National Headquarters
Level 12
80 The Terrace
PO Box 2133
Wellington
New Zealand
s 9(2)(a)

10/09/2018

Ginny Carter
Administrator, Determinations
Ministry of Business, Innovation and Employment
PO Box 1473
WELLINGTON 6140

By email: determinations@mbie.govt.nz

Copies to:

Malcolm Gray
Forbes and Davies Limited
s 9(2)(a)

By email: Malc@ForbesandDavies.co.nz

The Building Manager
Selwyn District Council
PO Box 90
ROLLESTON 7643

By email: bca@selwyn.govt.nz

Dear Ginny

Draft determination 3023
Regarding the compliance of a warehouse fitout, comprising storage racking and a mezzanine floor, with the fire safety requirements of the building code at 49 Stoneleigh Drive, Rolleston

Thank you for providing Fire and Emergency New Zealand (**Fire and Emergency**) with the opportunity to review and comment on draft determination 3023.

Fire and Emergency accepts the draft determination. A copy of the formal response form is *attached* accordingly. I note that the current heading to the draft determination refers to the site address as '49 Rolleston Drive', which appears to be a typographic error.

Please contact me if you require any further information from Fire and Emergency in relation to this matter. I can be reached on 04 462 4947 or ashley.cornor@fireandemergency.nz.

Yours sincerely,

Ashley Cornor
Senior Counsel

File ref: **3023**

23 August 2018

Administrator, Determinations
Ministry of Business, Innovation and Employment
P.O. Box 1473
Wellington 6140

Draft determination for 49 Stoneleigh Drive, Izone, Rolleston

Please select one of the following options (tick the appropriate box ☑) before signing and returning this form. **If you select option b, c, or d** you must also complete the check list below.

☑ (a) The draft determination, dated 23 August 2018, is accepted and I have sent a copy of my response to the other parties.

☐ (b) The draft determination, dated 23 August 2018, is accepted subject to the attached non-contentious amendments and I have sent a copy of my amendments to the other parties.

☐ (c) The draft determination, dated 23 August 2018, is not accepted. I request that the determination acknowledge and take account the attached comments and I have sent a copy of my comments to the other parties.

☐ (d) The draft determination, dated 23 August 2018, is not accepted. I request a hearing to speak and call evidence and I have sent a copy of my response to the other parties.

Check list for options b, c, or d:

☐ (i) My submission setting out the changes I request and/or my reasons for not accepting the draft and/or requesting a hearing is **attached**. OR

☐ (ii) My submission setting out the changes I request and/or my reasons for not accepting the draft and/or requesting a hearing will be sent to the Ministry and the other parties.

Please return this form by 7 September 2018

Signed: ..... Date: 10/09/18.

(Please print name here: ASHLEY CONNOR)

For and on behalf of: FIRE AND EMERGENCY NZ.

Stephen Lambert
NZFS Engineering Unit
National Headquarters
PO Box 2133
Wellington 6140
New Zealand

stephen.lambert@fire.org.nz

s 9(2)(a)

Carol Caldwell

Enlightened Solutions

PO Box 8709

Christchurch 8440

19 May 2017

Dear Carol,

Re: New Platform in Existing Warehouse, 49 Stoneleigh Drive, Rolleston (NZFS Reference: 9571 - Rev 03)

Thank you for the additional information concerning the above project. The NZFS understands that the project involves the construction of a new storage platform (33.5m by 13.5m at a height of 2.4m in an existing building of area 958m^2: this represents 50.2% of the warehouse area and 47.2% of the total building's footprint. The platform is to be access via two stairways.

The occupant load is proposed to be 20 in the warehouse/office areas and an additional 1 person in the sleeping firecell.

A Type 4 (automatic smoke detection) system is proposed for the bulk of the building with Type 5 coverage in the sleeping firecell.

The NZFS understands that the platform is a recently-constructed but unconsented feature. The BCA has indicated that the building's owner has approached the Council for retrospective consent and has taken interim measures to mitigate life risk in the building. The BCA has provide information concerning the project and is content with the progress of the project.

The NZFS notes that local Fire Risk Management involvement has been sought and advice obtained. The comments in this memo take into account that advice.

In the context of the indicated application for a Certificate of Acceptance, the NZFS understands that the 'as nearly as reasonably practicable' (ANARP) avenue is not available to the applicant.

The FEB neither states the height of the building nor indicates the storage height in the 450m^2 outside the perimeter of the intermediate floor.

The FEB report proposes to use a fully performance-based design approach to demonstrate that the fire design for the building will meet the performance requirements of the NZ Building Code. This letter outlines the NZFS position as a stakeholder in the building design process.

