



# Development Act

Minister's Specification

SA H2.2

July 1997

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## Construction of Bulk Grain Storage Facilities



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 1. PREFACE

The Minister's Specification SA H2.2 has been developed because many of the requirements imposed by the Building Code of Australia 1996 (BCA 96) for Class 7 buildings are not appropriate for bulk grain storage facilities. Minister's Specification SA H2.2 provides a standard for assessing and approving applications for such facilities which will achieve a uniform and acceptable level of safety. Constructors of bulk grain storage facilities will be able to develop standard designs to this specification, which will satisfy the objectives of the BCA and be acceptable to approving authorities.

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## 2. APPLICATION

This Specification only applies to commercial bulk handling facilities. It does not apply to farm structures associated with and located on land devoted to the practice of farming. Farm structures as defined in AS 2867 is the basis for the exclusion.

An existing bulk grain storage facility lawfully constructed pursuant to Section 28 of the *Statutes Repeal and Amendment (Development) Act 1993* is considered to be safe for legislative purposes. Defective fabric may be repaired or replaced to the standard applicable at the time of construction. Any new additions or alterations to an existing structure must comply with this Minister's Specification.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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### 3. SCOPE

Design and construction in accordance with this Minister's Specification is deemed-to-satisfy the relevant performance requirements of Part C, Part D, Part E and Part F of the 1996 edition of the Building Code of Australia - Volume One as amended, for the construction of bulk grain storage facilities.

The Specification will allow some concessions against the BCA. However, the general provisions of Part A and the structural provisions of Part B of the Building Code of Australia will still apply.

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### 4. OBJECTIVES

The intent of this specification is to achieve, in the following order of priority -

- (a) a reasonable standard of life safety for the occupiers of the bulk grain storage facility;
- (b) the minimal spread of fire and smoke;
- (c) an acceptable fire fighting environment, in accordance with the fire safety objectives and performance criteria of the Building Code of Australia; and
- (d) an acceptable standard of health and amenity for the occupiers of the bulk grain storage facility.

## 5. DEFINITIONS

### 5.1 Bulk grain storage facility

means a building or structure for the storage of granular materials such as grain, ore, or the like, where only a few employees are in or around the storage areas.

Two types of facility are covered by this Specification, storage sheds and cell type silos, typical examples are illustrated in Figure 1.

