Dear HCAA Member

On the Tuesday 21 June 2022 and Tuesday 28 June 2022 it is proposed to have two (2) CPD sessions of 1.5 hours each on the provisions of AS2419.1—2021. To maximise this learning time and to tailor the presentation to your needs, if you have any specific questions that you would like addressed during these sessions could you please complete the Table below. To assist with collating members questions could you please—

(a) Accurately record the clause number or numbers detailed in AS2419.1—2021; and
(b) Ensure that each question asked is specific to the clause number or numbers listed.

Attention: In relation to the comments offered below, the first point I would like to make is that these are the opinions of Mark Porter not FRNSW, etc. etc. and I am not a hydraulic consultant. ☺ Notwithstanding the preceding disclaimer, comments have been provided for each of the questions submitted.

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(1)	Rod Ware		*How is the new Fire Hydrant code AS2419.1-2021 read in conjunction with the existing Combined Fire Hydrant & Fire Sprinkler code AS2118.6-2012.* *For example a high rise building over 50m in height with (3) pressure zones, designing to the current AS2118.6 code would require the following;* • *Dual water supply (usually town's main and on-site water storage tank)* • *2 x full duty pumps (usually one connected to town's main, and one connected to on-site water storage tank)* • *Building over 50m in height requires a relay pump* • *Booster assembly (containing a low, mid & high rise boost points)* *However if designing to the new AS2419.1-2021 code would require the following;* • *Refer to Appendix N, Figure N.5 (B)*	Hi Rod, see comments in row below.

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
			• *Two on-site water storage tanks with automatic inflow from town main* • *2 x multi-stage full duty pumps (connected to two on-site water storage tanks manifolded together)* • *Booster assembly (containing a low, mid & high rise boost points)*	

NOTE: For readability purposes some of the text in the bullet points below have been amended and modified. Where black text follows a bullet point this shows the original text discussed in the presentation to the HCAA. Note: after further consideration some recommendations have been modified. These are highlighted in yellow.

In relation to the application of AS 2419.1—2021 with AS 2118.6, the only differences I believe would be that new designs would need to accommodate the changes of AS 2419.1—2021. What would this mean?

- AS2419.1—2005 requires the installation of a relay pump, AS2419.1—2021 does not require the installation of a relay pump. As such, a relay pump would not be required in buildings having an effective height of more than 50 m.
- AS 2419.1—2005 indicates that where a building has an effective height of not more than 25 m, an on-site water storage tank of not less than 25,000 L is required to be provided. AS 2419.1—2021 though indicates that where the building has an effective height of 50 m, an on-site water storage tank of not less than 36,000 L is required to be provided. To mitigate future regulatory risk with regard to the application of AS 2118.6, I would provide a minimum capacity of not less than 36,000 L for the fire hydrant system component for any building above 50 m until the next version of AS 2118.6 is published.

  NOTE: Original Clause. AS2419.1—2005 requires the installation of an on-site water storage tank of not less than 25,000 L when the building has an effective height of 25 m, AS2419.1—2021 requires the installation of an on-site water storage tank of not less than 36,000 L when the building has an effective height of 50 m. To mitigate future regulatory risk, I would provide a minimum capacity of not less than 36,000 L for the fire hydrant system component for any building above 25 m until the next version of AS2118.6 is published.
- AS2419.1—2005 does not require automatic inflow to be provided to a 25,000 litre water storage tank required by Clause 4.3.1 & 4.3.2, AS2419.1—2021 however requires automatic inflow into the water storage tank of a building having an effective height of more than 50 m (i.e. the compartmented 36,000 L tank). To mitigate future regulatory risk, I would provide automatic inflow into any water storage tank of a combined system hydrant and sprinkler system at a flow rate equivalent to but not less than the fire hydrant demand.
- AS2419.1—2005 requires the installation of not less than two on-site pumps to be installed whenever an on-site water storage tank is provided, with each of these pumps being capable of delivering 5 L/s for the number of fire hydrants required to flow. AS2419.1—2021 details two differing flow rates for when an on-site pump is installed, not less than 5 L/s for building having an effective height of not more than 50 m and not less than 10 L/s for buildings having an effective height of more than 50 m. In a combined hydrant and sprinkler system where an on-site pump is required I would provide flow rates in accordance with AS2419.1—2021.
- AS 2419.1—2005 allows for a single pipe riser to serve a pressure zone, AS 2419.1—2021 requires not less than two pipe risers to serve pressure zones in buildings having an effective height of more than 50 m. To mitigate future regulatory risk, I would provide two pipe risers to each pressure zone.

