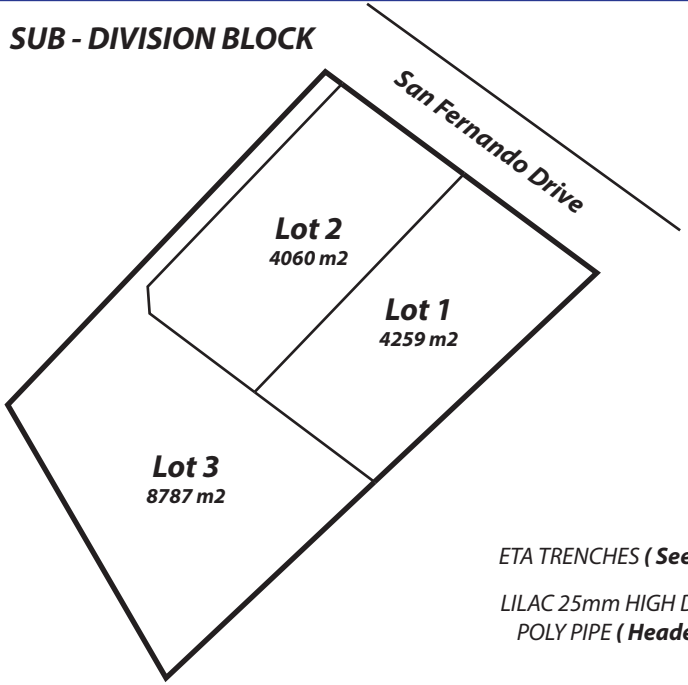
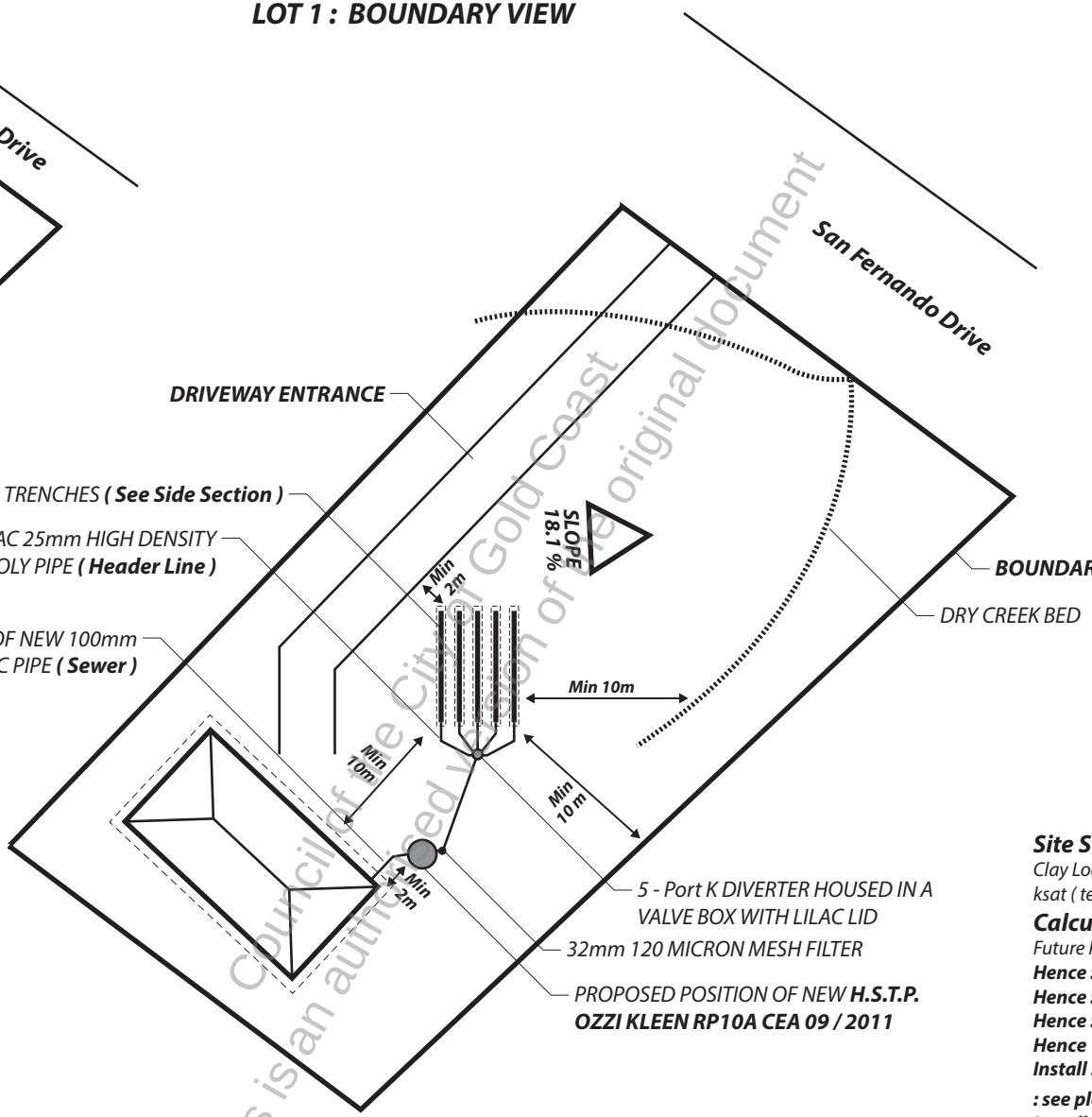
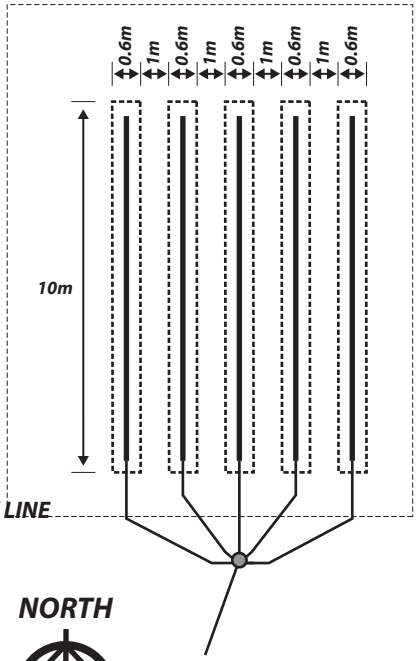
SUB - DIVISION BLOCK



LOT 1 : BOUNDARY VIEW

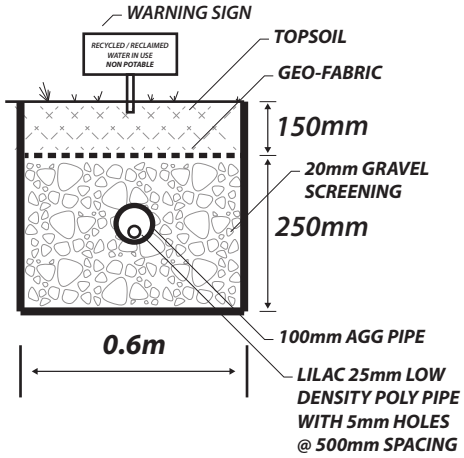


LAND APPLICATION AREA



NORTH

SIDE SECTION EXAMPLE DRAWING



Site Soil :
Clay Loam Cat 4 , Moderately Structured , Well Drained .
ksat (test) 0.5 - 0.9 range - DIR : 3.5mm / day

Calculations :
Future Proposed Secondary 4 bedroom Dwelling .
Hence : *4 bedroom : 6 Persons (6 EP)*
Hence : *6 X 150 litres per person per day = 900 L/day*
Hence : *900 L Divide by DLR 30mm / day = 30m2*
Hence *Allow 30 metres squared*
Install : Conventional Piped Trenching 50 Linear m @ 0.6m
: see plan : 30m2
Install : ACROSS THE SLOPE