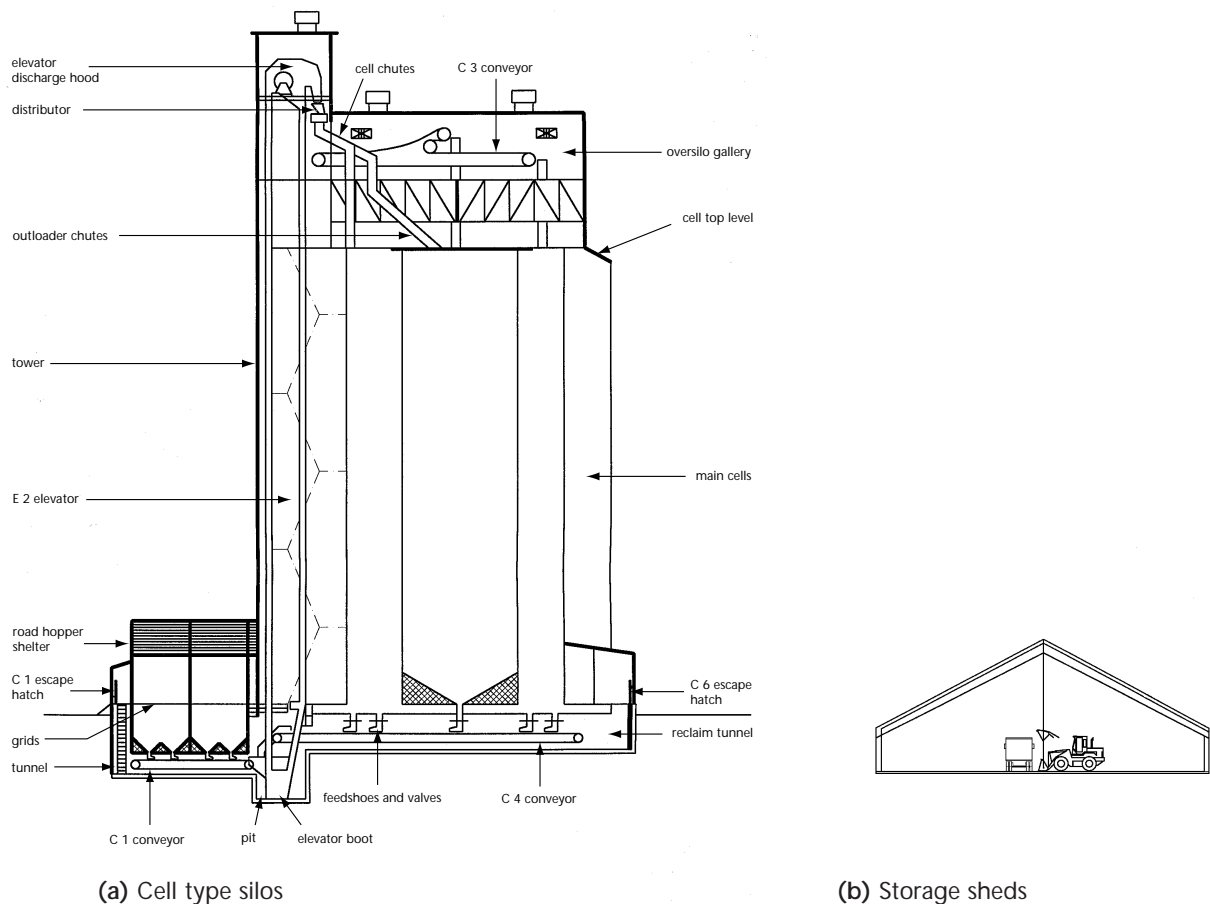


Figure 1

Two types of bulk grain storage facilities

### 5.2 Means of egress

means a required exit including the path of travel, and may include ladders.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 6. GENERAL PROVISIONS

### 6.1 Classification

A bulk grain storage facility is classified as a Class 7 building.

### 6.2 United Buildings

A number of cell type silos less than 3 metres apart and interconnected with walkways, gantries or the like may be considered as united buildings for the purposes of this Minister's Specification.

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## 7. DESIGN AND CONSTRUCTION REQUIREMENTS FOR FIRE RESISTANCE

### 7.1 Deemed-to-satisfy

A bulk grain storage facility satisfies the relevant BCA performance requirements CP1 to CP9 by complying with Part 7.

### 7.2 Fire resistance and stability

#### 7.2.1 Concession for external walls

An external wall of a cell type silo or storage shed must-

- (a) be of non-combustible construction; and constructed at least 3 metres away from a side boundary or 6 metres from another building, other than a Class 10 building, on the same allotment; or
- (b) be of Type C fire-resisting construction in accordance with the Building Code of Australia.

#### 7.2.2 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:  
C1.8, C1.10 and C1.11

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Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

---

## 7.3 Compartmentation and separation

### 7.3.1 Concession for fire separation

Bulk grain storage facilities, not less than 3 metres from a boundary, are exempted from any requirements for fire resistance except non-combustibility. A minimum space of 6 metres must be maintained between bulk grain storage facilities and another building other than a Class 10 building, on the same allotment. A space of 2 metres between silos or cells of silos is adequate to preserve fire separation between cells.

### 7.3.2 Vehicular access

- (a) Bulk grain storage facilities, 40 metres or more in width, must have 6 metre wide vehicular access on all sides, complying with clause C2.4(b) of the Building Code of Australia.
- (b) Bulk grain storage facilities less than 40 metres wide, must have such vehicular access along one of the two longest sides.

### 7.3.3 Underground passageways

Underground passageways must be smoke isolated.

