Hardstand and Emergency Vehicular Access for Firefighting Appliances

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Sponsor: Dangerous Goods

Authorised by: Director, Fire Safety

1. PURPOSE

This guideline has been developed to provide consistent advice to designers, developers, certifiers and building surveyors who are involved in the design, construction, inspection and approval of emergency vehicle access roads and hardstand surfaces for firefighting appliances within the Fire Rescue Victoria (FRV) district.

The principle purpose of this guideline is:

- to outline the distinction between hardstand and emergency vehicular access
- to ensure that FRV firefighting appliances are able to utilise emergency vehicle access roads and hardstand surfaces, which will enable FRV's operational equipment to be deployed safely
- to outline the specifications necessary to design and construct emergency vehicular access roads and hardstand surfaces.

2. SCOPE

This guideline applies to the design and construction of **emergency vehicle access roads and hardstand surfaces** within the FRV district.

3. DEFINITIONS

BCA: the Building Code of Australia, which forms Volume One of the National Construction Code Series.

Emergency Vehicle Access: as referenced by Clause C2.4 (b) of the BCA, refers to the road or carriageway that surrounds a large isolated building and includes the access road to the site, which is suitable for use by emergency vehicles.

Hardstand: has the same meaning as Clause 1.4.12 of AS 2419.1-2005.

4. HARDSTAND REQUIREMENTS

4.1 LOCATIONS

A hardstand surface must be provided where a firefighting appliance is required to be located on a site adjacent to:

- water storage tanks
- feed fire hydrants
- fire brigade booster connections.

Building sites that rely on external fire hydrants to protect all portions of a building are also required to be provided with a hardstand surface. In these instances, hardstand surfaces must be provided within 50 metres of fire hydrants.

4.2 CONSTRUCTION REQUIREMENTS

A required hardstand and its vehicular approaches shall remain suitable for use by firefighting appliances throughout the following:

- discharge of water during firefighting operations
- rain periods.

All hardstand surfaces must be constructed as detailed in AS 2419.1, and by taking into account the recommendations in Section 7 of this guideline.

5. EMERGENCY VEHICLE ACCESS REQUIREMENTS

The BCA generally requires that all large isolated buildings be provided with a means of emergency vehicle access for the purpose of facilitating the activities of the attending fire brigade.

The criteria used to satisfy the emergency vehicle access requirements of the NCC are contained within Clauses C2.3 and C2.4. These clauses generally prescribe that:

- emergency vehicle access be provided to surround the entire perimeter of the large isolated building (refer to Figures 1 & 2)

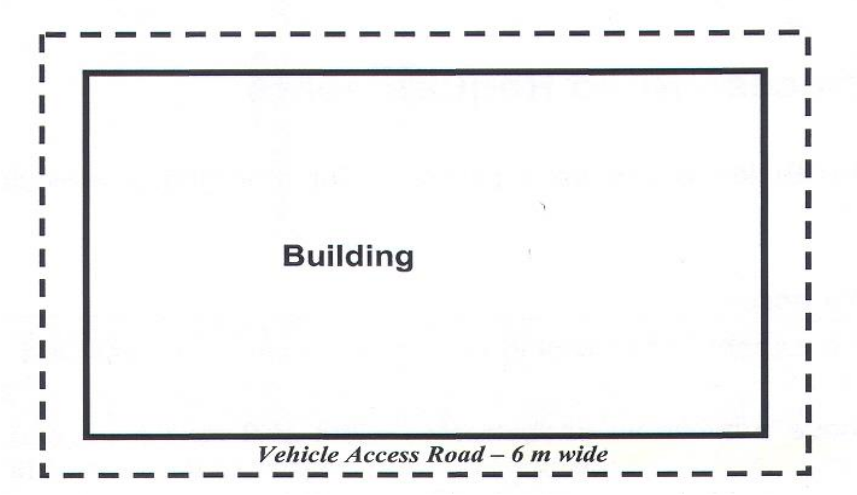

Figure 1 – Sprinkler Protected Option

- the road must be capable of providing emergency vehicle access and passage from a public road
- the road must have a minimum unobstructed width of 6 metres, with no part of its furthest boundary more than 18 metres from the building and in no part of the 6 metre width be built upon or used for any purpose other than vehicular or pedestrian movement (refer to Figure 2)
- the road must provide reasonable pedestrian access to the building

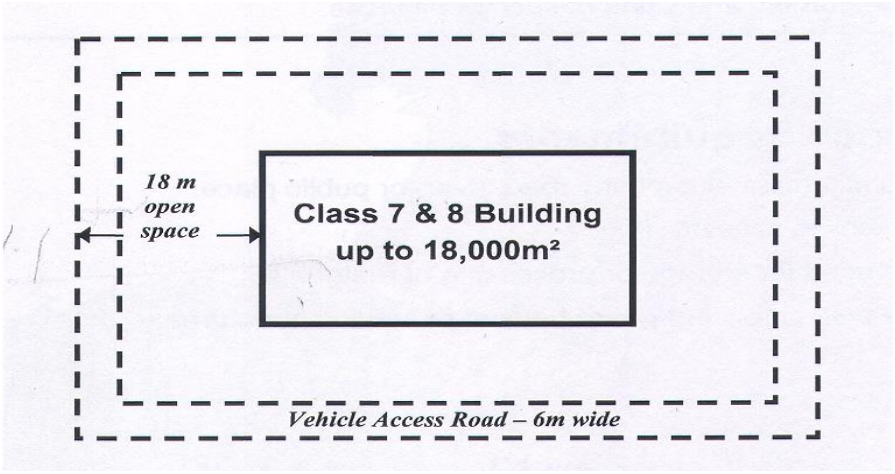

Figure 2 – Non Sprinkler Protected

- the road must have a load bearing capacity and unobstructed height to permit the operation and passage of firefighting appliances
- some public roads maybe used to partially satisfy the emergency vehicle access requirements of a large isolated building
- if the large isolated building is not provided with a sprinkler system, then an 18 metre wide open space must be provided around the entire perimeter of the building (refer to Figure 2).

