SOUTHERN MIDLANDS COUNCIL

ATTACHMENTS
SPECIAL COUNCIL MEETING

Wednesday, 13th January 2021

9.30 a.m.

Victoria Memorial Hall
89 Main Street, Kempton

Item 4.1	**Development Application (DA 2020/113) for six (6) Bond Storage Sheds at 20 Bentwick Street, Oatlands, Owned by Lake Frederick Inn P/L**
	Attachment 1 – Development Application Documents
	Attachment 2 – Representation

DA2020/113 six (6) Bond Storage Sheds, 20 Bentwick Street, Oatlands

Development & Environmental Services
Email: mail@southernmidlands.tas.gov.au
Phone: (03) 62545050
Postal Address: PO Box 21 Oatlands Tas 7120

SOUTHERN MIDLANDS COUNCIL

APPLICATION FOR PLANNING PERMIT – USE AND DEVELOPMENT
Commercial, Industrial, Forestry and other Non- Residential development

Use this form to apply for planning approval in accordance with section 57 and 58 of the *Land Use Planning and Approvals Act 1993*

Applicant / Owner Details:

Owner / s Name	Lake Frederick Inn P/L – John Ibrahim (Sole Director)		
Postal Address	19 Kinsella Street, Illawong	Phone No:	0411 500 818
	Sydney NSW 2234	Fax No:	02 9672 1848
Email address	john@caltexm4.com.au		
Applicant Name (if not owner)	As above.		
Postal Address		Phone No:	
		Fax No:	
Email address:			

Description of proposed use and/or development:

Address of new use and development:	20 Bentwick Street, Oatlands	
Certificate of Title No	Volume No 122266	Lot No: 2
Description of Use	Storage of aging whisky barrels from local distilleries. Whisky made from Tasmanian barley predominantly grown in the Midlands region of Tasmania.	Refer Definitions in Clause 8.2 of the Southern Midlands Planning Scheme 2015 Attach additional information if required.
Development on site	Construction of six 'bond store' sheds 12m x 30m	
current use of land and building	Six bond store sheds exist on site and another six are under construction. The site is otherwise pasture.	E.g. Are there any existing buildings on this title? If yes, what is the main building used as?

	Please tick ✓answer			
Is the property Heritage Listed	Yes		No	✓

		Please tick ✓answer		
Signage	Is any signage proposed?	Yes		No ✓

Business Details

Existing hours of operation

Hours	am	to	pm
Weekdays	6:00am		6:00pm
Sat	6:00am		6:00pm
Sun	6:00am		6:00pm

Proposed hours of new operation

Hours	am	to	pm
Weekdays	6:00am		8:00pm
Sat	6:00am		8:00pm
Sun	6:00am		8:00pm

Number of existing employees: 1 (at delivery times)

Number of proposed new employees: 0

Traffic Movements	Number of commercial vehicles servings the site at present	2. One small and one large commercial vehicle per day	Approximate number of commercial vehicles servicing the site in the future	No change.
Number of Car Parking Spaces	How many car spaces are currently provided	Many spaces on existing hardstand area.	How many new car spaces are proposed	Many spaces on new hardstand area.

Is the development to be staged: Please tick ✓answer — Yes [ ] No [✓]

Is the development to be stages, If yes	Described proposed stages		Described period of proposed stages	

Proposed Material Types

What are the proposed external wall colours	Galvanised Iron	What is the proposed roof colour	Galvanised Iron
What is the proposed external wall materials	Galvanised Iron	What is the proposed roof materials	Galvanised Iron
What is the proposed new floor area m^2	6 x 360m^2	What is the estimated value of all the new work proposed	$600,000

If yes attach details: size, colours, fonts, location

Please attach any additional information that may be required by Part 8.1 Application Requirements of the Planning Scheme.

Signed Declaration

I/we hereby apply for a planning approval to carry out the use or development described in this application and in the accompanying plans and documents, accordingly I declare that:

1. The information given is a true and accurate representation of the proposed development. I understand that the information and materials provided with this development application may be made available to the public. I understand that the Council may make such copies of the information and materials as, in its opinion, are necessary to facilitate a thorough consideration of the Development Application. I have obtained the relevant permission of the copyright owner for the communication and reproduction of the plans accompanying the development application, for the purposes of assessment of that application. I indemnify the Southern Midlands Council for any claim or action taken against it in respect of breach of copyright in respect of any of the information or material provided.
2. I am the applicant for the planning permit and I have notified the owner/s of the land in writing of the intention to make this application in accordance with Section 52(1) of the *Land Use Planning Approvals Act 1993* (or the land owner has signed this form in the box below in "Land Owner(s) signature);

Applicant Signature	Applicant Name (print)	Date
John Ibrahim	JOHN IBRAHIM	22/09/2020
Land Owner(s) Signature	**Land Owners *Name (please print)***	**Date**
Land Owner(s) Signature	**Land Owners *Name (please print)***	**Date**

Address all correspondence to:
The General Manager, PO Box 21, Oatlands, Tasmania 7120
Or by Email Address: mail@southernmidlands.tas.gov.au 'in single PDF file format'
Phone (03) 62545050

DEVELOPMENT – Information & Checklist sheet

Use this check list for submitting your application

Submitting your application ✓

1. All plans and information required per Part 8.1 Application Requirements of the Planning Scheme ❑
2. Copy of the current Certificate of Title, Schedule of Easements and Title Plan (Available from Service Tasmania Offices) ❑
3. Any reports, certificates or written statements to accompany the Application (if applicable) required by the relevant zone or code. ❑
4. Prescribed fees payable to Council ❑

Information

If you provide an email address in this form then the Southern Midlands Council ("the Council") will treat the provision of the email address as consent to the Council, pursuant to Section 6 of the Electronic Transactions Act 2000, to using that email address for the purposes of assessing the Application under the Land Use Planning and Approvals Act 1993 ("the Act").

If you provide an email address, the Council will not provide hard copy documentation unless specifically requested.

It is your responsibility to provide the Council with the correct email address and to check your email for communications from the Council.

If you do not wish for the Council to use your email address as the method of contact and for the giving of information, **please tick** ✓ the box ❑

Heritage Tasmania

If the Property is listed on the Tasmanian Heritage Register, then the Application will be referred to Heritage Tasmania unless an Exemption Certificate has been provided with this Application. (Phone 1300 850 332 (local call cost) or email enquires@heritage.tas.gov.au)

TasWater

Depending on the works proposed Council may be required to refer the Application to TasWater for assessment (Phone 136992)

PRIVACY STATEMENT

The Southern Midlands Council abides by the Personal Information Protection Act 2004 and views the protection of your privacy as an integral part of its commitment towards complete accountability and integrity in all its activities and programs.

Collection of Personal Information: The personal information being collected from you for the purposes of the Personal Information Protection Act, 2004 and will be used solely by Council in accordance with its Privacy Policy. Council is collecting this information from you in order to process your application.

Disclosure of Personal Information: Council will take all necessary measures to prevent unauthorised access to or disclosure of your personal information. External organisations to whom this personal information will be disclosed as required under the Building Act 2000. This information will not be disclosed to any other external agencies unless required or authorised by law.

Correction of Personal Information: If you wish to alter any personal information you have supplied to Council please telephone the Southern Midlands Council on (03) 62545050. Please contact the Council's Privacy Officer on (03) 6254 5000 if you have any other enquires concerning Council's privacy procedures.

Address all correspondence to:
The General Manager, PO Box 21, Oatlands, Tasmania 7120
Or by Email Address: mail@southernmidlands.tas.gov.au 'in single PDF file format'
Phone (03) 62545050

DEVELOPMENT APPLICATION FOR SIX SHEDS (BOND STORES)

C.T. 122266/2 PID 2046563

20 BENTWICK STREET, OATLANDS

LAND BOUNDED BY TUNNACK ROAD, BENTWICK STREET, WHYNYATES STREET & HASTINGS STREET

20 September 2020

Application for Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

APPLICATION DETAIL:

This is an application for six additional sheds on a 8.589 Ha title containing six existing sheds with a further six sheds currently under construction, leading to a total of 18 sheds. The new sheds are proposed to be identical to those existing and will be used for the same purpose: as 'bond stores' for the storage of aging whisky barrels. The land is located at 20 Bentwick Street, Oatlands, on the southern outskirts of the town. The property is bounded by Tunnack Road, Bentwick Street, Whynyates Street and Hastings Street. .

The land is zoned Rural Resource (Zone 26), is mostly under pasture and has a gentle slope to the east, down to its Tunnack Road frontage.

Each shed will be 30m x 12m and no greater in height than 6.9m. They will be positioned in a new line across the property in front of the existing line of sheds when viewed from Tunnack Road. The six new sheds will align with the existing sheds, forming a six-shed by three-shed grid, as indicated on the site plan. They will utilise the existing vehicular access from Bentwick Street, with vehicular access then gained from the internal hardstand vehicular maneuvering area surrounding the existing sheds.

They will be setback approximately 255m from the Tunnack Road frontage, 140m from the rear boundary (Whynyates Street), 27.5m from the eastern side boundary (Bentwick St) and 27.5m from the western side boundary (Hastings St). They will be separated from each other and from the existing line of sheds by 15m.

The gravel hardstand area around the existing sheds will be extended to encompass the new sheds, in accordance with the existing Bushfire Hazard Management Plan.

The sheds are to be used for the storage of aging whisky barrels from the soon-to-be-completed Callington Mill Distillery, to be sited next to Callington Mill in Oatlands. Whisky from other Tasmanian distilleries will also be stored.

Malt whisky is produced from Tasmanian barley which is predominantly grown in the Midlands region. As such, the use of the sheds is directly associated with the local processing of this local agricultural produce into a high-value product.

Bond stores are simply secure storage sheds. There is no machinery or processing involved and no external lighting.

Commercial vehicles accessing the site would be no more than one truck and one light vehicle per day. A forklift would be used within the sheds.

Staffing of the site is generally limited to the times when barrels are delivered, which is no more than once a day for a period of one or two hours. Facilities will therefore not be provided within the sheds, as staff can access these at their permanent place of work.

Application for Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

BUSHFIRE HAZARD MANAGEMENT PLAN:

The site is subject to an existing certified Bushfire Hazard Management Plan (BHMP).

The requirements of the BHMP will be applied and maintained in relation to the six new sheds, including:

- A gravelled area to be established between and around the buildings extending 20 metres in all directions.
- The remainder of the land to be maintained by grazing, slashing or similar to keep the fuel load low.
- Sheds constructed to BAL 12.5.
- Each shed to have access to at least 10,000 litres of water reserved for fire fighting purposes.

DIAGRAMS

The attached diagrams detail the following:

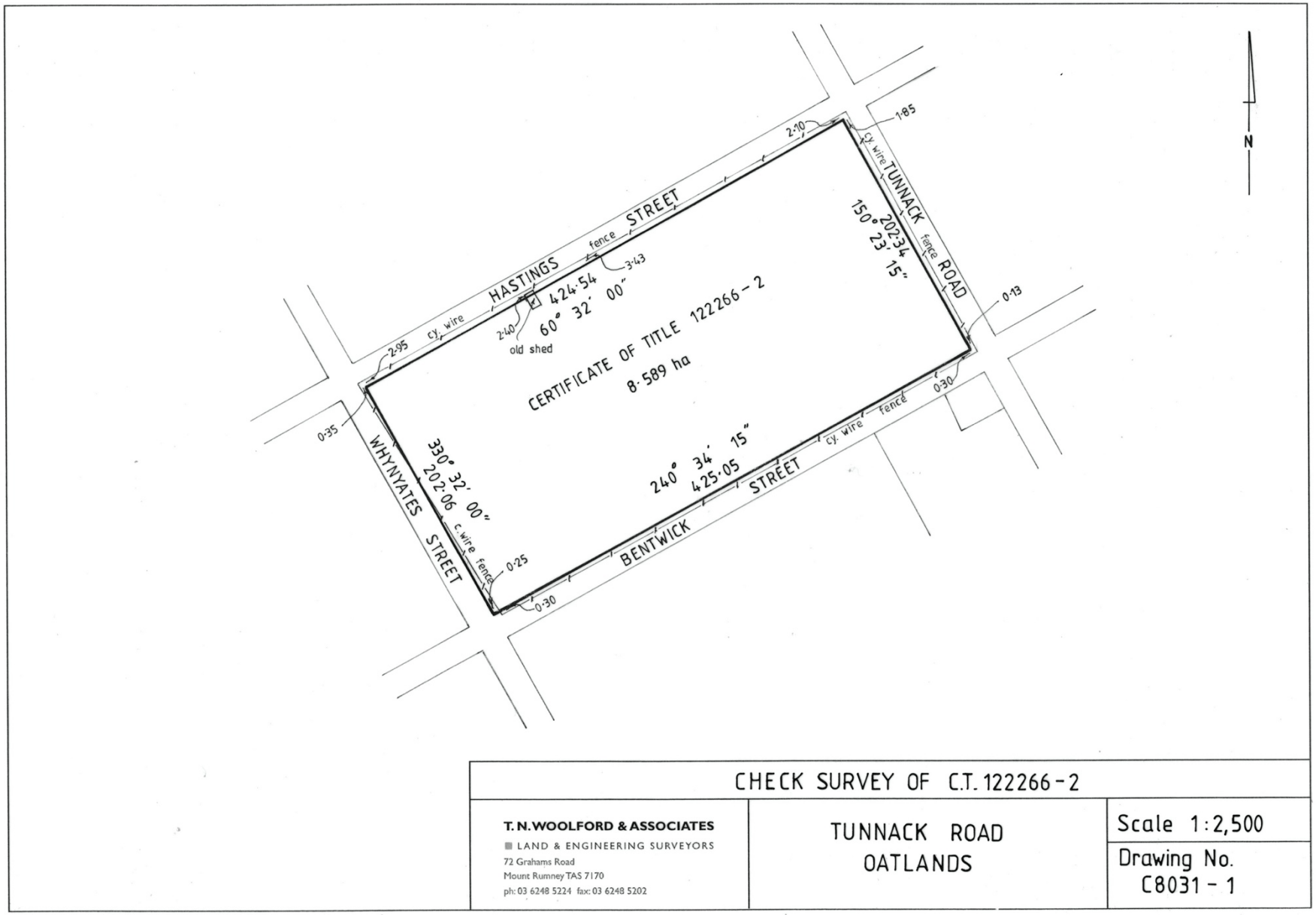
- Diagram 1: Site Plan.
- Diagram 2: Check Survey Plan.
- Diagram 3: Elevations and Floor Plan
- Diagram 4: Images: Existing Sheds. (New sheds to be the same as existing).
- Diagram 5: Images: Location of New Sheds.

Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 1 - Site Plan

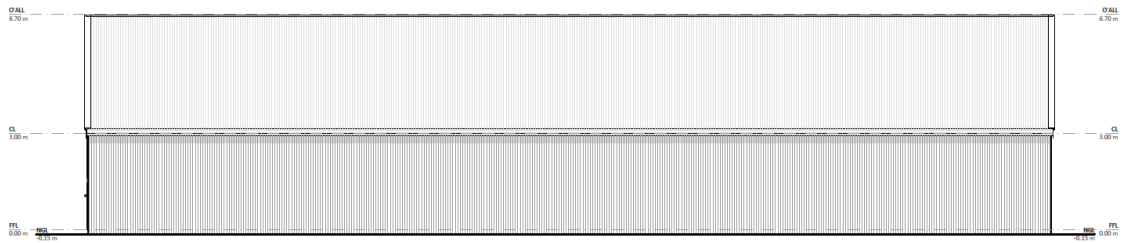
Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 2 – Check Survey Plan

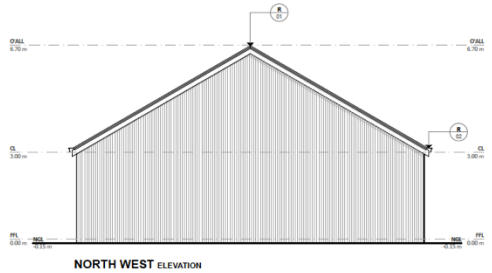


Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

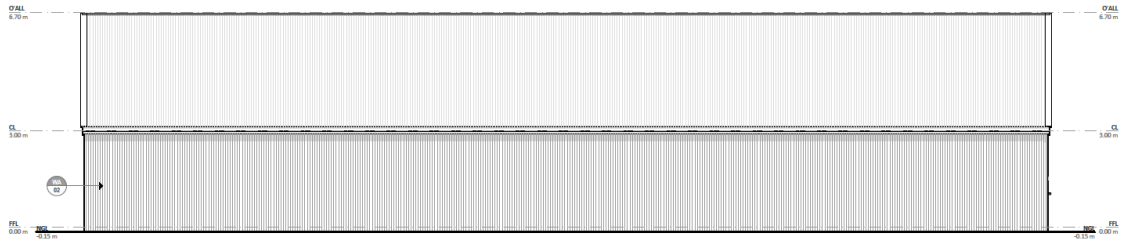
Diagram 3 – Elevations and Floor Plan



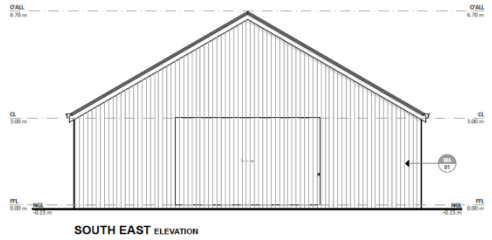
NORTH EAST ELEVATION



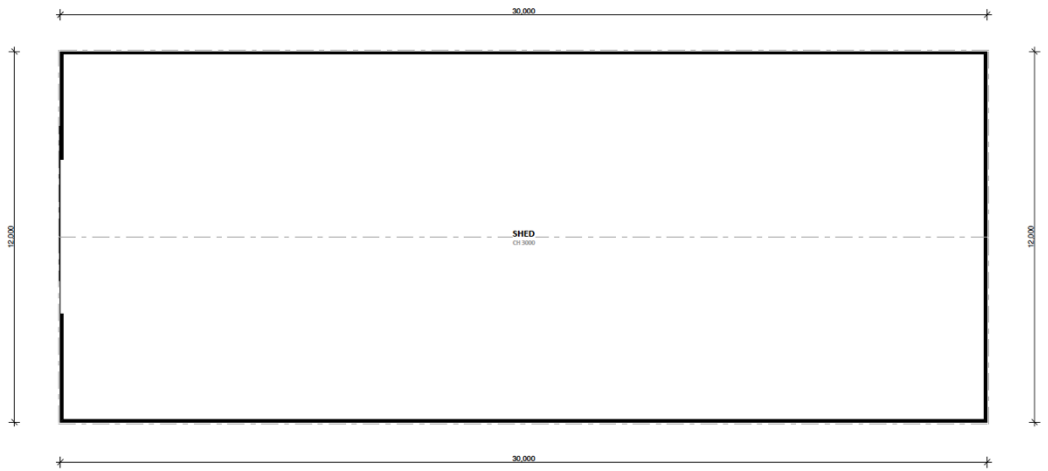
NORTH WEST ELEVATION



SOUTH WEST ELEVATION



SOUTH EAST ELEVATION



Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 4 – Images: Existing Sheds.

Existing sheds: view from Hastings Street boundary showing rear walls (facing away from Tunnack Rd)

The new sheds will be the same design as existing.

Existing sheds: view from Bentwick Street boundary, showing ends (and water tanks) facing Tunnack Road. Proposed sheds to be located to the right.

Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 5 – Images: Location of New Sheds.

View looking east across the proposed location of the new sheds with respect to the existing sheds. They will be located on the hardstand area.

The new sheds will be the same design as existing.

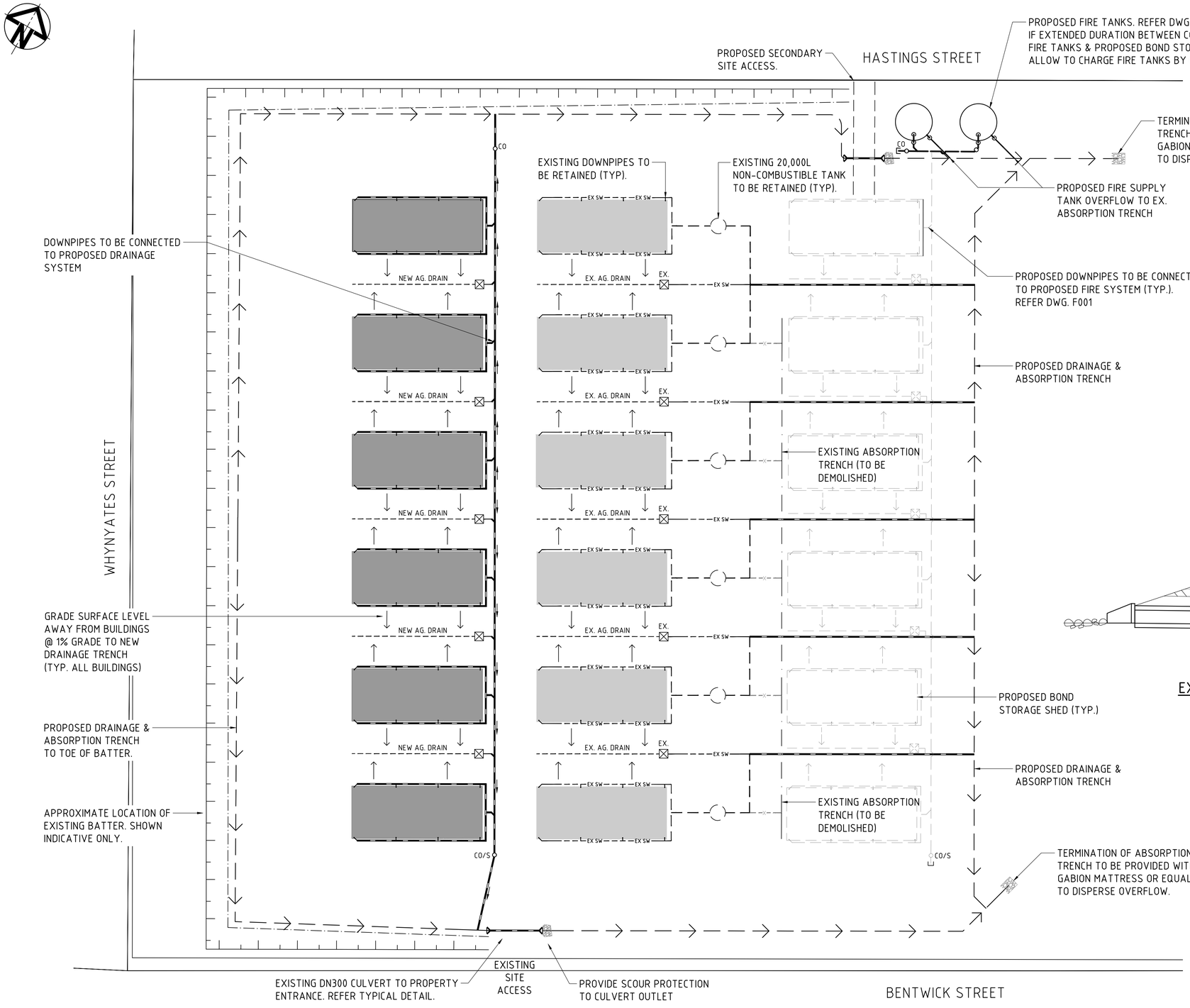
View looking north-east across the proposed location of the new sheds towards Tunnack Road.

NOTE

NOT ALL SERVICES SHOWN ON THIS DRAWING. BUILDER TO ENSURE AREA OF WORKS ARE FREE OF SERVICES OR APPROPRIATE PROTECTION ARE IN PLACE PRIOR TO WORKS.

DESIGN BASED OFF EXISTING DESIGN INVERT LEVELS. INVERT LEVELS MUST BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION, DISCREPANCY MUST BE REPORTED TO ENGINEER, AWAIT ADVICE.

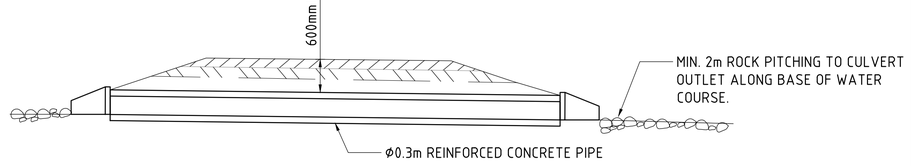
U.N.O. MINIMUM 600mm COVER TO BE PROVIDED TO ALL HYDRAULIC SERVICES.



SITE DRAINAGE PLAN
SCALE 1:500

LEGEND

- EX SW — EXISTING DRAINAGE PIPE
- PROPOSED DRAINAGE PIPE
- EXISTING DRAINAGE TO BE DEMOLISHED
- PROPOSED FIRE INFRASTRUCTURE. REFER DWG F001
- EX. — EXISTING GRATED SW PIT (NOT TO SCALE)
- NEW — PROPOSED GRATED SW PIT TO MATCH EXISTING (NOT TO SCALE)
- EXISTING DRAINAGE/ABSORPTION TRENCH
- PROPOSED DRAINAGE/ABSORPTION TRENCH
- EXISTING BOND STORAGE SHED
- BOND STORAGE SHED UNDER CONSTRUCTION
- PROPOSED BOND STORAGE SHED
- CO — CLEAROUT
- CO/S — CLEAROUT TO SURFACE



EXISTING ϕ300 R.C.P. CULVERT DETAIL
SCALE 1:50

SMC - KEMPTON

RECEIVED

3/12/2020

CONTRACTOR MUST VISIT SITE BEFORE TENDERING & INCLUDE ALLOWANCE WITHIN THE TENDER FOR EXISTING CONDITIONS

REV.	DESCRIPTION	DRN	CHK	APP.	DATE
E	MINOR REVISIONS	MWF	CM	JC	02.12.20
D	MINOR REVISIONS	MWF	CM	JC	24.11.20
C	MINOR REVISIONS	MWF	CM	JC	20.11.20
B	MINOR REVISIONS	TDC	CM	JC	18.11.20
A	ISSUED FO CLIENT REVIEW	TC	CM	JC	17.11.20

DRAWING CHECK	SIGNATURE	DATE
DRAWN	TDC	13.11.20
DESIGNED		
CHECKED		
CLIENT		

CO-ORDINATION CHECK	SIGNATURE	DATE
STRUCT.		
MECH.		
ELECT.		
HYDR./CIVIL		
FIRE/ENV.		

CLIENT: DASCO

COVA Stronger Together
1300 35 7363 covathinking.com
ACN 117 492 814

PROJECT: OATLANDS & SHENE BOND STORES FIRE HYDRANT INSTALLATIONS

TITLE: CIVIL SERVICES OATLANDS BOND STORE SITE DRAINAGE PLAN

20 0 20 40 60 — A1

STATUS: PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION

SCALE @ A1: 1:500 DIMENSIONS IN: METRES

DRAWING No.: 5519.001-C100 REV.: E

CERTIFICATE OF TITLE

LAND TITLES ACT 1980

TASMANIA

TORRENS TITLE

VOLUME	FOLIO
122266	2
EDITION	**DATE OF ISSUE**
4	27-Mar-2018
Page 1	of 1

I certify that the person described in Schedule 1 is the registered proprietor of an estate in fee simple (or such other estate or interest as is set forth in that Schedule) in the land within described subject to such exceptions, encumbrances, interests and entries specified in Schedule 2 and to any additional entries in the Folio of the Register.

