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MINUTES OF A MEETING OF THE DRAINATE COMMITTEE
held at Coquitlam Municipal Hall
at 1200 h Wednesday, 1986 March 12

Attending:

Alderman R. Mitchuk, Chairman,
Alderman E. Parker
Alderman L. Bewley

Jim Hockey, Operations Administrator
Neil Nyberg, Municipal Engineer

CALL TO ORDER

1. CALL TO ORDER

The Chairman called the meeting to order at 1200h.

503-1 1986 DITCH ELIMINATION PROGRAM

2. The Committee considered the report of the Municipal Engineer and resolved that:

503-1A That the 1986 Ditch Elimination Program 532343 be approved as proposed in Engineering memorandum 05 03 01 dated 1986 March 03 in advance of the 1986 Budget Bylaw, as follows:

1986 Program Engineering 532343-011	\$ 40,000
1986 Program Construction 532343-012	<u>360,000</u>
	\$400,000

503-1B That \$400,000 of expenditure from the Drainage Capital Works Reserve be approved for the 1986 Program.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED

503-2 1986 MAILLARDVILLE DRAINAGE IMPROVEMENT PROGRAM

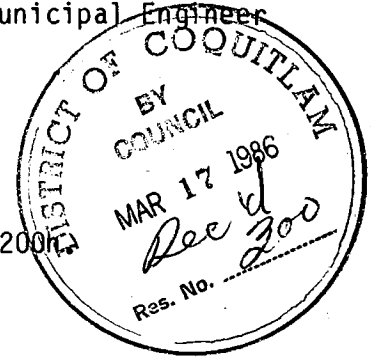
3. The Committee considered the report of the Municipal Engineer and resolved that:

503-2A That the Maillardville drainage improvement project (Area Four and Area Five) be postponed until 1987 when both the regular proceeds of investment and the accelerated program will combine with maximum impact.

503-2B That engineering design and contract documents for Areas Four and Five (Maillardville) be completed in 1986 to allow an early start on construction in 1987.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED



Council Action Required

APPROVED BY
CO. RES. # 200/86

APPROVED BY
CO. RES. # 200/86

Drainage Committee Minutes

- 4. The Committee discussed augmentation of the Heritage fund for ditch elimination with proceeds from the Land Sale Reserve. The Municipal Engineer advised that the proposed 1987 program could be accomplished using the existing level of investment in the Capital Drainage Reserve. The Committee decided to refer the investment issue to the Finance and Audit Committee, resolving:

503-2C That the Drainage Committee recommends to the Finance and Audit Committee that additional funds be approved for the Ditch Elimination Program when and if Land Sale proceeds permit.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED

503-3 1986 TOWN CENTRE DRAINAGE PROGRAM

- 5. The Committee considered the report of the Municipal Engineer and resolved:

503-3A That the 1986 Municipal Drainage Trunk Program 532342 as set out in Engineering Report 05 02 86 07 d 1986 March 06, be approved in advance of the 1986 Budget Bylaw as follows:

Lafarge Lake Dyke	532342-138	\$250,000
Johnson Drainage Trunk	532342-022	\$48,000
Ponderosa Street Drainage Trunk	532342-023	\$50,000

Council
Action
Required

*APPROVED
C.O.
#203/SU
B.J.
B.*

503-3B That a bylaw to withdraw \$348,000 of funds from the Drainage Development Cost Charge Reserve Fund be drafted and presented to Council.

503-3C That engineering design and contract documents for the Lafarge Lake Dyke be completed in 1986 to allow a start in construction at short notice.

Moved by Alderman Parker
Seconded by Alderman Bewley

CARRIED

Drainage Committee Minutes

503-4 COQUITLAM RIVER FLOOD CONTROL PROJECT

6. The Committee heard the report of the Operations Administrator and decided that additional support was required on the part of Coquitlam Council. The overall effect of the project would include improved protection against flooding and more extensive construction and maintenance work. Accordingly, the Committee resolved:

503-4A That the report on Coquitlam River Flood Control status be received.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED

503-4B That Mayor Sekora write to Member of Parliament G. St. Germaine urging a speedy commencement of the evaluation study of flood control measures for the Coquitlam River, as set out Resolution of Council # 1122, dated October 7, 1985.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED

503-5 STORM FLOODING RESPONSE

7. The Committee reviewed the reports of flooding response for 1986 January 18 and 1986 February 23, 24, 25.

503-5 That report 03 01 06 d 1986 March 07 be received.

Moved by Alderman Parker
Seconded by Alderman Bewley

CARRIED

503-6 ANNUAL MEETING: COQUITLAM DYKING DISTRICT

8. The Committee reviewed the report of the Operations Administrator and resolved:

503-6 That report 01 10 01 dated 1986 March 07 be received.

Moved by Alderman Bewley
Seconded by Alderman Parker

CARRIED

Drainage Committee Minutes

503-7 REQUESTS FOR DRAINAGE ENCLOSURES: 1986

9. The Committee reviewed the applications for ditch enclosures and cost sharing. It was noted that these projects were not initiated by the District, but rather came from residents who wished to improve their properties with District assistance. The Committee requested that applications for 713 Edgar Avenue, 250 Hart Street and 432 Hickey Street be transferred to the backlog of requests, and that the applicants be so advised. Owing to historical commitments made to Mr. West of 310 Marathon Court, the Committee decided to recommend this project to the Finance and Audit Committee, as follows:

*APP'D
Co. RES
208/86*

503-7A That the Finance and Audit Committee consider the enclosure of a drainage swale at 310 Marathon Court for the 1986 Annual Budget.

Moved by Alderman Parker
Seconded by Alderman Bewley

CARRIED

10. The Committee directed that a contingency plan be developed by the Engineering Department in the event that the full allotment of 1986 funds for ditch enclosure was not required by reason of lower than expected tenders. In the event that funds come available from the 1986 enclosure allotment:

**Council
Action
Required**

*APP'D
Co. RES
207/86*

503-7B That Grover Street ditch enclosure be added to the 1986 Ditch Elimination Program as a contingent item of \$12,000; provided that the overall program budget is not exceeded.

Moved by Alderman Parker
Seconded by Alderman Bewley

CARRIED

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: J. L. Tonn
Municipal Manager

DEPARTMENT: Administration

DATE: 1986 03 03

FROM: Neil Nyberg

DEPARTMENT: Engineering

YOUR FILE:

SUBJECT: 1986 DITCH ELIMINATION PROGRAM

OUR FILE: 05 03 01

FOR DRAINAGE COMMITTEE1.00 BACKGROUND

- 1.01 The fourth year of the ditch elimination program will complete nine major projects in Drainage Area No.3 in the general area of Clarke Road at a cost of approximately \$400,000. To date, approximately 6,400 metres of ditch enclosure on 38 streets have been accomplished in Drainage Areas 1, 2 and 3.
- 1.02 As of 1985 December 31, the Capital Drainage Works Reserve contained \$4,354,489. Only the interest proceeds may be expended to finance ditch enclosures.
- 1.03 The 1986 program has been evaluated on the basis of the DITCH ELIMINATION WARRANT SYSTEM (Appendix A). The projects requiring enclosure:

Thompson Avenue:	west of Clarke Road
Farrow Street:	Smith Avenue to Como Lake Avenue
Dogwood Street:	Regan Avenue to Como Lake Avenue
Lea Avenue:	to Dogwood Avenue
Emerson Street:	to Como Lake Avenue
Regan Avenue:	Emerson Street to Dogwood Street
Langside Avenue:	to Breslay Street
Breslay Street:	Regan Avenue to Smith Avenue
Robinson Street:	Miller to Como Lake Avenue.

- 1.04 The estimated cost is less than the interest proceeds available from the Capital Drainage Works Reserve Fund. Eight of nine projects are completely designed: only Robinson Street requires expenditures for engineering design. All projects will require as-constructed drawings and on site consultation with the designer.

1986 03 03
1986 DITCH ELIMINATION PROGRAM


1.05 The construction season commences in April. We wish to start work no later than May 1 in order that fall restoration work does not extend into the rainy season. This means that advance approval by Council of the 1986 Ditch Elimination Program is necessary.

2.00 RECOMMENDATIONS

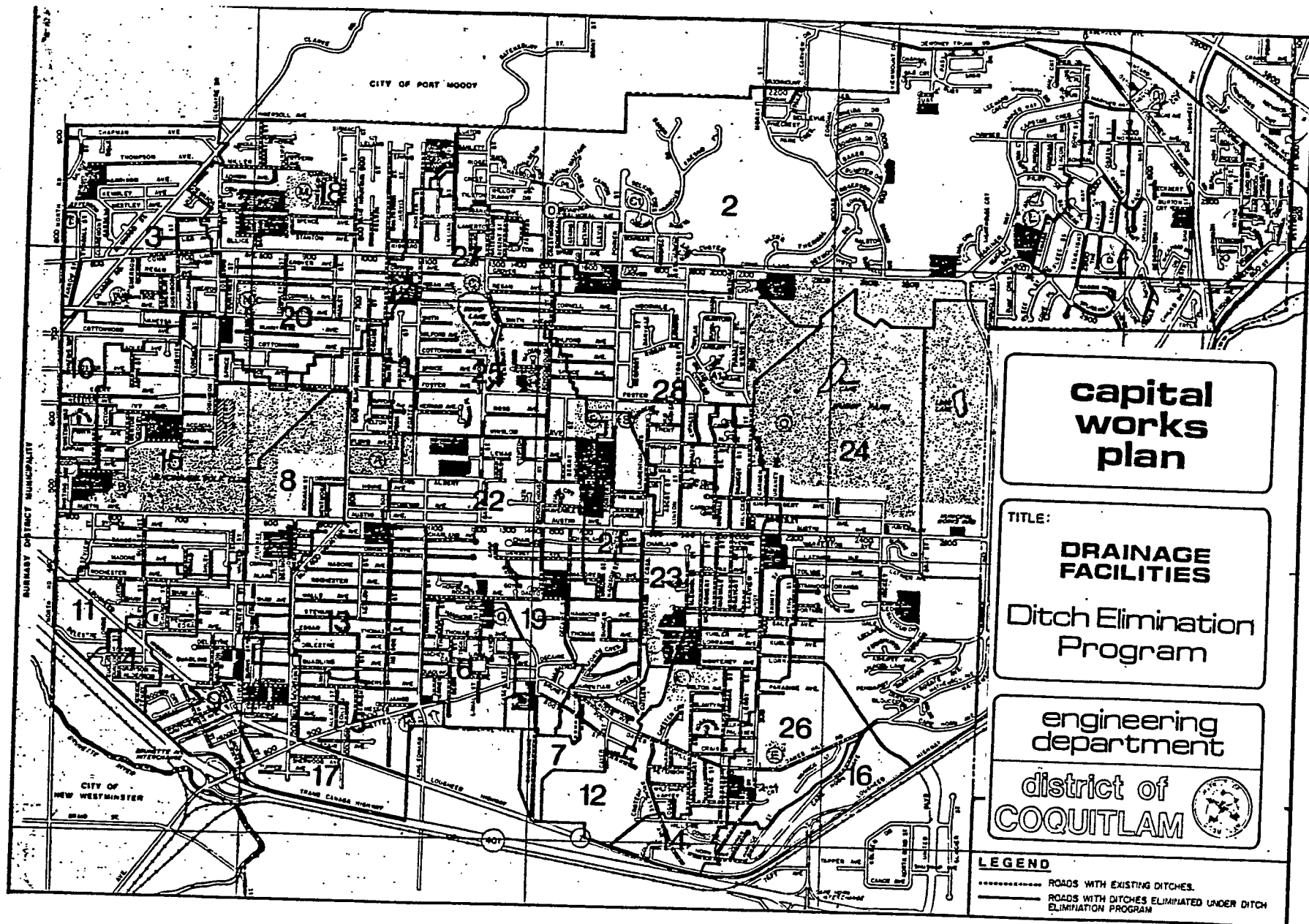
2.01 That the 1986 Ditch Elimination Program 532343 be approved in advance of the 1986 Budget Bylaw, as follows:

