Australian Standard®

Fire hydrant installations

Part 1: System design, installation and commissioning



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- Association of Hydraulic Services Consultants Australia
- Australasian Fire Authorities Council
- Australian Building Codes Board
- Certification Interests (Australia)
- Copper Development Centre—Australia
- Department of Defence (Australia)
- Fire Protection Association Australia
- Institution of Engineers Australia
- Plastics Industry Pipe Association of Australia
- Property Council of Australia
- Water Services Association of Australia

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AS 2419.1—2005 (Incorporating Amendment No. 1)

Australian Standard[®]

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Part 1: System design, installation and commissioning

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PREFACE

This Standard was prepared by the Standards Australia Committee FP-009, Fire Hydrant Installations, to supersede AS 2419.1—1994.

This Standard incorporates Amendment No. 1 (June 2007). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The changes to the previous edition of this Standard comprise the following:

- (a) A stated objective.
- (b) Clarification of intent.
- (c) A restructure of the document into more user friendly equipment-specific sections.
- (d) Incorporation of all revisions contained in Amendment No. 1, which expanded the requirements for fire hydrant system design, acceptable sources of water supply, water supply capacities and general revisions to account for advances in technology for materials, methods of installation and firefighting requirements.
- (e) Inclusion of a commentary to some clauses.

This Standard will be referenced in the Building Code of Australia 2006; thereby superseding AS 2419.1—1994, which will be withdrawn 12 months from the date of publication of this Standard.

Commentary is for information only and does not need to be followed for compliance with the Standard.

Notes to the text contain information and guidance. They are not an integral part of the Standard.

Illustrations in this Standard are purely diagrammatic and are intended to show functional requirements only, not methods of construction.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the Appendix to which they apply. A 'normative' Appendix is an integral part of a Standard, whereas an 'informative' Appendix is only for information and guidance.

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FOREWORD

The availability of fire hydrants is essential to fire protection. Fire hydrants may be used to control the spread of fire, protect neighbouring properties and extinguish an outbreak of fire, or extinguish a fire controlled by an automatic fire protection system, such as sprinkler, gaseous and foam systems.

Although fire hydrants are installed within properties for use by the fire brigade, they may also be used by trained personnel.

An adequate source of water is a fundamental consideration in the design of a fire hydrant installation and may comprise water from more than one source. A source based on a 4 h duration at the flow rates given in this Standard is regarded as the minimum safe quantity to enable fire brigades to commence an initial attack to limit fire spread, protect neighbouring properties and extinguish the fire.

Fire hydrant systems need to be regularly inspected, tested and maintained to ensure continued readiness for use. Where pump sets are installed, regular maintenance is essential.

Fire brigade equipment and firefighting procedures may vary between and within states and should be considered in the fire hydrant system design.

STANDARDS AUSTRALIA

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Australian Standard Fire hydrant installations

Part 1: System design, installation and commissioning

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements for the design, installation, and commissioning of fire hydrant systems to protect properties. It applies to fire hydrant systems installed to protect buildings, structures, storage yards, marinas and associated moored vessels, wharves, and plant. This Standard also applies to street fire hydrants used in lieu of on-site fire hydrants or to supplement the coverage afforded by street fire hydrants.

A1 This Standard does not apply to (but may be referenced during design for) the protection of special hazards such as flammable and combustible liquid installation (see Note 4).

NOTES:

- 1 Requirements for maintenance of fire hydrant installations are given in AS 1851 (see Appendix G).
- 2 Appendix C sets out a flow chart for a fire hydrant system design based on the type and capability of the water supply.
- 3 Hose couplings and the regions in which they are used in Australia are given in Appendix E.
- 4 General guidance for fire hydrant installations in special hazard areas is given in Appendix H.

1.2 OBJECTIVE

The objective of this Standard is to specify minimum requirements for the design, installation and commissioning of fire hydrant systems which—

- (a) will augment the efficient extinguishment of fire within the boundaries of the site;
- (b) can be utilized to minimize fire spread within or between one property or building and another;
- (c) can be used by trained firefighting personnel; and
- (d) are compatible with the local fire brigade's firefighting equipment.

1.3 NORMATIVE REFERENCES

The normative documents referenced in this Standard are listed in Appendix A.

NOTE: Documents referenced for informative purposes are listed in Appendix G.

1.4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 2484.2, AS/NZS 3500.0 and those below apply.

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1.4.1 Design pressure

The pressure, at a defined reference point used in the system design, necessary to maintain the required flow and pressure at the most hydraulically disadvantaged number of fire hydrants that are required to operate simultaneously.

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1.4.2 Effective height

The height to the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.

1.4.3 Fire brigade booster assembly

A connecting device enabling the fire brigade to pressurize or pump water into a fire hydrant system.

1.4.4 Fire brigade pumping appliance

A fire brigade emergency vehicle that has an inbuilt pump to which firefighting hose may be connected.