Referenced Information

Item	Title	Date	Revision
162030	Email from Carol Caldwell with attached minutes concerning site meeting held on 01 May 2017	09 May 2017	n/a
9571	NZFS's response to additional information	29 Nov 2016	02
162030	FEB – New Platform in Existing Warehouse at 49 Stoneleigh Drive, Rolleston	8 Nov 2016	1
162030	Meme from Apeksha Shah to Stephen Lambert providing additional information	08 Nov 2016	n/a
9571	NZFS's response to FEB	31 Oct 2016	01
162030	FEB – New Platform in Existing Warehouse at 49 Stoneleigh Drive, Rolleston	10 Oct 2016	0

As discussed, the NZFS has reviewed the FEB documentation identified above and offers the following comments.

The following items are considered to relate to compliance with the requirements of the Building Code:

With reference to the NZFS's previous letter concerning the project (Response 02, dated 29 Nov 2016), the Service considers that the issues indicated in items 1 to 4 of that letter have been addressed at the site meeting and, therefore, are not addressed further in this letter

5. Period of Structural Adequacy Calculations - The NZFS has reviewed the calculations provided for the period of structural adequacy (PSA) for the unprotected steel supporting the intermediate floor, and offers the following comments:

    a. The PSA calculations have employed the limiting temperature correlation and have assumed equivalent standard fire exposure for reaching this limiting temperature. The NZFS notes the following:

        i. The loading schematic does not appear to reflect the photographs taken on site, and the number of storage levels contributing to the axial load on the columns. Of particular note are the stated sizes of the columns compared to the exposed perimeter. Also it is not clear the perforations in the columns have been fully accounted for in the calculations. In addition, on-site observation indicated that some columns were note of a closed section. These details would benefit from the provision of further information

        ii. The beams supporting the floor have not been assessed for their period of structural adequacy. Given the relatively long span and potentially more critical three-sided exposure, the NZFS considers that the failure of beams should be assessed.

        iii. The limiting temperature calculated (887°C) is higher than the upper bound of 850°C specified in Section 11.6 of NZS 3404. This alone would reduce the PSA to approximately 19 minutes.

b. In addition, calculations have been performed in a spreadsheet and calculations to support some individual inputs are not supplied. Areas of uncertainty include, but are not limited to:

i. Derivation of the tributary area including the intermediate floor
ii. The derivation of buckling stresses and critical stresses.
iii. Use of the calculated effective widths in later calculations.
iv. The calculation of the weight of the wood floor assembly.
v. Information relating to the 400 kg storage load per level.
vi. Assumptions relating to the mechanical properties of steel.

Given the issues and perceived lack of clarity concerning the issues above, the NZFS is unable to place confidence in the proposed calculations.

6. Operational Response – Given that the intermediate floor is intended to support an imposed load above floor level, the NZFS considers this to be a "structural system".

Clause C5.6 of the Building Code indicates that the purpose of the fire protection of intermediate floors and their means of access to is to allow firefighters to reach the scene of a fire (whether on or beneath and intermediate floor) to conduct fire-fighting and search operations and, if necessary, to withdraw to a place beyond the extent of the intermediate floor prior to the floor's structure support and access being compromised by fire.

The proposal suggests that no applied fire protection is required because the structure inherently provides 20 minutes' fire resistance. The NZFS observes that this implies that the structure will be directly affected from the onset of the fire and, therefore, that the period of fire resistance is taken to be the time between ignition and the period when the intermediate floor is subject to structural failure.

As indicated in previous letters, the decision to enter a building to conduct firefighting or rescue operations is a decision made by the Incident Commander at the time of the fire. Clause C5.6 of the Code requires buildings to be designed and constructed with regard to the safety of firefighters and does not make this provision contingent on the probability of firefighters entering the building.

Clause C5.6 also makes the consideration of "the firefighters' personal protective equipment and standard training" a requirement of the design. The NZFS considers this to be relevant to the resources available and the attendance times of those resources. Fire Service training indicates that entry into the building would not be made until, at the very least, the crews of two appliances are available on site. The Service has made initial investigations of responses to incidents in the area: the initial results suggest a response time that would encompass approximately 90% of the incidents to be approximately 800 seconds from being alerted. It should be noted that this period is not the same as 800 seconds from ignition of the fire. The complete results will be made available to the stakeholders once they have been compiled and collated.

A further period is required to brief the crews and set up the safety system for the Breathing Apparatus wearers who are to enter the building. The advice of the NZFS's operational officer consulted on this issue was that "3-5 minutes" would be required for the BA crew to be formed and briefed and to reach the outer wall of the building. Taking the longer period, this gives a cumulative time of over 18 minutes.

The following factors must then be added to the response time:

a. The alarm system's detection period;
b. The notification time and/or time for the call to be made to the Fire Service;
c. The time for the Breathing Apparatus wearers to enter the building and locate the seat of the fire and/or search the intermediate floor.

