

ITEM 2
MANAGER'S REPORT NO. 23
COUNCIL MEETING 90/03/26

RE: FIRE UNDERWRITERS SURVEY OF BURNABY'S FIRE DEFENSES CONDUCTED FROM
1989 MARCH 06 - 22 FOR FIRE INSURANCE GRADING PURPOSES

MUNICIPAL MANAGER'S RECOMMENDATION:

!. THAT the recommendation of the Fire Chief be adopted.

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1990 MARCH 08

TO: DIRECTOR ADMINISTRATIVE AND COMMUNITY SERVICES

FROM: FIRE CHIEF

SUBJECT: FIRE UNDERWRITERS SURVEY OF BURNABY'S FIRE DEFENSES CONDUCTED FROM
1989 MARCH 06 - 22 FOR FIRE INSURANCE GRADING PURPOSES.

PURPOSE: TO PROVIDE THE CORPORATION OF BURNABY WITH AN UP-TO-DATE SURVEY OF
ITS FIRE DEFENSES FROM THE INSURANCE INDUSTRY'S PERSPECTIVE.

RECOMMENDATION:

1. That the attached Fire Underwriters Survey Report be received for
information purposes.

BACKGROUND:

Fire Underwriter surveys are conducted every seven to 10 years to
establish a Classification Rating for a municipality under the
Commercial Code System and to review the condition of a municipality's
fire defenses. This information is one of the factors used to establish
the rates the insurance industry charges. Burnaby's last survey was done
in 1980 April allotting Burnaby a Classification Rating of 1218 pts. and
a Code Classification of 3. An application was made to the Fire Under-
writers Survey on 1987 November 09 to place Burnaby on the waiting
list for an up-to-date survey. The survey was conducted between
1989 March 06 - 22 resulting in a grading of 1461 pts. and a Code
Classification of 3.

THE SURVEY:

The Survey covered several topics including Water Supply, Fire
Department, Fire Service Communications and Fire Safety Control. There
are several recommendations for improvement to the fire protection
provided by The Corporation of Burnaby to its citizens.

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Two recommendations considered by the Surveyor to be the most important are: **106**

1) The number of qualified Operators on duty in the Communication Centre.

It is recommended that two qualified Operators are to be on duty at all times. (This is scheduled to take place with the building of No.7 Fire Hall and the relocation of No. 1 Fire Hall Fire Operations, with Council approval.)

2) The frequency of fire inspections.

It is recommended that commercial properties be inspected twice yearly, and buildings with high life hazard occupancies be inspected three times per year. (Section 26 (2) of the Fire Services Act R.S.B.C. 1976 c.133, which requires inspections of buildings used as a place of public resort to be inspected every two months, was repealed effective 1989 June 30.)

The Office of the Fire Commissioner is presently working on a guideline for municipalities to help in establishing a system of inspections. (We received this information 1990 February 22, and a review of the frequency of inspections for The Corporation of Burnaby is being done.)

The Hydrant Flow Test results identified two sites of concern:

1) Test No.1 - North Fraser Way and Fraser Wood Street.
Council approval has already been received to supplement the water system in this area to provide adequate fire flows. In the near future, construction will commence on a new connection and pressure regulating chamber on the existing high pressure G.V.W.D. main on Marine Way. This additional supply will alleviate the deficiency identified by the Hydrant Flow Test.

2) Test No.10 - Barnet Highway.

The tests conducted at this site will be done again. It is felt there was insufficient demand put on the hydrant to activate the booster pump on this section of the water main.

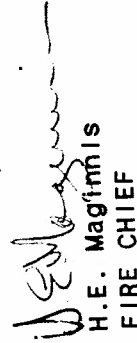
The Survey also identified several hydrants to be below the elevation of the surrounding ground. There were 200 hydrants raised to the proper elevation in 1989. However, this is an on-going problem with landscapers and homeowners continually installing Berms for their privacy and affecting the grade level of hydrants.

SUMMARY:

While the survey makes several recommendations for improvement to the fire protection of Burnaby, it does state that fire defenses are adequate with management and staff well trained. Also the Engineering Water Division records management is well done with the water supply in most cases adequate, and management and staff experienced and competent.

The majority of the Survey's concerns will be addressed with planned improvements to the Fire Department, and the completion of Metrotown and other major projects that have demanded extensive use of the Engineering Department's resources.

Mr. Ian Josephson A.Sc.T. Surveyor, Pacific Region, will be in attendance at the 1990 March 26 Council meeting to discuss his report.