COUNTRY-WIDE WATER PTY LTD
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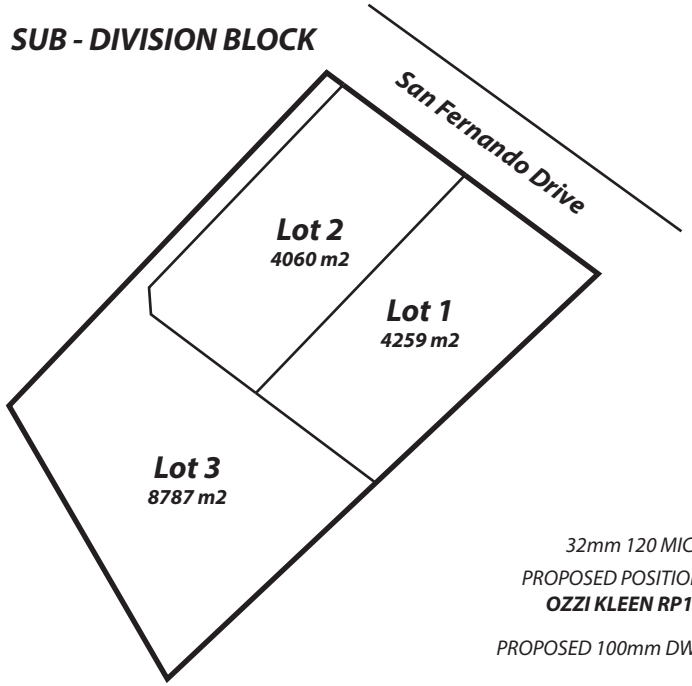
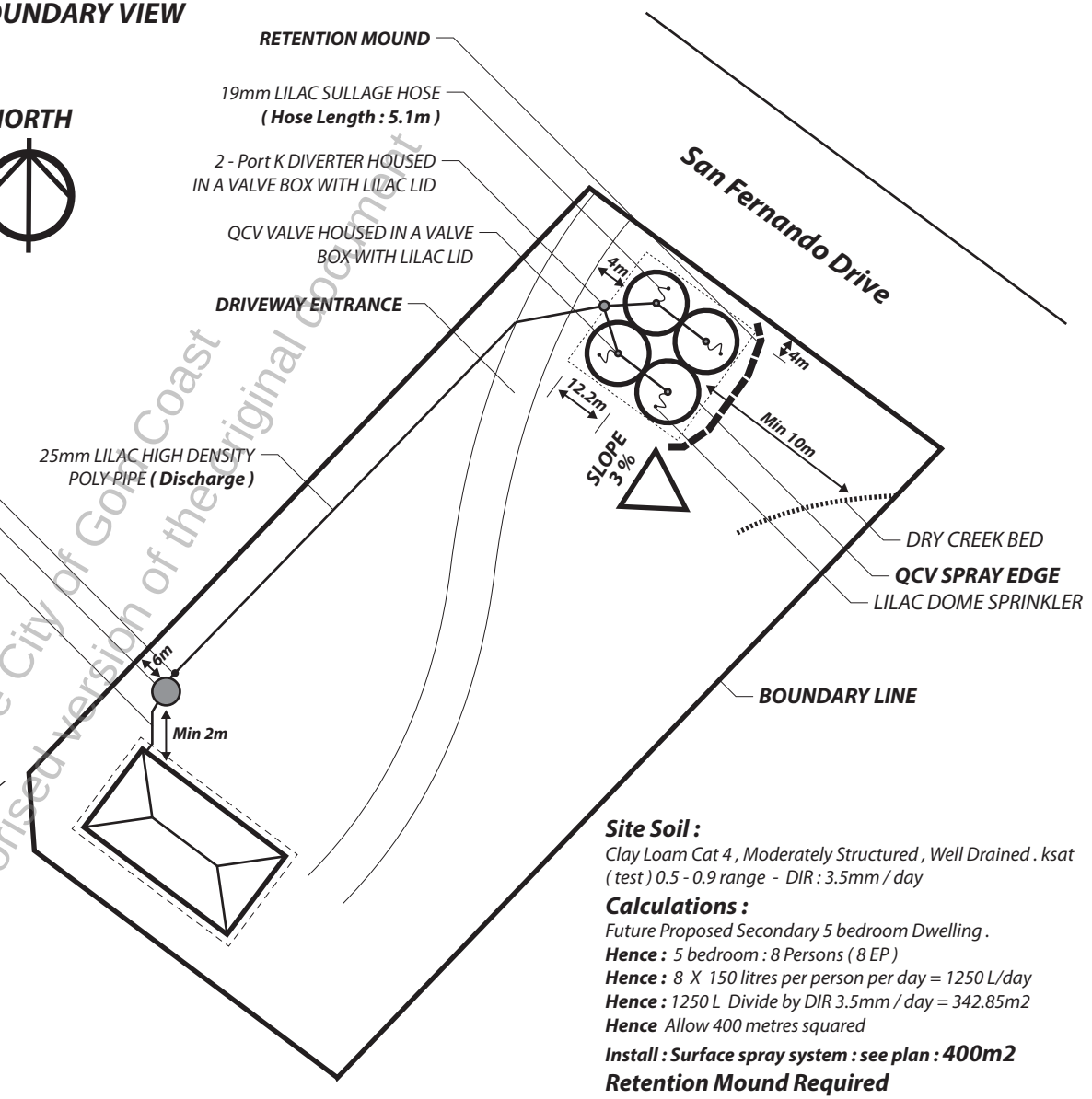
W: www.countrywidewater.com.au
M: 0418 230 850

Title: Site-Soil Evaluation Report No. CWW 221.15 - ***Boundary Plan***	***Client:*** *BC Currey Surveys*
Address : (Lot 1) #No. 211 San Fernando Drive , Worangary 4213 .	***Drawing No:*** CWW 221.15
Drawn: D. Lonergan : Site & Soil Evaluator & Designer QBCC Lic 1305650	***Scale:***
Date: 13/03/15 site visit : 11/3/2015 .	***Document #: CWW 221.15***

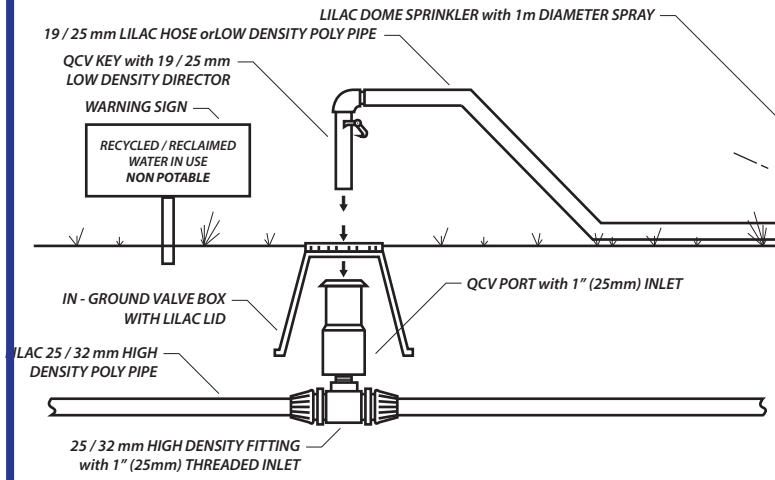
SUB - DIVISION BLOCK



LOT 2 : BOUNDARY VIEW



SURFACE SPRAY EFFLUENT DISPOSAL



Site Soil :

Clay Loam Cat 4 , Moderately Structured , Well Drained . ksat (test) 0.5 - 0.9 range - DIR : 3.5mm / day

Calculations :

Future Proposed Secondary 5 bedroom Dwelling .
Hence : *5 bedroom : 8 Persons (8 EP)*
Hence : *8 X 150 litres per person per day = 1250 L/day*
Hence : *1250 L Divide by DIR 3.5mm / day = 342.85m2*
Hence *Allow 400 metres squared*
Install : Surface spray system : see plan : 400m2
Retention Mound Required

COUNTRY-WIDE WATER PTY LTD

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M: 0418 230 850

Title: Site-Soil Evaluation Report No. CWW 221.15 - ***Boundary Plan***	***Client:*** *BC Currey Surveys*
Address: (Lot 2) #No. 211 San Fernando Drive , Worangary 4213 .	***Drawing No:*** CWW 221.15
Drawn: D. Lonergan : Site & Soil Evaluator & Designer : QBCC Lic No 1305650 .	***Scale:***
Date: 13/03/15 : site visit : 11/3/2015	***Document #: CWW 221.15***

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ON SITE AND SOIL EVALUATION FOR *EFFLUENT DISPOSAL*

FOR

PROPOSED *EFFLUENT DISPOSAL* FOR
BC Currey Surveys

Lot 1 : 211 San Fernando Drive
Worongary
Qld 4213

Issue No. 1
11th March 2015

CLIENT:
BC Currey Surveys

PREPARED & DESIGNED BY:

David Lonergan
Cert IV Domestic Waste Water & Environmental Plumbing . (Qld).
Building Services : Designer Hydraulic : Accreditation No : CC6068 G (Tas).
QBSS : Hydraulic Services Designer . QBCC Lic No : 1305650 , Lic No: 66575 , Lic No : 50064
GCCC Site & Soil Evaluator Registration No : ER075

Country-Wide Water Pty. Ltd.
Professional Indemnity Insurance Policy No : 005705

ABN: 60 561 482 213

QBSA: 66575

David M Lonergan Tas Accreditation No CC6068 G (Building Services : Designer Hydraulic).
Qualified in the States of : Queensland & Tasmania .
- ☒ Site Soil Evaluation
- ☒ On-site Sewerage Systems Designer
- ☒ Effluent Disposal Systems Designer
- ☒ Industrial Waste Water Filtration

Member
- ☒ Australian Society of Soil Science
- ☒ International Water Association
- ☒ Irrigation Australia

FILE NO. CWW 225.15

1 Introduction

1.1 Site Evaluator : David Lonergan : Hydraulic Services Designer .

Country-Wide Water Pty Ltd has been engaged by **BC Currey Surveys** to conduct a site and soil evaluation and provide an on-site Wastewater Management Report for the Proposed New Dwelling within the property described as **Lot 1 on RP 225089** which is situated at **Lot 1 : 211 San Fernando Drive**, **Worongary. 4213**

1.2 Site Details

Location

Site Address:	Lot 1 : 211 San Fernando Drive, Worongary, Qld 4213
RP Description:	Lot 1 (proposed) on RP 225089
Parish:	
Country:	Gold Coast City Council
Site Area:	
Dwelling Sizing:	Proposed New 4 Bedroom Dwelling
Building Envelope Sizing:	N/A
Other Buildings Structures Present:	Proposed New 4 Bedroom Dwelling

1.3 Report References

- AS/NZS 1547:2012 – On-Site Domestic Wastewater Management
- QPC – Queensland Plumbing and Wastewater Code 2006
- Local Council (On-Site Sewerage Facility) Guidelines

1.4 Report Objectives

a) Identify sources and quantities of domestic effluent from the site.

b) Examine and identify the existing soil conditions in relation to any proposed effluent disposal and its suitability.

c) Provide information on any site constraints that may affect a proposed land application area.

d) Identify any environmental considerations and possible impact.

e) Provide detailed site specific recommendations for the treatment of wastewater and provide the most effective land application system for the effluent disposal installation.

1.5 Scope of Work

In order to provide to the client an effective solution in regards to on site wastewater management the following scope of work has been undertaken.

a) A desktop study including a review of the proposed or existing development, site plans, aerial photographs, soil mapping of the area and geology charts.

b) A site visit inspection was carried out by the site evaluator and an inspection of the surrounding environment to ascertain a proposed land application area and any potential on-site wastewater management constraints.

c) The site evaluator has carried out two borehole tests to a depth of 600 mm below the ground level. Borehole tests to obtain recovery of the soil samples at horizon depths of 150mm , 300mm , 450mm , 600mm. As required to prepare the required soil evaluation report.

2 Site and Soil Assessment Report

The site evaluator has identified the following tabled characteristics on the day of 12th March in the year 2015.