Alice Kawa

Recorder of Titles.

RECORDER OF TITLES TASMANIA

DESCRIPTION OF LAND

Town of OATLANDS
Lot 2 on Plan 122266
Being the land thirdly described in Indenture of Assent 56/9391
Derivation : For grantees see plan
Derived from W3782

SCHEDULE 1

M681157 TRANSFER to LAKE FREDERICK INN PTY LTD Registered 27-Mar-2018 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

User: johnw / Status: OK / Printed: 12-Jan-1996 11:34

OWNER L.T.ACT 1980

FOLIO REFERENCE W3782

GRANTEE WHOLE OF LOTS 1, 2, 3, 4, 5, 6, 7, & 8, 5-1-0 EACH GTD TO DANIEL McANNENY, ROBERT CLAYDON, PHILLIP SMITH, JOHN WHELAN, SAMUAL BARNES, JOHNATHON McDERMOTT, ELIZA BENN AND THOMAS FLEMMING

PLAN OF TITLE

LOCATION

MONMOUTH - BATH
SEC X8 & X9

FIRST SURVEY PLAN No. O/19L.O.

COMPILED BY

SCALE 1: 4000 LENGTHS IN METRES

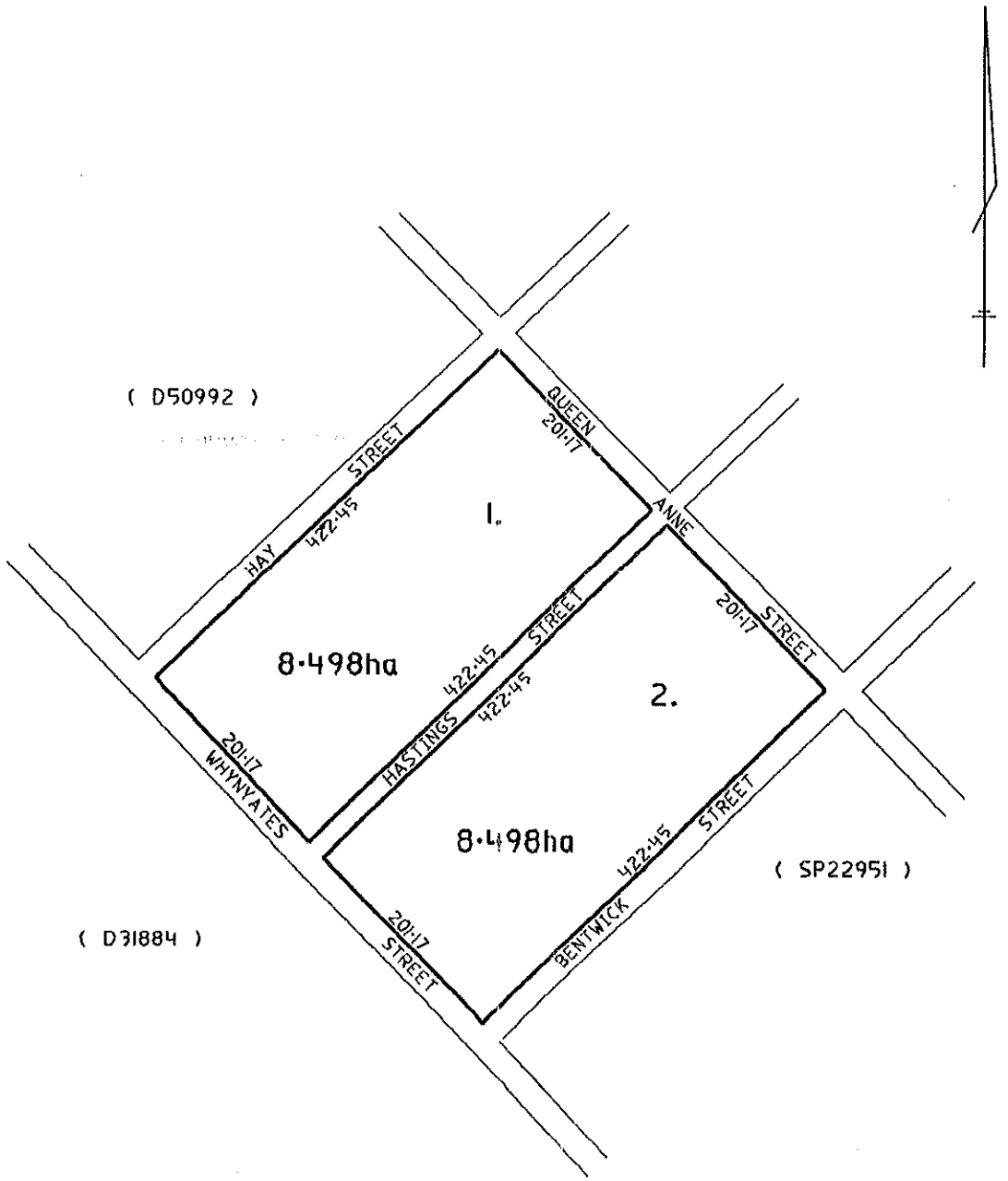
Registered Number

P.122266

APPROVED 02 JAN 1996

Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 125	LAST UPI No 2500960-63, 2500970-73	LAST PLAN No.	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN



PCD

20 Bentwick Street, Oatlands

C.T. 122266/2

Bushfire Assessment Report
Resource Processing (storage of flammable liquid)

6 November 2020

PLANNING
& ENVIRONMENT

ERA Planning Pty Ltd trading as ERA Planning and Environment

ABN 67 141 991 004

Job Number: Enter Job number (eg 1819-001)

Document Status

Document Version	Date	Author	Reviewer
DRAFT_V1	3 November 2020	Clare Hester	Frances Beasley
Final	3 November 2020	Clare Hester	Client
Final_V1 (revised Appendix C and D)	5 November 2020	Clare Hester	TFS
Final_V2 (revised BFHMP)	6 November 2020	Clare Hester	Council

Table of Contents

1 Introduction

1.1 Purpose of the report

ERA Planning and Environment (ERA) have been engaged by John Ibrahim of Lake Frederick to undertake a Bushfire Assessment for the use and development of Resource Processing at 20 Bentwick Street, Oatlands C.T. 122266/2 (also known as 41 Hastings Street, Oatlands).

The proposal requires an assessment of the bushfire risk against the provisions of E1.0 Bushfire Prone Areas Code of the *Southern Midlands Interim Planning Scheme 2015.*

Enquiries relating to this report should be directed to:

Clare Hester
Principal Planner
ERA Planning and Environment
clare@eraplanning.com.au
0429 359 636

1.2 Proposal

The subject site is bounded by Tunnack Road, Bentwick Street, Whynyates Street (unformed) and Hastings Street on the outskirts of Oatlands. The site has approval for 12 sheds for the storage of aging malt whisky barrels with six sheds constructed and six currently under construction; these approvals, included a certified Bushfire Assessment Report.

The current proposal is for six additional sheds (resultant total of 18). Each shed will be approximately 6.9 m in height measuring 30 m x 12 m. Each shed will align with the existing sheds on the site and will use the primary vehicular access from Bentwick Street and the secondary access off Hastings Street.

A graveled area will be established between and around each bond store extending a minimum of 20 m in all directions.

The sheds will also be used for the storage of aging malt whiskey and will have a storage capacity of approximately 30,000 L per shed or an additional 180,000 L of whiskey on site: a total storage capacity on site of 540,000 L. This quantity exceeds the Manifest Quantity for the storage of flammable liquids pursuant to Schedule 11 – Placard and Manifest Quantities and therefore requires an assessment against the provisions of the Bushfire Prone Areas Code.

A full set of plans for the proposal are attached at Appendix A with the site plan shown in Figure 1.

Figure 1: Site plan with existing sheds shown in orange, sheds under construction shown with yellow dashed outline and proposed sheds for bushfire assessment purposes shown in blue.

1.3 Site description and context

The site is located approximately 1.2 km south of the centre of Oatlands and less than 400 m south of the Light Industrial area on Chatham Street (refer Figure 2 and Figure 3 below).

The site is generally flat and in addition to the six existing bond stores is covered by a combination of managed grassland, low threat vegetation and unmanaged grassland as per the classification under *AS3959-2018 Table 2.3 Classification of Vegetation*. The surrounding vegetation is used for the grazing of animals, resulting in the vegetation type also being grassland with some residential dwellings with gardens (LTV). The area is also generally flat.

Primary access to the site is from Bentwick Street which is an unsealed 4 m wide road within a 20 m wide road reserve. The site includes a secondary access from Hastings Street also an unsealed 4 m wide road within a 20 m wide road reserve.

Figure 2: Subject property highlighted in blue; site is located 1.2km south of Oatlands

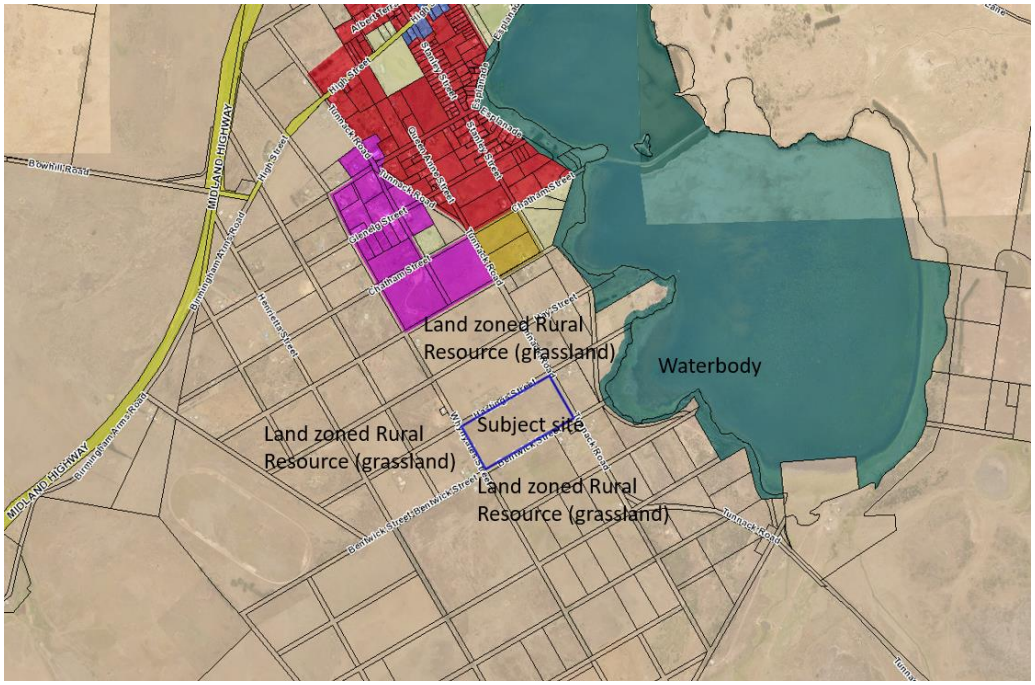


Figure 3: site context with zoning

1.4 Fire history

Figure 4 below identifies the fire history of the site and surrounding area. The nearest fires occurred in 2013 – 2014, approximately 500 m to the south and in 2015 – 2016, approximately 2km to the south west from the site.

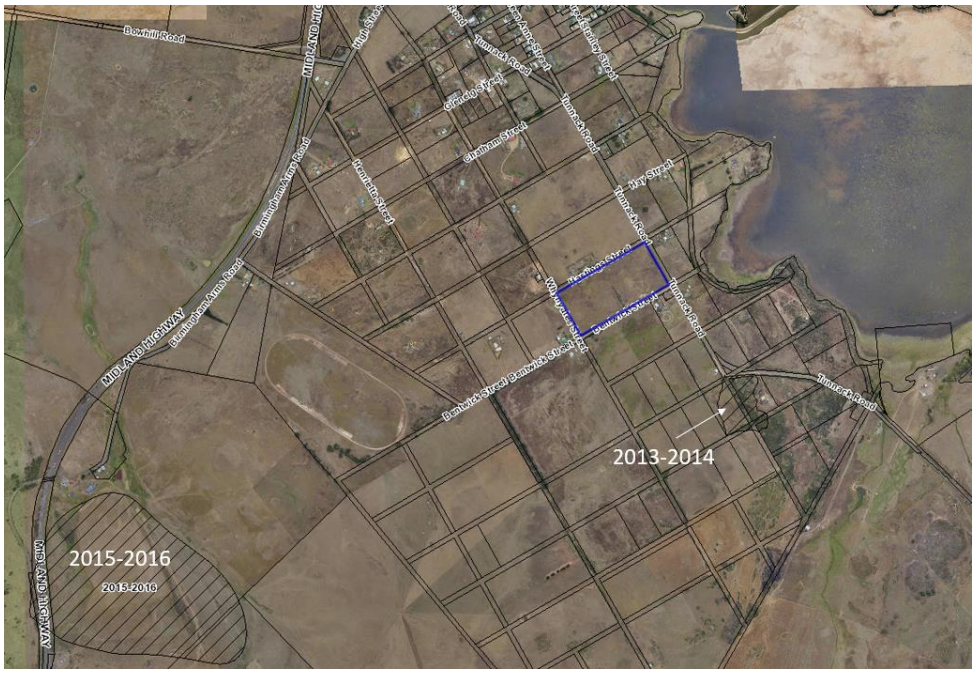


Figure 4: Bushfire history of site (source www.thelist.tas.gov.au 23 March 2020)

1.5 Site photographs

Photograph 1: Grassland to the south of site

Photograph 2: Grassland to the north of site

Photograph 3: Grassland to the east of site (existing Bond Stores shown)

Photograph 4: Grassland to the west of site

Photograph 5: View from Hastings Street road reserve of rear of existing Bond Stores with water tanks

Photograph 6: Main entrance to the site with current works occurring for the construction of the previously approved bond stores

Photograph 7: Secondary entrance to the site off Hastings Street

2 Bushfire context

2.1 Bushfire hazard

A bushfire prone area is defined as *land that is within 100m of an area of bushfire-prone vegetation equal to or greater than 1 hectare*.

Bushfire-prone vegetation: *means contiguous vegetation including grasses and shrubs but not including maintained lawns, parks and gardens, nature strips, plant nurseries, golf courses, vineyards, orchards or vegetation on land that is used for horticultural purposes*.

Table 2.3 of AS 3959-2018 classifies bushfire-prone vegetation types. Bushfire-prone vegetation within 100 m of the site is identified below:

- North – Land to the north includes a 20 m graveled hardstand area; then 7.5 m of managed grassland (defined as Low Threat Vegetation pursuant to Clause 2.2.3.2 (f) of AS3959-2018); a 20 m wide road reserve (Hastings Street); a dwelling with managed gardens for a distance of 40 m defined as Low Threat Vegetation pursuant to Clause 2.2.3.2 (f) of AS3959-2018; then for a distance of 100 m+ land used for agricultural purposes and containing Group G - Grassland vegetation. Land to the north is flat.
- East – Land to the east is zoned Rural Resource. For 20 m from the proposed storage sheds is graveled hardstand area. Further to the east the land contains Group G - Grassland vegetation for approximately 235 m. The land is flat.
- South – Land to the south includes a 20 m graveled hardstand area; from the hardstand area there is 7.5 m of managed grassland (defined as Low Threat Vegetation pursuant to Clause 2.2.3.2 (f) of AS3959-2018); a 20 m wide road reserve (Bentwick Street); south of Bentwick Road is land zoned Rural Resource and which appears to be predominantly used for agricultural purposes. Vegetation on this land is defined as Group G - Grassland. Land to the south is flat.
- West – To the west is 100 m of graveled hard stand and existing storage sheds); the development including the already approved storage sheds will be setback 50 m from the 20 m wide unformed road reserve of Whynyates Street. Both the road reserve and the 50 m setback are zoned Rural Resource and contain Group G - Grassland vegetation. Land to the west is flat.

2.2 Bushfire Attack Level – FDI 50

	North	East	South	West
Vegetation Classification in accordance with Table 2.3. **LTV = Low threat vegetation** **G = Grassland**	Grassland & LTV	LTV & Grassland	LTV & Grassland	LTV & Grassland
Distance (shown in metres) to classified vegetation in accordance with Table 2.3.	0m – 87.5m (LTV) 87.5m – 100 m +(G)	0m – 20m (LTV) 20 m – 100m + (G)	0m – 47.5m (LTV) 47.5m – 100m+ (G)	0m – 100m (LTV) 100m+ (G)

Effective Slope				
Slope under the classified vegetation	Upslope/0° ✓	Upslope/0° ✓	Upslope/0° ✓	Upslope/0° ✓
	>0 to 5°	>0 to 5°	>0 to 5°	>0 to 5°
	>5 to 10°	>5 to 10°	>5 to 10°	>5 to 10°
	>10 to 15°	>10 to 15°	>10 to 15°	>10 to 15°
	>15 to 20°	>15 to 20°	>15 to 20°	>15 to 20°

BAL value for each side of the site (predominant veg)	North BAL 12.5	East BAL 12.5	South BAL 12.5	West LOW
Minimum separation distance required to classified veg to achieve BAL-12.5	14m	14m	14m	14m

2.3 Access

Primary access to the site will be from Bentwick Street, however the fire appliance access will be from Hastings Street. The length of the access to the hydrants on the site will be greater than 30 m. Given the graveled hardstand area proposed and the separation of buildings the access on site will meet the requirements of Table E2 of the Bushfire-Prone Areas Code.

2.4 Water

The site does not have access to reticulated water infrastructure. The site will utilise two tanks of 110,000 kL each (total water supply of 220,000 L on site) accessed from Hastings Street. The water system will include reticulated infrastructure with hydrants located within 90m of each building area.

Details of the water supply can be found in the Fire Safety Engineering Report (Appendix D).

2.5 Other Restrictions

There are no other known restrictions on the site or the area that would impact on the bushfire assessment.

3 Bushfire-Prone Areas Code

The purpose of the Bushfire-Prone Areas Code (the code) is identified under clause E1.1.1 of the *Southern Midlands Interim Planning Scheme 2015* as follows:

The purpose of this Code is to ensure that use and development is appropriately designed, located, serviced and constructed to reduce the risk to human life and property and the cost to the community, caused by bushfire.

In accordance with clause E1.2.1 the code applies to a hazardous use:

(b) a use, on land that is located within, or partially within, a bushfire-prone area, that is vulnerable use or hazardous use…

3.1 Use Standards

3.1.1 Hazardous use

There is no acceptable solution under clause E1.5.2 Hazardous uses, accordingly P1 must be satisfied.

P1

A hazardous use must only be located in a bushfire-prone area if a tolerable risk from bushfire can be achieved and maintained, having regard to:

(a) the location, characteristics, nature and scale of the use;

(b) whether there is an overriding benefit to the community;

(c) whether there is no suitable alternative lower-risk site;

(d) the emergency management strategy and bushfire hazard management plan as specified in A2 and A3 of this Standard; and

(e) other advice, if any, from the TFS.

The proposal is for the expansion of an existing resource processing use, which involves the storage of a flammable liquid (whiskey). The whiskey will initially be processed at 99 High Street, Oatlands and then stored on the subject site whilst it is aging. A resource processing use is an allowable use in the rural resource zone and given the size and utilitarian nature of the proposed sheds, the requirement for the size of the land and the operational need for the whisky aging process to be undertaken within proximity to 99 High Street, the subject site is ideal to meet the operational requirements of the use.

There are limited suitable alternative sites within proximity to the processing site at 99 High Street. With the requirement for a large site, all of the potential sites are on the edge of town as the use and development is prohibited within the General Residential and General Business zones and accordingly any alternative site would also be in a bushfire prone area. The subject site and surrounding land are flat, contains only grassland vegetation and has good road access. Given the above, the site presents a tolerable risk.

The proposal, which complies with A2 and A3 of this standard is consistent with the requirements of P1.

A2

An emergency management strategy, endorsed by the TFS or accredited person, that provides for mitigation measures to achieve and maintain a level of tolerable risk that is specifically developed to address the characteristics, nature and scale of the use having regard to:

(a) the nature of the bushfire-prone vegetation including the type, fuel load, structure and flammability; and

(b) available fire protection measures to:

(i) prevent the hazardous use from contributing to the spread or intensification of bushfire;

(ii) limit the potential for bushfire to be ignited on the site;

(iii) prevent exposure of people and the environment to the hazardous chemicals, explosives or emissions as a consequence of bushfire; and

(iv) reduce risk to emergency service personnel.

The preparation of an emergency management strategy is critical to the mitigation of bushfire risk for the site and to achieve a tolerable level of risk for the proposed use. The emergency management strategy described below identifies the nature of the bushfire hazard and the mitigating risk considerations.

TFS have endorsed the emergency management strategy on the 6 November 2020 with the following comments:

> *In relation to clause E1.5.1 A2, TFS has endorsed your emergency management strategy. The final bushfire emergency plan will need to be approved by TFS prior to occupancy. I note the facility will likely already have an emergency plan that deals with other types of risks so it would make sense to incorporate bushfire procedures into that document, in consultation with your client, rather than create a separate stand-alone EP for bushfire.*

3.2 Nature of Bushfire Hazard

As identified within section 2 of the report the potential bushfire risk is generated primarily from existing grassland vegetation to the north, south and east of the site – noting that the land to the west is existing graveled hardstand containing the previously approved storage sheds. Furthermore, given the location of Oatlands to the north, Lake Dulverton to the east and the prevailing summer winds from the north, the bushfire risk is highest from the north-west and west. The hazard management provisions that will form part of the bushfire hazard management plan include a graveled area for 20 m in all directions as well as a 50 m hazard management area to the west and east of the site and Bentwick and Hastings Street to the south and north respectively.

Given the larger context of the site, being entirely within the Midland Irrigation Scheme, the area being flat, and the incremental development of intensive farming enterprises such as cherry orchards and vineyards, the fuel load, structure and flammability of the nature of the bushfire prone vegetation is considered tolerable. Importantly, the graveled area surrounding, and between the sheds exceeds the minimum separation required to comply with the BAL 12.5 by 40%.

The potential bushfire scenario is likely to be impacted by ember attack only. Importantly, it is unlikely that direct flame contact will occur given the minimum separation distance of nearly 50 m from grassland vegetation.

3.3 Mitigating the Risks

The risk cannot be completely avoided given the proximity to grassland vegetation and the fundamental purpose of the use being for the storage of aging whiskey. The following is a breakdown of the risk.

3.3.1 Nature of Risk

The risk is associated with the resource processing use; specifically, the storage of a flammable liquid (whiskey); there will be no other flammable substances on the site. The sheds will be constructed to a BAL 12.5 and in combination with a 20 m setback, direct flame contact is unlikely; the flammable liquid will be isolated.

3.3.2 Occupancy Characteristics

The proposal will include a maximum of 1 – 2 staff which will visit the site 2 – 3 times per week. The period of time that the site will be visited will be between 7am and 7pm and will vary in length from 1 – 4 hours. Staffing of the site is limited to when the barrels are delivered; amenities such as toilets or a staff kitchen are not provided onsite, as staff will access these at their permanent place of work. It is notable that each staff member will always have a vehicle to access or leave the site.

The proposed use is operationally benign with the occupancy characteristics for the site reflecting this.

3.3.3 Offsite Occupancy Characteristics

The site is located within an area used for agricultural purposes and is approximately 500 m south of the edge of the Oatlands township. The site is not within proximity to schools, the town centre or neighbourhood centres, with the nearest residential use being over 50 m from the site.

3.3.4 Building and Site Vulnerability

The proposed sheds will each have a floor area of 360 m^2; each shed will be surrounded by a 20 m graveled area, will be constructed to BAL 12.5 and will each be serviced by a specialised water system using both 220,000 L of water storage and reticulated infrastructure with double head hydrants.

In addition to the area surrounding the hazardous use exceeding the setback requirements from the bushfire prone vegetation, the unlikely scenario of direct flame contact, the site has two road access points: Bentwick Street and Hastings Street.

3.3.5 Likelihood and Consequence of Flammable Liquid Being Impacted by Fire

As described above, the barrels holding the liquid will be stored within a building constructed to BAL 12.5, and will be stored in accordance with *AS1940-2004 The storage and handling of flammable and combustible liquids*, thereby isolating the hazardous substance from the risk. A detailed Fire Engineering Report can be found in Appendix D.

The risk is further mitigated by the graveled area having a minimum width of 20m.

3.4 Emergency Management Structure and Capability

It is highlighted that given the site is located within proximity to the township of Oatlands, the emergency management in terms of bushfire must be undertaken in a manner that is consistent with the management of

the entire town. Should the town be put on notice, evacuated or otherwise then the management of the site needs to be undertaken accordingly.

However, the Emergency Management Strategy will be reliant on the training of staff regarding the emergency management procedures in the event of a bushfire and importantly, understanding the alert levels for a bushfire risk and the trigger for the closure of the site to personnel. The training will include:

- Monitoring the Fire Dander Index (FDI) for the day. If the FDI is severe or greater (50+) then all staff (at the 99 High Street operation) are to be on high alert and monitor the bushfire threats in the area through the Tas Fire Service website (www.fire.tas.gov.au).
- If there is a bushfire in the area, the bushfire is to be continually monitored until the bushfire is no longer a risk.
- Understanding the trigger (through consultation with the fire agency) and the procedure for alerting all relevant personnel that the site is not to be accessed.
- Compulsory staff training is to be part of the induction process for all personnel that visit the site with the site managers being given a greater level of training involving the monitoring, alert levels, and the necessary contact people.

3.5 Primary and Contingency Bushfire Safety Options

The site is located on the edge of an established township. The monitoring of the fire in addition to the site managers role will be undertaken therefore on a whole of township basis in accordance with the direction of the Tasmanian Fire Service.

3.6 Evaluation of Risk

Whilst the storage of flammable liquid is a hazardous use, the materials are isolated from the bushfire hazard due to the barrels being stored within a building constructed to a BAL 12.5 and the graveled area surrounding the sheds.

The risk is manageable due to the following key factors:

- The site is on the edge of an established township which contains the first stage of the whiskey processing, ensuring that any risk of fire and associated alert levels will be continually monitored by the Tasmanian Fire Service.
- The expansive area surrounding the sheds which will be graveled (i.e. managed in a minimum fuel load condition).
- The site having good access to high quality public roads.
- Each shed having access to a minimum of 10,00 L in water supply.
- Infrequency of staff being located on site, whilst still having staff within 1.5km of the storage sheds.
- The ease of shutting the site down to personnel.
- The preparation of a Bushfire Emergency Management Plan in accordance with Bushfire Emergency Planning Guideline. The Bushfire Emergency Management Plan is a written set of instructions which detail what occupants and visitors to a site should do in preparation, response and following a bushfire emergency.

Accordingly, the proposed hazardous use on the subject site has a tolerable level of risk.