H.E. Maginnis
FIRE CHIEF

HEM:mc
Attachment

FIRE UNDERWRITERS SURVEY

A SERVICE TO THE INSURANCE AND FINANCIAL INDUSTRIES

Fire Insurers' Advisory Organization Inc.

Ian G. Josephson, A.Sc.T.
Surveyor, Pacific Region

350-409 Granville St., Vancouver, British Columbia V6C 1W5
Tel: (604) 681-3111 • Fax: (604) 688-6986

RWRITERS SURVEY

FOR ALL MUNICIPALITIES

n, 409 Granville Street, Vancouver, British Columbia V6C 1W5 (604)681-3111

Received
15 11 89
Municipal Administration

18 December 1989

The Corporation of the District
of Burnaby
4949 Canada Way
Burnaby, BC
V5G 1M2

Attention: Mr. Ernie Olson, Municipal Manager

Gentlemen:

A survey of Burnaby's fire defenses was conducted from 6-22 March 1989 by Fire Underwriters Survey for fire insurance grading purposes.

We have completed the survey results analysis and offer the following comments for the consideration of the Municipal Administration and Council.

Water Supply

Water is supplied to Burnaby by the Greater Vancouver Water District. Supply combined with storage is considered adequate to deliver a calculated basic fire flow of 14,500 litres per minute (3200 Imperial gallons per minute) for a duration of 3.2 hours. This flow is in addition to domestic consumption at the maximum daily rate.

Forty-one hydrant waterflow tests were conducted in representative areas throughout Burnaby to determine the adequacy of supply. Please refer to the enclosed "Hydrant Flow Test Results" sheets for details. The adequacy of supply is determined by comparing the two far right columns titled "Calculated Flow at 150 kPa (20 p.s.i.)" and "Waterflow Required at 150 kPa (20 p.s.i.)". Most locations tested revealed an adequate supply. However, deficiencies observed at tests 1, 8, 10, 19, 21 and 23 ranged from 41% to 63%.

Maintenance and condition of pump stations and reservoirs is commendable. These facilities are checked frequently and records appear satisfactory. The availability of standby diesel generators and internal combustion drivers ensures continuity of an adequate supply during power outages, principle main or valve breaks, or pump breakdowns. A central monitoring station at the public works yard is manned 24 hours a day. This provides reliable and effective monitoring of waterworks system operations.

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C.S. DIR. ADMIN. & COMM. SERV.
~~DIR. PLNG. & BLDG. INSP.~~
FIRE CHIEF

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Mr. Ennie Olson
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Installation of water mains appear to conform with recommended standards. Water main flushing is an important aspect of water distribution maintenance and its continued practice is encouraged.

Hydrant and valve spacing and distribution is fairly good. Detailed hydrant and valve maintenance records are kept though the inspection frequency is below recommended standards. Unsatisfactory conditions were noted in approximately 78 per cent of the hydrants exercised during testing operations. These deficiencies included: external leaking, set too low from grade, paint required to enhance visibility, stiff operating spindle, etc. Hydrants are not color-coded to indicate the available water supply. Major valves in the water system (eg. pressure reducing, etc.) are checked frequently and records appear satisfactory.

Plans and records vital to the operation of the waterworks department are safely stored in a fire resistive vault or are in duplicate at different locations.

Management and operations personnel of the waterworks department are competent and experienced.

Fire Department

The Fire Chief and his senior staff provide progressive leadership.

Since our last survey, existing fire station locations have required re-examination due to changing growth patterns in the community. The 1982 "Fire Prevention and Control Plan" identified the needs of the community and is fully implemented should help to achieve balanced and effective fire protection.

Our assessment of the fire suppression resources needed to control and extinguish major fires reveals the number of pumpers and aerial apparatus is adequate. However, manning is slightly below our recommended level.

Available pumping capacity is adequate. Apparatus is not tested from draft on an annual basis. These tests are vital to ensure pumping apparatus complies with their design requirements.

Fire apparatus is maintained on a regular basis and records appear satisfactory. Maintenance staff are well qualified and experienced. A fully equipped maintenance facility is provided at fire station 1. Aerial apparatus is non-destructive tested annually. The formal program

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of replacing fire apparatus on a scheduled basis is commendable. Apparatus is well designed and meets recommended standards.

The complement of tools and minor equipment carried on the fire apparatus is generally good.

Fire hose is pressure tested annually and records are satisfactory. Hose drying and storage facilities are adequate.

The training program is directed by the chief training officer. A more formalized and detailed training program is under development. Training facilities are provided at fire station 1 though a pumper test pit is needed.