These tabled characteristics relate to the proposed land application area.

2.1 Soil & Site Characteristics

Table 1 Soil & Site Characteristics

Feature	Description
Slope	18.10%
Configuration	Linear Divergent
Vegetation Present Detail Existing	Minmal grass , scattered trees .
Exposure	Filtered Sunlight
Run-off Potential	Sloped
Environmental concerns present water-ways etc.	Mod Slope
Buildings/Structures	To Service Proposed Dwelling
Site Drainage	Mod Drained
Aspect	South
Other	Dry creek bed at lower property

2.2 Site Soil Characteristics

On site the site evaluator has carried out a total of Two borehole tests using a Dormer 75mm diameter soil Auger to aid in the determination of a soil textural classification assessment. The site soil characteristics identified during the site soil evaluation are detailed in table 2.2 below.

2.3 Soil Characteristics

Table 2: Soil Characteristics

Borehole	Depth (m)	Soil Type (Description)	Structure	Category	Dispersive
1	0.0 - 0.15	Clay Loam	Mod Structured	Cat 4	No
	0.15 - 0.30	Clay Loam	Mod Structured	Cat 4	No
	0.30 - 0.45 0.45 - 0.60	Clay Loam Clay Loam	Mod Structured Mod Structured	Cat 4 Cat 4	No No
2	0.0 - 0.15	Clay Loam	Mod Structured	Cat 4	No
	0.15 - 0.30	Clay Loam	Mod Structured	Cat 4	No
	0.30 - 0.45 0.45 - 0.60	Clay Loam Clay Loam	Mod Structured Mod Structured	Cat 4 Cat 4	No No

The sub-soil examined during the site evaluators site inspection and testing have been classified in accordance with AS/NZS 1547:2012 . **Category 4 These soils are described as Well Drained with a tested permeability of 0.5 to 0.9 Range AS/NZS1547 : 2012 recommends a DLR : 30mm /day of mm per for Light Clay soils.**

2.4 Site Separation Distances

The recommended separation distances for land application areas are specified in the Queensland Plumbing & Wastewater Code (QPW). The tables below provide this information. Site specific separation distances are detailed on the attached plan that relates to this specific site soil assessment.

Table 3: Setback distances for (subsurface) land application area for a greywater treatment plant or an on-site sewage treatment plan

Feature	Horizontal Separation Distance (mtrs)		
Distance from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature.	**Up Slope**	**Down Slope**	**Level**
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall, footings.	2	4	2
In ground swimming pools.	6	6	6
In ground potable water tank.	6 *	6 *	6 *

Table 3.5 (surface spray)

Setback Distances : Surface Irrigated Land Application Areas : Advanced Secondary On Site Sewerage Treatment Plants

Feature	Horizontal Separation Distance (mtrs)
Distance from the edge of surface spray / irrigation distribution pipework to the nearest point of the feature.	**Metres**
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall, footings.	2
In ground swimming pools.	6
In ground potable water tank.	6 *

* Note:- For primary effluent the distance from an in-ground potable water tank must be 15 mtrs.

Table 4: Setback distances for on-site sewerage facilities and greywater use facilities. (Protection of surface water and groundwater)

Feature	Separation	Distance	(metres)
For On-Site – see Appendix 1	**Advanced Secondary**	**Secondary**	**Primary ***
For Greywater – see T1A or T1B	High	Medium	Low
Top of bank of permanent water course; or Top of bank of Intermittent water course; or Top of bank of a lake, bay or estuary or, Top water level of a surface water source used for agriculture , aquaculture or stock purposes or; Easement boundary of unlined open stormwater drainage channel or drain. Bore or a dam used or likely to used for human and or domestic consumption	10	30	50
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

* Note:- Primary effluent typically has a BOD (Biochemical Oxygen Demand) of between 120-240 mg/L and Total Suspended Solids of between 65-180 mg/L.

2.5 On-Site Evaluation Assessment and Calculations

On-site soil test procedures and evaluation at the site have determined that the most suitable form of on-site sewerage treatment : **Ozzi-Kleen Rp10A On Site Sewerage Treatment Plant . CEA 09/2011.**

On-site soil testing procedures and evaluation of the land application area available, it is recommended that the following form of effluent disposal be adopted Conventional Trenching Effluent Disposal.

Wastewater Flow Calculations

Site: Lot 1 : 211 San Fernando Drive, Worongary, Qld, 4213

Table 5

OR

Number Bedrooms	Population Equivalent	Typical Wastewater Flow L/person/day	Daily Wastewater Flow (L/day)	Weekly Wastewater Flow (L/week)	DLR mm Day	DIR mm Week
4	6	150	900		DLR : 30mm/day	

As effluent Disposal System will be Conventional Piped Trenching System.

The following Calculations will apply:

Site Soil : Clay Loam Cat 4 , Moderately Structured , Well Drained , Ksat : 0.5 to 0.9 (tested) range .
DLR : 30mm/day .

Calculations : Proposed Future 4 bedroom dwelling .

Hence : 4 bedroom dwelling : 6 persons X 150 litres per person per day = 900 L/day

Hence : 900 L/day divide by DLR of 30mm/day = **30 metres squared LAA**

Install As Conventional Piped Trenching System .

Install As : Width of 600mm : requires **50 linear metres of trenching**

Install As Five Trench System (5) X 10m length X 400mm depth .

Install Across The Slope .

2.6 Proposed Land Application Area

The area that will be required for the land application of effluent disposal via irrigation has been calculated to be **30m 2 installed as Conventional Piped Trenching System**. Refer to the design drawings supplied with this report for the required installation criteria.

The above calculation along with the design provided is to be seen as a minimum requirement.

3 Site Wastewater Management

3.1 On-Site Wastewater Treatment System

It is proposed that an aerobic wastewater treatment plant be installed to cater for all wastewater produced by the location **Lot 1 : 211 San Fernando Drive, , Worongary, Qld, 4213.**

Table 6 below shows the effluent quality criteria for secondary treated effluent.

Table 6: Secondary Effluent Quality

Parameter	Level

Parameter	Level
Biochemical Oxygen Demand (BODs)	20mg/L
Total Suspended Solids (SS)	30mg/L
Total Nitrogen (TN)	30mg/L
Total Phosphorous (TP)	10mg/L
Thermotolerant Coliform (org/100mL)	10 organisms

Note: - Under Section 91 of the Plumbing and Drainage Act 2002, Chief Executive Approval is required for an On-Site Sewerage Treatment Plant where the sewerage generated on the property is less than that of 21 equivalent persons. Performance criteria - refer to the Queensland Plumbing and Wastewater Code Part 5 P1,P2, P3, P4, published 17/6/2009.

The Chief Executive Approval number will be noted on the effluent disposal design plans that make up part of this said report.

3.2 Proposed Land Application Area for Effluent Disposal

A land application system must be designed, constructed, installed and maintained in such a manner as to:-

a) complete the treatment, uptake and absorption of the final effluent within the boundaries of the approved application area.

b) Avoid the likelihood of the creation of unpleasant odours or the accumulation of offensive matter.

c) Avoid the likelihood of the ingress of effluent, foul air or gasses entering buildings.

d) Avoid the likelihood of stormwater run-off entering the system.

e) Avoid the likelihood of root penetration or ingress of ground water entering the system.

f) Protect against internal contamination.

g) Provide adequate access for maintenance.

h) Provide and incorporate adequate provisions for effective cleaning.

i) Avoid the likelihood of unintended or uncontrolled discharge.

j) Avoid the likelihood of blockage and leakage.

k) Avoid the likelihood of damage from superimposed loads or ground movement.

l) Provide ventilation to avoid the likelihood of foul air and gasses from accumulating in the system.

m) Minimise nuisance eg noise to the occupants of neighbouring properties and

n) Ensure that the installation throughout its design life will continue to satisfy the requirements of items (a) to (m).

The above detailed performance criteria is in accordance with the Queensland Plumbing and Wastewater Code Part 3. P1.

The required designed effluent disposal method will be detailed with all required relevant information and installation criteria on the site specific effluent design plan. That is to say the method of effluent disposal will be site relevant and detailed in depth on the design plans that relate directly to that site location.

4 Servicing and Maintenance

4.1 The Manufacturer

The manufacturer of the On-Site Sewerage Treatment System shall provide a comprehensive and detailed operation and maintenance instructions to authorised service personnel. The manual must be written in English and it must be written so that it can be easily understood.

The supplier/manufacturer will provide a registered maintenance contract to the home owner in accordance with the normal required schedule maintenance of the installed on-site sewerage treatment system.

4.2 Land Application Maintenance

- On-site systems generally operate more efficiently when the wastewater load is minimised and 'shock loads' are avoided. Heavy water use activities such as laundering and showering should be evenly spread over the day and week.
- Only detergents that are low in sodium and phosphorus should be used. Do not allow large volumes of bleaches, disinfectants, whiteners or spot removers to enter the system.
- Do not allow large volumes of food and cooking oils to enter the system and do not install an in-sink macerator.
- The in-line strainer must be cleaned every few months to prevent clogging, and serviced by the service provided at least once a year.
- Annual servicing must include measurement of the sludge and scum levels, and a check of the outlet and inlet junctions for blockages.
- The service provider must flush and maintain the irrigation system annually.
- Surface water diversion mounds and drains must be regularly maintained to prevent stormwater entering the irrigation area.
- The grass must be regularly mowed and the clippings removed from the site to maintain the nutrient uptake rate within the irrigation area.

5 References and Data

5.1 Regulating Reference Material

- AS/NZS 1547:2012 – On-site domestic wastewater management. Standards Australia International Ltd and Standards NZ ISBN073373439.
- Queensland Plumbing and Wastewater Code 2006. Department of Local Government, Planning, Sport and Recreation.
- Queensland Department of Natural Resources "On-site sewerage Facilities Guidelines for Vertical and Horizontal Separation Distance". (Done 2007).
- Refer to the Local Authority Standard Conditions and helpful hints for domestic wastewater treatment plant maintenance.

