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FIRE PROTECTION SURVEY

MAYNE ISLAND

IMPROVEMENT DISTRICT

CONDUCTED BY THE

OFFICE OF THE FIRE COMMISSIONER

1994.

FIRE PROTECTION SURVEY

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IMPROVEMENT DISTRICT

This survey was initiated at the request of the Mayne Island Improvement District, Board of Trustees, to determine appropriate levels of service, equipment and fire department capability to meet present and future needs.

CONDUCTED BY THE

OFFICE OF THE FIRE COMMISSIONER

Alan J. Troughton
Regional Fire Commissioner
Vancouver Island
Regional Office

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SUMMARY OF RECOMMENDATIONS:

1. The Board of Trustees consider entering into a written agreement with the Forest Service to provide fire protection to the forested areas of the community.
2. Provide an adequate and reliable water supply for fire fighting purposes.
3. Have all fire hydrants flow tested by qualified technicians to obtain accurate gallonage per minute.
4. Additional water tanker vehicles acquired to meet or exceed ULC S515 M88.
5. Implement a program to install dry standpipes. The standpipes would provide static water for fire fighting. The standpipes should be located in strategic locations within the community.
6. Install several static water tanks in the fire protection area. The water supply tanks would provide for a rapid recharge of the fire department tankers, with a limited number of fire fighters required to perform this evolution. Each water supply tank should be capable of holding a volume of water sufficient to recharge the largest tanker truck at least once.
7. Upgrade fire hall for seismic loading.
8. Reorganize existing floor space in fire hall to make efficient use of present floor area.
9. Construct an outdoor fire department training area complete with training tower, fire hydrant (if possible) and drafting pit.
10. When considering the purchase of new fire apparatus, in the long term planning process, take into account the community risk factors and the fire flow requirements. The fire apparatus considered for purchase should meet the current ULC S515 Standard.
11. Emergency fire vehicles be equipped with the recommended standard lighting package in compliance with NFPA Standard 1901, 3-3-5 "**Lights and Warning Devices**".

12. Emergency fire vehicles be equipped with the recommended reflective tape affixed in such a manner that it complies with NFPA Standard 1901, 6-3-2.
13. Implement a regularly scheduled inspection and maintenance program for all fire department equipment in accordance with NFPA Standard 1201 "Developing Fire Protection Services for the Public".
14. Acquire approved fire fighting equipment compatible with apparatus in use for fire protection.
15. Repair, maintain, record and replace existing fire fighting equipment at regularly scheduled intervals to ensure proper and reliable performance during fire ground operations.
16. That the fire chief initiate a recruitment drive to bring the number of volunteer fire fighters up to the recommended level.
17. Implement a training program that meets or exceeds the volunteer fire fighter training standard and provide certification for successful completion.
18. It is recommended that all replacement apparatus be equipped with compatible two way radios, and that pagers be acquired for all additional personnel recruited.
19. That the fire chief apply for permission to use the Fire Commissioner's radio frequency which is available to this fire department for use as a command frequency in the event of a major fire, leaving the normal frequency free for fire ground operations. To acquire access to this frequency a request must be submitted through the Regional Office of the Fire Commissioner in Nanaimo.
20. That the fire chief establish and conduct a frequency of inspections for the community as laid down in Section 26(1) and 38(3) of the Fire Services Act.
21. The fire chief and the Board of Trustees establish a long term development plan to enable the fire protection/prevention requirements to grow with the community.

INTRODUCTION:

Subsequent to a request by Mr. W.A. Weeks, Chairman, on behalf of the Mayne Island Improvement District, a fire protection survey was carried out on the Mayne Island fire protection area.

To provide a comprehensive survey of Mayne Island the following areas were assessed:

- Fire Protection Area
- Water Supply
- Fire Hall
- Fire Apparatus
- Fire Equipment
- Staffing
- Communications
- Fire Prevention
- Long Term Planning

The recommendations contained in this report are those considered to be of a more important nature.

Changes in the structure of the fire department in the nature of equipment, management, and manpower should come through a process developed during a long term plan.

FIRE PROTECTION AREA:

The Mayne Island Volunteer Fire Department was organized under the Municipal Act, and has a by-law in effect that allows for legal operations.

The Mayne Island Fire Protection Area is located in the Southern Gulf Islands in the centre of Galiano, Saturna and Pender Islands. The area is accessible only by B.C. Ferries and private watercraft.

