



# Fire Protection Guideline for Packhouse and Fruit Cold Storage Facility

**First Issue**

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## 1 INTRODUCTION

Packhouse operators are challenged in these times to achieve occupancy certificates. Compliancy in terms of specific codes should be achieved and that should also satisfy the requirements for insurance. Operators are faced with two aspects which each have their own set of rules for compliance. On the one hand the SANS building codes must be adhered to and on the other the packhouse requires insurance. Due to a lack of trust in the completeness of the SANS codes, insurance companies have developed their own standards or minimum requirements to be met to be insured. This guideline provides the minimum SANS guidelines as well as the perspective through which insurance companies view their projects.

Several Cold store facilities and insurance companies have been contacted/visited to achieve information for this report.

The nature of the facility necessitates that the building be divided into three sections namely: 1. Packing store, 2) Cold store and 3) Dry material store.

This document serves as a guideline for users to gain a basic understanding of fire requirements and concepts relating to fruit packhouse and cold storage facilities derived from the SABS codes as well as the perspective of insurance companies. Another document, the Design Report, records all the research and surveys done to obtain the results.

## 2 OCCUPANCY CLASSIFICATIONS

It is of vital importance to understand occupancy classifications to determine the fire requirements relating to any building. Many times, there are disagreements regarding certain classifications, and this can have a significant financial impact. Packhouse personnel might reason their building is a certain classification to avoid expensive fire equipment, while insurance companies lean toward over designing to protect their asset (the building).

Below are the occupancy classifications into which a pack store, cold store or dry material store shall fall into:

<b>Class of occupancy of building</b>	<b>Occupancy</b>
D1	<b>High risk industrial</b> Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions.
D2	<b>Moderate risk industrial</b> Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
D3	<b>Low risk industrial</b>

	Occupancy where an industrial process is carried out and where neither the material handled, or the process carried out falls into the high or moderate risk category. Most packhouses/stores will fall into this category
J1	<b>High risk storage</b> Occupancy where material is stored and where the material is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions. This will include dry materials/goods stores.
J2	<b>Moderate risk storage</b> Occupancy where material is stored and where the material is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions. Stores containing plastic bins etc.
J3	<b>Low risk storage</b> Occupancy where material is stored does not fall into the high or moderate risk category Cold stores, Freezer rooms. Material stored will not burn easily.

### 3 SUMMARY OF REQUIREMENTS FOR FRUIT STORE APPLICATIONS

The following is a summary of the fire requirements as obtained from SANS 10400 Part, SANS 10287 and insurance companies. Some of the clauses and tables are referenced to the Design Report which is a separate document.

#### 3.1 Packing store

- ✓ SANS 10400 and 10287
  - Insulated panels shall be tested according to SANS 10177:5 to see if it is combustible. If combustible, its use and application should be accepted according to the protocol in SANS 428.
  - Any structural element or component directly supporting a fire wall shall have tested structural stability for specified fire rated time periods (minimum 30 minutes).
  - Anywhere in the building, people should reach an emergency route (see definition) or escape door within 45m to avoid required sprinklers.
  - Escape routes widths shall not be less than 1m (or 1.5m if disabled people use the building)
  - Occupancy D3 only requires fire detection for buildings with a floor area of more than 5000 m<sup>2</sup>
  - Fire hydrants, hose reels and extinguishers shall be provided throughout
  - Fixed automatic fire fighting systems shall be provided when the building is higher than 30m or if the stacking heights in SANS 10287 require so.
  - If a building has a division between 500 and 2500m<sup>2</sup> or is a single storey building, its smoke control requirements can be fulfilled by roof ventilators/openable windows. If

the building has a division larger than 2500m<sup>2</sup>, it shall be provided with a system of mechanical or natural smoke ventilation in accordance with EN 12101.

