MILLBRIDGE

Updated Sprinkler Installation Report 2-3-18

Brentwood Town Hall - Main Project

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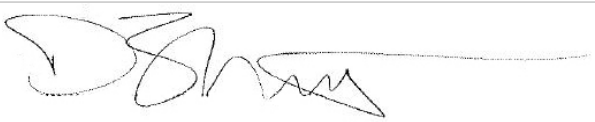
Issued by:	D Longstaff	

1.0 Introduction

Millbridge Project Management have been requested by Brentwood Borough Council to undertake a review of whether there is a statutory requirement for the provision of an Automated Fire Prevention Sprinkler or Water Misting Systems to be installed as part of the Town Hall redevelopment project.

In turn on behalf of Brentwood Borough Council, Millbridge commissioned Lawrence Webster Forrest Ltd (LWF) a specialist Fire Consultant to review the current fire strategy design proposals for the Brentwood Town Hall redevelopment project to ensure compliance with current fire safety standards and then to provide further information regarding the possible installation of a sprinkler system and its impact.

1.1 General Description of Development

The Brentwood Town Hall Redevelopment is an existing 5 storey building, comprising basement, ground and three upper floors.

The building will be multi occupied and will comprise of police and council offices, a community hub and lettable offices on the basement, ground and first floors. 19 residential units will be provided on the second and third floors and these will be let on short term tenancy agreements by the council.

1.2 Purpose & Scope of Report

The purpose of this report is to review the proposed fire strategy for the redevelopment of Brentwood Town Hall to current fire safety standards and highlight any areas which may require further review due to non-compliance. For the purpose of this report and in line with the principle design guidance, the report makes recommendations for life safety only.

Additionally, this report will look at the potential for implementation of further automated fire suppression systems over and above that required by Building Regulations. These fall into two basic categories either the introduction of a sprinkler system or a water misting system to the residential apartment areas or possibly throughout the whole building.

2.0 LWF Report

2.1 Does the current Design Scheme as proposed legally require an Automated Fire Sprinkler System ?

The Report concludes that providing that the few non-compliant items noted are reviewed, the current proposals for Brentwood Town Hall demonstrate a level of fire safety equal to the general standard implied by compliance with the current recommendations in Building Regulations 2010 Part B "Fire Safety" Approved Document B (2006 Edition) incorporating 2007, 2010 and further 2013 amendments. The advice from the fire engineering and risk expert is that it is not deemed necessary to install either a sprinkler or a water misting system to comply with current Building Regulations. However, the added benefits and drawbacks of installing additional fire suppression measures are now examined and summarised both in terms of providing sensible and proportionate additional protection to the occupants of the building and the resultant additional capital costs.

3.0 Automated Fire Suppression System Options considered

3.1 Full Sprinkler installation to the whole building

3.2 Sprinkler system to Residential Accommodation only

3.2.1 Pump and Tank system

3.2.2 Mains Fed system

3.2.3 Water Misting system

3.3 Full Sprinkler installation to the whole building

This is an extreme option and is probably not necessary to the office areas of the building as the existing fire protection and means of escape measures required by Building Regulations will provide the requisite protection to the occupants of the office areas of the building. If it were considered appropriate to introduce a sprinkler system to the whole building the following would need to be designed in to the scheme

3.3.1 a stored / tanked water system. This would need a plant room of approx. 6 x 8 m to house a tank and associated standby/duty pump-set.

3.3.2 a secondary power supply (life safety) in the form of a diesel generator which would require space of 3 x 5 x 3 m that would need a filling strategy, ventilation for cooling and combustion air in and out for heat rejection

3.3.3 a combustion flue to roof (twin walled stainless steel, nom diameter 500mm),

3.3.4 Sprinkler pipework through the building and associated coordination issues

3.3.5 Alarm interfaces

These design changes would involve significant amounts of extra work to the project which are likely to create delays to the completion dates as well as significant additional capital cost. It is considered that a more proportionate and appropriate change would be to provide additional fire suppression measures to the residential accommodation areas only which are reviewed below.

