FIRE BRIGADE BOOSTER ASSEMBLY'S

COMMON INSTALLATION OVERSIGHTS

By Peter Griffith
Building Services Supervisor
Dubbo City Council

April 2013

- **Fire Brigade Booster Assembly**

  "a connecting device enabling the fire brigade to pressurise or pump water into a fire hydrant system" (AS 2419.1)

AS 2419.1 specifies in respect of booster assemblies:

- When required;
- Where required;
- Its components;
- How its installed; and
- Requirements for testing.

AS 2419.3 specifies requirements for the design of the booster inlet component of the booster assembly - it is adopted by the BCA by virtue of the adoption of AS 2419.1-2005.

➢ WHEN REQUIRED:

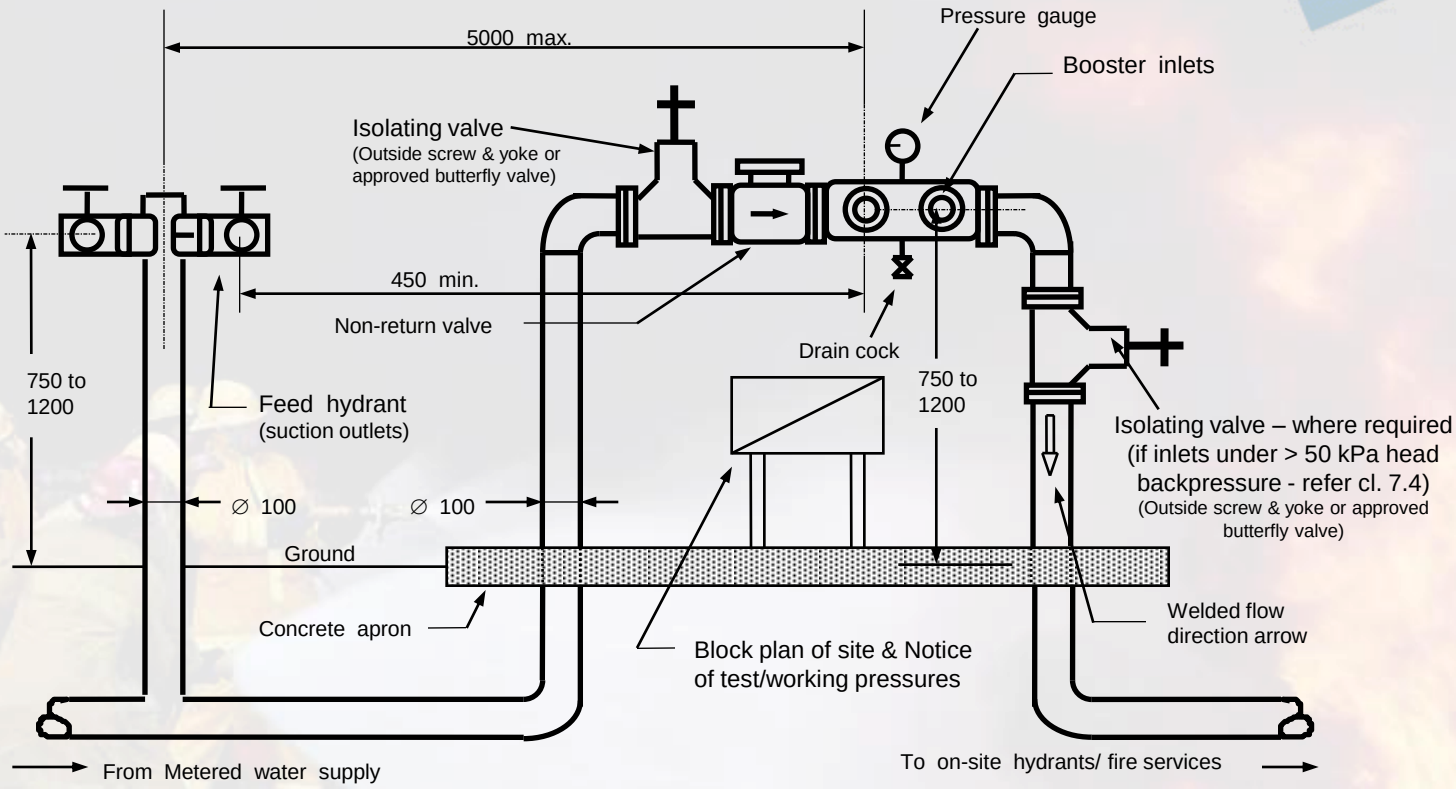
On Hydrants Systems which have-

- **a pumpset;**
- **on-site storage tanks;**
- **more than 6 external pillar hydrants;**
- **internal hydrants installed;**
- **more than one (1) external hydrant is required to serve a building having a fire compartment > 2,000 m^2; or**
- **an external hydrant(s) more than 20 m from a fire brigade pumping hardstand.**

➢ WHERE REQUIRED:

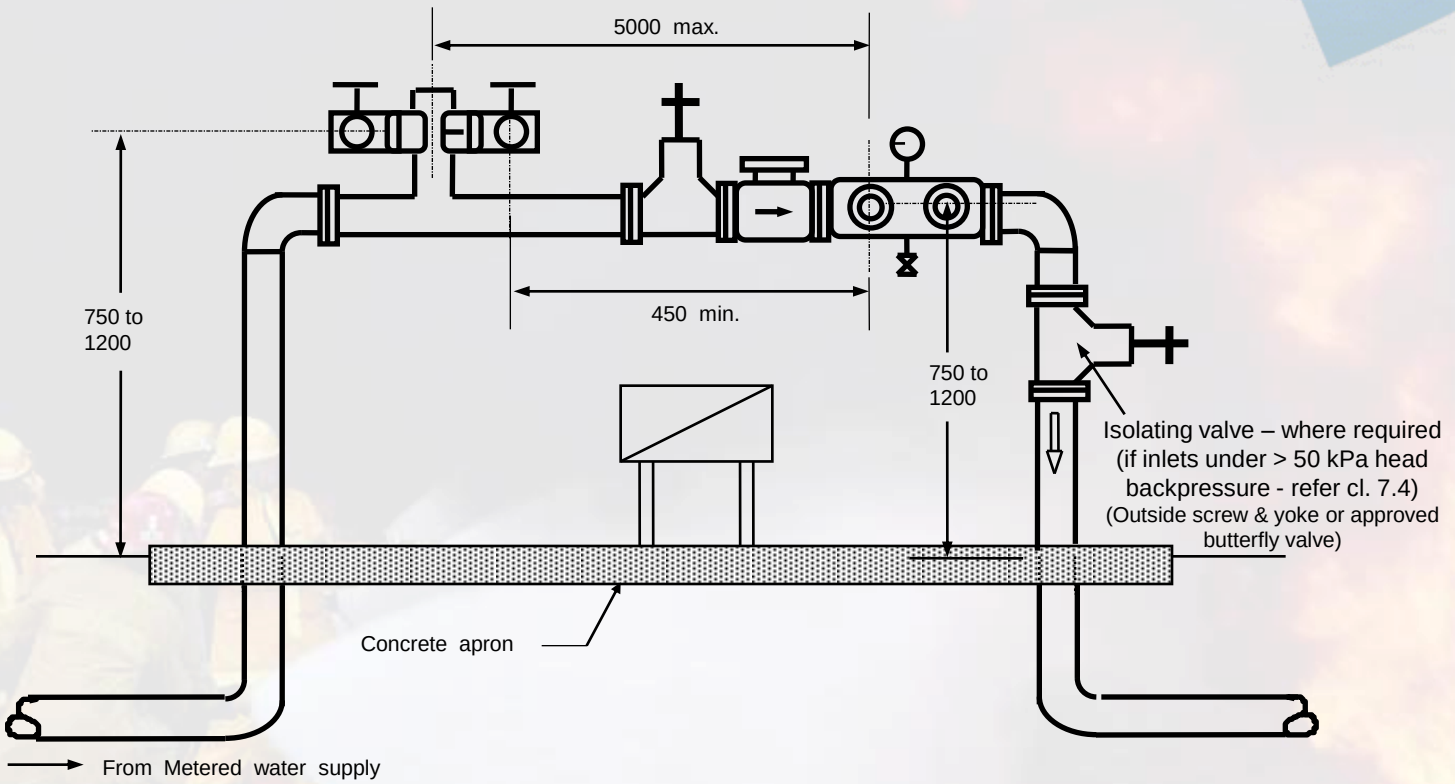
- Readily accessible to the Fire Brigade.
- Operable by Fire Brigade pumping appliances located within 8 m.
- If remote from the building -
  - (i) At the boundary of the site or within site of the main entrance of the building;
  - (ii) Adjacent to the principal vehicular access to the site; and
  - (iii) Located not less than 10 m from an external wall of the building.
- If within, or affixed to, the external wall of the building -
  - (i) within sight of the main entrance to the building; and
  - (ii) separated from the building by construction of not less than FRL 90/90/90.
- In a position approved by the regulatory authority which satisfies the operational requirements of the Fire & Rescue NSW.
- In a position not less than 10 m from any high voltage main electrical distribution equipment, liquefied petroleum gas and other combustible storage.