### 7.3.4 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses: C2.7, C2.9, C2.12, C2.13.

## 7.4 Protection of openings

### 7.4.1 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses: C3.1, C3.2, C3.4, C3.15 to C 3.17.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 8. DESIGN AND CONSTRUCTION REQUIREMENTS FOR ACCESS AND EGRESS

### 8.1 Deemed-to-satisfy

A bulk grain storage facility satisfies the relevant BCA performance requirements DP1 to DP9 by complying with Part 8.

### 8.2 Provision for escape

#### 8.2.1 Concession to allow ladders as exits

Fire isolated exits are not required in Class 7 buildings, which are bulk grain storage facilities. For cell type silos a minimum of one exit must be provided. Exit stairs and industrial standard ladders complying with AS 1657 are permitted as alternative means of egress.

#### 8.2.2 Exits in storage sheds

For storage sheds, at least two means of egress must be available and travel distances to exits are not limited, provided the alternative paths of travel provide egress in two approximately opposite directions. Except that, where the travel distance does not exceed 150 metres, only one exit is required.

#### 8.2.3 Exits in cell type silos

For cell type silos, a minimum of two means of egress in approximately opposite directions at gallery level must be provided. Exits must be provided at spacings of not more than 100 metres.

#### 8.2.4 Exit distribution

Exits which are required as alternative means of egress must be distributed as uniformly as practicable within or around the storey served. They must be in positions where unobstructed access to at least two exits is readily available from all points on the floor including lift lobby areas; and those paths of travel are in approximately opposite directions.

#### 8.2.5 Path of travel

A non-fire-isolated stairway, ladder or ramp serving as a means of egress must provide a continuous path of travel from every storey served to the level at which egress to a road or open space is provided.

The distance from any point on a floor to a point of egress to a road or open space by way of a required non-fire-isolated stairway, ladder or ramp is not limited.

#### 8.2.6 Exit width

All exits, including doors, shall have a minimum width of 750mm.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 8.2.7 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:

D1.10, D1.14 and D1.15

## 8.3 Construction of Exits

### 8.3.1 Stairways and ladders

External stairways or ladders complying with AS 1657 may be used as required means of egress and-

- (a) if any part of the stairway is exposed to, and less than 6 metres from, a window, or doorway, (except a doorway complying with C3.4 serving the external stairway), or other opening in an external wall of the building served by the stairway-
  - (i) the stairway must be enclosed for its full height above the lowest level of the window or doorway by non-combustible construction with an FRL of not less than 60/60/60; and
  - (ii) no window or other opening in the enclosing walls of the stairway must be within 6 metres if it is unprotected, (or 3 metres if it is protected in accordance with clause C3.4 of the BCA), of any window, doorway or other opening in the external walls of the building; or
- (b) if any part of the stairway is exposed to, and less than 6 metres from a window, doorway or other opening in an external wall of the building, the opening must be protected in accordance with clause C3.4 of the BCA.

### 8.3.2 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:

D2.7(b), (c), (d), D2.8(b), D2.10(b), (c), D2.15(b), D2.17 to D2.21 and D2.22

## 8.4 Access for people with disabilities

Access for people with disabilities is not required to or within Class 7 buildings, which are bulk grain storage facilities. Access for people with disabilities must be provided to sampling rooms, staff and office areas and sanitary facilities in accordance with Part D3 of the BCA. In an existing building, where it is not practicable to locate sampling rooms at ground level, call-button facilities must be provided.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 9. DESIGN AND CONSTRUCTION REQUIREMENTS FOR SERVICES AND EQUIPMENT

### 9.1 Deemed-to-satisfy

A bulk grain storage facility satisfies the relevant BCA performance requirements EP1.1 to EP1.6, EP2.2, EP3.3 and EP4.1 to EP4.3 by complying with Part 9.

### 9.2 Fire fighting equipment

#### 9.2.1 Hydrants and hose reels

A bulk storage facility is exempt from the requirements of on-site fire hydrants and hose reels, provided there are hydrants in streets adjacent to the site which could supply water at not less than 5 litres per second for firefighting, or where mains water is not available a water storage tank containing not less than 25,000 litres is provided on site. Vehicular access must be provided to the tank.