A3

A bushfire hazard management plan that contains appropriate bushfire protection measures that is certified by the TFS or an accredited person.

Appendix B shows bushfire management plan certified by the TFS. A3 is satisfied.

4 Conclusion

The proposal for the final six bond stores to be located on the site at 20 Bentwick Street, Oatlands has a tolerable level of risk and is consistent with the requirements of the Bushfire Prone Areas Code.

A condition is recommended for the planning permit that requires the proposal be consistent with the Bushfire Assessment Report and Hazard Management Plan.

Appendix A Plans

DEVELOPMENT APPLICATION FOR SIX SHEDS (BOND STORES)

C.T. 122266/2 PID 2046563

20 BENTWICK STREET, OATLANDS

LAND BOUNDED BY TUNNACK ROAD, BENTWICK STREET, WHYNYATES STREET & HASTINGS STREET

20 September 2020

Application for Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

APPLICATION DETAIL:

This is an application for six additional sheds on a 8.589 Ha title containing six existing sheds with a further six sheds currently under construction, leading to a total of 18 sheds. The new sheds are proposed to be identical to those existing and will be used for the same purpose: as 'bond stores' for the storage of aging whisky barrels. The land is located at 20 Bentwick Street, Oatlands, on the southern outskirts of the town. The property is bounded by Tunnack Road, Bentwick Street, Whynyates Street and Hastings Street. .

The land is zoned Rural Resource (Zone 26), is mostly under pasture and has a gentle slope to the east, down to its Tunnack Road frontage.

Each shed will be 30m x 12m and no greater in height than 6.9m. They will be positioned in a new line across the property in front of the existing line of sheds when viewed from Tunnack Road. The six new sheds will align with the existing sheds, forming a six-shed by three-shed grid, as indicated on the site plan. They will utilise the existing vehicular access from Bentwick Street, with vehicular access then gained from the internal hardstand vehicular maneuvering area surrounding the existing sheds.

They will be setback approximately 255m from the Tunnack Road frontage, 140m from the rear boundary (Whynyates Street), 27.5m from the eastern side boundary (Bentwick St) and 27.5m from the western side boundary (Hastings St). They will be separated from each other and from the existing line of sheds by 15m.

The gravel hardstand area around the existing sheds will be extended to encompass the new sheds, in accordance with the existing Bushfire Hazard Management Plan.

The sheds are to be used for the storage of aging whisky barrels from the soon-to-be-completed Callington Mill Distillery, to be sited next to Callington Mill in Oatlands. Whisky from other Tasmanian distilleries will also be stored.

Malt whisky is produced from Tasmanian barley which is predominantly grown in the Midlands region. As such, the use of the sheds is directly associated with the local processing of this local agricultural produce into a high-value product.

Bond stores are simply secure storage sheds. There is no machinery or processing involved and no external lighting.

Commercial vehicles accessing the site would be no more than one truck and one light vehicle per day. A forklift would be used within the sheds.

Staffing of the site is generally limited to the times when barrels are delivered, which is no more than once a day for a period of one or two hours. Facilities will therefore not be provided within the sheds, as staff can access these at their permanent place of work.

Application for Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

BUSHFIRE HAZARD MANAGEMENT PLAN:

The site is subject to an existing certified Bushfire Hazard Management Plan (BHMP).

The requirements of the BHMP will be applied and maintained in relation to the six new sheds, including:

- A gravelled area to be established between and around the buildings extending 20 metres in all directions.
- The remainder of the land to be maintained by grazing, slashing or similar to keep the fuel load low.
- Sheds constructed to BAL 12.5.
- Each shed to have access to at least 10,000 litres of water reserved for fire fighting purposes.

DIAGRAMS

The attached diagrams detail the following:

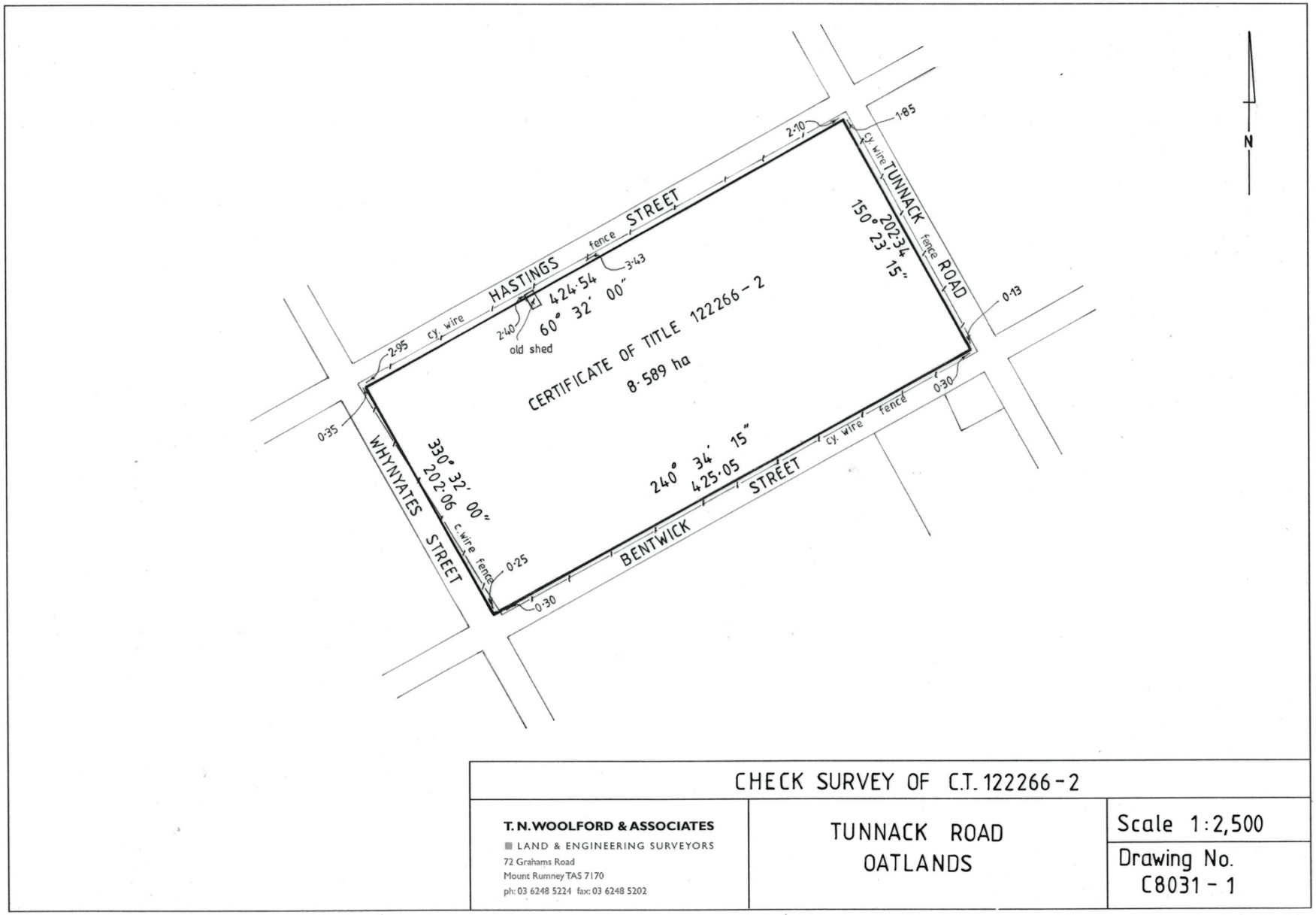
- Diagram 1: Site Plan.
- Diagram 2: Check Survey Plan.
- Diagram 3: Elevations and Floor Plan
- Diagram 4: Images: Existing Sheds. (New sheds to be the same as existing).
- Diagram 5: Images: Location of New Sheds.

Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 1 - Site Plan

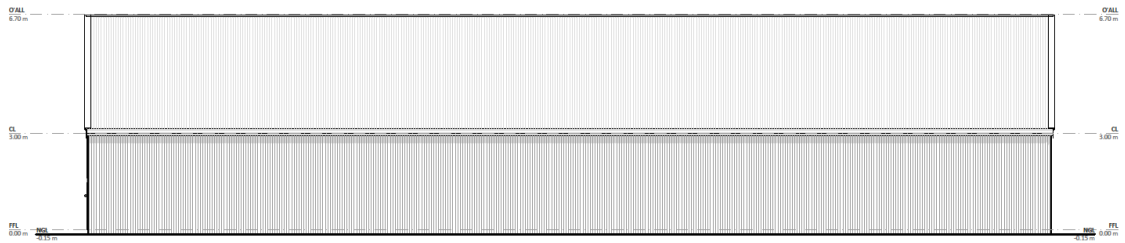
Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 2 – Check Survey Plan

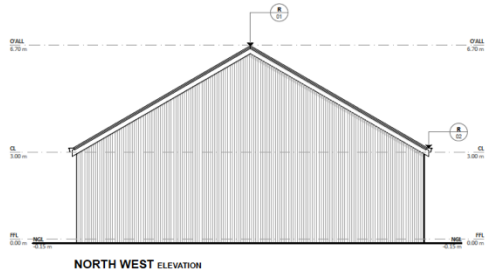


Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

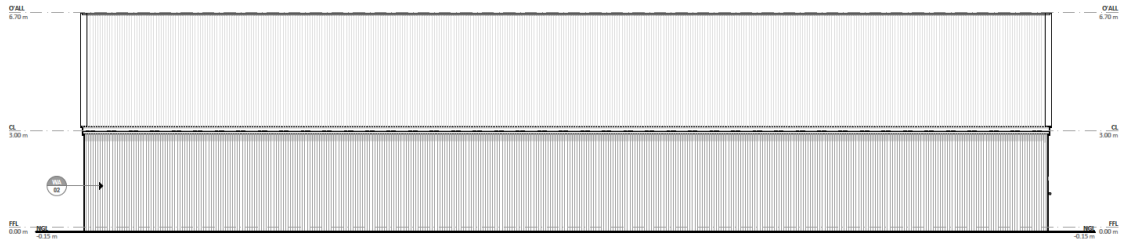
Diagram 3 – Elevations and Floor Plan



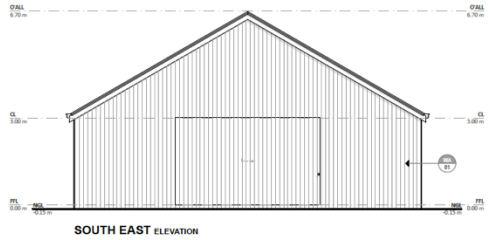
NORTH EAST ELEVATION



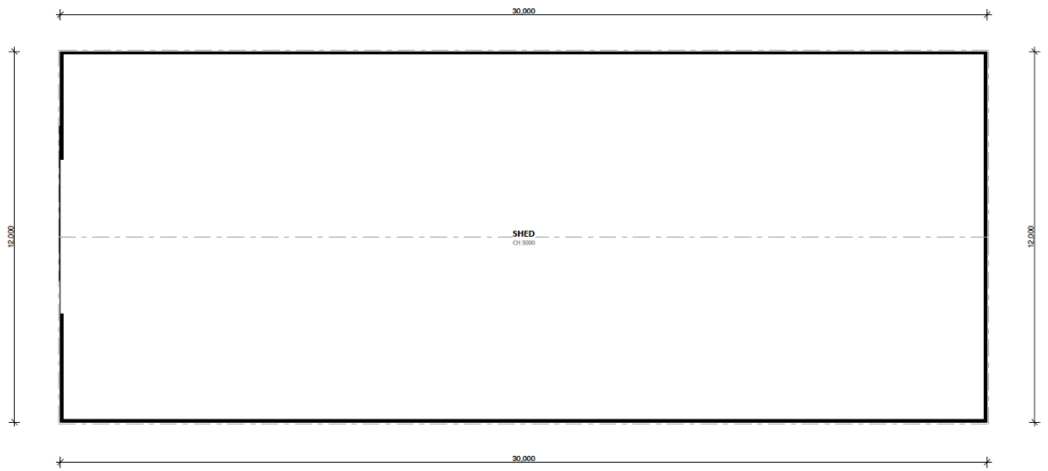
NORTH WEST ELEVATION



SOUTH WEST ELEVATION



SOUTH EAST ELEVATION



Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

Diagram 4 – Images: Existing Sheds.

Existing sheds: view from Hastings Street boundary showing rear walls (facing away from Tunnack Rd)

The new sheds will be the same design as existing.

Existing sheds: view from Bentwick Street boundary, showing ends (and water tanks) facing Tunnack Road. Proposed sheds to be located to the right.

Application for Storage Sheds (Bond Stores) - CT 122266-2, 20 Bentwick Street, Oatlands

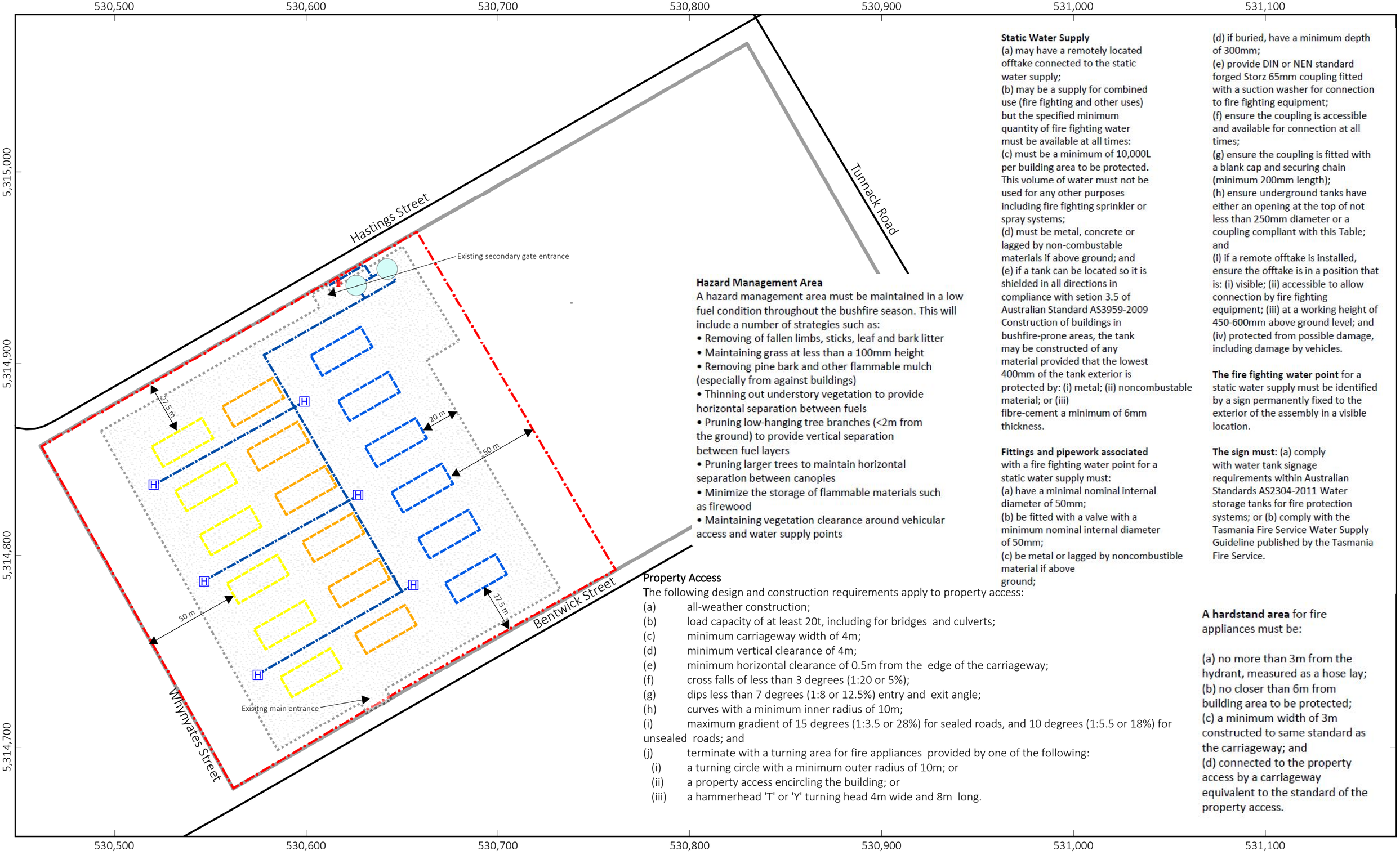
Diagram 5 – Images: Location of New Sheds.

View looking east across the proposed location of the new sheds with respect to the existing sheds. They will be located on the hardstand area.

The new sheds will be the same design as existing.

View looking north-east across the proposed location of the new sheds towards Tunnack Road.

Appendix B Bushfire Hazard Management Plan



Hazard Management Area
A hazard management area must be maintained in a low fuel condition throughout the bushfire season. This will include a number of strategies such as:
- Removing of fallen limbs, sticks, leaf and bark litter
- Maintaining grass at less than a 100mm height
- Removing pine bark and other flammable mulch (especially from against buildings)
- Thinning out understory vegetation to provide horizontal separation between fuels
- Pruning low-hanging tree branches (<2m from the ground) to provide vertical separation between fuel layers
- Pruning larger trees to maintain horizontal separation between canopies
- Minimize the storage of flammable materials such as firewood
- Maintaining vegetation clearance around vehicular access and water supply points

Property Access
The following design and construction requirements apply to property access:
(a) all-weather construction;
(b) load capacity of at least 20t, including for bridges and culverts;
(c) minimum carriageway width of 4m;
(d) minimum vertical clearance of 4m;
(e) minimum horizontal clearance of 0.5m from the edge of the carriageway;
(f) cross falls of less than 3 degrees (1:20 or 5%);
(g) dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;
(h) curves with a minimum inner radius of 10m;
(i) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and
(j) terminate with a turning area for fire appliances provided by one of the following:
(i) a turning circle with a minimum outer radius of 10m; or
(ii) a property access encircling the building; or
(iii) a hammerhead 'T' or 'Y' turning head 4m wide and 8m long.

Static Water Supply
(a) may have a remotely located offtake connected to the static water supply;
(b) may be a supply for combined use (fire fighting and other uses) but the specified minimum quantity of fire fighting water must be available at all times:
(c) must be a minimum of 10,000L per building area to be protected. This volume of water must not be used for any other purposes including fire fighting sprinkler or spray systems;
(d) must be metal, concrete or lagged by non-combustable materials if above ground; and
(e) if a tank can be located so it is shielded in all directions in compliance with setion 3.5 of Australian Standard AS3959-2009 Construction of buildings in bushfire-prone areas, the tank may be constructed of any material provided that the lowest 400mm of the tank exterior is protected by: (i) metal; (ii) noncombustable material; or (iii) fibre-cement a minimum of 6mm thickness.

Fittings and pipework associated with a fire fighting water point for a static water supply must:
(a) have a minimal nominal internal diameter of 50mm;
(b) be fitted with a valve with a minimum nominal internal diameter of 50mm;
(c) be metal or lagged by noncombustible material if above ground;
(d) if buried, have a minimum depth of 300mm;
(e) provide DIN or NEN standard forged Storz 65mm coupling fitted with a suction washer for connection to fire fighting equipment;
(f) ensure the coupling is accessible and available for connection at all times;
(g) ensure the coupling is fitted with a blank cap and securing chain (minimum 200mm length);
(h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and
(i) if a remote offtake is installed, ensure the offtake is in a position that is: (i) visible; (ii) accessible to allow connection by fire fighting equipment; (iii) at a working height of 450-600mm above ground level; and (iv) protected from possible damage, including damage by vehicles.

The fire fighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location.

The sign must: (a) comply with water tank signage requirements within Australian Standards AS2304-2011 Water storage tanks for fire protection systems; or (b) comply with the Tasmania Fire Service Water Supply Guideline published by the Tasmania Fire Service.

A hardstand area for fire appliances must be:

(a) no more than 3m from the hydrant, measured as a hose lay;
(b) no closer than 6m from building area to be protected;
(c) a minimum width of 3m constructed to same standard as the carriageway; and
(d) connected to the property access by a carriageway equivalent to the standard of the property access.

04.28.5 17 25.5 34 42.5
Metres
Map Projection: Transverse Mercator
Horizontal Datum: WGS 1984
Grid: WGS 1984 UTM Zone 55S

Job Number	1920_028
Revision	B
Date	02 Nov 2020

N

Lot Boundary
Hazard Management Area
Hardstand Area
<all other values>

Whiskey Storage Sheds
Exisiting
Proposed
Under construction

Water Tanks 110 KL
Supply Pipeline
Hydrants
Brigade Hydrant Booster

41 Hastings Street Oatlands

Bond Store BHMP

Date: 29/10/2020
Proposal: Resource Processing (storage of flamable liquid - WhiskeyJob Reference: 1718-089

Bushfire practitioner: Clare hester (BFP 149)

era PLANNING & ENVIRONMENT

Appendix C Planning Certificate

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE[1] UNDER S51(2)(d) *LAND USE PLANNING AND APPROVALS ACT 1993*

1. Land to which certificate applies

The subject site includes property that is proposed for use and development and includes all properties upon which works are proposed for bushfire protection purposes.

Street address:	20 Bentwick Street, Oatlands
Certificate of Title / PID:	**122266/2**

2. Proposed Use or Development

Description of proposed Use and Development:	Resource processing (storage of flammable liquid) Storage of (total on site) 540,000 L
Applicable Planning Scheme:	*Southern Midlands Interim Planning Scheme 2015*

3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
Bushfire Assessment Report	Clare Hester	6 November 2020	Final_V1
Fire Safety Engineering Report	COVA	3 November 2020	Rev_1

[1] This document is the approved form of certification for this purpose and must not be altered from its original form.

4. Nature of Certificate

The following requirements are applicable to the proposed use and development:

☐	**E1.4 / C13.4 – Use or development exempt from this Code**	
	Compliance test	**Compliance Requirement**
☐	E1.4(a) / C13.4.1(a)	Insufficient increase in risk

☐	**E1.5.1 / C13.5.1 – Vulnerable Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.1 P1 / C13.5.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.1 A2 / C13.5.1 A2	Emergency management strategy
☐	E1.5.1 A3 / C13.5.1 A2	Bushfire hazard management plan

☐	**E1.5.2 / C13.5.2 – Hazardous Uses**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.2 P1 / C13.5.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.*** See assessment in Bushfire Assessment Report
☒	E1.5.2 A2 / C13.5.2 A2	Emergency management strategy
☒	E1.5.2 A3 / C13.5.2 A3	Bushfire hazard management plan

☐	**E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.1 P1 / C13.6.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.6.1 A1 (a) / C13.6.1 A1(a)	Insufficient increase in risk
☐	E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots (including any lot designated as 'balance')

☐	E1.6.1 A1(c) / C13.6.1 A1(c)	Consent for Part 5 Agreement

☐	**E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.2 P1 / C13.6.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.6.2 A1 (a) / C13.6.2 A1 (a)	Insufficient increase in risk
☐	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

☐	**E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes**	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.3 A1 (a) / C13.6.3 A1 (a)	Insufficient increase in risk
☐	E1.6.3 A1 (b) / C13.6.3 A1 (b)	Reticulated water supply complies with relevant Table
☐	E1.6.3 A1 (c) / C13.6.3 A1 (c)	Water supply consistent with the objective
☐	E1.6.3 A2 (a) / C13.6.3 A2 (a)	Insufficient increase in risk
☐	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant Table
☐	E1.6.3 A2 (c) / C13.6.3 A2 (c)	Static water supply consistent with the objective

5. Bushfire Hazard Practitioner

Name:	Clare Hester	**Phone No:**	0429 359 636
Postal Address:	7 Commercial Road North Hobart	**Email Address:**	clare@eraplanning.com.au
Accreditation No:	BFP – 149	**Scope:**	1, 2, 3A, 3B

6. Certification

I certify that in accordance with the authority given under Part 4A of the *Fire Service Act 1979* that the proposed use and development:

☐ Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or

☒ The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate.

Signed:
certifier

Name: Clare Hester **Date:** 3 November 2020

Certificate Number: 1718-089

(for Practitioner Use only)

Appendix D Fire Safety Engineering Report

Oatlands Bond Stores, Oatlands, Tas. – Fire Safety

FIRE ENGINEERING REPORT for DASCO PTY LTD

Project No: 5519.001
FSER Rev 1
3rd November 2020

DOCUMENT ISSUE AUTHORISATION

PROJECT: Oatlands Bond Stores, Oatlands, Tasmania – Fire Safety
PROJECT NO: 5519.001
AUTHOR: Miles Harrison
BSc(Mech Eng), FIEAust,
NER (Mechanical & Fire Safety),
Grad Cert Performance Based Fire & Building Codes (VUT).
Grad Diploma in Building Fire Safety & Risk Engineering (VUT).
Licenced Building Practitioner (Tas) CC1536R

DATE	PURPOSE OF ISSUE/NATURE OF REVISION	REV	REVIEWED BY	ISSUE AUTHORISED BY
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COVA Thinking Pty Ltd
Suite 5, 40 Molle St, Hobart, TAS 7000 AU
ACN 117 492 814 ABN 24 117 492 814

Telephone: (03) 6212 4400
Email: cova@covathinking.com

CONTENTS

APPENDIX A - DRAWINGS

1. EXECUTIVE SUMMARY

The firefighting water supply system at the Oatlands Bond Store facility has been designed to suit the particular hazard presented by this type of installation and does not fully comply with the National Construction Code (NCC) Deemed to Satisfy (DtS) requirement which references Australian Standard AS 2419.1 – Fire Hydrant Installations Systems Design, Installation and Commissioning. A Performance Solution is presented to allow the use of fire extinguishers in lieu of fire hose reels.

This Fire Safety Engineering Report (FSER) presents an NCC compliant Performance Solution that will allow the project to meet the requirements of the Tasmanian Building Act 2016 (as amended).

The non-compliances with NCC DtS requirements applying to this project is shown below together with the proposed Performance Solutions:

Item	Proposed Construction	Assessment Method	Deemed-to-Satisfy Requirement	Meeting the Performance Requirement
Non-Compliant Water Storage and water delivery arrangement.	Minimum Fire Water storage volume of 220,000 litres. Fire Water pumping by means of Tasmania Fire Service appliance.	A2.2(2)(c)	E1.3	A2.2(1)(a), EP1.3
Deletion of the requirement for Hose Reels	Provision of Fire Extinguishers as required by Table 11.3 of AS 1940	A2.2(2)(c)	E1.4	A2.2(1)(a), EP1.1

A Schedule of Required Fire Safety Features can be found in Section 10 of this FSER.

2. INTRODUCTION

2.1 BACKGROUND

The Oatlands Bond Stores have a range of almost unique features that make them very different to the types of buildings envisaged in the NCC. Whilst they are classified as Class 7b – storage buildings, they are more akin in some regards to archive buildings wherein, once the stored material is in place, access is extremely rare with the storage periods being measured in decades. They are located remote from populated areas being surrounded by paddocks in an agricultural setting. During the long storage periods, the buildings have a fully compliant power supply and hence a fire accident due to an electricity fault is extremely unlikely. Given these features, risk to life and property from a fire incident are extremely low, but the stored material is flammable Potable Spirit in wooden barrels (65% Ethanol by volume is classified as a Packing Group II Flammable Liquid. Refer AS 1940) and due to this and the large volume of the stored material (around 150,000 litres/store – varies with store size), such a fire could be very large and would need to be appropriately managed as required by the Tasmanian Fire Service Act.