Signed

David M Lonergan : site & soil evaluator
Country-Wide Water Pty Ltd

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ON SITE AND SOIL EVALUATION FOR *EFFLUENT DISPOSAL*

FOR

PROPOSED *EFFLUENT DISPOSAL* FOR
BC Currey Surveys

211 San Fernando Drive : Lot 2 (proposed) .

Worongary
Qld 4213

Issue No. 1
12th March 2015

CLIENT:
BC Currey Surveys

PREPARED & DESIGNED BY:

David Lonergan
Cert IV Domestic Waste Water & Environmental Plumbing . (Qld).
Building Services : Designer Hydraulic : Accreditation No : CC6068 G (Tas).
QBSS : Hydraulic Services Designer . Lic No 1305650
GCCC : site & soil registration number ER075

Country-Wide Water Pty. Ltd.
Professional Indemnity Insurance Policy No : 005705

ABN: 60 561 482 213

QBSA: 66575

David M Lonergan Tas Accreditation No CC6068 G (Building Services : Designer Hydraulic).
Qualified in the States of : Queensland & Tasmania .
☒ Site Soil Evaluation
☒ On-site Sewerage Systems Designer
☒ Effluent Disposal Systems Designer
☒ Industrial Waste Water Filtration

Member
☒ Australian Society of Soil Science
☒ International Water Association
☒ Irrigation Australia

FILE NO. CWW 221.15

1 Introduction

1.1 Site Evaluator : David Lonergan : Hydraulic Services Designer .

Country-Wide Water Pty Ltd has been engaged by **BC Currey Surveys** to conduct a site and soil evaluation and provide an on-site Wastewater Management Report for the **Proposed 4- 5 bedroom dwelling** within the property described as **Lot 2 on RP 225089** which is situated at **211 San Fernando, Drive** , **Worongary. 4213 .**

1.2 Site Details

Location

Site Address:	211 San Fernando, Drive Worongary, Qld 4213
RP Description:	Lot 2 : RP 225089
Parish:	Gilston
Country:	**Gold Coast City Council**
Site Area:	4060 metres squared
Dwelling Sizing:	Proposed 4 - 5 bedroom dwelling
Building Envelope Sizing:	N/A
Other Buildings Structures Present:	Proposed dwelling

1.3 Report References

- AS/NZS 1547:2012 – On-Site Domestic Wastewater Management
- QPC – Queensland Plumbing and Wastewater Code 2006
- Local Council (On-Site Sewerage Facility) Guidelines

1.4 Report Objectives

a) Identify sources and quantities of domestic effluent from the site.

b) Examine and identify the existing soil conditions in relation to any proposed effluent disposal and its suitability.

c) Provide information on any site constraints that may affect a proposed land application area.

d) Identify any environmental considerations and possible impact.

e) Provide detailed site specific recommendations for the treatment of wastewater and provide the most effective land application system for the effluent disposal installation.

1.5 Scope of Work

In order to provide to the client an effective solution in regards to on site wastewater management the following scope of work has been undertaken.

a) A desktop study including a review of the proposed or existing development, site plans, aerial photographs, soil mapping of the area and geology charts.

b) A site visit inspection was carried out by the site evaluator and an inspection of the surrounding environment to ascertain a proposed land application area and any potential on-site wastewater management constraints.

c) The site evaluator has carried out two borehole tests to a depth of 600 mm below the ground level. Borehole tests to obtain recovery of the soil samples at horizon depths of 150mm ,300mm , 450mm , 600mm .. As required to prepare the required soil evaluation report.

2 Site and Soil Assessment Report

The site evaluator has identified the following tabled characteristics on the day of 12th March in the year 2015.

These tabled characteristics relate to the proposed land application area.

2.1 Soil & Site Characteristics

Table 1 Soil & Site Characteristics

Feature	Description
Slope	6 % - 9%
Configuration	Linear Divergent
Vegetation Present Detail Existing	Turf coverage , scattered large trees .
Exposure	Filtered Sunlight
Run-off Potential	Mod Slope
Environmental concerns present water-ways etc.	
Buildings/Structures	To service proposed dwelling
Site Drainage	Well drained
Aspect	South Slope
Other	

2.2 Site Soil Characteristics

On site the site evaluator has carried out a total of two borehole tests using a Dormer 75mm diameter soil Auger to aid in the determination of a soil textural classification assessment. The site soil characteristics identified during the site soil evaluation are detailed in table 2.2 below.

2.3 Soil Characteristics

Table 2: Soil Characteristics

Borehole	Depth (m)	Soil Type (Description)	Structure	Category	Dispersive
1	0.0 - 0.15	Clay Loam	Mod Structured	Cat 4	No
	0.15 - 0.30	Clay Loam	Mod Structured	Cat 4	No
	0.30 - 0.45 0.45 - 0.60	Clay Loam Clay Loam	Mod Structured Mod Structured	Cat 4 Cat 4	No No
2	0.0 - 0.15	Clay Loam	Mod Structured	Cat 4	No
	0.15 - 0.30	Clay Loam	Mod Structured	Cat 4	No
	0.30 - 0.45 0.45 - 0.60	Clay Loam Clay Loam	Mod Structured Mod Structured	Cat 4 Cat 4	No No

The sub-soil examined during the site evaluators site inspection and testing have been classified in accordance with AS/NZS 1547:2012 as **Category Four (4) These soils are described as Moderately Structured , Well Drained with a permeability of 0.5 -0.9 Range (tested) AS/NZS 1547 : 2012 recommends a DIR : 3.5mm / day for Clay Loam soils.**

2.4 Site Separation Distances

The recommended separation distances for land application areas are specified in the Queensland Plumbing & Wastewater Code (QPW). The tables below provide this information. Site specific separation distances are detailed on the attached plan that relates to this specific site soil assessment.

Table 3: Setback distances for (subsurface) land application area for a greywater treatment plant or an on-site sewage treatment plan

Feature	Horizontal Separation Distance (mtrs)		
Distance from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature.	**Up Slope**	**Down Slope**	**Level**
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall, footings.	2	4	2
In ground swimming pools.	6	6	6
In ground potable water tank.	6 *	6 *	6 *

Table 3.5 (surface spray)

Setback Distances : Surface Irrigated Land Application Areas : Advanced Secondary On Site Sewerage Treatment Plants

Feature	Horizontal Separation Distance (mtrs)
Distance from the edge of surface spray / irrigation distribution pipework to the nearest point of the feature.	**Metres**
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall, footings.	2
In ground swimming pools.	6
In ground potable water tank.	6 *

* Note:- For primary effluent the distance from an in-ground potable water tank must be 15 mtrs.

Table 4: Setback distances for on-site sewerage facilities and greywater use facilities. (Protection of surface water and groundwater)

Feature	Separation	Distance	(metres)
For On-Site – see Appendix 1	**Advanced Secondary**	**Secondary**	**Primary ***
For Greywater – see T1A or T1B	High	Medium	Low
Top of bank of permanent water course; or Top of bank of Intermittent water course; or Top of bank of a lake, bay or estuary or, Top water level of a surface water source used for agriculture , aquaculture or stock purposes or; Easement boundary of unlined open stormwater drainage channel or drain. Bore or a dam used or likely to used for human and or domestic consumption	10	30	50
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

* Note:- Primary effluent typically has a BOD (Biochemical Oxygen Demand) of between 120-240 mg/L and Total Suspended Solids of between 65-180 mg/L.

2.5 On-Site Evaluation Assessment and Calculations

On-site soil test procedures and evaluation at the site have determined that the most suitable form of on-site sewerage treatment : **Ozzi-Kleen Rp10A On Site SewerageTreatment Plant . CEA 09/2011.**

On-site soil testing procedures and evaluation of the land application area available, it is recommended that the following form of effluent disposal be adopted Standard Surface Spray Effluent Irrigation.

Wastewater Flow Calculations

Site: 211 San Fernando, Drive Worongary, Qld, 4213

Table 5

OR

Number Bedrooms	Population Equivalent	Typical Wastewater Flow L/person/day	Daily Wastewater Flow (L/day)	Weekly Wastewater Flow (L/week)	DIR mm Day	DIR mm Week
5	8	150	1200		DIR : 3.5mm/day	

As effluent Disposal System will be Standard Surface Spray.

The following Calculations will apply:

Site Soils : Clay Loam Cat 4 , Moderately Structured , Well Drained , Ksat (test) 0.5 - 0.9 range
DIR : 3.5 mm / day

Calculations : Future Proposed 4 -5 bedroom dwelling Adopt ; 5 bedroom : 8 persons (8EP).

Hence : 8 X 150 litres per person per day = 1200 L/day .

Hence : 1200 L/day divide by DIR 3.5mm/day = 342.85 m2 : Allow : **400 metres squared .**

Land Application Area : 400 metres squared ; As Surface Spray Effluent Disposal .
Retention Mound Required .

See Plans Provided .

2.6 Proposed Land Application Area

The area that will be required for the land application of effluent disposal via irrigation has been calculated to be 342.85 m 2 : **Install : 400m 2 installed as Standard Surface Spray.** Refer to the design drawings supplied with this report for the required installation criteria.

The above calculation along with the design provided is to be seen as a minimum requirement.

3 Site Wastewater Management

3.1 On-Site Wastewater Treatment System

It is proposed that an aerobic wastewater treatment plant be installed to cater for all wastewater produced by the location : **Future Lot 2 : 211 San Fernando, Drive, Worongary, Qld, 4213.**

Table 6 below shows the effluent quality criteria for secondary treated effluent.

Table 6: Secondary Effluent Quality

Parameter	Level
Biochemical Oxygen Demand (BODs)	20mg/L
Total Suspended Solids (SS)	30mg/L
Total Nitrogen (TN)	30mg/L
Total Phosphorous (TP)	10mg/L

Parameter	Level
Thermotolerant Coliform (org/100mL)	10 organisms

Note: - Under Section 91 of the Plumbing and Drainage Act 2002, Chief Executive Approval is required for an On-Site Sewerage Treatment Plant where the sewerage generated on the property is less than that of 21 equivalent persons. Performance criteria - refer to the Queensland Plumbing and Wastewater Code Part 5 P1,P2, P3, P4, published 17/6/2009.

