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# SOUTH AUSTRALIAN FIRE AUTHORITIES

## Community Safety Department

### BUILT ENVIRONS SECTION GUIDELINE NO. 06

### Shopping Centres

This policy document describes features that should be considered for incorporation into the design of shopping centres that the MFS Community Safety Department believe are important for the safety of the general public and to integrate with the operational procedures of the MFS.

#### 1. Exit Identification

Department of Housing and Urban Development (DHUD) exit identification should be employed throughout a shopping centre comprising:

- Green and white diagonal stripes,
- Fire exit sign writing
- Exit Sign and
- Green strobe light.

Photo 1 below shows typical DHUD exit identification.



**Photo 1: DHUD exit identification**

The size, colour and type of line marking and sign writing should be in accordance with the DHUD pamphlet. Green strobe lights should have a light output no less than that generated by a 125 W Xenon lamp at approximately 2 flashes per second. Strobe lights and exit lights should be mounted adjacent to each other at the same horizontal level above a doorway, which should be not more than 2.7 metres unless the doorway is of greater height (see AS 2293).

Exit stripes above doorways should continue full height to the underside of a ceiling or roof above and 0.5 metres each side of the doorframe, unless specifically agreed otherwise.

Entry doorways from a trading area which form a part of the exit way through a back of house storage area or a corridor, should be DHUD identified. Exit paths through back of house storage areas should have zebra stripes (sunflower yellow) painted on the floor, to create an identified path of travel not less than 1.0 m wide. The identified pathway should connect the DHUD identified entry door leading into the storage area, to the DHUD identified exit door in the storage area that leads to outside the building.

Consideration should be given to the use of jumbo exit signs over identified exits to accommodate the needs of the visually impaired. Directional exit signs should be provided throughout the shopping centre at a mounting height of no more than 2.7 m (see As 2293) so that occupants in the centre can always see one sign directing them to an exit.

### **2. Occupant Warning Systems**

Where an occupant warning system is provided, a female voice message should be interspersed in between the alert and the evacuation signals to reinforce the intent of the signal.

Each audible tone should sound for 3 cycles followed by a voice message. The alert tone and voice message should sound for 5 minutes before any automatic cascade evacuation process is activated.

The voice message for the alert tone should be without any urgency:

*“Your attention please, a fire alarm has activated in this area please be prepared to leave by your nearest exit if instructed to do so.”*

The voice message for the evacuation tone should be with urgency:

*“Attention attention! Leave now by your nearest exit.”*

Door strobe lights should be activated at the same time as the alert tone and message is broadcast, and continue to flash until the FIP has been reset or a faulty circuit is isolated.

### **3. Smoke Management Systems**

Smoke curtains should ideally have their bottom edge located 4/5 the height of the floor to ceiling soffit of the lowest horizontal part of the ceiling in the smoke reservoir. In retail trading areas where the ceiling height is of the order 4 m high, the maximum area of a smoke reservoir may be extended from 2000 m<sup>2</sup> to not more than 2500 m<sup>2</sup>. Smoke curtains in malls should generally be located in accordance with the BCA.. Curtain depths should be as for retail areas and across whole width of a mall.

No flat ceiling sections at a lower level than the bottom edge of a smoke curtain should be installed across or at the end of a smoke curtain as these may form paths for smoke to bypass the bounding curtain of the reservoir. Particular attention should be given to low level ceilings at retail entry locations and flat ceilings each side of a barrel vault in a shopping mall. Consideration should also be given to the incorporation of smoke curtains into below ceiling obstructions such as rows of fluorescent lighting or exposed air-conditioning ductwork.

Smoke exhaust fans should be installed in accordance with the BCA. Attention should be given to noise generated by smoke exhaust fans.. Noise attenuation will

likely be required. This is a most important aspect of a shopping centre fire safety system package. Too much noise drowns out the emergency warning and intercommunication speaker system

Each smoke exhaust fan should be individually started by smoke flow activating ceiling mounted zoned smoke detectors in the vicinity of the fan. In most large shopping centres, employing a hot smoke test in accordance with AS 4391 will check this control sequence. This test is recommended because it will also confirm correct activation of all other integrated fire safety systems.

#### **4. Fire and Smoke Separation**

Ideally stores of more than 1000 m<sup>2</sup> floor area should be fire separated from a shopping mall at time of fire. This is not required under the BCA and may be cost prohibitive. This Department recommends the use of steel roller shutter or bi-fold doors to be used for the dual role of security and to resist the unwanted passage of smoke and heat through the opening interconnecting a store with a shopping mall.

Doors should be fabricated of 0.16 mm sheet steel and employ fastenings of a similar melting point to steel (e.g. stainless steel or monel pop rivets). Where a viewing panel is required in the door for security purposes it should ideally be a material having a performance at least equivalent to wired glass. In such cases makeup air for smoke exhaust fans in the store cannot be sourced from a mall area.

Where makeup air for the store smoke exhaust fans can only be sourced from the shopping mall, then mall entry doors must open upon a fire alarm in the store. Velocity through the door opening should ideally be not more than 0.5 m/s.

Automatic fire sprinklers should be located in the bulkhead each side of a roller or bi-fold door. Sprinkler heads should be located at minimum spacing each side of the door to afford maximum wetting of the door surface at time of fire.

During trading hours, upon a fire alarm in the store or mall area, automatic lowering of the bottom edge of store entry doors to 2.1 m will assist with the control of smoke and permit occupants to exit to and from a store at time of fire. A minimum of two door position-sensing devices should be used in each opening to control the door position.