As part of the Building Approvals process for buildings used for storage of Hazardous/Dangerous Goods, the Bond Stores have been subjected to a formal Risk Assessment process in order to comply with the requirements of the Dangerous Goods (General) Regulations 1998 and the Tasmanian Building Act 2016. The report produced in respect of this is used as a source document for this FSER. The key conclusion and recommendation of the Risk Report is that a fixed firefighting water supply be provided and this FSER confirms the Risk Report's findings and outlines a firefighting methodology that is judged to be appropriate for a site of this nature.

This Fire Safety Engineering Report (FSER) provides an NCC compliant Performance Solution that will enable the Bond Store buildings to comply with the Tasmanian Building Act 2016 (as amended). This FSER has been prepared in accordance with the general methodology of the International Fire Engineering Guidelines (IFEG).

2.2 STAKEHOLDERS

Proprietor:	Lake Frederick Inn Pty Ltd,
Proprietor's Representative:	Mr Hamid Saeidi, Dasco Pty Ltd
Building Surveyor:	Mr Leon McGuinness, Leon McGuinness Building Surveying
Responsible Fire Authority:	Mr Daniel Greig & Mr Steven Davison, Tasmania Fire Service (TFS)
Fire Engineer:	Mr Miles Harrison, COVA Thinking
Services Engineers:	Mr Julian Cook, COVA Thinking

2.3 LIMITATIONS

The Performance Solution proposed herein is based on the above documents and on the specific criteria identified in this report. The Performance Solutions may be invalidated by any subsequent design or usage changes.

This FSER does not consider the cases of

- A terrorism attack or
- A situation in which multiple ignition sources (arson) are involved.

This FSER does not include detailed design information. It includes sufficient performance-based information to enable an appropriately qualified designer to carry out the required detailed design work.

2.4 REFERENCE DOCUMENTS

The following documents form the basis of preparation of this FSER: -

- Report by Riskcon Engineering Pty Ltd – Pontville & Oatlands Bond Rooms reference number RCE-20063_RA_Final_28Oct20_Rev(2). This report is appended to the FSER in full.
- Drawings and aerial photos of the site are attached at the back of this report.
- AS 1940:2017 – Storage and Handling of Flammable & Combustible Liquids
- National Construction Code 2019 (NCC)
- Building Surveyor document DOC-43965-5386574074-23350-9778976440.pdf.
- Bushfire Assessment Report by Era Planning & Environment – project # 1718-089

3. BUILDING DESCRIPTION

3.1 GENERAL

The building description is focussed on the proposed Performance Solution and it is therefore not fully comprehensive.

3.2 BUILDING USAGE, CLASSIFICATION AND TYPE OF CONSTRUCTION

The Bond Stores are classified as Class 7b – Storage.

A single storey Class 7b building of less than 2000m^2 must be constructed to Type C fire resistant construction standard. However additional requirements arise in respect of AS1940 compliance with the key requirement being that a Bond Store building of the proposed size must be constructed from non-combustible materials.

3.3 MATERIALS OF CONSTRUCTION

The floors are concrete slabs. External walls and roofs are sheet metal supported on structural steel frame. Skylights are of Polycarbonate material. This has good fire properties in that it does not readily ignite and, if subjected to high radiation levels, tends to melt away from the fire source.

Internal bunding is to be provided with the bund wall height to be capable of containing the liquid volume required by AS1940. Access ramps will need to be provided over the bund wall to facilitate loading and unloading of barrels.

3.4 BUILDING GEOMETRY & FUNCTION

Floor plans are included at the back of this report to assist in understanding of the Performance Solution.

Each Bond Store is approximately 12m x 30m with 3m wall height up to the gutters. Pitched roof apex height is 6m.

The sole function of the buildings is long term storage of Potable Spirits in maturing timber barrels.

3.5 ACCESS & EGRESS

The Building Surveyor has judged that building access and egress provisions meet requirements of the NCC.

The site is provided with 2 entrances as required by the TFS.

3.6 FIRE & SMOKE COMPARTMENTATION AND SEPARATION

The minimum separation distance between buildings as required by the NCC DtS provisions is not relevant to this project because it is less than that required by AS 1940 – Storage and Handing of Flammable & Combustible Liquids. Table 4.1 of AS 1940 requires:

- a minimum separation distance of 20m between stores and
- 3m separation from the property boundary in the instance where no off-site protected place exists or
- 20m minimum separation distance to an off-site protected place.

At Oatlands the side to side separation distances are 15m and the end to end separation distances are 12.5m. Distances from the property boundary are 27.5m. The separation distance non-compliance issue is addressed in the Risk Assessment Report and, for the site geometry and application, has been found to be acceptable.

3.7 SERVICES

The following paragraphs identify services being provided to meet NCC DtS requirements and requirements arising from the Performance Solution. A schedule of fire safety features required to satisfy the proposed Performance Solution can be found in Section 10 – *Conclusion & Required Fire Safety Features*.

Fire Detection & Occupant Warning
Not Required

Sprinklers
Not Required.

Hydrants
A performance solution proposes the provision of a firefighting water supply system as described below and as shown on the attached drawings.

Hose Reels
A performance solution proposes that no hose reels be provided for the Bond Stores.

Fire Extinguishers
Fire extinguishers will be provided in accordance with Table 11.3 of AS 1940 (>100 to ≤600m^3) or AS2444, whichever is the more stringent.

Exit & Emergency Lighting
The Bond Stores will have a fully compliant power supply as required for use in an area housing flammable liquids. The Building Surveyor has assessed that the proposed exit and emergency lighting arrangement meets NCC requirements.

Ventilation & Smoke Management
There is no requirement for a smoke management system.

Ventilation is currently by means of ridge line natural ventilators. At present there are no fixed low-level air inlets, but these will be provided during remedial works. The new inlet ventilation louvres will need to incorporate ember protection screens and shall be sized to meet AS 1940 air flow requirements with such screens in place.

4. OCCUPANT CHARACTERISTICS

Only Oatlands staff and government inspectors will enter the Bond Stores. Staff will be trained in emergency response and will be fully familiar with building geometry and firefighting resources. Refer to the Performance Solution section below for further discussion in respect of emergency response.

5. FIRE SAFETY OBJECTIVES

5.1 LEGISLATIVE OBJECTIVES

The only objective in respect of fire safety is to achieve compliance with the requirements of the NCC and the Tasmanian Dangerous Goods (General) Regulations 1998. By default, such compliance includes occupant safety, emergency services personnel safety and provides for protection of adjacent property.

5.2 CLIENT OBJECTIVES

The Client has no objectives other than compliance with regulatory requirements.

6. NCC DTS NON-COMPLIANCES & PERFORMANCE SOLUTION PROPOSALS

6.1 BOND STORE FIRE HYDRANT SYSTEM - PERFORMANCE SOLUTION

NCC Clause E1.3 requires that a fire hydrant system shall comply with AS 2419.1:2017 - Fire Hydrant Installations System Design, Installation and Commissioning. The prescribed number of hydrants flowing simultaneously and required flow rates are set down in AS1940 – Storage and Handling of Flammable and Combustible Liquids.

A formal risk assessment has determined worst credible fire characteristics and the amount of firefighting water needed to cool adjacent structures. The rural nature of the unpowered site and its use for long term storage with no occupants normally on site has led to the selection of a fire hydrant system that will use tanks as a water source and which will rely on the use of a Tasmania Fire Service pumping appliance for delivery of firefighting water. The Performance Solution will provide NCC compliant fire safety by virtue of compliance with Performance Requirement EP1.3.

6.2 DELETION OF HOSE REELS - PERFORMANCE SOLUTION

A fire incident at a Bond Store housing timber barrels full of Potable Spirits is likely to be extremely fast in developing untenable conditions. Under these circumstances it is essential that staff (untrained in fire suppression) evacuate immediately and do not attempt to deploy a small capacity fire hose to suppress the fire. The Performance Solution will argue for the use of fire extinguishers deployed to comply with AS1940 in preference to the use of Hose Reels. NCC compliance will be demonstrated by meeting Performance Requirements EP 1.1.

6.3 PERFORMANCE SOLUTION SUMMARY

Item	Proposed Construction	Assessment Method	Deemed-to-Satisfy Requirement	Meeting the Performance Requirement
Non-Compliant Water Storage and water delivery arrangement.	Minimum Fire Water storage volume of 220,000 litres. Fire Water pumping by means of Tasmania Fire Service appliance.	A2.2(2)(c)	E1.3	A2.2(1)(a), EP1.3
Deletion of the requirement for Hose Reels	Provision of Fire Extinguishers as required by Table 11.3 of AS 1940	A2.2(2)(c)	E1.4	A2.2(1)(a), EP1.1

7. HAZARDS AND PREVENTATIVE & PROTECTIVE MEASURES

Refer to the attached Risk Assessment report for a discussion of hazards and associated preventative and protective measures.

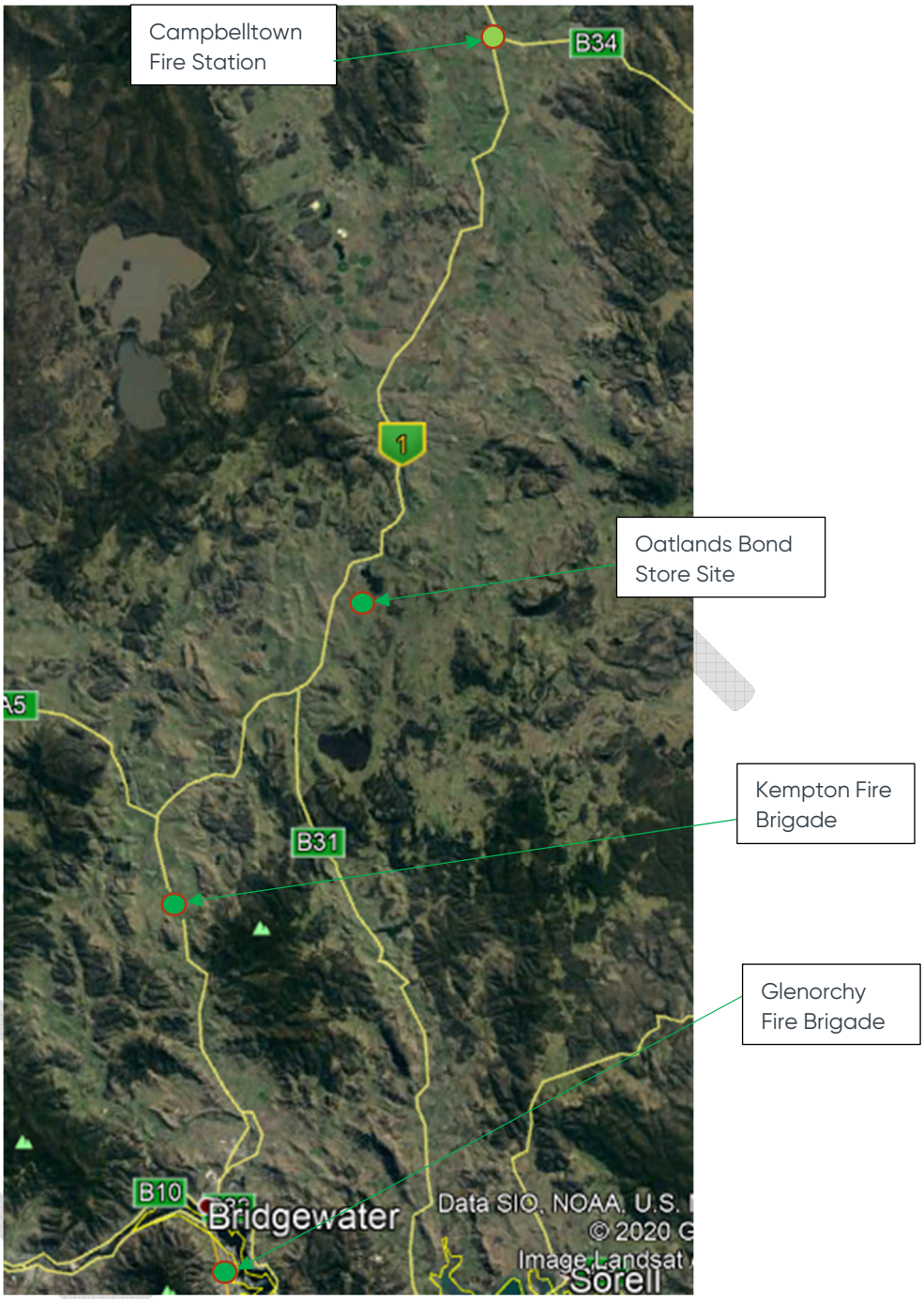
The Bushfire Hazard Report for this development outlines measures required to manage bushfire risk at the Bond Store site.

8. FIRE BRIGADE RESPONSE

Tasmania Fire Service (TFS) facilities nearest to the Oatlands Bond Store site are located at Oatlands, Campbelltown/Ross and Kempton. All of these fire stations are equipped with pumper appliance vehicles and smaller capacity bushfire trucks, but all are manned by volunteer crews. The nearest 24-hour manned fire station is at Glenorchy as shown on the map below. Travel distance from Glenorchy to Oatlands is around 77km so that likely response time to site would be in the region of over one hour. The Launceston Fire Station is 116km from Oatlands so response time would be in the region of 1.5 hours.

Once on site the Fire Brigade would connect the pumping appliance(s) to the fire water tanks and adjacent feed hydrant inlets.

Fire hoses would be deployed and connected to attack hydrants located near the Bond Stores requiring cooling water. In the early stage of a fully developed Bond Store fire, it is essential that fire water NOT be directed at the fire as this could result in the containment bund overflowing with possible rapid fire spread to adjacent Bond Stores and in environmental contamination. In the early stage of a fire firewater must be directed ONLY to cool adjacent



buildings and to control any nearby grass fire. For building cooling purposes, it will be necessary to use low pressure long throw nozzles to minimise water loss due to spray. High pressure fogging nozzles must not be used. The design flow rate for adjacent building cooling purposes is an average of 15 l/s as stipulated in the attached Risk Report. After a burning period of approximately 2 hours, it should be possible to commence dilution of the remaining Ethanol pool in the bund and this would eventually result in extinguishment of the pool fire.

9. PERFORMANCE SOLUTIONS

9.1 BOND STORE FIRE HYDRANT SYSTEM - PERFORMANCE SOLUTION

9.1.1 PERFORMANCE SOLUTION CONCEPT

The intention of this Performance Solution is to provide a foolproof, reliable firewater supply system that ensures safety for Fire Brigade personnel, prevents fire spread to other Bond Stores, allows for bushfire control and for eventual suppression of the fire.

9.1.2 APPROACH & ANALYSIS METHOD

The Performance Solution will use a combination of qualitative and deterministic quantitative arguments (by means of reference to the attached Risk Report) to demonstrate that it meets the NCC Performance requirements. IFEG Subsystems considered will include the following:

SSA – Fire Initiation & Development & Control - considered
SSC – Fire Spread & Impact & Control - considered
SSD – Fire Detection, Warning and Suppression - considered
SSE – Occupant Evacuation and Control – considered
SSF – Fire Services Intervention - considered

9.1.3 ACCEPTANCE CRITERIA AND SAFETY FACTORS

Numerical acceptance criteria are not required for this Performance Solution. Fire Brigade personnel will be able to deploy firefighting hoses in such a manner that recommended maximum radiation levels are not exceeded at any time.

9.1.4 DESIGN FIRE SELECTION

Two principal types of fire scenario could occur at the Oatlands Bond Stores:

1. An outbreak of fire when staff are on site.
2. An outbreak of fire when the site is unattended.

The critical type of fire for which the fire hydrant system is designed can only occur due to the prolonged application of fire energy to a wooden barrel of Potable Liquid, with the worst case being that of a fire at the bottom of a storage stack. Under this circumstance, barrels above would distort allowing flammable liquid to contribute towards increasing fire size. With a large enough fire in a vertical stack, radiant heat would cause adjacent barrels to commence burning and these, in turn, would leak flammable liquid. With sufficient mass loss of barrel strakes, the fire affected barrels would progressively collapse, and all of the remaining stored liquid would fall into the bunded area whereon flames would spread to other stacks and the process would be repeated. The Risk Assessment company, Riskcon Engineering, has assessed that the rate of barrel collapse and associated build-up of liquid would be consistent with the bunding requirements of AS1940. Rising internal building temperature would eventually cause the polycarbonate roof lights to melt thereby providing increasing air supply for the growing fire. Ultimately internal temperature would be high enough to cause building collapse with the fire continuing to consume the bunded ethanol by virtue of the gaps in the distorted and collapsed sheet metal walls and roof.

Having outlined the critical design fire, it must be recognised, as identified in the Risk Report, that the probability of such an occurrence is very low, particularly as the Oatlands Bond Stores have a fully compliant power supply and, for most of the time, are unstaffed. The only credible ignition sources capable of producing such a fire are:

A loading/unloading fork lift truck accident

- A bushfire
- A lightning strike
- Vandalism

These will be discussed below.

9.1.5 FIRE SAFETY DISCUSSION AND ANALYSIS

Outbreak of Fire when Staff are on site.
A gas powered fork lift truck fire scenario will either only involve the fork truck itself, in which case the staff involved may be able to suppress the fire using fire extinguishers provided specifically for this purpose, or will involve a collision with or dropping of barrels which allows flammable liquid to join the conflagration. Under these circumstances staff should immediately evacuate the building and call the fire brigade. Staff are not trained in fire suppression using an on-site fire hydrant system so there is no purpose in constructing one that can be used before Fire Brigade appliances arrive on site.

Outbreak of Fire when the site is unattended.
Lightning strikes are becoming more common as a result of climate change. A direct hit on the metal roof of one of the Bond Stores could cause molten metal to fall onto the timber barrels below. Whether or not the heated metal would have sufficient thermal energy to ignite a timber barrel and cause a sustained fire is clearly open to question because of the number of variables involved. However, in 2018 Tasmania sustained thousands of lightning strikes that caused massive bushfire damage, so this ignition source cannot be ruled out.

Grassland type bushfires are common in Tasmania and the Oatlands Bond Stores are surrounded by grassland. The bushfire hazard management plan will ensure that combustibles surrounding the Bond Stores are kept to a minimum. This means that the most likely fire transmission mechanism is by means of ember attack. Ventilators and inlet grilles will be ember protected and building materials will be non-combustible. Grassland embers have low thermal mass and limited fire duration so that, even if some embers make their way into the interior of the Bond Stores, it is highly unlikely that they would have sufficient ignition energy to cause a sustained barrel fire.

Vandalism of the Bond Stores is a possibility and a determined person could certainly initiate the sort of critical fire scenario outlined in section 9.1.4.

The common factor in all of these situations is that the presence of fire would not be noticed until a Bond Store was well alight under which circumstance a member of the public or resident would raise the fire alarm.

Firefighting Response
Section 8 outlines Fire Brigade Response requirements. The common thread in all of the above scenarios is that, in the highly unlikely event of a developing Bond Store fire, Fire Brigade response time inevitably means that fire suppression following site set-up will not immediately be possible. Once a pumping appliance has arrived on site and has been connected to the water tanks and feed hydrant, the fire would be managed by keeping adjacent structures cool until such time as extinguishment by means of bund pool dilution becomes possible.

9.1.6 NCC PERFORMANCE REQUIREMENTS

The above arguments have shown how the Performance Solution meets NCC Performance Requirements and these are summarised in following tables.

EP1.3	Compliance Comment
A hydrant system must be provided to the degree necessary to facilitate the needs of the fire brigade appropriate to-	The referenced Risk Assessment Report outlines firefighting water supply requirements for protection of adjacent structures and eventual suppression of a bond store fire.
(a) fire-fighting operations; and	Dual Water tanks will be provided with suction connections for attachment to TFS pumper appliance(s). Firefighting water will be reticulated in an AS2419 compliant underground piped network to attack hydrants positioned to facilitate delivery of cooling water to buildings adjacent to the fire whilst providing safe working conditions for Firefighters. Refer to the attached drawing for details.
(b) the floor area of the building; and	Each bond store is single storey and has a floor area of 360m^2.

EP1.3 (Cont)	Compliance Comment
(c) the fire hazard.	Each bond store contains in the region of 150,000 litres of 65% proof potable spirits stored in wooden barrels. Once liquid level in the bund has reduced due to burning, the remaining ethanol can be diluted to achieve fire suppression.

The above arguments demonstrate NCC compliance in accordance with Clauses A2.2(2)(c) and A2.2(1)(a).

9.2 DELETION OF INTERNAL FIRE HYDRANTS & HOSE REELS - PERFORMANCE SOLUTION

9.2.1 PERFORMANCE SOLUTION CONCEPTS

The Performance Solution in respect of the deletion of the requirement for fire hose reels argues that the use of a fire hose reel in a potable spirits bond store situation would actually decrease fire safety.

9.2.2 APPROACH & ANALYSIS METHOD

This Performance Solution utilises a qualitative comparative argument in order to demonstrate NCC compliance.

9.2.3 ACCEPTANCE CRITERIA AND SAFETY FACTORS

Numerical acceptance criteria are not required for a comparative Performance Solution. A safety factor is not required.

9.2.4 DESIGN FIRE SELECTION

No specific design fire is required.

9.2.5 FIRE SAFETY DISCUSSION AND ANALYSIS

Sections 9.1.4 and 9.1.5 outline likely fire scenarios and the associated responses to such occurrences. Should a fire occur with a staff member(s) on site, and should the accident have occurred in such a way that no barrels had been initially damaged, then first fire attack using one of the fire extinguishers located no more than 15m away would provide a fast and effective means of fire suppression. By contrast, a fire hose reel could be up to 30m away from the site of the fire and the staff member would have to take valuable time to travel to the hose reel and then to deploy the hose before being able to commence first fire attack. Given the nature of the stored material, the fire may well have become uncontrollable by the time the hose reel had been deployed thereby decreasing safety for the staff member.

9.2.6 PERFORMANCE REQUIREMENTS

The following tables show how the Performance Solution meets NCC Performance Requirements.

EP1.1	Compliance Comment
A fire hose reel system must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to-	The nature of the stored materials (65% proof potable spirits stored in wooden barrels) and the consequential likely rapidity of fire spread makes the use of fire hose reels potentially less safe than the use of fire extinguishers. Refer above text.
(i) the size of the fire compartment; and	Each bond store is single storey and has a floor area of 360m^2.
(ii) the function or use of the building; and	Each bond store contains in the region of 150,000 litres of 65% proof potable spirits stored in wooden barrels.
(iii) any other fire safety systems installed in the building; and	There are no other fire safety systems

EP1.1 (Cont)	Compliance Comment
(iv) the fire hazard.	Fire Extinguishers & Hose Reels are only used for early fire control. In the event of rapid fire development whilst a hose reel is being deployed, such a situation would provide less fire safety for the staff member than the use of a fire extinguisher located nearer to the fire. The use of Fire Extinguishers under this circumstance provides superior safety for staff members and is therefore better than the DTS requirement.

The above discussion has shown that the Performance Solution provides equivalent fire safety when compared with an NCC DtS compliant solution thereby meeting the requirements of NCC Clauses A2.2(2)(c) and A2.2(1)(a).

10. CONCLUSION AND REQUIRED FIRE SAFETY FEATURES

Provided the following required fire safety features, and those identified in Section 3, are installed at Oatlands Bond Store site, the proposed Performance Solutions have been demonstrated to meet NCC Compliance Requirements.

- Ensure that electrical systems comply with the Hazardous Area requirements of AS3000 – Wiring Rules.
- All Bond Stores shall be provided with 50mm bunding – refer attached Riskcon report.
- Provide a fire hydrant system and fire water storage as described in Section 3 and as shown on the attached drawing.
- Fire extinguishers shall be provided in accordance with Table 11.3 of AS 1940 (>100 to ≤600m^3) or AS2444, whichever is the more stringent
- Provide new natural ventilation inlet ventilation louvres as per requirements of AS1940. These will need to incorporate ember protection screens and shall be sized to meet AS 1940 air flow requirements with such screens in place.

In respect of "Management in Use" issues:

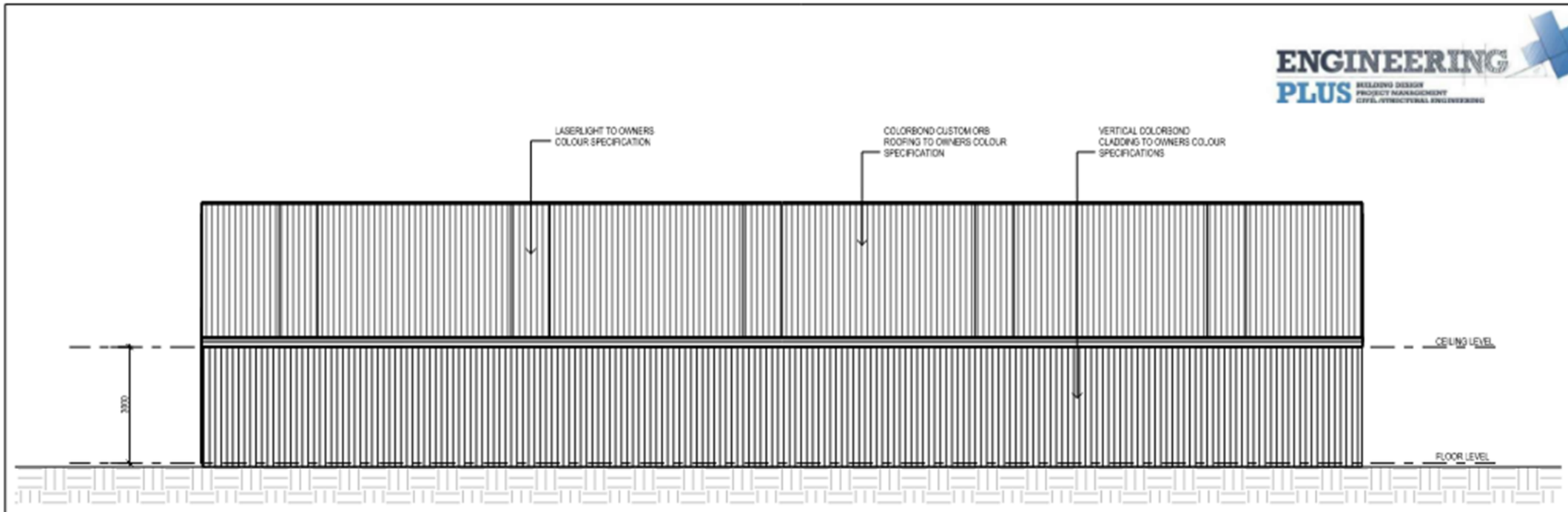
- Observe the requirements of the Bushfire Hazard Management Plan.
- Identify that the building is the subject of Performance Solutions on the building Form 56 and reference this FSER.

