

ITEM "SUPPL." 17
MANAGER'S REPORT NO. 31
COUNCIL MEETING 85/04/29

RE: B.N.R. GRADE SEPARATION - PROGRESS REPORT
TO END OF PROJECT

MUNICIPAL MANAGER'S RECOMMENDATION:

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

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TO: MUNICIPAL MANAGER 1985 04 24

FROM: DIRECTOR ENGINEERING

SUBJECT B.N.R. GRADE SEPARATION - PROGRESS REPORT
TO END OF PROJECT

RECOMMENDATION:

THAT this report be received by Council for information purposes.

REPORT:

During the peak periods of construction of the Overpass, progress reports were submitted on a regular basis. Council is well aware of the labour problems encountered in 1984 and because of the special reports made at that time, we felt a further progress report should be held in abeyance until we were close enough to completion to be able to forecast final cost outcome.

S.G.M. Construction Ltd., the non-union contractor on Concrete Deck II, was given a completion certification on 1984 December 14, and has been paid in full for work completed up to that date. Any remedial work and final concrete treatment is being done by others and this work was deleted from S.G.M.'s final payment.

Scandia Blacktop Ltd. has been working normal full-time hours and additional hours as well to complete the last contract in order to maximize the return from Approved Revenue Sharing funds. The latest information from the site indicates that the work will be effectively completed before 1985 April 30 and we have now set the official opening date as 14:00 h on 1985 May 06.

In previous reports we showed, for Council's information, the original estimates for all ten contracts and, for comparison purposes, the indicated contract value (tender) and the final contract cost. In Appendix I, we have shown all of these figures projected fo final project completion; in order to arrive at a final figure to compare with the original estimate, we had to forecast the final costs for contract #8401 and also for engineering, testing, utility relocation, insurance and miscellaneous items. We expect that these forecast figures will be very close to the final figures because all work is very close to completion.

(Cont'd.)

ITEM "SUPPL."	17
MANAGER'S REPORT NO.	31
COUNCIL MEETING	85/04/29

Contract #8401 (Scandia Blacktop)

Council policy stipulates that when a contract exceeds \$100,000 in value and is overspent by 10% or more, an explanation for the over-expenditure must be submitted to Council.

The over-expenditure on Contract #8401 was caused by a number of factors which were completely unforeseeable at the time of calling for tenders. Accordingly, change orders totalling approximately \$638,000 were issued to authorize compensation for the following categories of changed conditions:

<u>Condition</u>	<u>Approximate Cost</u>
1. Unforeseen underground soil and ground water conditions causing running "liquid silt," poor footing conditions and earth slippage problems at west end of major retaining wall. (Sta. 1 + 160 to Sta. 1 + 210)	136,000
2. Native soils at the east end of the major retaining wall having a natural slip plane which required the use of full temporary retaining works and other special stabilization measures which were essential in order to ensure the stability of private properties lying above and immediately adjacent to the excavation area. (Sta. 1 + 220 to Sta. 1 + 260)	129,000
3. Special requirements for working around B.C. Hydro duct passing under major retaining wall in the form of drainage works, soil stabilization, and temporary retaining works. (Sta. 1 + 210 to Sta. 1 + 220)	86,000
4. Premium time (overtime) required to:	
a) accommodate tenuous arrangements made with the Carpenter's Union permitting departure from what would have been the "normal" requirement to completely "layer" the site between Union and non-Union contractors.	
b) maximize the return of approved Revenue Sharing funds from the Province prior to 1985 March 31 deadline.	
Total for both (a) and (b)	90,000
5. A review of on-site physical conditions indicated that additional street lighting along Winston "slip-road" and its intersection with the Loughheed Highway were warranted in order to enhance traffic safety conditions.	68,000

ITEM	"SUPPL."	17
MANAGER'S REPORT NO.		31
COUNCIL MEETING	85/04/29	

- 6. Restoration and drainage works required in conjunction with the acquisition of additional property from Chevron at northeast corner of Sperling and Loughheed (arising from requirement of Ministry of Transport and Highways). 52,000
- 7. Remedial works to correct deficiencies from Contract #8305 - deducted from S.G.M. Contract. 32,000
- 8. Earthworks and additional excavation on Kensington Avenue south of the structure, snow removal, and work on Loughheed Highway. 28,000
- 9. Approach slabs at south abutment of structure (originally in S.G.M. Contract #8305 but not paid in that Contract). 17,000

TOTAL \$638,000

The amount of the over-expenditure above the amount shown as changed conditions is accounted for in individual variances in actual final quantities used in relation to original estimated quantities provided in the tender call.

