Fire Safety Guideline
Scissor Stairs

MFS Fire Safety Guideline for Scissor Stairs

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Government of South Australia

METROPOLITAN FIRE SERVICE SOUTH AUSTRALIA

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DOCUMENT CONTROL

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Clause	Amendment
Title	Update document title from *Built Environment Section Guideline 002: Scissor Stairs* to *MFS Fire Safety Guideline for Scissor Stairs*
Whole document	Update document to new format Minor typographical and grammatical amendments

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CONTENTS

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GLOSSARY

AS	Australian Standard
BES	MFS Built Environment Section
CSRD	Community Safety and Resilience Department
MFS	South Australian Metropolitan Fire Service
NCC	National Construction Code

REFERENCED DOCUMENTS

The following documents are referred to in this Guideline:

AS 2118.6 Australian Standard 2118 – *Automatic fire sprinkler systems, Part 6: Combined sprinkler and hydrant systems in multistorey buildings*

Australian Building Codes Board, *National Construction Code, Volume One, Building Code of Australia,* (Edition applicable at the time of Development Approval), Australian Building Codes Board, Canberra.

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1 PURPOSE

To provide advice regarding operational firefighting and occupant safety issues in relation to scissor stairs in multi-storey buildings.

The recommendations made within this guideline are in addition to other relevant legislative requirements, including those of the National Construction Code (NCC).

2 GENERAL

The "scissor stair" is an architectural feature of many Australian multi-storey buildings. Essentially this comprises one stair spiral stacked on top of another stair spiral; a double helix. The advantage of such a stair configuration is that it takes up less room per floor than would be the case if two traditional "return" stair shafts are employed. The space saving in reality equates to the area taken up by a stairway floor landing.

Figure 1 below shows a vertical section taken through a scissor stair. The detail identifies a red stair and a blue stair; each having different wall colours. As can be seen, the red stair (buff coloured walls) is sandwiched between, or stacked on top of, the blue stair (blue coloured walls).

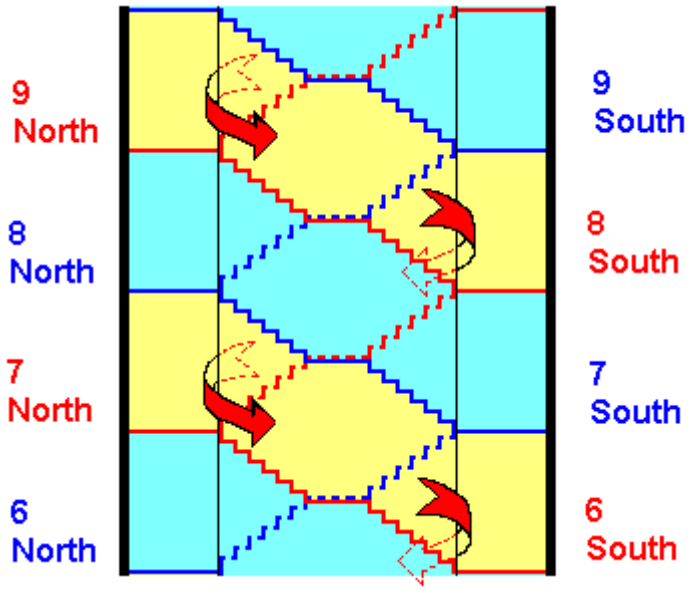

Figure 1: Section through a scissor stair.

Occupants descending in the red stair will find it connects each floor but on opposite compass points. Descending from the 10th level (not shown in Figure 1) users will reach the 9th level North door, further descent connects to the 8th level South door, then the 7th North, the 6th South and so on.

3 PROBLEMS ASSOCIATED WITH SCISSOR STAIRS

The explanation of how a scissor stair functions is relatively easy to understand because colours and compass points have been used to explain the effect of the double helix stair arrangement.

In practice, in an unmarked stair, firefighters ascending to fight a fire or occupants evacuating via the stair will soon become disorientated.

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When firefighters open a door onto a fire floor, smoke or water may make the stair unusable for occupant evacuation. This poses problems for effective occupant evacuation and operational firefighting, such as:

1. How occupants can be directed to use the other tenable stair, which criss-crosses its way up the building,
2. How firefighters determine which stair to use/enter to locate colleagues and equipment, particularly where lifts are used to access floors below the fire, and
3. How firefighters can determine which is the appropriate stair from which to fight the fire.