➢ ITS COMPONENTS & INSTALLATION:

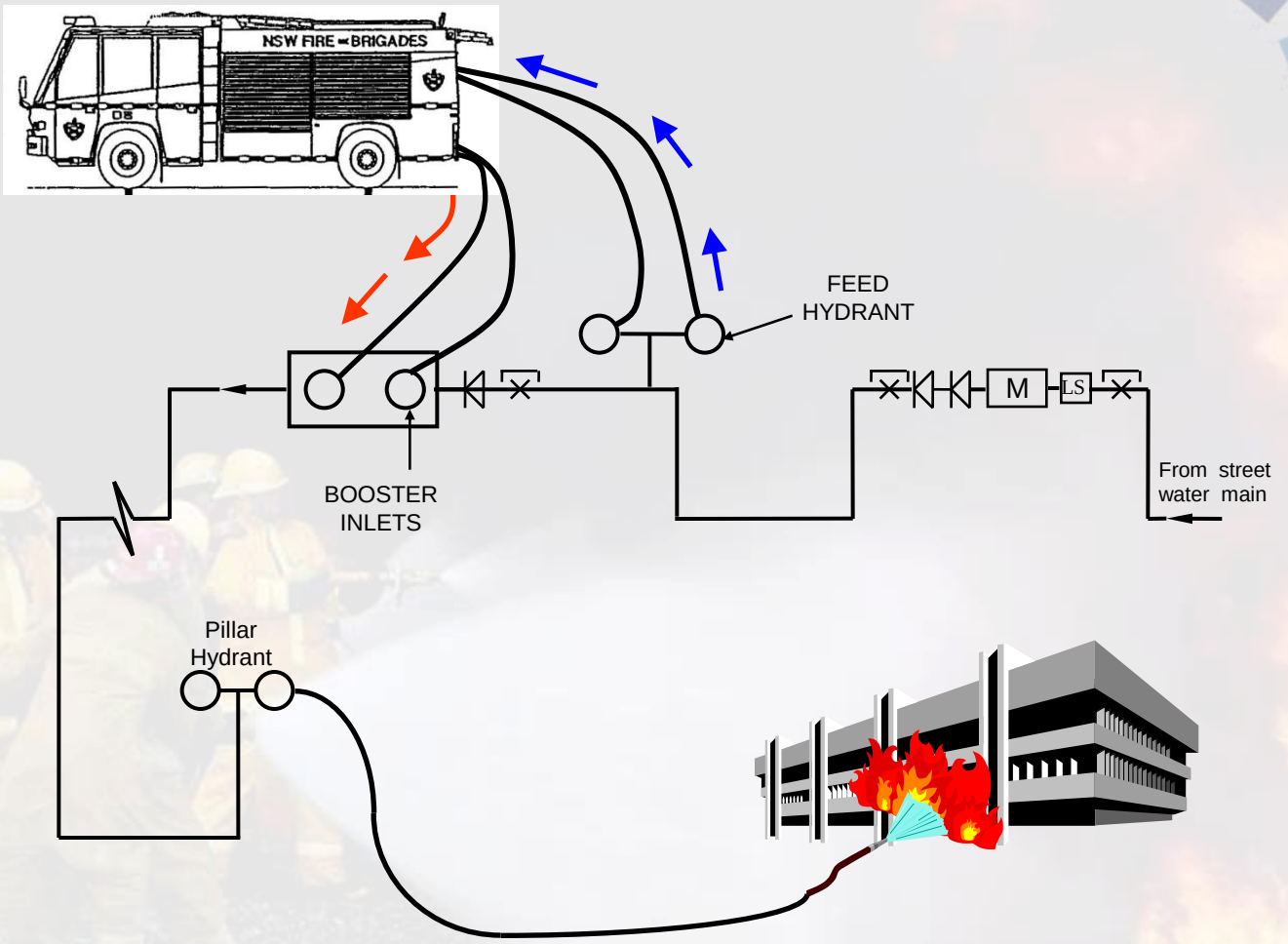


Adapted from Figure 7.4(c) AS 2419.1-2005

ITS COMPONENTS & INSTALLATION cont.:



How a booster connection is used-



Specific Components – feed hydrants (suction outlets)

Clause 7.4 (AS 2419.1-2005):

"The number of installed feed fire hydrants outlets for the fire brigade booster assembly shall be equal to the number of fire brigade booster assembly inlets."

Clause 8.5.11.1 (AS 2419.1-2005):

"Above-ground hydrant valves shall-

(a) be DN 65 mm;

(b) have their outlets fitted with hose connections compatible with the local fire brigade;

(c) be equipped with protective caps and retaining chains; and

(d) comply with AS 2419.2."

Note: Fire & Rescue NSW have adopted Storz fittings for hydrant system outlets in order to be compatible with their hose connections.

EXAMPLES

Storz fittings ➲

Specific Components – booster inlets

Clause 7.1 (AS 2419.1-2005):

"Fire brigade booster assemblies …. shall conform to the requirements of AS 2419.3 and the hose couplings shall be compatible with those used by the fire brigade serving the area."

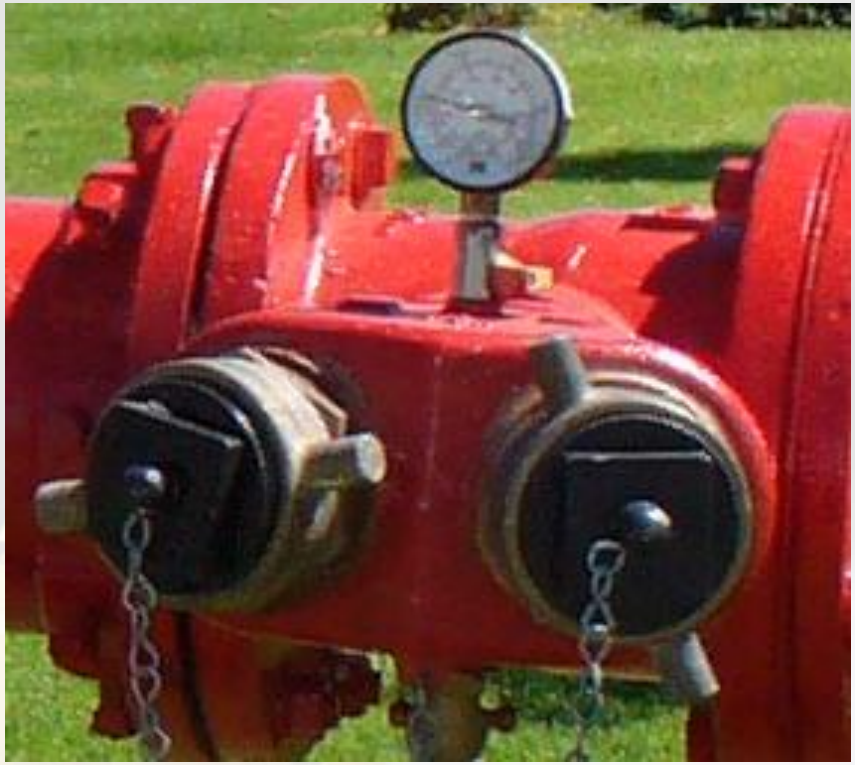
Note: Fire & Rescue NSW require that the inlets be fitted with a Storz coupling having the standard NSWFB thread and secured with a low strength thread sealant

Note:

The inlet connections of a booster body are required to be fitted with a non-return valve of a spring-loaded type.

Note:

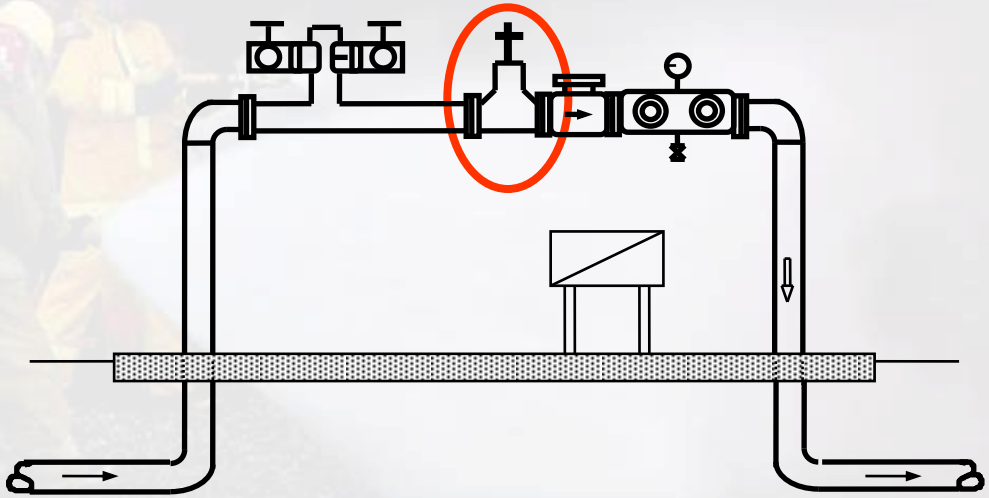
Both the feed hydrant outlets and booster inlets are required to be positioned such that they are either horizontal or sloping not more than 35° below the horizontal.



Specific Components – isolating valve

Clause 7.4 (AS 2419.1-2005):

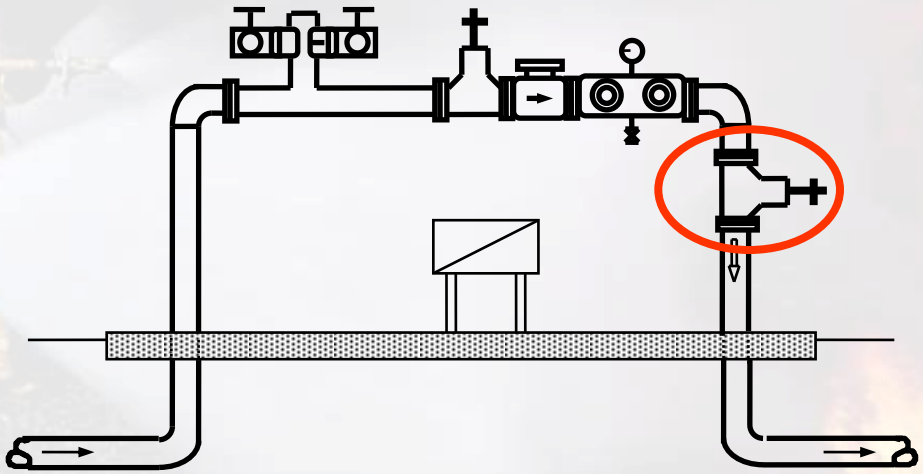
> "Where there is a town main supply to the hydrant system, there shall be a full flow non-return valve and an isolating valve installed above ground on the supply. The isolating valve shall be on the inlet, before the non-return valve."