✓ Insurance

- Basic compliance with the minimum SANS requirements
- Depending on the size of the building – sprinklers will be required.
- Yearly audits from risk surveyors

### 3.2 Cold stores

✓ SANS

- Insulated panels shall be tested according to SANS 10177:5 to see if it is combustible. If combustible, its use and application should be accepted according to the protocol in SANS 428.
- Any structural element or component directly supporting a fire wall shall have tested structural stability for specified fire rated time periods (minimum 30 minutes).
- Anywhere in the building, people should reach an emergency route (see definition) or escape door within 45m to avoid required sprinklers.
- Escape routes widths shall not be less than 1m (or 1.5m if disabled people use the building)
- Occupancy classification J2 requires fire detection throughout. If a J3 occupancy has a floor area of more than 5000 m<sup>2</sup>, it requires fire detection.
- Fire hydrants, hose reels and extinguishers shall be provided on external walls of Cold stores where practical
- Fixed automatic fire fighting systems shall be provided when the building is higher than 30m or if the stacking heights in SANS 10287 require so.
- Where a Cold store requires sprinklers, if the roof void has a height of more than 800 mm and an area of compartment of more than 100 m<sup>2</sup>, the roof void shall also require sprinklers.

✓ Insurance

- Basic compliance with the minimum SANS requirements
- Depending on the size of the building – sprinklers will be required on the inside
- Sprinklers will mostly be required between the roof and ceilings
- Yearly audits from risk surveyors

### 3.3 Dry material stores

✓ SANS

- Any structural element or component directly supporting a fire wall shall have tested structural stability for specified fire rated time periods. For a single storey building, J1 requires 60 min fire rated stability and J2 30 minutes.

- Anywhere in the building, people should reach an emergency route (see definition) or escape door within 45m to avoid required sprinklers.
  - Escape routes widths shall not be less than 1m (or 1.5m if disabled people use the building)
  - Occupancy classification J1 and J2 requires fire detection throughout.
  - Fire hydrants, hose reels and extinguishers shall be provided throughout
  - Fixed automatic fire fighting systems shall be provided when the building is higher than 30m or if the stacking heights in SANS 10287 require so.
  - If a building has a division between 500 and 2500m<sup>2</sup> or is a single storey building, its smoke control requirements can be fulfilled by roof ventilators/openable windows. If the building has a division larger than 2500m<sup>2</sup>, it shall be provided with a system of mechanical or natural smoke ventilation in accordance with EN 12101.
- ✓ Insurance
- Basic compliance with the minimum SANS requirements
  - Sprinklers will mostly be required as this is the largest risk area
  - Some insurers might request monthly audits from risk surveyors

## 4 CONCEPT FIRE PROTECTION AND INSURANCE GUIDELINE

### 4.1 Fire protection guidelines for Packing Stores

#### 4.1.1 *Definitions*

Access door – Entrance door to an emergency route

Common path of travel – part of an escape route that leads to only one exit door, access door or escape door

Emergency route – that part of an escape route which provides 120 min fire protection to the occupants of any building and which leads to an escape door

Escape door – door in an escape route which, at ground level, leads directly to a street or public place or to any approved open space which leads to a street or public place

Escape route – Entire path of travel for all persons, including persons with disabilities, from the furthest point in any room in a building to the nearest escape door and may include an emergency route

Exit door – Door that is a component of an escape route from any room

Feeder route – That part of an escape route which allows travel in two different directions to the access doors of at least two emergency routes

Fire rated wall – A wall (bricks, fire board etc.) that can resist a fire for a given amount of time.

Fire retardant – In general, fire-retardant materials have been chemically treated to slow ignition, burning, or self-extinguish when exposed to an open flame.

Fire resistant - Fire-resistant and flame-resistant products are designed to be non-flammable at a chemical level, and to self-extinguish without melting or dripping when directly exposed to extreme heat.

