KILKENNY FIRE and RESCUE SERVICE

Report: **GUIDANCE SPECIFICATION FOR FIRE HYDRANTS and FIRE FIGHTING WATER SUPPLIES**

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FIRE and RESCUE SERVICE
KILKENNY
PREVENTING PROTECTING RESPONDING

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SECTION 1.0– LEGISLATION

1.1 – Legislation – Fire Services Acts 1981 and 2003

Number 30 of 1981
Fire Services Acts 1981 and 2003

Section 4
Offences

Any person who contravenes (by act or omission) any requirement of Part III of this Act or of any regulation under this Act or any notice to which this Act applies shall be guilty of an offence.

Section 5
Penalties

1) A person who is guilty of an offence by reason of a contravention of section 18(2), section 20 or section 20A or regulations made under section 37 shall be liable—
   (a) on summary conviction, to a fine not exceeding €3,000 or to imprisonment for a term not exceeding 6 months, or to both, or
   (b) on conviction on indictment, to a fine not exceeding €130,000 or to imprisonment for a term not exceeding 2 years, or to both.
2) Where a person is convicted of an offence referred to in subsection (1) and there is a continuation by the person of the offence after the conviction, the person shall be guilty of a further offence on every day on which the contravention continues and for each such offence shall be liable—
   (a) on summary conviction, to a fine not exceeding €500 for each day on which the offence is so continued or to imprisonment for a term not exceeding 6 months, or to both, but if a person is convicted in the same proceedings of 2 or more such further offences, the aggregate term of imprisonment to which the person shall be liable shall not exceed 6 months, or
   (b) on conviction on indictment, to a fine not exceeding €13,000 for each day on which the offence is so continued, or to imprisonment for a term not exceeding 2 years, or to both, but if a person is convicted in the same proceedings of 2 or more such further offences, the aggregate term of imprisonment to which he or she shall be liable shall not exceed 2 years.
3) A person who is guilty of an offence under this Act, other than an offence referred to in subsection (1) or (2), shall be liable, on summary conviction, to a fine not exceeding €3,000 or to imprisonment for a term not exceeding 6 months, or to both.
4) Where an offence under this Act is committed by a body corporate or by a person acting on behalf of a body corporate and is proved to have been so committed with the consent, connivance or approval of, or to have been facilitated by any neglect on the part of a person, being a director, manager, secretary or other officer of that body or a person who was purporting to act in any such capacity, that person shall also be guilty of an offence and shall be liable to be proceeded against and punished as if he or she were guilty of the first-mentioned offence.
5) Where the affairs of a body corporate are managed by its members, subsection (4) shall apply in relation to the acts and defaults of a member in connection with his or her functions of management as if he or she were a director of the body corporate.

Section 10
Functions of fire authorities

1) A fire authority shall have the functions assigned to it by or under this Act.
2) A fire authority shall—
   (a) make provision for the prompt and efficient extinguishing of fires in buildings and other places of all kinds in its functional area and for the protection and rescue of persons and property from injury by fire, and
   (b) establish and maintain a fire brigade, provide premises and make such other provision as it considers necessary or desirable for such purpose, and
   (c) make adequate provision for the reception of and response to calls for the assistance of the fire brigade.

Section 10
Functions of fire authorities – contd.

3) A fire authority shall, in the exercise of its functions under subsection (2), have regard (in addition to all other relevant considerations) to the nature of the fire hazards and the probable incidence and extent of fires in its functional area, the character of the area and the value of the property liable to be damaged by fires.

Section 18
General obligations with regard to fire safety.

1) This section applies to premises or any part thereof put to any of the following uses
   (a) use as or for any purpose involving the provision of, sleeping accommodation, excluding premises consisting of a dwelling house occupied as a single dwelling:
   (b) use as, or as part of, an institution providing treatment or care:
   (c) use for purposes of entertainment, recreation or instruction or for the purpose of any club, society or association:
   (d) use for purposes of teaching, training or research;
   (e) use for any purpose involving access to the premises by members of the public, whether on payment or otherwise: and use for any other prescribed purpose, including
      i. premises used as a factory within the meaning of the Safety in Industry Acts, 1955 and 1980;
      ii. premises used as a store and subject to licensing under regulations made under the Dangerous Substances Act, 1972;
      iii. a magazine, store or registered premises within the meaning of the Explosives Act, 1875; and
      iv. an oil jetty within the meaning of regulations under the Dangerous Substances Act, 1972.
      v. any workplace.
2) It shall be the duty of every person having control over premises to which this section applies to –
   (a) Take all reasonable measures to guard against the outbreak of fire on such premises,
   (b) Provide reasonable fire safety measures for such premises and prepare and provide appropriate fire safety procedures for ensuring the safety of persons on such premises,
   (c) Ensure that the fire safety measures and procedures referred to in paragraph (b) are applied at all times, and
   (d) Ensure, as far as is reasonably practicable, the safety of persons on the premises in the event of an outbreak of fire whether such outbreak has occurred or not.
3) It shall be the duty of every person, being on premises to which this section applies, to conduct himself in such a way as to ensure that as far as is reasonably practicable any person on the premises is not exposed to danger from fire as a consequence of any act or omission of his.
4) A fire authority may give advice in relation to fire safety to the owner or occupier of any premises or to any person having control over any premises.
5) Advice referred to in subsection (4)—
   (a) may include a warning that a fire safety notice may be served under section 20 or that the owner or occupier may be liable to prosecution by reason of a contravention of a provision of this Act,
   (b) may be given on behalf of the fire authority by an authorised person authorised for the purposes of this section by a fire authority in accordance with subsection (11) of this section, and
   (c) may include recommendations, orally or in writing, to such persons concerning fire safety measures and procedures.
6) An authorised person may require a person having control over premises to which this section applies or to an owner or occupier of such premises—
   (a) to carry out a fire safety assessment of such premises and to notify the fire authority of such assessment, and
   (b) to carry out works specified under subsection (9) to such premises within a period of time so specified.

Section 18
General obligations with regard to fire safety – contd.

7) An authorised person may issue a warning, in writing, concerning any matter arising out of fire safety procedures and measures on such premises.
8) An authorised person may enter and inspect a premises to which this section or section 24 applies at all reasonable times for the purposes of this section.
9) An authorised person may specify works to be carried out at a premises to which this section applies and may specify a period of time within which such works are to be carried out.
10) Section 20(4) shall apply with any necessary modifications to works to be carried out under subsection (6).
11) A fire authority may authorise a person to be an authorised person for the purposes of this section by an order made by a city manager or a county manager as the case may be.
12) In this section 'authorised person' means a person appointed in accordance with subsection (11) of this section.".

Section 29
Public water supply for fire-fighting

1) The functions of a sanitary authority for the provision of a supply of water shall extend to the supply of water for fire-fighting purposes and the provision and maintenance of fire hydrants at such places as the fire authority requires.
2) Where a fire authority represents to a sanitary authority that reasonable provision has not been made for a supply of water for fire-fighting purposes, the sanitary authority shall consult with the fire authority as to the measures required and shall take such measures as may be agreed.