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
• AS 2419.1—2005 allows for any number of pressure zones to be linked together using pressure reducing valves (PRV), AS 2419.1—2021 however limits this to a maximum of three pressure zones. To mitigate future regulatory risk, I would limit the number of pressure zones linked by PRV to three. • AS 2419.1—2005 places no limitation on the height of building that may be served by a 25,000 L tank, two automatic starting pumps and a relay pump, AS 2419.1—2021 places a height limit of 135 m on the design approach detailed in the normative sections (36,000 L tank with automatic inflow and two automatic starting pumps). For buildings above 135 m, a performance solution is required, in developing this solution I would make reference to the relevant informative appendix in AS2419.1—2021.				
(2)	Shaun Wallace	Section 11 – Ancillary Equipment, Signage and Baseline Data – Clause 11.5	Block Plan (baseline data) – Subclause (e) states *'The block plan shall be sized not less than A3 and have a minimum size scale of 1 to 250'*. On some developments, in particular the Western Sydney Industrial area, even if we were to use multiple A0 size sheets a scale of 1 to 250 isn't always possible. What would be the suggested process in deviating from this?	Hi Shaun, please see comment in row below.
One of the biggest problems with the application of the NCC and the Australian Standards it references, is that industry generally deem the requirements detailed to be the maximum requirements. This is clearly not the case particularly for an item such as a block plan. Now despite this, you would be amazed what industry can squeeze onto an A3 block plan. You may also not be surprised that in many instances "firies" are unable to read the block plan because industry believe A3 is the maximum size. The requirements detailed in AS 2419.1—2021 are an attempt then to get industry to provide block plans appropriate to the size and complexity of the building and the information required to be provided. The scale detailed was an attempt to ensure that both text and figure was legible. A minimum font size was discussed by the committee of FP009, but it was generally agreed that the detailing of a minimum font size may only result in industry including smaller drawings. Now to your question, regarding deviating from the provisions of AS 24191.1—2021 my answer, develop a performance solution and seek feedback from the relevant fire brigade.				

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(3)	Intrax	5.1 (f)	Suggests that existing tanks MUST be replaced where the FH system is being upgraded. Q: Does this mean that you cannot reuse existing FH Tanks in an existing building? Does this apply to pipework as well? **I note this was previously raised at the HCAA meeting and Mark but would be good to discuss for all Members. The intent is that an existing tank in a building that is being refurbed can be retained if it is suitable condition and meets the requirements of the new standard.**	AS 2419.1—2021 has been written for new buildings. In relation to an existing building requiring upgrading, any design developed should be appropriate to the risks presented by the building. If the building is of a height that requires a tank and the installed tank does not meet the requirements of an applicable Australian Standard (AS 2419.1—2021, AS 2118.6) a performance solution should be developed. In this regard, it is important to note that EP1.3 requires a fire hydrant system design to facilitate the needs of the fire brigade appropriate to the firefighting operations, the floor area of the building and the fire hazard.
(4)	Intrax	6.5 (d)	Q: Can Mark please provide some commentary on this? Is this referring to the pipework arrangement adjacent to the tank which must be interconnected with each pump? Is this suggesting you can't connect 2 x full-duty pumps to a single on-site storage tank? What is the intent of the single point of failure?	AS 2419.1—2005 allows for a building having an effective height of more than 50 m to be served by a fire hydrant system characterised by multiple single points of failure. The intent of AS 2419.1—2021 was to address this risk. What does this mean, a manifold from compartmented tank should have no single point of failure and each ring main being served by not less than 2 pipe risers. Apologies, but I will again return to EP1.3, if you designed a fire hydrant system that served a 250 m building, and you provided a single pipe riser to each of the pressure zones I do not believe that the fire hydrant system design has appropriately addressed the "fire hazard" as a single pipe fail can make the whole system inoperable. **See Clause 6.5, Clause 8.6.2, Clause 8.12 & Clause 8.13.**

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(5)	Intrax	6.11.1	Pump room must ONLY contain fire-fighting equipment in this standard. Provide red strobe light on the outside of the building at the entry to the pump room. Q: What is the extent of the "associated equipment"? Mechanical Exhaust grills, floor wastes, hose taps? If in a basement, can this pump room contain access to a sewer/stormwater pumping station?	See comments in row below.