Personnel attend courses and workshops offered both internally and externally. This is a very positive aspect of the training program. The availability of management courses at a local college is beneficial for senior personnel wishing to upgrade their administrative skills. Training aids including codes, standards, video equipment, etc. are generally good.

The pre-fire planning program produces good quality plans. A full-time pre-fire planning officer would help to improve the maintenance and expansion of this very important program.

Fire department records appear to be current and complete.

The Greater Vancouver Regional District (G.V.R.D.) mutual aid agreement has been in effect since 28 May 1982.

Other aspects of the fire department administration and operation appear satisfactory.

Fire Service Communication

Receipt of fire alarms is almost totally dependent on the commercial telephone system. Loss of this service would seriously disrupt the prompt receipt of emergency calls. A formal contingency plan with BC Telephone would be an asset to reliable communications.

The communication centre at fire station 1 is properly maintained and operated but lacks adequate protection from potential disruptions such as fire or vandalism. During the survey, detailed plans were underway to relocate the alarm room to a larger, more secure room within fire station 1. The on-duty operators in the communication centre are proficient with their duties. Based on the number of emergency calls received annually (approximately 8000), the number of on-duty operators is deficient.

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Fire emergency calls are automatically recorded at their time of receipt.

Fire apparatus are equipped with mobile radios. A sufficient number of portable radios exist to communicate on the fire ground.

Implementation of the 9-1-1 system in 1990 will be a progressive step towards more reliable and effective communications.

Fire Safety Control

Provincially adopted modern building, fire prevention and other regulatory codes are enforced. The building inspection department provides an acceptable level of building construction control.

Building and fire department personnel are working together to ensure all new construction meets applicable codes.

Fire prevention is of equal importance to fire suppression. The shift from a defensive fire fighting role to an offensive fire prevention-orientated role is fast becoming the accepted standard in many Canadian municipalities. Since our last survey, the available manpower in the fire prevention division has not increased in proportion to the number of risks to be inspected. As a result, the frequency of complete routine building fire safety inspections is less than recommended, especially in the commercial and industrial occupancies. The appointment of the public education officer is a positive development though additional fire prevention staff should be recruited to assist with the inspection and public education programs.

The use of fire suppression crews to carry out basic fire prevention inspections appears to be working well and is encouraged.

Fire prevention records are being computerized and storage facilities are located at the Municipal Hall.

Effective fire prevention and public education programs help to increase public awareness of the fire problem and reduce the number of fires.

General Comments

We have attached a recommended improvement program the District may wish to use in future planning. The recommendations offered may be helpful when viewed in conjunction with more specific studies of local needs conducted

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by consultants, staff or other parties. Fire protection decisions should be based upon an analysis of local priorities and financial capabilities.

We would be pleased to provide assistance with matters relating to fire protection and prevention.

May we express our appreciation for the willing and courteous service provided by the various department officials and staff during and after the survey.

Yours truly,

Ian Josephson

Ian Josephson, A.Sc.T.
Surveyor
Pacific Region

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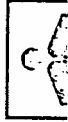
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Survey Recommendations

For *The Corporation of the District of Burnaby*

Date *18 December 1989*

"The following recommendations are directed toward the elimination of significant deficiencies in the fire protection facilities of the municipality relative to the widely recognized standards of Fire Underwriters Survey. They are offered to the municipality to assist officials in providing improved conditions with respect to control of life and property losses in the community. Any recommendations printed in capital letters are considered to be of prime importance."



Recommendations - District of Burnaby, BC

Water Supply

1. Hydrant water flow tests conducted during the survey revealed an adequate supply in most locations tested. Please refer to the enclosed "Hydrant Flow Test Results" sheets for details.
Adequate volumes of water at sufficient pressures are vital to a fire department's fire ground operations. Future water supply system upgrading should consider meeting or exceeding the fire flows shown in the last column of the flow test sheets.
2. Hydrants should be installed with a minimum grade clearance of 0.30 m (12"), preferably 0.46 m (18"), to allow full rotation of hydrant wrenches during opening and closing operations.
3. Hydrants should be color-coded according to their rated capacities.
Please refer to the National Fire Protection Association (NFPA) 291-1988 edition "Fire Flow Testing and Marking of Hydrants" for details.
4. Hydrants should be inspected after use and on a semi-annual basis (eg. Spring and Fall). Inspection should include operation at least annually. Servicing should be performed as the need arises or according to hydrant manufacturer's recommendations.
From a fire protection standpoint, hydrants constitute one of the most important components of the water supply system. Since hydrants are used relatively infrequently, it is extremely important they be periodically inspected and operated to ensure their reliability.
5. Well spaced and situated fire hydrants minimize the amount of fire hose the

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fire department must lay at an emergency. The maximum recommended spacing of hydrants in industrial, commercial, institutional and multi-family residential areas is 100 metres (300 feet); in single family residential areas, 200 metres (600 feet) is recommended.