Section 31
Damage to fire hydrant

1) Any person who interferes with, damages, or obstructs a fire hydrant or any apparatus for drawing water from a main for the purpose of fire-fighting otherwise than in connection with operations of a fire brigade or for any purpose authorised by the sanitary authority shall be guilty of an offence.

1.2 – Legislation – Building Regulations 1997

Statutory Instrument No. 497 of 1997
Building Regulations, 1997
Second Schedule, Part B, Fire Safety
B5, Access and facilities for the fire service

Access and Facilities for the fire service

"A building shall be so designed and constructed that there is adequate provision for access for fire appliances and for such other facilities as may be reasonably required to assist the fire service in the protection of life and property."

1.3 –Legislation – Water Services Act 2007

Number 30 of 2007
Water Services Act

32.—(1) A water services authority may, and shall when directed by the Minister, take all necessary measures to ensure compliance with its obligations under section 31 and for the purposes of carrying out its functions under section 31, whether within or outside its functional area, including—

…

(r) measures to facilitate the provision of water supplies for fire-fighting or other public health and safety purposes including the provision of notices to assist in the location of fire hydrants….

SECTION 2.0 - Hydrant details

2.1 OUTLET: Male, round thread, 62.5mm diameter, with cap chained to bolt of spindle flange. The depth of the hydrant outlet shall not exceed 350mm below finished ground level.

2.2 LOCATION: As far as possible hydrants shall be located in the footpath or grass margin adjoining the roadway near the kerb. Where it is found necessary to locate the hydrant in the grass, the area around the box shall be periphery of the box. The surface box and concrete surround shall be kept over the level of the adjoining surface and weathered to prevent polluted water from entering the hydrant pit. Hydrant pits shall be constructed so as to be self-draining. The location of hydrants shall be such as shall allow easy fitting of a standpipe and ready access of fire appliance without causing obstruction to other vehicles.

2.3 DEPTH: Spacer lengths under hydrant body shall be fitted to permit the top of false spindle being 75mm minimum to 225mm maximum below finished surface of footpath.

2.4 CHAMBER: The containing chamber shall provide not less than 75mm clearance around the hydrant body.

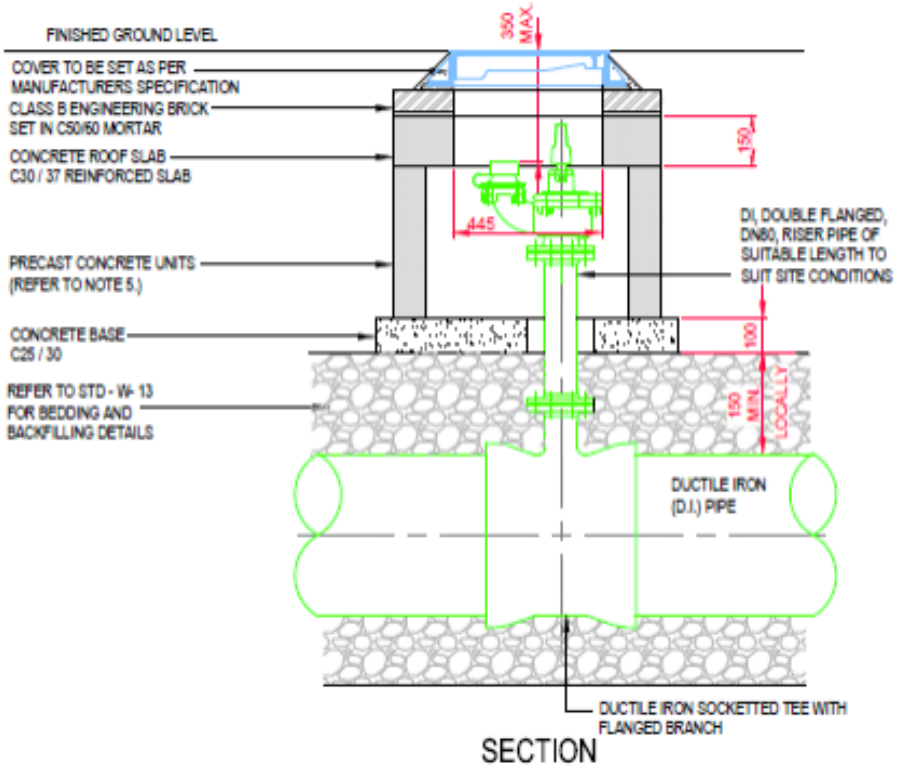


Figure 1.0 – Typical Hydrant Chamber Arrangement

Hydrant chambers are provided with cast iron surface boxes, in compliance with the requirements of IS 261. The surface boxes are embedded in mortar on the chamber walls, and where any of the hydrants are located other than on a footway, driveway or roadway, are surrounded by 150mm concrete of 100mm in depth.

2.5 DRAINAGE: A 37.5mm minimum diameter drain from chamber to an open watercourse, shall be carried from a position at 50mm lower than the flanged base of the hydrant.

2.6 COVER: The hydrant cover box, with a 375mm x 225mm clear opening area, shall be placed centrally over the hydrant to permit freedom of affixing stand-pipe and operating key.

2.7 MARKER: A hydrant indicator plate, to BS 3251: 1976, shall be fitted on boundary wall or on a marker post provided at preferably 600mm with a minimum of 450mm over footpath surface level. They should show the diameter of the watermain in millimetres on the upper part of the plate and the distance in metres of the marker from the hydrant on the lower part of the plate, as shown below:

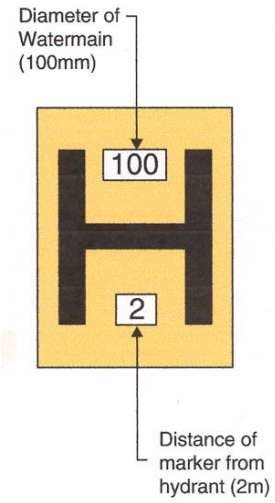


Figure 2.0 – Marker Plates

All the characters are black and the remainder of the front face should conform to colour reference No. 309 (Canary Yellow) of BS 381C.
Some indicator plates may be present and are fixed to solid boundary walls, or where marker posts are utilised they should be constructed as shown below.

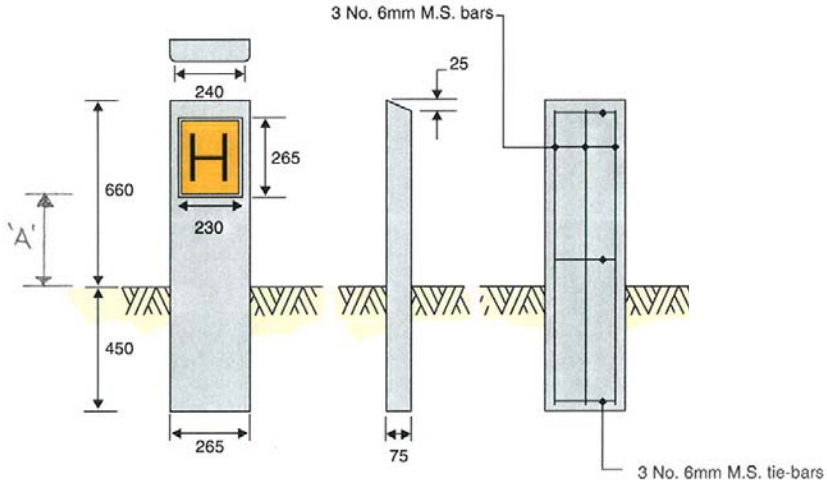


Figure 3.0 – Marker Plates
Note – Distance 'A' preferably the height from finished ground level to the base of the fire hydrant marker plate should be a minimum of 350mm.