Regarding Changed Conditions #1, #2, and #3, there was agreement between the Consulting Engineers and the Contractor as to the total cost of the additional work resulting from these changed conditions. Further, there was substantial agreement between the two parties as to the validity of Conditions #1 and #3 as claims for extra compensation. The two parties did not, however, agree on the extent to which Condition #2 was a valid claim and, accordingly, the difference of opinion was referred to the Director Engineering for resolution. The Director Engineering heard a great deal of argument from both parties and their respective soils engineers and subsequently reached a decision which resolved the disagreement.

The basis of recognition of Changed Conditions #1, #2, and #3 as being valid claims is to be found in the test of reasonableness. In spite of soils information being made available to the contractors, there is no way that a reasonable person would have been able to predict the precise nature of the unfavorable behavior of the particular soils in that particular location under conditions of excavation and forming which exposed and freed natural springs and seepage to mingle and flow with the native silts and clays rendering them completely unstable. It is our opinion that no reasonable amount of additional soils information would have assisted in predicting the soils behavior. It is our further opinion that neither the techniques nor lack of techniques of this particular contractor contributed substantially to either worsening or preventing a solution to the problem; in other words, it is felt that any contractor would have faced the same problems in that location.

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It is normal practice to report to Council on over-expenditures (by re-issuing the Work Order) as soon as they happen or are known as likely to happen, but in this case we were anxious to report on the reasons all at one time in order to present the over-all picture. A preferable approach would probably have been to present Council with a progress report with partial information as time progressed and as the individual over-expenditures became known to us.

Engineering Fees

Early discussions concerning the provision of engineering services for the project resulted in the Corporation and Associated Engineering (B.C.) Ltd. agreeing on an upset price of \$1,200,000 for design and contract supervision from the start of the project until 1984 September 30. As is normal in such situations, the cost of subconsultants and disbursements was not an integral part of this agreement. The following Table recognizes that the agreement reached between the two parties created two distinct reporting periods, i.e. before and after 1984 September 30. The actual date used is 1984 October 31 for reporting period reasons.

	Up To <u>1984 October 31</u>	Following <u>1984 October 31</u>	<u>Total</u>
Engineering and Supervision	1,180,900	120,400	1,301,300
Subconsultants	133,600	10,800	144,400
Disbursements	57,100	16,600	73,700
Engineering Extras	<u>67,300</u>	<u>73,800</u>	<u>141,100</u>
	<u>1,438,900</u>	<u>221,600</u>	<u>1,660,500</u>

The payment of engineering extras was necessitated by the following factors:

- (1) Many changes in design which were completely beyond the consultant's control. A good example was the Ministry of Highways' direction to carry out a complete geometric design change for the Sperling-Lougheed intersection.
- (2) Disruptions caused by the Union/non-Union aspects of the project during the past year increased construction supervision costs.
- (3) Costs were increased considerably when the contractor worked overtime to maximize the return on Revenue Sharing funds.
- (4) The unforeseen soil conditions at the retaining wall required the construction of many temporary works which in turn entailed extra costs in checking design of the temporary works and in construction supervision.

It should be noted that the range of engineering costs in relation to total project costs for past Burnaby public works construction contracts is from 8-12%. The figure for the B.N.R. project based on grand total of all engineering costs is 8.9% which is considered to be very favorable because work involving structures and difficult ground conditions generally runs higher in cost than the more "normal" municipal public works projects.

Source of Funds

Appendix II shows the Source of Funds forecast through to the end of the Project. It will be noted that we were able to "salvage" \$250,085 of surplus U.T.A.P. funds from the North Road Overhead Project which were surplus to requirements on that job but were able to be used at B.N.R.

Burnaby's share of total cost is slightly higher than the Province of B.C.'s share. This comes about because some elements such as lighting between intersections and landscaping are not eligible for Revenue Sharing funds.

Revenue Sharing

It should be noted from Appendix I that the final estimated total cost is approximately \$2,087,000 less than the originally estimated total cost of \$20,700,000.

Appendix III shows a complete tabulation of all costs eligible for claims on Provincial Revenue Sharing funds to 1985 March 31. It should be noted that, after making allowances for Federal U.T.A.P. funds and the B.N.R. contribution, the eligible 50% Provincial share comes to within approximately \$65,000 of the total amount available up to 1985 March 31.