#### **4.1.2 Occupancy classifications and separations**

Packing stores shall either fall under occupancy classification D3 (Low Risk Industrial) or J3 (Low Risk Storage). If the area contains a packing line or machinery, it will be D3 and if it is only used to store goods then it is a J3.

In most cases it would be a cold store inside another occupancy like industrial (D2 or D3).

Occupancies J2 and J3 areas may not be more than 300 m<sup>2</sup> within another occupancy.

A 60 min fire wall is required between an office (G1) and the processing area (D3). There are options available such as fire shutters, curtains and fire rated glass.

A 60 min fire wall is required between a dry material store (J2) and a processing area (D3).

#### **4.1.3 Insulated panels**

Insulated panels shall be tested according to SANS 10177:5 (Fire testing of materials, components and elements used in buildings) to see if it is combustible. If combustible, its use and application should be accepted according to the protocol in SANS 428 (Fire performance classification of thermal insulated building envelope systems).

Where there are no sprinklers and smoke control systems, the ceiling area between any ceiling insulated panels and roof structure shall be divided into areas (separated by fire structures with an integrity of at least 20 min) as follows:

- ✓ If the insulation panels are combustible, then areas may not be more than 250 m<sup>2</sup> and the distance between fire stops may not be more than 20m.
- ✓ If the insulation panels are not combustible, then areas may not be more than 500 m<sup>2</sup> and the distance between fire stops may not be more than 30m.

#### **4.1.4 Structural fire stability**

Any structural element or component directly supporting a fire wall shall have tested structural stability for specified fire rated time periods.

For a single storey building, D3 requires 30 mins fire rated structural stability.

For a single storey building, J2 and J3 requires 30 mins fire rated structural stability.

For a double storey building, J2 requires 60 mins and J3 30 mins. Double storey actually requires a physical second storey. A 20 meter high packing store would therefore be a single storey building.

#### **4.1.5 Travel distance and escape doors**

Where the travel distance to the nearest escape door is more than 45 meters, two or more escape routes shall be provided and an emergency route shall form part of each escape route.

For emergency routes, the travel distance measured to the nearest access door or escape door shall be less than 45 meters, except where protected by a sprinkler system, the distance may be increased to 60 meters. This path shall be along a feeder route and the feeder route shall lead in two different directions to two or more independent emergency routes or escape doors.

The exit door from any room shall lead directly into a feeder route or common path of travel. Where an exit door leads into another room, the room should be within the same tenancy and the exit door from such room should lead into a feeder route, also within travel distances listed above.

The total common path of travel (route which only leads to one escape door, access door or exit door) shall not exceed 35m.

Any room that has a population of more than 25 people shall have at least two exit doors.

#### **4.1.6 Width of escape routes**

Please refer to SANS 10400 Part T 4.21

1	2	3
<b>Maximum number of persons</b>	<b>Escape routes for buildings not required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations</b>	<b>Emergency routes for building which are required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations</b>
	<b>Minimum width</b> mm	
≤100	1 000	1 500
≤120	1 100	1 500
≤130	1 200	1 500
≤140	1 300	1 500
≤150	1 400	1 500
≤160	1 500	1 500
≤170	1 600	1 600
≤180	1 700	1 700
≤190	1 800	1 800

NOTE This table does not contemplate simultaneous evacuation from multi-storey buildings.

#### **4.1.7 Fire detection**

Occupancy classification J2 requires fire detection throughout. If a J3 occupancy has a floor area of more than 5000 m<sup>2</sup>, it requires fire detection.

Occupancy D3 only requires fire detection for buildings with a floor area of more than 5000 m<sup>2</sup>

#### **4.1.8 Fire hose reels, hydrants and extinguishers**

Hose reels shall be installed in any building of two or more storeys in height or in any single-storey building of more than 250 m<sup>2</sup>, at a rate of 1/500 m<sup>2</sup> or part thereof. The hose reels shall be so positioned that the end of the hose reaches all areas (physical reach of hose, not arc of discharging water).