2.8 SPACING: Fire hydrants should be located such that-

(a) The distance from the building is not less than 6m or more than 46m;
(b) The distance from a hydrant to a vehicle access roadway or hard standing area for fire appliances is not more than 30m;
(c) They are distributed around the perimeter of the building having regard to the provision of access for fire appliances.
(d) Housing Estates / Residential Developments - Hydrants should be provided such that no house is more than 46 metres from a hydrant.

2.9 HYDRANT FLOW TESTING –

Kilkenny County Council Fire/Building Control Authority shall require for all fire safety certificate applications having a gross total internal floor area of 600m² or greater to demonstrate there is an adequate supply (volume) of firewater immediately available for the proposed application(s), either by means of an adequate number of fire hydrants, static storage and/or an open source of water.

On a 'fire safety' risk assessment basis buildings of any floor area may be requested to demonstrate there is an adequate supply (volume) of firewater immediately available for the proposed application(s), either by means of an adequate number of fire hydrants, testing of existing local/adjacent hydrants, static storage and/or an open source of water.

The flows (l/s) and pressure (bar) from the existing fire hydrants should be confirmed in writing to the assessing authority. Therefore demonstrating there is an adequate supply of water for use in an emergency. Fire-fighters must have immediate access to adequate supplies of water. Calibration certificates for any flow meters utilised shall be submitted with the test results.

Where a person is applying for a fire safety certificate it may be prudent for the applicant to seek specific advice, on a without prejudice basis, from the assessing Fire Authority.

A building shall be so designed and constructed that there is adequate provision for access for fire appliances and for such **other facilities** as may be reasonably required to assist the fire service in the protection of life and property.

2.10 SAFETY WARNING – PLASTIC / NYLON OUTLETS ON HYDRANTS –

Kilkenny Fire Authority is of the view and understanding that these fittings (plastic/nylon outlet) to fire hydrants pose an unacceptable level of risk of injury to both firefighters and members of the public.

We make reference to Section 5.1 of BS 750: 2012 and quote the following –

> ***"5.1** The outlets shall be manufactured from copper alloy or stainless steel materials conforming to **4.3.3** and shall conform to **10.3** and **10.4**. The outlet shall conform to the dimensions shown in Figure 3.*
> ***5.2** Components involved in the attachment or retention of fire hydrant outlets shall not be made from plastics."*

See figure 4.0 below of such type of plastic/nylon outlet that are unacceptable to Kilkenny Fire Authority.

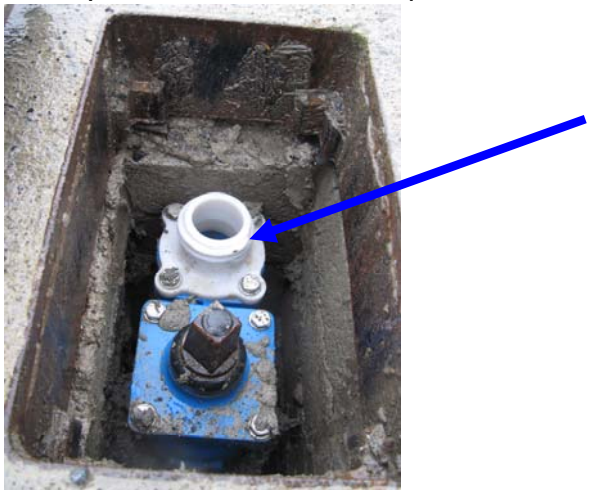


Figure 4.0 – Plastic/nylon outlets on hydrants

2.11 **IRISH WATER Guidance** - Irish Water Connections and Developer Services - Code of Practice for Water Infrastructure – Connections and Developer Services – July 2020 (Revision 2).

Reference is made to the "Irish Water Connections and Developer Services - Code of Practice for Water Infrastructure – Connections and Developer Services – July 2020 (Revision 2)- Document IW-CDS-5020-03", the following excerpts have been reproduced.

Section 1.17 – Liaison with Fire Authority

The Local Fire Authority shall be consulted by the Developer on all details of Self-Lay Works to ensure compliance with their requirements. The Developer or his/her designer shall be responsible for all liaisons with the Fire Authority and agreeing all arrangements for the provision of fire flow for fire fighting purposes. Irish Water shall be made aware of and provided with relevant documentation arising from such consultation/liaison.

Irish Water may carry out a modelling assessment (if an appropriate calibrated model is available) of the existing Network and based on the known demands at the time advise the Developer of the theoretical flow and pressures at the proposed connection point in the Network. Alternatively, an in-situ flow a pressure test may be carried out at the expense of the Developer by an approved person/organisation in conjunction with Irish Water to identify the actual flow and pressure

available in the network at a particular point in time. It should be borne in mind that the theoretical results from the modeling and the actual results from the in-situ tests cannot be guaranteed by Irish Water.

Where a Developer requests increased fire flow capacity in the water supply network to meet fire flow requirements, Irish Water will review the existing network and may offer to carry out network upgrades, at the expense of the Developer. In such instances, Irish Water cannot guarantee that the flow rates and residual pressures will meet the requirements of the Fire Authority.

Irish Water shall be contacted if the Fire Authority requires measures that affects the design of the Network, e.g. a requirement to have more than one connection serving a development. Irish Water cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority.

Where the existing Network does not have capacity to provide the Fire Authority fire flow requirements and/or if no Network infrastructural improvements are planned by Irish Water, the Developer shall provide adequate fire storage capacity or an alternative source within the Development to satisfy the Fire Authority's fire flow requirements. This fire water storage infrastructure shall be provided with facilities to ensure that no cross contamination is possible of the potable water within Works. This necessary works to prevent cross contamination shall be provided to the agreement of Irish Water. Fire flow provision shall have regard to Irish Water policies for private side revenue metering.

Where separate fire mains are provided off of Irish Water's Network, a dedicated bulk flow meter, with a make and model specified by Irish Water, and associated telemetry system shall be provided at the Developer's cost. The connection arrangement shall be provided with a non-return valve to prevent backflow into the Water Network system.

Fire hydrants should be located in accordance with the Fire Authority's requirements such that they provide a convenient supply of water for fire fighting within the Development. The location and type of fire hydrant should be shown in any design submitted for Irish Water review. The Fire hydrants and washouts hydrants should be sited on footways, wherever possible and should be located such that access is maintained at all times.