1986 Program Engineering 532343-011	\$40,000
1986 Program Construction 532343-012	<u>360,000</u>
	\$400,000

2.02 That \$400,000 of expenditure from the Drainage Capital Works Reserve be approved for the 1986 Program.


Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw
Attach



capital works plan

TITLE:
DRAINAGE FACILITIES
 Ditch Elimination Program

engineering department

district of
COQUITLAM



LEGEND
 ROADS WITH EXISTING DITCHES.
 ——— ROADS WITH DITCHES ELIMINATED UNDER DITCH ELIMINATION PROGRAM

DITCH ELIMINATION WARRANT SYSTEM

PROGRAM OBJECTIVES

The original objectives of the Ditch Elimination Program were threefold:

- to provide enclosed storm drainage to approximately 8200 lots in SW Coquitlam;
- to improve public safety and convenience;
- to reduce maintenance and operating costs.

METHOD OF SELECTION

In 1977, the entire area of SW Coquitlam was divided into 21 drainage catchment areas. These areas are determined by topography. Rainfall which occurs in a catchment area finds its way to a dominant natural watercourse, channel or enclosed storm sewer, depending on location.

Each drainage area was evaluated in terms of preponderance of serious safety, convenience, maintenance and aesthetic deficiencies. Once drainage areas were listed in order of priority, individual ditch systems were assessed as to relative importance.

The nature of drainage systems is that they become relatively larger and more important at the downstream end. This dendretic pattern requires construction projects to commence at the lower elevations of each drainage catchment, and generally proceed upstream. In some cases, the presence of an outstanding hazard or public nuisance will place a particular priority on a specific length of enclosure.

Many people relate to streets and neighbourhoods exclusively in identifying their community ties. Unfortunately, drainage systems do not necessarily confine themselves to single streets or one neighbourhood. As a result, some Coquitlam residents find it difficult to understand why some streets are improved over others of similar vintage or appearance. The answer is that drainage systems and topography are the governing factors in assessing location and sequence of ditch elimination.

One additional factor which is considered is the presence of major roadway upgrading projects. It is often very economical to improve sections of ditch which are tributary to a major road drainage system. As a result, when a major roadway bisects a drainage basin, we commonly attempt to enclose some adjacent sections of open ditch.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: J. L. Tonn Municipal Manager	DEPARTMENT: Administration	DATE: 1986 March 04
FROM: Neil Nyberg	DEPARTMENT: Engineering	YOUR FILE:
SUBJECT: 1986 MAILLARDVILLE DRAINAGE IMPROVEMENT PROGRAM		OUR FILE: 05 03 01

1.00 BACKGROUND

- 1.01 In the inaugural speech, Mayor Sekora outlined a proposal to increase the Capital Drainage Works Reserve so that some projects could be advanced more quickly. The Engineering Department was asked to examine the Maillardville area as a potential location for an expedited program.
- 1.02 The overall cost of Zone Four projects, including contingency allowance and engineering charges, approaches \$200,000. To accumulate this sum, it would be necessary to invest the sum of \$2,000,000 for a period of 12 months at 10 percent. This would mean work could start in April 1987 in Area Four provided that the existing Capital Drainage Reserve was augmented by an additional \$2,000,000 in April 1986.
- 1.03 To obtain action in 1986 it would be necessary to approve funds from the Land Sale Reserve in the amount of \$200,000. If a one-year delay can be tolerated, however, both the normal ditch elimination program (Area Five); and the accelerated program (Area Four) can be accomplished in Maillardville.
- 1.04 One major obstacle to 1986 construction in Area Four is the current lack of detailed engineering plans and contract documents. Municipal staff is fully committed to other current projects, and to carry out the necessary proposal call, evaluation and consultant briefing could carry the project towards a mid-summer start. Although feasible, such a timetable would postpone completion, cleanup and restoration until the late fall and early winter. From experience, we know that fall/winter projects suffer higher costs and are less satisfactory to the public owing to interference from the weather.

2.00 DRAINAGE AREA FOUR

- 2.01 Drainage Area Four is a significant zone in Maillardville and the component projects in this area are as follows:

1986 Maillardville Drainage Improvement Program

Alderson	North side,	#579 to Dunlop	30 metres of 375 mm
Dunlop	West Side	Alderson to Sunset	137 metres of 375 mm
Sunset	North Side	Dunlop to #617	97 metres of 375 mm
Dunlop	East Side	Sunset to Edgar	137 metres of 250 mm
Dunlop	West Side	Sunset to Edgar	137 metres of 450 mm
Sunset	North Side	Dunlop to Loring	63 metres of 250 mm
Loring	East Side	Sunset to Delestre	80 metres of 250 mm
Edgar	North Side	Loring to Dunlop	42 metres of 250 mm
Edgar	North Side	#605 to #611	27 metres of 375 mm
Guilby	East Side	Guilby to lane N of Shaw	100 metres of 300 mm
Guilby	East Side	#373 NPL	110 metres of 300 mm
Edgar	North Side	LeClair Creek to Richard	164 metres of 300 mm
Richard	East Side	Edgar to Pembroke	105 metres of 300 mm
Richard	East Side	Pembroke to Shaw	100 metres of 300 mm
Richard	East Side	Shaw to Lane S of Rochester	41 metres of 200 mm
15 Projects			1,280 metres

3.00 AREA FIVE

3.01 Area Five is the next most important ditch elimination zone in Maillardville and would normally be done in 1988. Under the proposal to advance the program in Maillardville, the fifteen projects in Area Five could be accomplished in 1987 in conjunction with the work of Area Four.

3.02 Area Five projects comprise:

Adair	North Side	West to Woolridge	88 metres of 300 mm
Adair	North Side	Woolridge to east bdy	72 metres of 300 mm
Roderick	North Side	Blue Mtn to lane W of Allard	168 metres of 300 mm
Allard	West Side	#206 to #218	94 metres of 300 mm
Boileau	West Side	Brunette to Harris	129 metres of 300 mm
Harris	North Side	#915 to Allard	170 metres of 300 mm
Harris	North Side	Allard to Boileau	25 metres of 250 mm
Allard	West Side	Harris North	53 metres of 250 mm
Nelson	West Side	N Loughed to S Brunette	100 metres of 300 mm

1986 Maillardville Drainage Improvement Program

Area Five projects - cont'd....

LeBleu	West Side	Brunette to Alderson	161 metres of 300 mm
Alderson	North Side	LeBleu to King	162 metres of 250 mm
Alderson	North Side	King to #917 EPL	83 metres of 250 mm
King	West Side	Alderson to Quadling	72 metres of 300 mm
James	North Side	Nelson to #1057	127 metres of 300 mm
James/Nelson	North and West	15 m W of Nelson	55 metres of 300 mm
15 projects			1,559 metres