We expect to receive approval of a new application for \$90,000 in Sharing Funds for the Provincial 1985/1987 fiscal years to cover the balance of the work being carried out this month (1985 April) required to complete the project. Your Director Engineering has been advised that approval of these funds is not expected to have negative impact on our other "normal" Revenue Sharing applications for the same fiscal period which are currently being considered by the Ministries of Transportation and Highways and Municipal Affairs. It appears that the \$90,000, which covers \$180,000 in project costs, will be very close to the amount required to complete the project.

The following Table shows the final allocation of total Provincial Revenue Sharing funds which were approved by the British Columbia Government for the B.N.R. Project:

<u>Approvals Received:</u>	
Project 46-1981	\$ 750,000
Project 2-1982	3,200,000
Project 4-1983	<u>3,767,221</u>
	\$7,717,221
<u>Allocation:</u>	
B.N.R. Project	\$6,610,221
Oakland	337,000
Willingdon	562,000
Sprott	<u>208,000</u>
	\$7,717,221

The final Provincial contribution to the B.N.R. Project will increase to \$6,700,221 after receiving the anticipated approval of the new application for \$90,000 for work done beyond 1985 March 31.

We had originally allocated \$812,000 to the Willingdon job but we received approval to transfer \$250,000 back to the B.N.R. project as soon as it became obvious that this amount was not required for Willingdon but could be used to full advantage on the B.N.R. project.

Landscaping

There is a need to provide an aesthetically-pleasing but low-maintenance level of landscaping on the B.N.R. Project in several locations. It will not only be pleasing to the eye but will also assist in providing erosion and weed control.

(Cont'd.)

ITEM	"SUPPL."	17
MANAGER'S REPORT NO.		31
COUNCIL MEETING	85/04/29	

153

It is intended that the Parks Department will do the work required, which is expected to cost very roughly about \$100,000. When we have had a chance to refine this figure through design considerations, we will issue a Work Order requesting Council approval; it is intended to charge the cost to the existing C.A.W.F.F. Bylaw for the total project.



DIRECTOR ENGINEERING

cc: () Director Finance
Attach. (3)

EEO:cf

B.N.R. GRADE SEPARATION

PROJECT COSTS TO DATE SHOWING ORIGINAL ESTIMATES,

INDICATED CONTRACT VALUE, COMPLETED CONTRACT COSTS AND ATTENDANT VARIANCES

CONTRACT/ITEM	ORIGINAL ESTIMATE	INDICATED CONTRACT VALUE (TENDER)	ACTUAL COMPLETED CONTRACT VALUE	OVER(+) UNDER(-) EXPENDITURE
1. PROPERTY ACQUISITION	\$ 500,000	-	\$ 622,574	+\$ 122,574
2. EARTHWORKS - CONTRACT #8109	1,200,000	\$1,119,725	1,257,192	+ 57,192
3. FOUNDATIONS I - CONTRACT #8211	1,718,000	1,483,590	1,439,131	- 278,869
4. FOUNDATIONS II - CONTRACT #8212A	1,863,000	1,622,155	1,554,787	- 308,213
5. STEELWORK I - CONTRACT #8213	2,772,000	3,082,780	3,051,867	+ 279,867
6. CONCRETE DECK I - CONTRACT #8301	1,167,000	1,087,489	1,015,474	- 151,526
7. ROADWORKS I - CONTRACT #8309	466,000	380,132	431,650	- 34,350
8. STEELWORKS II - CONTRACT #8303	2,850,000	2,392,000	2,356,622	- 493,378
9. FOUNDATIONS III - CONTRACT #8302	1,054,000	860,400	896,688	- 157,312
10. CONCRETE DECK II - CONTRACT #8305	1,588,000	1,133,038	1,199,850	- 388,150
11. ROADWORKS II - CONTRACT #8401 (See Footnote*)	3,009,000	1,697,200	2,147,000 (Estimate) - (2,408,000; See Footnote*)	- 862,000
12. ENGINEERING, TESTING, UTILITY RELOCATION, INSURANCE AND MISCELLANEOUS	2,513,000	-	2,640,000 (Estimate) +	127,000
TOTALS	\$20,700,000	\$18,612,835	-\$2,087,165	

*Since the original estimate for works in Contract #8401 did not make provision for construction of Kensington Avenue from Sprout Street to Laurel Street and to keep comparisons meaningful, the cost of this work in the amount of approximately \$260,000 has been deducted from the actual completed contract value. The total final cost of Contract #8401 including the above portion of Kensington Avenue is expected to be approximately \$2,408,000.