This is likely to bring the total time to significantly greater than 20 minutes. The NZFS observes that both the Acceptable Solutions and C/VM2 require fire rating of intermediate floors of at least 30 minutes' duration.

To avoid unnecessary iterations of the FEB process the NZFS welcomes discussion on any of the above items, however the NZFS recommends that the FEB be revised to address the items identified above as well as any additional items identified by other stakeholders. The NZFS also observes that the issues may be more quickly addressed by an on-site meeting.

Our review of the information provided has focused on the performance-based design elements identified and is intended to provide guidance to reduce the consent risks associated with undertaking performance-based design. No assessment against the requirements of the acceptable solutions has been undertaken. Also please note that this advice does not imply a technical verification of the information provided.

If you have any queries or questions related to the above please do not hesitate to contact either of the signatories below

.

Sincerely,

Stephen Lambert & Jeremy Gall
Fire Engineering Unit

cc:	Jenny Lilley, Selwyn District Council	jenny.lilley@selwyn.govt.nz
	Jonathan Nyman, Fire Review Solutions	jonathan@firereview.co.nz
	Malcom Gray	malc@forbesanddavies.co.nz
	Mike Gaskin, NZFS	mike.gaskin@fire.org.nz
	Fire Engineering Unit, NZFS	engineers@fire.org.nz

Our Ref: 162030

6 April 2017

Selwyn District Council

P O Box 90

Rolleston 7643

Attn: Jenny Lilley

Dear Jenny,

RE: 49 Stoneleigh Drive, Rolleston - NZFS Reference: 9571 – Rev 02

Thank you for your email on 14 March requesting to address the NZFS second response comments on FEB of dated 29 November 2016.

We are very disappointed that NZFS has added new comments in second response than the first response comments of dated 31 Oct 2016. It is a huge time delay and expense to our client and it has caused frustration to him about the NZFS FEB response system.

We already discussed the proposed approach to BCA, BCA peer reviewer and NZFS operation officer beforehand. The alternative solution is to demonstrate the means of escape from the existing platform under S 112 of the building code. The building is significantly upgraded with Type 4 system which will give early warning to occupants compare to existing Type 3 system.

We are expecting the BCA to take proactive approach and resolve the issues to help client.

Please find appended below our replies to the queries relating to …

1. *Use of C/VM2 – Your response is noted. Notwithstanding the BCA's reported agreement to the approach, the NZFS observes that, while the building may be consented, the over-sized intermediate floor is subject to a Certificate of Acceptance: as previously stated, this does not allow for any ANARP consideration.*

   Given that the approach taken is indicated to be an alternative solution, the selective use of C/VM2, is not considered to be appropriate given the context of the MBIE guidance that states, "The Verification Method C/VM2 method is a complete design system with interrelated inputs and design parameters that result in an acceptable level of risk," and, "Should a designer wish to vary the design inputs other than listed in C/VM2…..all design inputs must be justified" (MBIE "Verification Method C/VM2 interpretations" 2.6). The NZFS therefore considers that reliance on a partial application of the methodology may not result in a proposal that achieves the level of safety indicated by the compliance documents.

Please amend the documentation to either justify all inputs used in the proposal or comply in full with the requirements of C/VM2.

Reply: The provided alternative solution approach in FEB was discussed and agreed by Council, Council peer reviewer and NZFS operation engineer. The existing warehouse is recently consented so not worth to check the full compliance with the C/VM2.

2. *Argument regarding Size of Intermediate Floor – The argument concerning the size of the intermediate floor is not considered to address the intention of the provision. The NZFS observes that the 35m2 value allows for a limited balcony plume and therefore, a reasonable level of air entrainment: this may result in a small increase in the level of smoke production but not one that exceeds the safety margins implied by conservativism of the other factors.*

   The proposal involves the 450m2 platform, with none of the side located against a side wall. This results in a potential for over 88m of balcony edge around a fire beneath the intermediate floor. The result may be a very significant increase in the volume of smoke and a commensurately shorter time until the visibility criterion is breached.
   The FEB does not address the height of the warehouse; therefore, an assessment of the potential for smoke production against the available smoke volume cannot be made. In this respect, the NZFS notes that the FEB proposes ventilation to the under-floor area is limited to the aisles.

   This implies that there are walls surrounding the space beneath the intermediate floor and that these walls are effectively smoke separations. Unless this is the case, the potential for leakage and, therefore, smoke production may be greatly understated.

   Please demonstrate that the assumptions made with regard to ventilation of the fire and smoke production are justified.

Reply: We don't think that the limitation of the 35m^2 area in C/ASx is related to a limited balcony plume and air entrainment concern. The 35m^2 value was in the old Acceptable Solutions C/AS1. Certainly, the intent of the 35m^2 would need to be confirmed with MBIE.