6. Gate valves in the distribution system should be exercised annually. This inspection program will help to ensure valves are kept fully open, except those required to be closed by system design characteristics. Regular valve inspection and maintenance also helps to ensure reliability of function.

7. Hydrants should be installed with a pumper outlet if:

i) Fire flows exceed 4500 litres per minute (1000 Imperial gallons per minute).
eg. commercial, industrial and institutional areas

ii) Pressures are low.

8. The program of replacing small diameter mains (eg. 4" or less) with larger pipe and looping dead-end mains should be continued as finances permit.

A copy of our publication titled "Water Supply For Public Fire Protection" is enclosed. This document contains a summary of the major recommendations we make concerning municipal water supply systems. Future waterworks system design upgrading should consider meeting the recommendations offered in this text.

Fire Department

1.1 Reliability is vital in the operation of fire apparatus. Pumpers should be service tested from draft annually and after repairs or extended use at fires. These pump tests consist of the following:

i) Priming Test

Dry pumps should take suction and discharge water with a lift of at

continued.....



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least 3 meters (10 feet) through 6 meters (20 feet) of hard suction hose within 30 seconds.

ii) Capacity Test

Fire apparatus pumps should deliver their rated capacity against a net pump pressure of 1000 kPa (150 p.s.i.) for 20 minutes.

iii) Pressure Test

Fire apparatus pumps should deliver 50% of their rated capacity against a net pump pressure of 1700 kPa (250 p.s.i.) for 10 minutes. Detailed records of test results should be kept.

Please refer to our attached publication titled "Fire Stream Tables and Testing Data for Fire Department Use" for further information on testing procedures.

1.2 A pumper test pit is needed to carry out the above tests.

Please refer to the attached bulletins titled "Fire Department Pumper Test Pits" and "Construct Your Own Pump Testing Facility".

2. A comprehensive training program is essential to the development and maintenance of efficient and effective fire fighting operations. Training records should be detailed and current.

Please refer to the following National Fire Protection Association (N.F.P.A.) standards for guidance purposes:

- i) N.F.P.A. 1001 - Fire Fighter Professional Qualifications - 1987 edition
- ii) N.F.P.A. 1021 - Fire Officer Professional Qualifications - 1987 edition
- iii) N.F.P.A. 1401 - Fire Protection Training Reports and Records - 1989 edition

3. The pre-fire planning program should be expanded to provide detailed plans of all buildings except four-family dwellings or smaller residential

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structures. Current and detailed plans, notes and sketches should be used in company training drills and be readily accessible to officers in command at fires.

Consideration should be given to appointing a full-time pre-fire planning officer to co-ordinate and expand this essential program.

Fire Service Communications

1. BASED ON THE NUMBER OF CALLS RECEIVED ANNUALLY, AT LEAST TWO QUALIFIED OPERATORS SHOULD BE ON DUTY IN THE COMMUNICATIONS CENTER. THIS ADDITIONAL OPERATOR IS NECESSARY TO MORE EFFECTIVELY MANAGE THE WORKLOAD, PARTICULARLY DURING PEAK PERIODS.

2. A contingency plan should be established between BC Telephone and the fire department in the event of a partial or total failure in the communication system.

If there is a disruption, fire emergency telephone calls could be transferred to an alternate location (call redirection). Fire apparatus could be dispatched by radio from this emergency location until the failure is discovered and repaired.

3. Future fire service communications upgrading should meet the intent of the National Fire Protection Association (N.F.P.A.) standard 1221-1988 edition titled "Installation, Maintenance and Use of Public Fire Service Communication Systems".

Fire Safety Control

1. A COMPLETE FIRE PREVENTION INSPECTION OF ALL COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL PROPERTIES SHOULD BE CONDUCTED AT LEAST TWICE A YEAR TO

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ASSIST IN KEEPING PREVENTABLE LOSSES AT AN ACCEPTABLE LEVEL. HIGH HAZARD AND SEVERE LIFE HAZARD OCCUPANCIES SHOULD BE INSPECTED AT LEAST THREE TIMES A YEAR. SUITABLE FOLLOW-UP PROCEDURES ARE VERY IMPORTANT.

2. ADDITIONAL QUALIFIED FIRE PREVENTION PERSONNEL SHOULD BE RECRUITED TO MEET THE INSPECTION FREQUENCY RECOMMENDED IN #1 (ABOVE).