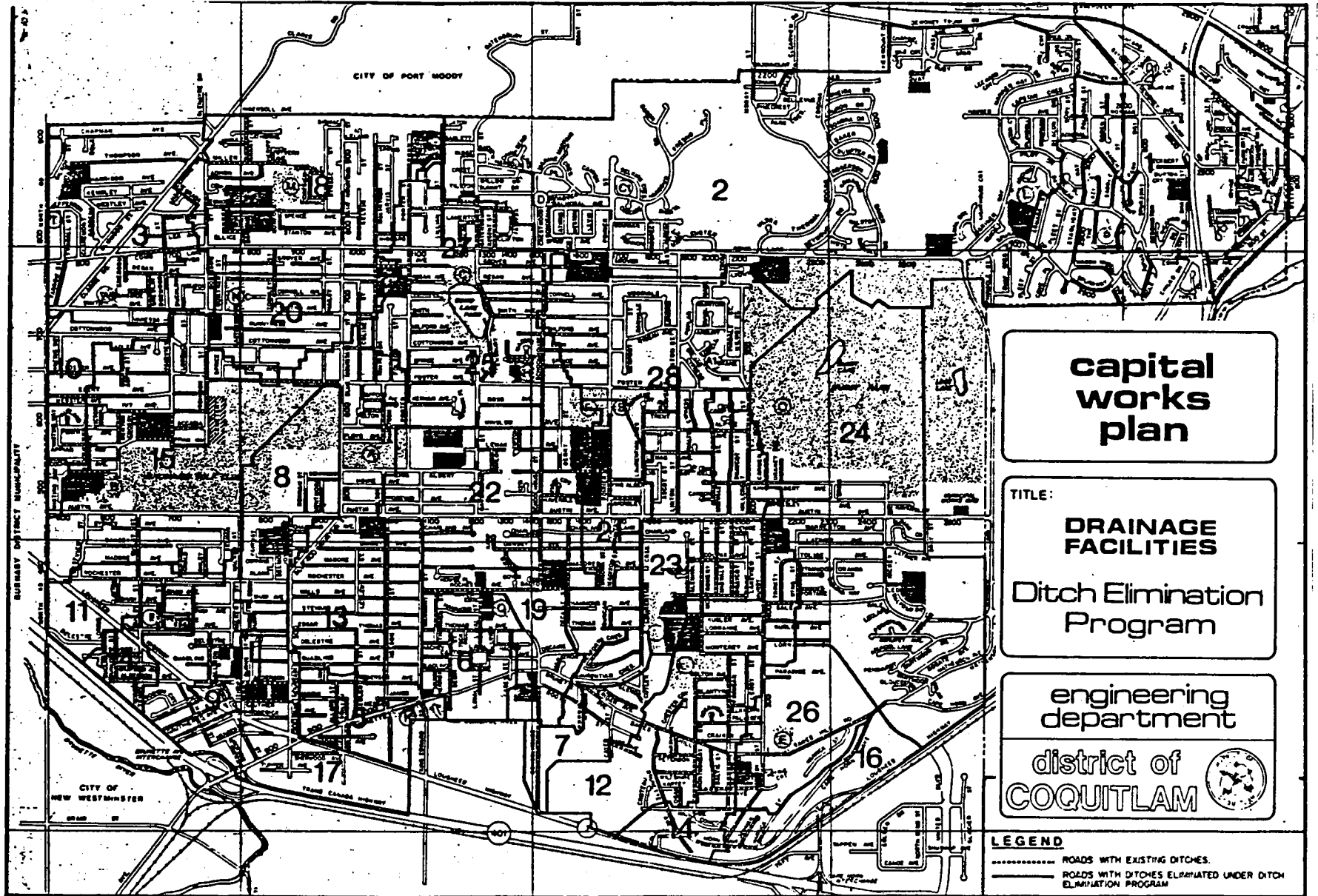
3.03 Area Five projects, including engineering and contingency allowance, are budgeted at \$200,000 in 1986 dollars.

4.00 RECOMMENDATIONS

- 4.01 That the Maillardville drainage improvement project (Area Four and Area Five) be postponed until 1987 when both the regular proceeds of investment and the accelerated program will combine with maximum impact.
- 4.02 That engineering design and contract documents for Areas Four and Five (Maillardville) be completed in 1986 to allow an early start on construction in 1987.



Neil Nyberg, P. Eng.
Municipal Engineer



**capital
works
plan**

TITLE:
**DRAINAGE
FACILITIES**
Ditch Elimination
Program

engineering
department

district of
COQUITLAM



LEGEND
 ROADS WITH EXISTING DITCHES.
 ——— ROADS WITH DITCHES ELIMINATED UNDER DITCH
 ELIMINATION PROGRAM

DISTRICT OF COQUITLAM

503-3

Inter-Office Communication

TO: J.L.Tonn, Municipal Manager DEPARTMENT: Administration DATE: 1986 March 06
 FROM: Neil Nyberg DEPARTMENT: Engineering YOUR FILE:
 SUBJECT: 1986 TOWN CENTRE DRAINAGE PROGRAM OUR FILE: 05 02 86/07

FOR DRAINAGE COMMITTEE

1.00 BACKGROUND

1.01 Bylaw 988, 1979, as amended by Bylaw 1124, 1980, authorizes collection of development cost charges from various sectors of the Town Centre to assist in financing the cost of municipal trunk storm sewers. As of 1985 December 31, the Development Cost Charge Reserves contained the following sums:

834916-200	Drainage Area No.1 @ \$27,420/hectare	\$648,724
834916-300	Drainage Area No.2 @ \$38,580/hectare	84,062
834916-400	Drainage Area No.3 @ \$16,740/hectare	70,106
834916-500	Drainage Area No.4 @ \$23,560/hectare	7,445
		<u>\$810,337</u>

1.02 The projects which are required to extend or improve the municipal drainage system in 1986 are as follows:

532342-138	Lafarge Lake Dyke	Bylaw 960(1979)	80,000
		Drainage Area #1	170,000
532342-023	Ponderosa Municipal Drainage Trunk	Drainage Area #2	50,000
532342-022	Johnson Street Municipal Drainage Trunk	Drainage Area #3	48,000

1.03 The project description for the Lafarge Lake Dyke is attached as Appendix A. Construction of the dyke must await the relocation of Pinetree Way to a new alignment across the GVSDD lands, so an early start on the work is unlikely. However, we would like to have the dyke authorized in the 1986 budget to allow design and stockpiling, if necessary, of the construction materials. As development in the Town Centre proceeds apace, the potential risk of flooding from a surcharging Lafarge Lake becomes an important consideration.

1986 Town Centre Drainage Program


- 1.04 The Ponderosa Storm Drainage Trunk extends the Christmas Way outfall system to potential development lands north of Lincoln Avenue. Appendix B is the detailed project description.
- 1.05 The Johnson Street storm extension joins an existing manhole at Johnson Street and Guildford Way to a major storm sewer installed by private developers. A second section pushes the Municipal storm trunk as far north as Banbury Street. These connecting links are necessary to reduce the extensive erosion and flooding experienced on Johnson Street as major developments proceed upslope. Existing open ditches are poorly suited to handle the increased runoff from this expanding part of the Municipality.

2.00 RECOMMENDATIONS

- 2.01 That the 1986 Municipal Drainage Trunk Program 532342 be approved in advance of the 1986 Budget Bylaw as follows:

Lafarge Lake Dyke	532342-138	\$250,000
Johnson Drainage Trunk	532342-022	48,000
Ponderosa Street Drainage Trunk	532342-023	50,000

- 2.02 That a bylaw to withdraw \$348,000 of funds from the Drainage Development Cost Charge Reserve Fund be drafted and presented to Council.
- 2.03 That engineering design and contract documents for the Lafarge Lake Dyke be completed in 1986 to allow a start in construction at short notice.


Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw
Attach.

Item: LAFARGE LAKE DYKE

File No. 05 04 06

Account No. 532342

Finance: Town Centre Drainage Development Cost Charge

Bylaw No. 1510

Schedule: Construction: May 1987

PROJECT OBJECTIVES:

To complete the Hoy Creek diversion project to provide flood protection to the Town Centre for up to the 1:100 year storm occurrence by dyking Lafarge Lake to a minimum elevation of 35 m.

SCOPE OF WORK:

This system comprises two dykes adjacent to Lafarge Lake. One, located on the west bank, is 325 m long. The other, located on the south bank, is 20 m long. The predesign top elevation of the dyke is 35.00 m geodetic. This is 0.24 m higher than the expected 1:100 year storm flood level of 34.76 m. The dyke height varies up to 2.0 m. Dykes will be extensively landscaped with shrubs and trees. Design include a gravel promenade at lake edge.

DESIGN FACTORS:

- (1) This project should be initiated after the relocation of Pinetree Way and before extensive redevelopment of the Town Centre. Cost estimate does not include Pinetree Way relocation.
- (2) Lafarge Lake acts as a detention facility as part of the Hoy Creek diversion to Coquitlam River. Therefore, the dyke is required only during major storm events where inflow exceeds outflow.

JUSTIFICATION:

All Hoy Creek flows greater than 2800 L/s are diverted to Lafarge Lake. The Hoy Creek diversion culvert has a capacity of 16,400 L/s which corresponds to the 1:10-0 year Hoy Creek flood flow. The culvert from Lafarge Lake to the Coquitlam River has a capacity of 14,400 L/s based on a design maximum water level of 34.76 m geodetic. The minimum level is 32.0 m which is the invert of the outflow structure. When inflows exceed outflows, the difference is stored in Lafarge Lake causing the level to rise to a maximum 34.76 m. The west and south banks are much less than 34.76 m and will, therefore, flood during major storms. This flooding will disrupt arterial and collector street traffic and residential and commercial properties. The proposed dyke will prevent flooding and permit proper hydraulic operation of the diversion and detention system.

PROJECT DESCRIPTION
1986 01 30

Item: JOHNSON ST. DRAINAGE TRUNK - GUILDFORD WAY TO BANBURY AVE.

File No. 05 04 06 and 8-3590

Account No. 533054-022

Finance: Development Cost Charges

Schedule: Engineering: February to April, 1986
Construction: May to September, 1986

PROJECT OBJECTIVES:

To extend the municipal trunk drainage system as part of a phased trunk drainage system for the Town Centre area. This segment joins two separated segmented trunk main.

SCOPE OF WORK:

Work includes 120 m of 600 mm \emptyset concrete storm sewer from an existing manhole at Johnson St./Guildford Way to connect to an existing 600 mm drainage trunk servicing Tau Holdings. Also, 60 m of 450 mm \emptyset from the existing 450 mm trunk at the north end of Tau Holdings to Banbury Avenue.

DESIGN FACTORS:

- (1) Storm sewers north and south of Guildford Way have different offsets.
- (2) Design must allow for proposed Johnson Street widening and realignment.
- (3) Design should take into account continuation of subsurface drainage patterns and replenishment of water to nearby creeks and tributaries.
- (4) Drainage area as per attached plan.

JUSTIFICATION:

The Town Centre trunk drainage system is a District obligation as part of the Drainage Development Cost Charge Bylaw.

PROJECT DESCRIPTION APPROVED BY: _____

MW Myberg

DISTRICT OF COQUITLAM

Inter-Office Communication

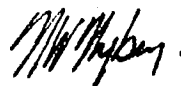
TO: J. L. Tonn
Municipal Manager DEPARTMENT: Administration DATE: 1986 March 07

FROM: Neil Nyberg DEPARTMENT: Engineering YOUR FILE:

SUBJECT: COQUITLAM RIVER FLOOD CONTROL: STATUS REPORT OUR FILE:

FOR DRAINAGE COMMITTEE1.00 BACKGROUND

- 1.01 The City of Port Coquitlam initiated a Federal funding request to Member of Parliament G. St.Germaine in 1985, with the support of Coquitlam Council. The objective was to fund an engineering study of necessary improvements to the Coquitlam River for flood control.
- 1.02 Reference A is a background paper which was previously considered by the Drainage Committee and by Council.
- 1.03 The Operations Administrator, Mr. Jim Hockey, was invited to attend a meeting on 1986 March 7 to discuss the application with the Member of Parliament and officials of Port Coquitlam. His verbal report of the progress towards a new Coquitlam River Study will be given at the meeting.



Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw
Attach.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: N. W. Nyberg

DEPARTMENT: Engineering

DATE: 1986/03/07

FROM: H. F. Hockey

DEPARTMENT: Engineering

YOUR FILE:

SUBJECT: Coquitlam River Control Project

OUR FILE:

This will confirm the attendance of the writer to the Environmental Protection Committee meeting of the Port Coquitlam City Council on Friday, March 7th, 1986 at 10:00 a.m. in the City Council Chambers.

In attendance were:-

Mr. G. St.Germaine, M.P., Mission/Port Moody Riding,
Alderman J. Keryluk, City of Port Coquitlam Council,
Mr. Bryan Kirk, City Administrator,
Mr. A. Chong, P.Eng., Assistant City Engineer,
and the writer.

Mr. Chong briefed Mr. St.Germaine of the background to the contemplated project emphasizing the need for an up-to-date consultants study in order to clearly define the proposed works and prepare an accurate estimate of cost. Mr. Chong reiterated that the City was applying for federal funding of the study and would like the assistance of Mr. St.Germaine in expediting the application.

Mr. Chong stated that the District fully endorsed the application as an enthusiastic participant. The writer was asked to brief Mr. St.Germaine on the proposed works which were of particular importance to Coquitlam.

Mr. St.Germaine stated it was essential to his pressing the matter at the federal level that all political and quasi jurisdictions which would be effected by the works be made knowledgeable of the project and encouraged to be fully supportive.

For example, Mr. St.Germaine cited representatives of the native Indians who occupy the reserve land as well as the appropriate Provincial Ministries. He questioned the writer closely on the priority which the District placed upon the project, adding that he could not recall the Mayor raising the subject in any conversations which they have had in the past. The writer advised that the full endorsement by the District was evidenced by the approval of the Municipal Engineer's report by the Drainage Committee on September 30th, 1985 and the subsequent resolution by the Municipal Council on October 7th, 1985.

The meeting concluded with Mr. St.Germaine stating he would make early contact with Mr. Austin Pelton, M.L.A., Dewdney Constituency for the purpose of arranging co-ordination with Provincial jurisdictions. Additionally, he would seek a meeting with Mayor Sekora for a discussion of the proposed project.

The City for their part at this time is to contact the representative(s) of the native Indians domiciled on the reservation for the purpose of alerting them to the project under consideration and ascertaining their concurrence or otherwise.

A handwritten signature in black ink, appearing to read "H. F. Hockey", is written over a horizontal line.

H. F. Hockey
Operations Administrator

HFH:sh

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: J.L.Tonn, Municipal Manager DEPARTMENT: Administration DATE: 1985 09 19
 FROM: Neil Nyberg DEPARTMENT: Engineering YOUR FILE:
 SUBJECT: COQUITLAM RIVER FLOOD CONTROL PROJECT OUR FILE: 03 03 05

FOR DRAINAGE COMMITTEE

- Reference: A. Chapt.4, Coquitlam River Water Management Study.
 B. Engineering memo report 03 03 05 d 1985 September 04
 C. Manual OM 413D/01 Coquitlam Dam Emergency Preparedness Plan, B.C.Hydro 1984.

1.00 BACKGROUND

- 1.01 On 1985 August 25, Operations Administrator Jim Hockey met with officials of Port Coquitlam to discuss a proposed study and construction project for the Coquitlam River. The Chairman of the Environmental Protection Committee in Port Coquitlam has apparently discussed the possibility of Federal funding for river improvements with Federal Member of Parliament, G. St. Germain. City staff then approached Coquitlam to formulate a specific request to the Federal Government.
- 1.02 In 1978, the B. C. Ministry of Environment concluded a study of the Fraser River which included flood control recommendations. The floodplain of a natural watercourse is normally defined by the expected flood elevation which is expected to occur, on average, once every 200 years. This 1:200 year flood has a probability of occurrence of 0.05 percent in any given year. The last flood of this magnitude may have occurred in 1921.
- 1.03 The 1:200 year flood, estimated at about 20,670 cfs, would probably inundate Shaughnessy Street and involve about 1600 acres below the Lougheed Highway bridge. Portions of the Lougheed and the Pitt River Road would be impassable. Existing dykes along the Coquitlam River were determined, in 1975, to be adequate for a 1:13 year event of about 12,000 cfs.
- 1.04 High water levels in the Coquitlam River commonly occur in late summer due to the influence of the backwater effect from the Fraser River flood stage. Even larger flood flows can occur between November and April, as heavy rains, and impermeable surfaces contribute to high runoff conditions. The flood events mentioned in the Coquitlam River Study include:

1921	est. 21,000 to 26,000 cfs.
1955	est. 16,000 cfs.
1961	est. 16,800 cfs.
1:200 year flood:	est. 20,670 cfs.

COQUITLAM RIVER FLOOD CONTROL PROJECT-

- 1.05 By way of comparison, B. C. Hydro has estimated the consequences of a total breach of the Coquitlam Lake Dam. A computer simulation predicted a flow of 20,300 cubic metres per second, and the dam breach was predicted to cause flooding to rise 12.9 metres over initial water level at the CPR bridge. The possibility of such an event is described as 'extremely remote'.

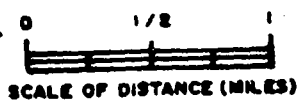
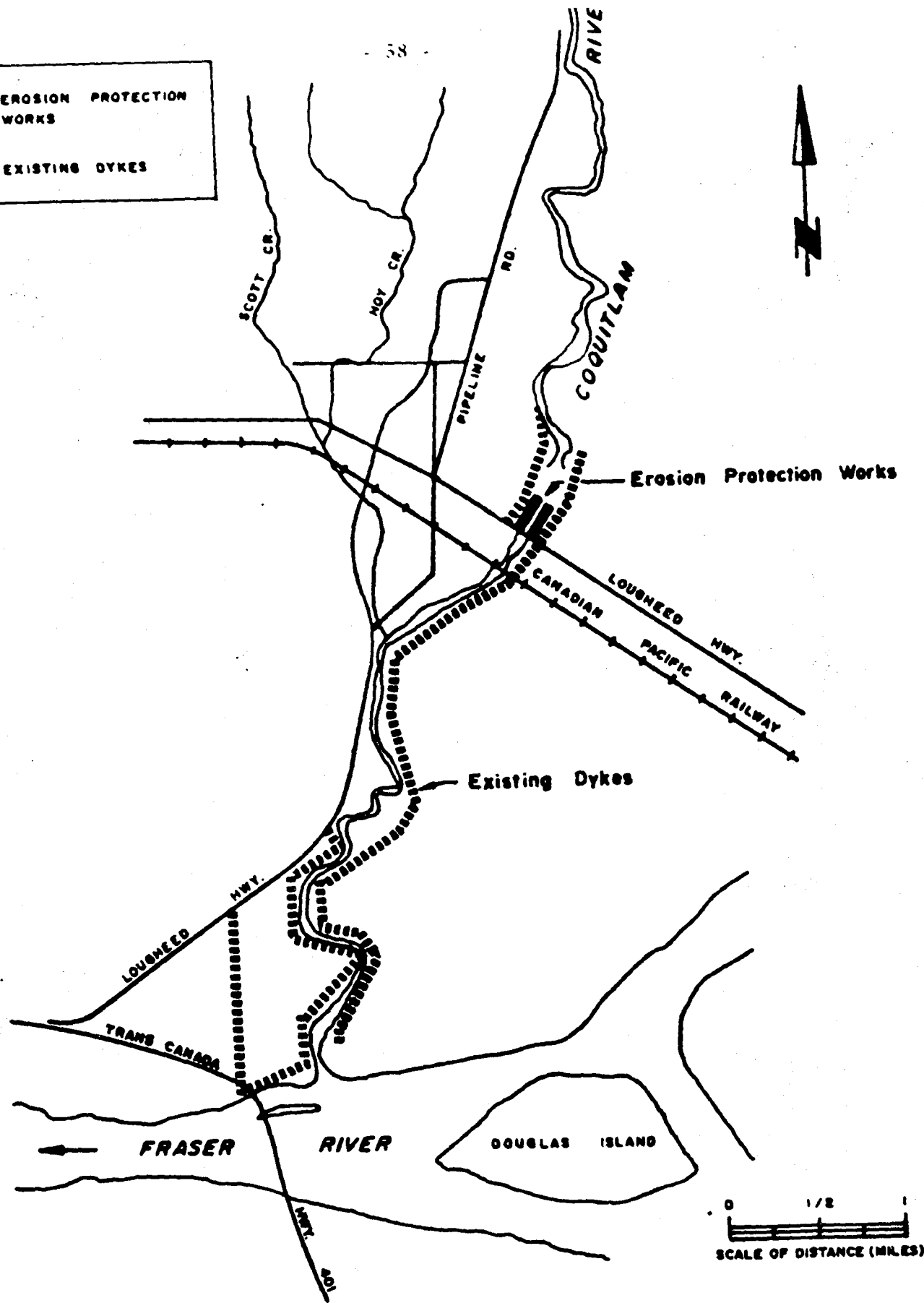
2.00 DISCUSSION

- 2.01 Reference B outlines Port Coquitlam's plans which comprise channel dredging, re-alignment and widening of the channel, removal of underbrush and dyke reconstruction from Lincoln Avenue to the Fraser. The initial stage would be a \$30,000 consulting study to update the recommendations of the Coquitlam River Study. Port Coquitlam Council endorsed the project on 1985 August 12.
- 2.02 Under Section 622 of the Municipal Act RSBC 1979, Council may make agreements with adjoining municipalities to construct, maintain or remove obstructions from watercourses to lessen the danger of flooding. In 1977, the Coquitlam Dyking District was formed, with the municipalities of Coquitlam and Port Coquitlam as parties to an agreement. The intermunicipal agreement of 1977 October 05 assigns responsibilities for dyke and river bank protection and flood control to each party within their own municipal boundaries. The area of coverage basically extends from Cedar Drive (at the west end of the deBouville slough) to the Pitt River.
- 2.03 Existing dykes along the Coquitlam are depicted in Figure 4.3 of the Coquitlam River Study. On the west bank of the river, a short section of pitrun gravel dyke, faced with broken rock riprap, lies north of the Lougheed Highway Bridge. South of the Scott Creek confluence with the Coquitlam, the Colony Farms dykes provide 0.33 to 0.67 metres of freeboard for a Coquitlam River discharge of 340 cubic metres per second (12,000 cfs), but would be overtopped by the 1:200 year flood of 580 metres per second (20,670 cfs). In addition, these dykes provide about 0.67 metres of freeboard for a Fraser River evaluation of 3.25 m (1951 GSC datum). The assessment of the Coquitlam River Study was:

'the existing dykes are low; of less than adequate construction and are poorly maintained. The thick growth of trees obstruct visual inspection of the embankments and culverts, and provide a potential for the development of a dangerous seepage. They only protect to a river discharge of about 340 metres per second (12,000 cfs), equivalent to a 1:13 year flood without upstream storage, or a 200 year flood with upstream storage. Undyked areas will flood with damage at river discharges exceeding 200 cubic metres per second (7,500 cfs).