Section 3.5.15 – Layout of works - housing developments of 40 houses and up to 100 houses

The minimum pipe size shall be 100mm internal diameter in housing developments of 40 houses and up to 100 houses. Developments of 100 houses and above shall have minimum pipe sizes of 150mm internal diameter spine Main with 100mm branch Mains. Nominal internal diameters of 80mm and less may be allowed in smaller Developments but not where hydrants are located and only after prior written agreement has been received from Irish Water.

Section 3.5.16 – Layout of works - industrial or commercial developments

The minimum pipe size shall be **150mm** in industrial or commercial developments, or as agreed with Irish Water.

Section 3.5.26 – Layout of works – fire hydrants minimum diameter supply

Fire hydrants should not be supplied from Water Mains of less than 100mm internal diameter.

Section 3.5.41 – Layout of works

The location of fire hydrants should be such that they are accessible in an emergency. Fire hydrants should only be located on paths or open spaces or approved areas. …….The provision of such valves shall only be incorporated subject to the approval and knowledge of the Fire Authority. …… Where bulk meters are provided, a bypass meter shall also be provided to allow measurement of night-flow demand.

Section 3.7 – Sizing of Water Mains

The minimum size of Water Main shall be 100mm nominal internal diameter but pipes with a nominal internal diameter of 80mm may be allowed in certain circumstances and only after the prior written permission of Irish Water has been obtained.

Section 3.16.5 – Hydrants (80mm)

Hydrants shall be double flanged drilled to PN 16. They shall comply with the requirements of IS EN 14339, IS EN 1074: Part 6 and BS 750. Fire hydrants shall be Type 2 and shall have an 80mm diameter flange, PN16 rated. The hydrant shall incorporate a screw-down gate valve, underground, "guide to head" type, with a false spindle cap. The hydrant shall incorporate an outlet connection (threaded, flanged, bayonet, etc.). The outlet type shall be confirmed with the Fire Authority prior to commencement of the works. The outlet shall be provided with a cap and iron chain.

The surface of the hydrant shall be blue and it shall be protected from corrosion by a coating in accordance with WIS 4-52-01 or IS EN 14901. For coatings in accordance with WIS 4-52-01, the internal water-wetted surface shall be coated to Class A standard while all other surfaces shall be coated to Class B standard.

The depth of the hydrant cap shall be located at most 350mm from the finished ground level. All hydrants shall be ANTI-CLOCKWISE OPENING. Hydrants can be provided either on line or off line depending on the site requirements. The hydrant shall have a minimum flow coefficient (Kv) value of 92m3 per hour.

Section 3.23 – Indicator Marker Plates and Posts

Indicator plates shall clearly identify hydrant, air valve, scour valve, washout hydrant, meter, pressure reducing/sustaining valve and sluice valve locations. They shall be located to the approval of both Irish Water and the Roads Authority for the area. The plates shall be mounted on marker posts at the back of footpaths or on the boundary wall of the public thoroughfare nearest to the hydrant or valve.

Hydrant indicator plates and baseboard plates shall comply with BS 3251, with hydrant plates of fixed black letter H on a canary yellow background (colour reference 309 to BS 381C). The plate shall show the diameter of the trunk Main in **"mm"** and the distance from the marker to the hydrant in **"m"**. Indicator plates for air valves, sluice valves, scour valves, washout hydrant, pressure reducing/sustaining valves, meters and bulk meters shall also comply with BS 3251 with fixed black letters (AV, SV, ScV, WO, PRV/PSV, Me and BM respectively) on a white background. The plate shall show the diameter of the Main in **"mm"** and the distance from the marker to the fitting shall be indicated in **"m"**.

Marker plates shall be metal and shall be fixed with stainless steel non-retractable screws.

Marker posts shall be of concrete construction, complying with IS EN 206, to conform to IS 162. They shall be set 450mm deep in a 0.06m3 support base of C25/30 concrete, 20mm aggregate size.

Plastic marker posts and plastic indicator plates shall not be provided under any circumstance.

SECTION 3.0 - Water Supplies

3.1 WATER SUPPLIES - **Residential/Housing Estate**

Outcome: The supply of water is sufficient to meet firefighting purposes.

Fire Hydrants + Fire Water Main note (Residential/Housing Estate)

All fire hydrants shall be located in accordance with Technical Guidance Document B – Fire Safety Dwelling Houses – Volume 2 of the Building Regulations, 2017 Statutory Instrument 57 of 2017.

All fire hydrants to be installed in accordance with 'Recommendations for Site Development Works for housing works' DoEHLG, BS 5306: Part 1: 2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets *(BS 5306: Part 1: 1976 has be withdrawn since May 2006)* and BS 9990: 2015 Code of practice for non-automatic fire-fighting systems in buildings, and marked in accordance with BS 3251: 1976 and installed in accordance with BS 750: 2012.

- Specific reference is made to the new Irish Standard – IS 391 – 2020, *Fire mains for buildings – Installation, commissioning, maintenance and testing.* This standard covers good practice in matters affecting the design, installation, commissioning, testing and maintenance of such systems including wet and dry fire-fighting mains and private fire hydrants.

Final verification should be sought from the fire authority for agreed layout of all hydrants and the number of water supply connections to the firewater ring main, preferably there should be more than one and, preferably from supplies obtained from different mains.

<<<**Housing developments** with units of detached or semidetached houses of not more than two floors should have a water supply capable of delivering a minimum of eight litres per second (8 l/s) through any single hydrant.>>>
OR
<<<**Multi occupied housing developments** with units of more than two floors should have a water supply capable of delivering a minimum of 20 to 35 litres per second through any single hydrant on the development.>>>

The minimum water main pipe size shall be 100mm internal diameter in housing developments of 40no houses and up to 100no houses. Developments of 100no houses and above shall have minimum pipe sizes of 150mm internal diameter spine Main with 100mm branch Mains.

The flows (l/s) and pressure (dynamic – bar) from the existing/adjacent/extended fire water main hydrants should be confirmed in writing to the fire authority, thus to demonstrate an adequate fire water main supply for the fire authority in the event of an emergency. Fire-fighters must have immediate access to adequate supplies of water.

3.2 WATER SUPPLIES - **Commercial Development – Industry**

Outcome: The supply of water is sufficient to meet firefighting purposes.

Fire Hydrants + Fire Water Main note (**Commercial Development - Industry**)

All fire hydrants shall be located in accordance with Technical Guidance Document B of Building Regulations, 2006 Statutory Instrument 497 of 1997.

All fire hydrants to be installed in accordance with 'Recommendations for Site Development Works for housing works' DoEHLG, BS 5306: Part 1: 2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets *(BS 5306: Part 1: 1976 has be withdrawn since May 2006)* and BS 9990: 2015 Code of practice for non-automatic fire-fighting systems in buildings, and marked in accordance with BS 3251: 1976 and installed in accordance with BS 750: 2012.

- Specific reference is made to the new Irish Standard – IS 391 – 2020, *Fire mains for buildings – Installation, commissioning, maintenance and testing.* This standard covers good practice in matters affecting the design, installation, commissioning, testing and maintenance of such systems including wet and dry fire-fighting mains and private fire hydrants.