3. The use of suppression crews to supplement the inspections carried out by the fire prevention division is encouraged.

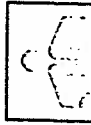
These inspections will:

- i) Ensure acceptable life safety conditions.
- ii) Familiarize fire fighters with buildings and potential hazards which may exist in the community.
- iii) Assist in pre-fire planning.
- iv) Determine the adequacy and maintenance of fire protection equipment.
- v) Encourage public and fire department co-operation.
- vi) Ensure that fire prevention/protection by-laws are properly enforced.

4. Records vital to the satisfactory operation of the fire prevention and building inspection departments should be adequately protected from loss by fire or other causes. Important files should be stored in a fire resistant vault or duplicated and stored in separate buildings.

5. The main frame computer room at the municipal hall should be upgraded to meet the requirements of National Fire Protection Association (N.F.P.A.) 75 titled "Standard For The Protection Of Electronic Computer/Data Processing Equipment" 1989 edition.

Adequate protection for this important facility is essential.



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I have enclosed a complimentary copy of our publication titled "Evaluation Of Public Fire Protection". This text summarizes the recommendations we make concerning municipal fire departments and is intended to be used as a planning guide.



HYDRANT FLOW TEST RESULTS

FIRE UNDERWRITERS SURVEY



A SERVICE TO INSURERS AND MUNICIPALITIES

HYDRANT LOCATIONS	HYDRANT PRESSURES		WATER FLOW OBTAINED	CALCULATED FLOW AT 500 kPa/ 75 ps.i.	CALCULATED FLOW AT 150 kPa/ 20 ps.i.	TEST NO.	DISTRICT	TYPE
	STATIC	RESIDUAL						
	kPa	ps.i.	L/min	L/min	L/min			
	FLOW							
	GAUGE							
	FLOW							
INDUSTRIAL 1	NORTH FRASER WAY - WEST OF FLOW HYDRANT (HYDRANT #2728)	NORTH FRASER WAY AND FRASER WOOD STREET - (HYDRANT #2727)	910	165	5660	4010	5773	14500
RESIDENTIAL 2	MARINE DRIVE AND ROYAL OAK - (HYDRANT #1057)	MARINE DRIVE - WEST OF GAUGE HYDRANT - (HYDRANT #1056)	800	496	5796	5578	8828	9100
RESIDENTIAL 3	MANDEVILLE AVENUE - NORTHWEST OF TILLIUM STREET (HYDRANT #1929)	MANDEVILLE AVENUE - SOUTHEAST OF ABBOTSFORD STREET (HYDRANT #1928)	896	620	9565	11365	16520	13600
INDUSTRIAL 4	FRASER PARK DRIVE - SOUTHEAST OF TILLIUM STREET (HYDRANT #2774)	FRASER PARK DRIVE - SOUTHEAST OF GAUGE HYDRANT (HYDRANT #2775)	896	510	10269	10174	14793	13600
INDUSTRIAL 5	THORNE STREET - WEST OF WIGGINS STREET	THORNE STREET - CLOSEST HYDRANT TO INCINERATOR	883	579	10956	12106	11784	16400
RESIDENTIAL 6	THORNE STREET - SOUTH WEST OF MARINE DRIVE - (HYDRANT #2486)	THORNE STREET - NORTH EAST OF WILLARD STREET - (HYDRANT #2485)	951	717	6887	9619	13497	4500
RESIDENTIAL 7	EDMONDS STREET - NORTH EAST OF FLOW HYDRANT (HYDRANT #2128)	EDMONDS STREET AND SALISBURY AVENUE - (HYDRANT #182)	579	552	6287	9774	28158	9100
RESIDENTIAL 8	18th AVENUE AND MARY AVENUE - (HYDRANT #883)	18th AVENUE - SOUTHWEST OF CANADA WAY - (HYDRANT #1426)	386	331	2405	-	5428	14500
INDUSTRIAL			56	48	529	-	1194	3200

NOTE: TESTS WERE CONDUCTED FOR INSURANCE GRADING PURPOSES

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BURNABY, B.C.