To manually control door opening and closure, two key operated switches should be located in a fire hose reel cupboard outside the store and adjacent to the doors within the store. One key should manually open and close a single door, the second key should control all other doors. The key switch location should be adjacent to the single controlled roller door.

## **5. Fire Extinguisher and Hose Reel Signs**

Fire extinguisher and fire hose reel signs should be located at high level so they can be viewed above merchandising displays signs and stored stock that may obscure these fire safety features.

## **6. Identification of Maximum Stock Storage Height**

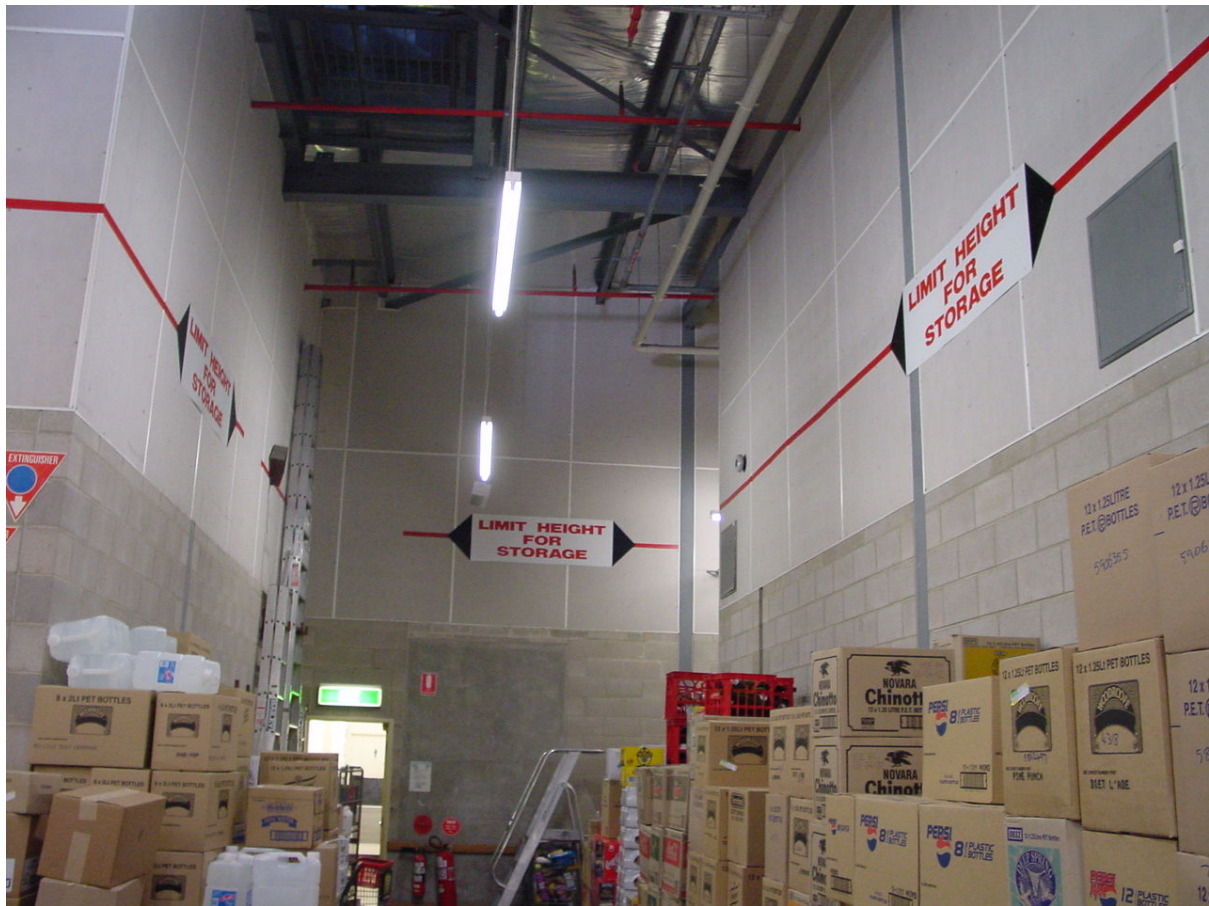
A 50 mm wide red line should be painted on the walls of storage areas at the maximum height of stored materials for which the sprinkler system has been designed. The words "LIMIT HEIGHT FOR STORAGE" should be painted in 75 mm high red letters on a white background at 10 m intervals along the line. Two black triangles should be included on each side of the sign with their apex at the line centre, all in accordance with Photo 2.

## **7. Miscellaneous Issues**

Shopping centres will have both fire detection and fire suppression systems. The Fire indicator panel in a fire control room should be connected to primary one input of the transponder unit. Where a second fire brigade command and control location is provided, the fire indicator mimic panel should have a primary two input. All sprinkler valve room locations should utilise other primary inputs.

Automatic gas shut down at time of fire is to be avoided. Appliances with appropriate flame out safety controls should be employed. Consideration should however be given to a key operated switch at the FIP in the fire control room to allow manual shut down of the gas supplies to the shopping centre by the attending fire fighters.

At time of fire alarm, in store public address systems should be disabled so that the occupant warning system can be heard. Alternatively, consideration should be given to the use of the store public address system for occupant warning purposes.



**Photo 2: Identification of maximum storage height**

### **7. Final Inspection of the centre**

A final inspection of the shopping centre will be undertaken after final fit out, when the store is operating and all advertising signage and merchandising displays are in place.

This inspection will check the location and identification of fire extinguishers, fire hose reels and fire exit direction and location signs, having due regard to any merchandising displays signs and stored stock that may obscure these fire safety features.

At this time a test of the occupant warning system to check for sound levels above ambient conditions will be made.