



Building and Development Tribunals

Queensland Government

Department of **Local Government and Planning**

APPEAL

Integrated Planning Act 1997

File No. 3-05-001

BUILDING AND DEVELOPMENT TRIBUNAL - DECISION

Building Certifier: Thomas Independent Certification

Site Address: withheld – “the subject site”

Applicant: Queensland Fire and Rescue Service

Building Certifier: Keith Thomas, Thomas Independent Certification

Local Government: Gold Coast City Council

Nature of Appeal

Appeal against the decision of Thomas Independent Certification to issue an amended decision notice for a development permit for building work contrary to the recommendation of the QFRS as a referral advice agency that the application be refused on the basis that Special Fire Services forming part of the building work does not comply with the *Standard Building Regulation 1993* and the Building Code of Australia (BCA).

Date and Place of Hearing: 9:00am. on Monday 14 February 2005 at Level 25 Mineral House, 41 George Street Brisbane.

Tribunal: David Kay - Tribunal Chairperson
Chris Odgers - Tribunal member

Present:
Keith Thomas – Thomas Independent Certification
Steven Spurr- Enterprise Fire
Andrew Telford
Tim Blinco – Enterprise Fire
Warwick Barnett
Brian Humphreys- QFRS
Lex Mildren-QFRS

Decision

The amended decision of Keith Thomas building certifier of Thomas Independent Certification dated 22 December 2004 to approve the building work including amended drawings SC 53 –EFS 01 and SC EFS 02 for a single fire main for the hydrant and sprinkler system including Conditions Of Approval in particular Condition 6.0 titled Queensland Fire and Rescue Service referring to the QFRS approval dated 27 February **is changed** and is to read as follows:-

6.0 QUEENSLAND FIRE AND RESCUE SERVICE.

All building work must comply with the following conditions:-

The fire hydrant main is to be a ring main as required by AS 2419.1-1994 (Amdt.1, Oct 1996) Clause 4.4.4.1(a) as the building requires full perimeter access for fire authority vehicles.

The hydraulic design of the system is to comply with AS 2419.1 Clause 4.2 for a hydrant system and also AS 2118.1 Clause 4.4.1(c) for a combined hydrant and sprinkler system which requires water flow velocity in the pipework to not exceed 4m/sec.

Note: The flow from a single main in the road reserve to a branch dividing to serve the sprinkler system and the hydrant system just inside the site is not considered to be limited to this velocity.

Compliance with Part E1.3(b)(vii) of the BCA requires the fire hydrant to be capable of being boosted from the fire hydrant booster cabinet by a fire brigade appliance to achieve a flow of 10 l/sec at 700kpa for the two most hydraulically disadvantaged hydrants without turning off the sprinkler system in order to satisfy the operational requirements of the QFRS.

The flow and pressure tests can be based on the flows currently available from the mains supply (subject to the qualifications of AS 2419.1 Clause 4.5.3.3 and AS 2118.1 Clause 4.3.2.2). Part I 1.1 Safety Measures of the BCA states that the safety measures are to perform to a standard not less than that they were originally required to achieve. Where the current level of supply can not be maintained by the local water supply authority the existing internal fire and sprinkler main system will be required to be upgraded at that time.

Fire Hydrant Installations:

- Certification indicating compliance of system installation and system performance with AS 2419.1 will be required upon completion of the project.
- Whilst the hydrant coverage complies with AS 2419.1, the circumstances could alter when building fit-out becomes apparent. A reassessment of the hydrant coverage may be required to be undertaken by QFRS to ascertain compliance of an extensive storage racking system within the building upon completion of the building fit out.

External Hydrants:

- Pillar hydrants to be protected by bollards where they are likely to be subject to physical damage such as vehicle impact or workmen.
- Hydrants to be painted red.
- Cabinet housing must be provided with signage in accordance with AS 2419.1.
- Landing valve outlets to face the floor to which they serve in a downward position of 35 degrees from horizontal.

- 100mm clearance is required around the valve wheel.
- Must not be obstructed by landscaping.
- Hydrants adjacent to the building they serve must be protected to comply with AS 2419.1 clause 4.3.1.5(a)(iv) and certification confirming protecting wall has an FRL of 90/90/90 is required, in particular the hydrant less than 10m from building 2.