Hydrants shall be installed in any building that exceeds 12m in height or has a total floor area that exceeds 1000 m<sup>2</sup> at a rate of 1/1000 m<sup>2</sup> or part thereof.

Occupancy J2 requires portable fire extinguishers at a rate of 1/100 m<sup>2</sup> and J3 1/400 m<sup>2</sup>. The extinguishers specified are 9kg Dry chemical powder type.

Occupancy D3 requires fire extinguishers at a rate of 1/200 m<sup>2</sup>. The extinguishers specified are 9kg Dry chemical powder type.

#### **4.1.9 Fixed automatic fire-fighting systems**

Fixed automatic fire-fighting systems shall be installed in any building that exceeds 30m in height and in any basement storey which exceeds 500 m<sup>2</sup> in floor area.



Occupancies D3 and J3 do not require sprinkler systems solely based on the area requirement of table 3 in Annexure A of the Design Report. Other regulations might trigger sprinkler systems for these occupancies such as stacking heights.

Where a packing store requires sprinklers, if it has a ceiling or roof void of more than 800 mm in height and an area of compartment of more than 100 m<sup>2</sup>, the void shall also require sprinklers.

Sprinklers are required when storage of goods cannot be within the requirements of SANS 10287. Goods (product) shall be stored lower than the height specified in column 4 of table 2 (Annexure A in Design Report) for the type of storage in column 2, or within 1m of a ceiling or roof, whichever is the lowest. Also note column 6 of table 2. Fruit packhouses and Cold storage facilities will fall under ordinary hazard.

Also see table A.1 in Annexure A in the Design Report for the Goods Category. Fruit and vegetables (wholesale) and Cold-storage warehouses are category 1.

#### ***4.1.10 Smoke control***

If a building has a division between 500 and 2500m<sup>2</sup> or is a single storey building, its smoke control requirements can be fulfilled by roof ventilators/openable windows.

If the building has a division larger than 2500m<sup>2</sup>, it shall be provided with a system of mechanical or natural smoke ventilation in accordance with EN 12101.

## **4.2 Fire protection guidelines for Cold stores**

### ***4.2.1 Definitions***

Access door – Entrance door to an emergency route

Common path of travel – part of an escape route that leads to only one exit door, access door or escape door

Emergency route – that part of an escape route which provides 120 min fire protection to the occupants of any building and which leads to an escape door

Escape door – door in an escape route which, at ground level, leads directly to a street or public place or to any approved open space which leads to a street or public place

Escape route – Entire path of travel for all persons, including persons with disabilities, from the furthest point in any room in a building to the nearest escape door and may include an emergency route

Exit door – Door that is a component of an escape route from any room

Feeder route – That part of an escape route which allows travel in two different directions to the access doors of at least two emergency routes

Fire rated wall – A wall (bricks, fire board etc.) that can resist a fire for a given amount of time.

Fire retardant – In general, fire-retardant materials have been chemically treated to slow ignition, burning, or self-extinguish when exposed to an open flame.

Fire resistant - Fire-resistant and flame-resistant products are designed to be non-flammable at a chemical level, and to self-extinguish without melting or dripping when directly exposed to extreme heat.

#### 4.2.2 Occupancy classification

Cold stores shall be one of the following occupancy classifications:

- J2 (moderate risk storage) – Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
- J3 (low risk storage) – Occupancy where the material stored does not fall into the high or moderate risk category. This will attribute to 90% of all cold stores.

In most cases it would be a cold store inside another occupancy like industrial (D2 or D3).

Occupancies J2 and J3 areas may not be more than 300 m<sup>2</sup> within another occupancy.

#### 4.2.3 Structural fire stability

For a single storey Cold store (which should cover most), J2 and J3 requires 30 mins fire rated structural stability. This means that the structure will be able to withstand a high temperature fire for 30 mins without collapsing.