3.4 Coverage of the Residential Accommodation only

3.4.1 Pump & Tank System

3.4.1.1 Introduction of a sprinkler system even though significant less extensive than for item 3.3 this would still require (i) a stored tank water system (ii) diesel generator (iii) associated combustion flue to roof level (iii) sprinkler pipework (iv) alarm interface. This again could potentially delay the completion of the residential units and the favoured option is therefore the water misting system as noted in 3.4.3 below.

3.4.2 Mains Fed System

3.4.2.1 It is not considered this is realistically possible – each apartment is likely to require a normal supply and then a dedicated sprinkler supply, requiring double the pipework. The sprinkler supply pipe bore would need to be large to achieve the flow rates / pressures required from the ground floor entry point and would likely require Essex Water to modify the existing mains and install manifolds to support required flow rates. This option is not practically possible so it is not discussed further.

3.4.3 Water Misting System

3.4.3.1 This installation would be much simpler – a 13A power supply, 15mm cold water supply, and interfaced fire alarms and wired/plumbed back to each of the mist generators, where each residential unit would have its own dedicated system. It is considered that this is the most sensible option for providing additional fire suppression measures over and above those required by Building Regulations. There are two alternatives for implementing a water misting system and these are to provide these to the residential flats via independent tanks or through a central plant fed by two tanks on the residential floors.

3.5 Option Summary

Option	Advantage	Disadvantage	Install Cost	Annual Maintenance Cost
Whole Building				
Full Pump & Tank sprinkler system	**Full Building Coverage**	**Cost**: **Space**: space for necessary tanks will prove very difficult to provide **Planning Consent** will be required which inevitably delay the project completion **Large amount of water discharge** in the event of a sprinkler head activating with significant consequential damage **Maintenance**	£389,500	TBC
Residential Only				
Pump & Tank System		**Cost**: **Space**: as with above option space for necessary tanks will prove very difficult to provide **Planning Consent** will be required which inevitably delay the project completion **Large amount of water discharge** in the event of a sprinkler head activating with significant consequential damage **Maintenance**	£146,500	£5000.00 (budget)

Option	Advantage	Disadvantage	Install Cost	Annual Maintenance Cost
Water Misting System **Via Independent Tanks**	**Independent to each unit** **Cost** **Flush discharge heads** **Less water consequential water damage** **Relatively easy Installation**	**Space for Tank** within each unit 700wx 450 x 400 **Revised design drawings** will need to be provided **Difficulty in obtaining comparable quotes across different specialist suppliers** – hence cost range given above	£75,000 - £125,000	£4750.00 (£250.00 per unit)
Water Misting System **Via Central Plant Tanks**	**Cost** **Flush Discharge heads** **Less consequential water damage** **Relatively easy Installation**	**Space for central plant and tank** - requires separate dedicated water supply 4 bar min **Revised design drawings** will need to be provided **Difficulty in obtaining comparable quotes across different specialist suppliers** – hence cost range given above	£40,000 - £50,000	TBC

3.6 Conclusions & Recommendations

The LWF Report concludes that providing the few non-compliant items noted are included, the current proposals for Brentwood Town Hall demonstrate a level of fire safety equal to that required by the Building Regulations Approved Document B. Therefore, it is not necessary to install either a sprinkler or water misting system to ensure compliance with Building Regulations throughout the premises. The provision of either a sprinkler or water misting system will be an added benefit rather than a necessary component to ensure the benchmark fire safety standard is achieved.

In reviewing the options available, the sprinkler 'Mains Fed' system is simply not possible so should be discounted from the consideration. The tank-based sprinkler system, if considered the proportionate and appropriate option should be provide to the residential accommodation areas as the existing fire protection and means of escape measures already being provided to the general office areas are considered sufficient and therefore less of a risk. However, installing a sprinkler to the residential accommodation may also prove difficult owing to space necessary for the water

storage tanks. In addition this may significantly impact on the completion date for the residential units which will have significant financial consequences.

Therefore, the water Misting system is the most practical and feasible solution although the annual maintenance cost owing to the 'individual' systems would be higher.

If the Council decide 'Residential' coverage is required, there are a number of 'Mist' systems suppliers in the market and we would recommend that further review is undertaken with alternative suppliers to ensure the right system is selected for the 'short term tenancy' use ie robustness, taper proofing, ongoing maintenance and life cycle costs.