Final verification should be sought from the fire authority for agreed layout of all hydrants and the number of water supply connections to the fire water ring main, preferably there should be more than one and, preferably from supplies obtained from different mains.

The water supply infrastructure to any industrial estate should have a minimum nominal diameter of 150mm and have a water supply capable of delivering a minimum of 20 to 75 litres per second through any single hydrant, depending on acreage of industrial estate.

The minimum water main pipe size shall be 150mm in industrial or commercial developments.

3.3 WATER SUPPLIES - **Transportation**

Outcome: The supply of water is sufficient to meet firefighting purposes.

Fire Hydrants + Fire Water Main note (**Transportation** – lorry/coach parks, multi storey car parks, service stations)

All fire hydrants shall be located in accordance with Technical Guidance Document B of Building Regulations, 2006 Statutory Instrument 497 of 1997.

All fire hydrants to be installed in accordance with 'Recommendations for Site Development Works for housing works' DoEHLG, BS 5306: Part 1: 2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets *(BS 5306: Part 1: 1976 has be withdrawn since May 2006)* and BS 9990: 2015 Code of practice for non-automatic fire-fighting systems in buildings, and marked in accordance with BS 3251: 1976 and installed in accordance with BS 750: 2012.

- Specific reference is made to the new Irish Standard – IS 391 – 2020, *Fire mains for buildings – Installation, commissioning, maintenance and testing.* This standard covers good practice in matters affecting the design, installation, commissioning, testing and maintenance of such systems including wet and dry fire-fighting mains and private fire hydrants.

Final verification should be sought from the fire authority for agreed layout of all hydrants and the number of water supply connections to the firewater ring main, preferably there should be more than one and, preferably from supplies obtained from different mains.

The minimum water main pipe size shall be 150mm in industrial or commercial developments.

All of these amenities should have a water supply capable of delivering a minimum of 25 litres per second through any single hydrant on the development or within a vehicular distance of 90m from the complex.

3.4 WATER SUPPLIES - **Shopping, offices, recreation and tourism**

Outcome: The supply of water is sufficient to meet firefighting purposes.

Fire Hydrants + Fire Water Main note (**shopping, offices, recreation and tourism**)

All fire hydrants shall be located in accordance with Technical Guidance Document B of Building Regulations, 2006 Statutory Instrument 497 of 1997.

All fire hydrants to be installed in accordance with 'Recommendations for Site Development Works for housing works' DoEHLG, BS 5306: Part 1: 2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets *(BS 5306: Part 1: 1976 has be withdrawn since May 2006)* and BS 9990: 2015 Code of practice for non-automatic fire-fighting systems in buildings, and marked in accordance with BS 3251: 1976 and installed in accordance with BS 750: 2012.

- Specific reference is made to the new Irish Standard – IS 391 – 2020, *Fire mains for buildings – Installation, commissioning, maintenance and testing.* This standard covers good practice in matters affecting the design, installation, commissioning, testing and maintenance of such systems including wet and dry fire-fighting mains and private fire hydrants.

Final verification should be sought from the fire authority for agreed layout of all hydrants and the number of water supply connections to the fire water ring main, preferably there should be more than one and, preferably from supplies obtained from different mains.

The minimum water main pipe size shall be 150mm in industrial or commercial developments.

Commercial developments of this type should have a water supply capable of delivering a minimum of 20 to 75 litres per second to the development.

3.5 WATER SUPPLIES - **Education, health and community facilities**

Outcome: The supply of water is sufficient to meet firefighting purposes.

Fire Hydrants + Fire Water Main note (**Education, health and community facilities**)

All fire hydrants shall be located in accordance with Technical Guidance Document B of Building Regulations, 2006 Statutory Instrument 497 of 1997.

All fire hydrants to be installed in accordance with 'Recommendations for Site Development Works for housing works' DoEHLG, BS 5306: Part 1: 2006 Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets *(BS 5306: Part 1: 1976 has be withdrawn since May 2006)* and BS 9990: 2015 Code of practice for non-automatic fire-fighting systems in buildings, and marked in accordance with BS 3251: 1976 and installed in accordance with BS 750: 2012.

- Specific reference is made to the new Irish Standard – IS 391 – 2020, *Fire mains for buildings – Installation, commissioning, maintenance and testing.* This standard covers good practice in matters affecting the design, installation, commissioning, testing and maintenance of such systems including wet and dry fire-fighting mains and private fire hydrants.

Final verification should be sought from the fire authority for agreed layout of all hydrants and the number of water supply connections to the fire water ring main, preferably there should be more than one and, preferably from supplies obtained from different mains.

<<Village Halls or the like>>
Should have a water supply capable of delivering a minimum of 15 litres per second through any single hydrant on the development or within a vehicular distance of 100m from the complex.

OR

<<Primary schools and/or Single storey health centres and/or the like>>
Should have a water supply capable of delivering a minimum of 20 litres per second through any single hydrant on the development or within a vehicular distance of 90m from the complex.

OR

<<Secondary schools, colleges, large health and community facilities and/or the like>>
Should have a water supply capable of delivering a minimum of 35 litres per second through any single hydrant on the development or within a vehicular distance of 90m from the complex.

SECTION 4.0 - Static Storage

4.1 STATIC STORAGE

First and foremost, direct advice should be sought from a senior fire officer of Kilkenny Fire and Rescue Service. The size of the static storage tank(s) shall be agreed in writing with Kilkenny Fire and Rescue Service. The design, location, and layout of these tank(s) shall be agreed in writing with Kilkenny Fire and Rescue Service. Prior to commencement on-site, the Kilkenny Fire and Rescue Service requires that you submit all supporting calculations and drawings indicating the location and access to the static storage tank(s). The static storage tank(s) should be monitored for water level.

However, in brief we provide the following as guidance notes for static storage tanks –

4.2 The fire authority requires that a static storage tank(s) is provided on-site –

1.1. To be sizing according to the risk assessment, and

1.2. To provide an adequate supply of water for fire fighting.

4.3 The area around the static storage tank(s) shall be a suitable designed hard-standing area for fire appliances, see guidance in Table 5.2 of Building Regulations, Technical Guidance Document, Part B. The heaviest Fire Appliance currently in Kilkenny Fire Authority' operational area is the high-reach appliance which is 18.5 tonnes.

4.4 <u>If above ground tanks</u>, the base of the static storage tank should be a minimum of 1.0m off the adjacent hard-standing area; this will facilitate a gravity discharge of the entire tank contents to the eye of the main pump of the adjacent fire appliance.

1.1. At least 2no. (two) instantaneous female fire brigade couplings shall be provided from the base of each static storage tank(s) each with hand lever independently operated isolation valve(s), and

1.2. At least 2no. (two) 4" (four) screw (hard suction) female fire brigade connection shall be provided from the base of each static storage tank with a hand lever independently operated isolation valve(s).