In the FEB, the 35m2 approach from C/AS5 is used only for the equivalency for travel distance. The challenging fire is proposed to get the activation time of proposed smoke detector and egress time for occupants. The occupant load on the platform is very low in comparison of large volume of warehouse space. Therefore, the above comment #2 is considered to be irrelevant.

3. *RSET – The RSET is not proposed to be assessed against a calculated ASET; rather, it is compared to the travel distance requirements of the Acceptable Solutions. However, the equivalence of all other aspects of the Acceptable Solutions is not addressed.*

   While the NZFS acknowledges that an escape distance can be inferred from a calculated escape time, the distances cited in the Acceptable Solutions rely on a number of other aspects that contribute to the implicit level of safety: one of these is the size of the intermediate floor. The NZFS observes that the intermediate floor exceeds the area allowed for a Type 4 alarm system in the Acceptable Solutions. The NZFS therefore

considers this approach to be an incomplete assessment.

The NZFS observes that the uncertainty regarding the validity of the ASET/RSET relationship can be readily resolved by modelling the conditions.

Please revise the FEB to include consideration of the ASET/RSET relationship.

Reply: This is a new comment compared to previous FEB comments from NZFS. This comment is considered to be irrelevant to our proposed approach of FEB which is approved by BCA.

4. *Use of B-Risk for ASET Assessment – The NZFS observes that, unless the conditions indicated in Figure 1 of the FEB can be confirmed to be valid, there is potential for significant areas of overlapping smoke flows from beneath the intermediate floor. This will complicate the assessment of smoke production and, therefore, the assessment of the ASET.*

   If an ASET/RSET relationship is to be determined, please indicate how B-Risk will be configured to assess these interacting smoke plumes.

Reply: This is a new comment compared to previous FEB comments from NZFS. This comment is considered to be irrelevant to our proposed approach of FEB which is approved by BCA.

5. *Fire-rating of Intermediate Floor – The FEB seeks to argue that the intermediate floor is an existing feature and, therefore, can be assessed on an ANARP basis. The NZFS observes that the application for a Certificate of Acceptance does not allow for application of ANARP considerations. While the NZFS acknowledges that the BCA may nevertheless grant Consent, the Service is obliged to offer its comments on the proposal irrespective of any pre- determined agreement or limitations. In this case, the NZFS considers that the intermediate floor should be considered as new work.*

   Furthermore, the FEB notes the opinion of the Fire Risk Management Officer that all occupants would be able to evacuate the building and that internal fire-fighting operations would be unlikely to occur if there is no life risk.

   The NZFS observes that fire-fighting operations involve dynamic risk assessment and that, in the circumstances described, internal fire-fighting may not take place. However, that is a decision to be taken at the time of the incident. By not providing the protection required by the Building Code, the outcome of the dynamic risk assessment is effectively pre-determined and, therefore, if circumstances mean that occupants have not evacuated, fire-fighters may be placed at significant additional hazard that would have been addressed had the requirements of the Building Code been applied.

   The NZFS therefore considers that the argument regarding whether or not fire operations are conducted not to be relevant to the provisions required by the Building Code.

Please indicate how this issue is to be addressed.

Reply: We have addressed all the relevant clauses of firefighting operations in our revised FEB rev 1 and first response to NZFS. We don't agree with NZFS comments. The approach put forward in the FEB is in line with the support from Canterbury NZFS.

6. *Disapplication of 'C' Clauses – Section 10 of the FEB includes several comments stating that, "This clause is not applicable for this building under S.112".*

   The NZFS observes that new works must comply in full with the Building code and that existing conditions should not be worsened by the new works. By seeking to disregard several aspects of the Clauses without analysis, the FEB proposes that the Consent stage documentation will not demonstrate non-worsening. The NZFS considers that this is not appropriate given the conditions within the building have been changed by the un-Consented addition of a non-compliant intermediate floor.

   Please indicate whether the non-worsening of existed conditions is proposed to be demonstrated.

Reply: The provided FEB adequately addresses the fire requirements and there is no 'worsening' of the existing fire features in the building. There is in fact an improvement as the existing Type 3 system is proposed to be changed to a Type 4 system.

Please contact me should you have any queries regarding this.

Yours faithfully,

Enlightened Solutions Ltd

A Shah

Apeksha Shah
BE (Civil), MEFE
GIPENZ (Fire)

Stephen Lambert
NZFS Engineering Unit
National Headquarters
PO Box 2133
Wellington 6140
New Zealand

stephen.lambert@fire.org.nz

s 9(2)(a)

Apeksha Shah

Enlightened Solutions

PO Box 8709

Christchurch 8440

29 November 2016

Dear Apeksha,

Re: New Platform in Existing Warehouse, 49 Stoneleigh Drive, Rolleston (NZFS Reference: 9571 - Rev 02)

Thank you for the additional information concerning the above project. The NZFS understands that the project involves the construction of a new storage platform (33.5m by 13.5m at a height of 2.4m in an existing building of area 958m^2: this represents 50.2% of the warehouse area and 47.2% of the total building's footprint. The platform is to be access via two stairways.