ITEM "SUPPL." 17
MANAGER'S REPORT NO. 31
COUNCIL MEETING 85/04/29

Appendix II

ITEM	"SUPPL."	17
MANAGER'S REPORT NO.		31
COUNCIL MEETING	85/04/29	

SOURCE OF FUNDS Revised **155**

Urban Transportation Assistance Program (U.T.A.P.)	<u>\$4,892,720</u>	
U.T.A.P. Funds transferred from North Road	<u>170,085</u> <u>80,000</u>	<u>\$5,142,805</u>
Burlington Northern Railway	<u>62,500</u>	<u>62,500</u>
Province of B.C. Revenue Sharing	#46-1981 750,000 # 2-1982 3,200,000 # 4-1983 3,767,221 <u>7,717,221</u>	
Less Transfers (Oakland, Willingdon, Sprott)	# 4-1983 1,107,000 <u>6,610,221</u>	
Plus anticipated grant to complete project (Provincial Fiscal Years 1985 to 1987)	<u>90,000</u>	<u>6,700,221</u>
The Corporation of the District of Burnaby	<u>8,027,559</u>	<u>6,707,309</u>
Estimated Cost of Completed Project		<u>\$18,612,835</u>

SUMMARY:

	<u>Original</u>	<u>Final</u>
U.T.A.P.	\$ 4,892,720	\$ 5,142,805
B.N.R.	62,500	62,500
Province of B.C.	7,717,221	6,700,221
Burnaby	<u>8,027,559</u>	<u>6,707,309</u>
	<u>\$20,700,000</u>	<u>\$18,612,835</u>

BNR GRADE SEPARATIONTABULATION OF COSTSELIGIBLE FOR PROVINCIAL REVENUE SHARINGUP TO 1985 MARCH 31

60-16040	Engineering Fees	\$	19,253.45
60-16045	Property Acquisition		622,573.96
60-16047	Design Consultant		1,660,474.04
60-16048	Relocate Utilities		729,119.69
60-16049	Relocate Watermains		1,208.52
60-16050	Earthworks - Contract 8109		1,257,192.26
60-16056	Insurance		167,090.17
60-16057	Foundations 1 - Contract 8211		1,439,130.88
60-16058	Foundations 2 - Contract 8212A		1,554,786.81
60-16059	Steelwork 1 - Contract 8213		3,051,867.15
60-16060	Deck 1 - Contract 8301		1,015,474.17
60-16061	Roadwork 1 - Contract 8309		431,649.59
60-16063	Foundations 3 - Contract 8302		896,688.23
60-16064	Steelwork 2		2,356,622.18
60-16065	Deck 2 - Contract 8305		1,154,487.86
60-16066	Roadwork 2 - Contract 8401		1,879,637.80
60-16076	Contracts Admin.		<u>31,418.11</u>
	TOTAL OVERPASS PROJECT COSTS TO DATE	\$	<u>18,268,674.87</u>
60-16082	Kensington Construction -Spratt to		260,096.61
60-16086	Laurel Supervision/Engineering		<u>26,458.66</u>
	TOTAL KENSINGTON AVENUE - LAUREL TO SPOTT COSTS TO DATE		<u>286,555.27</u>
	TOTAL PROJECT COSTS TO DATE		<u>18,555,230.14</u>
	Less: Urban Transport Assistance Grant Cash received and receivable B.N. Railway contribution		<u>5,142,805.00</u> <u>62,500.00</u>
			<u>5,205,305.00</u>
	TOTAL APPROVED COSTS INCURRED TO DATE		<u>13,349,925.14</u>
	COST APPLICABLE TO PROJECT 46-1981		<u>1,500,000.00</u>
	COST APPLICABLE TO PROJECT 2-1982		<u>6,400,000.00</u>
			<u>7,900,000.00</u>
	COST APPLICABLE TO PROJECT 4-1983		<u>5,449,925.14</u>
	PROVINCE OF B.C. 50% SHARE		<u>2,724,962.57</u>
	LESS: AMOUNT AVAILABLE		<u>2,660,221.00</u>
	DIFFERENCE		<u>64,741.57</u>

ITEM	"SUPPL."	17
MANAGER'S REPORT NO.		31
COUNCIL MEETING		85/04/29

