

**NATIONAL BUILDING REGULATIONS & BUILDING STANDARDS ACT**

**REVIEW BOARD<sup>1</sup>**

**Held at the Offices of the National Regulator for Compulsory Specification**

**Situated at Willow Park Units 25 & 26**

**Willow Road Business Park**

**Willow Road**

**Fairview**

**On Monday, 12 December 2016**

---

**LKJ FIRE ENGINEERING CONSULTANT**

**APPELLANT**

(REPRESENTED BY MR. JAMES FOOT)

And

**NELSON MANDELA BAY MUNICIPALITY**

**RESPONDENT**

(REPRESENTED BY MR. HENDRIK MCLEOD)

**REVIEW BOARD: N. NDONGA (Chairperson), A. GREIG (BOARD member), I. NKOANE (BOARD member)**

---

**RULING**

---

**1. PARTIES:**

1.1 Appellant is LJK Fire Engineering consultant acting on behalf of its client. The appeal relates to the PE cold storage premises located at the Corner of Alcyon, Bridgewater Streets, Coega, Port Elizabeth Eastern Cape, Lease 1 of erf 233, Coega (hereinafter referred to as the "premises").

1.2 Respondent is the Nelson Mandela Bay Municipality, the local authority responsible for the jurisdiction within which the premises is situated and with which the legislative oversight responsibility to approve or refuse the erection of buildings resides with in terms of section 4 of the National Buildings Regulations and Building Standards Act<sup>2</sup> (hereinafter referred to as 'the Act')

---

<sup>1</sup>section 9 of the Act

<sup>2</sup> 103 of 1977

## 2. INTRODUCTION

- 2.1 As background, following an application for approval of building plans submitted by the appellant, on or about 11 March 2008, the respondent approved building plans for the erection of additions to an existing building. The building construction was to be carried out in phases. According to the appellant, after the completion of Phase 1, the respondent issued occupancy certificate<sup>3</sup> relating to that part of the building, this is despite sprinklers not having been installed which in its view was confirmation that it had complied with the approved plans as it relates to this phase at least.
- 2.2 Despite the aforesaid averment, the appellant however hastened to acknowledge that there had been subsequent deviations to the approved plans when Phase 2 construction commenced. The deviations were however justified by the appellant as being necessary and same having been duly communicated to the respondent.
- 2.3 Notwithstanding this, the appellant submits that the respondent nevertheless refused to approve the revised plans incorporating the deviations. This is despite a rational design having submitted by a professional engineer on behalf of the appellant. The appellant has in addition to this advised the Board that its original intent was to submit the drawings for the extensions as a “J3 – Low risk” occupancy classification. However due to the respondent having informed the appellant that such a submission would be refused, the drawings were then submitted as a “J2 - Moderate occupancy” classification to accommodate the requirements of the Respondent and to facilitate ground breaking for the extension project. This however has been indicated by the appellant to be in no

---

<sup>3</sup> Certificate of occupancy dated 05/11/2009 for Building plan No.265452 in respect of Erf233

way an admission and/or concession that the respondent's view regarding classification of the building and/or interpretation of the applicable rules and/or law is correct.

2.4 The appellant therefore disputes the interpretation of the relevant rule and/or law and has lodged this appeal in terms of section 9(1)(c)<sup>4</sup> of the Act.

2.5 The primary motive behind this appeal is to obtain the Board's interpretation of the issue in dispute, thereby setting judicial precedence for the industry going forth.

2.6 Consequently the appellant has requested the Review Board to provide a ruling relating to an "assessment" of the fire hazard classification of the premises by the Respondent. The appellant prays that the Board should find that the respondent erred in its interpretation of the law and/or rules relevant to the issue in dispute. Alternatively failed to apply itself to the substance of the rational assessment which in its view fully demonstrates compliance to the National Regulation 10400 Part T1, (a) to (e) read with section B5, (g) of the Annexure to Part A to SANS 10400. As such the Board should uphold its appeal on these terms or on terms it deems appropriate under the circumstances.

### 3 POINT IN LIMINE

None

---

<sup>4</sup> "Any person who disputes the interpretation or application by a local authority of any national building regulation or any other building regulation or by-law, may within the period, in the manner and upon payment of fees prescribed by the regulation, appeal to a review board"

#### 4 RECORD OF PROCEEDINGS

- 4.1 The appellant has *inter alia* provided the Board with documents (record of proceedings), paginated bundle, pages 1 to 80.
- 4.2 Supplementary documents were submitted at the hearing including the plans relevant to the hearing.
- 4.3 At the behest of the Board, the parties were requested to provide further photographic evidence and/or video recording subsequent to the hearing however prior to the ruling being issued.