EROSION PROTECTION WORKS

EXISTING DYKES



**EXISTING COQUITLAM RIVER DYKES
AND**

Figure 4, 3

COQUITLAM RIVER FLOOD CONTROL PROJECT-

2.04 The Provincial Ministry of Environment Water Investigations Branch published the Coquitlam River Water Management Study in September 1978. This study recommended protecting existing development through dyke construction and storage in Coquitlam Lake. In particular, the study recommended:

- (4) The Coquitlam Lake Reservoir not be operated above a water level elevation of 493 feet, which is 10 feet below the spillway crest level, for flood storage purposes
To open the undersluice gates when the Coquitlam water level rises above the 493 feet elevation, but to close the undersluice gates should the flow of the Coquitlam River at Port Coquitlam exceed 12,000 cfs.

The dykes along the Coquitlam River be upgraded along those segments of the river where the benefits outweigh the costs to protect against a flood flow of 12,000 cfs (instantaneous peak flow) which is the 1:200 year flood flow with full use of Coquitlam Lake reservoir storage.

- (5a) An adequate flood channel for the river be provided such that the hydraulic regime of the river is typical of a natural stream. In accomplishing this, the dykes be positioned that they are sufficiently set back from the high water channel and clear of bypass channel.
- (5b) The clearing of streamside vegetation be kept to an absolute minimum and where areas have to be cleared they be replanted as soon as possible. Removal of large healthy trees be avoided except where they constitute a hazard to structures.
- (5c) Erosion protection be accomplished so as to not alter the integrity of the natural river bank.
- (5d) the high water flood channel be encroached upon only in areas where the river hydraulics are not going to be altered significantly as a result. Setback dykes be considered in such areas.
- (5e) Channelization and alteration of existing channels (such as widening) be avoided where possible.
- (5f) Works upstream of spawning areas which are likely to cause excessive siltation be avoided.
- (5g) Works which are likely to result in degradation of spawning areas be avoided.

COQUITLAM RIVER FLOOD CONTROL PROJECT-

(5h) Removal of gravel within the meander belt be avoided except where deemed absolutely necessary for flood control or Fisheries' enforcement.

2.05 From the recommendations of the study, it appears that certain objectives are almost mutually exclusive. On one hand, the study recommends against widening and channel improvements, removal of vegetation and trees, and removal of gravel from the meander bed. On the other hand, Table 4.1 of the study (attached as Appendix E) recommends extensive clearing and felling large trees on the dykes. The study recommends 'set back' dykes as a possible compromise between environmental protection and flood control objectives. Such dykes, however, may be more costly than conventional river training techniques, including vegetation removal, riprap and channel excavation.

2.06 From the Port Coquitlam Environmental Protection Committee report of 1985 August 08, it appears that the original scope of work of th project was to include removal of large trees on the gravel islands of the river channel, and dredging of the channel to protect bridges across the Coquitlam. The Committee added the construction of dykes along the river bank. The consultant's terms of reference comprise a complete analysis of these requirements, pre-engineering and cost estimating, detailed design and project administration.

2.07 Modifications to the existing river channel considered by the Coquitlam River Study are set out in Tables 4.1 and 4.3 on pages 6 and 7. The major improvements for Coquitlam are itemized in Table 4.3 reproduced on page 7. The estimated costs of Coquitlam projects was:

- Scott Creek dyke construction and channel improvements:	\$312,000
- Bank improvements: Oxbow area	353,000
- Bank improvements: mile 5.5 to mile 7.2	375,000
- Bank improvements adjacent to gravel pits	<u>143,000</u>
	\$1,183,000

2.08 From the cost estimates of Table 4.3, it appears that Coquitlam would be responsible for about 25 percent of the work, exclusive of modifications to the dykes surrounding Colony Farm, which have recently been taken over by the British Columbia Building Corporation. The Colony Farm dykes are the responsibility of the adjoining land owners.

Table 1.1

Summary of the Capability of the Existing River Channel,
Flood and Erosion Control Works on the Coquitlam River

River Sector	Estimated Discharge at which Flooding will begin to occur	Freeboard Feet	Dyke		Remarks (flooding)	Remarks (vegetation)
			Material of Construction	Foundation		
Coquitlam Lake to Or Creek	13,000 cfs	adequate	-	-		Tall trees on the riverbank which threaten to fall into the river should be felled and removed.
Or Creek to Lincoln Ave. (excluding the Hochaday Road Area)	10,000 cfs to 20,670 cfs at the lower end	2	Till	Till	Flooding of gravel mining settling ponds is threatened at higher discharges.	
Hochaday Road Area	7,500 cfs	nil	-	-	Flooding of land and homes will occur at higher discharges.	
Lincoln Ave. to the Louheed Highway	20,670 cfs	adequate	Pit run gravels	River alluvial fan gravels	Dykes are generally protected with broken rock riprap. Protection should be extended.	Tree growth on the dyke and river bank. Larger trees should be removed. Small trees at the river's edge may be left in place.
Louheed Highway to the CFB Bridge	9,000 cfs	nil	Pit run gravels	River alluvial fan gravels	The right bank will overflow at this discharge. The left bank will have zero freeboard at 20,670 cfs.	
CFB Bridge to Wilson Avenue	12,500 cfs	nil	Pit run gravels and sands	River alluvial fan gravels and sands	The left bank will overflow at this discharge. The right bank is undyked and flooding will begin at 9000 cfs; considerable damage is expected to occur at 12,500 cfs.	Trees on the dyke and river bank. Tall and large trees should be felled and removed. Small trees at the river's edge and on the river bank may be left.
Wilson Avenue to Pitt River Road "Red" Bridge	7,500 cfs	nil	Sandy silts	Sandy silts	Overbank flooding will occur at this discharge. Flooding of buildings in the City will occur at 12,000 cfs.	The dykes and both dyke toes should be cleared of all trees and brush. Dykes may be planted with grass for erosion protection.
Pitt River Road	6,000 cfs	nil	-	-	This discharge will close the sand.	
Coquitlam Indian Reserve No. 2.	12,000 cfs	nil	Pit run gravels	Probably the same as the Colony Farm Sector	Dykes will overflow at three or more locations. If these dykes are not upgraded, at higher flows the Colony Farm north cut-off dyke must be improved.	Some trees on the dyke. These dykes and the dyke toes should be kept clear of all trees and brush. Grasses should be encouraged on the dyke embankment as protection against erosion and sloughing.
Escondido Colony Farms	12,000 cfs	2	Sandy silt, some organic materials present	Layered sand and sandy silts, some organic materials present. Very wet.	Escondido Colony Farms dykes will protect against a flood of the Fraser of 10.7 feet (1001 GEC datum), 10.7 feet at Mission, with 2 foot freeboard. Underseepage is evident at higher water levels.	

Table 4,3

Dyking and Bank Protection Alternatives*

Summary of Estimated Costs by Sectors

Sector	Coquitlam River Flood Discharge		
	20,670 cfs \$	14,200 cfs \$	11,200 cfs \$
Essondale Colony Farm	1,495,000	1,415,000	1,415,000
Coquitlam I.R. #2 Dyke	357,000	148,000	107,000
City of Port Coquitlam Flood protection works	857,000	340,000	303,000
City of Port Coquitlam Erosion control works	565,000	514,000	475,000
District of Coquitlam Scott Creek area	312,000	53,000	41,000
Pitt River Road Improvements to prevent road closure from floodings	192,000	83,000	47,500
District of Coquitlam Left bank at Oxbow area	353,000	352,000	350,000
District of Coquitlam Right bank mile 5.5 to mile 7.2	375,000	335,000	315,000
District of Coquitlam: Adjacent to the CEWE Park	93,000	87,000	80,500
Adjacent to Allard Gravel	50,000	45,000	43,000
TOTALS	4,649,000	3,372,000	3,177,000

*The location of the proposed works are shown on Drawings 5099-6 and 5099-7, Sheets 1 to 4.

COQUITLAM RIVER FLOOD CONTROL PROJECT

- 2.09 From a brief examination of the remedial work, costs, and benefits to be derived from flood control on the Coquitlam River, it appears that the major share risks and major costs are attributable to Port Coquitlam rather than the District. This balance is influenced by the recent switch of ownership of the Colony Farm lands to the British Columbia Building Corporation.