#### 4.2.4 Travel distance and escape doors

Where the travel distance to the nearest escape door is more than 45 meters, two or more escape routes shall be provided and an emergency route shall form part of each escape route.

For emergency routes, the travel distance measured to the nearest access door or escape door shall be less than 45 meters, except where protected by a sprinkler system, the distance may be increased to 60 meters. This path shall be along a feeder route and the feeder route shall lead in two different directions to two or more independent emergency routes or escape doors.

The exit door from any room shall lead directly into a feeder route or common path of travel. Where an exit door leads into another room, the room should be within the same tenancy and the exit door from such room should lead into a feeder route, also within travel distances listed above.

The total common path of travel (route which only leads to one escape door, access door or exit door) shall not exceed 35m.

Any room that has a population of more than 25 people shall have at least two exit doors.

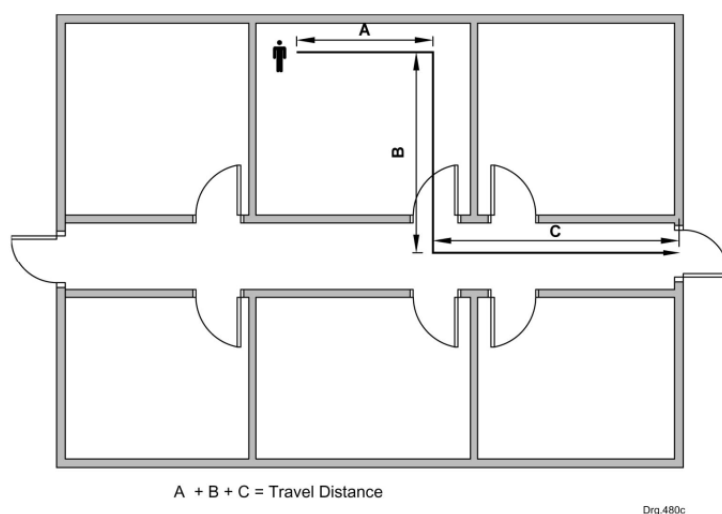


Figure 12 — Travel distance

#### 4.2.5 Insulated panels

Insulated panels shall be tested according to SANS 10177:5 (Fire testing of materials, components and elements used in buildings) to see if it is combustible. If combustible its use and application should be accepted according to the protocol in SANS 428 (Fire performance classification of thermal insulated building envelope systems).

Where there are no sprinklers and smoke control systems, the ceiling area between any ceiling insulated panels and roof structure shall be divided into areas (separated by fire structures with an integrity of at least 20 min) as follows:

- If the insulation panels are combustible, then areas may not be more than 250 m<sup>2</sup> and the distance between fire stops may not be more than 20m.
- If the insulation panels are not combustible, then areas may not be more than 500 m<sup>2</sup> and the distance between fire stops may not be more than 30m.

#### 4.2.6 Width of escape routes

Please refer to SANS 10400 Part T 4.21

1	2	3
Maximum number of persons	Escape routes for buildings not required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations	Emergency routes for building which are required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations
	Minimum width mm	
≤100	1 000	1 500
≤120	1 100	1 500
≤130	1 200	1 500
≤140	1 300	1 500
≤150	1 400	1 500
≤160	1 500	1 500
≤170	1 600	1 600
≤180	1 700	1 700
≤190	1 800	1 800

NOTE This table does not contemplate simultaneous evacuation from multi-storey buildings.

#### 4.2.7 Fire detection

Occupancy classification J2 requires fire detection throughout. If a J3 occupancy has a floor area of more than 5000 m<sup>2</sup>, it requires fire detection.

#### 4.2.8 Fire hose reels, hydrants and extinguishers

Hose reels shall be installed in any building of two or more storeys in height or in any single-storey building of more than 250 m<sup>2</sup>, at a rate of 1/500 m<sup>2</sup> or part thereof. The hose reels shall be so positioned that the end of the hose reaches all areas (physical reach of hose, not arc of discharging water).