The occupant load is proposed to be 20 in the warehouse/office areas and an additional 1 person in the sleeping firecell.

A Type 4 (automatic smoke detection) system is proposed for the bulk of the building with Type 5 coverage in the sleeping firecell.

The NZFS understands that the platform is a recently-constructed but unconsented feature. The BCA has indicated that the building's owner has approached the Council for retrospective consent and has taken interim measures to mitigate life risk in the building. The BCA has provide information concerning the project and is content with the progress of the project.

The NZFS notes that local Fire Risk Management involvement has been sought and advice obtained. The comments in this memo take into account that advice.

In the context of the indicated application for a Certificate of Acceptance, the NZFS understands that the 'as nearly as reasonably practicable' (ANARP) avenue is not available to the applicant.

The FEB neither states the height of the building nor indicates the storage height in the 450m^2 outside the perimeter of the intermediate floor.

The FEB report proposes to use a fully performance-based design approach to demonstrate that the fire design for the building will meet the performance requirements of the NZ Building Code. This letter outlines the NZFS position as a stakeholder in the building design process.

Referenced Information

Item	Title	Date	Revision
162030	FEB – New Platform in Existing Warehouse at 49 Stoneleigh Drive, Rolleston	8 Nov 2016	1
162030	Meme from Apeksha Shah to Stephen Lambert providing additional information	08 Nov 2016	n/a
9571	NZFS's response to FEB	31 Oct 2016	01
162030	FEB – New Platform in Existing Warehouse at 49 Stoneleigh Drive, Rolleston	10 Oct 2016	0

As discussed, the NZFS has reviewed the FEB documentation identified above and offers the following comments.

The following items are considered to relate to compliance with the requirements of the Building Code:

1. Use of C/VM2 – Your response is noted. Notwithstanding the BCA's reported agreement to the approach, the NZFS observes that, while the building may be consented, the over-sized intermediate floor is subject to a Certificate of Acceptance: as previously stated, this does not allow for any ANARP consideration.

   Given that the approach taken is indicated to be an alternative solution, the selective use of C/VM2, is not considered to be appropriate given the context of the MBIE guidance that states, "The Verification Method C/VM2 method is a complete design system with interrelated inputs and design parameters that result in an acceptable level of risk," and, "Should a designer wish to vary the design inputs other than listed in C/VM2…..all design inputs must be justified" (MBIE "Verification Method C/VM2 interpretations" 2.6). The NZFS therefore considers that reliance on a partial application of the methodology may not result in a proposal that achieves the level of safety indicated by the compliance documents.

   Please amend the documentation to either justify all inputs used in the proposal or comply in full with the requirements of C/VM2.

2. Argument regarding Size of Intermediate Floor – The argument concerning the size of the intermediate floor is not considered to address the intention of the provision. The NZFS observes that the 35m^2 value allows for a limited balcony plume and therefore, a reasonable level of air entrainment: this may result in a small increase in the level of smoke production but not one that exceeds the safety margins implied by conservativism of the other factors.

   The proposal involves the 450m^2 platform, with none of the side located against a side wall. This results in a potential for over 88m of balcony edge around a fire beneath the intermediate floor. The result may be a very significant increase in the volume of smoke and a commensurately shorter time until the visibility criterion is breached. The FEB does not address the height of the warehouse; therefore, an assessment of the potential for smoke production against the available smoke volume cannot be made. In this respect, the NZFS notes that the FEB proposes ventilation to the under-floor area is limited to the aisles.

This implies that there are walls surrounding the space beneath the intermediate floor and that these walls are effectively smoke separations. Unless this is the case, the potential for leakage and, therefore, smoke production may be greatly understated.

Please demonstrate that the assumptions made with regard to ventilation of the fire and smoke production are justified.

3. RSET – The RSET is not proposed to be assessed against a calculated ASET; rather, it is compared to the travel distance requirements of the Acceptable Solutions. However, the equivalence of all other aspects of the Acceptable Solutions is not addressed.

   While the NZFS acknowledges that an escape distance can be inferred from a calculated escape time, the distances cited in the Acceptable Solutions rely on a number of other aspects that contribute to the implicit level of safety: one of these is the size of the intermediate floor. The NZFS observes that the intermediate floor exceeds the area allowed for a Type 4 alarm system in the Acceptable Solutions. The NZFS therefore considers this approach to be an incomplete assessment.

   The NZFS observes that the uncertainty regarding the validity of the ASET/RSET relationship can be readily resolved by modelling the conditions.

   Please revise the FEB to include consideration of the ASET/RSET relationship.