The Chief Executive Approval number will be noted on the effluent disposal design plans that make up part of this said report.

3.2 Proposed Land Application Area for Effluent Disposal

A land application system must be designed, constructed, installed and maintained in such a manner as to:-

a) complete the treatment, uptake and absorption of the final effluent within the boundaries of the approved application area.

b) Avoid the likelihood of the creation of unpleasant odours or the accumulation of offensive matter.

c) Avoid the likelihood of the ingress of effluent, foul air or gasses entering buildings.

d) Avoid the likelihood of stormwater run-off entering the system.

e) Avoid the likelihood of root penetration or ingress of ground water entering the system.

f) Protect against internal contamination.

g) Provide adequate access for maintenance.

h) Provide and incorporate adequate provisions for effective cleaning.

i) Avoid the likelihood of unintended or uncontrolled discharge.

j) Avoid the likelihood of blockage and leakage.

k) Avoid the likelihood of damage from superimposed loads or ground movement.

l) Provide ventilation to avoid the likelihood of foul air and gasses from accumulating in the system.

m) Minimise nuisance eg noise to the occupants of neighbouring properties and

n) Ensure that the installation throughout its design life will continue to satisfy the requirements of items (a) to (m).

The above detailed performance criteria is in accordance with the Queensland Plumbing and Wastewater Code Part 3. P1.

The required designed effluent disposal method will be detailed with all required relevant information and installation criteria on the site specific effluent design plan. That is to say the method of effluent disposal will be site relevant and detailed in depth on the design plans that relate directly to that site location.

4 Servicing and Maintenance

4.1 The Manufacturer

The manufacturer of the On-Site Sewerage Treatment System shall provide a comprehensive and detailed operation and maintenance instructions to authorised service personnel. The manual must be written in English and it must be written so that it can be easily understood.

The supplier/manufacturer will provide a registered maintenance contract to the home owner in accordance with the normal required schedule maintenance of the installed on-site sewerage treatment system.

4.2 Land Application Maintenance

- On-site systems generally operate more efficiently when the wastewater load is minimised and 'shock loads' are avoided. Heavy water use activities such as laundering and showering should be evenly spread over the day and week.
- Only detergents that are low in sodium and phosphorus should be used. Do not allow large volumes of bleaches, disinfectants, whiteners or spot removers to enter the system.
- Do not allow large volumes of food and cooking oils to enter the system and do not install an in-sink macerator.
- The in-line strainer must be cleaned every few months to prevent clogging, and serviced by the service provided at least once a year.
- Annual servicing must include measurement of the sludge and scum levels, and a check of the outlet and inlet junctions for blockages.
- The service provider must flush and maintain the irrigation system annually.
- Surface water diversion mounds and drains must be regularly maintained to prevent stormwater entering the irrigation area.
- The grass must be regularly mowed and the clippings removed from the site to maintain the nutrient uptake rate within the irrigation area.

5 References and Data

5.1 Regulating Reference Material

- AS/NZS 1547:2012 – On-site domestic wastewater management. Standards Australia International Ltd and Standards NZ ISBN073373439.
- Queensland Plumbing and Wastewater Code 2006. Department of Local Government, Planning, Sport and Recreation.
- Queensland Department of Natural Resources "On-site sewerage Facilities Guidelines for Vertical and Horizontal Separation Distance". (Done 2007).
- Refer to the Local Authority Standard Conditions and helpful hints for domestic wastewater treatment plant maintenance.

Signed

David M Lonergan : site & soil evaluator : GCCC registration no ER075.
Country-Wide Water Pty Ltd

FPA AUSTRALIA
Certified Business
Bushfire Planning & Design

BUSHFIRE MANAGEMENT REPORT
FM 2376
for
J & Y HEPPLEWHITE
at
211 SAN FERNANDO DRIVE
WORONGARY

PREPARED BY
ELDON BOTTCHER ARCHITECT PTY LTD
145 VARSITY PARADE
VARSITY LAKES
PH 07 55920082
EMAIL bushfires@eb-a.com.au

Member Australian Institute of Architects

TABLE OF CONTENTS

DISCLAIMER

Experienced fire fighters with extensive knowledge of building have prepared this Report. Their practical knowledge of fire fighting has been backed up by academic study.

However, fire is an element of nature. Small natural occurrences can disastrously affect the outcome of the best planning. Human actions similarly can have disastrous results.

Whilst every care has been taken in the formulation of this management report, there can be no guarantee that even the strictest adherence to its recommendations can guarantee safety of life and property.

The authors of this report accept no responsibility for any damage to life or property caused by fire or any other cause to persons using land or structures, which could in any way be construed to be the subject of this report.

The report has been commissioned as the land falls within an area deemed a fire risk by the local authority.

As such, it must be recognized that structures upon this land and those using the structures could be deemed at risk.

Very Important Note:

The Australian Standard for Construction in Bush Fire Prone Areas has been reviewed and the new version, AS 3959-2009 came into force in Queensland on 1st October 2009, and there have been a number of subsequent amendments.

State Planning Policy SPP 01/03 has now lapsed and has been replaced by State Planning Policy 2013, portions of which are still in draft form at time of writing this report.

References made to these documents and measures required for compliance with these documents are correct to the best understanding of the author at the time of preparation of this report.

Delays in implementation of the works, which are the subject of this report, may mean that the revised Standard and Policy are in force and that the measures recommended in this report may no longer be current.

In that event, this report may have to be reprepared to maintain currency.

Note that there are references to both versions of the State Planning Policy. This is due to the State Planning Policy containing draft documentation, particularly in relation to mapping, and no new guidelines have been produced.

Current council mapping throughout the state has generally been produced under the methodologies of the SPP 01/03.

INTRODUCTION

This Fire Management Report has been written for the benefit of future occupants of this proposed site and developed in accordance with the requirements of;

- The Gold Coast City Council Town Plan,
- SPP 2013.
- Queensland Sustainable Planning Act
- The National Construction Code and
- Australian Standard AS3959,
- International Fire Safety Engineering Guidelines

The report has been prepared as supporting documentation for a Material Change of Use (Building) /Reconfiguration of Lot Application.

1.1. **Address:**
211 San Fernando Drive
Worongary

1.2. **Local Authority**
Gold Coast City Council

1.3. **R.P.D.**
Lot 1 on RP 225089

1.4. **Site area**
1.514ha

1.5. **Responsible Fire Authority**
Rural Fire Service Queensland via the rural fire brigade for rural fires and QFES for Structural fires.

1.6. **Potential Bushfire Hazard Rating.**
The hazard rating maps prepared for the Council show the ratings on this property ranging from Medium to Low
The draft risk rating maps prepared for the State Government show the ratings on this property ranging from Medium to High and being in a bushfire buffer area.

1.7. **Land tenure**
Freehold

1.8. **Adjoining owners are:**
Freehold

1.9. **Current Land Use:**
Residential

1.10. **Fire danger Index**
FDI 40 (nominated by AS 3959-2009)

1.11. **Topography**
Gorges and Mountains

1.12. **Predominant Wind Direction**
The predominate wind direction is from the South East. In times of severe fire weather the wind direction will be from the North West. The Topography will create microclimates, which will cause swirling, which will modify the apparent wind direction according to primary direction and velocity

1.13. **Slope**
20^0

1.14. **Aspect**
East to south

1.15. **Fuel Type**
Slashed Grass
Grassy Eucalyptus

1.16. **Fire History**
There is no evidence of a recent fire event

1.17. **Location of Access Tracks**
There are no access tracks relevant to this application. The site is served by a sealed road system.

1.18. **Location of Fire Breaks**
There are no formal firebreaks

1.19. **Location of existing fire fighting Infrastructure**
The site is served by reticulated water

1.20. **Historical and Cultural Sites**
There is no evidence of Historical and Cultural sites on the property.

2. SITE AND HAZARD ASSESSMENT

2.1. Discussion with Responsible Fire Authority

The fire management report has not been discussed with the First Officer of the Rural Fire Brigade.

2.2. Vegetation Types

The vegetation type predominate to this site is as scheduled below. Note that under SPP 2013, differing vegetation types are used. This report does not refer to these but does take into account draft mapping prepared under different methodology and published by the State Government.

VEGETATION TYPE	STATE PLANNING POLICY 01/03 INDICE	AS 3959 CATEGORY	COMMENTS
Grassy Eucalypt and acacia forest, exotic pine plantations, Cyprus pine forests, wallum heath	6	B	For the purposes of construction level assessment under AS 3959-2009, woodland is the appropriate vegetation type to use due to fuel load.
Grazed grasslands, slashed grass	2	Low Threat Or G	Note that where grassland is maintained below 100mm it is regarded as Low Threat by AS 3959. State variation (Qld) to Section 3.7.4.0 of Volume 2 Building Code of Australia states that *"The requirements of (a) do not apply when the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300mm high."* This is interpreted as stating that where these communities exist within a Designated Bushfire Prone Area construction in accordance with AS 3959 is not required in relation to this vegetation. Where the SPP 01/03 (amended) index is, or is less than, 2 the hazard is automatically regarded as LOW and no further assessment is required.

2.3. Potential Bushfire Hazard Rating.

Site inspection and assessment against the State Planning Policy SPP 01/03 indicates a rating of Medium across the whole of the site taking the 50m safety buffer into account.

Note that SPP 01/03 has lapsed at time of preparing this report, whilst the revised methodology under SPP 1013 is in Draft Form and under question. However the current mapping from Gold Coast City Council was formulated under this methodology, and this is therefore still relevant.