Hydrants shall be installed in any cold store that exceeds 12m in height or has a total floor area that exceeds 1000 m<sup>2</sup> at a rate of 1/1000 m<sup>2</sup> or part thereof.

Occupancy J2 requires portable fire extinguishers at a rate of 1/100 m<sup>2</sup> and J3 1/400 m<sup>2</sup>. The extinguishers specified are 9kg Dry chemical powder type.

Hydrants, hose reels and extinguishers should not be installed inside Cold rooms below 5°C to avoid freezing of water. It can then be installed on the outside, so that all areas of the Cold room will have water available.

#### **4.2.9 Fixed automatic fire-fighting systems**

Fixed automatic fire-fighting systems shall be installed in any building that exceeds 30m in height and in any basement storey which exceeds 500 m<sup>2</sup> in floor area.

Occupancy J2 has a maximum division area of 2500 m<sup>2</sup> where no fixed automatic fire system is installed. Once the area is more than this, fixed fire-fighting system is required, or the division area should be decreased by means of a fire wall/separation with 60 mins fire rating.

Occupancy J3 has no limit to its divisional area which requires a fixed fire-fighting system.

Where a Cold store requires sprinklers, if the roof void has a height of more than 800 mm and an area of compartment of more than 100 m<sup>2</sup>, the roof void shall also require sprinklers.

Sprinklers are required when storage of goods cannot be within the requirements of SANS 10287. Goods (product) shall be stored lower than the height specified in column 4 of table 2 (Annexure A in Design Report) for the type of storage in column 2, or within 1m of a ceiling or roof, whichever is the lowest. Also note column 6 of table 2. Fruit packhouses and Cold storage facilities will fall under ordinary hazard.

Also see table A.1 in Annexure A of the Design Report for the Goods Category. Fruit and vegetables (wholesale) and Cold-storage warehouses are category 1.

Sprinkler installations that protect cold-storage warehouses shall be dismantled for drying out after each operation.

Where exposed to possible physical damage, sprinklers other than ceiling sprinklers shall be fitted with a sprinkler guard that is made of metal, fit for purpose and supplied and fitted by the manufacturer. (6.2.4.1)

### **4.3 Fire protection guidelines for Dry Material Stores**

#### **4.3.1 Definitions**

Access door – Entrance door to an emergency route

Common path of travel – part of an escape route that leads to only one exit door, access door or escape door

Emergency route – that part of an escape route which provides 120 min fire protection to the occupants of any building and which leads to an escape door

Escape door – door in an escape route which, at ground level, leads directly to a street or public place or to any approved open space which leads to a street or public place

Escape route – Entire path of travel for all persons, including persons with disabilities, from the furthest point in any room in a building to the nearest escape door and may include an emergency route

Exit door – Door that is a component of an escape route from any room

Feeder route – That part of an escape route which allows travel in two different directions to the access doors of at least two emergency routes

Fire rated wall – A wall (bricks, fire board etc.) that can resist a fire for a given amount of time.

Fire retardant – In general, fire-retardant materials have been chemically treated to slow ignition, burning, or self-extinguish when exposed to an open flame.

Fire resistant - Fire-resistant and flame-resistant products are designed to be non-flammable at a chemical level, and to self-extinguish without melting or dripping when directly exposed to extreme heat.

#### **4.3.2 Occupancy classification**

Dry material stores shall be one of the following occupancy classifications:

- ✓ J2 (moderate risk storage) – Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions.
- ✓ J1 (high risk storage) – Occupancy where material is stored and where the material is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions.

#### **4.3.3 Structural fire stability**

For a single storey building, J1 requires 60 min fire rated stability and J2 30 minutes.

For a double storey building, J1 requires 90 min fire rated stability and J2 60 minutes.

#### **4.3.4 Travel distance and escape doors**

Where the travel distance to the nearest escape door is more than 45 meters, two or more escape routes shall be provided and an emergency route shall form part of each escape route.

