

RE: END OF PROJECT REPORT FOR:

- 1) OAKLAND STREET - ROYAL OAK AVENUE TO SPERLING AVENUE; 2) SPROTT STREET - DOUGLAS ROAD TO TRANS CANADA HIGHWAY NO. 1; 3) STILL CREEK STREET - DOUGLAS ROAD WEST TO DEAD END; 4) WILLINGDON AVENUE - KEMP STREET TO IMPERIAL

MUNICIPAL MANAGER'S RECOMMENDATION:

- 1. THAT the recommendation of the Director Engineering be adopted.

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TO: MUNICIPAL MANAGER 1985 12 11
FROM: DIRECTOR ENGINEERING

SUBJECT: END OF PROJECT REPORT FOR:

- (1) OAKLAND STREET - ROYAL OAK AVENUE TO SPERLING AVENUE; (2) SPROTT STREET - DOUGLAS ROAD TO TRANS CANADA HIGHWAY #1; (3) STILL CREEK STREET - DOUGLAS ROAD WEST TO DEAD END; (4) WILLINGDON AVENUE - KEMP STREET TO IMPERIAL.

REPORT:

All four streets listed above were constructed or reconstructed in 1984. Oakland, Sprott and Willingdon were approved projects under the Provincial Government Revenue Sharing Program; Still Creek Street did not qualify for Revenue Sharing because it does not serve an important enough component of overall road network but it was, nonetheless, necessary to reconstruct it.

Now that almost all costs are in and accounted for, the time is appropriate to report out on final costs of construction, cost of engineering services for design and construction supervision, and Revenue Sharing funds received.

The construction work on Oakland, Sprott and Still Creek was performed by Progressive Contracting (Langley) Ltd., with engineering design and construction supervision services provided by R.F. Binnie & Associates Ltd. Very significant construction cost economies were effected by using the same contractor and the same engineering firm for all three projects and thus being able to move surplus construction material from one project to another, particularly in the salvage of granular base materials which had been deposited on Still Creek Street over a period of many years.

The construction work on Willingdon Avenue was done by B.A. Blacktop Ltd. with engineering design and construction supervision services provided by McElhanney Surveying and Engineering Ltd.

CONSTRUCTION COSTS:

	<u>Original Estimate</u>	<u>Final Cost</u>	<u>Variance</u>	<u>Over</u>	<u>(Under)</u>	<u>\$</u>
Oakland	\$2,322,224	\$2,141,077	\$	(181,147)	(7.8)	
Sprott	416,000	419,176	3,176		0.8	
Still Creek	506,000	473,412	(32,588)		(6.4)	
Willingdon	1,737,000	1,246,941	(490,059)		(28.2)	
	<u>\$4,981,224</u>	<u>\$4,280,606</u>	<u>\$</u>	<u>(700,618)</u>	<u>(14.1%)</u>	

PROVINCIAL REVENUE SHARING:

	<u>Final Cost</u>	<u>Revenue Sharing</u>	<u>%</u>	<u>Net Cost to Burnaby</u>
Oakland	\$2,141,077	\$ 337,000	15.7	\$1,804,077
Sprott	419,176	195,792	46.7	223,384
Still Creek	473,412	NIL	0	473,412
Willingdon	1,246,941	509,563	40.9	737,378
	<u>\$4,280,606</u>	<u>\$1,042,355</u>	<u>24.4</u>	<u>\$3,238,251</u>

The total amount of Revenue Sharing funds of \$1,042,355 were transferred from the B.N.R. Kensington Grade Separation Project because they were surplus to requirements on that project. The Provincial Government (Ministry of Transportation and Highways) was persuaded to qualify these additional projects in order that none of the Revenue Sharing funds originally made available to Burnaby went unused or were transferred out of the municipality.

The Revenue Sharing contribution is nominally 50% but was much smaller on Oakland because it was decided to construct the road to a 36-foot curb-to-curb standard rather than the fully-shareable 46-foot width. The Revenue Sharing contributions on Sprott and on Willingdon were less than the theoretical 50% because some items of cost do not qualify for sharing.