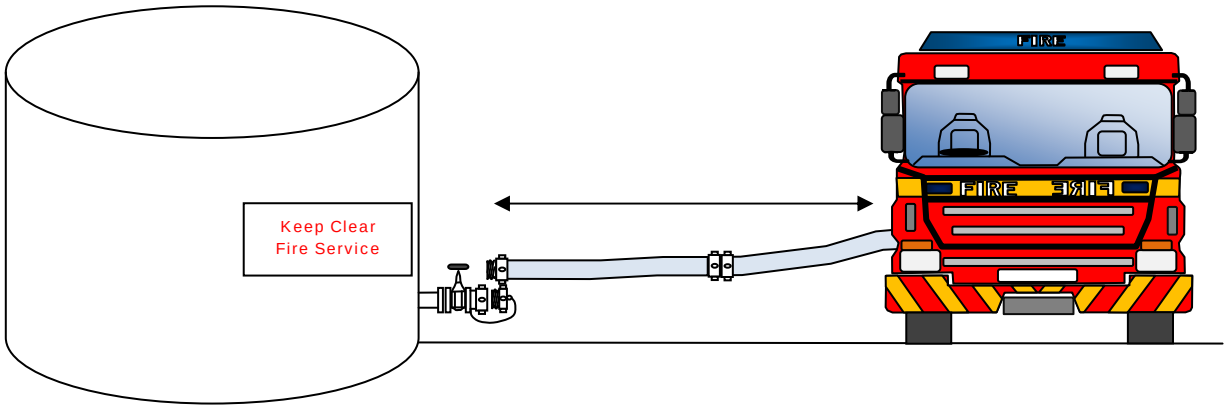


Figure 5.0 – pictorial example of above ground static storage tank
Reference – SACFO Des O'Brien, Waterford City and County Fire and Rescue Service

4.5 <u>If below ground tanks</u>, the [1] number of, [2] locations of, and [3] sized of access point to these tanks should be agreed in writing with Kilkenny Fire and Rescue Service prior to being placed.

1.1. If a number of tanks are to be connected together, the sizes of and number of connections between tanks shall be agreed in writing with Kilkenny Fire and Rescue Service.

1.2. Emergency access to these tanks should be through a fire hydrant cover box, with a 375mm x 225mm clear opening area in accordance with BS 750: 2012. NOTE – adequate risk assessments must be done and documented in accordance with best practice.

SECTION 4.0 – Static Storage contd.

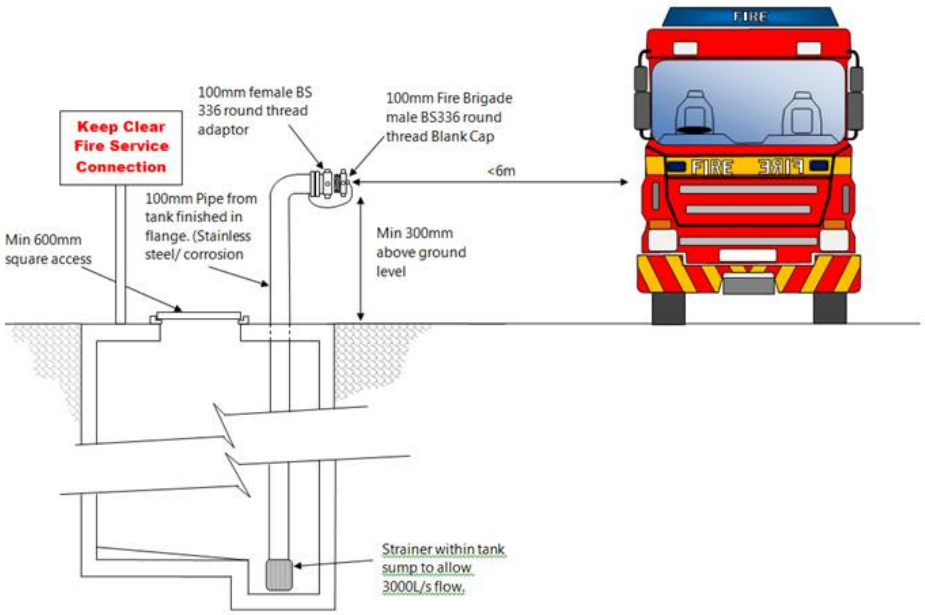


Figure 6.0 – pictorial example of below ground static storage tank
Reference – SACFO Des O'Brien, Waterford City and County Fire and Rescue Service

4.6 The tank shall have

1.1. A sump to allow all water to be pumped from the tank.
1.2. A 600mm x 600mm hinged square access into the tank.
1.3. A 100mm pipe of non corroding material, from the bottom of the tank to above the surface, terminating in a 4" fire brigade round thread female connection and blank cap (to BS336) a minimum of 300mm above ground level. The blank cap shall be attached to the flange by chain to prevent it being stolen.
1.4. The pipe shall be fitted with a strainer, allowing a flow of 3,000 l/s, to prevent debris entering the pipe.
1.5. Access for a fire brigade pumping appliance shall be to within 4m of the access and outlet pipe *(Note - a typical fire appliance carries 4no lengths of hard suction – 2.4m long each).*
1.6. A sign, in red, stating KEEP CLEAR FIRE SERVICE CONNECTIONs shall be erected adjacent to the access/outlet pipe. This sign must not be demountable.
1.7. All above ground fittings shall be painted red.
1.8. The access cover shall be painted yellow.

4.7 A methodology of monitoring the contents, water level, of this static storage tank(s) will be required. We propose a low level alarm probe to be fitted at a high level position, typically at 90% contents of the tank, this probe can be hard wired into the an approved system for continual monitoring (technical alarm). The graphics interface for this system will be required. We also propose that a clear pipe be provided on the external façade of the tank(s) to allow for visual monitoring of the water level within the tanks, if above ground tanks are installed.

SECTION 4.0 – Static Storage *contd.*

4.8 All tanks shall be signed in accordance with BS 3251: 1976, Specification Indicator plates for fire hydrants and emergency water supplies.

1.1. These signs should be of a permanent construction and should be appropriately sized.
1.2. The background and all text should be of photo-luminance properties.
1.3. The signs should be erected in permanent fashion and all an appropriate height to be legible at all material times.
1.4. The final layout of these signs with content should be agreed in writing with Kilkenny Fire and Rescue Service prior to manufacture and erection.
1.5. Example text could include the following – "FIRE-FIGHTING EMERGENCY WATER SUPPLIES", "USE BY KILKENNY FIRE and RESCUE SERVICE ONLY – BY ORDER"
1.5.1. Volume of tank in m3 and litres
1.5.2. The continual maintenance of these tanks and contents – contact details (24-hour basis)
1.5.3. If tanks content are monitored, where and by whom - contact details (24-hour basis)