The protection area is approximately 50 km², with an approximate size of 8x11 kilometres. Seventy five percent of this area is forested with decreases as the island grows. This Island has a steep hilly terrain which presents a problem in response times for loaded fire apparatus.

The Island has a population of 850 permanent residents and further 1500 that vacation and are temporary residents to the area. The five year projection is for an increase of approximately 15%. It is anticipated that the main growth areas would be in the single family dwellings and other Group C occupancies, with some increased light industrial construction. The main industries are service and tourism, with all the associated support businesses.

RECOMMENDATION:

1. The Board of Trustees consider entering into a written agreement with the Forest Service to provide fire protection to the forested areas of the community.

WATER SUPPLY:

A relatively small portion of the protection area is protected by fire hydrants, with a total of 26 hydrants over two areas. The remainder of the area is protected by trucking water to the fire ground using the department's existing water tankers.

The two areas that are presently protected by fire hydrants, to my knowledge, have not been flow tested and no records of fire flows are available. An adequate and reliable water supply for fire fighting is an essential part of the fire protection system of a community. **"Adequate and reliable"** is defined as a supply that is sufficient every day of the year to control and extinguish anticipated fires in the community, particular building, or building group served by the water supply.

At present, it is unlikely that a continuous adequate and reliable supply of water, can be provided to all regions of the protection area. The two existing tanker vehicles are not equipped with dump valves and use of the fire department's porta tank is not part of any strategic fire department pre fire plan. The present method of water supply is to pump directly from one of the two tankers, only one of the tankers is equipped for this kind of operation. This system does not allow for an adequate and reliable supply of water.

The present plan is to build another tanker using an older model tractor. If this project is completed the department will then have an additional tanker that is approximately the same age as it's newest model which is 25 years old. In the event that this department requires an additional tanker it is recommended that a much newer vehicle meeting the requirements of ULC S515 M88 be acquired.

Where water mains of sufficient size are installed, they are equipped with dry barrel hydrants. Some of the hydrants are maintained and some appear not to be maintained at all. In either case there does not appear to be any set frequency of maintenance of the fire hydrants.

It is recommended that all fire hydrants be maintained by qualified personnel on a regularly scheduled frequency.

It is also recommended that all fire hydrants be flow tested (using the formula $24.7 D^2 / P C$)¹ to determine the number of gallons per minute that each hydrant can be expected to produce. These figures can then be used for pre fire planning and future development of higher risk areas.

Through calculations contained in "**Water Supplies for Public Fire Protection**" issued by Fire Underwriters Survey (copy enclosed) the required fire flow for the existing community can be calculated.

In addition to the present water supplies on the Island the fire chief should plan for the installation and utilization of a dry standpipe system for emergency fire fighting water supply. The fire chief should also investigate into the feasibility of a series of static water supply tanks being installed at strategic locations throughout the Island.

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¹ Formula $24.7 D^2 / P C$ IFSTA 205 "**Water Supplies**".

RECOMMENDATIONS:

2. Provide an adequate and reliable water supply for fire fighting purposes.
3. Have all fire hydrants flow tested by qualified technicians to obtain accurate gallonage per minute.
4. Additional water tanker vehicles acquired to meet or exceed ULC S515 M88.
5. Implement a program to install dry standpipes. The standpipes would provide static water for fire fighting. The standpipes should be located in strategic locations within the community.
6. Install several static water tanks in the fire protection area. The water supply tanks would provide for a rapid recharge of the fire department tankers, with a limited number of fire fighters required to perform this evolution. Each water supply tank should be capable of holding a volume of water sufficient to recharge the largest tanker truck at least once.

FIRE HALL:

The present fire hall is centrally located on Fernhill Road. The two storey wood frame building was constructed in 1968 and conformed to the Building Code in force at the time of construction. This fire hall is constructed with the apparatus bays at ground level and the offices, training and social areas upstairs.

This fire hall has not undergone upgrading for seismic loading and requires this modification, after seismic upgrading this fire hall appears to be adequate for the present needs of the fire department.

The useable floor area of this fire hall requires reorganization. The office, training and social areas should be reorganized to make more efficient use of the existing floor area.

At present the fire department does not have an outdoor training area. As training in all areas of fire fighting is an integral part of effective fire ground performance it is recommended that consideration be given to constructing a fire training area complete with a training tower.

In addition to the training tower the training area should be equipped with a fire hydrant and a drafting pit of sufficient size to perform all pumping operations that may be required. The drafting pit would also be used for performance testing of all fire apparatus.