The ratings from the State Planning Policy SPP 01/03 are as scheduled below;

KEY LAND CHARACTERISTIC	INDICE	COMMENTS
Vegetation Communities	6	Grassy Eucalypt
Slope	5	Gorges and Mountains
Aspect	0	East to South
Total	**11**	**Sum of indices is between 6 and 12.5 denoting a Medium Hazard**

This confirms a rating of Medium on the site

The SPP 2013 is a Planning Policy (instrument) referred to under the Sustainable Planning Act. Its requirements bind all persons and override Council Bushfire Hazard Plans.

SPP 2013 states that being located in a Medium, High or Very High Hazard area triggers the need for compliance with AS 3959.

Footnote 24 to the SPP 01/03 and Footnote 34 to The SPP Guideline states "A natural Hazard management area may be defined using a different term (e.g. bushfire prone area; flood affected area)." This confirms the designation of a Natural Hazard Area (Medium and High Hazard defined by the SPP) as a bushfire prone area and therefore requiring Construction complying with the Australian Standard.

2.4. Building Construction

All buildings situated within the site are in a Designated Risk Area. There is a requirement that any Buildings within this area be constructed in accordance with the Australian Standard for Construction in Bushfire Prone Areas. The levels determined effect the types and usage of materials in relation to the type of Bushfire Attack, which may occur as assessed under the Standard. The Level of Bushfire Attack is assessed taking the vegetation types, slope, and distance from vegetation into account. The most common elements affected are Windows and flyscreening, with some restrictions on cladding and timber types. A comprehensive breakdown is available in either the National Construction Code or the Australian Standard for Construction in Bushfire Prone Areas. Extracts of these documents are not provided due to copyright reasons. Full details can be obtained from your building designer or certifier.

Building Class requirements AS 3959-2009

2.4.1.	FDI	40
2.4.2.	Vegetation Classification	Site Specific Fuel Loads
2.4.3.	Land slope	Downslope 20 degree

Distance of site from Predominate vegetation class	Bushfire Attack Level
0-<10	BAL -FZ
10-<14.1	BAL-40
14.1-<21.5	BAL-29
21.5-<30.7	BAL-19
30.7-<50	BAL-12.5
50-	BAL-LOW

Note:
The levels shown above have been produced using Method 2 as outlined in the AS 3959-2009. Printouts of these calculations are included as Appendix 5.3.1.

THE DISTANCES NOTED ABOVE ARE TO BE MEASURED FROM THE LINE OF VEGETATION RUNNING APPROX. EAST WEST THROUGH PROPOSED LOT 1.

Construction levels for elevations of a building that are subject to shielding from the fire sources can be reduced in accordance with 3.5 of AS 3959-2009 by one level but not

below BAL-12.5 All fire sources on adjoining sites and across roads must be considered when utilising this reduction.

2.5. Ecological Requirements

There are no specific ecological requirements in relation to bushfire management.

Note;
The Category of Bushfire Attack referred to in the Australian Standard is different to the Hazard/Risk area referred to above.

Extensive modification of the existing vegetation types including that on adjoining sites could result in a change of Category of Bushfire Attack and therefore variation in the Level of construction required.

It is the responsibility of the owner of each individual site to ensure that plantings subsequent to their occupation of the site do not reduce the safety of their buildings in a manner, which could require a higher level of Construction than that originally utilised

3. RISK MANAGEMENT PLAN

3.1. Agencies / Persons Responsible

The responsible Fire Authority is the Rural Fire Service Queensland through the Rural Fire Brigade being responsible for Bush Fires and the Queensland Fire and Emergency Service being responsible for Structural Fires

It is the responsibility of the Developers and Owners of the properties to ensure that the relevant measures required by this Management Report are in place prior to inspection by the Council and the Building Certifier and to ensure that those measures are in place prior to the occupation of any buildings, which are the subject of this report. It is the responsibility of Council and Building Certifiers to ensure that relevant measures within their responsibility are in place prior to the issuance of any certification.

3.2. Bushfire Safety Objective

The objective of this report is to minimise potential risk to life and property by protecting the buildings from the effects of bushfire.

3.3. Aims

The aims to achieve this objective are to mitigate the effect of the bushfire attack mechanisms of: -

- 3.3.1. Radiant Heat
- 3.3.2. Direct Flame Contact
- 3.3.3. Wind
- 3.3.4. Ember Attack
- 3.3.5. Smoke

3.4. Functional Requirements

The functional requirements to achieve this objective are: -

- 3.4.1. The provision of safe conditions for fire fighters
- 3.4.2. The provision of safe conditions for residents
- 3.4.3. Ensure adequate and safe access to and from the property
- 3.4.4. Ensure adequate and safe water supply to the property and the establishment of fire fighting water reserves
- 3.4.5. Provide a system of fire breaks and trails to protect the building component
- 3.4.6. Remove vegetation that is considered dangerous and a hazard in Fire Conditions
- 3.4.7. To ascertain the required standard of construction of the buildings in accordance with the requirements of the National Construction Code and the Australian Standard for Construction in Bushfire Prone Areas or the provision of a satisfactory alternative solution
- 3.4.8. Facilitate the return to " normalcy"

3.5. Proposed Fire Fighting Infrastructure

- 3.5.1. The proposed buildings are to be served by a reliable reticulated water supply

3.6. Circulation Road Layout

The site is situated in a Medium PBHR. The circulation road layout combined with the fire trails shown conforms to the general requirements for such a hazard rating.

3.7. Construct a Fire Trail/Emergency Access track

A new pedestrian fire trail is to be established running from San Fernando Drive along the line of vegetation running approx. east west through proposed lot 1, and connecting with the driveway to the south of the existing residence.

- 3.7.1. This trail is to comply fully with the standards as set out in this Report
- 3.7.2. All Building Envelopes are to have a 6m wide defendable space, generally complying with the requirements (except for width) of the vehicular fire trail requirements to the whole perimeter. This space is not to be obstructed by structures or landscaping.
- 3.7.3. The road access and all boundary crossings through fences to these trails can be either a gate or a fence cutting point consisting of strainer posts 3.6m apart with fencing wire between
- 3.7.4. Fire trails are to be protected by an easement in favour of the Council and QFES/RFSQ.
- 3.7.5. The location shown is indicative only and can be modified to suit terrain and vegetation.
- 3.7.6. The trails form part of the Alternative Solution to the clearing of buffer areas as set out in the State Planning Policy SPP01/03, and the Sustainable Planning Act.

3.8. Vegetation Management

3.8.1. All grass and existing mid storey vegetation within an area of a minimum of 10m in width surrounding the Buildings or to the boundary, which ever is lesser, shall be kept to a maximum of 100mm at all times or be of less flammable or rain forest species.

3.8.2. Existing trees within this area are to be reduced to give a noncontinuous canopy cover between trees with a total cover of less than 30% of the area.

3.8.3. The width of the low threat vegetation band noted above can be used to calculate the required BAL. from Section 2.4

3.8.4. All other grass within a further 15 m or to the boundary, which ever is lesser shall be kept to a maximum of 200 mm at all times, with a reduction to 100mm during Fire Season.

3.8.5. All other grass in unforested areas to be kept to a maximum of 300 mm at all times by slashing and/or grazing to 100m from the building or the boundary, whichever is the minimum.

3.8.6. All dead and damaged timber to be removed from the building envelope and the surrounding areas indicated to be fuel reduced, and removed from site.

3.8.7. Requirements noted above may be subject to State and Local Authority approval. Those approvals must be obtained prior to implementation of any of these measures.

3.8.8. Refer to Sections 14 and 19 of the Sustainable Planning Act in relation to Local Authority Approval.

3.8.9. The management referred to above is regarded as " Essential Management "(necessary to remove or reduce the imminent risk that the vegetation poses of serious personal injury or damage to infrastructure" under the Sustainable Planning Regulation Schedule 24. It is recommended that the owner register any clearing work with www.dnrm.qld.gov.au, "Vegetation management notification form for self assessable codes".

The management is a component of the Construction Level. Therefore, the Building Certifier must ensure that the management has occurred in accordance with this report before issuing final certification

The management also forms part of the Alternative Solution to the management of buffer areas as set out in the State Planning Policy SPP01/03, and the Sustainable Planning Act.

Recent research (Project Vesta) indicates that tree canopy without mid storey and surface fuels forms an important filter for control of ember attack, which is responsible for in excess of 90% all bushfire related house fires.

3.9. Minimum Pedestrian Fire Trail Standards

The Fire/Maintenance trail has: -

3.9.1. A minimum cleared width of 4m

3.9.2. A minimum formed width of 1.5m

3.9.3. A maximum gradient of 25%with adequate drainage to prevent soil erosion and minimise ongoing trail maintenance

3.10. Fencing

Any boundary fencing located adjoining bushland or a fire access trail is to be

3.10.1. A maximum of 1000mm high

3.10.2. At least 75 % transparency

3.10.3. Contain at least 1 personal gate to each adjoining lot

3.10.4. Fencing between houses should be of materials matching the requirements for external walls for the relevant level of construction of the subject house where within 6m of the house.

3.11. Effluent Disposal Areas

Where possible, effluent disposal shall be located on the downhill side of the building envelope and be maintained in a band with a minimum 6m width. Grass in this area should be kept to a maximum of 50mm and any landscaping should be of Less Flammable Vegetation

3.12. Fire Trail and Fire Break Maintenance

3.12.1. Proposed driveways are to be kept in a condition suitable for 2wd Heavy Vehicles at all times.

3.12.2. The fire trails are to be kept mowed to a maximum of 50mm at all times and to be kept in a manner to the satisfaction of the Fire Brigade.

3.13. Building Construction

All construction is to be in accordance with Australian Standard AS 3959 2009 Construction of Buildings in Bush Fire-Prone Areas and the Level of construction assessed under " Site and Hazard Assessment "

Note that it is our opinion that timber should not be used externally for BAL-29 plus construction even though under the Australian Standard situations could arise where it could be deemed acceptable.

The plans lodged for Building Certification are to be assessed on this basis by the Building Certifier.
A final stage completion certificate (Form 21) issued by the Building Certifier is to be received prior to occupation of the building.
Buildings are not to be occupied until certification is received

Buildings are to be maintained in a manner that protects the integrity of the construction and building elements as outlined in this report

3.14. Street Numbering

Numbering is to be installed in accordance with the current Street Numbering System at time of completion of building.