I will provide a "firie" response first. If on arrival at a building alight and "firies" are tasked with locating the pump room to either turn off an automatic starting pump or to coordinate the starting of a relay pump on following the required signage and opening the door to this room they should not then be required to navigate a maze of differing equipment to locate the required fire pump.

Now for a lay persons interpretation of the NCC with regard to plant rooms and pump rooms, they are different things.

The NCC makes 24 references to a plant room, 17 of these in the general normative sections and 7 in the state appendices. Examples of these references are as follows:

- Under A6.0(3) a plant room, machinery room, lift motor room or boiler room, have the same classification as the part of the building they are in.
- Clause D1.13. Plant room—ventilation, electrical or other service units – 30 m^2.
- Clause D1.13. Plant room—boilers or power plant 50 m^2.
- Clause D1.16. A ladder may be used in lieu of a stairway to provide egress from— (i) a plant room with a floor area of not more than 100 m^2; or (ii) all but one point of egress from a plant room, a lift machine room or a Class 8 electricity network substation with a floor area of not more than 200 m^2.
- Clause E2.1. (b) The smoke exhaust and smoke-and-heat vent provisions of this Part do not apply to any area not used by occupants for an extended period of time such as a storeroom with a floor area less than 30 m^2, sanitary compartment, plant room or the like.
- Performance Requirements FP5.1, FP5.2, & FP5.5.
- Verification Method FV5.2 & FV5.4.

With regard to Clause C2.12 *Separation of equipment* Item (c) states: *"Separation of on-site fire pumps must comply with the requirements of AS 2419.1."* The Guide to the NCC further clarifies this requirement by stating: *The types of equipment referred to in C2.12(a)(i) and (ii) and C2.12(c) need to continue to operate during an emergency, such as a fire. It is therefore important to stop the spread of fire to this equipment. The requirement under C2.12(c) that on-site fire pumps comply with E1.3 ,rather than C2.12(d), recognises the importance of this equipment to fire-fighting.*

My thoughts then associated equipment means the items directly related to the operation of the fire hydrant pump and that fire hydrant pumps should be separated from other plant or items not associated with the fire hydrant pump. For example; sprinkler alarm valve sets serving an AS2118.1 sprinkler system.

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(6)	Intrax	6.11.2 (d)	Diesel pumps can discharge exhaust to mechanical systems now. Exhaust terminal must be 2.7m above the ground in a path of travel or road. Q: Does the fan that provide the mechanical exhaust need to be connected to the "Essential Service" power supply?.	As the fire hydrant pump is required to run for the duration of a fire incident, I would assume that if the operation of the fan (or any other equipment) is critical to the ongoing operation of the fire hydrant pump then this equipment should be provided with the same level of operational redundancy as the pump itself. Again, the fire hydrant system design developed should be appropriate to the risk. See also EP1.3. At this point I think it is also important to bring your attention to the commissioning requirements for an on-site pump in Clause T8.1. **See Appendix T**
(7)	Intrax	7.3.4	Q: Is this saying that if you can't satisfy 7.3.3, you must provide a booster at every building? Doesn't make sense because both (a) and (b) require you to comply with 7.3.3. Therefore, what is the difference? Can you just pick which option you want? Can FRNSW provide any commentary on this?	If you think about multiple buildings across a site; there are three possible options for the location of a fire brigade booster assembly these are as follows: (1) Locate the booster assembly at the boundary of a site to serve all buildings; (2) Locate a booster assembly at the front or near each building across the site that requires a booster assembly; or (3) A combination of (1) and (2). Clause 7.3.4 of AS2419.1—2021 excludes item (3) due to the variety in designs that may occur. Clause 7.3.4 allows for option (1) or (2) to be applied and that in each case the location of the booster assembly [option (1)] or booster assemblies [option (2)] are to comply with the requirements of Clause 7.3.3 with regard to accessibility. **See Clause 7.3.**