4 THE EFFICIENT USE OF SCISSOR STAIRS

It is imperative that the issues described above be addressed so that firefighters and occupants can effectively use the stairs during an emergency. Designers should discuss these matters further with the MFS Built Environment Section (BES) whenever scissor stairs are to be incorporated in a building design.

Solutions that designers should consider to maximise the efficient use of scissor stairs include clear identification of the different stairs through colour coding and the location of services within a common stair as follows.

4.1 Stair Identification – Colour Coding

It is suggested that each stair in the building be colour coded (e.g. red stair, blue stair, green stair, brown stair) as described here for rapid identification.

1. The design team shall select a robust naming convention and colour coding scheme for each stair which must be carried through to all design and as-built documentation, block plans, etc. Approval should be sought from the BES prior to finalising this system.
2. A coloured “stripe” of a minimum 150mm thickness to be painted around the internal walls of each stair. The coloured stripe should be located at a height above and following the handrail, in the stair’s corresponding identifying colour.
3. The internal (stair side) face of each stair entry door to be painted in the stair’s corresponding identifying colour. Refer example in Figure 2.
4. On the internal (stair side) face of each entry door, sign write the floor level and compass point in 50mm high lettering of a contrasting colour (e.g. white text). Refer example in Figure 2.
5. On the external (building side and outside) face of each stair entry door, the preferred stair identification method is to paint a band of colour in the stair’s corresponding identifying colour, within which sign write the floor level and compass point in 50mm high lettering in a contrasting colour (e.g. white text). Alternatively, colour code the sign writing of the floor level and compass point (in 50mm high lettering) to the corresponding stair identification colour. Refer examples provided in Figure 3.

Alternative colour coding identification methods may be considered and should be discussed with the BES.

The above requirements are in addition to any mandatory door signage requirements of the NCC.

4.2 Location and Identification of Sprinkler Control Valves

Where sprinkler control valves are installed within a fire rated scissor stair at each level, they should be located such that one stair entry provides access to all sprinkler control valves, as per the requirements of AS 2118.6. This means they will be located at alternating compass points on alternating levels.

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The stair within which the sprinkler control valves are located shall be identified on the external (building side and outside) face of the stair entry door at each level in 50mm high lettering of either a contrasting colour, or in the corresponding stair identifying colour. Refer examples given in Figure 3.

Figure 2: Scissor stair fire door identification - internal (stair side) face of fire stair door.

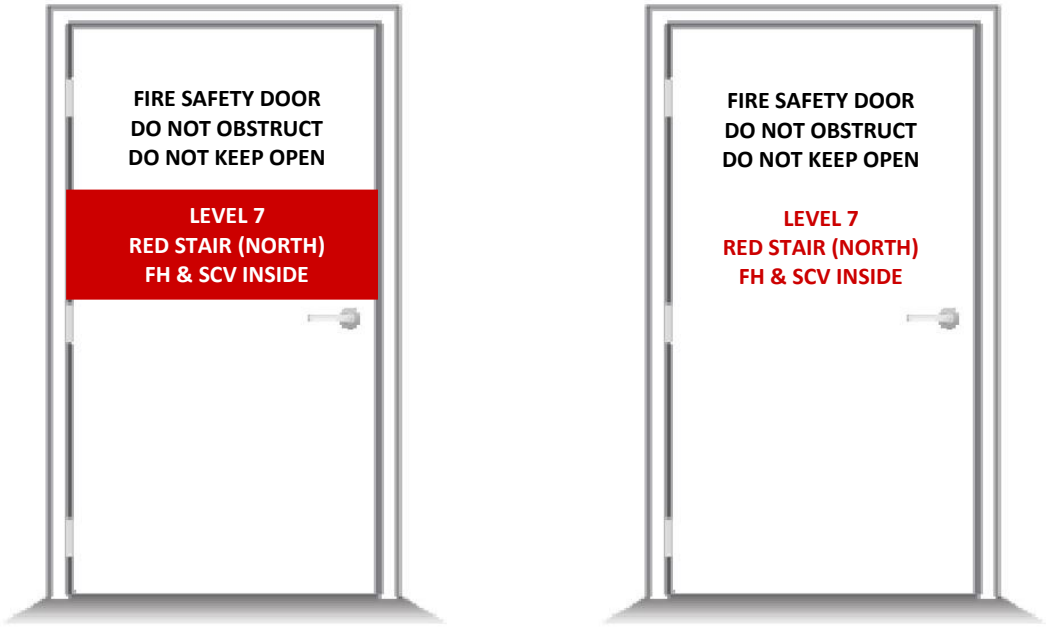

Figure 3: Scissor stair fire door identification - external (building side and outside) face of fire stair door.

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