charge of the design to ensure that all existing features on the street are recorded by the surveyor for design consideration and compilation of quantities for tendering.

1. Establish a base line along the centre of the street allowance, the base line shall be accurately tied in to legal property markers at each end of each block. The off-sets from the property markers shall be recorded together with a description of property markers used.
2. All elevations shall be related to the bench marks provided and each series of levels shall be started and closed to the bench marks provided without significant difference between the value provided and the value calculated by the survey readings. Location of intermediate temporary bench marks shall be recorded.
3. Chainages along the base lines shall commence at 0 approximately 150' south or west of the intersection from which the survey commences and shall extend approximately 150' north or east of the intersection at which it terminates.
4. Secondary base lines shall be established on all intersecting streets and lanes, related to legal property markers and shall be extended approximately 150' in each direction from the main base line for the work.
5. Locate and relate to the base line and datum elevation all topographical detail existing within the street allowance and as required for design consideration on adjoining private property, including the following:
  - (a) Cross sections at a maximum interval of 50' along the base line chainage (use shorter interval where non-uniform changes in conditions occur), recording all elevations to accurately plot the surface conditions within the street allowance and extending 15' beyond the street property lines on each side.
  - (b) Spot elevations in street or lane intersection areas in order to plot an accurate surface profile.
  - (c) Locate and record the size of all poles, trees, bushes, signs, hydrants, valve boxes, manholes, catch basins, etc.
  - (d) All sidewalks, private walkways extending to the street, driveways, curbs, stone entrances etc. shall be located and width and type of surface recorded together with sufficient detail of these facilities on private property to permit evaluation of modification required by design.

- (e) Location of all existing pavements of gravel, asphalt, or concrete shall be recorded.
  - (f) Location, height, and type of all retaining walls shall be recorded.
  - (g) Location, size and invert elevation of all culverts.
  - (h) Particular attention shall be given to record the location invert elevation and cross section of all street ditches.
6. Where the base line is curved, the curve characteristics shall be recorded and cross section lines extended radially.
  7. House numbers for existing houses shall be recorded.
  8. All survey notes shall be recorded in hard cover, bound field books. Pages shall be numbered and indexed. Title, descriptive notes, diagrams, etc. shall be provided to clearly describe all entries in a manner which will enable them to be clearly understood.
- ON COMPLETION OF THE DESIGN THE FIELD BOOKS SHALL BECOME THE PROPERTY OF THE CORPORATION AND SHALL BE DELIVERED WITH THE DESIGN PLANS.

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THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT

Design Division

Engineering Requirements for Drafting of Streets and Lanes

It is the intent of these requirements to prepare a drawing to show all details relating to streets and or lanes which have been recorded by the surveyor in his field book in order that a full assessment of the street conditions can be made by the designer. The designer shall in turn, indicate all relevant details of his design superimposed on the existing features.

Detailed requirements are as follows:

1. Use standard 10 by 10 cross section tracing paper 20 inches wide. No restrictions for the length of drawing, but not less than 36 inches.
2. Place standard title block (see attachment) at lower right hand corner. Complete in ink. Show surnames of persons involved in survey and drafting. Place standard end roll labels (see attachment) on outside of drawing at both ends.
3. All drafting symbols are to be in accordance with the attached legend for road design.
4. Draft the plan at a scale at 1 inch equals 20 feet with the base line 5 inches below the top of the grid. Orientate the plan as nearly as possible so that the north or west is at the top of the drawing, and indicate the orientation with north arrow.
5. The plans shall consist of property lines, lot lines, lot numbers, house numbers, and all other topographical surface features as recorded by the surveyor in the field book.
6. Show on plan, chainage of property line at each intersection, curve data and chainage stations, along the top and bottom of the drawing.
7. Place street names on plan at each intersection and place them outside the road allowance.
8. Record bench mark information in the top right hand corner of the drawing.
9. Show on the plan all ground elevations taken in and adjoining the street or lane including the cross section elevations at 50' intervals. These elevations are the actual ground elevations at their relative locations as recorded by the surveyor.
10. Draw profile of existing base line directly below the plan at a vertical scale 1 inch equals 2 feet and a horizontal scale 1 inch equals 20 feet in ink. A vertical scale ladder at convenient horizontal intervals should be shown to indicate the vertical scale of the profile.
11. Plot similar profiles on side streets for 150' in both directions from the base line.
12. Draw out cross sections of the full width of the right of way to the same scale as indicated above for the profile, at 50 foot intervals, as recorded by the surveyor. These cross sections shall be located on the drawing below the plan such that their centre line is on the same vertical chainage lines as its relevant location on the plan and profile.