RECOMMENDATIONS:

7. Upgrade fire hall for seismic loading.
8. Reorganize existing floor space in fire hall to make efficient use of present floor area.
9. Construct an outdoor fire department training area complete with training tower, fire hydrant (if possible) and drafting pit.

FIRE APPARATUS:

The existing fleet of the Mayne Island Volunteer Fire Department consists of a 1973 Thibault 840 GPM triple combination pumper with a 500 gallon water tank, a 1975 Chevrolet water tanker with a 1700 gallon tank and a 100 GPM pump and a 1978 International water tanker with a 1700 gallon water tank and a 100 GPM pump.

All mobile fire apparatus on inventory of this fire department should conform to ULC S515 M88 "**Standard for Automobile Fire Apparatus**". Fire Underwriters Survey recommends ULC which stipulates, a maximum service life of fifteen years for first line fire apparatus, an additional five years as reserve apparatus, and retirement from service at twenty years. If the apparatus following twenty years of service, passes the annual service tests, the maximum service life is thirty years.

All vehicles on inventory have reached or are near to the twenty year retirement age. Apparatus at this juncture may have one or more faults which precludes effective use for emergency service. These deficiencies may include, inadequate braking system, slow pick up and acceleration, structurally weakened chassis due to overloading and pump wear.

It is recommended that the Mayne Island Fire Department and Board of Trustees implement a long term plan for the replacement of existing fire apparatus and any future vehicles that are acquired.

RECOMMENDATIONS:

10. When considering the purchase of new fire apparatus, in the long term planning process, take into account the community risk factors and the fire flow requirements. The fire apparatus considered for purchase should meet the current ULC S515 Standard.
11. Emergency fire vehicles be equipped with the recommended standard lighting package in compliance with NFPA Standard 1901, 3-3-5 "Lights and Warning Devices".
12. Emergency fire vehicles be equipped with the recommended reflective tape affixed in such a manner that it complies with NFPA Standard 1901, 6-3-2.

FIRE EQUIPMENT:

To enable a fire department to effectively and safely combat fire, an assortment of equipment is required to create a self contained fire fighting force. This includes hose, nozzles, ladders, self contained breathing apparatus, and various other special purpose tools and ancillary equipment for fire ground operations.

Fire fighters also require complete protection in the form of turnout clothing to prevent injury during fire ground operations.

Fire fighters protective clothing is required by the Workers Compensation Act and Regulations. The current Act and Regulations may be obtained from your local WCB office.

A list of basic fire fighting equipment is contained in the appendices of the ULC S515 M88 noted in my recommendations.

It was noted during my site visit that some of the basic fire fighting equipment in use on first line apparatus, i.e. nozzles, were obsolete and not recommended for attacking a working fire.

It is recommended that a complete review of all fire fighting equipment be undertaken, new equipment purchased as required, and installed on front line apparatus.

It was also noted that there appeared to be no record of equipment inspection and maintenance carried out.

In addition to regular inspections by the vehicle operator, a procedure for periodic inspection of apparatus and related equipment by qualified personnel should be established. Written instructions should define the performance of the work, the frequency schedule, and the requirement for documentation. This should include all fire fighting and ancillary equipment on inventory.

RECOMMENDATIONS:

13. Implement a regularly scheduled inspection and maintenance program for all fire department equipment in accordance with NFPA Standard 1201 **"Developing Fire Protection Services for the Public"**.
14. Acquire approved fire fighting equipment compatible with apparatus in use for fire protection.
15. Repair, maintain, record and replace existing fire fighting equipment at regularly scheduled intervals to ensure proper and reliable performance during fire ground operations.

STAFFING:

At present the Mayne Island Fire Department has a compliment of 20 volunteer fire fighters including the fire chief. The fire commissioner recommends a minimum of 25 personnel be on staff at any given time. This is considered a satisfactory number to provide a nucleus of trained personnel on a fire ground within a reasonable period of time, on a year round basis.

It is suggested that any personnel recruited be subject to passing enrolment standards established by the fire chief and the Board of Trustees.

Fire fighting is considered to be one of the most dangerous occupations in North America. Death and injury to fire fighters exceeds most other recognized labour groups, therefore, it is imperative that fire fighters be equipped with approved turnout clothing and equipment. Safety Regulations and practises should be adopted and enforced to ensure the safety of all members at all drills and fires.