3.15. Less Flammable Landscaping

Any new landscaping within 10m of the buildings, or within a vegetation management zone, is to be Less Flammable, in accordance with the list enclosed as an Appendix at the rear of this Report.
Note that vegetation management and landscaping on Proposed Lot 1 will impact on the construction requirements on Proposed Lot 2.

3.16. Insurance

Failure to comply with this management report may have a detrimental effect upon the Insurance of the subject Buildings.

3.17. Emergency Response Procedures

3.17.1. In the event of Fire Emergency, assistance is to be obtained by dialling 000

3.17.2. The owner should read thoroughly the brochures contained and those recommended at the rear of this report. They contain valuable information that could assist in the saving of lives and property in a fire event!

3.18. Community Awareness Strategies

3.18.1. Each subsequent owner is to be provided with a copy of this Fire Management report with an alert placed on either Title or Council Rate searches that the Report is in existence and is to be made available to ensuing owners.

3.18.2. The hazard ratings are to be placed on Council Plans and Rate notices.

3.19. Administering Staff

It is the responsibility of the developers and owners to ensure compliance with this Report and the Town Plan, and to ensure that each of the new owners is provided with a copy of this report.

It is the responsibility of the Council and the Building Certifier to ensure that the relevant measures required by this management report are in place prior to the final completion stage inspection of any buildings on any sites which are the subject of this report as noted in Clause 3.1 of this report.

It is the responsibility of the ensuing owners of the properties to maintain the properties in the conditions outlined in this report.

4. FIRE MANAGEMENT ACTION SUMMARY AND SCHEDULE

DEVELOPMENT REQUIREMENTS	BUILDING REQUIREMENTS	MAINTENANCE
Provision of fire access trails All dead and damaged timber to be removed from the areas indicated to be mowed and removed from site	Buildings to comply with the Australian Standard for Construction with in Bush Fire Prone Areas. No occupation until compliance with Standard and Management Report Pedestrian fire trail through proposed Lot 1.	Regular mowing and maintenance of the vegetation areas as set out in this report. Drive and fire trail access to be kept clear and accessible to satisfaction of the Fire Brigade. Building materials are to be maintained in "as new " condition to preserve the integrity of the relevant materials.

5. APPENDICES

5.1. Form 15
5.2. Site Plans
5.3. Supporting Information:
5.3.1. Method 2 Calculation printouts
5.3.2. Fuel Load Calculation

(Note. These items below are referenced for information purposes only and are not to be construed as being part of the management report)

5.3.3. Prepare.Act.Survive
5.3.4. Rural property Fire Management Guide 2010
5.3.5. Notes for Landholders
5.3.6. Bushfire Action Guide
5.3.7. Bushfire Safety in Urban Fringe Areas
5.3.8. Water + Power -Vital for Fire fighting
5.3.9. Less Flammable Vegetation
5.3.10. Tree selection for Fire-Prone Areas
5.3.11. First Draft (specifying timber in bush fire zones)
5.3.12. External water spray system
5.3.13. Fire Retardant Coating Solutions
5.3.14. Archicentre Bushfire Design Guide
5.3.15. Section 3.8 Sign Types - Fire Trail Signage of the GCCC Natural Areas Management Unit Guidelines (Page 16) Signage
5.3.16. Trail Number and Key Point signage
5.3.17. Bushfire Hydrant detail
5.3.18. Tank detail
5.3.19. Recycled Water for Firefighting
5.3.20. Sample Easement Document
5.3.21. Bushfire Windows and Shutters
5.3.22. A guide to retrofit your home for better protection from a bushfire.
5.3.23. FireFly BAL-FZ System
5.3.24. Extracts from Sustainable Planning Act relating to clearing.
5.3.25. Bushfire Planning and Design Certification Scheme Update
5.3.26. SAC Notification Form

We also recommend that the landholder obtains and reads the following;

5.3.27. Bushfire Hazard Planning in Queensland
5.3.28. Protecting your home against Bushfire
Both available from the Dept. of Local Government and Planning, and

5.3.29. Building in Bushfire Prone Areas
Available from Standards Australia

5.3.30. Fire in Bushland Conservation
Available from the National Heritage Trust

Signed

.....

Eldon Bottcher
Grad Dip DBPA (UWS) Dip. Arch. (QIT), Cert. R.F.M. (USQ), F.R.A.I.A., M.A.I.E.S. M.UDIA AIFireE
Architect
BPAD-L3 Practitioner

APPENDIX 5.1
FORM 15

Compliance Certificate for building Design or Specification

15

NOTE	**This is to be used for the purposes of section 10 of the *Building Act 1975* and/or section 46 of th *Building Regulation 2006.*** **RESTRICTION: A building certifier (class B) can only give a compliance certificate about whethe building work complies with the BCA or a provision of the QDC. A building certifier (Class B) cannot give a certificate regarding QDC boundary clearance and site cover provisions.**
1. Property description **This section need only be completed if details of street address and property description are applicable.** **e.g. In the case of (standard/generic) pool design/shell manufacture and/or patio and carport systems this section may not be applicable.** The description must identify all land the subject of the application. The lot & plan details (e.g. SP / RP) are shown on title documents or a rates notice. If the plan is not registered by title, provide previous lot and plan details	Street address *(include no., street, suburb / locality & postcode)* 211 SAN FERNANDO DRIVE WORONGARY Postcode Lot & plan details *(attach list if necessary)* Lot 1 on RP 225089 **In which local government area is the land situated?** Gold Coast City Council
2. Description of component/s certified Clearly describe the extent of work covered by this certificate, e.g. all structural aspects of the steel roof beams.	Preparation of Bushfire Management Report
3. Basis of certification Detail the basis for giving the certificate and the extent to which tests, specifications, rules, standards, codes of practice and other publications, were relied upon.	Compliance with; The Acceptance of Design and Construction Provisions of the National Construction Code, The Bushfire Provisions of the National Construction Code, Australian Standard AS 3959, Queensland Sustainable Planning Act Bushfire Hazard Planning in Queensland International Fire Engineering Guidelines State Planning Policy SPP 2013 Gold Coast City Council Town Plan Bushfire Management Constraint Code,

4. Reference documentation
Clearly identify any relevant documentation, e.g. numbered structural engineering plans.

Bushfire management Report entitled;
Bushfire management Report
for
J & Y HEPPLEWHITE
at
211 SAN FERNANDO DRIVE WORONGARY

5. Building certifier reference number

Building certifier reference number

6. Competent person details
A competent person for building work, means a person who is assessed by the building certifier for the work as competent to practise in an aspect of the building and specification design, of the building work because of the individual's skill, experience and qualifications in the aspect. The competent person must also be registered or licensed under a law applying in the State to practice the aspect.

If no relevant law requires the individual to be licensed or registered to be able to give the help, the certifier must assess the individual as having appropriate experience, qualifications or skills to be able to give the help.

If the chief executive issues any guidelines for assessing a competent person, the building certifier must use the guidelines when assessing the person.

Name (*in full*)
Eldon John Bottcher

Company name (*if applicable*)
Eldon Bottcher Architect Pty Ltd

Contact person
Eldon Bottcher

Phone no. *business hours*
07 55920082

Mobile no
0412434134

Fax no.

Email address
architects@eb-a.com.au

Postal address
P.O.Box 3606
Robina Town Centre Postcode 4230

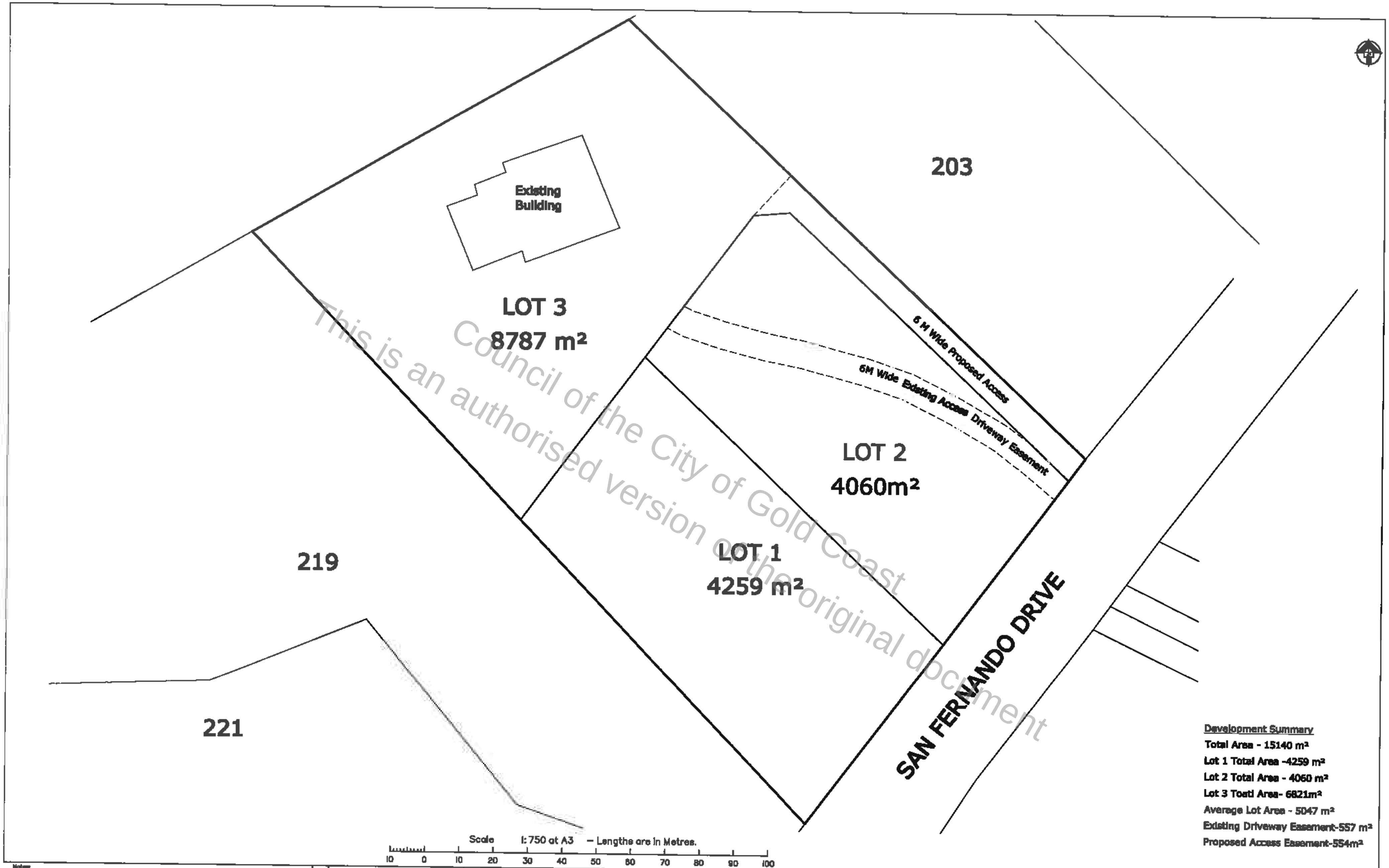
Licence or registration number (*if applicable*)
Reg Architect 1325
FPA Australia -BPAD-Level 3 Practitioner 16935
Associate Member Institution of Fire Engineers