The hydrants or tanks referred to above must be located not more than 90 metres from the dry riser booster connection (Refer to figure 2). On-site hydrants, connections and equipment must comply with AS 2419.1

#### 9.2.2 Dry risers

Cell type silos must have one dry riser per block located in the middle of the longest side of the block and within 4 metres of a required exit. The base of the riser must be accessible from the vehicular access and be provided with Fire Services booster connections. The top of the riser must be accessible by a stairway, ladder, platform or walkway complying with AS 1657.

The dry riser must be located within 90 metres of the tank or hydrant pipe distribution system so that all areas required to be protected are within 60 metres of the riser outlet, measured around obstacles. A metal or high pressure plastic pipe may be used for the dry riser (Refer to figure 2).

#### 9.2.3 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:

E1.6 and E1.9(a)

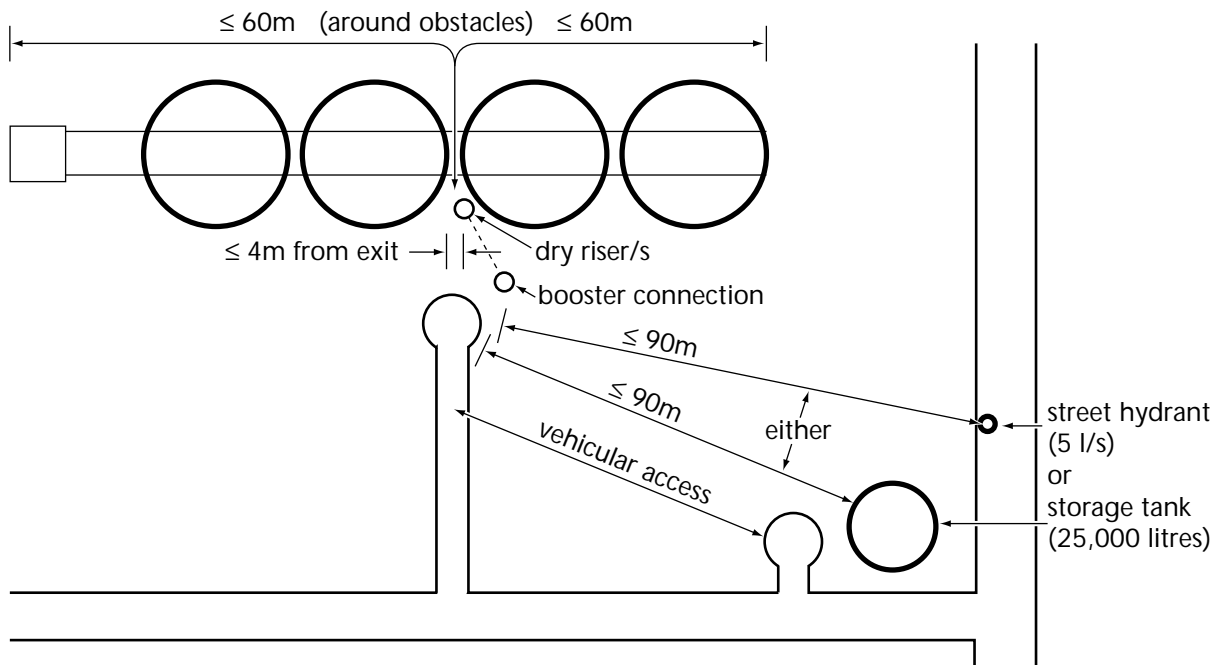


Figure 2

Hydrants, tanks, booster connections and dry risers

### 9.3 Smoke hazard management

#### 9.3.1 Smoke venting

Cell type silos must have suitable natural smoke venting by fixed vents at the top of elevator towers and overhead galleries.

Elevator towers must be vented for smoke removal in the event of a fire but grain storage areas are exempt.

#### 9.4 Lift installations

Where a lift is installed, access and egress to and from liftwell landings must be by a continuous path of travel in accordance with this specification.

Warning signs against use of lifts if there is a fire must be installed in accordance with clause E3.3 of the BCA.



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 9.5 Emergency lighting, exit signs and warning systems.