LOCATION:

3-4 APRIL 1989

DATE:

HYDRANT FLOW TEST RESULTS

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FIRE UNDERWRITERS SURVEY

A SERVICE TO INSURERS AND MUNICIPALITIES



WATERFLOW REQUIRED AT 150 kPa/ 20 p.s.i.	L/min	CALCULATED FLOW AT 150 kPa/ 20 p.s.i.	CALCULATED FLOW AT 500 kPa/ 75 p.s.i.	L/min	CALCULATED FLOW AT 150 kPa/ 20 p.s.i.	L/min	WATER FLOW OBTAINED	HYDRANT PRESSURES		HYDRANT LOCATIONS		TEST NO.	DISTRICT	TYPE OF TEST				
								STATIC	RESIDUAL	GROSVENOR AVENUE - DUNDAS STREET AND (HYDRANT #1161)	SPRINGER AVENUE - (HYDRANT #871)							
								ps.i.	ps.i.						GAUGE	FLOW		
5500	1200	1406	874	1200	18200	4000	114	786	455	4446	3973	6392.	5500	1200	RESIDENTIAL	9	DUNDAS STREET AND SPRINGER AVENUE - (HYDRANT #871)	DUNDAS STREET AND GROSVENOR AVENUE - (HYDRANT #1161)
18200	1200	1406	874	1200	18200	4000	114	786	455	4446	3973	6392.	5500	1200	RESIDENTIAL	9	DUNDAS STREET AND SPRINGER AVENUE - (HYDRANT #871)	DUNDAS STREET AND GROSVENOR AVENUE - (HYDRANT #1161)
18200	1200	1406	874	1200	18200	4000	114	1034	448	5623	5255	7074	18200	1200	INDUSTRIAL	10	BARNET HIGHWAY - WEST OF FLOW HYDRANT - (HYDRANT #2136)	BARNET HIGHWAY - LAST HYDRANT ON MAIN - (HYDRANT #1949)
7300	1600	1604	609	1604	7300	4000	593	345	5260	2768	7292	7300	7300	1600	RESIDENTIAL	11	HEWITT STREET - WEST OF GAUGE HYDRANT - (HYDRANT #2291)	QUEENSTON COURT - WEST OF GAUGE HYDRANT - (HYDRANT #2053)
10900	10900	7965	5478	7965	10900	9100	896	786	2819	5478	7965	10900	10900	1600	RESIDENTIAL	12	AUGUSTA AVENUE AND KITCHENER STREET - (HYDRANT #135)	AUGUSTA AVENUE - SOUTH OF GAUGE HYDRANT - (HYDRANT #760)
2400	10900	2400	23889	34722	9100	2000	896	786	12288	23889	34722	9100	2000	2400	INSTANTIONAL	13	GILMORE AVENUE AND TRIUMPH STREET - (HYDRANT #258)	GILMORE AVENUE AND DUNDAS STREET - (HYDRANT #257)
2400	10900	2400	1608	2126	2400	2400	156	68	1681	1608	2126	2400	2400	2400	INSTANTIONAL	14	DELTA AVENUE AND NORTHLAWN DRIVE - (HYDRANT #152)	DELTA AVENUE AND SOUTHLAWN DRIVE - (HYDRANT #2707)
10900	10900	31908	22362	31908	10900	2400	924	800	11774	22362	31908	10900	2400	2400	COMMERCIAL	15	SPERLING AVENUE AND KITCHENER STREET - (HYDRANT #596)	SPERLING AVENUE AND WINCH STREET - (HYDRANT #597)
14500	14500	19307	12711	19307	14500	3200	841	621	10329	12711	19307	14500	14500	2400	INDUSTRIAL	16	GORING STREET - 2nd ROAD - (HYDRANT #1277)	GORING STREET AND HOLDOM AVENUE - (HYDRANT #1762)

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FIRE UNDERWRITERS SURVEY
A SERVICE TO INSURERS AND MUNICIPALITIES

DATE: 4 APRIL 1989
LOCATION: BURNABY, B.C.