During my site visit training records were unavailable for my perusal and therefore, I was unable to determine the level of training for the Mayne Island Volunteer Fire Department. All fire fighters should be enrolled in a training program that meets the Volunteer Fire Fighter Training Standard and results in certification for all training received. Copies of this standard and other related information can be obtained from:

FIRE ACADEMY
JUSTICE INSTITUTE OF BC
4125 WEST 8TH AVENUE
VANCOUVER BC V6R 1Z7 **TELEPHONE: 222-3630**

Assistance in establishing a fire fighter training program can be obtained from the Fire Academy, Justice Institute of B.C. A request for assistance should be directed to:

THE DIRECTOR, FIRE ACADEMY
JUSTICE INSTITUTE OF BC
4125 WEST 8TH AVENUE
VANCOUVER BC V6R 1Z7 **TELEPHONE: 222-3630**

Fire department training aids can also be obtained through the Fire Academy. Other training aids may be obtained through recognized agencies such as, the National Fire Protection Association (NFPA) and the International Fire Service Training Association (IFSTA).

The quality and quantity of training for fire department personnel will be reflected in the level of performance and effectiveness demonstrated during fire and emergency operations. The training goals of every fire department should be to provide the highest level of competency possible, thereby, assuring a high degree of professionalism and morale.

RECOMMENDATIONS:

- 16. That the fire chief initiate a recruitment drive to bring the number of volunteer fire fighters up to the recommended level.
- 17. Implement a training program that meets or exceeds the volunteer fire fighter training standard and provide certification for successful completion.

COMMUNICATIONS:

All fire emergency calls are handled by 911 through Langford, all Gulf Island emergency calls are handled in this manner.

All fire department apparatus is equipped with two way radios. A number of two way radios are also available for responding fire fighters. All personnel are currently alerted by pager and central siren.

This fire department also has access to the Fire Commissioner's radio frequency for use as a command channel in the event of a major fire, leaving the normal frequency free for fire ground operations.

RECOMMENDATIONS:

18. It is recommended that all replacement apparatus be equipped with compatible two way radios, and that pagers be acquired for all additional personnel recruited.
19. That the fire chief apply for permission to use the Fire Commissioner's radio frequency which is available to this fire department for use as a command frequency in the event of a major fire, leaving the normal frequency free for fire ground operations. To acquire access to this frequency a request must be submitted through the Regional Office of the Fire Commissioner in Nanaimo.

FIRE PREVENTION:

Section 26(1) of the Fire Services Act Regulations states that "each municipal council shall provide for a regular system of inspection of hotels and public buildings in the municipality".

It is recognized that Mayne Island is an improvement district, however, it is our recommendation that regular inspections be carried out to provide an adequate level of life safety in your community.

The fire chief is an appointed Local Assistant Fire Commissioner and has recently completed the LAFC Orientation Course which covers inspections in some detail. As of my site visit, inspections of hotels and public buildings were not being carried out.

All structural development within the fire protection area falls under the B.C. Building Code and where applicable the Fire Services Act and Regulations. Fire prevention is a very important part of any fire protection program and fire inspections quite often eliminate the potential for fires starting.

A current and expandable fire prevention program should be part of the community's continued endeavour in keeping low fire loss a priority. It is recognized that any fire prevention program developed must have the community in mind.

RECOMMENDATION:

20. That the fire chief establish and conduct a frequency of inspections for the community as laid down in Section 26(1) and 38(3) of the Fire Services Act.

LONG TERM PLANNING:

Long term planning for the Mayne Island Fire Protection Area must recognize accepted fire protection standards and, how changes within the area may alter and effect the general requirements.

The long term plan should not only relate to the requirements for fire apparatus but to the progressive development and upgrading of water supply and distribution for fire fighting and, the changing needs for fire prevention services and public safety programming.

To this end, it is incumbent on the fire chief and the Board of Trustees to recognize, in advance, any and all developments that may have an effect on the efficiency or capabilities of the fire department.

To achieve the above, it is recommended that an area development plan be drawn up covering the next twenty years, which covers not only projected increases in buildings and population, but all related services and their impact on the ability to provide effective fire protection.

This plan should be reviewed every three years and updated as required.

Additional apparatus and equipment requirements identified in this plan should be budgeted for well in advance to prevent a situation where equipment currently in service no longer meets the required level of protection.

Many of the recommendations contained in this report, due to cost of implementation, can be planned and budgeted for during the long term.

The recommendations contained in this report will, if implemented, provide a base from which a long term plan can be established.

RECOMMENDATION:

21. The fire chief and the Board of Trustees establish a long term development plan to enable the fire protection/prevention requirements to grow with the community.