Specific Components – isolating valve (cont.)

Clause 7.4 (AS 2419.1-2005):

> "Where the head of water present at the booster inlets, due to the system configuration or additional water supplies, can at any time be greater than 50 kPa, additional valves shall be installed to isolate the booster inlets."



Specific Components – isolating valve (cont.)

Clause 8.5.8 (AS 2419.1-2005):

"Above-ground isolating valves shall be full-flow outside screw and yoke wheel gate valves of the indicating type, complying with AS 3579, or low torque wheel-operated multi-turn post indicator ball or butterfly valves with all metal actuating mechanisms, closed by rotating the wheel clockwise, and shall-

(a) be secured or locked in the open position; and

(b) have affixed to the valve body or strap a plate inscribed with the words 'FIRE MAIN VALVE-SECURE OPEN' in uppercase letters not less than 8 mm high; …..

All isolating valves shall be clearly identified with a tag showing the valve number on the block plan in accordance with Figure 8.5.8."

Specific Components – isolating valve (cont.)

Clause 8.5.8 (AS 2419.1-2005):

> "All isolating valves shall be clearly identified with a tag showing the valve number on the block plan in accordance with Figure 8.5.8."

VALVE nn*

FIRE MAIN VALVE – SECURE OPEN

EXAMPLES

Gate valve

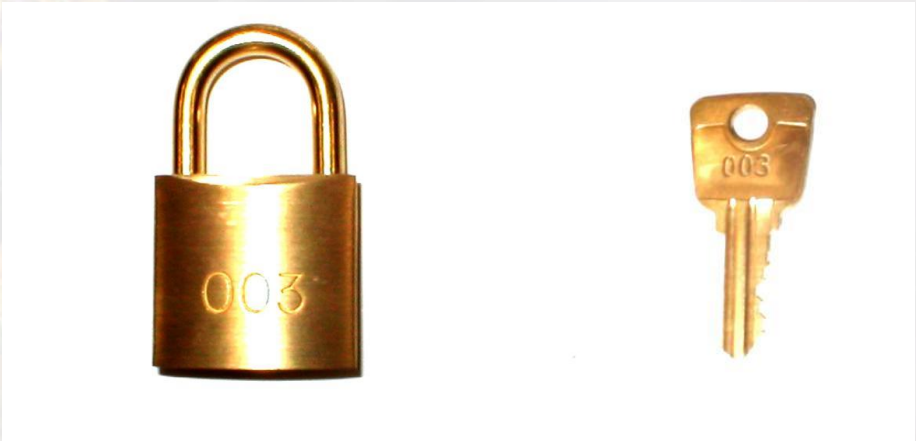
Butterfly valves

Gate valve

NOTE:

The chain/leather strap being used to secure the isolation valve in the open position, should be locked with a standard “003” fire brigade padlock.

The “003” key is the standard lockset used on fire indicator panels and is thus carried by Fire & Rescue NSW crews.



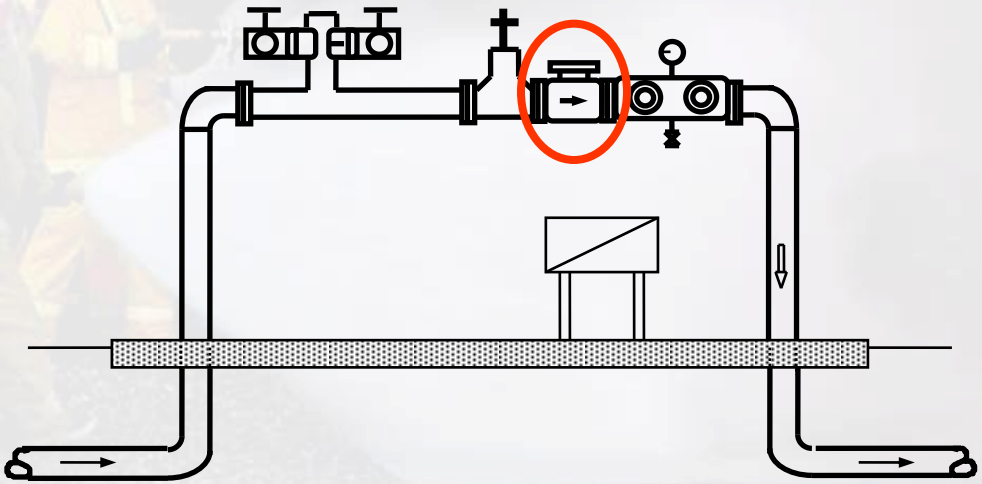
EXAMPLE

Specific Components – non-return valve

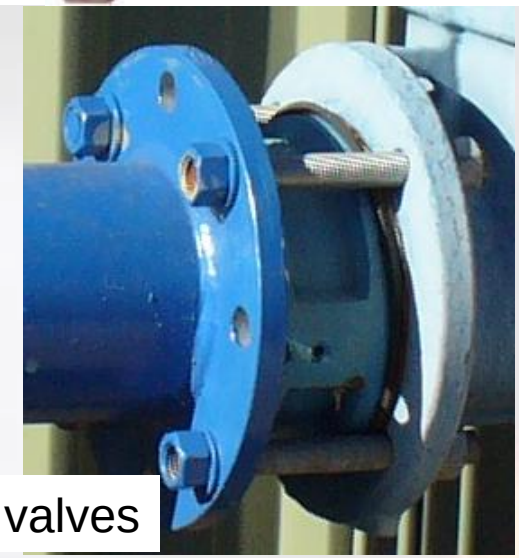
Clause 7.4 (AS 2419.1-2005):

"Where there is a town main supply to the hydrant system, there shall be a full flow non-return valve and an isolating valve installed above ground on the supply. The isolating valve shall be on the inlet, before the non-return valve."

"Booster assemblies shall permit a fire main to be pressurised without recourse to the manual operation of isolating valves and shall be arranged generally in accordance with Figure 7.4"



Swing check valves



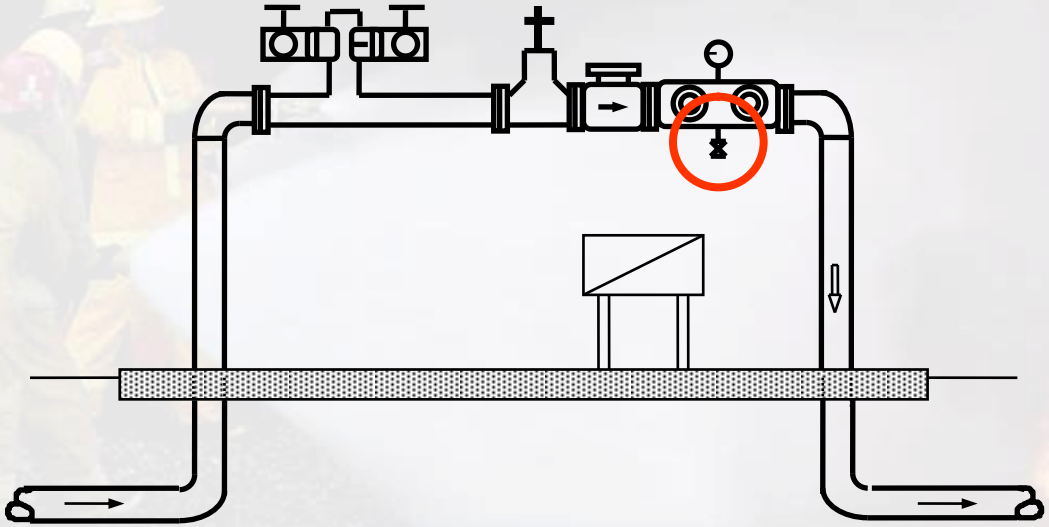
Duo wafer check valves

Specific Components – drain valve (bleed valve)

Clause 2.5 (AS 2419.3):

"Booster bodies shall be fitted with a drain valve with a 25 mm BSP outlet complying with the requirements of AS 1628.

For ease of attaching a drain hose, the drain valve outlet shall be positioned so that it faces in the same direction as, and at a lower level than, the inlet connections on the booster."

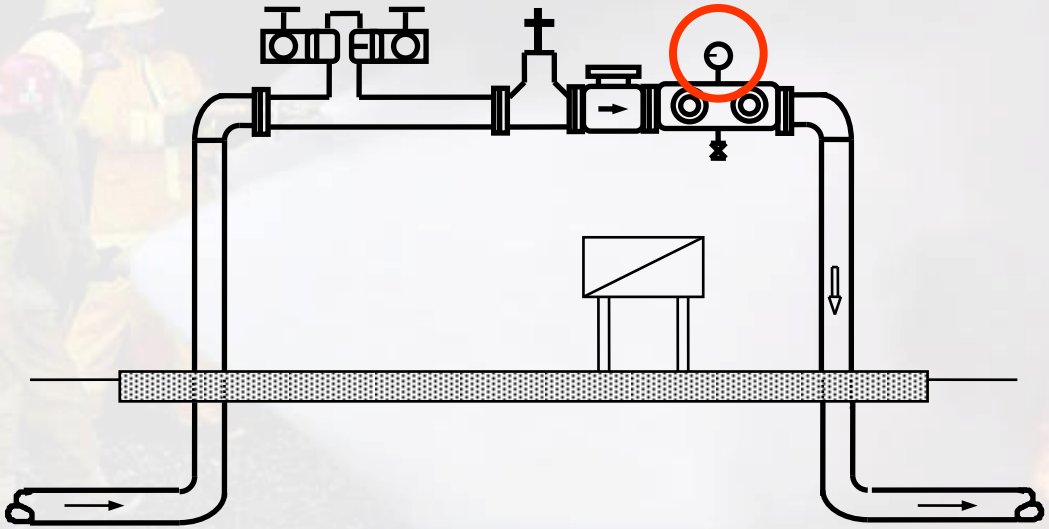


Specific Components – pressure gauge

Clause 9.3.2 (AS 2419.1-2005): "Pressure gauges shall be installed on a fire hydrant system as follows:

(a) For all installations-

(ii) adjacent to any fire brigade booster assembly inlet connection [see Figure 7.4(a), (b) or (c)];"



Specific Components – pressure gauge (cont.)