3.00 CONCLUSIONS

- 3.01 The proposal by Port Coquitlam to request an engineering study of improvements to the Coquitlam River is a sound idea. However, by expanding the terms of reference from the original channel clearing and widening to include dyke improvements, it is possible that the scope of the project may have been expanded beyond the likely approval limits of the senior governments. For instance, to design and superintend construction of over five million dollars of channel improvements and dyke construction, could not likely be accomplished within the suggested \$30,000 budget of the proposed study update. Instead, the \$30,000 sum would probably cover the technical survey, evaluation and pre-design phases for a rather more limited set of improvements.
- 3.02 The second effect of including dyke construction in the terms of reference is to change the balance of risk and benefit sharply towards the City of Port Coquitlam. The City tends to benefit more substantially than does the District. This suggests a partnership based on municipal boundaries and river frontage rather than a simple 50:50 sharing of responsibility for the study and for the eventual improvements to the river.
- 3.03 An intermunicipal agreement, of the general form of the 1977 division of the Coquitlam Dyking District (deBouville Slough) is likely required. Under this agreement each party covenants to operate and maintain works within their municipal boundaries so that the integrity of the dyke system as a whole, is maintained.
- 3.04 Section 595 of the Municipal Act RSBC 1979 appears to allow the Council to construct a work under a drainage agreement and to enter into an agreement with the Provincial Government such that:
- (a) the entire cost or part of the cost is borne by a levy on properties protected by the dyking work; or
 - (b) the Council may borrow for construction purposes without the assent of the electorate.

COQUITLAM RIVER FLOOD CONTROL PROJECT

- 3.05 The value of dyking and channel improvements along the Coquitlam River justifies the expenditure of public monies even if grants cannot be obtained from the Federal Government. The special powers of a District municipality make works of drainage and flood protection more easily financed than in a conventional municipality. Consequently, even if Federal and Provincial funds cannot be obtained, Coquitlam should consider entering a program of limited improvements to areas within the District.
- 3.06 The inundation of large areas of the Town Centre area caused by a major dam failure cannot be protected against by flood control works. The Ministry of Environment policy of floodproofing new developments to the elevation of the 200 year storm will also fail under those circumstances. Fortunately, the probability of a catastrophic dam failure is rated by B.C.Hydro as being extremely low.

4.00 RECOMMENDATIONS

- 4.01 The Drainage Committee should endorse the Port Coquitlam plan for updating the flood control sections of the Coquitlam River Plan, and recommend to Council that a joint approach for funding be made to the Provincial and Federal Governments.
- 4.02 The initial scope of work for channel improvements should be given highest priority, because of the immense cost of building dykes.
- 4.03 In the event that no funding assistance is forthcoming, the Drainage Committee should examine whether to initiate a study and plan of improvements using the special powers of District municipalities under sections 595 and others of the Municipal Act. The initial step would be to commission a study along the lines of the Port Coquitlam proposal. Consideration of the study should be given in the 1986 Annual Budget deliberations.

Neil Nyberg

Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw

- Attach:
- A. Summary of Recommendations Coquitlam River Study
 - B. Staff report on study proposal
 - C. Coquitlam Dam Breach Inundation Map
 - D. Intermunicipal Agreement on Dyking Areas
 - E. Section 622 Municipal Act
 - F. Special Provisions: District Municipalities.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: J. L. Tonn
Municipal Manager

DEPARTMENT: Administration

DATE: 1986 March 07

FROM: Neil Nyberg

DEPARTMENT: Engineering

YOUR FILE:

SUBJECT: STORM FLOODING REPORT/1986 FEBRUARY 23, 24, 25,/1986 January 18 OUR FILE: 03 01 06

FOR DRAINAGE COMMITTEE

Reference: A. Engineering memo report 03 01 06 d 1986 February 25
B. Engineering memo report 01 12 03 d 1986 January 18

1.00 BACKGROUND

- 1.01 At the cessation of each emergency mobilization, a situation report is compiled by the Superintendent in charge of the response team. Reference A is a report of the heavy rainfall of the weekend of 1986 February 23-25. Reference B is a memo based on the experience of 1986 January 18.
- 1.02 The major objectives of storm response are:
- . to detect and control true hazards to public safety;
 - . to minimize loss and damage to public and private property which is attributable to malfunction or overloading of Municipal ditches, water courses and storm sewers;
 - . to operate Municipal storm collection, conveyance and pumping facilities under extreme runoff conditions; and
 - . to maintain accurate, complete and timely records of operations.
- 1.03 The 1986 January 18 response lasted about 10.5 hours, involved fourteen persons, and cost in excess of \$4,700. The 1986 February 23-25 response lasted 33 hours, involved twenty-two people at the peak of operations, and cost in excess of \$8,270. We forecast about five such events in every calendar year and budget accordingly. A year of unusually heavy rain or frequent storms tends to increase the total cost of response very rapidly.
- 1.04 We are now in the process of reviewing the detailed plan for storm flooding response so as to make the most effective use of personnel resources and funds during emergency operations.

Submitted for Information.



Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw
Attach.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: N. Nyberg

DEPARTMENT: Engineering

DATE: 1986/02/25

FROM: W. Erwood

DEPARTMENT: Surface Operations

YOUR FILE:

SUBJECT: Flooding and Erosion Control

OUR FILE: 03 01 06

FROM: 2300 Hrs. 1986 / 02 / 23 to 0800 Hrs. 1986 / 02 / 25

RECORD RAINFALL ON TOP OF 20 cms RESIDUAL SNOWFALL LAST WEEK

OPERATIONS LOG:

1. INITIATION:

101: Shift initiated by: R. Nisbet Time: 23:00 - 86/02/23
102: Foreman called by: #1 Firehall Time: 22:30 - 86/02/23

2. MOBILIZATION:

201: Number of men initially called out: 4 Time: 23:00 - 86/02/23
202: Crew increased to: 9 Time: 04:00 - 86/02/24
203: Dispatch centre opened: S. Hill Time: 04:00 - 86/02/24

3. OPERATIONS RECORD:

301: Total number of calls received 81 From: 23:00 To: 08:00
86/02/23 86/02/25

302: Total number of light trucks used: 6 From: 23:00 To: 08:00
86/02/23 86/02/25

303: Total number of heavy equipment: 6 From: 08:00 To: 08:00
86/02/24 86/02/25

304: Number of employees used Minimum: 2 Maximum: 22

305: Breakdown of calls received:

A) Plugged Ditches	<u>8</u>	E) Washed Out Roads	<u>15</u>
B) Plugged C.B.'s	<u>9</u>	F) Landslides	<u>1</u>
C) Flooded Roads	<u>6</u>	G) Plugged Culverts	<u>27</u>
D) Flooded Private Property	<u>11</u>	H) Miscellaneous Calls	<u>4</u>

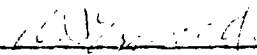
4. RESOURCE CONSUMPTION:

401: Labour Hrs:	197.25 Hrs.
402: Equipment Hrs:	155.50 Hrs.
403: Labour Costs:	\$ 5058.00
404: Equipment Costs:	\$ 1918.00
405: Material Costs:	<u>\$ 1294.00</u>
TOTAL COSTS:	\$ 8270.00

5. ACCIDENTS OR INJURIES:

No accident nor injuries to report this incident.

This report is only costs and actions by Surface Operations Branch.



W. J. Erwood, A.Sc.T.
Surface Operations Superintendent

WJE:sh

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: Jim Hockey DEPARTMENT: Engineering DATE: 1986 01 23

FROM: Neil Nyberg DEPARTMENT: Engineering YOUR FILE:

SUBJECT: HEAVY RUNOFF/STORM RESPONSE PROCEDURES OUR FILE: 01 12 03

Reference: A. Engineering memo 1986 January 18.

1.00 BACKGROUND

1.01 On Saturday, 1986 January 18, we had a storm response operation. Between 0600 h and 1435 h, we had 45 calls referred to the Service Centre and one minor landslide on Shaughnessy Street. The task breakdown included:

- . 11 reports of basement flooding
- . 6 reports of road flooding
- . 6 plugged culverts
- . 6 plugged catchbasins
- . 1 plugged ditch
- . 5 reports of flooding on private property
- . 9 reports of manhole surcharging
- . repeat calls and other miscellaneous items.

1.02 The resources used in about ten and a half hours were estimated to cost \$4,700. Ten men were called out by Surface Operations and three additional men and one more foreman were contributed from Underground Operations.

1.03 One foreman was used to answer telephone calls and to dispatch crews. The date, time and address of calls to the Service Centre were recorded, and the dispatch assignment was noted, but there is no record of the action taken or of the causal factors for each case... except for flooded basement reports.

1.04 Many liability claims result from conditions of heavy rainfall. It is essential that full, complete, timely records be kept as part of the response in order to formulate a defense against liability claims.

1.05 There must be absolute concentration on elimination of repetitive and preventable flooding situations. This means that the cause of every problem which warrants an emergency response should be pinpointed for follow up action. This analysis and reporting is mandatory.

1.06 The very large expenditures involved during storm response must be managed very closely. Only true emergency repairs involving risk to public safety or imminent property damage, should be attempted. Manpower, material and equipment records should be complete and exact.

1986 01 23

Heavy Runoff/Storm Response Procedures

- 1.07 There must be a systematic reconnaissance of all potential problem areas throughout the emergency period. A record of each reconnaissance must be maintained.

2.00 OBJECTIVES

2.01 The objectives of a storm mobilization are as follows:

- A. To detect and control true hazards to public safety.
- B. To minimize loss and damage to public and private property which is affected by municipal ditch, storm sewer and road system performance under extreme runoff conditions.
- C. To operate municipal storm collection, conveyance, pumping facilities under extreme runoff conditions.
- D. To contain storm runoff, where possible, to municipal ditches, storm sewers, natural watercourses and roadways.
- E. To maintain complete, accurate and timely records of:
 - . work requests;
 - . programmed reconnaissance/inspection/operation routines;
 - . work crews/resources/dispatch assignments;
 - . description of work carried out/site conditions;
 - . follow up investigations required; and
 - . resources used.

3.00 ORGANIZATION

3.01 Command and Control

Direction of work forces working under difficult extreme conditions is normally handled by foremen who operate in radio equipped vehicles in the field. Typical duties include:

- Planning and authorizing personnel call outs and mobilization of contractor equipment.
- Organizing personnel into work crews and assigning work territories, maintenance duties, reconnaissance duties, repair duties.
- Preparing and maintaining stockpiled supplies of filled sandbags on pallets, emergency pallets of road signs, flashers, barricades and perimeter tape.
- Personally investigating critical situations in the field and personally directing major recovery operations.