#### 5 SUBMISSIONS BY PARTIES

- 5.1 As its first witness, the Appellant called Mr Louis Kruger, a fire engineering consultant in private practice.
- 5.2 According to Mr Kruger and in his professional expert opinion, the building in question is a J3 – D3 classification and as such does not require sprinklers. Based on this view, he prepared a rational design.
- 5.3 Mr Kruger acknowledged though that he had initially (i.e. in 2015) only submitted a draft rational design to the respondent with no drawing plans accompanying such design. The drawing plans according to his version of events were however later submitted.
- 5.4 Under cross examination, the respondent disputes Mr Kruger's version and categorically states that it has never seen the drawings which Mr Kruger alleges

were submitted with the rational design, nor could Mr Kruger provide proof of such submission to the respondent at the hearing.

- 5.5 For a building which is 22 000 square metres, the respondent states that no proof has been provided that the panels used during construction had been tested. It is further unclear whether fire would be retained within the cold room
- 5.6 A further issue raised by the respondent was that of Mr Kruger's qualification as a registered professional as required in terms of SANS 10400-T<sup>5</sup>. Under re-examination, Mr Kruger conceded that he is not a registered professional as required of a person drawing up rational designs. In response to the point, the appellant however argued that the objection based on his lack of registration was never raised as an issue in the past by the respondent.
- 5.7 The appellant then called its second witness, Mr John Colborne to *inter alia* testify as to the facts surrounding his peer review of the Rational Assessment produced by Louis Kruger and his opinion as to the content thereof.
- 5.8 At the centre of Colborne's testimony was that the respondent's letter dated 29 August 2016 does not provide technical reasons which would form the basis for the refusal. The appellant argues that no technical reports or expert evidence has been provided to justify the interpretation adopted by the respondent in dealing with its application. To merely refuse the rational design without any technical and/or expert evidence is not sufficient technical basis in the eyes of the appellant. This is supported by reference to section B5 of SANS 10400<sup>6</sup> which provides:

---

<sup>5</sup>SANS 10400 – T: 2011, Edition 3, “Competent person (fire engineering) is a person who a) is registered in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000), as either a Professional Engineering Technologist, and b) is generally recognised as having the necessary experience and training to undertake rational assessments or rational designs in the field of fire engineering”.

<sup>6</sup>(g) of the Annexure to Part A of SANS 10400 – A:2010 , Ed 3, pg. 53

*"(g) Where an application is not approved, section 7 of the Act makes it clear that reasons for such rejection should be given to the application in writing. In the case of the application not being approved due to non-compliance with the functional regulations, it is important to note that such reason would have to be good technical reasons why the proposed building would not comply with the Regulations, and these should be provided in sufficient detail to enable the designer to amend his design accordingly."*

5.9 What is however not specified which would be unreasonable for either the parties or the Board to expect the legislator to do is to define what constitutes "good technical reasons". It can therefore only be inferred and accepted that each case would have to be considered based on its merits including what constitutes "good technical reasons".

5.10 The respondent's view is that the appellant and the Board have to consider the impact of any risk materialising post the approval of any building (including the building in question) application where no sufficient information has been provided to the satisfaction of the respondent. The respondent states that in order for it to contemplate approval, the appellant has to demonstrate compliance to SANS 10400 part T<sup>7</sup> as more detailed in its aforementioned letter dated 29 August 2016.

## 6 REASON FOR THE DECISION

6.1 In considering this matter, it is the understanding of this Board that the Appellant has requested the Review Board to provide a ruling as referred to in clause 2.6 above relating to an "assessment" of the fire hazard classification of the PE Cold Storage facility<sup>8</sup>. However prior to dealing with this critical aspect, it is prudent in our view as the Board that we deal with a few aspects which have been raised during the hearing.

6.2 Firstly, the Board wishes to briefly deal with the issue of Mr Kruger who has himself acknowledged that he is not a registered professional as required in terms of SANS 10400 for a person drawing up rational designs and/or assessments. While this

---

<sup>7</sup> Pg 43;47 3<sup>rd</sup> edition of 2011

<sup>8</sup> Corner of Alcyon, Bridgewater Streets, Coega, Port Elizabeth Eastern Cape, Lease 1 of erf 233, Coega

may in the ordinary course of any proceedings be a material procedural point on which the appeal could be dismissed on it alone. In this case we however find that the manner in which it has been raised by the respondent clearly suggests that it is an after-thought on its part. We therefore cannot find that it is a genuine basis to disregard his assessment purely on that basis alone. In all the engagements between the respondent and Mr Kruger and/or the appellant which the Board has been made aware of or documentation made available to the Board, what would appear to be such a critical issue does not appear to have been such until now. We therefore cannot take the point raised by the respondent any further than that nor will this point persuade the Board's view in any material manner.