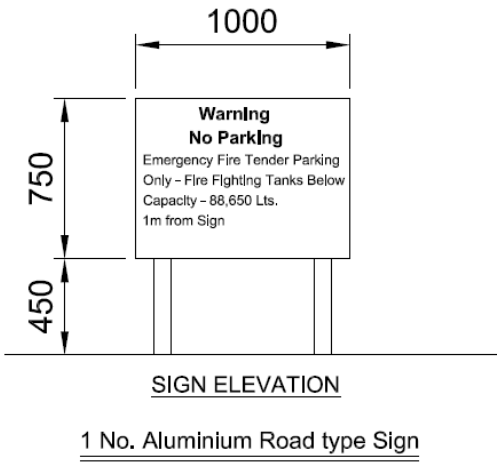


Figure 7.0a – example of sign

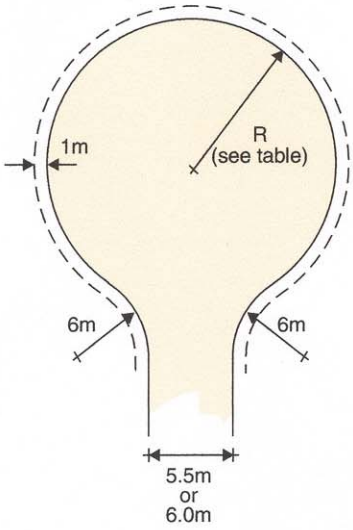
Figure 7.0b – example of sign

Figure 8.0a – example of typical fire hydrant access cover plate inserted into hinged square 600x 600mm static water storage tank access cover

Figure 8.0b – example of safety arrangement underneath hinged square access cover

SECTION 5.0– Vehicle Access

5.1 RESIDENTIAL TURNING BAYS



Value of R which permits turning without reversing	
Vehicle Type	R metres
Private Car	6
Fire Engine	9
Refuse Vehicle	10
Furniture Removal	11

1m clearance for vehicle overhang shown dashed

NOT TO SCALE

Figure 9.0 – Turning Bays and Table

As extracted from Technical Guidance Document, Part B, the minimum size of turning circles for fire appliances are as specified in Table 1.0 below -

Appliance type	Minimum width of road between kerbs (m)	Minimum width of gateways between kerbs (m)	Minimum turning circle between kerbs (m)	Minimum turning circle between walls (m)	Minimum clearance height (m)	Minimum carrying capacity (tonnes)
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High Reach	3.7	3.1	26	29	4	16.25

Note:
Use of these figures will cater for nearly all of the fire appliances in use at present. Some fire authorities use different sized appliances and it is therefore advisable that the relevant fire authority be consulted.

Note – the high reach platform in Kilkenny Fire Authority has a minimum carrying capacity of 18.5 tonnes.

Table 1.0 – Vehicle access route specifications

SECTION 6.0– Standards and Engineering Codes

6.1 IRISH, BRITISH AND INTERNATIONAL STANDARDS

Standards affect all areas of fire safety and are continually being developed to protect and support both consumers and professionals. With regards fire related products, standards are created to cover new areas or are updated to encompass the latest technological advancements.

As standards continue to evolve to meet Irish, British, European and International criteria, it is crucial for specifiers/proprietors to know which standards apply to fire products. Standards provide common performance levels for both products and services. This ensures that a product is fit for the purpose it is intended. There are a large number of Irish, British and European Standards applicable to fire protection equipment and systems today.

At the time of going to press/publication the Irish, British and European Standards referred to in this specification were believed to be true and accurate. However, they are the current standards, which may be revised from time to time, so we would ask you to use our information as a basic guide only.

Compliance with this specification/guidance document does not of itself confer immunity from legal obligations.

SECTION 7.0 – Model forms for Fire Hydrant Checks

SIDE A

KILKENNY FIRE and RESCUE SERVICE

CHECKLIST FOR FIRE HYDRANTS

Section A

To: **Senior Executive Engineer (Sanitary Services) Kilkenny County Council**
Uisce Éireann / Irish Water - Southern Region - *Wastewater Infrastructure (Below Ground)* (tick as appropriate) ☐

Section A1

To: **Water Services Supervisor** (tick as appropriate) ☐
or
Developer/Occupier ☐☐☐☐☐☐☐☐☐☐☐☐☐☐ (tick as appropriate) ☐
or
Planning Enforcement Section Kilkenny County Council (tick as appropriate) ☐

Section B

Brigade: ☐☐ ☐☐ CIS Reference: ☐☐☐☐☐☐ (if appropriate)

Date: ☐☐ ☐☐ ☐☐☐☐

Incident Number: ☐☐ - ☐☐ - ☐☐☐☐☐☐ (if appropriate)

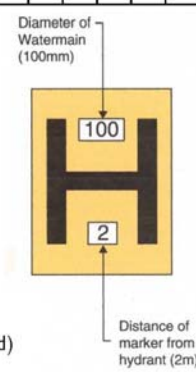
GPS Co-ordinates: ☐ - ☐☐☐☐☐ / ☐☐☐☐☐ Eircode: ☐☐☐ ☐☐☐☐

Location of Hydrant:

Section C

Defects observed during (tick appropriate box)

1. Drill ☐
2. Incident (Fire) ☐
3. Hydrant testing exercise ☐



Section D (tick box, if appropriate)

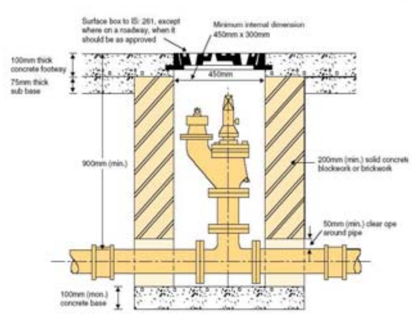
(a) Hydrant correct (no faults) ☐

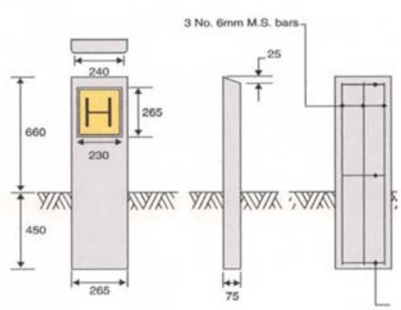
Section E (fill-in appropriate boxes)

(a) Flow (litres/minute) (after two minutes running) ☐☐☐☐ / ☐☐☐☐ Flow (litres/second)

(b) Static Pressure (bar) ☐☐☐☐

(c) Dynamic Pressure (bar) (after two minutes running) ☐☐☐☐





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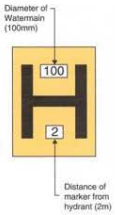
SECTION 7.0– Model forms for Fire Hydrant Checks

SIDE B

KILKENNY
FIRE and RESCUE SERVICE

CHECKLIST FOR FIRE HYDRANTS



Section F

Please note the following Hydrant Defects: (tick appropriate boxes)