1986 01 23

Heavy Runoff/Storm Response Procedures

3.01 Command and Control - cont'd...

- Keeping senior personnel informed at periodic intervals.
- Auditing field operations and personnel for safe working practice, excessive fatigue, appropriate equipment etc.
- Dealing with the public in difficult or unusual circumstances.

3.02 Radio Dispatch

Effective immediately, use a clerical person with radio skills to carry out dispatch duties when multiple crews are involved in emergency operations over a sustained period. A radio dispatcher should be a first priority for call out when large scale operations are anticipated. The Radio Dispatcher should:

- assist the foreman in callout of personnel by reaching designated individuals by telephone;
- maintain complete records of time of arrival, crew posting, radio call sign, equipment number, and area of operation for each individual on callout;
- issue note books to each crew to record operations during the course of the emergency;
- answer all telephone, fire dispatcher and radio calls, logging each work request or message as to time, identity, caller.
- pass messages to foreman, field crews, contractors, suppliers;
- pass work request information to designated field crews;
- maintain a status board showing:
 - work assignment of each crew;
 - current location of each crew;
 - work backlog for each crew;
- collect reports of work completed by each crew, descriptions of site conditions, contracts made, etc. contained in each crew record note book;
- prepare time cards and check for complete information prior to signature by individuals and approval by foreman.

3.03 Backup and Succession

Where possible, emergency response should be planned with succession in mind, i.e. at a certain point, relief foremen and personnel are brought in to take over from individuals who have already worked extended hours. In terms of supervisors, replacement foreman should

1986 01 23
Heavy Runoff/Storm Response Procedures

3.03 cont'd...

be considered after an initial 10 to 12 hour recall period. Shift schedules for extended response in 12 hour shifts should be developed in the first period if emergency conditions are likely to persist. This means that all personnel should not be recalled for every emergency situation, but rather the first potential shift, i.e. one Surface foreman, one Underground foreman. Where key decisions must be made during the first response as to the duration and scale of operations, one Superintendent should be called in, with provision for a replacement Superintendent at the end of the first working period.

3.04 Technical and Engineering Support

In cases where landslides, sloughing or other major damage has occurred, or potential damage to roads, bridges and structures is anticipated, technical support should be called in.

Drainage Technician, Municipal Inspectors: minor sloughing or landslide, localized flooding.

Engineering Superintendent: structural damage, major flooding, landslide.

Transportation Technologist: major traffic rerouting or evacuation.

3.05 Mechanical Support

Where extended operations are anticipated, one or more mechanics may be called in to repair and service equipment.

3.06 Reporting

Where sustained emergency operations are underway, status reports should be given every four hours, or in the event of any major incident or loss, by telephone to

Superintendents
Operations Division Manager
Municipal Engineer.

4.00 RECONNAISSANCE AND SURVEILLANCE

4.01 Major intakes, outlets, bridges, culverts are areas known to be susceptible to flooding and must be patrolled regularly during heavy rainfall and runoff. Immediately problems are detected which cannot be handled by the patrol, a backup crew should be dispatched to remove blockages or effect repairs.

4.02 Unstable or sloughing slopes known to impinge on roads, walkways, public buildings, must be patrolled regularly. Immediately problems are detected or anticipated, the area of affection is to be signed and blocked off. Backup is then requested.

1985 01 23
Heavy Runoff/Storm Response Procedures

5.00 RECOVERY PERIOD

5.01 Immediately following the emergency operation (first working day) a debriefing meeting will be held, chaired by the Operations Division Manager. All events will be reviewed as to:

- effectiveness of response;
- appropriateness of scale;
- economy of operation;
- prevention of repetitive problems;
- completeness and accuracy of records; and
- potential liability problems.

5.02 An incident report will be completed and delivered on the first working day after cessation of emergency response.

5.03 Repair or restoration should normally be done during regular working hours on a planned and scheduled basis. Emergency response repairs should be limited to securing the site or to critical safety tasks.

6.00 RISK MANAGEMENT

6.01 The debriefing report shall be reviewed by the Drainage Technician immediately it becomes available. Each site will be examined to determine necessary damage/risk mitigation measures.

6.02 Where a liability claim is possible, a separate incident report will be compiled for the Operations Division Manager for onward transmittal.

7.00 IMPLEMENTATION

7.01 Identify and assign emergency dispatches. Arrange for tours of fire and police dispatch operations for familiarization. Set up dispatching practice sessions during normal working hours. Draw up reclassification questionnaire.

TARGET DATE: 1986 FEBRUARY 10

ACTION: DOUG WILLIAMS

7.02 Identify emergency traffic control barricades, flashers, signs; group into two pallets for emergency deployment; palletize sand-bags, arrange speeding loading procedure to place pallets in dump boxes or light trucks as required.

TARGET DATE: 1986 JANUARY 31

ACTION: DOUG WILLIAMS
TIM MURPHY

1986 01 23
Heavy Runoff/Storm Response Procedures

7.03 Prepare plans and lists of reconnaissance and inspection checkpoints for flooding, sloughing and other potential incidents.

TARGET DATE: 1986 JANUARY 31

ACTION: BILL ERWOOD
SEVER RONDESTVEDT

7.04 Prepare supervisory succession list for emergencies.

TARGET DATE: 1986 JANUARY

ACTION: JIM HOCKEY
PETER GILLIS

7.05 Acquire command and control VHF portables from the Fire Department if and when such are available.

TARGET DATE: 1986 JULY 30

ACTION: DOUG WILLIAMS
RICHARD WHITE

7.06 Make weekly status reports on progress and completion.

TARGET DATE: 1986 JANUARY 27,
1986 FEBRUARY 3,
1986 FEBRUARY 10.

ACTION: JIM HOCKEY



Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw

c.c. Tony Edwards
Sever Rondestvedt
Monty Hurd
Vic Fraser

Jim Hockey
Peter Gillis
Bill Erwood
Doug Williams

Norm Staff
Bill MacDonald
Romy Nisbet
Chester Evans

Tim Murphy
Richard White
Colin Walker
Jack White

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: J. L. Tonn
Municipal Manager

DEPARTMENT: Administration

DATE: 1986 March 07

FROM: Neil Nyberg

DEPARTMENT: Engineering

YOUR FILE:

SUBJECT: ANNUAL MEETING: COQUITLAM DYKING DISTRICT

OUR FILE: 01 10 01

FOR DRAINAGE COMMITTEE1.00 BACKGROUND

1.01 The attached report on the Dyking Commission was compiled by
Operations Administrator, Jim Hockey.

For information.



Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw

Attach.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: N.W. Nyberg DEPARTMENT: Engineering DATE: 1986 02 12
FROM: H.F. Hockey DEPARTMENT: Engineering YOUR FILE:
SUBJECT: ANNUAL TAXPAYERS' GENERAL MEETING OUR FILE: 01 10 01
OF THE COQUITLAM DYKING DISTRICT.

1:00 Location, Date and Time:

Minnekhada Lodge
February 11, 1986
8:00 p.m.

2:00 Present:

R.J. Henry, P.Eng.,
Assistant Inspector of Dykes
Two Taxpayers of the Dyking District
A representative of the G.V.R.D. Parks
J. Hockey, Coquitlam District representative

3:00 Discussion:

- 3:01 Mr. Henry reviewed the "Statement of Revenue and Expenditures, January 1, 1985 to December 31, 1985" and the "Financial Status Statement, Coquitlam Dyking District - December 31, 1985", copies of which are attached.
- 3:02 Mr. Henry briefly reviewed the maintainance work conducted during the year which consisted mainly of dyke brushing and ditch cleaning from Cedar Drive to the pump station.
There was no major work planned for 1986. The program of brushing and ditch cleaning will be continued extending onwards from the pump station.
- 3:03 The Dyking Commissioner is going to review the practice of granting permission to private business people to dump acceptable waste along the dyke for widening and sloping puproses in view of the problems they experienced recently in this regard.

TO: N.W. Nyberg
FROM: H.F. Hockey

Page 2

1986 02 12

RE: Annual Taxpayers' General Meeting
of the Coquitlam Dyking District.

3:00 Discussion (Continued):

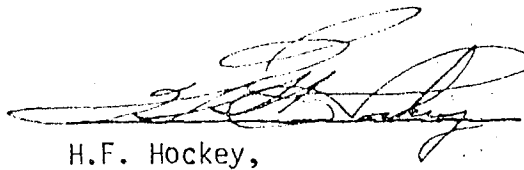
3:04 Due to the obvious lack of interest in the annual meeting, consideration will be given as to whether it is a worthwhile undertaking. Problems appear to be resolved satisfactorily on an ongoing basis whereby the residents within the Dyking District contact the Commissioner's office directly.

4:00 Conclusion:

4:01 The meeting adjourned at 8:45 p.m.

Att'ds.