11. REFERENCES

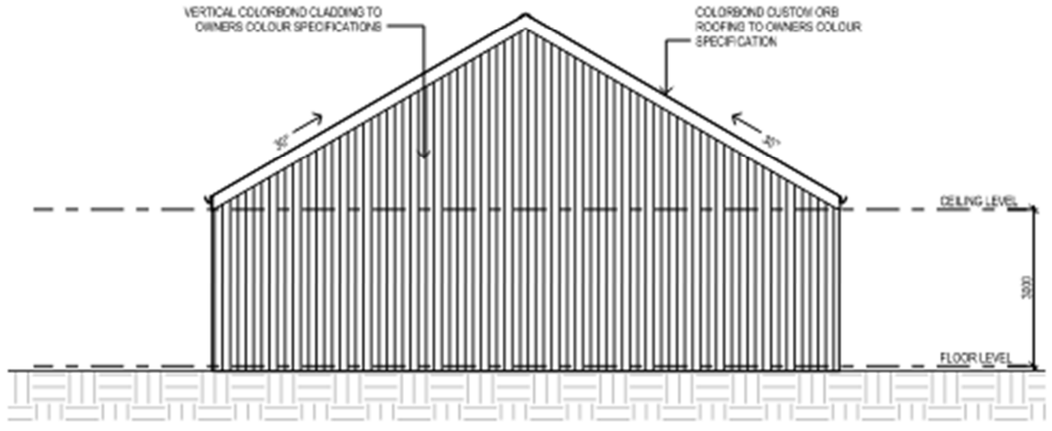
1. International Fire Engineering Guidelines - 2005
2. CIBSE Guide E – Fire Safety Engineering

APPENDIX A

DRAWINGS



NORTH WEST ELEVATION
SCALE 1 : 100



SOUTH WEST ELEVATION
SCALE 1 : 100

Southern Midlands Council
Certificate of Likely Compliance Plumbing
CLC: 2020/51
Date: 14/5/2020
Permit Authority:

ISSUED FOR CONSTRUCTION

Rev:	Amendment:	Date:	Int:
0	ISSUED FOR CONSTRUCTION	23.04.20	L.K.

Date Drawn: 23.04.20
Drawn: L. Kaukenas
Checked: A. Taylor
Approved: J. Pfeiffer
Scale: As Shown @ A3

Client: LAKE FREDERICK INN PTY. LTD.
Project: PROPOSED BOND STORES
Address: 20 BENTWICK STREET
OATLANDS

Mob 0412 382 783 or 0417 515 813
jack@engineeringplus.com.au
trin@engineeringplus.com.au
ENGINEERING PLUS

Accredited Building Designer
Designer Name: J.Pfeiffer
Accreditation No: CC2211T

Drawing No: 80020 A04 Rev 0

SLABS & FOOTINGS
ALL CONCRETE PREPARATION INCLUDING EXCAVATIONS & PLACEMENT OF REINFORCEMENT IS TO BE SEEN & APPROVED BY COUNCIL BUILDING INSPECTOR AND/OR ENGINEER PRIOR TO POURING ANY CONCRETE. REFER TO ENGINEERS DRAWINGS FOR FOOTING & CONCRETE SLAB DETAILS. REFER TO SOIL REPORT FOR CLASSIFICATION & SITE MAINTENANCE REQUIREMENTS.

DOWNPIPES:
DOWNPIPES TO BE DN100 PVC PAINTED TO MATCH GUTTERING. FIX WITH WALL BRACKETS @ 1200CC BEGINNING AT DOWNPIPE ELBOW.
MAXIMUM CENTRES FOR GUTTERS TO BE 12000 AND LOCATED SO AS TO COMPLY WITH PART 3.5.2.5 OF THE BCA

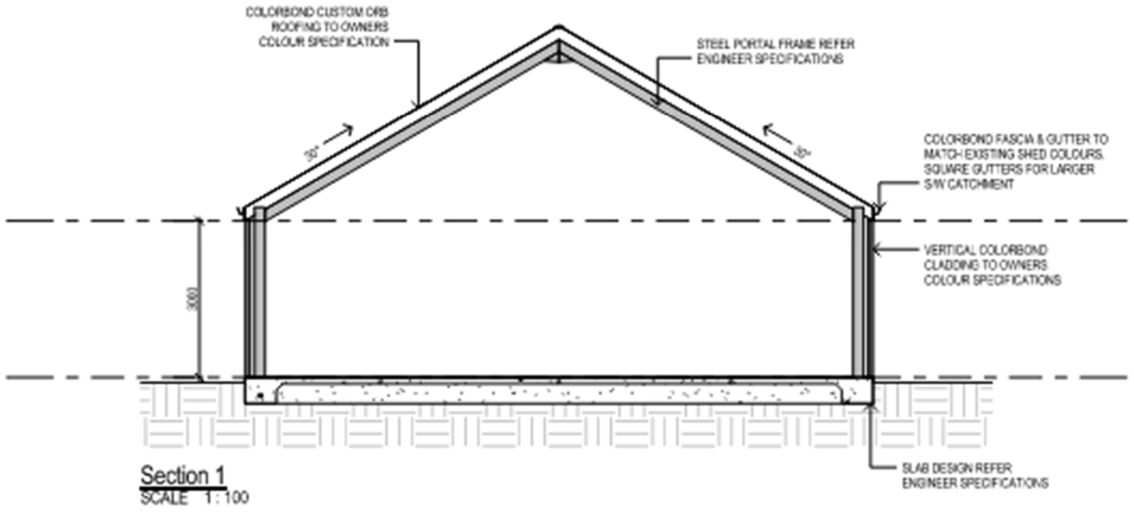
FASCIA
COLORBOND PREFORMED METAL FASCIA AND GUTTER INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. COLOUR TO OWNERS SPECIFICATIONS.

CAPPINGS & FLASHINGS
ALLOW FOR PREFORMED CAPPINGS & FLASHINGS NECESSARY TO ENSURE THE INTEGRITY OF THE ROOF STRUCTURE AGAINST WATER PENETRATION. INSTALL FLASHINGS TO ROOF VENTS, FLUES ETC. ALTERNATIVELY USE "DEKTITE" OR SIMILAR FITTINGS TO ROOF PENETRATIONS

GUTTERS
INSTALL SELECTED COLORBOND SQUARE FASCIA GUTTERS FOR LARGE CATCHMENT OR AS NOMINATED BY THE OWNER, LAP GUTTERS 75MM IN THE DIRECTION OF FLOW, RIVET & SEAL WITH AN APPROVED SILICONE SEALANT.

EXTERNAL CLADDING

EXTERNAL WALL CLADDING	REFER ELEVATIONS
SUB FLOOR	REFER ELEVATIONS



Section 1
SCALE 1:100

Southern Midlands Council
Certificate of Likely Compliance Plumbing
CLC: 2020/51
Date: 14/5/2020
Permit Authority:

ISSUED FOR CONSTRUCTION

Rev:	Amendment:	Date:	Int:
0	ISSUED FOR CONSTRUCTION	23.04.20	L.K.

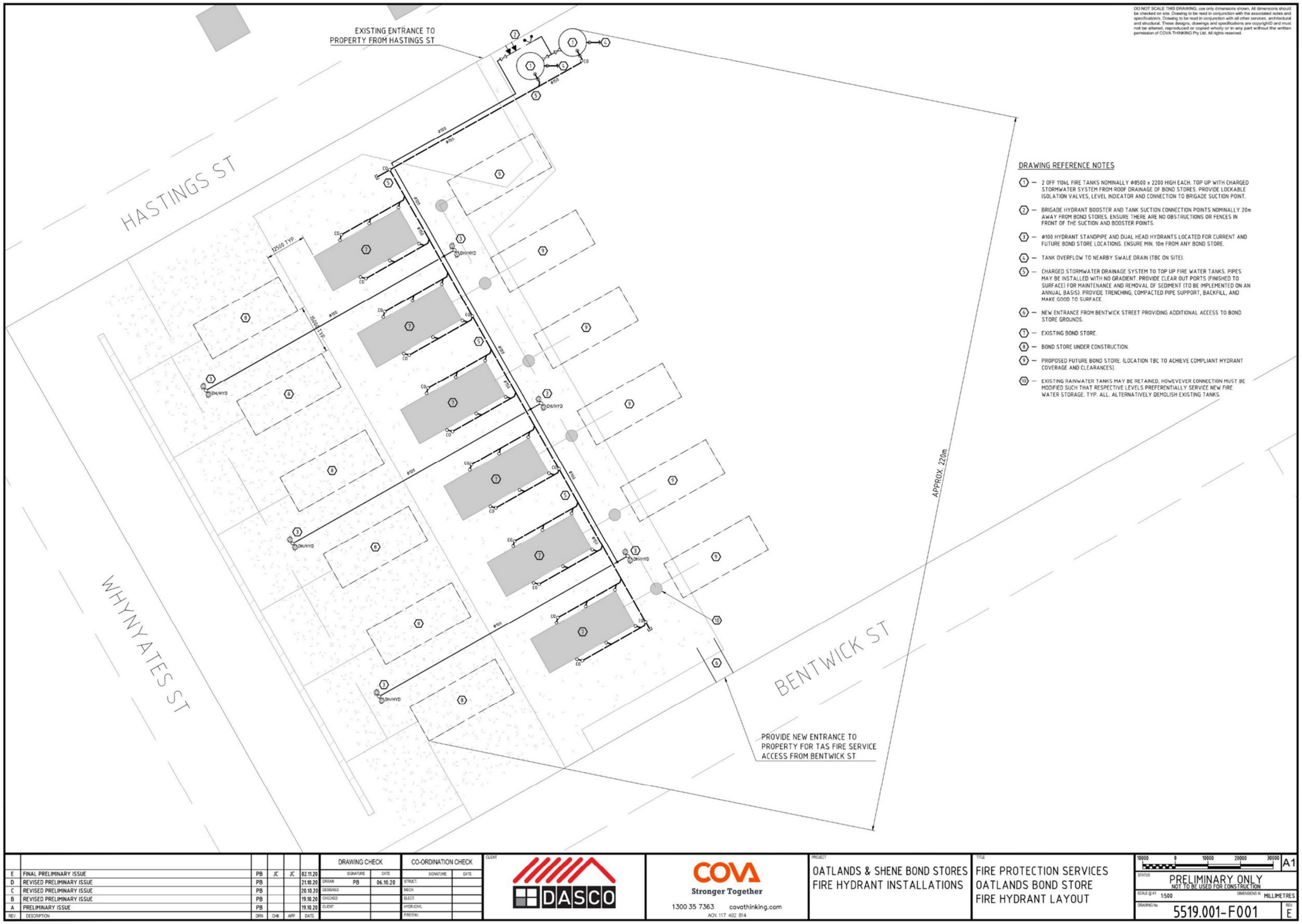
Date Drawn: 23.04.20
Drawn: L. Kaukenas
Checked: A. Taylor
Approved: J. Pfeiffer
Scale: As Shown @ A3

Accredited Building Designer
Designer Name: J.Pfeiffer
Accreditation No: CC2211T

Client: LAKE FREDERICK INN PTY. LTD.
Project: PROPOSED BOND STORES
Address: 20 BENTWICK STREET OATLANDS

Mob 0417 382 383 or 0417 595 813
jack@engineeringplus.com.au
tim@engineeringplus.com.au

Drawing No: 80020 A06 Rev 0



DRAWING REFERENCE NOTES

1. 2 OFF 110kL FIRE TANKS NOMINALLY Φ8500 x 2200 HIGH EACH. TOP UP WITH CHARGED STORMWATER SYSTEM FROM ROOF DRAINAGE OF BOND STORES. PROVIDE LOCKABLE ISOLATION VALVES, LEVEL INDICATOR AND CONNECTION TO BRIGADE SUCTION POINT.
2. BRIGADE HYDRANT BOOSTER AND TANK SUCTION CONNECTION POINTS NOMINALLY 20m AWAY FROM BOND STORES. ENSURE THERE ARE NO OBSTRUCTIONS OR FENCES IN FRONT OF THE SUCTION AND BOOSTER POINTS.
3. Φ100 HYDRANT STANDPIPE AND DUAL HEAD HYDRANTS LOCATED FOR CURRENT AND FUTURE BOND STORE LOCATIONS. ENSURE MIN. 10m FROM ANY BOND STORE.
4. TANK OVERFLOW TO NEARBY SWALE DRAIN (TBC ON SITE).
5. CHARGED STORMWATER DRAINAGE SYSTEM TO TOP UP FIRE WATER TANKS. PIPES MAY BE INSTALLED WITH NO GRADIENT. PROVIDE CLEAR OUT PORTS (FINISHED TO SURFACE) FOR MAINTENANCE AND REMOVAL OF SEDIMENT (TO BE IMPLEMENTED ON AN ANNUAL BASIS). PROVIDE TRENCHING, COMPACTED PIPE SUPPORT, BACKFILL, AND MAKE GOOD TO SURFACE.
6. NEW ENTRANCE FROM BENTWICK STREET PROVIDING ADDITIONAL ACCESS TO BOND STORE GROUNDS.
7. EXISTING BOND STORE.
8. BOND STORE UNDER CONSTRUCTION.
9. PROPOSED FUTURE BOND STORE. (LOCATION TBC TO ACHIEVE COMPLIANT HYDRANT COVERAGE AND CLEARANCES).
10. EXISTING RAINWATER TANKS MAY BE RETAINED, HOWEVEVER CONNECTION MUST BE MODIFIED SUCH THAT RESPECTIVE LEVELS PREFERENTIALLY SERVICE NEW FIRE WATER STORAGE. TYP. ALL. ALTERNATIVELY DEMOLISH EXISTING TANKS.

REV	DESCRIPTION	DRN	CHK	APP	DATE
E	FINAL PRELIMINARY ISSUE	PB	JC	JC	02.11.20
D	REVISED PRELIMINARY ISSUE	PB			21.10.20
C	REVISED PRELIMINARY ISSUE	PB			20.10.20
B	REVISED PRELIMINARY ISSUE	PB			19.10.20
A	PRELIMINARY ISSUE	PB			19.10.20

DRAWING CHECK: SIGNATURE — DATE — DRAWN: PB 06.10.20 — DESIGNED — CHECKED — CLIENT

CO-ORDINATION CHECK: SIGNATURE — DATE — STRUCT. — MECH. — ELECT. — HYDR./CIVIL — FIRE/ENV.

CLIENT: DASCO

COVA Stronger Together
1300 35 7363 covathinking.com
ACN 117 492 814

PROJECT: OATLANDS & SHENE BOND STORES
FIRE HYDRANT INSTALLATIONS

TITLE: FIRE PROTECTION SERVICES
OATLANDS BOND STORE
FIRE HYDRANT LAYOUT

10000 0 10000 20000 30000 A1
STATUS: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION
SCALE @ A1: 1:500 DIMENSIONS IN: MILLIMETRES
DRAWING No.: 5519.001-F001 REV: E

APPENDIX B

Riskcon Engineering Risk Assessment Report - RCE-20063_RA_Final_28Oct20_Rev(2)

Riskcon engineering

Risk Assessment

Pontville & Oatlands Bond Rooms

Document No. RCE-20063_RA_Final_28Oct20_Rev(2)
Date 28/10/2020

Risk Assessment

Pontville & Oatlands Bond Rooms

Prepared by

Riskcon Engineering Pty Ltd
Unit 19/5 Pyrmont Bridge Road
Camperdown, NSW 2050
www.riskcon-eng.com
ABN 74 626 753 820

Document No. RCE-20063_RA_Final_28Oct20_Rev(2)
Date 28/10/2020

Quality Management

Rev	Date	Remarks	Prepared By	Reviewed By
A	2 July 2020	Draft issued for comment	Jason Costa	Renton Parker
0	8 July 2020	Issued Final		
1	17 August 2020	Updated hydrant information		
2	28 October 2020	Additional cooling assessment		

Executive Summary

Background

Dasco Australia Pty Ltd (Dasco) has been engaged to construct several bond stores for the purposes of storing whisky to allow it to age. The bond stores will be located at two sites located in Pontville and Oatlands, Tasmania. Whisky is classified as a flammable liquid and is therefore subject to the Tasmania Work Health and Safety Regulation 2012 (WHS) which requires the risks associated with the storage to be assessed and minimized So Far As Is Reasonably Practicable (SFARP). Compliance with an Australian standard is considered the minimum acceptable level of risk reduction to comply with the Regulation.

A high level review of AS 1940-2017 was conducted for the bond stores to determine whether the stores comply with the standard. The results of this review showed that there would be several non-compliances; however, several of these would be easily managed (i.e. ventilation); however, given the restrictions of the site, some non-compliances (i.e. separation distances and hydrant protection) could not be complied with prescriptively without cost prohibitive modifications.

As noted, the requirements of the Regulation don't require prescriptive compliance with a standard and that the risks must be managed. Therefore, if an equivalent level of safety to the standard can be demonstrated then the risks would have been managed SFARP as required by the Regulation.

Dasco, on behalf of the client, has engaged Riskcon Engineering Pty Ltd (Riskcon) to prepare a risk assessment of the stores to determine whether the risks are managed SFARP as required by the Regulation.

Conclusions

The potential for a fire to occur in the bond stores at the Shene and Oatlands sites were modelled to determine whether the radiant heat which may be emitted would result in incident propagation or pose potential for injury / fatality offsite. The analysis showed that the radiant heat emitted from a fire would be insufficient to result in sufficient radiant heat to propagate to adjacent bond stores. Furthermore, the potential for injury / fatality offsite was also shown to not occur.

Based upon the analysis, the following conclusions may be drawn with respect to non-compliances identified against AS 1940-2017:

- Foam making hose reels could be omitted as these are for occupant use and would not assist the Fire Service. Foam extinguishers can be provided to allow occupants to enact a fire response attack.
- The separation distances between the bond stores are adequate as the potential for incident propagation would not occur based upon observed radiant heat emitted from a bond store fire.
- The separation distances to the site boundaries are adequate as the potential for propagation offsite or injury / fatality to occur at the site boundary would be below the acceptable criteria.
- The separation distance between Oatlands bond stores and fire water tanks is sufficient based upon the propagation contour (i.e. the tanks will remain operable should a bond store fire occur despite the distance being less than 10 m).

Recommendations

Notwithstanding the above assessment, the following recommendations have been made to ensure they are captured within the design:

- The ventilation of the bond stores shall comply with the requirements of AS 1940-2017.
- The bond stores shall be subject to hazardous area classification in accordance with AS/NZS 60079.10.1:2009.
- Any electrical equipment installed within the defined hazardous areas shall comply with the requirements of AS/NZS 60079.14:2017.
- Foam and dry powder fire extinguishers shall be provided within a 15 m travel distance to all parts of each bond store as required by AS 1940-2017.
- The fire water provided to protect against bushfire shall be interconnected with a hydrant system to provide protection against the bond stores.
- The fire water tanks at Shene Distillery shall be either relocated to 10 m away or a fire wall with an FRL of 120/120/120 shall be installed between the tanks and the bond store.
- The onsite fire water storage shall be capable of containing a minimum of 214,320 L provide for bushfire protection and protection against a potential bond fire store.
- Each bond store shall comply with the bunding requirements of AS 1940-2017 which would require the bond store bunds to be 50 mm high.

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Abbreviations

Abbreviation	Description
ADG	Australian Dangerous Goods Code
AS	Australian Standard
DA	Development Application
DGs	Dangerous Goods
DGS	Dangerous Goods Store
DPE	Department of Planning and Environment
HIPAP	Hazardous Industry Planning Advisory Paper
PHA	Preliminary Hazard Analysis
Pmpy	Per million per year
SEP	Surface Emissive Power
SEPP	State Environmental Planning Policy
SFARP	So Far As Is Reasonably Practicable
SSC	Spread Sheet Calculator
VF	View Factor

1.0 Introduction

1.1 Background

Dasco Australia Pty Ltd (Dasco) has been engaged to construct several bond stores for the purposes of storing whisky to allow it to age. The bond stores will be located at two sites located in Pontville and Oatlands, Tasmania. Whisky is classified as a flammable liquid and is therefore subject to the Tasmania Work Health and Safety Regulation 2012 (WHS) which requires the risks associated with the storage to be assessed and minimized So Far As Is Reasonably Practicable (SFARP). Compliance with an Australian standard is considered the minimum acceptable level of risk reduction to comply with the Regulation.

A high level review of AS 1940-2017 was conducted for the bond stores to determine whether the stores comply with the standard. The results of this review showed that there would be several non-compliances; however, several of these would be easily managed (i.e. ventilation); however, given the restrictions of the site, some non-compliances (i.e. separation distances and hydrant protection) could not be complied with prescriptively without cost prohibitive modifications.

As noted, the requirements of the Regulation don't require prescriptive compliance with a standard and that the risks must be managed. Therefore, if an equivalent level of safety to the standard can be demonstrated then the risks would have been managed SFARP as required by the Regulation.

Dasco, on behalf of the client, has engaged Riskcon Engineering Pty Ltd (Riskcon) to prepare a risk assessment of the stores to determine whether the risks are managed SFARP as required by the Regulation.

1.2 Objectives

The objectives of the risk assessment were to

- Complete a risk assessment to determine whether the risks posed by the storage are commensurate with the risk reductions afforded by compliance with AS 1940-2017.
- Demonstrate that the facility complies with the Work Health and Safety Regulation 2012 (Ref. [1])

1.3 Scope of Services

The scope of work is to complete a risk assessment for the whisky maturation bond stores located at; 76 Shene Road, Pontville and 20 Bentwick Street, Oatlands to demonstrate the risks are minimised SFARP as required by the WHS Regulations.

2.0 Methodology

2.1 Multi-Level Risk Assessment

The Multi-Level Risk Assessment approach (Ref. [2]), although published by the NSW Department of Planning and Environment, has been used as the basis for the study to determine the level of risk assessment required. The approach considered the development in context of its location, the quantity and type (i.e. hazardous nature) Dangerous Goods stored and used, and the facility's technical and safety management control. The Multi-Level Risk Assessment Guidelines are intended to assist industry, consultants and the consent authorities to carry out and evaluate risk assessments at an appropriate level for the facility being studied.

There are three levels of risk assessment set out in Multi-Level Risk Assessment which may be appropriate for a risk assessment, as detailed in **Table 2-1**.

Table 2-1: Level of Assessment PHA

Level	Type of Analysis	Appropriate If:
1	Qualitative	No major off-site consequences and societal risk is negligible
2	Partially Quantitative	Off-site consequences but with low frequency of occurrence
3	Quantitative	Where 1 and 2 are exceeded

The Multi-Level Risk Assessment approach is schematically presented in **Figure 2-1**.

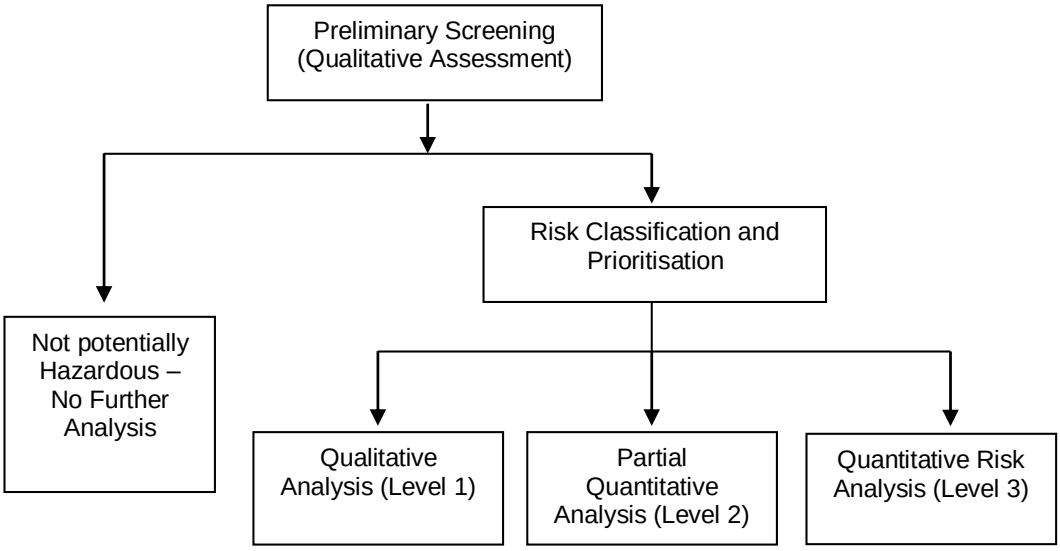


Figure 2-1: The Multi-Level Risk Assessment Approach

Based on the type of DGs to be used and handled at the proposed facility, a **Level 2 Assessment** was selected for the Site. This approach provides a qualitative assessment of those DGs of lesser quantities and hazard, and a quantitative approach for the more hazardous materials to be used on-site. This approach is commensurate with the methodologies recommended in "Applying SEPP 33's" Multi Level Risk Assessment approach (DPE, 2011).

2.2 Risk Assessment Study Approach

The methodology used for the risk assessment is as follows;

Hazard Analysis – A detailed hazard identification was conducted for the site facilities and operations. Where an incident was identified to have a potential off-site impact, it was included in the recorded hazard identification word diagram (**Appendix A**). The hazard identification word diagram lists incident type, causes, consequences and safeguards. This was performed using the word diagram format recommended in HIPAP No. 6 (Ref. [3]).

Each postulated hazardous incident was assessed qualitatively in light of proposed safeguards (technical and management controls). Where a potential offsite impact was identified, the incident was carried into the main report for further analysis. Where the qualitative review in the main report determined that the safeguards were adequate to control the hazard, or that the consequence would obviously have no offsite impact, no further analysis was performed. **Section 3.1** of this report provides details of values used to assist in selecting incidents required to be carried forward for further analysis.

Consequence Analysis – For those incidents qualitatively identified in the hazard analysis to have a potential offsite impact, a detailed consequence analysis was conducted. The analysis modelled the various postulated hazardous incidents and determined impact distances from the incident source. The results were compared to the consequence criteria listed in HIPAP No. 4 (Ref. [4]). The criteria selected for screening incidents is discussed in **Section 3.1**.

Where an incident was identified to result in an offsite impact, it was carried forward for frequency analysis. Where an incident was identified to not have an offsite impact, and a simple solution was evident (i.e. move the proposed equipment further away from the boundary), the solution was recommended, and no further analysis was performed.

Frequency Analysis – In the event a simple solution for managing consequence impacts was not evident, each incident identified to have potential offsite impact was subjected to a frequency analysis. The analysis considered the initiating event and probability of failure of the safeguards (both hardware and software). The results of the frequency analysis were then carried forward to the risk assessment and reduction stage for combination with the consequence analysis results.

Risk Assessment and Reduction – Where incidents were identified to impact offsite and where a consequence and frequency analysis was conducted, the consequence and frequency analysis for each incident were combined to determine the risk and then compared to the risk criteria published in HIPAP No. 4 (Ref. [4]). Where the criteria were exceeded, a review of the major risk contributors was performed, and the risks reassessed incorporating the recommended risk reduction measures. Recommendations were then made regarding risk reduction measures.