Booster Assembly:

- The booster enclosure must comply with Figure 5.2 of AS 2419.1 and may be of masonry or other construction in lieu of a red cabinet, provided the lettering on the door is of a contrasting colour to that of the background, and -
- Lettering to be in compliance with AS 2419.1
- The enclosure must face the roadway or street.
- Be located adjacent to the principal vehicular access which is to have a hard pavement work surface.
- Block plan to AS 2419.1 must be engraved and mechanically fixed to the cabinet door.
- Test and working pressure signs to AS 2419.1 must be engraved and mechanically fixed to the cabinet.
- All isolating valves to be wheel or handle operated and secured in the open position (003 key lockwood type padlock).
- Stays to be provided on cabinet doors to secure doors in the fully open position whilst in use.
- Locking devices on cabinet doors to be keyed to 003 key.

Note: The fire hydrant boosting system will be tested using a fire appliance ensuring the hydrant system is hydraulically effective.

Sprinklers:

- The use of an Early Suppression Fast Response (ESFR) sprinkler system in this situation is considered an acceptable design solution subject to compliance with the relevant parts of the Australian Standards and the BCA.
- The Early Warning System (EWS) control panel is to be located in the office reception area as indicated in the W. Barnett report which is the preferred location.
- As the fire alarm is required to be monitored by QFRS, connection must be arranged with PPU in place prior to final inspection. Approval for QFRS monitoring will be confirmed upon completion of the QFRS complying inspection report.
- Sprinkler valve room/enclosure must comply with requirements of BCA Spec E1.5 Clause 6.
- Occupant warning system sounders to be audible throughout the building, certification indicating achievement to AS 2220 will be required at completion of project.
- Location diagram to be permanently engraved. Approval should be obtained from QFRS prior to the diagram being permanently etched.
- Tagging plates to identify the control valves.
- Stop valves controlling water supplies strapped and pad locked with 003 key.
- A fire brigade booster connection located within sprinkler valve assembly is required.
- Certification of system installation compliance to AS 2118.1 and BCA Part E1.5 is required after installation.

Background

Applicant's submission to the tribunal.

Brian Humphreys of QFRS made an oral presentation outlining the grounds for the appeal based on the written submission detailed in the list of material considered by the tribunal.

Key points raised included the following:-

The combined hydrant and ESFR sprinkler system has a high demand and it will not be possible for QFRS to boost the combined system in the event of fire. The flow and pressures required for boosting exceeds the capacity of 3 fire brigade appliances. The system will not meet fire brigade operational requirements.

The combined system does not comply and QFRS believe that AS2118.1 and AS2118.6 plus AS2419 apply to the building work relating to this approval.

The flows in the main would be 6m/sec and exceed 4m/sec required by AS 2118.1 cl 4.4.1(c).

The fire main is not configured as a ring main system.

The QFRS does not accept the suggestion that the ESFR sprinkler system will be so effective in controlling a fire that fire fighting operations on the site will be limited and in the event of a major building fire the QFRS can isolate the sprinkler system to achieve the required fire hydrants flows and pressures for fire fighting purposes.

The booster assembly arrangements serving both systems is impractical and non compliant and the location of the sprinkler valve enclosure and booster assembly does not meet QFRS operational requirements. The hydrant serving building 2 may not have the required level of fire protection and the ability of emergency services vehicle to travel around the perimeter of the building may be restricted.

The ESFR sprinklers should be installed only if they are suitable for the type of application proposed and it is demonstrated that the sprinkler system is designed to accommodate their use. The certification provided lacks clarity on achievement of technical compliance.

The system in the future may not comply with flows and pressure requirements of the design due to change in the water supply network demand.

The system as installed does not comply.

Appeal by QFRS to the Certifiers decision is on the basis that the fire fighting systems installed will place intervening firefighters in a dangerous situation regarding in that sprinkler action will affect the flows and pressures of the fire hydrant system and that the booster assembly is impractical and non compliant.

There is no fire hydrant ring main provided.

Thomas Independent Certification submission to the tribunal.