Clause 9.3.1 (AS 2419.1-2005):

Fire Hydrant pressure gauges shall-

(a) comply with AS 1349;

(b) have a full reading of not less than 125% of the system hydrostatic test pressure at the point where the gauge is located;

(c) be fitted with a gauge cock to permit removal, servicing or testing of the gauge;

(d) have a dial face of not less than 65 mm dia. unless otherwise specified in this standard;

(e) have a window made of glass.

Specific Components – pressure gauge (cont.)

Note: As the minimum test pressure is 1700 kPa, the pressure gauge dial must read at least up to **2125 kPa** (i.e. 125% of 1700 kPa).

The provisions of Clause 9.3.1 of AS 2419.1-2005 are identical to Clause 2.7 of AS 2419.3

Specific Components – block plan

Clause 7.11 (AS 2419.1-2005):

"A block plan, A3 minimum size, shall be fixed within the booster cabinet, enclosure, recess, fire control room and pump room where it can be readily seen.

The block plan shall be water- and fade-resistant and display the following:

(a) A diagrammatic layout of the protected buildings or open yards and adjacent streets."

Specific Components – block plan (cont.)

(b) A diagram showing-

(i) size and location of water supply authorities mains and street fire hydrants (dimensioned);

(ii) valves and connections for non-industrial purposes;

(iii) location and size of on-site fire mains;

(iv) location and capacities of water storage tanks;

(v) location of pumps;

(vi) location and total number of hydrants;

(vii) location of all fire brigade booster assemblies;

(viii) location of isolating and non-return valves;

(ix) any connections to other installed fire protection systems;

Specific Components – block plan (cont.)

(x) pressure and flow rating of pumps (kpa and L/s);

(xi) location of main electrical switchroom;

(xii) location of LPG tanks and gas supply shutdown valve; and

(xiii) location of all flammable storage areas.

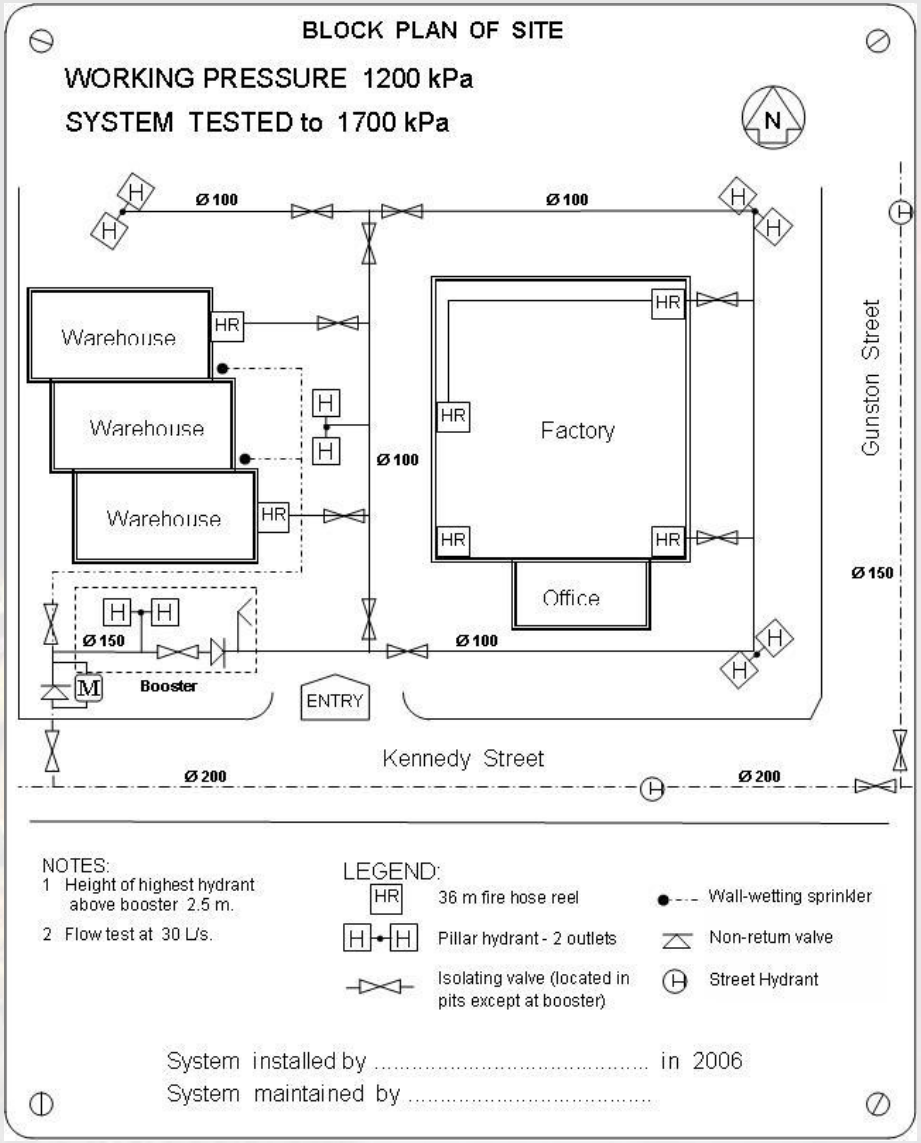
(c) The year of installation of the system, any major extensions thereto, and any unusual features of the installation, and-

(i) the name of the contractor who installed or modified the system;

(ii) the system design and commissioning pressure and flow rate; and

(iii) the height of the highest fire hydrant outlet above the lowest booster inlet connection."

EXAMPLE


BLOCK PLAN OF SITE
WORKING PRESSURE 1200 kPa
SYSTEM TESTED to 1700 kPa
N
Ø 100
Ø 100
Warehouse
Warehouse
Warehouse
HR
HR
HR
HR
HR
HR
Factory
Office
Ø 100
Ø 100
Ø 150
Ø 150
Booster
ENTRY
Gunston Street
Kennedy Street
Ø 200
Ø 200
NOTES:
1 Height of highest hydrant above booster 2.5 m.
2 Flow test at 30 L/s.
LEGEND:
36 m fire hose reel
Pillar hydrant - 2 outlets
Isolating valve (located in pits except at booster)
Wall-wetting sprinkler
Non-return valve
Street Hydrant
System installed by ..... in 2006
System maintained by .....

Specific Components – notice of pressure

Clause 7.10 (AS 2419.1-2005):

"A **fade-resistant** or **engraved sign** indicating **boost pressure** and **test pressure** (in kilopascals) shall be-

(a) fixed in a prominent position adjacent to the fire brigade booster assembly or within the cabinet or recess; and

(b) marked in upper case lettering not less than 25 mm high and in lettering in a colour contrasting with that of the background.

Note: The use of engraved or etched non-ferrous metal signs are the most suitable. Painted and laminated signs are not acceptable.

➢ Other noteworthy provisions

Clause 8.6.3 (AS 2419.1-2005):

> "Fire hydrant pipework shall be identified in accordance with AS 1345."

Clause 7.4 (AS 2419.1-2005):

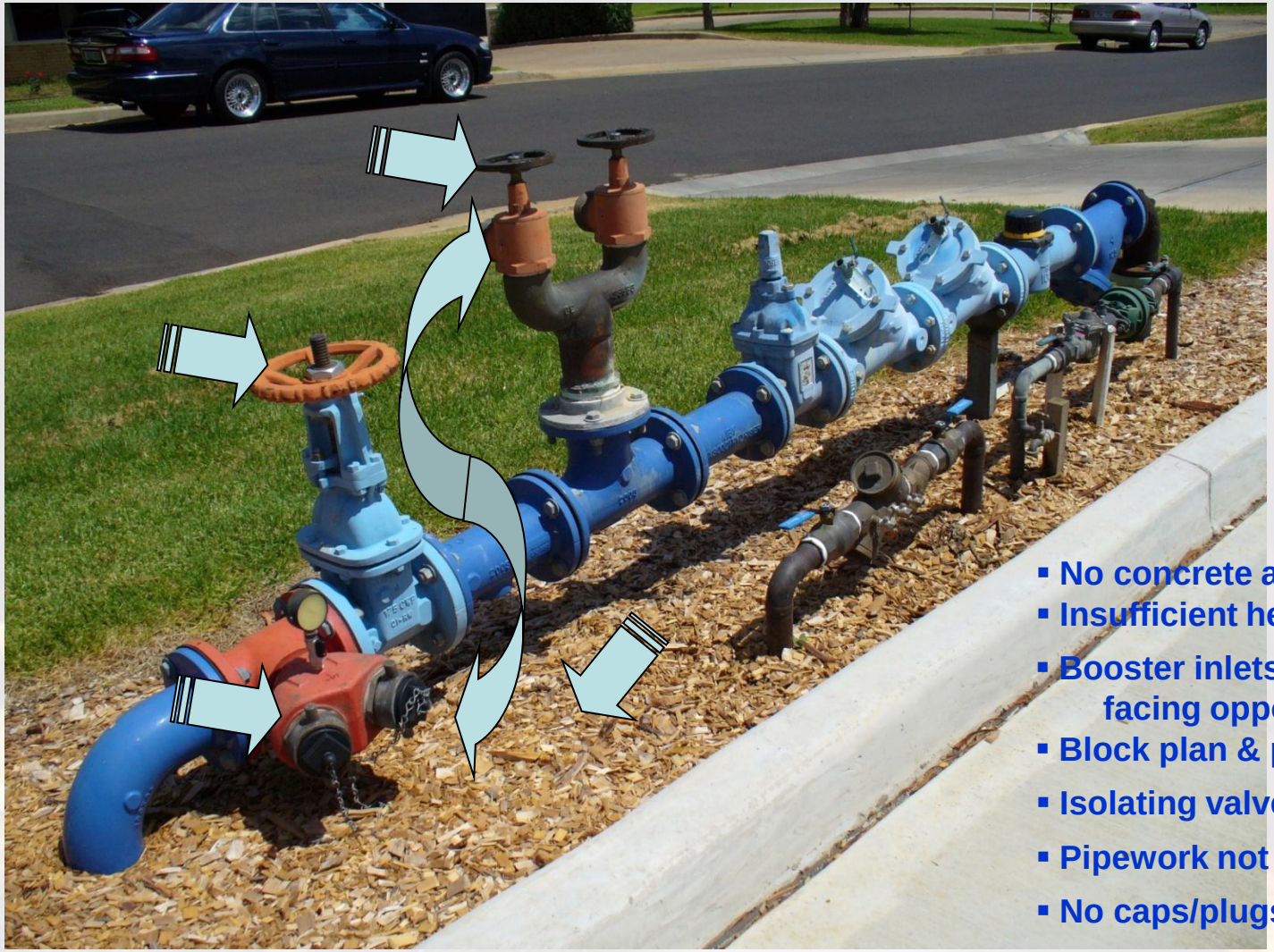
> "An arrow showing the direction of flow shall be welded or cast to the pipework adjacent the booster (see Figure 7.4(b)).
>
> Caps, chains, bleed valve and ancillary fittings shall be as specified in AS 2419.3."