HFH/SN



H.F. Hockey,
Operations Administrator.

cc W. Erwood
P. Gillis
S. Rondestvedt

COQUITLAM DYKING DISTRICT

STATEMENT OF REVENUE & EXPENDITURE

JANUARY 1, 1985 to DECEMBER 31, 1985

REVENUE

Tax Levies	\$ 11,339.35	
Interest on Taxes	147.19	
Bank Interest	740.16	
Less Outstanding Taxes	<u>(5,140.08)</u>	
		\$ 7,086.62

EXPENDITURE

Administrative cost recovery	\$ 150.00	
Renewal Reserve Payment	500.00	
Dyke & Pump Operation & Maintenance		
Hydro	\$ 1,811.28	
Beaver removal	186.00	
Ditch cleaning		
& dam removal	1,540.00	
Trash rack cleaning	127.60	
Brush clearing	4,940.00	
Dyke grading	315.00	
Annual meeting	<u>175.00</u>	
	\$ 9,094.88	
		\$ 9,744.88

Excess (Deficit) of Revenue over Expenditure (\$ 2,658.26)

FINANCIAL STATUS

COQUITLAM DYKING DISTRICT - DECEMBER 31, 1985

1. OPERATING

Current Account #23-00710	\$ 2,045.75	
Savings Account #95-09062	<u>\$ 14,143.97</u>	
		\$ 16,189.72
Taxes Owing - 1984	\$ 196.06	
- accrued interest from Sept. 30/84-Dec. 31/85 (457 days)	\$ 14.73	
Taxes Owing - 1985	\$ 4,944.02	
- accrued interest from Sept. 30/85-Dec. 31/85 (92 days)	<u>\$ 74.77</u>	
		<u>\$ 5,229.58</u>
		<u><u>\$ 21,419.30</u></u>

2. TERM DEPOSITS - RENEWAL RESERVE

Savings Account #95-09267		\$ 1,094.16
Term Deposit:	\$ 83,000.00	
\$83,000 @ 7.5% for 182 days accrued interest Oct. 15/85 to Dec. 31/85 (77 days)	<u>\$ 1,313.22</u>	
		<u>\$ 84,313.22</u>
		<u><u>\$ 85,407.38</u></u>

DISTRICT OF COQUITLAM

Inter-Office Communication

TO:	J. L. Tonn Municipal Manager	DEPARTMENT: Administration	DATE: 1986 March 07
FROM:	Neil Nyberg	DEPARTMENT: Engineering	YOUR FILE:
SUBJECT:	REQUESTS FOR DRAINAGE ENCLOSURES AND SUBSIDIES: 1986		OUR FILE: 05 01 03

FOR DRAINAGE COMMITTEE

Reference A. Letter d 1985 April 18 re 713 Edgar Avenue
 B. Letter 05 01 03 d 1986 March 06: 250 Hart Street
 C. Memo 1985 June 24 re: 432 Hickey Street.
 D. Ditch Enclosure: Marathon Court

1.00 BACKGROUND

1.01 Each year, the Municipality receives requests to enclose ditches and water courses across private property. Under Section 3.0 of the Amending Bylaw 1254 to the Subdivision Control Bylaw No.1023, the District may share with the owners the cost of certain components of the Municipal Drainage System. In other cases, however, property owners who want to eliminate existing water courses across their lots; or improve the subdivision potential of their lands, apply to the District for subsidy or improvement from public funds. Where these projects do not clearly fall under the Subdivision Control Bylaw stipulations, individual consideration of the applications is warranted.

1.02 There are four outstanding subsidy or enclosure requests:

- . 713 Edgar Avenue;
- . 250 Hart Street
- . 432 Hickey Street; and
- . 310 Marathon Court.

2.00 DESCRIPTION

2.01 713 Edgar Avenue

This application is for an upset cost of \$15,000 to enclose a storm sewer main across private lands. The enclosure would allow the owner to subdivide and otherwise improve the appearance and market value of the land. Reference A is attached.

Requests for Drainage Enclosures and Subsidies: 1986

2.02 250 Hart Street

This application is for an estimated enclosure of 45 metres of open ditch across 250 Hart Street and relocation of a storm sewer outfall at an estimated cost of \$12,000. The enclosure would allow the owner to subdivide and otherwise improve the appearance and market value of the land. Reference B is attached.

2.03 432 Hickey Street

This application is for an enclosure estimated to cost \$7,000. The owner of 432 Hickey has offered to pay \$4,000 towards enclosure. The enclosure would improve the appearance and market value of the land.

2.04 310 Marathon Court

This is a District initiated enclosure of 30 metres in length, in settlement of a long-standing dispute among adjoining owners of property on Marathon Court and the District. It appears an error was committed in establishing a right-of-way for drainage many years ago, and the resolution lies with enclosing the ditch, at an estimated cost of \$2,600.

3.00 RECOMMENDATIONS

- 3.01 That the Drainage Committee review these applications for possible onward transmittal to the Finance and Audit Committee.
- 3.02 That 310 Marathon Court be considered for 1986 implementation.



Neil Nyberg, P. Eng.
Municipal Engineer

NWN/mw
Attach.

Mr. & Mrs. Mike Simic
713 Edgar Avenue
Coquitlam, B.C.
V3K 2J3

1985 : 04 : 18

DISTRICT OF COQUITLAM
1111 Brunette Avenue
Coquitlam, B.C.
V3K 1E9

1985
District of Coquitlam
Administration

Attention: Mr. N. Nyberg, P. Eng.
Municipal Engineer.

Dear Sir,

Subject: 2 lot subdivision at 713 Edgar Ave., Coquitlam, B.C.
Storm Sewer.

This letter is a request to the Municipality for sharing of the costs of storm sewer trunk main extension through the subject subdivision.

Our intentions are, during the months of July and August, 1985, to proceed with the property subdivision according to plans approved by your department and prepared by SIMIC ENGINEERING.

The Municipality by-law No. 1254, 1982 enables the District to share with the owner the costs of storm sewer main when the following three conditions are met:

- a) The proposed storm sewer is part of the Municipal trunk system.
- b) The pipe diameter is larger than 600 mm and,
- c) The storm sewer services area outside the owner's lands.

Since the proposed storm sewer enclosure meets all three conditions, it is our belief that the Municipality is responsible for the costs of this storm main extension.

In the fall of 1984, the owner invited tenders to do this work. The lowest tendered price received, \$ 14,510.50 was from Tope Contracting Ltd. and the highest price was from Corside Construction Ltd. in the amount of \$ 24,000.00

Based on last fall's tenders it would be appropriate that the District's share would be set at an upset limit of \$ 15,000.00

ENGINEERING DEPT.		
COPIES TO:		
RECEIVED		
APR 22 1985		
CIRC.	INT.	DATE
ALW/N	W	850423
LTS		

...//... - 2 -

see memo to file

As the owners we will contract the local trades, obtain all performance maintenance and liability bonds and insurances. We propose to keep records of all cost and provide the District with all copies of subsequent invoicing to substantiate the proposed costs.

In conclusion may we point out that the storm service for the proposed new lot could be serviced from the existing Storm Sewer on Edgar Avenue at nominal costs. The additional costs to enclose the Municipal Drainage System discharging through the property are considered an unreasonable hardship in terms of normal Subdivision Servicing.

In view of the foregoing we trust you will acknowledge our position and accept responsibility for the drainage-costs outlined in this letter of request.

Yours truly

John H. Simic

Mr. and Mrs. M. Simic
Owners.

Please submit three sets of your revised plan for our review.

(four copies)

John H. Simic
1212 W. 12th St.
Chicago, Ill.

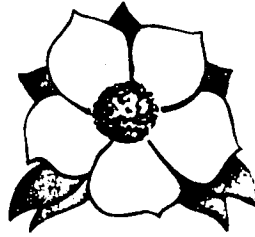
DISTRICT OF COQUITLAM

1111 Brunette Avenue
V3K 1E9

Mayor: L. Sekora

Coquitlam, B.C.
Phone 526-3611

1985 09 30



Engineering Dept.

File: 05 01 03

Mrs. Thelma Pipe
250 Hart Street
Coquitlam, B. C.
V3K 4A6

Dear Mrs. Pipe:

SUBJECT: RELOCATION AND ENCLOSURE OF WATERCOURSE

We have reviewed your request for relocation and enclosure of the watercourse on your property.

The Engineering Dept. has no funds available in the current budget to perform this work. We will, however, consider this project when we submit the Engineering Department proposals for the 1986 Annual Budget.

We would like to thank you for your patience in this matter.

Yours truly,

A handwritten signature in black ink, appearing to read "S. Rondestvedt". The signature is written in a cursive style with a large, sweeping initial "S".

S. Rondestvedt, A.Sc.T.
Engineering Technologist III

VF: ljs

cc: Ted Klassen: reference #20

1985 08 20
file: 05 01 03

PROJECT DESCRIPTION

STORM OUTFALL RELOCATION AND ENCLOSURE
250 HART STREET

BUDGET: For consideration in the 1985 amended budget.

SCOPE OF WORK:

Divert storm outfall 13 m south at the east property line of 250 Hart Street. Enclose 45 m of open ditch on this property. Obtain easement from property owner.

JUSTIFICATION:

With our outfall in its present location, it is impossible to develop this property to its full potential. We have enclosed all of this drainage course except the portion on this property. The property owner is willing to give an easement.

COST ESTIMATE:

Based on unit costs from 1985 contracts, it is estimated this work would cost \$12,000.00.

DISTRICT OF COQUITLAM

Inter-Office Communication

TO: Neil Nyberg DEPARTMENT: Engineering DATE: 1985 06 24
FROM: Vic Fraser DEPARTMENT: Engineering YOUR FILE:
SUBJECT: REQUEST FOR CREEK ENCLOSURE, 432 HICKEY STREET OUR FILE: 05 01 27

Mr. Foo requested that the District enclose the natural watercourse which runs through his property. Initially he offered to pay for this installation if the District would arrange to have it carried out.

A preliminary estimate was done using civil prices provided by John Meisl. This estimate amounts to \$7,000. When Mr. Foo was advised of our estimated cost he said he was willing to pay \$4,000, plus look after any tree removal and he would look after top soil and landscaping in the work area.

There is an existing right-of-way covering this watercourse through Mr. Foo's property.

An application would have to be made to the Water Management for approval to carry out this work.

Mr. Foo is now asking if the District would be willing to participate in this installation, and if it could be done this year.


Vic Fraser
Engineering Technician

VF/mw

PROJECT DESCRIPTION

1985 12 12

Item: DITCH ENCLOSURE: 310 MARATHON COURT

File No. 05 04 06

Account No. 532344

Finance: General Revenue

Schedule: Engineering -
Construction -

PROJECT OBJECTIVES:

To meet District obligation for ditch enclosure at 310 Marathon Court.

SCOPE OF WORK:

Install 30 m of 250 mm Ø storm sewer in a 3 m easement at the east edge of the property. System will pick up 2 existing catch basins and property drainage service and tie into an existing storm sewer at the southern edge of the property.

JUSTIFICATION:

Two catch basins on Marathon Court drain into the ditch on 310 Marathon Court. This ditch was to be enclosed at the time of development but due to a misunderstanding between the developer, the District and the Owner, this work was not completed. It would be cheaper and easier to enclose this ditch than construct an alternate system on the street allowance. Mr. and Mrs. West have signed a consent for easement.

COST ESTIMATE: ENR = 4200

Engineering	\$ 300
30 m of 250 mm Ø Pipe	1,500
Connections to Catch Basin	300
Restorations	500
	<u>\$2,600</u>

PROJECT DESCRIPTION APPROVED BY: 