

2 July 2021

Silverlight Studios C/- Edgar Planning
1 Kamahi Street
Wanaka, 9305

Email: scott@edgarplanning.co.nz

Dear Scott

Re: Silverlight Studios, Corbridge Estate, Wanaka – Fire Fighting and Fire Sprinkler Water Supply

We provide the following concept advise based on the Architectural drawings issued by Tilt Architecture on 11.06.21.

Fire Fighting Water Supply (FFWS)

SNZ PAS 4509 sets out the minimum requirements for Fire and Emergency New Zealand (FENZ) to carry out firefighting in structures. The volume of water required depends on the type of buildings, the activity in them, the maximum size of any fire cell and whether a fire sprinkler system is installed in the building. Below are two key tables from this Standard that determine minimum required flow rates and water storage volumes.

The Sound Stage buildings will be the highest Fire Hazard Category (FHC), given there is likely to be storage of equipment higher than 3m where this will trigger a FHC 4 classification. The Sound Stage buildings are greater than 1199 m² floor area therefore will require an FW7 water supply unless sprinkler protected. An FW7 water supply is a site specific calculation from SNZ PAS 4509 and would likely be greater than the prescriptive FW6 supply which requires 12,000 L/min (200 L/s) from a maximum of 8 hydrants.

Installing fire sprinklers in the Sound Stage buildings would reduce the FFWS to FW2 which is 1500 L/min (25 L/s) from 2 hydrants but sufficient water would also be required for the sprinkler system.

Fire Sprinkler Water Supply

Based on NZS4541:2020 sprinkler systems in the Sound Stage buildings require an Ordinary Hazard 3 Special (OH3S) system. The demand of this system will be approximately 5000 L/min.

It is expected that there will only be one fire incident at any one time however the FFWS requirement plus the fire sprinkler requirements have to be added together, therefore 1500 L/min plus 5000 L/min creates a total demand of 6500 L/min, noting that this is significantly less than FW6 without sprinklers of 12,000 L/min.



Combined Water Supply

For smaller buildings the 6500 L/min will provide FW4, as long as the fire cell size does not exceed 599 m². This means that fire sprinklers do not need to be installed in these. If the water supply was increased to 9000 L/min this would provide FW5 allowing fire cells up to 1199 m².

Source of Water

SNZ PAS 4509 and NZS4541 both permit the use of stored water from a lake. We understand domestic water may be supplied to the site but is it unlikely to be a large enough flow to satisfy the FFWS and fire sprinklers, therefore it is proposed to draw water from the lake. The attached marked site plan shows a possible scheme including pump room location and underground reticulation pipe work.

Fire water has to be pumped by a diesel fire pump therefore we propose a pump room on the edge of the lake containing fire pumps to provide the combined demand.

Reticulation

From the pump room underground pipe would run to each of the building groups on site, with in-ground hydrants being provided at maximum spacings of 135m to the vicinity of buildings. Underground connections would be made from the underground main to the sprinkler systems within each building.

Hydrants may not be required for the villages in or near the lake as there are provisions in SNZ PAS 4509 for FENZ to draw water directly from a lake by FENZ without reticulation. This is dependant on the access for fire trucks and approval from FENZ.

The final design and layout of equipment would be subject to discussions with FENZ.

Please advise if you require any further information.