Clause 8.2.5 (AS 2419.1-2005)

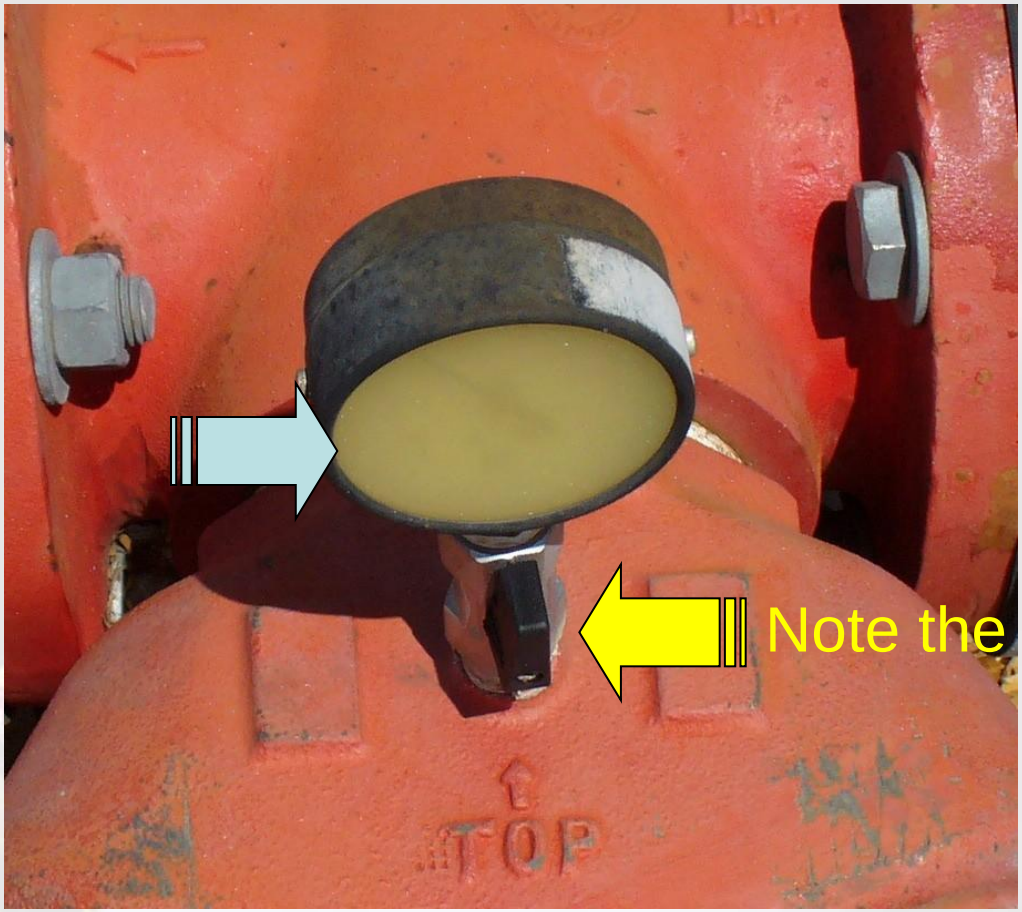
> "Hydrant installations are for fire-fighting purposes only. A separate system complying with AS/NZS 3500.1 shall be provided for any other use."


Examples -
The Good, the Bad and the Ugly

Examples of Installation Errors/Oversights

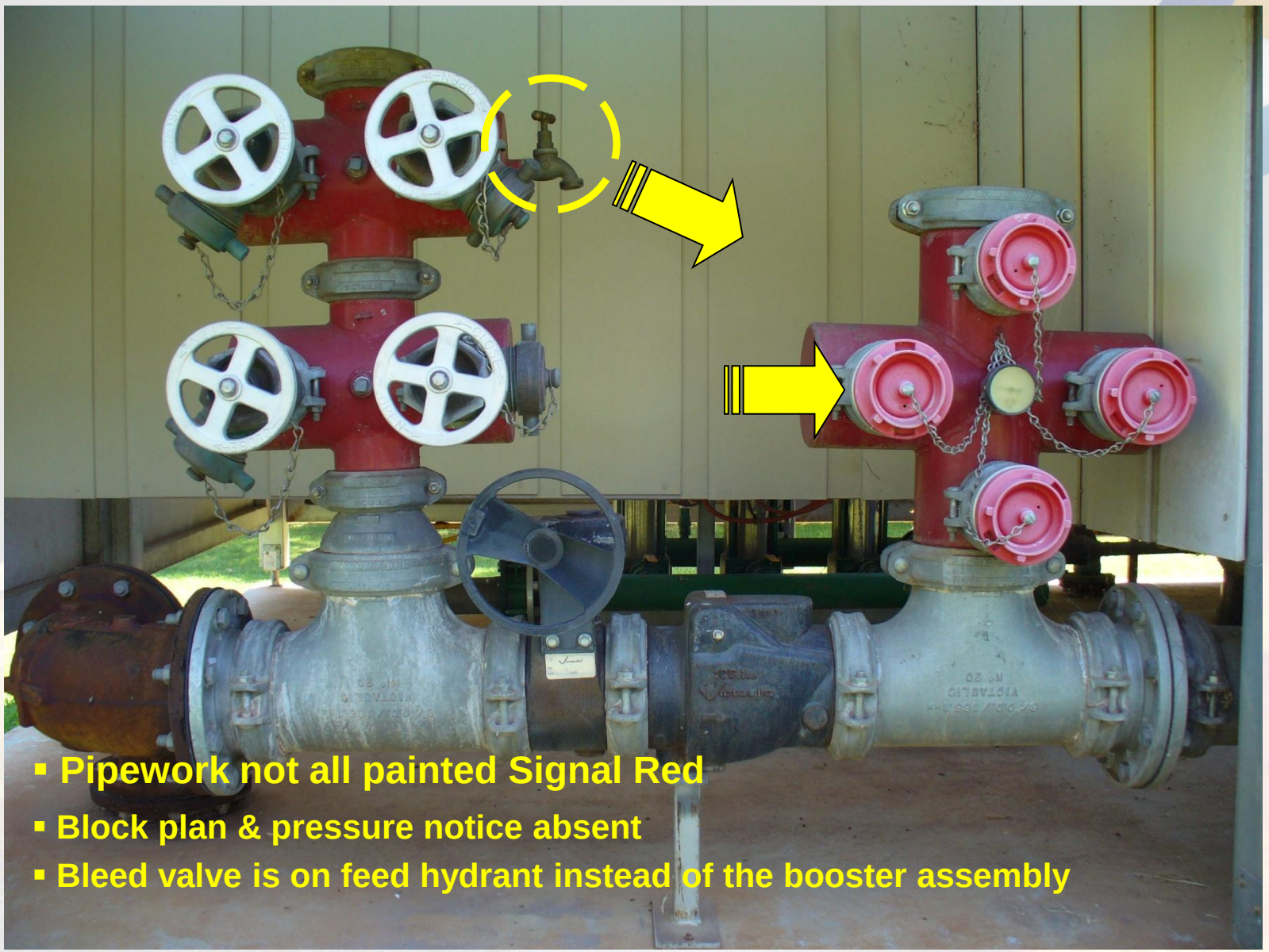


- No concrete apron
- Insufficient height of booster inlets
- Booster inlets/suction outlets facing opposite directions
- Block plan & pressure notice absent
- Isolating valve wheel not strapped
- Pipework not painted Signal Red
- No caps/plugs on feed hydrant
- No non-return valve