6.3 On the point raised regarding the insufficient technical reasons provided by the respondent. While the Board fully agrees with the appellant and in particular section B5 of SANS 10400<sup>9</sup> as captured in paragraph 5.9 above, read with section 5 of the Promotion of Administrative Justice Act<sup>10</sup>, one can however equally not dispute relative nature which will inform the assessment on whether sufficient reasons were provided or not. In our view, it nevertheless remains that reasons were provided. A view that reasons are not technical to the degree provided by the respondent remains a subjective assessment.

6.4 We now deal with what we regard as the main issue in dispute, SANS 10400-T<sup>11</sup>, defines a "rational assessment" as an "*assessment by a competent person of the adequacy of the performance of a solution in relation to requirements...*" If one is to consider the aforesaid definition in the context of this case including the representations made by the parties to this appeal, it is reasonable to deduce that no

---

<sup>9</sup>(g) of the Annexure to Part A of SANS 10400 – A:2010 , Ed 3, pg. 53

<sup>10</sup>Act 3 of 2000

<sup>11</sup> SANS 10400-T:2011 Edition 3, pg.14

"solution" was submitted in the form of a proposed fire protection scheme comprising drawing(s) or a supporting rational design document. There is thus no rational design fire protection scheme for the Board to determine the adequacy thereof with regard to the requirements of functional Regulation T1.

6.5 The submissions made at the hearing have rather focused on the nature of goods transshipped in the cold storage facility, with the contention that such goods only present a low fire risk. The appellant has acknowledged that no automatic sprinklers have been installed at this point after the review by its appointed competent person revealed that these are not required based on the contention that the facility is a "low risk storage".

6.6 It would seem that the Board is thus required to rule on the Appellant's interpretation of Regulation A20 regarding the classification and designation of the appropriate occupancy class. That being the case, the Board has makes the following observations:

#### The Occupancy

6.7 The facility can be described as a transshipment facility, as packaged agricultural goods (reportedly mostly fruit pre-packed in cardboard boxes) are delivered to the cold-storage facility, for export shipping purposes. These goods are stored in cold rooms for a relatively short period, and then removed and transported for loading into ships on their arrival at the nearby harbour.

6.8 This process of temporary holding of goods inside a purposely-built structure is clearly a storage process. In terms of Table 1 of Regulation A2, the Occupancy is thus "storage".



Class of Occupancy

6.9 Table 1 divides the storage occupancy into three classes; namely "high-risk storage", "moderate risk storage" and "low risk storage". It defines "moderate risk storage" as an "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."

6.10 It defines low risk storage as an "occupancy where material does not fall into the high or moderate risk category".

6.11 There are no further definitions in the Regulations to assist in understanding the meaning of "moderate rapidity," "poisonous fumes" or "explosions", and so the meaning of these should be considered in terms of good fire engineering practice.

Rapidity of combustion

6.12 This relates to the nature of the materials involved in a fire, and the configuration of these materials. The goods transshipped in the cold store are mostly fruit and vegetables (which are mostly non-combustible), but packaged in cardboard cartons, and in some cases with internal packaging that can be polystyrene separators or shredded wood (wool). These cartons are stacked on top of a timber pallet, and a number of these pallet packs are stacked on top of each other. (reference in this regard is made to the photos received). The packaging material is combustible, as are the pallets, and so is the separating material within the boxes. The configuration of these combustible materials is a stacked commodity in fire engineering terms, which facilitates burning of the cartons, pallets and fire spread between the pallet packs. Although the combustible mass per floor area (kg / m<sup>2</sup>) is low, the stacking arrangement in terms of height and air ingress paths around the stacked goods

increases fire spread rates in comparison with non-stacked goods.

6.13 There are therefore a number of methods to quantify rapidity of combustion; (a) estimates of heat release rate by calculation using heat of combustion of the fuel packages and the mass rate of loss when burning, (b) estimates of heat release rates using references for suggested rates / unit area, (c) using fire growth characteristic curves, (d) calculations from first principles, and (e) results from experiments. However, none of these methods can directly be related back to the Regulation A Table 1 definitions of growth rates. By way of an example, one test fire reference reports a vertical flame spread height of 1.5m in a cardboard box array of between 60 seconds and 130 seconds, depending on the gap spacing between panels. Some fire personnel would consider this to be a moderate growth rate, while others would perhaps hold a different opinion.