NOTE: ALL THE ABOVE WORK SHALL BE PLOTTED IN THE AND SHALL SHOW FULLY ALL INFORMATION RECORDED BY THE SURVEYOR IN HIS FIELD BOOK

The intent of the design is to provide the stipulated improvements meeting the existing conditions on the street as closely as possible. The primary design consideration shall be the retention of the existing pavement and provision of an overlay thickness to provide adequate strength has determined by Benkleman Beam readings. Based on this concept, curbs and sidewalks shall be designed to meet established boulevard conditions with the least possible modification. This is a general concept of design which may require modification in some circumstances. It is therefore essential that the designer maintain close liaison with the Corporation design staff in order that special conditions prevailing on any section of any street or lane may be considered before establishing a final design analysis. Designs shall be based on accepted good practice for this class of work based on the understanding that the improvements are to be made to existing developed street where major grade change and reconstruction is seldom acceptable. The designer shall endeavor to meet the following limitations wherever possible:

- (a) Gutter grades shall be not less than 0.5%.
- (b) Pavement cross-fall shall be a minimum of 3% and a maximum of 6%.
- (c) Longitudinal grades shall be as required to conform to that existing on the unimproved street.
- (d) Sidewalk cross-falls shall be a minimum of  $\frac{1}{2}$ " and a maximum of  $\frac{1}{2}$ " per foot, normally to gutter but may be reversed in severe grade problems.
- (e) At entrance crossings, curbs shall be 1" high on high side and 2" high on low side of street or  $1\frac{1}{2}$ " on symmetrical cross-sections.
- (f) Vertical curves for driveways shall not produce more than 4" rise at the vertex of a 10 ft. base to prevent bottoming.

The design shall be superimposed in pencil upon the ink drawings showing existing conditions and shall indicate the following:

1. On the street plan, at not more than 50 foot intervals, the design elevations of the centre line, gutters on both sides, back of sidewalk elevations, at intersecting gutter lines and at quarter points of each 20 foot radius curb return. These elevations shall be circled to distinguish them from existing ground elevations.
2. The plan shall clearly indicate drainage requirements both those existing on the street as picked up by the surveyor and required in the design, and those not existing but nevertheless required by the design. Those catch basins existing not required by the design shall be so noted.
3. The plan shall indicate the curb lines and curb returns as required by the improvement and shall indicate where conflict occurs between the location of the proposed curbs and any existing features on the street. Where major conflicts of this type occur, the location of the curbs may be adjusted with the approval of the Design Engineer in order to minimize such conflict.
4. Indicate on the profile, the profile line of the centre line of the pavement and both gutter lines.
5. Indicate on each cross section the design location and grades of pavement curbs, sidewalks, and the restoration work required between the limits of the improvement and the property line. This section should indicate all modifications to driveways, proposed grading work, on boulevards, retaining walls, access steps etc.

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6. All crossings and modifications thereto at lanes or private property entrances shall be indicated on the plan.
7. Where the design encroaches on to the abutting private land beyond the limit of the right of way the private land required to implement improvement shall be lightly cross hatched and so noted.

THE STANDARD CONSTRUCTION SPECIFICATIONS INCLUDING THE DRAWINGS THEREIN SHALL BE THE BASIS OF THIS DESIGN WORK.

ORIGINAL DESIGN PLAN SHALL BE DELIVERED TO CORPORATION

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THE CORPORATION OF THE DISTRICT OF BURNABY

ENGINEERING DEPARTMENT

Design Division

Engineering Requirements for Quantity Take-off for Streets and Lanes

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In general it is required that quantities be taken off conforming to the Schedule of Quantities forming part of the tender documents currently in use by the Corporation. All quantities and work items must be compiled as accurately as is practically possible in order to achieve as close a relationship between the quantity take-off and the actual quantities used for the construction of the work as possible. The Engineer must use his judgement and experience of actual construction methods in order to achieve reasonable accuracy related to actual construction methods. Quantities shall be taken-off separately for each of the streets listed in the project and shall be summarized by indicating these quantities on the standard summary sheet used by the Municipality for each total project.