4. Use of B-Risk for ASET Assessment – The NZFS observes that, unless the conditions indicated in Figure 1 of the FEB can be confirmed to be valid, there is potential for significant areas of overlapping smoke flows from beneath the intermediate floor. This will complicate the assessment of smoke production and, therefore, the assessment of the ASET.

   If an ASET/RSET relationship is to be determined, please indicate how B-Risk will be configured to assess these interacting smoke plumes.

5. Fire-rating of Intermediate Floor – The FEB seeks to argue that the intermediate floor is an existing feature and, therefore, can be assessed on an ANARP basis. The NZFS observes that the application for a Certificate of Acceptance does not allow for application of ANARP considerations. While the NZFS acknowledges that the BCA may nevertheless grant Consent, the Service is obliged to offer its comments on the proposal irrespective of any pre-determined agreement or limitations. In this case, the NZFS considers that the intermediate floor should be considered as new work.

   Furthermore, the FEB notes the opinion of the Fire Risk Management Officer that all occupants would be able to evacuate the building and that internal fire-fighting operations would be unlikely to occur if there is no life risk.

   The NZFS observes that fire-fighting operations involve dynamic risk assessment and that, in the circumstances described, internal fire-fighting may not take place. However, that is a decision to be taken at the time of the incident. By not providing the protection required by the Building Code, the outcome of the dynamic risk assessment is effectively pre-determined and, therefore, if circumstances mean that occupants have not evacuated, fire-fighters may be placed at significant additional hazard that would have been addressed had the requirements of the Building Code been applied.

   The NZFS therefore considers that the argument regarding whether or not fire operations are conducted not to be relevant to the provisions required by the Building Code.

   Please indicate how this issue is to be addressed.

6. Disapplication of ‘C’ Clauses – Section 10 of the FEB includes several comments stating that, “This clause is not applicable for this building under S.112”.

   The NZFS observes that new works must comply in full with the Building code and that existing conditions should not be worsened by the new works. By seeking to disregard several aspects of the Clauses without analysis, the FEB proposes that the Consent stage documentation will not demonstrate non-worsening. The NZFS considers that this is not appropriate given the conditions within the building have been changed by the un-Consented addition of a non-compliant intermediate floor.

   Please indicate whether the non-worsening of existed conditions is proposed to be demonstrated.

To avoid unnecessary iterations of the FEB process the NZFS welcomes discussion on any of the above items, however the NZFS recommends that the FEB be revised to address the items identified above as well as any additional items identified by other stakeholders. The NZFS also observes that the issues may be more quickly addressed by an on-site meeting.

Our review of the information provided has focused on the performance-based design elements identified and is intended to provide guidance to reduce the consent risks associated with undertaking performance-based design. No assessment against the requirements of the acceptable solutions has been undertaken. Also please note that this advice does not imply a technical verification of the information provided.

If you have any queries or questions related to the above please do not hesitate to contact me.

Sincerely,

Stephen Lambert
Fire Engineering Unit

cc:	Jenny Lilley, Selwyn District Council	jenny.lilley@selwyn.govt.nz
	Jonathan Nyman, Fire Review Solutions	jonathan@firereview.co.nz
	Graton Holding Warehouse	TBN
	Mike Gaskin, NZFS	mike Gaskin@fire.org.nz
	Fire Engineering Unit, NZFS	engineers@fire.org.nz

Enlightened SOLUTIONS

Our Ref: 162030

8 November 2016

NZFS Engineering Unit
PO Box 2133
Wellington 6140
Attn: Stephen Lambert

Dear Stephen,

RE: 49 Stoneleigh Drive, Rolleston - NZFS Reference: 9571 – Rev 1

Please find appended below our replies to the comments dated 31 October 2016.

1. Use of C/VM2 – Sections 11.1 and 11.2 propose the use of C/VM2 parameters in both the modelling and the ASET/RSET analysis.
   The NZFS observes that both MBIE guidance and Determination 2015/058 indicate that C/VM2 is a complete system that should be applied in its entirety. Therefore, selective use of parameters from the methodology may undermine the safety margin implied by its application.
   While C/VM2 may be valid as a comparator to demonstrate equivalence, the proposed approach does not identify or compensate for departures from C/VM2. The use of elements of C/VM2 therefore does not demonstrate equivalence with C/VM2.
   Where references to factors included in C/VM2 are made, please amend the FEB to provide the justification for their use and, if applicable, the source material.
   In addition, given the simplified RSET analysis permitted in C/VM2, please demonstrate that the travel speeds applied are justified. In this respect, the NZFS observes that C/VM2 explicitly refers to its limitations in respect of egress analysis and, in the comments following paragraphs 3.2 and 3.2.5, refers to Section 3 of the SFPE Handbook for further details.

Reply: The warehouse is recently consented and proposed approach was discussed and agreed by Council and Council reviewer and NZFS operation engineer.