Reporting – on completion of the study, a draft report was developed for review and comment. A final report was then developed, incorporating the comments received, for submission to the regulatory authority.

3.0 Site Description

3.1 Introduction

The risk assessment covers two sites in Tasmania which will house whiskey maturation bond stores. The general description will therefore reference both of the site locations to provide context for each site.

3.2 Pontville (Shene Distillery) Bond Stores

3.2.1 Site location

The Pontville bond stores are located at the Shene Distillery at 76 Shene Road which is approximately 5 km north of Brighton. **Figure 3-2** shows the regional location of the site in relation to Brighton. Provided in **Figure 3-3** is the layout of the site in Pontville.

Figure 3-1: Regional Site Location of Shene Distillery

Figure 3-2: Shene Distillery Site Layout

3.2.2 Description of Shene Distillery

The existing site is composed of a residence, agricultural buildings, the existing distillery production shed and barn. The northern section of the site is proposed to be allocated to the development of bond stores which will house whisky during maturation. The bond stores are 30 m x 12 m and are separated by 12 m between stores and 16.5 m to the site boundaries. The stores have a total height of 6.7 m at the ridge and 3 m at the eaves as shown in **Figure 3-3**.

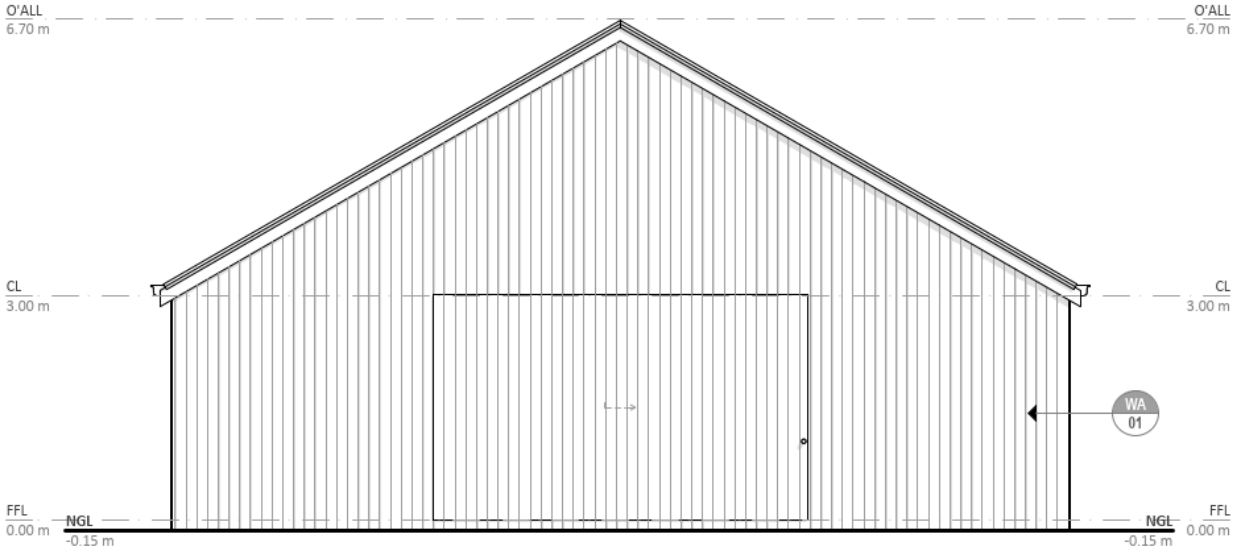


Figure 3-3: Shene Bond Stores Elevation

3.3 Oatlands Bond Stores

3.3.1 Site location

The Oatlands stores are located at 20 Bentwick St which is approximately 3 km south of the Oatlands town centre. **Figure 3-4** shows the regional location of the site in relation to Oatlands. Provided in **Figure 3-5** is the layout of the site in Oatlands.

Figure 3-4: Regional Site Location of Oatlands Bond Stores

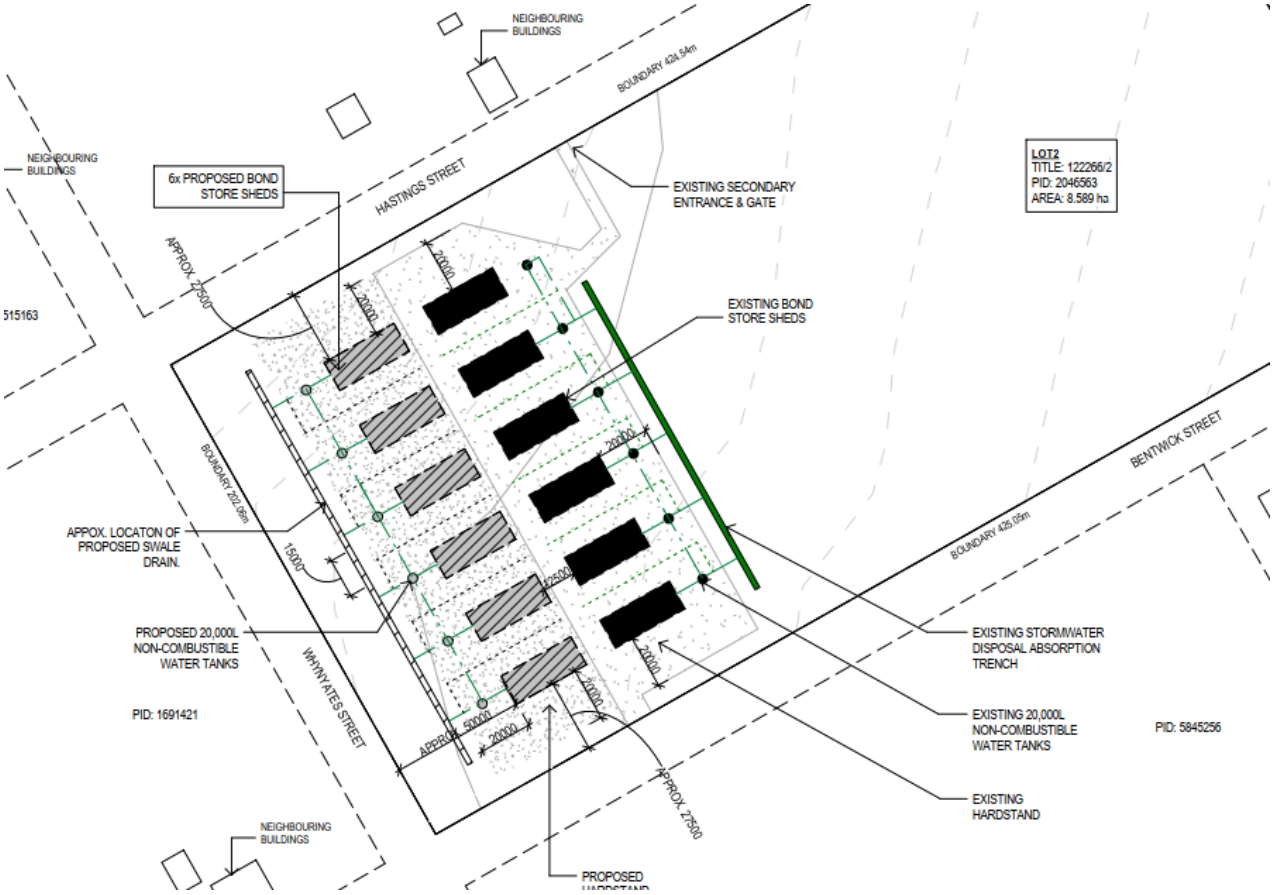


Figure 3-5: Site Layout of 20 Bentwick Street

3.3.2 Description of 20 Bentwick Street

The site currently is composed of six (6) bond stores with an additional six (6) stores to be constructed at the site to house whisky during maturation. The bond stores are 30 m x 12 m and are separated by 15 m between stores of 12.5 m between rows of stores. The distance between the stores and boundaries is a minimum of 27.5 m. The stores have the same height dimensions as those described in **Section 3.2.2**.

3.4 Quantities of Dangerous Goods Stored and Handled

The quantities of flammable liquid DGs stored at each of the sites have been provided in **Table 3-1**.

Table 3-1: Maximum Classes and Quantities of Dangerous Goods Stored

Site	Class	PG	Quantity (L per Bond Store)	Total Quantity (L)
Shene	3	II	177,000	354,000
Oatlands	3	II	157,000	942,000

4.0 Hazard Identification

4.1 Introduction

A hazard identification table has been developed and is presented at **Appendix A**. This table has been developed following the recommended approach in Hazardous Industry Planning Advisory Paper No. 6, Hazard Analysis Guidelines (Ref. [3]). The Hazard Identification Table provides a summary of the potential hazards, consequences and safeguards at the site. The table has been used to identify the hazards for further assessment in this section of the study. Each hazard is identified in detail and no hazards have been eliminated from assessment by qualitative risk assessment prior to detailed hazard assessment in this section of the study.

In order to determine acceptable impact criteria for incidents that would not be considered for further analysis, due to limited impact offsite, the following approach has been applied:

- *Fire Impacts* - It is noted in Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 (Ref. [4]) that a criterion is provided for the maximum permissible heat radiation at the site boundary (4.7 kW/m^2) above which the risk of injury may occur and therefore the risk must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk, for this study, incidents that result in a heat radiation less that at 4.7 kW/m^2, at the site boundary, are screened from further assessment.

  Those incidents exceeding 4.7 kW/m^2 at the site boundary are carried forward for further assessment (i.e. frequency and risk). This is a conservative approach, as HIPAP No. 4 (Ref. [4]) indicates that values of heat radiation of 4.7 kW/m^2 should not exceed 50 chances per million per year at sensitive land uses (e.g. residential).

- *Explosion* - It is noted in HIPAP No. 4 (Ref. [4]) that a criterion is provided for the maximum permissible explosion over pressure at the site boundary (7 kPa) above which the risk of injury may occur and therefore the risk must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk, for this study, incidents that result in an explosion overpressure less than 7 kPa, at the site boundary, are screened from further assessment. Those incidents exceeding 7 kPa, at the site boundary, are carried forward for further assessment (i.e. frequency and risk).

- *Toxicity* – No toxic gases have been proposed to be stored at the site; hence, toxicity has not been assessed in this study.

- *Property Damage and Accident Propagation* - It is noted in HIPAP No. 4 (Ref. [4]) that a criterion is provided for the maximum permissible heat radiation/explosion overpressure at the site boundary (23 kW/m^2/14 kPa) above which the risk of property damage and accident propagation to neighbouring sites must be assessed. Hence, to assist in screening those incidents that do not pose a significant risk to incident propagation, for this study, incidents that result in a heat radiation heat radiation less than 23 kW/m^2 and explosion over pressure less than 14 kPa, at the site boundary, are screened from further assessment. Those incidents exceeding 23 kW/m^2 at the site boundary are carried forward for further assessment with respect to incident propagation (i.e. frequency and risk).

- *Societal Risk* – HIPAP No. 4 (Ref. [4]) discusses the application of societal risk to populations surrounding the proposed potentially hazardous facility. It is noted that HIPAP No. 4 indicates that where a development proposal involves a significant intensification of population, in the vicinity of such a facility, the change in societal risk needs to be taken into account. In the case

of the facility, there is currently no significant intensification of population around the proposed site.

4.2 Properties of Dangerous Goods

The type of DGs and quantities stored and used at the site has been described in **Section 3**. **Table 4-1** provides a description of the DGs stored and handled at the site, including the Class and the hazardous material properties of the DG Class.

Table 4-1: Properties of the Dangerous Goods and Materials Stored at the Site*

Class	Hazardous Properties
3 – Flammable Liquids	Class 3 includes flammable liquids which are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc.) which give off a flammable vapour at temperatures of not more than 60^{o}C closed-cup test or not more than 65.6^{o}C open-cup test. Vapours released may mix with air and if ignited, at the right, concentration will burn resulting in pool fires at the liquid surface.

* The Australian Code for the Transport of Dangerous Goods by Road and Rail (Ref. [5]).

4.3 Hazard Identification

Based on the hazard identification table presented in **Appendix A**, the following hazardous scenarios have been developed:

- Flammable liquid release, delayed ignition and flash fire or explosion.
- Flammable liquid spill, ignition and racking fire / full bond store fire.

Each identified scenario is discussed in further detail in the following sections.

4.4 Flammable Liquid Release, Delayed Ignition and Flash Fire or Explosion

As noted in **Section 3.0**, flammable liquids in the form of whisky will be held at the site for maturation prior to bottling and distribution. There is potential a flammable liquid spill could occur in the bond store due to an accident (cask dropped from forklift, punctured by forklift tines) or deterioration of the cask. If a spill occurred, the liquid will begin to evaporate which if allowed to accumulate a substantial vapour cloud above the spill could occur.

If the spill is not identified, the cloud may continue to accumulate, eventually contacting an ignition source. If the cloud is confined (i.e. by racking and casks) the vapour cloud may explode if ignited, or, if it is unconfined, it may result in a flash fire which would burn back to the flammable liquid spill, resulting in a pool fire.

The whole product inventory consists of ethanol based products stored in casks which contain approximately 200 L which may result in a substantial size spill and subsequent evaporating surface. A flammable atmosphere can only explode if sufficient mass accumulates within the atmosphere prior to ignition. Based upon a 200 L cask, this mass would not be expected to occur and furthermore, the store is ventilated per the requirements of AS 1940-2017 (Ref. [6]) which provide cross flow ventilation preventing the accumulation from occurring. Therefore, an explosion would not be expected to occur from this scenario.

Nonetheless, there is the potential for a flammable atmosphere to exist which if ignited would still result in a flash fire which would burn back to the flammable liquid pool. The area has been subject

to a hazardous area classification per AS/NZS 60079.10:2009 (Ref. [7]) with electrical equipment controlled in accordance with AS/NZS 60079.14:2017 (Ref. [8]); hence, the potential for ignition to occur is substantially reduced.

Notwithstanding this, there remains the potential for ignition to occur; however, a flash fire would not impact offsite and would not be able to contribute to incident propagation by itself due to the short nature and low emission of radiant heat from a burning vapour cloud. The flash fire would ultimately result in a pool fire as assessed in **Section 4.5**.

Based upon the analysis, an explosion would not be considered to be a credible event and a flash fire would be insufficient to result in offsite impacts nor propagation issues; hence, these scenarios have not been carried forward for further analysis.

4.5 Flammable Liquid Spill, Ignition and Racking Fire / Full Bond Store Fire

As noted in **Section 4.4**, it is considered that there is a low potential for a cask to leak resulting in a flammable liquid spill and there are several controls in place to minimise the likelihood of a damaged container entering the bond store and additional controls to minimise the potential that ignition of a flammable liquid spill could occur.

However, if a flammable liquid spill was to occur (e.g. dropped cask during handling) and it was ignited (e.g. by static, etc.), the fire would initially be the size of the pool. As the fire continues to burn, radiant heat may result in the failure of racking / other casks which may add fuel to the fire. The initial event is unlikely to result in offsite impacts and propagation will occur to the adjacent casks. As a sprinkler system is not provided for the stores, it is considered that the fire would continue to propagate throughout the entire bond store which may then propagate to adjacent bond stores creating a fire scenario which would be untenable for the fire service to combat.

In addition, the incident may result in radiant heat which could impact over the site boundary resulting in offsite injury, fatality or incident propagation. Therefore, this incident has been carried forward for further analysis.

5.0 Consequence Analysis

5.1 Incidents Carried Forward for Consequence Analysis

The following incidents were identified to have potential to impact off site:

- Flammable liquid spill, ignition and racking fire / full bond store fire.

Each incident has been assessed in the following sections.

5.2 Flammable Liquid Spill, Ignition and Racking Fire / Full Bond Store Fire

5.2.1 Stable Conditions

There is the potential for a fire to develop within the bond store which as it grows it'll result in the failure of adjacent casks and racking which will accelerate the failure of adjacent casks. As the casks rupture, the ethanol will be released contributing to the fire until the fire has the dimensions of the bond. A detailed analysis has been conducted in **Appendix B** with the radiant heat impact distances estimated for this scenario are presented in **Table 5-1**. The radiant heat contours are provided in **Figure 5-1** for the Shene Distillery site and **Figure 5-2** for the Oatlands site.

Table 5-1: Heat Radiation from a Full Bond Store Fire

Heat Radiation (kW/m^2)	Distance (m)
35	Maximum heat flux is 20*
23	4.4
12.6	7.6
4.7	15.6

*Calculated limit based upon fire dimensions

The purpose of the separation distances contained with AS 1940-2017 is to provide sufficient distance that propagation doesn't occur onto protected places as this may result in incident escalation or injury. The separation distances are taken based upon volume with the distance calculated based upon a fire scenario arising from the volume stored. The inputs which go into the assessment are generic in nature and cover a range of flammable liquids; however, not all liquids burn the same and so this can result in under or over conservatism in the distance. Therefore, the intent of the standard must be taken when conducting a risk assessment. As noted, the intent of the separation distance is to ensure escalation onto a protected place doesn't occur.

The adjacent bond stores would be considered adjacent stores; hence, based upon Table 4.1 of AS 1940-2017 (Ref. [6]) which, based upon 170,000 L of ethanol would require a separation distance of 20 m. However, it is noted in Clause 4.3.1(bi) that for flammable liquids this need not exceed 15 m. The closest separation distance from either site is 12 m which is less than the 15 m required by AS 1940-2017.

However, when reviewing the intent of the standard, it is to prevent incident propagation. As ethanol is an incredibly slow burning liquid, the flame surface is smaller than what would have been modelled by a generic burning rate within AS 1940-2017; therefore, a smaller separation distance between stores may be acceptable.

The NSW Hazardous Industry Planning Advisory Paper No. 4 (Ref. [4]) assesses incident propagation criteria at 23 kW/m^2. Therefore, if the radiant heat observed at a sensitive receptor doesn't exceed 23 kW/m^2 then propagation would not be considered to occur. The radiant heat observed at 23 kW/m^2 is 4.2 m; hence, this value for propagation is not observed at the adjacent bond stores. Furthermore, if the distance of 12 m is substituted into the model, the calculated radiant heat is 6.6 kW/m^2 which is substantially lower than this incident propagation criteria. Therefore, it would be considered that incident propagation would not occur between bond stores.

Discussion with the Tasmania Fire Services (TFS) indicates that hydrant protection would be required for the stores at each of the sites. The site currently has tanks installed to provide water to combat bushfire; hence, it has been proposed to utilise these tanks to provide a source of water for use in the hydrant system. The BCA requires water tanks to be located at least 10 m away from the bond stores to ensure they are not rendered inoperable by a fire. The tanks at Oatlands are located 6 m away from the stores while the tanks at Shene are 2 m away and would therefore not comply with the minimum requirements.

Based upon the risk assessment, the tanks located at Oatlands would not be impacted by the propagation contours and the water provides a substantial heat sink and would be unlikely to fail based upon the exposed radiant heat. Therefore, it would be considered acceptable to use these tanks as they are for the hydrant system.

The Shene tanks are located 2 m away and would be likely to perilously impacted by a fire in the bond store. Therefore, there are two potential solutions which may be adopted to allow these tanks to be used to protect the bond stores; relocation of the tanks to 10 m away or inclusion of a fire rated wall to protect the tanks in their current position.

Based upon the above discussion, the following recommendations have been made:

- The fire water provided to protect against bushfire shall be interconnected with a hydrant system to provide protection against the bond stores.
- The fire water tanks at Shene Distillery shall be either relocated to 10 m away or a fire wall with an FRL of 120/120/120 shall be installed between the tanks and the bond store.

A review of the 4.7 kW/m^2 indicates this would not impact over the site boundary which is 16.5 m away at the closest boundary for either site. The selection criteria for injury / fatality is 4.7 kW/m^2 which indicates a fatality or injury may occur at the site boundary. It is noted that offsite protected places are not afforded the concession that onsite protected places are; hence, the required separation to the site boundary would be required to be 20 m to achieve compliance with AS 1940-2017. As the assessment criteria is observed at the site boundary based upon the consequence analysis, it is necessary to assess this incident further for the potential for injury / fatality to occur offsite.

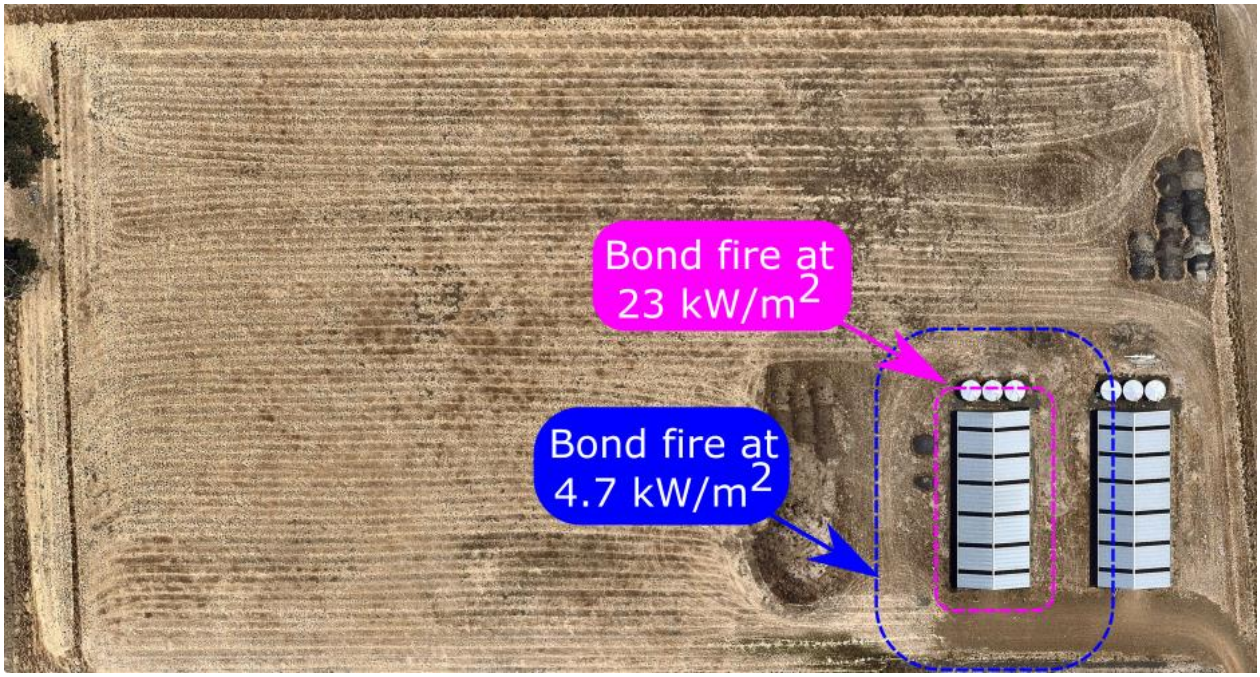


Figure 5-1: Full Bond Store Fire (Shene Distillery)

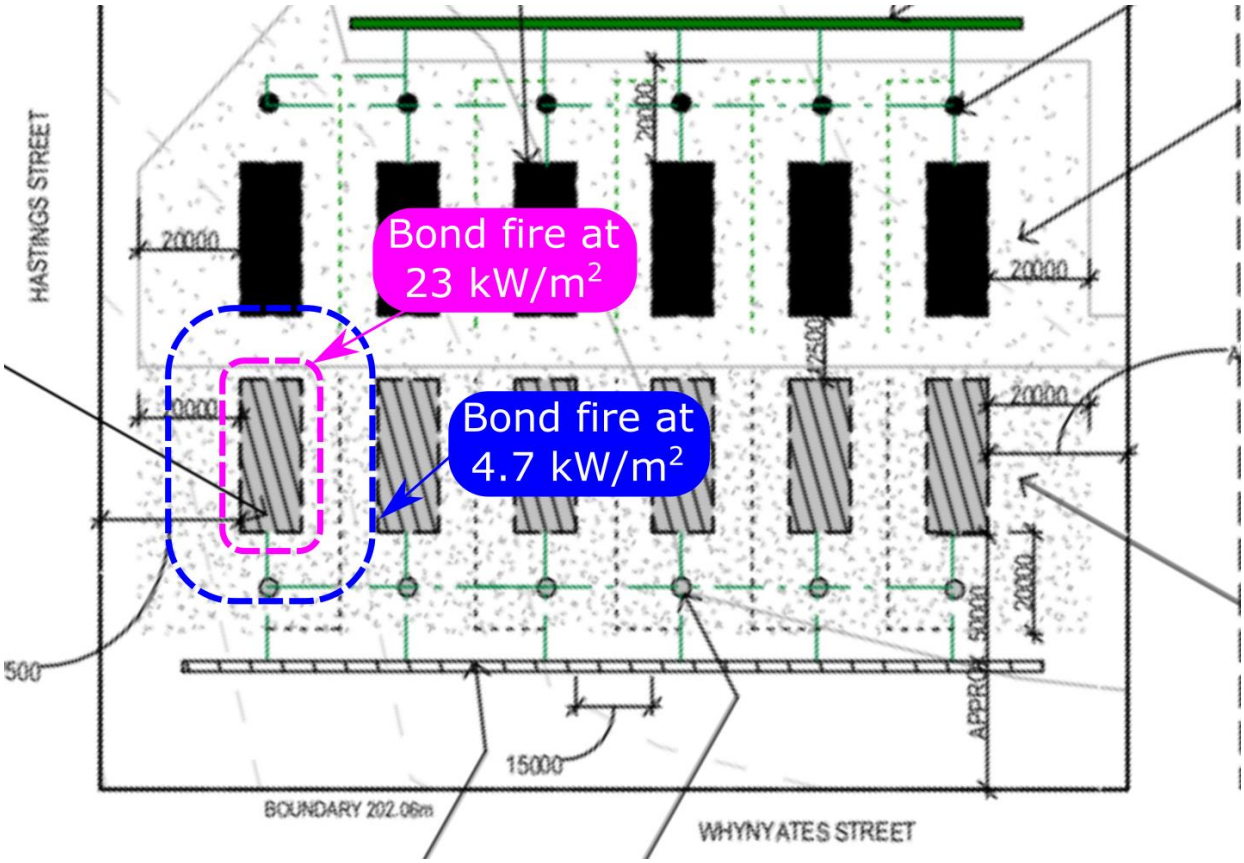


Figure 5-2: Full Bond Store Fire (Oatlands)

5.2.2 High Wind Conditions

An additional analysis was conducted for high wind conditions which may occur in during bushfire scenarios to determine the impacts on adjacent bond stores in such conditions. The analysis was

conducted in **Appendix B** with the results present in **Table 5-2**. The radiant heat contours are provided in **Figure 5-1** for the Shene Distillery site and **Figure 5-2** for the Oatlands site.