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(8)	David Lonergan		Please ask Mark to provide explanation on the revision to street hydrants and the use as part of the building in AS 2419.1-2021	Hi David, please see comment in row below.
The limitation placed on the use of street and on-site feed fire hydrants is to ensure that rural and country fire services are provided with fire hydrant system designs that are appropriate to the resources available. Previously under AS2419.1—2005, there was no limitation on the number of street fire hydrants and up to 6 on-site feed fire hydrants could be installed before a fire brigade booster assembly is required. Not much help, if the rural or regional brigade has only one or two trucks. Please note: the committee did consider detailing requirements for rural and regional fire brigades, but this was considered to be too complex of a task. **See Clause 2.2.10 and Clause 3.5.2.**				
(9)			Have recently had the opportunity to work on a large isolated storage facility where FRNSW had stipulated a fire hydrant performance of 80 L/sec @ 500kPa. Pumps but no tanks. Is this the sort of change in system performance that might be applied where the pressure required is reduced as a concession?	See comment below.
I would need more information to provide a comment on this question. Notwithstanding this remark, it would find it highly unlikely that FRNSW would recommend a minimum pump duty of 500 kPa when our default position is 700 kPa. Additionally, the removal of tanks and the need to provide 80 L/s from a town main is also a concern, particularly as AS1851 requires an on-site pump to run the pump monthly.				
(10)	Moustapha		Can I ask Mark the question of External Hydrant coverage to the lowest 4 levels of a building if can be covered by external hydrants plural numbers or just one external hydrant. Could he please clarify.	More than 1 external feed fire hydrant may be used to provide coverage to the lower levels of a building provided coverage to all parts of all storeys are protected. **See Clause 2.2.4, Clause 2.2.10, Clause 3.5.1 (a) & Clause 3.5.3.2**

NUMBER	HCAA MEMBER NAME	CLAUSE NUMBER	AS2419.1—2021 QUESTION	MARK PORTER RESPONSE
(11)	Paul De Las Alas		Has there been any discussions with Sydney Water regarding reduced flows and pressure throughout their network and how to address in the future, i.e. commissioning at completion.	Hi Paul please see comment in row below.

Sydney Water has no obligations under their operating licence to provide firefighting pressures and flows. This is clarified in the Water Services Association of Australia (WSAA) Water Supply Code. See excerpt below. Their licence does however require them to provide 150 kPa at domestic flow rates.

3.1.2 Minimum pipe sizes

Minimum pipe sizes shall comply with Table 3.1 except in the following locations where specific design requirements apply:

(a) Mains in dual water supply systems, see Clause 3.1.4;

(b) Reduced sized mains for the purpose of maintaining water quality, see Clause 5.2.4.

Minimum pipe diameters have been established to ensure adequate flow rates and residual pressures, including a contribution to basic fire fighting capability.

Equivalent pipe diameters for commonly used material are summarised in Appendix B - Equivalent Pipe Diameters for Commonly Used Materials.

For particular types of development such as CBDs, the Water Agency may specify alternative minimum pipe diameters.

TABLE 3.1

MINIMUM PIPE SIZES FOR PARTICULAR DEVELOPMENTS

ZONING/DEVELOPMENT	MINIMUM PIPE SIZE (DN)	
	Cast iron outside diameter series	ISO series
Low and medium density residential	100 (1)	125 (1)
High density residential (≥ 4 storeys)	150	180
Multiple developments of high density residential (≥ 8 storeys)	200 or 225 (2)	250 or 280 (2)
Industrial and commercial	150	180

(12)	David Lonergan		I have also another question for Mark on hydrant coverage for an open space carpark in the new version of AS 2419. Is hydrant coverage required to a carpark that has no roof or open deck carpark and if so what type of application is required for both scenarios?	Not sure exactly what this question means. Class 7a building is required to be provided with fire hydrant coverage to all parts of the floor area as defined by the NCC. **See Clause 3.1.**

Your competed questionnaire is to be returned to the HCAA no later than **Tuesday 14 June 2022** to enable all questions to be collated and to give the presenter time to formulate a response to each question asked.

Thanks in advance for your assistance with these requests.

Kind regards

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