Keith Thomas of Thomas Independent Certification made an oral presentation outlining the grounds for the appeal based on the written submission detailed in the list of material considered by the Tribunal.

The building work is not required to comply with AS 2118.6 as this standard applies only to installations in multi storey buildings.

The use of an ESFR sprinkler system in this building is an appropriate design and satisfies the requirements of AS 2118.1 for a special sprinkler system.

AS 2118.1 Clause 4.4.1 (a) allows the water supply system for the fire hydrants and sprinkler system to be a combined supply system subject to certain conditions.

The flows in the council mains show flows of 90l/s @ 800 kpa are available.

Certification of the system for compliance has been provided from W. Barnett for a combined flow of 6640l/m @ 400kpa, the flow velocity does not exceed 4m/s and the tested pressure of 400 kpa exceeds the required pressure of 380 kpa.

The reference documents provide statistics that support the philosophy that the fires are so well under control that they will not have to boost the sprinkler system and fight the fire with hydrants in the sprinkler protected area at the same time where an ESFR sprinkler suppression system is provided.

The fire brigade personnel can access the hydrants on site and obtain the fire fighting flows from these hydrants to feed their appliances and boost from these locations.

The fire brigade personnel can turn off the sprinkler valve and isolate the sprinkler system pipework to boost the fire hydrant main system.

The location and arrangement of booster connections and enclosures complies with Australian Standards and the suitability of connections should be to the Australian Standards and not left to the opinion of one fire safety officer.

Further responses from parties attending the hearing

Warwick Barnett advised that the system is in reality a system with a combined inlet pipe but not a combined system reticulated throughout the site.

Material Considered

- Amended decision dated 22 December 2004 issued by Keith Thomas of Thomas Independent Certification.
- Material submitted by applicant with the appeal notice to the Tribunal.
- Material submitted by applicant at Tribunal hearing.
- Material submitted by Thomas Independent Certification at Tribunal hearing
- *Integrated Planning Act 1997.*
- *Building Act 1975 and Standard Building Regulation 1993.*
- Building Code of Australia 1996 –Volume1 Amendment 13
- AS 2118-1999 Automatic Fire Sprinklers Part 1: General requirements
- AS 2118-1999 Automatic Fire Sprinklers Part 6: Combined Sprinkler and hydrant
- AS 2419-1994 Fire Hydrant installations Part1: System design, installation and commissioning

Findings of Fact

- Correspondence from Thomas Independent Certification to QFRS dated 3 February 2004 confirms that the fire compartment and building volume is 37800 m³ and floor area of 4438 m². The building is of Type C construction and is provided with sprinkler protection and 6m perimeter emergency vehicle access to comply with Part C2.3 (a) (ii) of the BCA.

- An amended development approval for building work for a building having a multiple classification of 5, 7b and 8 comprising 2 storeys above ground level was approved with conditions by Thomas Independent Certification on 22 December 2004.
- The building is protected by a fire hydrant system and a fire sprinkler system.
- The fire main system servicing the building can be a combined system.
- The appeal to a Building and Development Tribunal was lodged within the required time.
- The building is a large isolated building and requires a fire hydrant ring main.
- Part E1.5 of the BCA has a requirement for the installation of sprinklers in the building and these are to comply with Specification E1.5 of the BCA.
- The Queensland Fire and Rescue Service is a referral advice agency.

Reasons for the Decision

It would appear the building was first assessed as Type A construction (*not a large isolated building*) based on advice given at the hearing and an examination of the documents provided. An amended application changed the building to a large isolated building of Type C construction.

Under Part C2.3 of the BCA the building has a fire compartment exceeding the floor area or volume limitations of Table C2.3 and is required to be treated as a large isolated building. The building is provided with a 6.0m emergency vehicle access path around the perimeter and a sprinkler system.

Under Part E1.5 and Table E1.5 of the BCA for a building where the occupancy comprises a use or storage which is an excessive fire hazard – a sprinkler system is required.

AS 2118.6 “Automatic Fire Sprinkler Systems - Combined Sprinkler and Hydrant” is considered to not be applicable in this case as it is applicable to multi-storey buildings where “fully” combined systems are proposed. In any case AS 2118 Part 6 also refers back to AS 2118 Part 1 for combined hydrant and sprinkler systems.