HYDRANT FLOW TEST RESULTS

TEST NO.	DISTRICT	HYDRANT LOCATIONS		HYDRANT PRESSURES		WATER FLOW OBTAINED	CALCULATED FLOW AT 500 kPa/ 75 p.s.i.	CALCULATED FLOW AT 150 kPa/ 20 p.s.i.	WATERFLOW REQUIRED AT 150 kPa/ 20 p.s.i.
		GAUGE	FLOW	STATIC	RESIDUAL				
17	COMMERCIAL INDUSTRIAL	BOUNDARY ROAD AND LOUGHEED HIGHWAY - (HYDRANT #429)	BOUNDARY ROAD - 1st HYDRANT NORTH OF GAUGE (HYDRANT #428)	855	565	8101	8801	13211	14500
18	COMMERCIAL INDUSTRIAL	WILLINGDON AVENUE AND CANADA WAY - (HYDRANT #939)	WILLINGDON AVENUE - SOUTH OF GAUGE HYDRANT (HYDRANT #691)	827	758	9956	22407	34486	14500
19	COMMERCIAL INDUSTRIAL	NORLAND AVENUE-BETWEEN DOUGLAS ROAD AND LAUREL STREET-(HYDRANT #2321)	NORLAND AVENUE-BETWEEN DOUGLAS ROAD AND LAUREL STREET-(HYDRANT #2322)	883	317	6032	4764	7001	14500
20	RESIDENTIAL INDUSTRIAL	GILPIN STREET - WEST OF COLBROOK CRESCENT - (HYDRANT #266)	GILPIN STREET - EAST OF COLBROOK CRESCENT - (HYDRANT #267)	717	565	6442	7474	13270	10000
21	INDUSTRIAL	(WINSTON STREET-1st HYDRANT SOUTHEAST OF GREENWOOD STREET - (HYDRANT #1638)	WINSTON STREET-2nd HYDRANT SOUTHEAST OF GREENWOOD STREET - (HYDRANT #1639)	855	372	6928	5714	8578	14500
22	INDUSTRIAL	WINSTON STREET - WEST OF FLOW HYDRANT - (HYDRANT #1787)	WINSTON STREET-1st HYDRANT WEST OF BRIGHTON AVENUE-(HYDRANT #1788)	841	483	9124	8646	13133	14500
23	RESIDENTIAL	CARDSTON STREET - EAST OF FLOW HYDRANT - (HYDRANT #293)	CARDSTON STREET-1st HYDRANT EAST OF CARPTON CRESCENT - (HYDRANT #2224)	820	476	5069	4732	7333	12700
24	RESIDENTIAL INDUSTRIAL	BEAVER BROOK CRESCENT SOUTH OF FLOW HYDRANT (HYDRANT #1956)	BEAVER BROOK CRESCENT AND AQUARIUS DRIVE - (HYDRANT #1957)	896	703	7028	10119	14706	10900
				130	102	1546	2226	3235	2400

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COUNCIL MEETING 90/03/26

BURNABY, B.C.

LOCATION:

4-5 APRIL 1989

DATE:

HYDRANT FLOW TEST RESULTS

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FIRE UNDERWRITERS SURVEY

A SERVICE TO INSURERS AND MUNICIPALITIES



WATERFLOW REQUIRED AT 150 KPa/ 20 p.s.i.	CALCULATED FLOW AT 150 KPa/ 20 p.s.i.	CALCULATED FLOW AT 500 KPa/ 75 p.s.i.	WATER FLOW OBTAINED	HYDRANT PRESSURES		FLOW	TEST NO.	TYPE OF DISTRICT
				STATIC	RESIDUAL			
L/min	L/min	L/min	L/min	KPa	KPa	ps.i.		
L/min	L/min	L/min	L/min	ps.i.	ps.i.	g.p.m.		
10900	7364	841	5069	331	524	76	25	RESIDENTIAL
2400	1620	185	1115	48	76	76	25	INSTANTIAL
10900	8142	-	5487	331	510	74	26	RESIDENTIAL
2400	1791	-	1207	48	74	74	26	INSTANTIAL
4500	10806	6483	6592	510	758	110	27	RESIDENTIAL
1000	2377	1426	1450	74	110	110	27	INSTANTIAL
4500	14656	-	5442	427	483	483	28	RESIDENTIAL
1000	3224	-	1197	62	70	70	28	INSTANTIAL
14500	24594	-	9901	441	510	510	29	RESIDENTIAL
3200	5410	-	2178	64	74	74	29	INSTANTIAL
9100	20834	9560	5441	593	634	634	30	RESIDENTIAL
2000	4583	2103	1197	86	92	92	30	INSTANTIAL
10900	17684	7246	6287	538	607	607	31	RESIDENTIAL
2400	3890	1594	1383	78	88	88	31	INSTANTIAL
14500	25380	13547	9119	607	689	689	32	RESIDENTIAL
3200	5583	2980	2006	88	100	100	32	INSTANTIAL

HYDRANT LOCATIONS

ITEM 2
MANAGER'S REPORT NO. 23
COUNCIL MEETING 90/03/26

NOTE: TESTS WERE CONDUCTED FOR INSURANCE GRADING PURPOSES

BURNABY, B.C.