### 9.5.1 Emergency lighting requirements

Exit signs and emergency lighting must be installed to clearly identify exits and paths of travel, except that:

- (a) cell and shed type silos are exempt from a requirement for emergency lighting at ground floor level, and
- (b) for bulk grain storage facilities the spacing of emergency lights may be twice the distance required for Class 7 buildings.

Underground passages must have emergency lighting.

Emergency power must be available to:

- (a) illuminate the exit signs; and
- (b) illuminate the emergency lighting;

if the normal supply is cut off.

### 9.5.2 Compliance with the BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:

E4.2(b), (d), (h), E4.3, E4.4, E4.5, E4.6 and E4.8



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 10. DESIGN AND CONSTRUCTION REQUIREMENTS FOR HEALTH AND AMENITY

### 10.1 Deemed-to-satisfy

A bulk grain storage facility satisfies the relevant BCA performance requirements FP1.1 to FP1.3, FP2.1, FP3.1, and FP4.1 to FP4.5 by complying with Part 10.

### 10.2 Damp and Weatherproofing

#### 10.2.1 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clause:

SA F1.7

### 10.3 Sanitary facilities

#### 10.3.1 Concession for sanitary facilities

Where not more than 10 persons are employed, a unisex facility may be provided.

#### 10.3.2 Sanitary facilities for people with disabilities:

Where access is required for people with disabilities, one unisex sanitary facility must be provided.

### 10.4 Height of rooms

#### 10.4.1 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clause:

F3.1(b)



Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 10.5 Light and ventilation

### 10.5.1 Lighting

Adequate natural and/or artificial lighting must be provided to work areas and circulation areas. Artificial lighting in accordance with AS 1680.1, is acceptable.

### 10.5.2 Ventilation

Ventilation must be provided in sheds sufficient to carry out one air change inside the shed once every six hours. This ventilation must be achieved by providing openings in the shed structure with a total area of 35 square metres or one percent of the floor area, whichever is less. Alternatively mechanical ventilation may be provided to achieve the required air change in lieu of ventilation openings in accordance with AS 1668.2 or AS/NZS 3666.2.

### 10.5.3 Compliance with BCA

With the exception of the concessions herein, where applicable a bulk grain storage facility must comply with the following BCA clauses:

F4.8(e).

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## 11 MAINTENANCE

### 11.1 Deemed-to-satisfy

A bulk grain storage facility satisfies the relevant BCA performance requirements I1.1 by complying with Part 11.

### 11.2 Essential Safety Provisions

Regulation 76 of the *Development Act 1993* sets out requirements for the maintenance and testing of essential safety provisions installed in buildings. The owner is required to submit a certificate of compliance signed by the installer to the local council before the building can be occupied and to provide annual proof to the council that each essential safety provision has been maintained.

Maintenance and testing requirements are set out in Minister's Specification SA 76 - *Maintenance and testing of safety installations. Schedule of essential safety provisions.*

### 11.3 Compliance with BCA

Where applicable, a bulk grain storage facility must comply with the following BCA clauses:

I1.2 and I1.3.

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Minister's Specification SA H2.2 July 1997

Construction of bulk grain storage facilities

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## 12. REFERENCED STANDARDS

The following standards are referenced in this Minister's Specification:

AS 1657 - 1992	Fixed platforms, walkways, stairways and ladders. Design, construction and installation.
AS 1668.2 - 1991	The use of mechanical ventilation and airconditioning in buildings Part 2: Mechanical ventilation for acceptable indoor air quality.
AS 1680.1 - 1990	Interior lighting Part 1: General principles and recommendations.
AS 2293.1 - 1987	Emergency evacuation lighting in buildings. Design and installation (including amendments 1 and 2).
AS 2419.1 1994	Fire hydrant installations. System design, installation and commissioning.
AS 2867 - 1986	Farm structures - general requirements for structural design.
AS/NZS 3.666.2 - 1995	Air-handling and water systems of buildings - Microbial control Part 2: Operation and maintenance.

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Building Standards and Policy Branch

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

July, 1997