Under AS 2118.1 “Automatic fire sprinkler systems” Section 4.4.1 water supply for both automatic sprinkler and fire hydrant services may be combined subject to-

- (a) Sufficient water supply capacity for both systems.
- (b) The employment of ring mains incorporating isolating valves complying with AS 2419.1 where external fire hydrants may be subject damage -where ring mains are not employed an isolating valve shall be installed at the point of connection of any branch serving more than one hydrant..
- (c) Piping shall be sized on the basis of the aggregate flow at any point in the system with velocity not exceeding 4m/s.
- (d) refers to water storage and is not applicable in this case.
- (e) refers to pumps and is not applicable in this case.
- (f) the pressure limitations applicable for both the sprinkler and hydrant system shall be complied with.

The system has sufficient water supply capacity of 6640l/min at 400 kpa based on the evidence of W. Barnett and from test data provided by Enterprise Fire Protection dated September 2004.

.Based on the details provided the system branches to a sprinkler main and a fire hydrant main and flows and pressures to the fire hydrant main can be provided by turning off the isolating valve to the sprinkler main. It is considered that the feed pipe from the water main in the road to the hydrant/sprinkler branch at the front boundary is part of the supply main and not subject to this flow velocity limitation.

However if the sprinkler feed pipe diameter is 150mm. as specified then the maximum flow capacity for a flow of 4m/sec would be approximately 70l/sec or 4200l/min. With a demand of 6640 l/sec it would appear flow velocity in the pipework would exceed 4m/sec. Flows in the pipework for a combined system shall be limited to 4m/sec.

Under Part E1.4 of the BCA a fire hydrant system complying with AS 2419.1 is required. Part 4.4.4.1 requires a ring main to be provided where full perimeter vehicular access for fire authority appliances is a condition of protection. This over rides the option under AS 2118.1 Clause 4.4.1(b) for isolating valves to hydrants where a ring main is not provided. The fire hydrant system requires a ring main.

Under Part E1.3 (vii) of the BCA the fire hydrant system must be designed to meet the operational requirements of the fire brigade for operating flows and pressures. The demand for the fire sprinkler system can affect the pressure limitations of the fire hydrant system through the single 150mm pipe connection to the town main and it has not been demonstrated that a boost pressure of 700 kpa in the fire hydrant main can be obtained while the sprinkler system is operating..

The advice of the Queensland Fire Services representatives that QFRS would not be able to adequately boost the system with their current operational equipment from the booster points located at the front of the site due to the high volume of water demand from the combined sprinkler and hydrant is accepted.

The procedure of the QFRS to locate an appliance at booster cabinets to boost the system and not isolate the sprinkler system until the source of the fire is identified is considered to be a criteria for the design to meet the operational requirements of the fire brigade under Part E1.3 (b)(vii) of the BCA.

The option proposed by the consultants for the building owner for the QFRS to locate a fire brigade appliance at an external hydrant within the site and boost the fire fighting hoses from this appliance instead of boosting the complete fire main can not be accepted as suitable for fire brigade operational purposes.

The system in its current arrangement will not meet the operational requirement of the fire brigade (QFRS).

The capacity of the council mains to supply the system has been verified by the tests carried out by Enterprise Fire Services. If in future the flows and pressures agreed to be provided to the site by the water supply authority or the actual supply to the site are affected by variation in the town supply system the maintenance requirements of the Building Code of Australia and the *Fire and Rescue Act 1990* require the owner to maintain the system to its design standard and would allow the QFRS to require the owner of the building to upgrade the system at that time.

David Kay
Chairperson
Building and Development Tribunal
Date: 2 May 2005

Appeal Rights

Section 4.1.37. of the Integrated Planning Act 1997 provides that a party to a proceeding decided by a Tribunal may appeal to the Planning and Environment Court against the Tribunal's decision, but only on the ground:

- (a) of error or mistake in law on the part of the Tribunal or
- (b) that the Tribunal had no jurisdiction to make the decision or exceeded its jurisdiction in making the decision.

The appeal must be started within 20 business days after the day notice of the Tribunal's decision is given to the party.

Enquiries

All correspondence should be addressed to:

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