LOCATION:

5, 9 & 14 APRIL 1989

DATE:

HYDRANT FLOW TEST RESULTS

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FIRE UNDERWRITERS SURVEY

A SERVICE TO INSURERS AND MUNICIPALITIES



WATERFLOW REQUIRED AT 150 kPa/ 20 ps.i.	CALCULATED FLOW AT 150 kPa/ 20 ps.i.	CALCULATED FLOW AT 500 kPa/ 75 ps.i.	WATER FLOW OBTAINED	HYDRANT PRESSURES		FLOW	TEST NO.	DISTRICT OF TYPE
				STATIC	RESIDUAL			
16400	34209	23976	19439	648	924	924	33	INDUSTRIAL
3600	7525	5274	4276	94	134	134	34	RESIDENTIAL
10900	20425	11906	5623	683	738	738	34	INDUSTRIAL
2400	4493	2619	1237	99	107	107	34	RESIDENTIAL
14500	17916	-	7305	372	427	427	35	RESIDENTIAL
3200	3941	-	1607	54	62	62	35	RESIDENTIAL
14500	19252	-	8219	296	338	338	36	RESIDENTIAL
3200	4235	-	1808	43	49	49	36	RESIDENTIAL
16400	25671	-	14215	359	469	469	37	RESIDENTIAL
3600	5647	-	3127	52	68	68	37	INDUSTRIAL
10900	7978	4701	5623	427	745	745	38	RESIDENTIAL
2400	1755	1034	1237	62	108	108	38	INDUSTRIAL
13600	17098	11110	8606	634	827	827	39	RESIDENTIAL
3000	3761	2444	1893	92	120	120	39	INDUSTRIAL
14500	49270	34231	22398	731	910	910	40	RESIDENTIAL
3200	10838	7530	4927	106	132	132	40	COMMERICAL

HYDRANT LOCATIONS

33 THUNDERBIRD CRESCENT - 1st and 2nd HYDRANTS (HYDRANT #1726)
 THUNDERBIRD CRESCENT - WEST OF PRODUCTION WAY (HYDRANTS #1739 & 1666)
 34 GOVERNMENT STREET AND LOZELLS AVENUE - (HYDRANT #281)
 GOVERNMENT STREET AND JENSEN PLACE - (HYDRANT #282)
 35 KINGSWAY AND MCKAY AVENUE - (HYDRANT #1015)
 KINGSWAY AND MCKERCHER AVENUE - (HYDRANT #1016)
 36 KINGSWAY AND GRIMMER STREET - (HYDRANT #1020)
 KINGSWAY AND STREET - (HYDRANT #1021)
 37 KINGSWAY AND MISSION AVENUE - (HYDRANT #1026)
 KINGSWAY AND AVENUE AND GRIFFITHS AVENUE - (HYDRANTS #1027 & 1146)
 38 10th AVENUE AND 10th STREET - (HYDRANT #1333)
 10th AVENUE AND HENLEY STREET - (HYDRANT #1332)
 39 HASTINGS STREET-WEST OF KENNINGTON AVENUE - GROVE AVENUE - (HYDRANT #1485)
 HASTINGS STREET-WEST OF HASTINGS STREET-WEST OF GAMMA AVENUE (HYDRANT #1300)
 40 HASTINGS STREET-WEST OF ALPHA AVENUE - (HYDRANTS #1293 & 1292)

NOTE: TESTS WERE CONDUCTED FOR INSURANCE GRADING PURPOSES

ITEM 2
 MANAGER'S REPORT NO. 23
 COUNCIL MEETING 90/03/26

LOCATION: BURBARY, B.C. DATE: 9 APRIL 1989

HYDRANT FLOW TEST RESULTS

FIRE UNDERWRITERS SURVEY



A SERVICE TO INSURERS AND MUNICIPALITIES

HYDRANT PRESSURES	HYDRANT LOCATIONS		TEST NO.	DISTRICT OF TYPE	GAGE		FLOW						
	STATIC	RESIDUAL			ps.i.	kPa	l.g.p.m.	L/min	ps.i.	kPa			
WATER FLOW OBTAINED	500 kPa/ 75 ps.i.	150 kPa/ 20 ps.i.	41	RESIDENTIAL	HALIFAX STREET AND WILLINGDON AVENUE - (HYDRANT #2499)	565	510	11619	10824	35163	13600	7735	3000
CALCULATED FLOW AT 500 kPa/ 75 ps.i.					HALIFAX STREET - WEST OF GAUGE HYDRANT (HYDRANT #2500)	82	74	2556	2381	7735	3000		
CALCULATED FLOW AT 150 kPa/ 20 ps.i.													
CALCULATED WATER FLOW AT 150 kPa/ 20 ps.i. REQUIRED AT													

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NOTE: TESTS WERE CONDUCTED FOR INSURANCE GRADING PURPOSES

ITEM 2
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