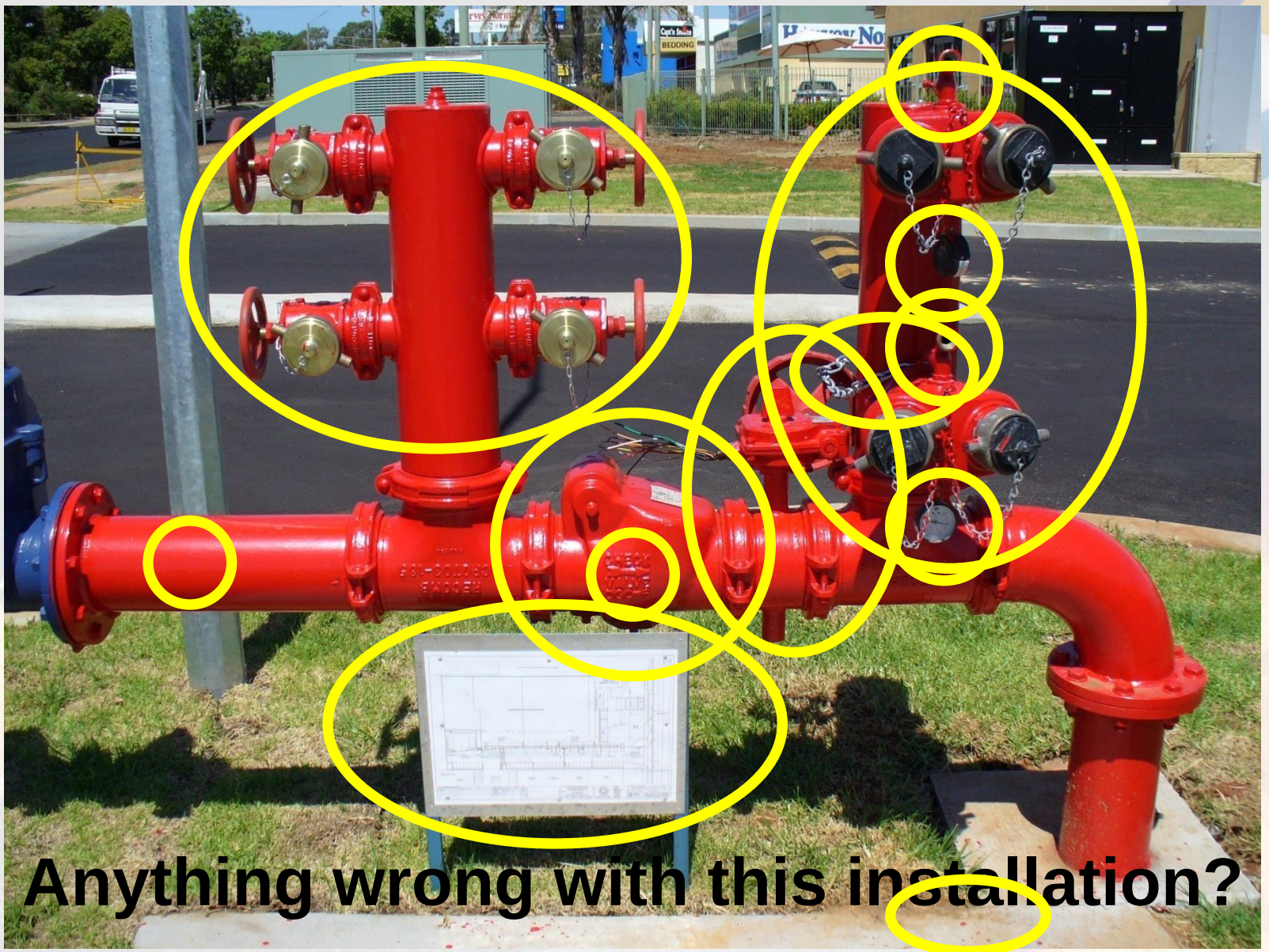
Observe the opaque condition of the pressure gauge's face – result of the plastic face's exposure to the weather.

One reason why AS 2419.1 specifies glass faces for such gauges!

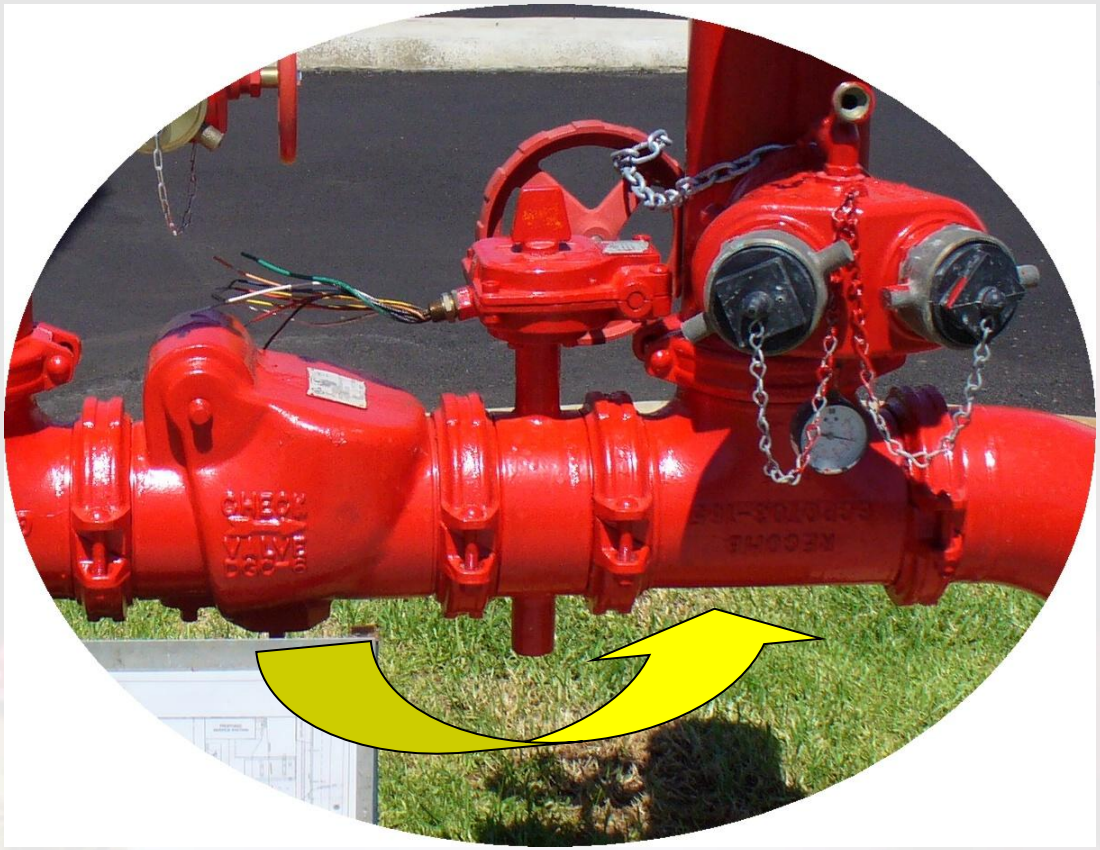


- Pipework not all painted Signal Red
- Block plan & pressure notice absent
- Bleed valve is on feed hydrant instead of the booster assembly

- Insufficient height of booster inlets
- Isolating valve wheel absent & not strapped
- Pipework not painted Signal Red
- No caps/plugs on feed hydrant
- No Block Plan

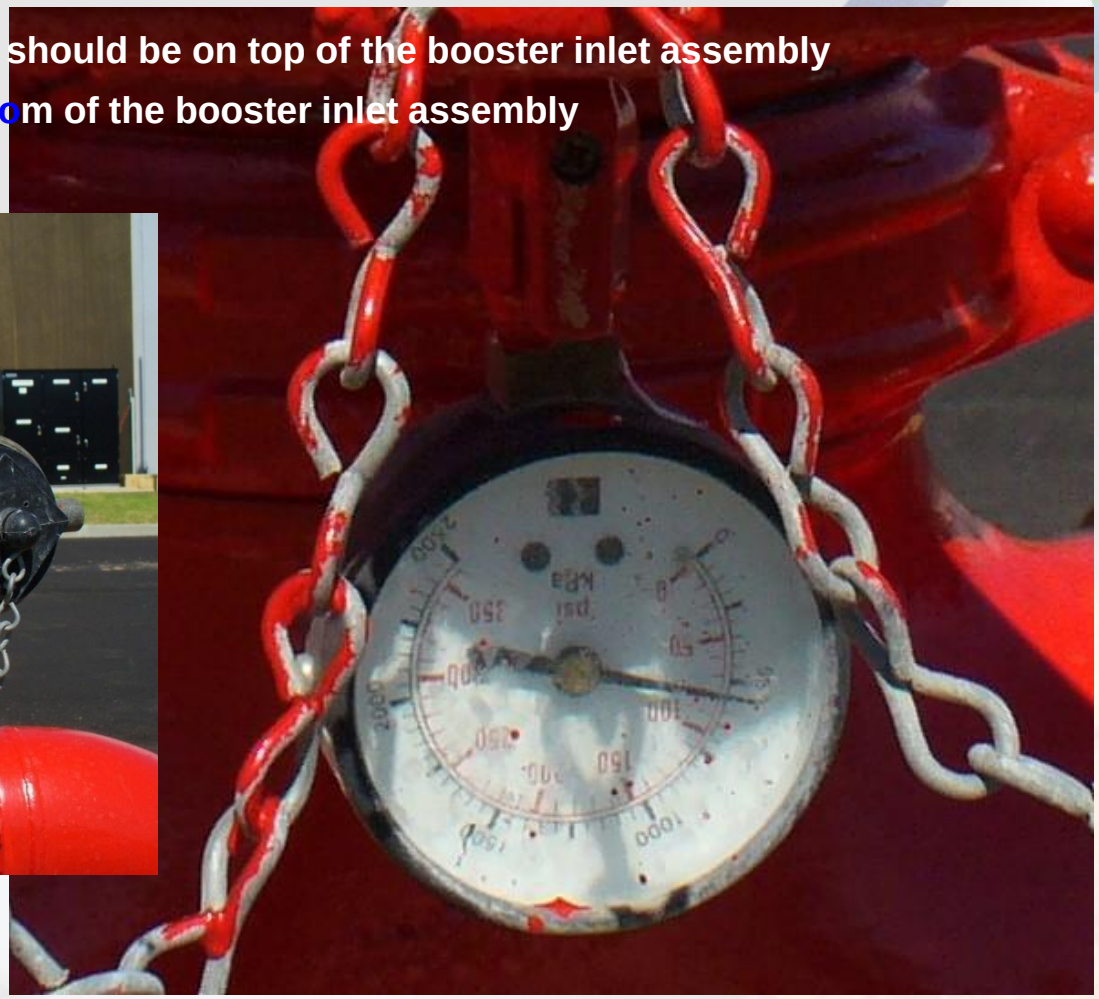


Anything wrong with this installation?