2. Fire-fighting Access and Facilities - Section 10.4 of the FEB proposes that consideration is not to be given to the requirements of Clause C5 because the project is proposed under s112 of the Building Act.
   Notwithstanding this opinion, there is a record of communications between the Fire Service's Operational representative and the design team appended to the report. The statement and the evidence are therefore contradictory.
   The NZFS observes that the provision of the storage platform represents new works and that s17 of the Building Act requires new works to comply in full with the Building Code. Consequently, the operational needs and safety of firefighters should be considered as part of this project.
   Please indicate how this issue is to be addressed.

Reply: We have included the compliance with C5 in the FEB. Please refer attached updated FEB.

3. Sleeping Area – The FEB refers to a sleeping firecell in the building. However, this is not apparent in the provided drawings. Please indicate where the firecell is located and show the means of escape from this space.

Reply: Please refer attached TM Consultants - Fire Design Report in Appendix A of FEB. The drawings at the back of the report shows fire separated sleeping room and its final exit door.

4. Route Shown on Drawing Fire#3 – Drawing Fire#3 shows a route with an associated distance of 63.7m. Given the presence of other doors in the plan north elevation of the building, please clarify whether this is intended to represent a maximum open path travel distance rather than a dead-end travel distance.

Reply: On the drawing of Fire #3, 63.7 m is the maximum open path travel distance. There are two means of escape available from the remote corner of the warehouse.

5. DEOP Calculation – Drawing Fire#2 shows a calculation comparing the DEOP travel distance from a hypothetical platform of area 35m2 with travel distance from the proposed platform.
In the context of a scenario involving consideration of RSET, please clarify the relevance of this assessment.
As indicated above, the NZFS considers equivalence to an element of a compliance methodology is not the same as demonstrating compliance with that methodology. In particular, given the reference is in the context of an intermediate floor that has an area more than 11 times greater than that permitted for storage greater than 3m by C/AS5, paragraph 4.13.7, the argument for equivalence is considered to be significantly undermined.

Reply: The travel distance from 35m^2 from a complying C/AS5 mezzanine floor and for this mezzanine floor are same and this is relevant to the discussion building code compliance. It demonstrates that the time on this platform and potential exposure to a fire is the same or less exposure in this case then in the C/AS complying case.

6. Modelling – Challenging Fire – Section 11.0 of the FEB proposes that a "challenging fire" will be modelled to determine the alarm activation time and will be limited to the extent of the platform only. The NZFS considers that this cannot be represented as a Challenging Fire as there is no assessment of tenability conditions in other parts of the warehouse. Furthermore, given that explicit consideration if either ASET or RSET is beyond the scope of the Acceptable Solutions, any reference to these factors requires tenability to be modelled. The terms of the FEB do not suggest that this is proposed. Consequently, the NZFS considers that the proposal neither demonstrates compliance with a recognised Compliance Document nor demonstrates compliance with the tenability criteria given in Clause C4.3 of the Building Code.
Please indicate how this issue is to be addressed

Reply: The warehouse is recently consented in 2015 under consent number BC150389 so it complies with the current code requirements.
It has been agreed with Council that the new platform requires compliance with means of escape form fire under S112 of the building code.

The fire under the platform is considered appropriate for the contents located under the platform.
The building is to be upgraded with the Type 4 system. The design approach is equivalency with the C/AS5 travel distance requirements, hence the Challenging Fire is proposed only underneath the platform to check tenability of occupants on the platform.

Please contact me should you have any queries regarding this.

Yours faithfully,
Enlightened Solutions Ltd

Apeksha Shah
BE (Civil), MEFE
GIPENZ (Fire)

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Apeksha Shah

Enlightened Solutions

PO Box 8709

Christchurch 8440

31 October 2016

Dear Apeksha,

Re: New Platform in Existing Warehouse At 49 Stoneleigh Drive, Rolleston (NZFS Reference: 9571 - Rev 01)

Thank you for the opportunity to be involved in the above project. The NZFS understands that the project involves the construction of a new storage platform (33.5m by 13.5m at a height of 2.4m in an existing building of area 958m^2: this represents 50.2% of the warehouse area and 47.2% of the total building's footprint. The platform is to be access via two stairways.

The occupant load is proposed to be 20 in the warehouse/office areas and an additional 1 person in the sleeping firecell.

A Type 4 (automatic smoke detection) system is proposed for the bulk of the building with Type 5 coverage in the sleeping firecell.

The NZFS understands that the platform is a recently-constructed but unconsented feature. The BCA has indicated that the building's owner has approached the Council for retrospective consent and has taken interim measures to mitigate life risk in the building. The BCA has provide information concerning the project and is content with the progress of the project.

The NZFS notes that local Fire Risk Management involvement has been sought and advice obtained. The comments in this memo take into account that advice.