For emergency routes, the travel distance measured to the nearest access door or escape door shall be less than 45 meters, except where protected by a sprinkler system, the distance may be increased to 60 meters. This path shall be along a feeder route and the feeder route shall lead in two different directions to two or more independent emergency routes or escape doors.

The exit door from any room shall lead directly into a feeder route or common path of travel. Where an exit door leads into another room, the room should be within the same tenancy and the exit door from such room should lead into a feeder route, also within travel distances listed above.

The total common path of travel (route which only leads to one escape door, access door or exit door) shall not exceed 35m.

Any room that has a population of more than 25 people shall have at least two exit doors.

#### **4.3.5 Width of escape routes**

Please refer to SANS 10400 Part T 4.21

1	2	3
Maximum number of persons	Escape routes for buildings not required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations	Emergency routes for building which are required to provide facilities for persons with disabilities in terms of Part S of the National Building Regulations
	Minimum width mm	
≤100	1 000	1 500
≤120	1 100	1 500
≤130	1 200	1 500
≤140	1 300	1 500
≤150	1 400	1 500
≤160	1 500	1 500
≤170	1 600	1 600
≤180	1 700	1 700
≤190	1 800	1 800

NOTE This table does not contemplate simultaneous evacuation from multi-storey buildings.

#### **4.3.6 Fire detection**

Occupancy classification J1 and J2 requires fire detection throughout.

#### **4.3.7 Fire hose reels, hydrants and extinguishers**

Hose reels shall be installed in any building of two or more storeys in height or in any single-storey building of more than 250 m<sup>2</sup>, at a rate of 1/500 m<sup>2</sup> or part thereof. The hose reels shall be so positioned that the end of the hose reaches all areas (physical reach of hose, not arc of discharging water).

Hydrants shall be installed in any building that exceeds 12m in height or has a total floor area that exceeds 1000 m<sup>2</sup> at a rate of 1/1000 m<sup>2</sup> or part thereof.

Occupancy J1 and J2 requires portable fire extinguishers at a rate of 1/100 m<sup>2</sup>. The extinguishers specified are 9kg Dry chemical powder type.

#### **4.3.8 Fixed automatic fire-fighting systems**

Fixed automatic fire-fighting systems shall be installed in any building that exceeds 30m in height.

Occupancies J1 and J2 has a maximum division area of 2 500 m<sup>2</sup> where no fixed automatic fire system is installed. Once the area is more than this, fixed fire-fighting system is required, or the division area should be decreased by means of a fire wall/separation with 60 mins fire rating for J2 and 120 mins fire rating for J1.

Where a store requires sprinklers, if the roof or ceiling void has a height of more than 800 mm and an area of compartment of more than 100 m<sup>2</sup>, the void shall also require sprinklers. 4.36.2

Sprinklers are required when storage of goods cannot be within the requirements of SANS 10287. Goods (product) shall be stored lower than the height specified in column 4 of table 2 (Annexure A in Design Report) for the type of storage in column 2, or within 1m of a ceiling or roof, whichever is the lowest. Also note column 6 of table 2. Fruit packhouses and Cold storage facilities will fall under ordinary hazard.

Also see table A.1 in Annexure A of the Design Report for the Goods Category. Special care is to be taken as this part of the packhouse is the highest risk in terms of fire. Wooden crates and pallets are category 3 in table A.1 and the maximum stacking height should be read accordingly on table 2. Card-board cartons (heavy weight made up boxes) are also category 3.

#### **4.3.9 Smoke control**

If a building has a division between 500 and 2500m<sup>2</sup> or is a single storey building, its smoke control requirements can be fulfilled by roof ventilators/openable windows.

If it is a double storey building (or more) or has a division larger than 2500m<sup>2</sup>, it shall be provided with a system of mechanical or natural smoke ventilation in accordance with EN 12101.