ENGINEERING COSTS:

Both of the engineering assignments being discussed in this report are made up of two major categories of cost, i.e., a design assignment portion based on projected terms of reference as the project is initially envisioned and a portion for construction supervision services which principally calls for on-the-job inspection and measurement and certification of quantities of materials for purposes of paying the construction contractor. Consultants normally provide a maximum or upset value of services for the design segment based on the terms of reference supplied to them; however, any time that it becomes necessary to amend these terms of reference or to change the scope of the assignment gives rise, quite properly, to paying additional compensation for those changes. The extent of construction supervision actually required as compared to that initially estimated is affected by such things as weather, quality of the contractor, contractor's method of operation, and the particular hours of work chosen by the contractor. The fact that it is common experience (and quite properly so) to find variances from the initial estimated cost of engineering services gives rise to using the term "Indicated Value" in the two following tables to show that, invariably, changes in the terms of reference and in actual field conditions do occur in the real world and must be recognized for compensation.

<u>R.F. Binnie & Associates Ltd.</u>	<u>Original Estimate (Indicated Value)</u>	<u>Final Cost</u>
Oakland Spratt	\$105,202	\$173,245
	*Extension of Oakland Assignment	92,123
Still Creek	1976 Agreement	92,822

*Approved by Council 1984 07 09.

On this assignment, some significant changes took place in the design terms of reference and in the extent of construction supervision actually required to construct the project, as follows:

- (1) A bridge was added to replace culverts in order that a more suitable continuity of park trails and park access could be acheived. This required a sub-consultant to be engaged.
- (2) The road width was changed from 46 feet to 36 feet, necessitating the redrawing of 53 individual design drawings.
- (3) The alignment was changed at the last minute in the area of Oakland and Gilley, bringing on further changes.
- (4) Overtime and Saturday hours were worked by the contractor in order to meet stiff deadlines imposed by Revenue Sharing eligibility; the consultant had to follow suit, of course.
- (5) It was necessary to extend the term of the contract through no fault (property acquisition difficulties) of either the contractor or the Engineer.
- (6) A consultant with bridge construction expertise had to be employed for the inspection and certification of the bridge construction.

<u>McElhanney Surveying & Engineering Ltd.</u>	<u>Original Estimate (Indicated Value)</u>	<u>Final Cost</u>
Willington	\$79,491	\$104,163

Subsequent to the award of the construction contract a number of delays were encountered. As the construction contract included the lowering of the B.C. Hydro Rail, the Corporation had to receive the railway company's approval. The original design for lowering the railway was not accepted by B.C. Hydro Rail as they insisted on a number of fairly significant changes. These design changes were recognized as an extra cost to the project. A second delay factor was the fact that B.C. Hydro Electric could not relocate parts of their plant in time to allow our contractor to proceed on the original schedule. The third form of delay came about by way of inclement weather which again did not allow the contractor to maintain the construction schedule he had originally proposed. Also, premium time hours were worked in order to make up time and meet the crucial revenue sharing deadlines.

In addition to delays which basically extended the length of the contract and thereby extended the length of contract supervision and inspection which was required, McElhanney also performed a couple of other functions which were not originally in their Terms of Reference.

1) The B.C. Hydro Rail was to be relocated by the railway company at Burnaby's expense. However, at the railway company's suggestion, the Corporation was able to go out to a rail contractor and save considerable money. In order to do this we requested that McElhanney prepare the contract documents for this contract.

2) At project completion there were some contractor claims relating to delays caused by the railway company and again McElhanney was asked to review these claims and make recommendations to the municipality.

3) As part of eliminating a rail crossing on Kathleen the corporation decided to avoid the creation of a long deadend street by opening a short lane. This was a requested extra to McElhanney as well as to the contract.

As Professional Engineers, we have a serious duty to perform not only to the corporation but to the general public as well in assuring that there is a fully adequate level of professional services provided to projects such as these, both in design and in construction supervision. There is no room for skimping because we need to be satisfied that the payments to the contractor are accurate and that all facets of the projects are able to satisfy review procedures, not only those of the corporation but also those of the Provincial Government on Revenue Sharing projects.

Your Director Engineering is satisfied beyond any doubt that good value was obtained for the money expended, not only for engineering services but also for actual construction. In order to have been able to salvage the \$1,042,355 in available Revenue Sharing grants, it was necessary to meet very tough time constraints and overcome some difficult ground and weather conditions. It is to the credit of both contractors and both engineering firms that the challenge was fully met in a very efficient manner.

EEO:cf
cc: () Director Finance

E.E. Olson
DIRECTOR ENGINEERING