Both detailed quantity take-off for each sheet and completed summary sheet shall be provided to the Corporation.



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1977 STREET LOCAL IMPROVEMENT PROGRAM

PROJECT NO. 1 (730078)

<u>STREET</u>		<u>WIDTH</u>	<u>IMPROVEMENT</u>
1. Union St.	Willingdon to Delta	28'	curb & gutter N/S; curb and gutter with abutting walk on S/S
2. Union St.	Delta to Holdom	28'	same as 1 above
3. Georgia St.	Willingdon to Delta	28'	curbwalks B/S
4. Eton St.	Boundary to Madison	28'	curbwalks B/S Boundary to Esmond; curb & gutter B/S Esmond to Madison; 4' sep. walk N/S Esmond to Ingleton; 4' sep. walk S/S Gilmore to Carleton
5. Trinity St.	Boundary to Gilmore	28'	curbwalk B/S Boundary to Ingleton; curb & gutter on B/S Ingleton to Gilmore
6. Glynde Ave.	Empire to Cambridge	36'	curb & gutter B/S
7. Ellesmere	Hastings to Capitol	36'	curb & gutter B/S
8. Triumph St.	Boundary to Willingdon	28'	curb & gutter B/S Boundary to Gilmore and Carleton to Willingdon; curb & gutter S/S Gilmore to Carleton; 4' sep. walk N/S Madison to Willingdon; 4' sep. walk S/S Rosser to Willingdon
9. Pender St.	Willingdon to Delta	36'	curb & gutter B/S; abutting walk on N/S
10. Gamma Ave.	Hastings to Pandora	36'	curb & gutter B/S Hastings to Pandora; 4' separated walk E/S L/N Hastings to Pandora; abutting walk W/S Hastings to Pandora

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PROJECT NO. 2 (730079)

<u>STREET</u>		<u>WIDTH</u>	<u>IMPROVEMENT</u>
1. Gibson St.	Cliff to Duthie	28'	curbwalks B/S
2. Broadway	Holdom to Buchanan	46'	curb & gutter with abutting walks B/S
3. Buchanan St.	Cliff to Duthie	28'	curbwalks B/S
4. Aubrey St.	Sperling to Cliff	28'	curbwalks B/S
5. Union St.	Boundary to Carleton	28'	curb & gutter B/S; 4' sep. walk S/S Boundary to Esmond and McDonald to Gilmore
6. Second Ave.	Ingleton to Gilmore	46'	curb & gutter B/S
7. Grant St.	Fell to Kensington	28'	curbwalks B/S
8. Hardwick St.	Westminster to Douglas	28'	curbwalks B/S
** 9. Kincaid St.	Royal Oak to Canada Way	28'	curbwalks B/S
10. Napier St.	Sperling to Cliff	28'	curbwalks B/S
11. Dawson St.	Madison to Beta	46'	curb & gutter B/S
12. Kitchener St.	Boundary to Douglas	46'	curb & gutter B/S
* 13. Brentlawn	Willingdon to Delta	28'	curbwalks B/S

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\* Previously designed (#710047-1); update to current standard

\*\* Previously surveyed and plotted (#670107); update to current standard

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COUNCIL MEETING Sept. 30/74

"B"

**Robert F. Binnie Ltd.**

650 CLYDE AVENUE/WEST VANCOUVER/BRITISH COLUMBIA V7T 1E2  
TELEPHONE 926-7734

RFBinnie, P.Eng

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

Attention: Mr. E. E. Olson, P. Eng.,  
Municipal Engineer.

Dear Sirs:

Re: Engineering Services for  
1977 Street Local Improvement Program.

RECEIVED IN  
ENGINEERING DEPT.  
September 19, 1974

SEP 19 1974

REPORT TO NOTED

ACTION 1

Thank you for the opportunity of submitting a proposal  
for the above work - i.e., Projects 730078 and 730079.