In the context of the indicated application for a Certificate of Acceptance, the NZFS understands that the 'as nearly as reasonably practicable' (ANARP) avenue is not available to the applicant.

The FEB report proposes to use a fully performance-based design approach to demonstrate that the fire design for the building will meet the performance requirements of the NZ Building Code. This letter outlines the NZFS position as a stakeholder in the building design process.

Referenced Information

Item	Title	Date	Revision
162030	FEB – New Platform in Existing Warehouse at 49 Stoneleigh Drive, Rolleston	10 Oct 2016	0

As discussed, the NZFS has reviewed the FEB documentation identified above and offers the following comments.

The following items are considered to relate to compliance with the requirements of the Building Code:

1. Use of C/VM2 – Sections 11.1 and 11.2 propose the use of C/VM2 parameters in both the modelling and the ASET/RSET analysis.

   The NZFS observes that both MBIE guidance and Determination 2015/058 indicate that C/VM2 is a complete system that should be applied in its entirety. Therefore, selective use of parameters from the methodology may undermine the safety margin implied by its application.

   While C/VM2 may be valid as a comparator to demonstrate equivalence, the proposed approach does not identify or compensate for departures from C/VM2. The use of elements of C/VM2 therefore does not demonstrate equivalence with C/VM2.

   Where references to factors included in C/VM2 are made, please amend the FEB to provide the justification for their use and, if applicable, the source material.

   In addition, given the simplified RSET analysis permitted in C/VM2, please demonstrate that the travel speeds applied are justified. In this respect, the NZFS observes that C/VM2 explicitly refers to its limitations in respect of egress analysis and, in the comments following paragraphs 3.2 and 3.2.5, refers to Section 3 of the SFPE Handbook for further details.

2. Fire-fighting Access and Facilities – Section 10.4 of the FEB proposes that consideration is not to be given to the requirements of Clause C5 because the project is proposed under s112 of the Building Act.

   Notwithstanding this opinion, there is a record of communications between the Fire Service's Operational representative and the design team appended to the report. The statement and the evidence are therefore contradictory.

   The NZFS observes that the provision of the storage platform represents new works and that s17 of the Building Act requires new works to comply in full with the Building Code. Consequently, the operational needs and safety of firefighters should be considered as part of this project.

   Please indicate how this issue is to be addressed.

3. Sleeping Area – The FEB refers to a sleeping firecell in the building. However, this is not apparent in the provided drawings. Please indicate where the firecell is located and show the means of escape from this space.

4. Route Shown on Drawing Fire#3 – Drawing Fire#3 shows a route with an associated distance of 63.7m. Given the presence of other doors in the plan north elevation of the building, please clarify whether this is intended to represent a maximum open path travel distance rather than a dead-end travel distance.

5. DEOP Calculation – Drawing Fire#2 shows a calculation comparing the DEOP travel distance from a hypothetical platform of area 35m^2 with travel distance from the proposed platform.

   In the context of a scenario involving consideration of RSET, please clarify the relevance of this assessment.

   As indicated above, the NZFS considers equivalence to an element of a compliance methodology is not the same as demonstrating compliance with that methodology. In particular, given the reference is in the context of an intermediate floor that has an area more than 11 times greater than that permitted for storage greater than 3m by C/AS5, paragraph 4.13.7, the argument for equivalence is considered to be significantly undermined.

6. Modelling – Challenging Fire – Section 11.0 of the FEB proposes that a "challenging fire" will be modelled to determine the alarm activation time and will be limited to the extent of the platform only.

   The NZFS considers that this cannot be represented as a Challenging Fire as there is no assessment of tenability conditions in other parts of the warehouse.

   Furthermore, given that explicit consideration if either ASET or RSET is beyond the scope of the Acceptable Solutions, any reference to these factors requires tenability to be modelled. The terms of the FEB do not suggest that this is proposed. Consequently, the NZFS considers that the proposal neither demonstrates compliance with a recognised Compliance Document nor demonstrates compliance with the tenability criteria given in Clause C4.3 of the Building Code.

   Please indicate how this issue is to be addressed.

To avoid unnecessary iterations of the FEB process the NZFS welcomes discussion on any of the above items, however the NZFS recommends that the FEB be revised to address the items identified above as well as any additional items identified by other stakeholders.

Our review of the information provided has focused on the performance-based design elements identified and is intended to provide guidance to reduce the consent risks associated with undertaking performance-based design. No assessment against the requirements of the acceptable solutions has been undertaken. Also please note that this advice does not imply a technical verification of the information provided.

If you have any queries or questions related to the above please do not hesitate to contact me.

Sincerely,

Stephen Lambert
Fire Engineering Unit

cc:	Jenny Lilley, Selwyn District Council	jenny.lilley@selwyn.govt.nz
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