Table 5-2: Heat Radiation from a Full Bond Store Fire in High Wind Conditions

Heat Radiation (kW/m^2)	Distance (m)
35	Maximum heat flux is 28.7*
23	15.9
12.6	17.5
4.7	21.8

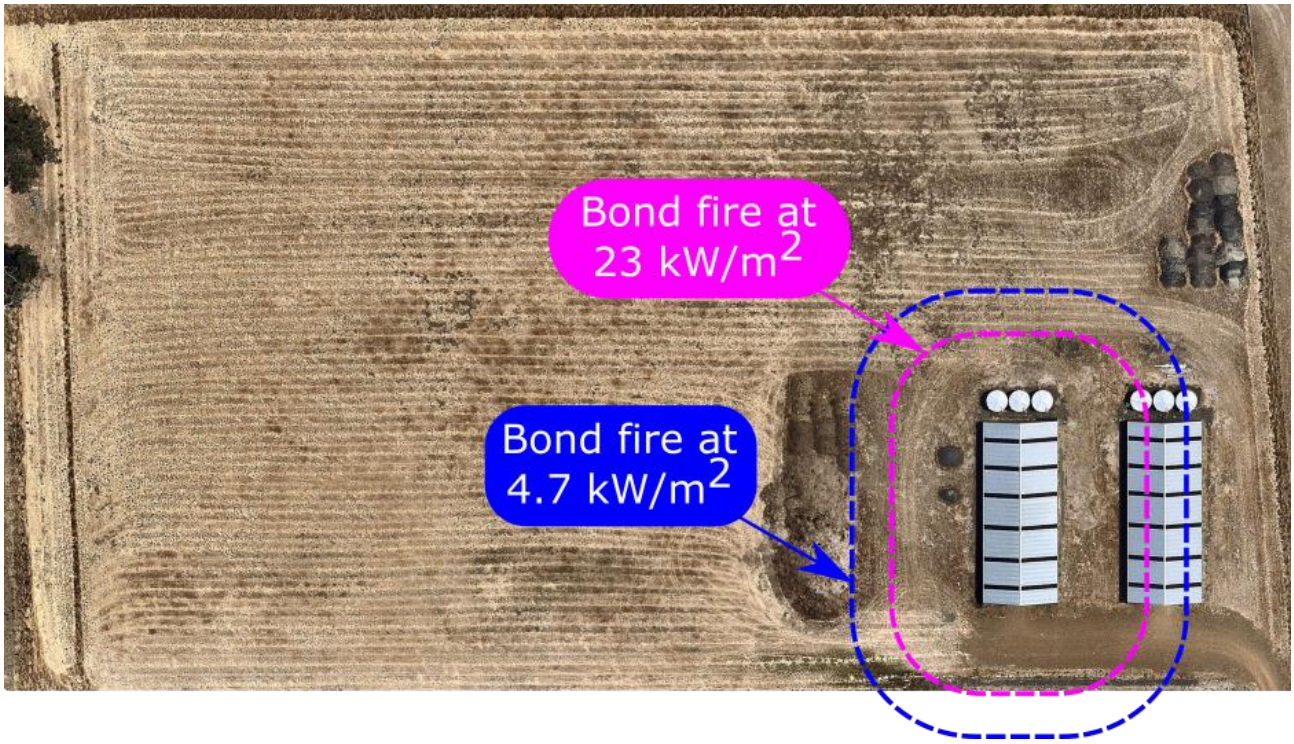


Figure 5-3: Full Bond Store Fire (Shene Distillery)

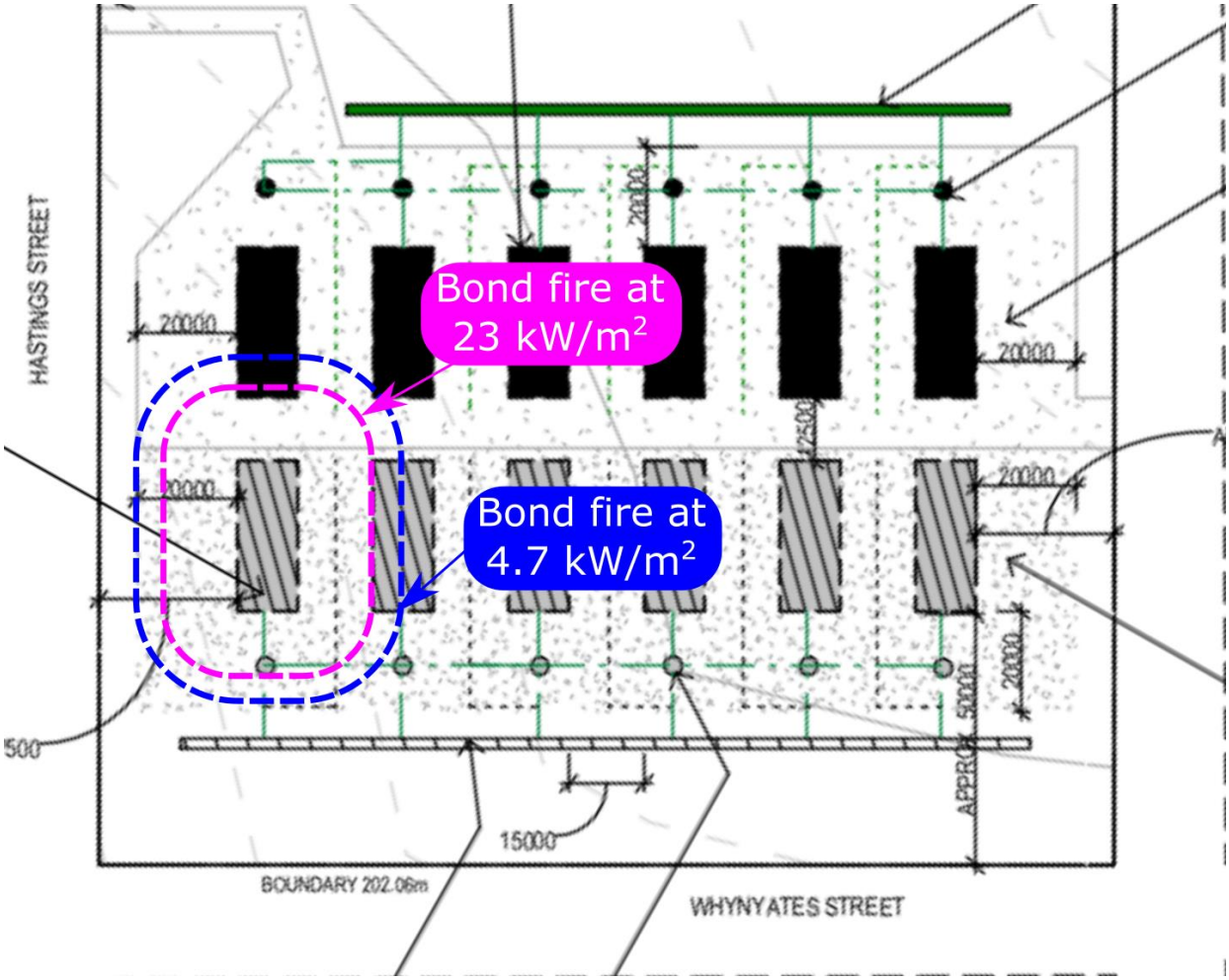


Figure 5-4: Full Bond Store Fire (Oatlands)

As can be seen in the high wind conditions there is the potential for propagation to impact the adjacent bond sites; however, it is noted that these conditions occur in very high wind conditions (i.e. >120 km/h) which are not the normal prevailing wind conditions. Nonetheless, should a fire occur under these conditions it would be necessary to ensure propagation to adjacent bond stores does not occur.

Appendix I of AS 1940-2017 (Ref. [6]) provides a methodology for estimating the required cooling water demand to protect adjacent tanks within a tank farm from a 'tank on fire'. While the bond stores are not tanks the methodology would be applicable to determining the necessary cooling water demand.

It is noted that the methodology for determining water demand is based upon a burn down rate of 300 mm/h. As noted in this risk assessment, ethanol is a slow burning liquid; hence, the core assumption of the methodology has been reviewed to determine whether there a modification to the results is required.

The stores contain 177,000 L ethanol at 70% ethanol concentration. Using the composition of ethanol and water, the density of the whisky is 852 kg/m^3 which results in a total mass of liquid within the bond stores of 15,804 kg. Therefore, the mass of ethanol within the store is 0.7 x 151,000 = 105,562 kg. The burning rate of ethanol is 0.015 kg/m^2.s and the store has an area of 360 m^2 resulting in a mass burning rate of 0.015 x 360 = 5.4 kg/s. The time taken to burn through the mass of ethanol would be 105,562/(5.4*3600) = 5.4 hours.

The depth of the ethanol within the bund (assuming 100% of liquid loss from all casks simultaneously) be 177/360 = 492 mm. Dividing the time to consume the ethanol by the depth yields a burn down rate of 90.5 mm/h which is approximately 1/3 of the burn down rate assumed for the fire exposure protection within Appendix I of AS 1940-2017. The water discharge rate is based upon the radiant heat experience at the target based upon a high burn down rate (i.e. large radiant heat exposure); hence, the water demand required per the methodology within AS 1940-2017 will be reduced by 1/3 to account for the reduced radiant heat exposure in this particular scenario.

The first step in determining the water demand is to work out the S/D ratio which is the separation distance from the bond store to the adjacent bond store divided by the diameter. The separation distance between bond stores is 12 m and the equivalent diameter is 21.4 m resulting in an S/D ratio of 12/21.4 = 0.56.

The value for W (the water in L/m^2.min) is read from the table using the S/D ratio as shown in **Figure 5-5**. Which results in a water flow of 4 L/m^2.min.

As noted, this table has been developed based upon a burn down rate of 300 mm/h which is about 3 times greater than that which would be observed for this fire scenario. Therefore, the water demand will be reduced by 1/3. The final water demand factor is thus adjusted to 4 x 0.33 = 1.33 L/m^2.min.

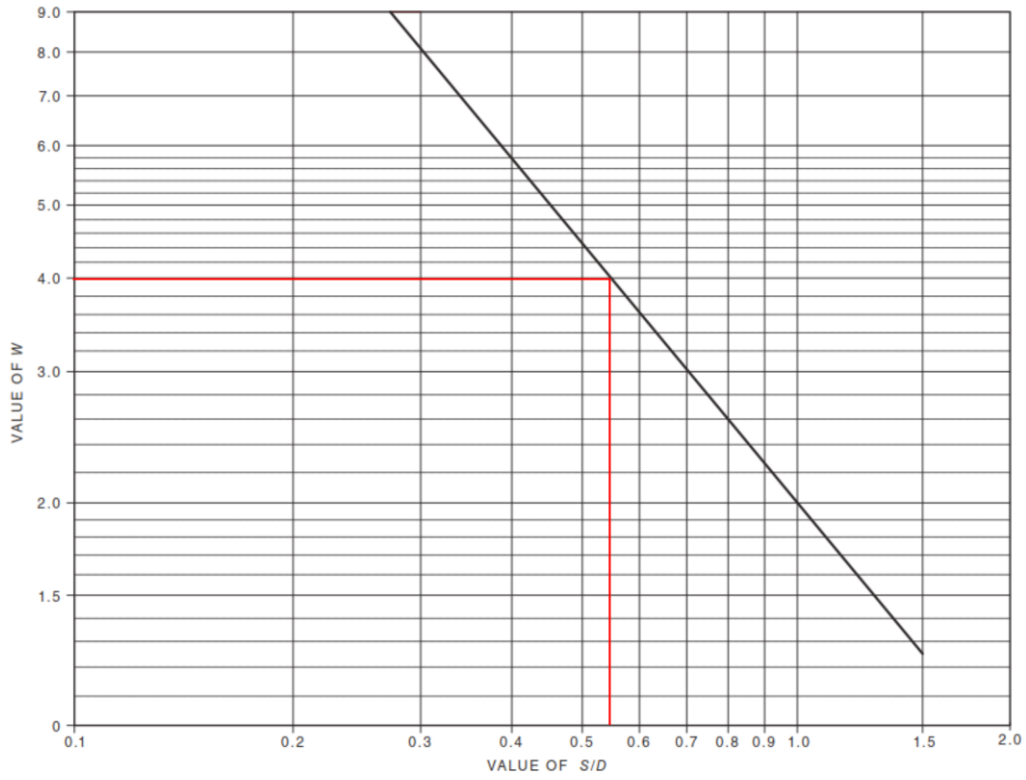


Figure 5-5: Water Demand

The volume of water required is based upon the surface areas requiring protection. The bond stores have vertical walls to 3 m which then slant to the height of 6.7 m as shown in **Figure 5-6**. Using Pythagorean Theorem the length of the slant roof can be calculated to be 6.95 m. Therefore, the total surface area requiring protection is 3.183 x 30 + 6.95 x 30 = 304 m^2 for an adjacent bond store. A bond store fire may occur in a central bond store which would result in two bond stores being impacted resulting in an additional 304 m^2 of surface area requiring protection. Finally, a

bond store located end to end may be impacted. The surface area of the end of a bond store is 3.183 x 12 + ((6.7-3.183) x 12)/2 = 59.3 m^2. The total area requiring protection is thus 2 x 304 + 59.3 = 667.3 m^2 or 670 m^2 for simplicity and conservatism.

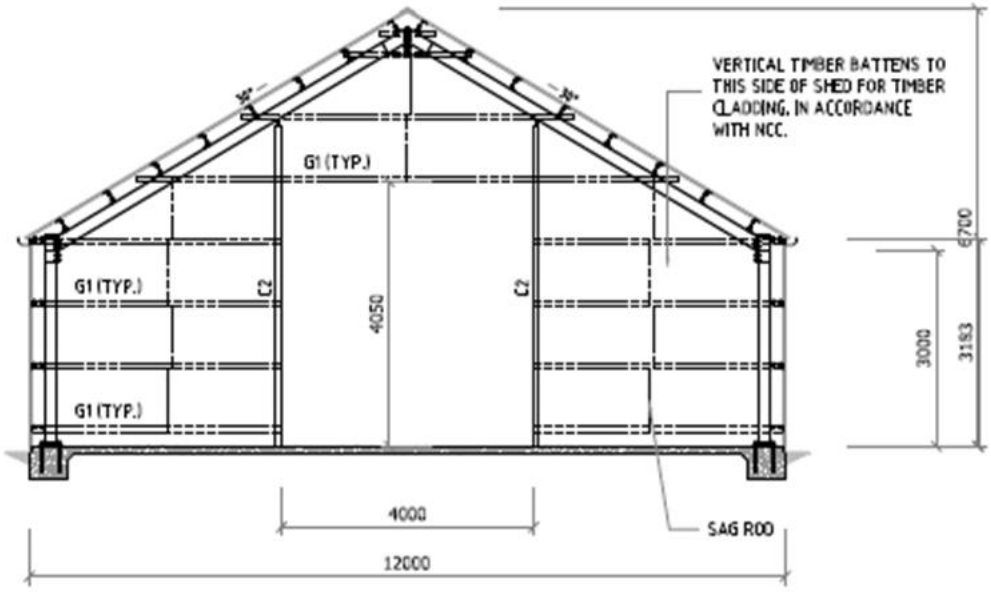


Figure 5-6: Bond Store Dimensions

The baseline water demand requirement is thus 1.33 x 670 = 893 L/min. The procedure notes that a safety factor shall be applied of 50% to account for spray loss when applying cooling water from a hydrant hose. Therefore, the total demand is 0.893/0.5 = 1,786 L/min.

It is noted that the protection requirements are based upon exposure to all structures around the bond stores in a high wind conditions; however, in those conditions the radiant heat impacts would be skewed in a particular direction thus the amount of water required for protection would be highly conservative.

A review of the burn down rate indicates that after 2 hours of burning, the volume of ethanol remaining in the store would be at a level where dilution may be able to occur. Therefore, taking the two-hour period results in a water storage requirement of 1,786 x 120 = 214,320 L. As noted, this provide coverage to all structures around the bond store which are unlikely to all be impacted based upon prevailing winds. Therefore, assuming 50% is required for actual protection the remains approximately 107,000 L which may be used to control spot fires or direct application to the fire.

Therefore, the following recommendation has been made:

- The onsite fire water storage shall be capable of containing a minimum of 214,320 L provide for bushfire protection and protection against a potential bond fire store.

6.0 Frequency Analysis

6.1 Incidents Carried Forward for Frequency Analysis

The following incidents have been carried forward for frequency analysis:

- Flammable liquid spill, ignition and racking fire / full bond store fire.

This incident has been assessed in the following section.

6.2 Flammable Liquid Spill, Ignition and Racking Fire / Full Bond Store Fire

6.2.1 Stable Conditions

The risk of fatality or injury is composed of two components;

- Frequency of the event (i.e. fire)
- Susceptibility of the exposed receptor to the hazard (i.e. exposure to radiant heat)

The overall risk is calculated by multiplying the frequency by the probability of a fatality based upon the exposure. Therefore, both components require an input value; however, if the probability of fatality at the exposure criteria is zero (0) then the risk also becomes zero (0). As the criteria at the site boundary is only just exceeded the probability of fatality / injury is assessed initially.

To estimate the probability of fatality it is necessary to review the susceptibility to personnel exposed to radiant heat that may occur at the site boundary. Tolerance to an exposure (i.e. radiant heat or toxicity) differs across a population which may be estimated using Probit analysis. For radiant heat exposure, the Probit equation is shown in **Eqn 6-1**.

$$Y = K_1 + K_2 lnV \qquad \textbf{Eqn 6-1}$$

Where for radiant heat the inputs are:

- K_1 = -36.38
- K_2 = 2.56
- $V = I^{4/3}t$
- I = radiant heat intensity (W/m^2)
- t = time (seconds)

The value obtained from the Probit equation is then read from the graph shown in **Figure 6-1**. Which yields the percentage of fatality for personnel exposed to the input radiant heat.

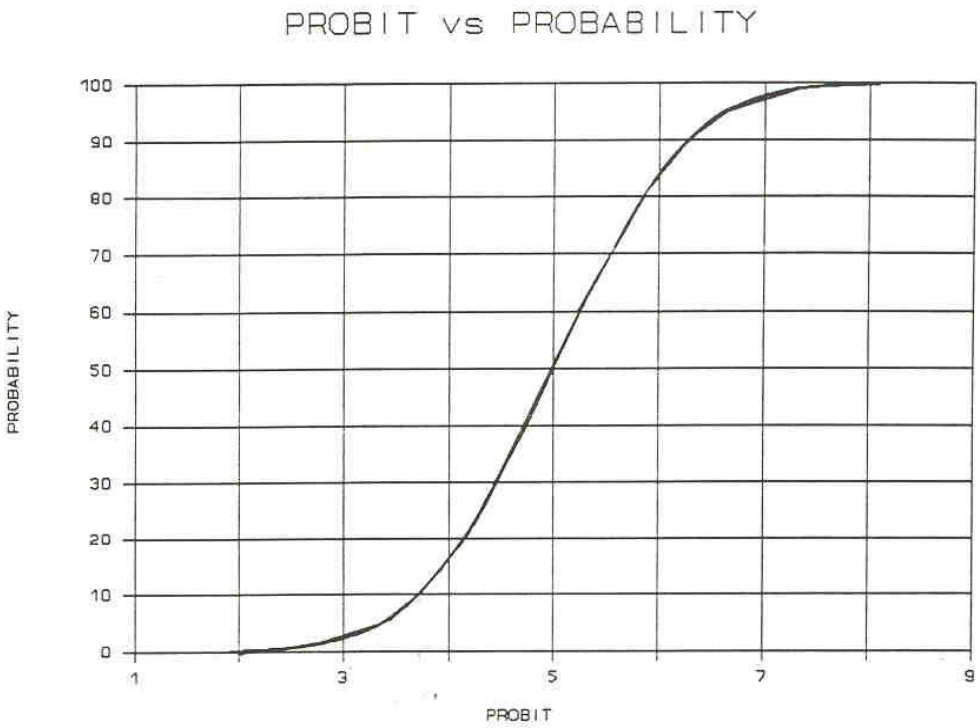


Figure 6-1: Probit vs Probability

The closet boundary is 16.5 m away which when input into the Spreadsheet Calculation results in a radiant heat exposure of 4.07 kW/m^2.Exposure time is taken to be 30 seconds which is considered conservative as personnel in the area would feel the intensity of the flame and would be able to evacuate the area to an area of lower radiant heat within 30 seconds.

Substituting these values into the Probit equation results in a Probit value of 0.7. When read from the graph shown in **Figure 6-1** the probability of fatality is 0%. Therefore, as the probability of fatality at the site boundary is 0%, the risk of fatality at the site boundary is also 0%.

6.2.2 High Wind Conditions

In the high wind conditions the 4.7 contours impact off site at the Shene site, further, the 23 kW/m^2 contour touches the site boundary with the 4.7 kW/m^2 extending a few metres further across the boundary.

The frequency of a bond store fire may be estimated from a number of sources (e.g. general warehouse fire frequencies or the summation of individual fire frequencies for each of the initiating fire events). As this is a preliminary hazard analysis, the fire frequency has been selected from general fire frequency data.

A detailed fire frequency analysis has been conducted in **Appendix C**. The results of this analysis indicates an initiating fire frequency would be in the order of 1x10^{-3} p.a.

The high wind condition resulting in such an impact over the site boundary are based upon the wind rows for the Melton Mowbray weather station which show that wind >40 km/h occurs about 2% of the time.

For a fatality to occur, it would require a person to be standing at the site boundary when the incident occurred and for them to be incapacitated such that they can't move away from the heat.

Based upon the area, people are not expected to be regularly at the site boundary; hence, for conservatism, it has been assumed that they are in position 1% of the time.

Therefore, the total frequency for the incident impacting offsite is $1x10^{-3}$ x 0.02 x 0.01 = $2x10^{-7}$ p.a. Assuming a fatality rate of 100% for an exposed person the fatality rate is $2x10^{-7}$ p.a.

6.3 Comparison Against Risk Criteria

The NSW Department of Planning and Environment has issued a guideline on the acceptable risk criteria (Ref. [4]). The acceptable risk criteria published in the guideline relates to injury, fatality and property damage. The values in the guideline present the maximum levels of risk that are permissible at the land use under assessment.

Conservatively assuming the adjacent land uses are residential, the acceptable fatality risk criteria at the site boundaries would be $1x10^{-6}$ p.a. The fatality risk criteria at the site boundary was calculated to be $2x10^{-7}$; hence, the fatality risk criteria are not exceeded.

7.0 Conclusion and Recommendations

7.1 Conclusions

The potential for a fire to occur in the bond stores at the Shene and Oatlands sites were modelled to determine whether the radiant heat which may be emitted would result in incident propagation or pose potential for injury / fatality offsite. The analysis showed that the radiant heat emitted from a fire would be insufficient to result in sufficient radiant heat to propagate to adjacent bond stores. Furthermore, the potential for injury / fatality offsite was also shown to not occur.

Based upon the analysis, the following conclusions may be drawn with respect to non-compliances identified against AS 1940-2017:

- Foam making hose reels could be omitted as these are for occupant use and would not assist the Fire Service. Foam extinguishers can be provided to allow occupants to enact a fire response attack.
- The separation distances between the bond stores are adequate as the potential for incident propagation would not occur based upon observed radiant heat emitted from a bond store fire.
- The separation distances to the site boundaries are adequate as the potential for propagation offsite or injury / fatality to occur at the site boundary would be below the acceptable criteria.
- The separation distance between Oatlands bond stores and fire water tanks is sufficient based upon the propagation contour (i.e. the tanks will remain operable should a bond store fire occur despite the distance being less than 10 m).

7.2 Recommendations

Notwithstanding the above assessment, the following recommendations have been made to ensure they are captured within the design:

- The ventilation of the bond stores shall comply with the requirements of AS 1940-2017.
- The bond stores shall be subject to hazardous area classification in accordance with AS/NZS 60079.10.1:2009.
- Any electrical equipment installed within the defined hazardous areas shall comply with the requirements of AS/NZS 60079.14:2017.
- Foam and dry powder fire extinguishers shall be provided within a 15 m travel distance to all parts of each bond store as required by AS 1940-2017.
- The fire water provided to protect against bushfire shall be interconnected with a hydrant system to provide protection against the bond stores.
- The fire water tanks at Shene Distillery shall be either relocated to 10 m away or a fire wall with an FRL of 120/120/120 shall be installed between the tanks and the bond store.
- The onsite fire water storage shall be capable of containing a minimum of 214,320 L provide for bushfire protection and protection against a potential bond fire store.
- Each bond store shall comply with the bunding requirements of AS 1940-2017 which would require the bond store bunds to be 50 mm high.

8.0 References

[1] WorkSafe Tasmania, “Work Health and Safety Regulation 2012,” WorkSafe Tasmania, Hobart, 2012.

[2] Department of Planning, Multi-Level Risk Assessment, Sydney: Department of Planning, 2011.

[3] Department of Planning, “Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis,” Department of Planning, Sydney, 2011.

[4] Department of Planning, “Hazardous Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use Safety Planning,” Department of Planning, Sydney, 2011.

[5] National Transport Commission (NTC), “Australian Code for the Transport of Dangerous Goods by Road & Rail, Edition 7.6,” 2018.

[6] Standards Australia, AS 1940-2017 - Storage and Handling of Flammable and Combustible Liquids, Sydney: Standards Australia, 2017.

[7] Standards Australia, AS/NZS 60079.10.1:2009 - Explosive Atmospheres Part 10.1: Classification of Areas, Explosive Gas Atmospheres, Sydney: Standards Association of Australia, 2009.

[8] Standards Australia, AS/NZS 60079.14:2017 - Explosive Atmospheres Part 14: Electrical Installations, Design, Selection and Erection, Sydney: Standards Australia, 2017.

[9] NSW Department of Planning, “Best Practice Guidelines for Contaminated Water Retention and Treatment Systems,” NSW Department of Planning, Sydney, 1994.

[10] I. Cameron and R. Raman, Process Systems Risk Management, San Diego: Elsevier, 2005.

[11] F. P. Lees, Loss Prevention in the Process Industries, London: Butterworth-Heinemann, 2005.

Appendix A

Hazard Identification Table

A1. Hazard Identification Table

Area/Operation	Hazard Cause	Hazard Consequence	Safeguards
Bond store	• Dropped cask • Damaged packaging (receipt or during storage) • Deterioration of packaging	• Spill of flammable liquids or gas, evolution of flammable vapour cloud ignition and vapour cloud explosion/flash fire • Spill of flammable liquids or gas, ignition and pool fire/racking fire • Escalation of incident into a full bond store fire.	• Robust casks (constructed of wood / metal) • Inspection of cask prior to filling • Hazardous area classification per AS/NZS 60079.10.1:2009 (Ref. [7]) • Control of ignition sources according to AS/NZS 60079.14:2017 (Ref. [8]) • Ventilation and bunding in accordance with AS 1940-2017 (Ref. [6])

Appendix B

Consequence Analysis

B1. Incidents Assessed in Detailed Consequence Analysis

The following incidents are assessed for consequence impacts.