6. ISSUES FOR CONSIDERATION

Where building designs propose to incorporate hardstand surfaces and provide for emergency vehicle access, due consideration should be given to all of the criteria listed below:

- the provision of external fire hydrants usually determines the requirements for hardstand and emergency vehicle access. All buildings and protected areas, irrespective of type, size or classification, require emergency vehicle access and hardstand for external fire hydrants and fire brigade booster connections
- in the case of low rise buildings with large floor areas, e.g. a large shopping complex or warehouse, hardstand is required to be provided adjacent to specific firefighting equipment and emergency vehicle access is also required to be provided around the building
- in the case of a fire in a non-sprinkler protected building (but not limited to a very large floor area) every type of firefighting appliance may be required to attend a fire incident. This includes specialist firefighting aerial appliances, which are the heaviest appliances operated by FRV
- greater point loads are generated from those specialist firefighting (aerial) appliances that utilise small area stabiliser pads (jacking points)
- as emergency vehicle access roads may also be used for general traffic routine inspections need to be undertaken to ensure that these areas remain clear and functional at all times. Potential traffic management issues should be considered in the design of roadways, for example, roll-over kerbing and passing areas
- location of emergency vehicle access and hardstand at premises containing dangerous goods should take into consideration prevailing wind directions, and the knock-on effect of fire on other dangerous goods storage areas located at the site

- vehicle access roads through a major hazard facility, or other facility with significant quantities of dangerous goods, should take into consideration:
    - location and placement of fire protection equipment
    - facility layout including overhead pipe racks
    - bund and spill containment design
    - areas of restricted traffic/movement of personnel
    - truck/trailer storage areas
    - container transit storage areas
    - hazards and potential emergency scenarios for that particular facility
    - evacuation assembly areas
    - perimeter gates
- consideration must also be given to overhead obstructions, such as building canopies or ornaments, and height clearances over access roads, such that they do not obstruct firefighting appliances. A minimum height clearance for all firefighting appliances of 4.2 m is acceptable under service pipelines, bridges, and the like
- if power lines cross the emergency vehicle access road, the clearance from the ground must be a minimum of 5500mm, in accordance with Part 3, Regulation 13 of the Electricity Safety (Installations) Regulations 2009.

7. CONSTRUCTION RECOMMENDATIONS

Any hardstand surface that is required by AS 2419.1–2005 to be provided to serve feed and attack fire hydrants as well as fire brigade booster connections, shall be designed to withstand a uniformly distributed load over the entire area of 7 kPa or 0.7 tonnes/m^2 and a continuous water discharge from a fire brigade appliance. This is to prevent the pumper from being undermined by water issuing from the appliance over an extended period.

If a building is fully sprinkler protected, the emergency vehicle access, and any other hardstand, should be designed to withstand a uniformly distributed load over the entire area of 7 kPa, which equates to 0.7 tonnes /m^2. This would provide the necessary stability for firefighting (pumping) appliances, and, if necessary, the use of a heavier firefighting (aerial) appliance.

If a building is not provided with a sprinkler system, the emergency vehicle access road is considered as being a hardstand and therefore shall also be designed to withstand a point load of 15 tonnes (or 150kN) so that it can withstand an aerial appliance at any location within the boundaries of the hardstand.

Note: this provision will apply wherever a firefighting appliance is required to access a fire hydrant. Consideration may also need to be given to other building elements, such as suspended slabs, and their ability to support these firefighting appliance loadings.

A surface of the hardstand or emergency vehicular access road must be able to maintain its integrity during fire conditions. For example, crushed rock is not permitted because firefighting water run off may wash the surface away resulting in an unstable footing for the appliance. Concrete (adjacent to fire hydrants and boosters) and/or asphalt would be considered acceptable to FRV.

Emergency vehicle access and hardstand should be clearly delineated from surrounding areas. Discussion with delegates of the Fire Rescue Commissioner for advice may be necessary to ensure satisfactory recognition of the firefighting appliance areas. These will depend on site-specific conditions.

Hardstand areas should be constructed as a flat surface. Any incline should be less than 5°. This will facilitate the setting up and siting of firefighting (aerial) appliances, and to allow water to run off and not pool.

8. REFERENCES

- AS 2419.1 – 2005, Fire Hydrant Installations – System design, installation and commissioning
- FRV Fire Safety Guideline *GL-27 – Planning Guidelines for Emergency Vehicle Access and Minimum Water Supplies within the Fire Rescue Victoria Fire District*
- Part 3, Regulation 13 of Electricity, Safety (Network Assets), Reys 1999
- National Construction Code Series Volume 1 (2013 Edition), Clauses C2.3 & C2.4