1. ☐ Hydrant leaking
2. ☐ Hydrant tarred over
3. ☐ Hydrant inaccessible or not located (expand on this defect below)
4. ☐ No hydrant marker post / plate
5. ☐ Wrong type of hydrant marker post; not painted Yellow ☐ (Canary Yellow colour reference No. 309 of BS 381C as per BS 3251: 1976)
6. ☐ Incomplete hydrant marker post; not painted Yellow ☐ (Canary Yellow colour reference No. 309 of BS 381C as per BS 3251: 1976)
7. ☐ Incomplete / ☐ Wrong type of hydrant marker plate; *see figure above*
8. ☐ Hydrant cover plate not adequately marked FIRE HYDRANT (≥ 30mm high) or F.H. (≥ 75mm high)
9. ☐ Wrong plate cover on hydrant (Sluice valve ☐, Water meter ☐ plate cover on hydrant chamber)
10. ☐ Hydrant cover plate on sluice valve / water meter (hydrant cover plate on sluice valve chamber)
11. ☐ Hydrant marker plate - Wrong height ☐, No post ☐, Incorrectly position ☐
12. ☐ Hydrant cover plate broken / cracked – Unsafe ☐
13. ☐ Hydrant cover plate could not be raised (hydrant could not be checked ☐)
14. ☐ No cover for hydrant seat (Section 6.5 of BS 750: 2012)
15. ☐ Hydrant mis-aligned within chamber (could not connect to hydrant as valve not straight up ☐)
16. ☐ Hydrant too deep (could not connect ☐) (greater than length of standard standpipe ☐)
17. ☐ Hydrant chamber with water (hydrant pit not self-draining ☐)
18. ☐ Hydrant chamber with debris
19. ☐ Outlet thread not made from Copper Alloy (Plastic outlet present ☐) (Section 6.0 of BS 750: 2012)
20. ☐ No false spindle (hydrant could not be checked ☐)
21. ☐ Hydrant valve not operating
22. ☐ Self operating frost valve not operating (not fitted ☐) (Section 8.0 of BS 750: 2012)
23. ☐ No supply (flow) from hydrant
24. ☐ Inadequate flow of water from hydrant (less than 480 litres/minute (8 litres /second) – minimum for all hydrants)
25. ☐ Insufficient supply from hydrant (inadequate supply of water from hydrant for risk area)
26. ☐ Low pressure from hydrant (less than 2 bar) (Inadequate pressure of water from hydrant ☐)
27. ☐ No water meter bypass fitted, water meter restricting fire water flow rate ☐
28. ☐ No marker plate for water meter bypass fitted (As per Figure 6 BS 3251: 1976)
29. ☐ Other (1) (expand on this defect below)
30. ☐ Other (2) (expand on this defect below)

Other Defects Observed: _____

Section G

Type of Hydrant (tick appropriate box)

Screw type ☐ Bayonet type ☐ Lug type ☐

Instantaneous type ☐ Ball type ☐ Pillar type ☐

Section H

Name: _____ **Rank:** _____

Fire HQ Office Use Only

Received by Fire HQ ☐☐ ☐☐ ☐☐☐☐ Copied to Section A ☐☐ ☐☐ ☐☐☐☐

Copied to Others _____ Copied to Irish Development Agency (IDA) ☐

G:\Fire Office\Zulu One - Killian\Generic Forms\Master Forms - KK\Hydrant Checklist Form, version 30.0.doc July 2017

SECTION 8.0 - References

8.1 **Recommendations for Site Development Works for housing works**, November 1998, available from Department of Environment Heritage and Local Government, Government Publications, Postal Trade Section, 4-5 Harcourt Road, Dublin 2, ISBN 0-7076-6163-3, Telephone number 01-6613111, approx price €12.70.

8.2 **Technical Guidance Document B Fire Safety - 1997**, Building Regulations 1997, Statutory Instrument 497 of 1997, available from Department of Environment Heritage and Local Government, Government Publications, Postal Trade Section, 4-5 Harcourt Road, Dublin 2, Telephone number 01-6613111.

8.3 **Technical Guidance Document B Fire Safety - 2006**, Building Regulations 2006, Statutory Instrument 497 of 1997, available from Department of Environment Heritage and Local Government, Government Publications, Postal Trade Section, 4-5 Harcourt Road, Dublin 2, Telephone number 01-6613111.

8.4 **Technical Guidance Document B – Fire Safety – Dwelling Houses – Volume 2**, Building Regulations 2017, Statutory Instrument 497 of 1997, available from Department of Environment Heritage and Local Government, Government Publications, Postal Trade Section, 4-5 Harcourt Road, Dublin 2, Telephone number 01-6613111.

8.5 **Technical Guidance Document B – Fire Safety - (2020 Reprint)**, Building Regulations 2020, Statutory Instrument 497 of 1997, available from Department of Environment Heritage and Local Government, Government Publications, Postal Trade Section, 4-5 Harcourt Road, Dublin 2, Telephone number 01-6613111.

8.6 **National guidance document on the provision of water for fire fighting**, UK Water, Local Government Association, 2nd Edition, May 2002

8.7 **Municipal Water related to Fire Fighting and Fire protection**, Chief Fire Officers Conference, Westport, Mayo 1986, Patrick J. Tobin & Co., Consulting Engineers, Galway.

8.8 **BS 5588 – Part 10 – 1997**, Code of Practice for shops, offices, industrial, storage and other similar buildings.

8.9 **BS 5588 – Part 11 – 1991**, Code of Practices for shopping complexes.

8.10 **BS 9999 – 2017**, Fire safety in the design, management and use of buildings – Code of practice.

8.11 **BS 750 – 2012**, Specification for underground fire hydrants and surface box frames and covers.

8.12 **BS 3251 - 1976**, Amendment 001-1991 - Specification Indicator plates for fire hydrants and emergency water supplies.

8.13 **BS 5306 - Part 1 - 2006**, Code of practice for fire extinguishing installations and equipment on premises – Part 1: Hose reels and foam inlets.

8.14 **BS 9990 – 2015**, Code of Practices for non-automatic fire fighting systems in buildings.

8.15 **IS 391 – 2020**, Fire mains for buildings – Installation, commissioning, maintenance and testing.

8.16 **NFPA 1142, National Fire Protection Association**, http://www.nfpa.org

8.17 **Fire engineering**, Chartered Institute of Building Services Engineers, CIBSE. (2003), 2nd Edition, Chartered Institute of Building Services Engineers: London, (CIBSE Guide E).

8.18 **Fire safety engineering; a reference guide**, Chitty. R. and Fraser-Mitchell. J. (2003), Building Research Establishment, Crown Copyright, (BR 459).

8.19 **Fire Services Act 1981**, Fire Services Act, 1981, Number 30 of 1981.

8.20 **Fire Services Acts 1981 and 2003**, Licensing of Indoor Events Act 2003, Number 15 of 2003.

8.21 **Water Services Act 2007**, Number 30 of 2007.

SECTION 8.0– References contd.

Irish Water Publications

https://www.water.ie/connections/

8.22 Irish Water Connections and Developer Services - **Code of Practice for Water Infrastructure – Connections and Developer Services** – July 2020 (Revision 2)- Document IW-CDS-5020-03, pages 38, 39, 41, 42, 43, 64, and 77.

8.23 Irish Water Connection and Developer Services - **Design Risk Assessment for Water Infrastructure Standard Details,** Document Number: IW-CDS-5020-02, August 2016, pages 52

8.24 Irish Water Connection and Developer Services – **Water Infrastructure Standard Details** - Document Number: IW-CDS-5020-01, August 2016, pages 42

8.25 **Guide to connect Water and Wastewater Large Business, Housing and Mixed Use Developments** - Document Number: W/BK/NC/B/0916, pages 32.