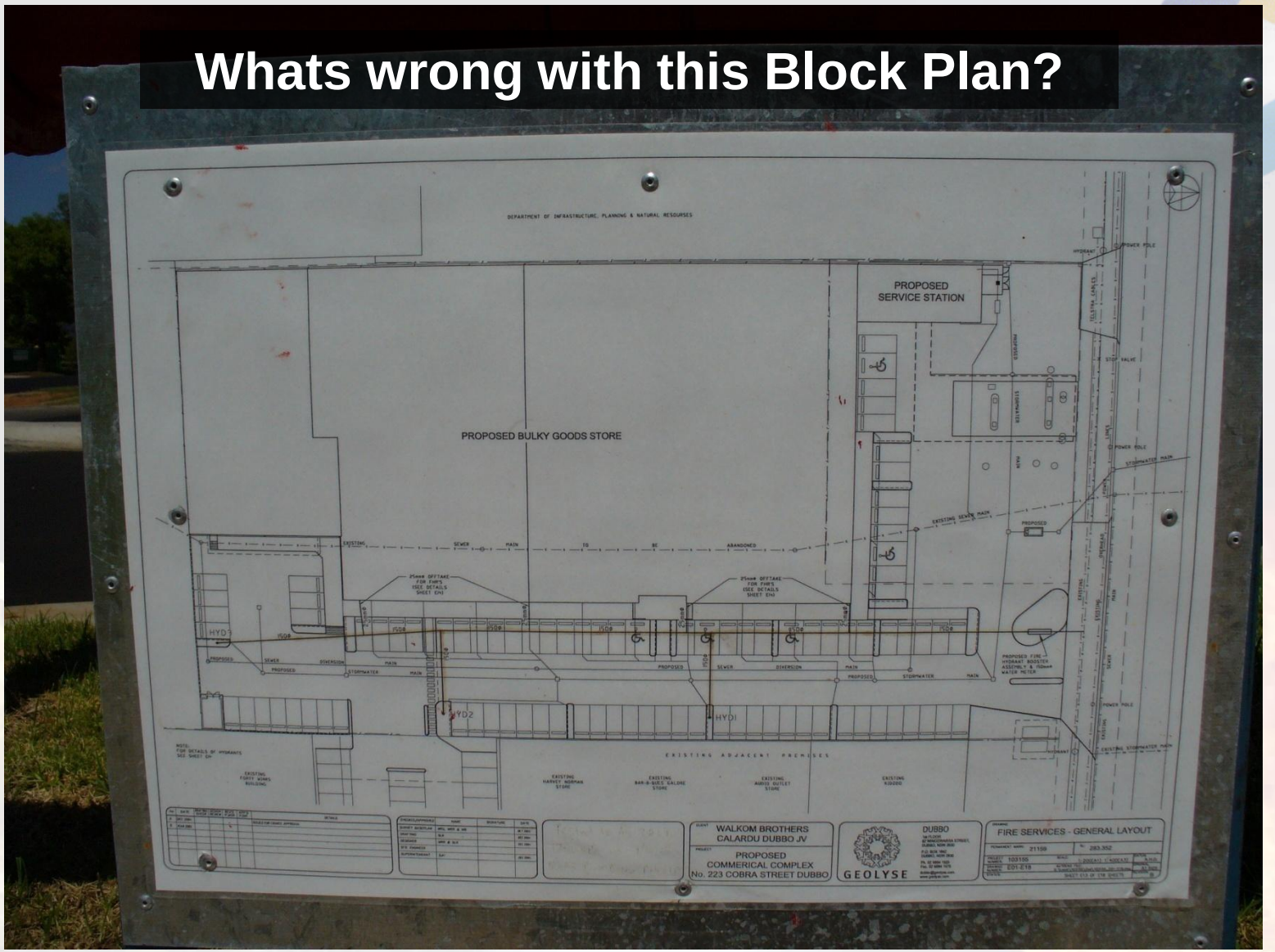


The non-return valve should be after the stop valve

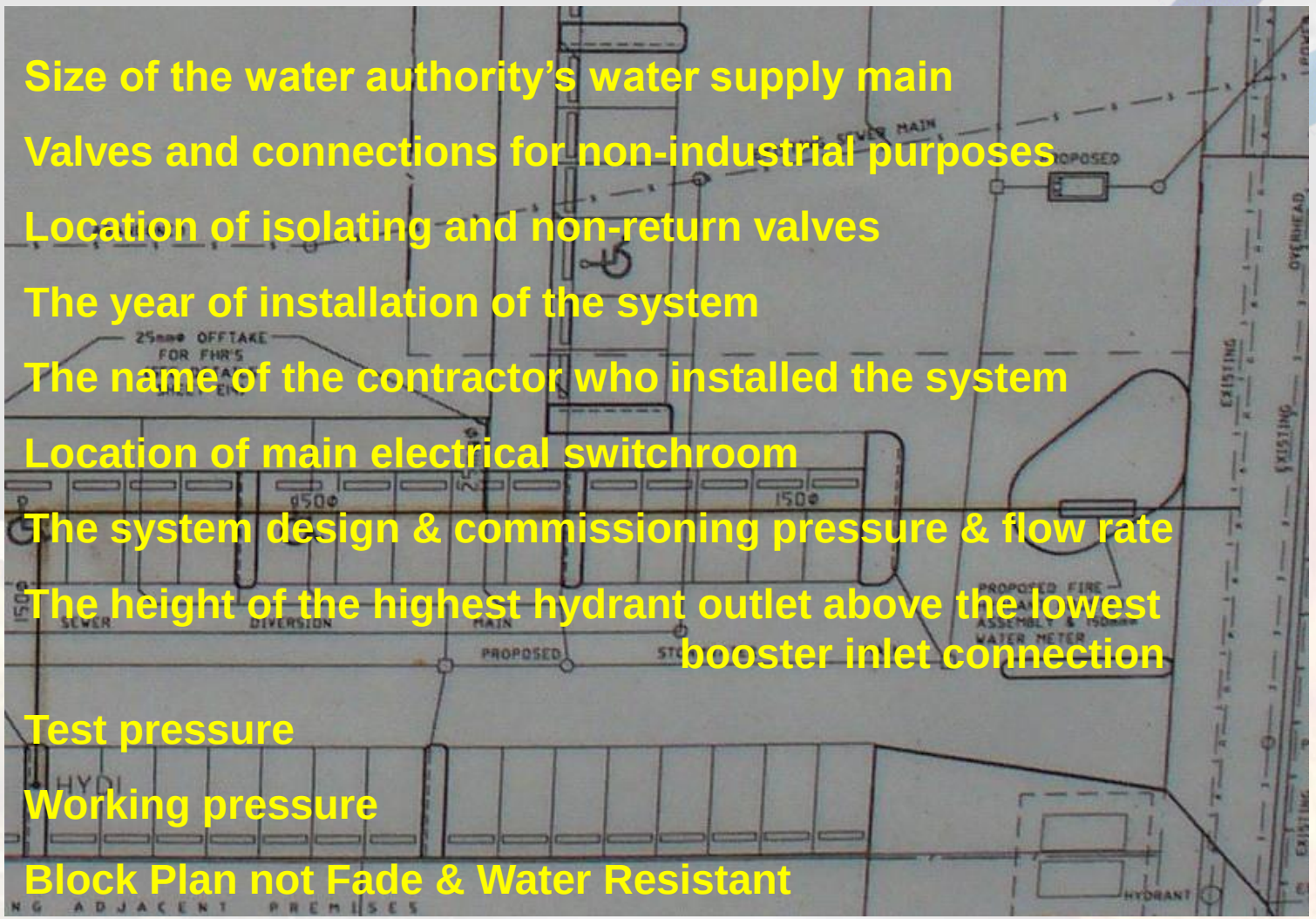
- **Pressure gauge upside down – it should be on top of the booster inlet assembly**
- **Bleed valve should be on the bottom of the booster inlet assembly**



Whats wrong with this Block Plan?



Information absent-



Why the Block Plan must be durable-

A better example of a Block Plan-

Main issue with this installation is?

Installation is reversed-

From Water Main in Street

Example of why the Pressure Gauge requires-

- a gauge cock; and
- a glass face, not plastic

‘Casualties’ of lack of space:


SPRINKLER
DUBBO REGIONAL THEATRE
THEATRE
CIVIC CENTRE
CHECK
VALVE


DUBBO REGIONAL THEATRE
THEATRE

Another casualty of lack of space-


Hall
Outdoor Area
Wingewarra Street
Block Plan

Suggested Checklist When Inspecting an Installation:

- ❑ Check the direction of water flow from the street main through the booster i.e.- the feed hydrant must be before the booster inlets!
- ❑ Check that an isolating valve and non-return valve are installed between the feed hydrant and booster inlets.
- ❑ Check the isolating valve is strapped/chained open – removing the hand wheel is not appropriate! Also, a metal tag must a fixed to the valve i.e.:

VALVE nn*

FIRE MAIN VALVE – SECURE OPEN

- ❑ Check the provision of a pressure gauge and a drain valve – on the booster inlet assembly! Note: *the pressure gauge must have a gauge cock, a glass face, 65 mm nominal diameter and read up to at least 2125 kPa.*
- ❑ Check a drain valve is provided below the level of the booster inlets.
- ❑ Check that the booster assembly body is marked with " AS 2419.3".