1.4.5 Fire compartment

The total space of a building; or any part of a building required by the Building Code of Australia to be separated from the remainder by walls and/or floors each having an FRL not less than that required for a firewall for that type of construction and where all openings in the separating construction are protected in accordance with the Building Code of Australia.

1.4.6 Fire hydrant

An assembly installed on a branch from a water pipeline, which provides a valved outlet to permit a supply of water to be taken from the pipeline for firefighting.

NOTES:

- 1 Fire hydrants utilized by firefighters are feed fire hydrants and attack fire hydrants.
- 2 Fire hydrants may be above-ground, with outlets suitable for connection for fire hose; or inground, with a connection suitable for attachment of a fire brigade standpipe to which fire hose may be connected.

1.4.7 Fire hydrant, attack

A fire hydrant that is connected to a system incorporating a fire hydrant booster and used for direct attachment of a firefighting hose line to achieve an effective firefighting hose stream.

NOTE: Attack fire hydrants are intended for use by fire brigade to attack a fire or prevent fire spread to adjoining property. They are not intended to supply a fire brigade pumping appliance.

1.4.8 Fire hydrant, external

A fire hydrant installed outside a building or structure.

1.4.9 Fire hydrant, feed

A fire hydrant used to supply water to a fire brigade pumping appliance.

1.4.10 Fire hydrant system

An assembly of pipes and other components that is dedicated for firefighting to permit the fire brigade to access a controlled supply of water.

1.4.11 Fire-resistance level (FRL)

The grading periods, in minutes, determined in accordance with Specification A2.3 of the Building Code of Australia, for—

- (a) structural adequacy;
- (b) integrity; and
- (c) insulation;

and expressed in that order.

NOTE: A dash means that there is no requirement for that criterion. For example, 90/-/- means there is no requirement for an FRL for integrity and insulation.

1.4.12 Hardstand

An identifiable and clearly marked trafficable all-weather pavement providing access and capable of supporting a fire brigade pumping appliance during firefighting operations.

NOTE: Examples of pavements are bituminous concrete, aggregate, concrete or similar surfaces.

1.4.13 Open yard

A designated area greater than 500 m^2 , which may be used for storage or processing of combustible material.

NOTE: Refer to AS 1940 (see Appendix G) for areas used for bulk storage of flammable and combustible liquids.

1.4.14 Residual pressure

Water pressure measured at a point within a system at a particular flow rate.

1.4.15 Suction connection

A suction hose connection used to draw water from a static supply.

1.4.16 Water agency

The owner of the water infrastructure or its legally appointed agent.

NOTE: A water agency can be an authority, board, business, corporation, council or local government body with the responsibility of operating and maintaining a water supply system.

1.4.17 Working pressure

The maximum pressure exerted within the system by the fire brigade, the system pumping equipment, or both, when the most hydraulically disadvantaged fire hydrant or fire hydrants are operated at the design flow.

NOTE: 'Operational pressure' for fire brigades is synonymous with 'working pressure'.

1.5 SYMBOLS

The graphical symbols in this Standard comply with those in SA HB 20.

SECTION 2 SYSTEM DESIGN

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2.1 DESIGN CONCEPT

2.1.1 General

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Fire hydrant systems designed in accordance with this Standard shall be compatible with the equipment and procedures employed by the attending fire brigade when fighting a fire in one location in a building or complex.

Where possible, all fire hydrants shall be located external to a building, as specified in this Standard. Fire hydrants within a building shall protect those portions not protected by external fire hydrants.

Where street fire hydrants provide coverage, flow rates and residual pressures in accordance with Sections 2, 3 and 4, they may be used to provide total or partial coverage provided a fire brigade booster assembly is not incorporated in the system.

A1 Where a hydrant system is used to supply water to any other firefighting system other than fire hose reels, the water supply and system design shall provide for the combined firefighting system(s) requirements. The system requirements shall be determined according to the fire system(s) used to combat a single fire.

NOTES:

- 1 Provision should be made for the disposal of water from flow tests (see Section 10).
- 2 Where seawater is used, adequate provision should be made to flush the system with fresh water to inhibit marine growth.
- 3 Where non-potable water is used, precautions should be taken to minimize the effects of corrosion on the system.
- 4 For more information on fire brigade appliances and strategies, see Appendix D.
- 5 It is intended that the system flow requirements in a large building or building complex will satisfy the firefighting requirements in specific locations or specific parts of the building. This will require an analysis of the building or the complex according to the hazard.

2.1.2 Fire brigade booster assembly

Where a fire brigade booster assembly is required, it shall comply with the requirements of Section 7.

2.1.3 Hardstand

A hardstand shall be provided where a fire brigade pumping appliance is required to be located adjacent to a tank, hydrant or booster in accordance with Section 3, 5 or 7.

A required hardstand and its vehicular approaches shall remain suitable for use by a fire brigade pumping appliance throughout —

- (a) discharge of water during firefighting operations; and
- (b) rain periods.

NOTES:

- 1 Many fire brigade pumping appliances discharge a continuous flow of water while operating.
- 2 Reference should be made to the fire brigade for detailed requirements for hardstand areas.

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