We submit the following maximum limits to our fees for  
performing the work in accordance with your letter of  
September 5, 1974, and accompanying documents:

Project 1: 730048 - \$17,941.00

Project 2: 730049 - \$18,400.00

Our proposal is based on the following provisions:

1. The following would constitute grounds for an extension  
of time:
  - (a) Any delays in receipt of required information from  
the Corporation of the District of Burnaby.
  - (b) Any delay in the award of the contract and possible  
start of the field work beyond October 7, 1974.
  - (c) Delays occasioned by snow, force majeure, or other  
conditions beyond our control.
2. Fees to be based on "Outline of Services and Scale of  
Minimum Fees to be Charged for General Engineering  
Projects" published by the Consulting Engineers'  
Division of the Association of Professional Engineers  
of British Columbia, dated May, 1972.

Yours very truly,

ROBERT F. BINNIE LTD.



R. F. Binnie, P. Eng.

RFB:eb

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**McELHANNEY SURVEYING & ENGINEERING LTD.**

7832 - 120th STREET, SURREY, B.C., CANADA V3W 3N2 • 596-0391 • ZENITH 6201

17 September 1974

File: P-310

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

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

Gentlemen:

Engineering Services for 1977 Street  
 Local Improvement Program

RECEIVED IN  
 ENGINEERING DEPT.  
 SEP 19 1974

REFER TO	BY	DATE
VIC	MTC	20/12
ACTION BY	L.S. DATE	

Thank you for your letter of September 5th, 1974 inviting proposals on the above design work.

We would be pleased to provide the necessary field survey, drafting, design and quantity estimate for the projects. Work would be completed as per the specification sheets. We would propose to complete the work to the best possible standard as per this company's previous road designs, and this of course will be considerably higher than the average standard obtained in previous years by the various designers involved. We assume that the usual design package will be available on request.

We have reviewed the work input involved and have ample experienced staff available to complete the work. Our labour fee for the projects will be based on the scale of fees published by the B.C. Association of Professional Engineers which would not exceed the following upset limits:-

Project No. 1	730078	\$19,480.00
Project No. 2	730079	\$20,600.00

Disbursements for materials, vehicle mileage and other items listed under Section V of the B.C. Association of Professional Engineers will be additional to the above.

Should your corporation decide to place both project designs with our company then we would reduce the total fee limit to \$39,580.00 because of economies obtained in communication, design continuity etc. We assume that the time limit of February 28th, 1975 would not be critical if the total project is awarded to our firm.

We look forward to working with you on the project.

Yours very truly,

McELHANNEY SURVEYING & ENGINEERING LTD.

*F. T. Wilton*

F. T. Wilton, P.Eng., Manager  
 Lower Mainland Municipal Engineering Branch

FTW:ra

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"D"

# Vector engineering services ltd.

3375 NORLAND AVENUE - BURNABY 2, B.C.

RECEIVED IN  
ENGINEERING DEPT.  
SEP 19 1974

REPORT NO.	SIGNED	DATE
W.V.	W.V.	24/74

ACTION BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Sept. 19, 1974

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

Attention: Mr. V. N. Wiebe

Dear Sir:

Re: Engineering Services for 1977  
Street Local Improvement Program  
Our File No. 47- 19

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 your letter of Sept. 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:

- Project 1. (730078) ..... \$ 30,750.00
- Project 2. (730079) ..... \$ 36,200.00
- Project 1 & 2 ..... \$ 66,000.00

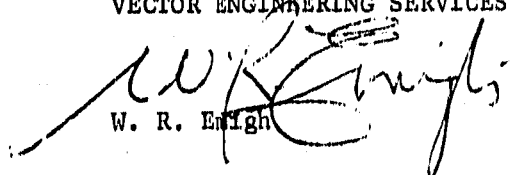
Our upset fee does not include any allowance for disbursements as covered by Section V of the Scale of Minimum Fees and these would be charged as an expense additional to the maximum fee. The use of survey vans would be considered a disbursement.

It is understood that Burnaby will supply survey control plans for these projects.

I trust that our proposal will meet with your approval.

Yours very truly,

VECTOR ENGINEERING SERVICES LTD.

  
W. R. Enigh