Suggested Checklist When Inspecting an Installation Cont.:

- Check a **Block Plan** and the **Working** and **System Test** pressures are provided.
- Check the provision of a concrete apron under at least the booster inlets.
- Check the height, angle and direction of the booster inlets & suction outlets.
  - *consider the practicalities of how fire brigade personnel will access and be able to connect up their hoses*.
- Check that the installation will be readily visible and accessible to the Fire & Rescue NSW.
- Check that a hardstand (sealed) area is available within 8 m of the installation.
- Check that a **directional arrow** is present - *typically, the gate valve, non-return valve or booster inlet assembly will have an arrow cast onto its body – if not, a welded arrow must be provided*.
- Check that the booster installation is painted 'Signal Red'. Note: *painting is preferred for weather exposed installations instead of adhesive marking labels*.

Additional Information:

- Fire & Rescue NSW Guide Sheets @ www.fire.nsw.gov.au
- AS 2419.1-2005

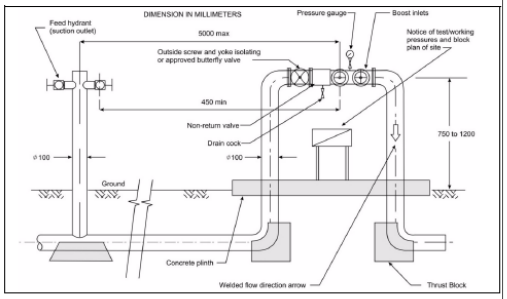
NSW FIRE BRIGADES

Guide Sheet No. 1

Features of AS2419.1 Booster Assembly

Version 01.01 Released: 24 Aug 2010

This guide sheet outlines the features of an AS2419.1 booster assembly.



When inspecting an AS2419.1 booster system ensure the following:

1 Equal number/s of valve controlled outlets to boost inlets are provided (e.g. 4 in and 4 out).
2 No more than eight booster inlets are installed in the booster assembly.
3 Sufficient room is provided for pumping appliances (1 pumper for four booster inlets).
4 Feed outlets are located no more than 5 metres from the boost inlets.
5 Feed outlets are located no closer than 450 mm from the boost inlets.
6 Feed outlets are located upstream (water supply side) of the main isolating valve.
7 A directional arrow indicating water flow is visible on the body of the booster.
8 A non-return valve is positioned downstream (property side) of the main isolating valve.
9 Boost inlets are located downstream (property side) of the non-return valve.
10 A pressure gauge is located downstream (property side) of the non-return valve.
11 A site block plan is provided.
12 The height of feed outlets and boost inlets is between 750mm and 1200mm.
13 When all feed outlets and booster inlets have firefighting hoses connected, one hose will not cause interference with other hoses, fixtures or construction.
14 A mark of compliance as per AS 2419.3 should be located on the

NSW FIRE BRIGADES

Guide Sheet No. 2

Location of AS2419.1 Booster Assembly

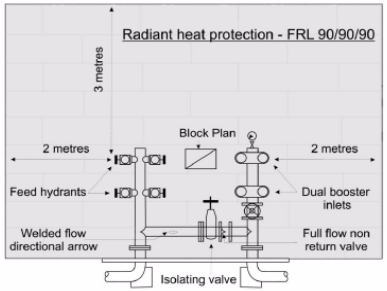
Version 01.01 Released: 24 Aug 2010

This guide sheet outlines the location of an AS2419.1 booster assembly.

Variations to the following may be observed when an exemption under Clause 188 or Claus of the Environmental Planning and Assessment Regulations have been given. Any hydra system concerns should be reported to the NSWFB Building Compliance Unit on (02) 9742

When inspecting an AS2419.1 booster system ensure the booster is located as follows:

1 In a position that is readily accessible to firefighters.
2 In a position that will not obstruct vehicle movement including access for emergency vehicles
3 In a position that allows fire brigade pumping appliances to be positioned within 8 metres of th booster assembly, or 4.5 metres if connected to a bulk water storage tank.
4 If located in an external wall, within sight of the main entrance of the building and separated from the building by construction having an FRL of 90/90/90 that extends not less than 2m eac side and 3m above the upper hose connections of the booster assembly.



5 If remote from the building the booster shall be;
(i) At the boundary of the site and within site of the main entrance of the building;
(ii) Adjacent to the principle vehicular access to the site; and
(iii) Located not less than 10 metres from the external wall of any building served.
6 In a position not less than 10 metres from any high voltage main electrical distribution equipment (e.g. transformers or distribution board) and from liquefied petroleum gas and othe combustible equipment.

NSW FIRE BRIGADES

Guide Sheet No. 4

Fire Brigade Hose Couplings

Version 02.01 Released: 24 Aug 2010

This guide sheet outlines the position of the NSWFB in relation to Fire Brigade hose copuplings.

Clauses within the Australian Standard AS 2419 suite of standards specify that hose couplings compatible with local fire brigades shall be provided on all booster assembly outlets and inlets, feed hydrants, attack hydrants and hard suction outlets. Booster assemblies for automatic water based suppression systems should also be provided with compatible hose couplings.

Accordingly, the NSWFB advises that forged (pressure cast) Storz hermaphrodite hose couplings should be provided. The hose couplings for valve controlled hydrant outlets, booster outlets and inlets should:

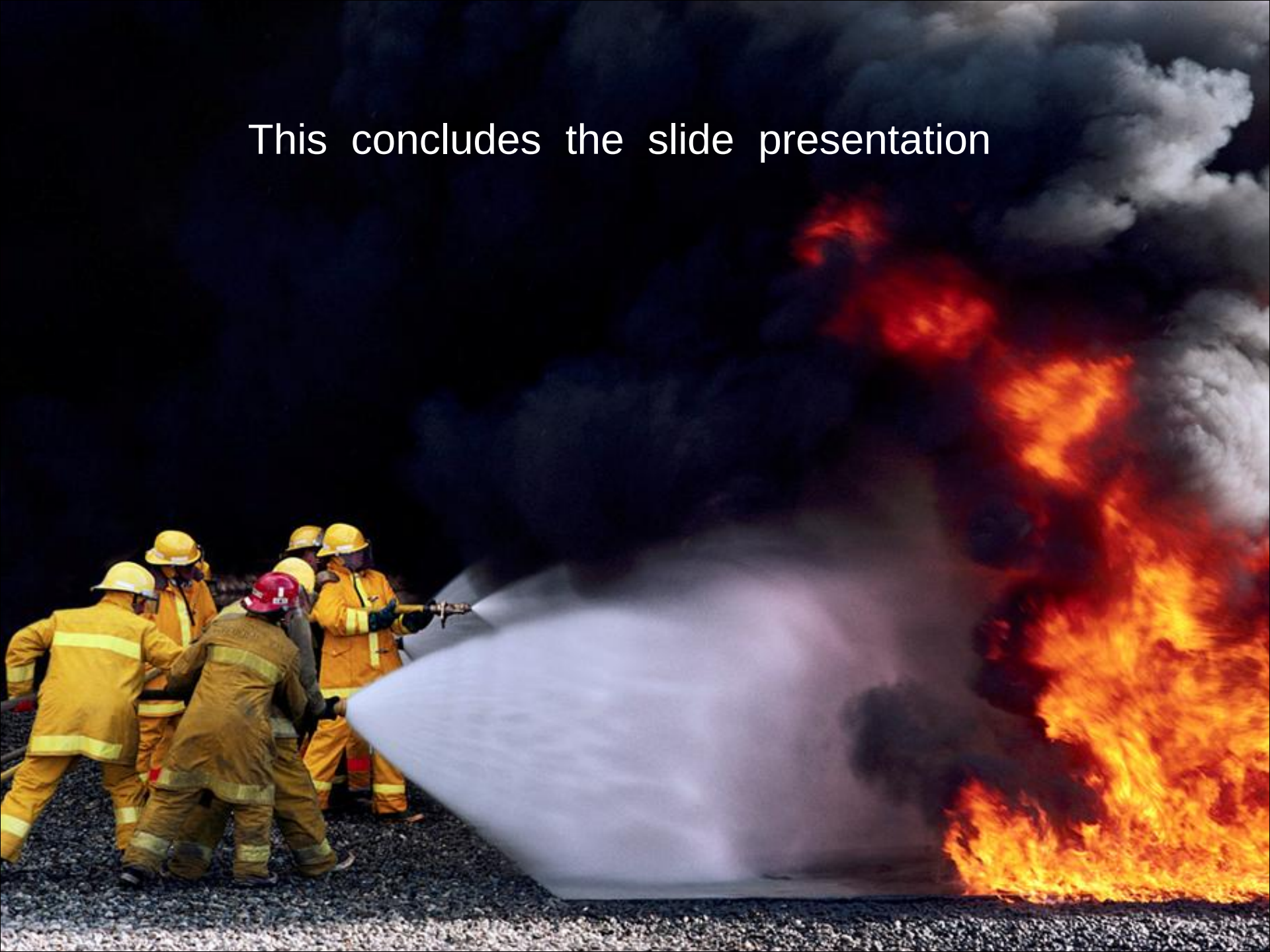
- have a nominal bore diameter of 65mm (refer to figure 1 on page 2),
- have an internal diameter between locking lugs of 81mm (refer to figure 1 on page 2),
- possess a forging symbol and the manufacturers mark (refer to DIN 14303),
- have the standard NSWFB thread of 64mm x 4.88mm pitch (2 1/2 x 5 1/5 TPI),
- be fitted with blank caps and securing chains.

Note: *Valve controlled hydrant outlets and booster outlets should have a male thread as described above and booster inlets should have a corresponding female thread. The standard NSWFB thread is required for instances where hose couplings have been vandalised or otherwise damaged, they may be replaced with spare NSWFB couplings to ensure that fire fighting operations can be commenced expediently.*

The NSWFB recommends that a low strength thread sealant is used between the hose coupling and pipe thread.

Note: *The NSWFB considers that these hose couplings are connectors and not fittings, thus not part of the fixed system to which the National Plumbing Code (AS 3500) relates.*

Further guidance on hard suction fittings for static water supplies can be found in AS 2419.1-2005.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