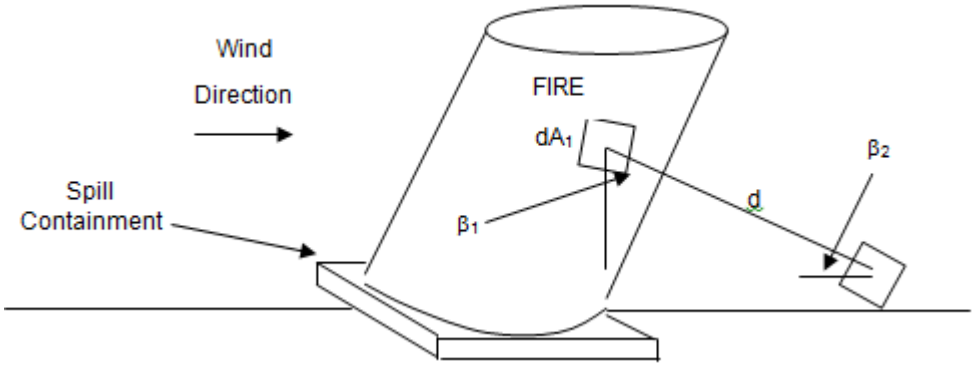
- Flammable liquid spill, ignition and racking fire / full bond store fire.

Each incident has been assessed in the sections below.

B2. Spreadsheet Calculator (SSC)

The SSC is designed on the basis of finite elements. The liquid flame area is calculated as if it is a circle to find the radius for input into the SSC model.

The SSC is designed on the basis of finite elements. The liquid flame area is calculated as if it is a circle to find the radius for input into the SSC model. **Appendix Figure B-1** shows a typical pool fire, indicating the target and fire impact details.



Appendix Figure B-1: Heat Radiation on a Target from a Cylindrical Flame

A fire in a bund or at a tank roof will act as a cylinder with the heat from the cylindrical flame radiating to the surrounding area. A number of mathematical models may be used for estimating the heat radiation impacts at various distances from the fire. The point source method is adequate for assessing impacts in the far field; however, a more effective approach is the view factor method, which uses the flame shape to determine the fraction of heat radiated from the flame to a target. The radiated heat is also reduced by the presence of water vapour and the amount of carbon dioxide in air. The formula for estimating the heat radiation impact at a set distance is shown in **Equation B-1** (Ref. [10]).

$$Q = EF\tau \qquad \textbf{Equation B-1}$$

Where:

- Q = incident heat flux at the receiver (kW/m^2)
- E = surface emissive power of the flame (kW/m^2)
- F = view factor between the flame and the receiver
- τ = atmospheric transmissivity

The calculation of the view factor (F) in **Equation B-1** depends upon the shape of the flame and the location of the flame to the receiver. F is calculated using an integral over the surface of the flame, S (Ref. [10]). The formula can be shown as:

$$F = \int\int s \frac{\cos\beta_1 \cos\beta_2}{\pi d^2}$$ **Equation B-2**

Equation B-2 may be solved using the double integral **or** using a numerical integration method in spread sheet form. This is explained below.

For the assessment of pool fires, a Spread Sheet Calculator (SCC) has been developed, which is designed on the basis of finite elements. The liquid flame area is calculated as if the fire is a vertical cylinder, for which the flame diameter is estimated based on the fire characteristics (e.g. contained within a bund). Once the flame cylindrical diameter is estimated, it is input into the SSC model. The model then estimates the flame height, based on diameter, and develops a flame geometric shape (cylinder) on which is performed the finite element analysis to estimate the view factor of the flame. **Appendix Figure B-1** shows a typical pool fire, indicating the target and fire impact details.

The SSC integrates the element dA_1 by varying the angle theta θ (the angle from the centre of the circle to the element) from zero to 90º in intervals of 2.5 degrees. Zero degrees represents the straight line joining the centre of the cylinder to the target (x0, x1, x2) while 90º is the point at the extreme left-hand side of the fire base. In this way the fire surface is divided up into elements of the same angular displacement. Note the tangent to the circle in plan. This tangent lies at an angle, gamma, with the line joining the target to where the tangent touches the circle (x4). This angle varies from 90º at the closest distance between the liquid flame (circle) and the target (x0) and gets progressively smaller as θ increases. As θ increases, the line x4 subtends an angle phi Φ with x0. By similar triangles we see that the angle gamma γ is equal to 90- θ - Φ . This angle is important because the sine of the angle give us the proportion of the projected area of the plane. When γ is 90º, sin(γ) is 1.0, meaning that the projected area is 100% of the actual area.

Before the value of θ reaches 90º the line x4 becomes tangential to the circle. The fire cannot be seen from the rear and negative values appear in the view factors to reflect this. The SSC filters out all negative contributions.

For the simple case, where the fire is of unit height, the view factor of an element is simply given by the expression in **Equation B-3** (Derived from **Equation B-2**):

$$VF = \Delta A \frac{\sin\gamma}{\pi \times X4 \times X4}$$ **Equation B-3**

Where ΔA is the area of an individual element at ground level.

Note: the denominator (π. x4. x4) is a term that describes the inverse square law for radiation assumed to be distributed evenly over the surface of a sphere.

Applying the above approach, we see the value of x4 increase as θ increase, and the value of sin(γ) decreases as θ increase. This means that the contribution of the radiation from the edge of the circular fire drops off quite suddenly compared to a view normal to the fire. Note that the SSC adds up the separate contributions of **Equation B-3** for values of θ between zero until x4 makes a tangent to the circle.

It is now necessary to do two things: (i) to regard the actual fire as occurring on top of a fire wall (store) and (ii) to calculate and sum all of the view factors over the surface of the fire from its base to its top. The overall height of the flame is divided into 10 equal segments. The same geometric technique is used. The value of x4 is used as the base of the triangle and the height of the flame, as the height. The hypotenuse is the distance from target to the face of the flame (called X4'). The

angle of elevation to the element of the fire (alpha α) is the arctangent of the height over the ground distance. From the cos(α) we get the projected area for radiation. Thus there is a new combined distance and an overall equation becomes in **Equation B-4 (**(Derived from **Equation B-3**):

$$VF = \Delta A \frac{\sin\gamma \times \cos\alpha}{\pi \times X4 \times X4} \qquad \textbf{Equation B-4}$$

The SCC now turns three dimensional. The vertical axis represents the variation in θ from 0 to 90º representing half a projected circle. The horizontal axis represents increasing values of flame height in increments of 10%. The average of the extremes is used (e.g. if the fire were 10 m high then the first point would be the average of 0 and 1 i.e. 0.5 m), the next point would be 1.5 m and so on).

Thus, the surface of the flame is divided into 360 equal area increments per half cylinder making 720 increments for the whole cylinder. Some of these go negative as described above and are not counted because they are not visible. Negative values are removed automatically.

The sum is taken of the View Factors in **Equation B-3**. Actually, the sum is taken without the ΔA term. This sum is then multiplied by ΔA which is constant. The value is then multiplied by 2 to give both sides of the cylinder. This is now the integral of the incremental view factors. It is dimensionless so when we multiply by the emissivity at the "face" of the flame (or surface emissive power, SEP), which occurs at the same diameter as the fire base (pool), we get the radiation flux at the target.

The SEP is calculated using the work by Mudan & Croche (Ref. [11] & Ref. [10]) which uses a weighted value based on the luminous and non-luminous parts of the flame. The weighting is based on the diameter and uses the flame optical thickness ratio where the flame has a propensity to extinguish the radiation within the flame itself. The formula is shown in **Equation B-5**.

$$SEP = E_{max}e^{-sD} + E_s(1 - e^{-sD}) \qquad \textbf{Equation B-5}$$

Where;

E_{max} = 140

S = 0.12

E_s = 20

D = pool diameter

The only input that is required is the diameter of the pool fire and then estimation for the SEP is produced for input into the SSC.

The flame height is estimated using the Thomas Correlation (Ref. [10]) which is shown in **Equation B-6**.

$$H = 42 d_p \left[\frac{\dot{m}}{\rho_a \sqrt{g d_p}}\right]^{0.61} \qquad \textbf{Equation B-6}$$

Where;

d_p = pool diameter (m)

ρ_a = density of air (1.2 kg/m^3 at 20ºC)

$\dot{m}$ = burning rate (kg/m^2.s)

g = 9.81 m/s^2

The transmissivity is estimated using **Equation B-7** (Ref. [10]).

$$\tau = 1.006 - 0.01171(\log_{10} X(H_2O) - 0.02368(\log_{10} X(H_2O))^2 - 0.03188(\log_{10} X(CO_2) + 0.001164(\log_{10} X(CO_2))^2$$

Equation B-7

Where:

- τ = Transmissivity (%)
- X(H_2O) = $\frac{R_H \times L \times S_{mm} \times 2.88651 \times 10^2}{T}$
- X(CO_2) = $\frac{L \times 273}{T}$

and

- R_H = Relative humidity (% expressed as a decimal)
- L = Distance to target (m)
- S_{mm} = saturated water vapour pressure in mm of mercury at temperature (at 25^{o}C S_{mm} = 23.756)
- T = Atmospheric temperature (K)

Appendix Table B-1 provides noteworthy heat radiation values and the corresponding physical effects of an observer exposed to these values (Ref. [4]).

Appendix Table B-1: Heat Radiation and Associated Physical Impacts

Heat Radiation (kW/m^2)	Impact
35	• Cellulosic material will pilot ignite within one minute's exposure • Significant chance of a fatality for people exposed instantaneously
23	• Likely fatality for extended exposure and chance of a fatality for instantaneous exposure • Spontaneous ignition of wood after long exposure • Unprotected steel will reach thermal stress temperatures which can cause failure • Pressure vessel needs to be relieved or failure would occur
12.6	• Significant chance of a fatality for extended exposure. High chance of injury • Causes the temperature of wood to rise to a point where it can be ignited by a naked flame after long exposure • Thin steel with insulation on the side away from the fire may reach a thermal stress level high enough to cause structural failure
4.7	• Will cause pain in 15-20 seconds and injury after 30 seconds exposure (at least second-degree burns will occur)
2.1	• Minimum to cause pain after 1 minute

B3. Flammable Liquid Spill, Ignition and Racking Fire / Full Bond Store Fire

If a fire occurs it will propagate throughout the whole bond store as casks continue to fail spilling the whisky into the bunded stored. Eventually the fire will have the dimensions of the bund. The bond stores have dimensions of 30 m x 12.0 m which will be used to assess all scenarios. Substituting the area of the dimensions into the model results in an equivalent circular diameter of:

$$D = \sqrt{\frac{4 \times 30 \times 12}{\pi}} = 21.4\ m$$

The following information was input into the models;

- Equivalent fire diameter – 21.4 m
- Burning rate – 0.015 kg/m^2.s (burning rate for ethanol Ref. [11])

The models provided the following information for the bond store fire:

- SEP – 29.2 kW/m^2
- Flame Height – 12.2 m
- Wind tilt – 15 degrees

Provided in **Appendix Table B-2** are the results generated by the SSC.

Appendix Table B-2: Heat Radiation Impacts from a Full Bond Store Fire

Heat Radiation (kW/m^2)	Distance (m)
35	Maximum heat flux is 20*
23	4.4
12.6	7.6
4.7	15.6

* Research conducted in relation to large fires (Ref. [10]) indicates that where a large fire occurs, it is difficult for complete combustion to occur towards the centre of the fire due to the lack of air being unable to reach the centre of the flames. Hence, combustion tends to occur effectively at the fire surface, but poorly towards the centre of the fire. This generates large quantities of black smoke, which shields the flame surface as the smoke from the centre of the fire escapes towards the outer fire surface. The research presented in Lees (Ref. [11]) indicates that fires will generate a SEP within a range of between 20 kW/m^2 for larger fires and 130 kW/m^2 for smaller fires. Hence, a full bond store fire would be of significant dimensions, generating large quantities of black smoke, shielding the flames at the fire surface. Hence, for the model calculated a SEP value of 20 kW/m^2 which has been used in this analysis.

An additional analysis has been conducted for the worst-case scenario has also been modelled where strong winds are present. To determine the worst-case flame tilt scenario a range of wind speeds were input into the flame tilt model published in the TNO Yellow book (Ref. [12]). The results of the analysis are shown in **Appendix Table B-3**.

Appendix Table B-3: Wind Speed vs Flame Tilt

Wind Speed	Tilt Angle (Degrees)
15	46.7
30	56.0

Wind Speed	Tilt Angle (Degrees)
45	61.7
60	63.7
75	65.8
90	67.5
105	68.8
120	69.8

It can be seen that wind tilt trends toward 70 degrees at high winds; hence, this condition has been used for the worst-case scenario.

The following information was input into the models;

- Equivalent fire diameter – 21.5 m
- Burning rate – 0.015 kg/m^2.s (burning rate for ethanol Ref. [11])

The models provided the following information for the bond store fire:

- SEP – 29.2 kW/m^2
- Flame Height – 12.2 m
- Wind tilt – 70 degrees

Provided in **Appendix Table B-4** are the results generated by the SSC.

Appendix Table B-4: Heat Radiation Impacts from a Full Bond Store Fire (with high wind flame tilt)

Heat Radiation (kW/m^2)	Distance (m)
35	Maximum heat flux is 28.7*
23	15.9
12.6	17.5
4.7	21.8

Appendix C

Bond Fire Frequency

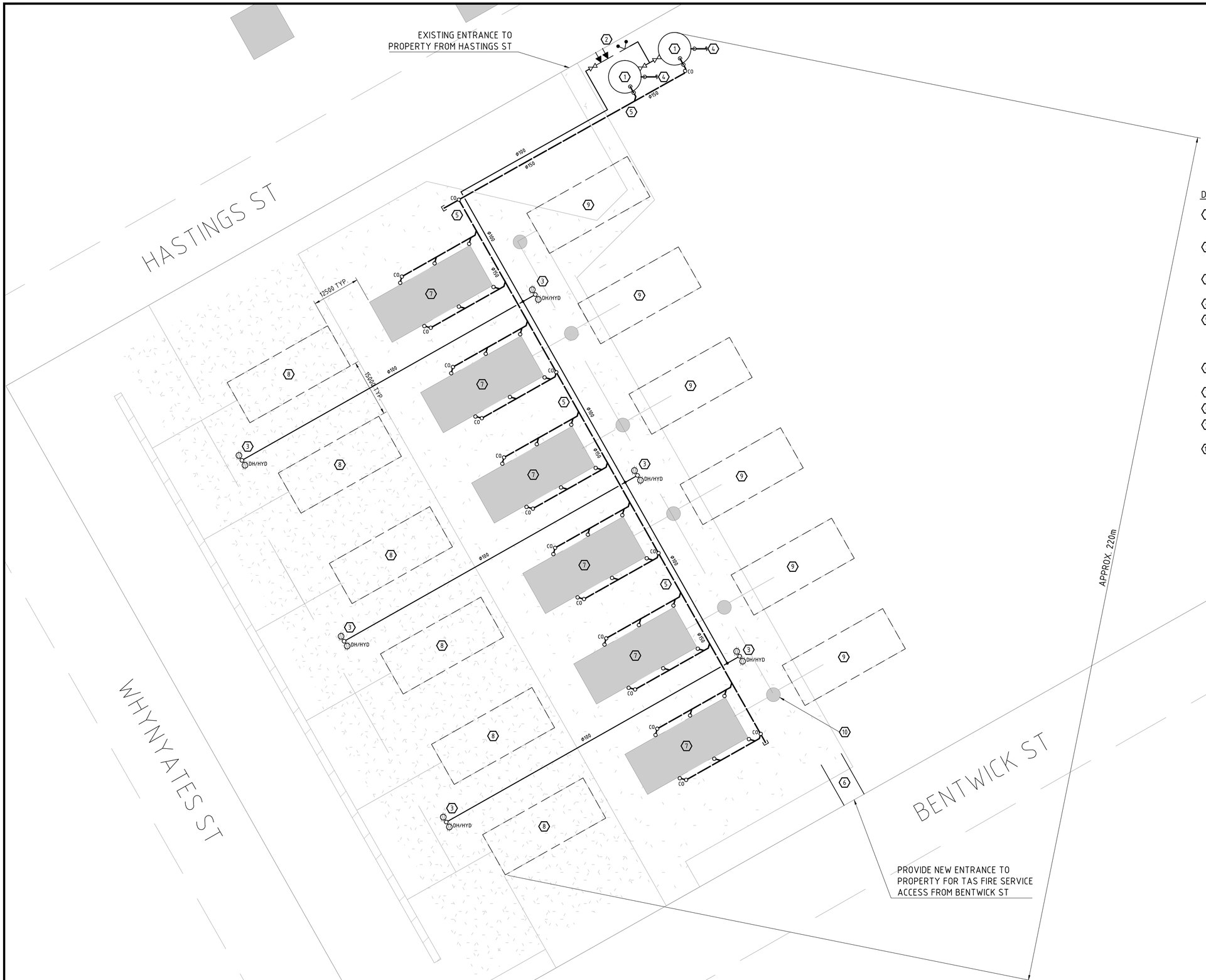
C1. Estimation of the Frequency of a Full Warehouse Fire

A review of readily available warehouse fire frequency information was conducted and a number of direct sources were identified. These were:

- Health and Safety Executive (HSE) in the United Kingdom [Hymes & Flynn, UKAEA - SRD/HSE R578, 2002] – this document lists the major warehouse fire frequency to be $2.5x10^{-3}$ p.a.;
- Baldwin, Accident Analysis and Prevention (Vol.6) – indicates a serious fire frequency in warehouses to be in the order of $1x10^{-3}$ p.a.;
- Environmental Impact Assessment Report for the Commission of Inquiry into Proposed Manufacturing Plant by WR Grace Australia Ltd., Kurnell, Sydney, October 1987 – indicates a fire frequency of $4.6x10^{-3}$ per warehouse year; and
- VROM 2005, Guidelines for quantitative risk assessment CPR 18E (Purple Book), Publication Series on Dangerous Substances (PGS 3), The Netherlands. – $4x10^{-4}$ p.a.

It is noted that the mix of overseas data and local data (albeit some is dated) correlates to indicate a fire frequency in warehouses to be in the order of $1x10^{-3}$ to $4x10^{-4}$. The data presented in the reports reviewed was for general warehouses, where stringent controls for spill and ignition sources (such as flame and explosion proof fittings, bunding, smoking and naked flame controls, isolation of power supplied on warehouse closure, etc.) were not part of the warehouse hazard controls. Hence, for a DG warehouse containing specific ignition, it would be expected that a major fire would occur with a lesser frequency than that of general warehouses. Notwithstanding this, to ensure a conservative assessment has been provided within the study, the estimated initiating fire frequency for the facility has been estimated as $1x10^{-3}$ p.a. (i.e. the upper end of the range).

Selected Initiating Fire Frequency = $1x10^{-3}$ p.a.



DRAWING REFERENCE NOTES

1. 2 OFF 110kL FIRE TANKS NOMINALLY ø8500 x 2200 HIGH EACH. TOP UP WITH CHARGED STORMWATER SYSTEM FROM ROOF DRAINAGE OF BOND STORES. PROVIDE LOCKABLE ISOLATION VALVES, LEVEL INDICATOR AND CONNECTION TO BRIGADE SUCTION POINT.
2. BRIGADE HYDRANT BOOSTER AND TANK SUCTION CONNECTION POINTS NOMINALLY 20m AWAY FROM BOND STORES. ENSURE THERE ARE NO OBSTRUCTIONS OR FENCES IN FRONT OF THE SUCTION AND BOOSTER POINTS.
3. ø100 HYDRANT STANDPIPE AND DUAL HEAD HYDRANTS LOCATED FOR CURRENT AND FUTURE BOND STORE LOCATIONS. ENSURE MIN. 10m FROM ANY BOND STORE.
4. TANK OVERFLOW TO NEARBY SWALE DRAIN (TBC ON SITE).
5. CHARGED STORMWATER DRAINAGE SYSTEM TO TOP UP FIRE WATER TANKS. PIPES MAY BE INSTALLED WITH NO GRADIENT. PROVIDE CLEAR OUT PORTS (FINISHED TO SURFACE) FOR MAINTENANCE AND REMOVAL OF SEDIMENT (TO BE IMPLEMENTED ON AN ANNUAL BASIS). PROVIDE TRENCHING, COMPACTED PIPE SUPPORT, BACKFILL, AND MAKE GOOD TO SURFACE.
6. NEW ENTRANCE FROM BENTWICK STREET PROVIDING ADDITIONAL ACCESS TO BOND STORE GROUNDS.
7. EXISTING BOND STORE.
8. BOND STORE UNDER CONSTRUCTION.
9. PROPOSED FUTURE BOND STORE. (LOCATION TBC TO ACHIEVE COMPLIANT HYDRANT COVERAGE AND CLEARANCES).
10. EXISTING RAINWATER TANKS MAY BE RETAINED, HOWEVEVER CONNECTION MUST BE MODIFIED SUCH THAT RESPECTIVE LEVELS PREFERENTIALLY SERVICE NEW FIRE WATER STORAGE. TYP. ALL. ALTERNATIVELY DEMOLISH EXISTING TANKS.

REV.	DESCRIPTION	DRN	CHK	APP.	DATE
E	FINAL PRELIMINARY ISSUE	PB	JC	JC	02.11.20
D	REVISED PRELIMINARY ISSUE	PB			21.10.20
C	REVISED PRELIMINARY ISSUE	PB			20.10.20
B	REVISED PRELIMINARY ISSUE	PB			19.10.20
A	PRELIMINARY ISSUE	PB			19.10.20

DRAWING CHECK	SIGNATURE	DATE
DRAWN	PB	06.10.20
DESIGNED		
CHECKED		
CLIENT		

CO-ORDINATION CHECK	SIGNATURE	DATE
STRUCT.		
MECH.		
ELECT.		
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PROJECT: OATLANDS & SHENE BOND STORES
FIRE HYDRANT INSTALLATIONS

TITLE: FIRE PROTECTION SERVICES
OATLANDS BOND STORE
FIRE HYDRANT LAYOUT

10000 0 10000 20000 30000 A1

STATUS: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

SCALE @ A1: 1:500 DIMENSIONS IN: MILLIMETRES

DRAWING No.: 5519.001-F001 REV.: E

E: enquiries@eraplanning.com.au
W: www.eraplanning.com.au

Attachment 2 - Representation
Agenda Item 4.1

Representation Received DA2020/113 six (6) Bond Storage Sheds

Louisa Brown

From:
Sent: Thursday, 17 December 2020 10:08 AM
To: SMC Mail
Subject: 6 Bond storage sheds
Attachments: thumbnail_20200809_092849.jpg; thumbnail_20200814_094103.jpg

Regarding the proposal DA2020/113 Six Bond Storage Sheds to be built at 20 Bentwick St. Oatlands, I wish to express my opposition for the following reason:
The area is starting to resemble a refugee camp and adding six more sheds to the site will not improve it visually.

Enough is enough!

Unfortunately allowances have been made by council to facilitate the construction of the distillery. Section "K" of the Southern Midlands Interim Planning Scheme 2015 Heritage Precinct Provisions (see attached) and the attached photograph taken from Esplanade shows a breech of this act. This has set a precedent, which means that now anyone can do as they please, unless of course council have one rule for John Ibrahim and another rule for the person who is made to tear down his garage because the pitch of the roof is wrong, or not allowed to use an old building because of a similar situation .

I am not against development, having worked in the National Capital Development Commission (Canberra) a very modern city, where much more thought to the siting, design and purpose of buildings was explored and impact assessments were extensively carried out. It is so unfortunate that this building was allowed to be placed in the main part of the township of Oatlands, when there is plenty of land on the outskirts. The poor residents now have to live with this ugly construction. Tourists who visit are amazed that something so inappropriate could be given permission to be built in the town, and ask us why have council allowed this to happen?

Will it bringing much employment to the town? John Ibrahim is setting up accommodation for his workers in the old Midlands Hotel and so far I haven't seen a great use of Oatlands people working on this development. He seems to have carte blanche when it comes to having his way which has upset so many people in the town, but he seems to have the council eating out of the palm of his hand - Why one may ask?

Table E.13.1 of the SMIPS2015, accordingly they would need to be retained.

Southern Midlands Interim Planning Scheme 2015 - Heritage Precinct Provisions:
The site is located in the Callington Mill Heritage Precinct. Table E.13.2 provides the following:

Statement of Historic Cultural Heritage Significance

The Callington Mill Precinct is of historic cultural heritage significance because:

(a) it is a rare and unique example of a flour mill complex dating from the early to mid-nineteenth century, demonstrating agricultural enterprises of the colony, and the success of the wheat industry in the Southern Midlands area;

(b) its creative and technical achievement as an Old Colonial Georgian flourmill of circular domed tower of sandstone;

(c) it is a distinctive landmark both within the township of Oatlands and from the Midland Highway.

Design Criteria / Conservation Policy

1. *The design and siting of buildings and works must satisfy the following criteria:*
   - *(a) scale, roof pitch, building height, form, bulk, rhythm, materials and colour of new buildings and additions to existing buildings should respect the principles of the Georgian architectural style dominant in the precinct, except if an addition to a heritage listed building of a non-dominant architectural style in which case consistency with that style is required;*
   - *(b) building setback from frontage must provide a strong edge to Main Street and be parallel to the street;*
   - *(c) buildings must address the street, unless at the rear of a site;*
   - *(d) buildings must not visually dominate the streetscape or buildings at places listed in Table.13.1*
   - *(e) architectural details and openings for windows and doors to visually prominent facades must respect the Georgian architectural style dominant in the precinct in terms of style, size, proportion and position;*
   - *(f) external wall building material must be any of the following:*
     - *(i) sandstone of a colour matching that commonly found in Oatlands' buildings*
     - *(ii) weatherboard (traditional profiles);*
     - *(iii) rendered, painted or lime wash brickwork;*
     - *(iv) unpainted brick of a traditional form and colour laid with a traditional bond;*
     - *(v) traditional Tasmanian vertical board (non-residential buildings only);*
     - *(vi) corrugated profile steel cladding, painted/colorbond or galvanised iron (not 'zincalume' or similar) (outbuildings only);*
   - *(g) roof form and material must be consistent with the following:*
     - *(i) pitch between 30 and 40 degrees and hipped or gable if a major part of the building;*
     - *(ii) pitch less than 30 degrees and skillion if a minor part of the building at the rear;*
     - *(iii) avoidance of large unbroken expanses of roof and very long roof lines*
     - *(iv) roof material either custom orb (corrugated profile) sheeting, timber shingles, and slate. Steel sheeting must be either traditional galvanised iron or painted;*
     - *(v) guttering is rounded profile, with downpipes of circular cross-section:*
   - *(h) wall height sufficient to provide for lintels above doors and windows, with wall space above;*
   - *(i) outbuildings generally to have a gabled, corrugated roof with an angle of pitch matching that of the primary building on the land, and with differentiated colouring of the exterior walls and roof so as to also approximate that of the primary building on the land;*
   - *(j) fences along frontages must be:*
     - *(i) (between 900mm and 1000mm high, with a maximum of 1200mm for posts;*
     - *(ii) (vertically articulated, (such as with dowel-and-rail, picket or palisade fences);*
     - *(iii) "semi-transparent" in appearance, that is, the distance between dowels or pickets, etc., must be such that the fence does not appear 'solid'.*
   - *(k) new buildings and additions to existing buildings must not significantly obstruct or diminish views of Callington Mill from High Street, the Esplanade or the Midland Highway.*