Yours sincerely



Martin Robertson
Associate/Fire Protection

Table 1 – Method for determining required water supply classification

Sprinklered structures															
Category	Water supply classification (see table 2)														
Single family homes with a sprinkler system installed to an approved Standard	FW1														
All other structures (apart from single family homes) with a sprinkler system installed to an approved Standard	FW2														
Non-sprinklered structures															
Category	Water supply classification (see table 2)														
Housing; includes single family dwellings, multi-unit dwellings, but excludes multi-storey apartment blocks	FW2														
All other structures (characterised by fire hazard category ⁽¹⁾), examples of which are given below	Water supply classification (see table 2)														
	Floor area of largest firecell of the building (m ²)														
	0-199 ⁽¹⁰⁾	200-399	400-599	600-799	800-999	1000-1199	1200-1399	1400-1599	1600-1799	1800-1999	2000-2199	2200-2399	2400-2599	2600-2799	>2800
FHC 1 ⁽²⁾	FW3	FW3	FW3	FW4	FW4	FW4	FW5	FW5	FW5	FW5	FW5	FW5	FW5	FW5	FW6
FHC 2 ⁽³⁾	FW3	FW3	FW4	FW5	FW5	FW5	FW6	FW6	FW6	FW7	FW7	FW7	FW7	FW7	FW7
FHC 3 ⁽⁴⁾	FW3	FW4	FW5	FW5	FW6	FW6	FW7	FW7	FW7	FW7	FW7	FW7	FW7	FW7	FW7
FHC 4 ⁽⁵⁾	FW4	FW6	FW6	FW6	FW6	FW7	FW7	FW7	FW7	FW7	FW7	FW7	FW7	FW7	FW7
For special or isolated hazards not covered in above categories ⁽⁹⁾	FW7														
NOTE –															
(1) Fire hazard category as defined in the compliance documents for the New Zealand Building Code, Acceptable Solution C/AS1.															
(2) FHC 1 is sleeping activities including care facilities, motels, hotels, hostels; crowd activities of <100 people including cinemas, art galleries, community halls, lecture halls, churches; working/business/storage activities processing non-combustible materials such as wineries, cattle yards, horticultural products; multistorey apartment blocks.															
(3) FHC 2 is crowd activities of >100 people, libraries, book storage, night clubs, restaurants; working/business/storage activities with low fire load such as hairdressers, banks, medical consulting rooms, offices.															
(4) FHC 3 is working/business/storage activities with medium fire load such as manufacturing, processing, bulk storage up to 3 metres.															
(5) FHC 4 is working/business/storage activities with high fire load such as chemical manufacturing, feed mills, plastics manufacturing, supermarkets or other stores with bulk display over 3 metres.															
(6) For special or isolated fire hazards in an area with a lower water supply classification, an assessment should be carried out to determine measures to mitigate the hazard or increase the water supply (see 4.4).															
(7) The values in the table were determined by heat release rate modelling for fully developed fires.															
(8) All non-sprinkler protected structures, except houses, have an entry level of FW3.															
(9) Examples of special or isolated hazards may include bulk fuel installations, timber yards, tyre dumps, wood chip stock piles, recycle depots, and marinas.															
(10) For non-sprinkler protected fire hazard category 1 structures less than 50 m ² in floor area, the FW3 requirement may be reduced by up to 50% with the agreement of the Fire Region Manager. Examples of the sorts of structures intended to be covered by this comment are predominantly garages, sheds, and outbuildings.															

SNZ PAS 4509:2008

Figure 1: Table 1 from SNZ PAS 4505 showing FHC 2 examples.

Table 2 – Method for determining firefighting water supply

Fire water classification	Reticulated water supply			Non-reticulated water supply	
	Required water flow within a distance of 135 m	Additional water flow within a distance of 270 m	Maximum number of fire hydrants to provide flow	Minimum water storage within a distance of 90 m (see Note 8)	
				Time (firefighting) (min)	Volume (m ³)
FW1	450 L/min (7.5 L/s) (See Note 3)	–	1	15	7
FW2	750 L/min (12.5 L/s)	750 L/min (12.5 L/s)	2	30	45
FW3	1500 L/min (25 L/s)	1500 L/min (25 L/s)	3	60	180
FW4	3000 L/min (50 L/s)	3000 L/min (50 L/s)	4	90	540
FW5	4500 L/min (75 L/s)	4500 L/min (75 L/s)	6	120	1080
FW6	6000 L/min (100 L/s)	6000 L/min (100 L/s)	8	180	2160
FW7	As calculated (see Note 7)				

NOTE –

- (1) Table 1 lists the minimum requirements for firefighting water supplies. In developing towns' main reticulation systems, a water supply authority needs to cater for domestic/industrial water usage in addition to the above. This procedure is outlined in Appendix K.
- (2) Special or isolated fire hazards which have higher requirements in an area of lower water supply classification must determine measures to mitigate the hazard or increase the water supply (see 4.4).
- (3) Where houses have a sprinkler system installed to an approved Standard, the distance to a fire hydrant or alternative water supply may be negotiated by agreement with the Fire Region Manager.
- (4) The water requirements for fire protection systems must be considered in addition to the firefighting water supplies, as detailed in table 1 (FW2), the fire protection system demand plus 1500 L/min (25 L/s) at 1 bar residual pressure.
- (5) The minimum flow from a single hydrant must exceed 750 L/min (12.5 L/s), except for those cases where a home sprinkler is installed, in which case the minimum is 450 L/min (7.5 L/s) while the maximum design flow, for safety reasons, is limited to 2100 L/min (35 L/s).
- (6) If the minimum water storage requirement as listed in the above table is not available from the reticulated system (reservoir), water can be sourced from an 'alternative supply' as approved by the Fire Region Manager. This water supply must always be within 90 m of the fire risk.
- (7) FW7 is for either special or isolated hazards or where the fire hazard due to the size of the largest firecell and its fire hazard category make specific fire engineering assessment necessary. Appendix H and J must be used as the basis for calculating this required firefighting water supply.
- (8) See Appendix B.

Figure 2: Table 2 showing example of FW4.