6.14 It should therefore be understood, as the considered view of this Board that the packaging materials are combustible, and that combustion (fire) will occur once flaming ignition of sufficient energy has occurred, irrespective of the room temperature. The only effect that room temperature may have is to slow the propagation rate, depending on the moisture content of the fuel. In this regard, stacked palletised commodities, (to about 6m as is the potential in such storerooms) would normally be classified as a high hazard storage risk for purposes of fire suppression design, whereas the effect of the cold room moisture could (questionably) reduce this high hazard to an ordinary or moderate hazard, but certainly not to a light hazard in protection design in our view.

#### Poisonous fumes

6.15 As it relates to poisonous fumes, the effluent from all fires is toxic, containing gases such as carbon monoxide, hydrogen cyanide, phosgene and inorganic acids. The chemical composition of the stacking & packaging materials will most certainly give rise to poisonous fumes once involved in a well-established fire. These fumes will increase

in toxicity arising from burning of the cold room insulating materials (polystyrene) containing fire retardant chemicals, which are toxic when released in combustion, and additional poisonous fumes will be released on rupture of chiller pipes containing ammonia. It should be noted that most fire deaths and injuries are not caused by burns, but by smoke inhalation, which contains these toxic chemical compounds. The Table 1 occupancy classification risk must thus take into consideration the volume of poisonous fumes that may be emitted in a fire.

### Explosions

6.16 Explosions can occur when a smouldering fire fills a closed space with smoke, and which smoke can suddenly ignite when the space is ventilated, for example by the opening of a door or breaching of a wall. The resulting explosion is known as a 'backdraft' or 'smoke explosion' and is extremely hazardous to persons in the vicinity. In this case, the cold rooms are well insulated and normally closed (not ventilated), so conditions are conducive for a smouldering fire to develop, building up heat within the enclosure and filling it with hot smoke, which could ignite and result in a smoke explosion on the opening of the cold room door or collapse of panels.

6.17 Considering the potential for some degree of rapidity of combustion, and giving rise to poisonous fumes and explosions, the risk of these phenomena occurring in this cold room storage facility cannot be negligible. If one is then to follow this reasoning, the interpretation of the Board is that the storage risk would thus be a moderate risk.

6.18 Assessment of the risk category can also be considered in the context of the classic definition of risk; namely the combination of probability and consequence. The Board could for an example, consider three fire sizes scenarios; small, medium and large. A small fire being a fire involving only one package of pallet stacks, a medium fire being one that spreads between adjacent pallet stacks and then spreading

between rows and growing to involve much of the product stored within a particular cold room, and a large fire spreading from the cold room of fire origin into adjacent cold rooms. The probability of any of the above fires on all three scenarios cannot be rejected, given that there is no automatic fire suppression proposed by the Appellant and hence no defined constraint to the spread of fire inside a cold room, nor any constraint against breach of the combustible cold room walls.

6.19 The consequence of the small fire could be a manageable release of poisonous fumes contained within a cold room with no risk of a smoke explosion - thus low risk storage.

6.20 The consequences of the medium fire would be the release of substantial quantities of poisonous fumes, and the risk of a smoke explosion - presenting a life safety hazard inside the cold room even for trained firefighters from a professional fire brigade. This scenario could credibly be considered at least a moderate risk.

6.21 The consequences of the large fire would be the release of substantial quantities of poisonous fumes, including ammonia, and the risk of an explosion involving ammonia - presenting a very serious life safety hazard inside and around the building area as a whole; for staff, the public and for trained firefighters from a professional fire brigade. This scenario could credibly be considered a high risk.

6.22 It is pursuant to the above reasoning and application that on the basis of this risk assessment discussion, the PE Cold-room would be considered at least a moderate risk storage, i.e. a J2 occupancy, particularly given the absence of guaranteed rapidly responding fire extinguishing (such as automatic sprinklers).

**7. DECISION:**

**The decision of the Review Board is therefore that:**

- 7.1 The fire hazard classification of the PE Cold Storage facility (premises) is a J2 Moderate Risk, and the appeal is therefore dismissed.

Signed on behalf of the Review Board this ~~22~~ day of *February*.....in the year 2017



**NTANDO NDONGA**

CHAIRMAN: REVIEW BOARD