7. Signature of competent person
This certificate must be signed by the individual assessed by the building certifier as competent.

Signature

Date
19/03/15

APPENDIX 5.2
SITE PLANS



Development Summary

Total Area - 15140 m²
Lot 1 Total Area -4259 m²
Lot 2 Total Area - 4060 m²
Lot 3 Toatl Area- 6821m²
Average Lot Area - 5047 m²
Existing Driveway Easement-557 m²
Proposed Access Easement-554m²

Notes:
This plan is a true representation of the proposed development, however, the plan is subject to changes resulting from approvals, survey, construction, registration and development processes, therefore all the information contained on this plan including areas, lot numbers and boundaries are subject to change.
This note is an integral part of this plan.

No	Revision Details	Date	By	No	Revision Details	Date	By

Client: Yevonne White

Title: Preliminary Plan of Proposed Sub division for Discussion Purposes on lot 1 on RP225089 San Fernado Drive, Worongary

Parish of: Gilston
County of: Ward

Level Datum: AHD
Origin: AHD
Coord System: PLANE
Origin: RP225089

Scale: 1:750

B.C.CURREY(SURVEYS)
DEVELOPMENT CONSULTANTS

Reference #: BL1063 E

APPENDIX 5.3
SUPPORTING INFORMATION

BUSHFIRE ATTACK ASSESSMENT

ELDON BOTTCHER ARCHITECT PTY LTD
145 VARSITY PARADE
VARSITY LAKES
QLD. 4327
PH 0755920082
E architects@eb-a.com.au

THIS ASSESSMENT USES METHOD 2 CONTAINED WITHIN AS 3959-2009

PROJECT	**PROPOSED SUBDIVISION**
SITE ADDRESS	**211 SAN FERNANDO DRIVE WORONGARY**

INPUTS

FDI	40
VEGETATION TYPE	Site Specific Fuel Loads
TOTAL FUEL LOAD	17.2 tonnes/ha
SLOPE UNDER VEGETATION	20 degrees
SLOPE BETWEEN VEGETATION AND BUILDING	20 degrees
FLAME WIDTH	100 m
ELEVATION OF RECEIVER	2.9 m
DISTANCE BETWEEN VEGETATION AND BUILDING	**10** m

RESULTS

RADIANT HEAT	39.99 kw/m^2
FLAME LENGTH	14.06 m
RATE OF SPREAD	9.15 km/hr
ATMOSPHERIC TRANSMISSIVITY	87%
PEAK ELEVATION OF RECEIVER	2.9 m
FLAME ANGLE	68 degrees
CONSTRUCTION LEVEL REQUIRED	**BAL—40 BAL**

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PROJECT	**PROPOSED SUBDIVISION**
SITE ADDRESS	**211 SAN FERNANDO DRIVE WORONGARY**

INPUTS

FDI	40
VEGETATION TYPE	Site Specific Fuel Loads
TOTAL FUEL LOAD	17.2 tonnes/ha
SLOPE UNDER VEGETATION	20 degrees
SLOPE BETWEEN VEGETATION AND BUILDING	20 degrees
FLAME WIDTH	100 m
ELEVATION OF RECEIVER	1.8 m
DISTANCE BETWEEN VEGETATION AND BUILDING	**14.1** m

RESULTS

RADIANT HEAT	28.97 kw/m^2
FLAME LENGTH	14.06 m
RATE OF SPREAD	9.15 km/hr
ATMOSPHERIC TRANSMISSIVITY	85%
PEAK ELEVATION OF RECEIVER	1.8 m
FLAME ANGLE	81 degrees
CONSTRUCTION LEVEL REQUIRED	**BAL–29 BAL**

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THIS ASSESSMENT USES METHOD 2 CONTAINED WITHIN AS 3959-2009

PROJECT	**PROPOSED SUBDIVISION**
SITE ADDRESS	**211 SAN FERNANDO DRIVE WORONGARY**

INPUTS

FDI	40
VEGETATION TYPE	Site Specific Fuel Loads
TOTAL FUEL LOAD	17.2 tonnes/ha
SLOPE UNDER VEGETATION	20 degrees
SLOPE BETWEEN VEGETATION AND BUILDING	20 degrees
FLAME WIDTH	100 m
ELEVATION OF RECEIVER	0 m
DISTANCE BETWEEN VEGETATION AND BUILDING	**21.5** m

RESULTS

RADIANT HEAT	18.97 kw/m^2
FLAME LENGTH	14.06 m
RATE OF SPREAD	9.15 km/hr
ATMOSPHERIC TRANSMISSIVITY	83%
PEAK ELEVATION OF RECEIVER	0 m
FLAME ANGLE	91 degrees
CONSTRUCTION LEVEL REQUIRED	**BAL – 19 BAL**

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THIS ASSESSMENT USES METHOD 2 CONTAINED WITHIN AS 3959-2009

PROJECT	**PROPOSED SUBDIVISION**
SITE ADDRESS	**211 SAN FERNANDO DRIVE WORONGARY**

INPUTS

FDI	40
VEGETATION TYPE	Site Specific Fuel Loads
TOTAL FUEL LOAD	17.2 tonnes/ha
SLOPE UNDER VEGETATION	20 degrees
SLOPE BETWEEN VEGETATION AND BUILDING	20 degrees
FLAME WIDTH	100 m
ELEVATION OF RECEIVER	0 m
DISTANCE BETWEEN VEGETATION AND BUILDING	**30.7** m

RESULTS

RADIANT HEAT	12.48 kw/m^2
FLAME LENGTH	14.06 m
RATE OF SPREAD	9.15 km/hr
ATMOSPHERIC TRANSMISSIVITY	81%
PEAK ELEVATION OF RECEIVER	0 m
FLAME ANGLE	95 degrees
CONSTRUCTION LEVEL REQUIRED	**BAL – 12.5 BAL**

RURAL FIRE SERVICE

Queensland Government

State-wide Bushfire Prone Area Mapping

Vegetation Hazard Classes and Potential Fuel Loads

(Summary of updated descriptions and labels)

30 Sep 2014

Table 1. Vegetation Hazard Class Descriptions and Potential Fuel Load

Broad Vegetation Group / Vegetation Hazard Class	*Potential Fuel Load*
BVG 1. Complex mesophyll to notophyll vine forests of the Wet Tropics bioregion.	
1.1 Complex mesophyll to notophyll vine forests	2.6
BVG 2. Complex to simple, semi-deciduous mesophyll to notophyll vine forest, sometimes with Araucaria cunninghamii (hoop pine).	
2.1 Complex to simple, semi-deciduous mesophyll to notophyll vine forest	3.5
BVG 3. Notophyll vine forest/ thicket (sometimes with sclerophyll and/or Araucarian emergents) on coastal dunes and sandmasses.	
3.1 Notophyll vine forest	4.5
3.3 Notophyll vine thicket	4.4
BVG 4. Notophyll and notophyll feather palm or fan palm vine forest on alluvia, along streamlines and in swamps on ranges	
4.1 Notophyll and notophyll palm or vine forest	4.5
BVG 5. Notophyll to microphyll vine forests, frequently with Araucaria spp. or Agathis spp. (kauri pines)	
5.1 Notophyll to microphyll vine forests	3.9
5.2 Notophyll to microphyll vine forest with sparse overstorey	3.9
5.5 Sedgeland within Notophyll to microphyll vine forests	3.9
BVG 6. Notophyll vine forest and microphyll fern forest to thicket on high peaks and plateaus.	
6.1 Montane Notophyll vine forest and microphyll fern forest	3.9
6.3 Montane Notophyll vine thicket and microphyll fern thicket	3.9
BVG 7. Semi-evergreen to deciduous microphyll vine thicket.	
7.1 Semi-evergreen to deciduous microphyll vine forest	6.0
7.2 Sparse semi-evergreen to deciduous microphyll vine forest	6.0
BVG 8. Wet eucalypt tall open forest on uplands and alluvia.	
8.1 Wet eucalypt tall open forest	35.0
8.2 Wet eucalypt tall woodland	23.9
BVG 9. Moist to dry eucalypt open forests to woodlands usually on coastal lowlands and ranges.	
9.1 Moist to dry eucalypt open forests on coastal lowlands and ranges	24.1
9.2 Moist to dry eucalypt woodland on coastal lowlands and ranges	17.2
9.3 Shrubland within moist to dry eucalypt on coastal lowlands and ranges	12.7
BVG 10. Corymbia citriodora (spotted gum) dominated open forests to woodlands on undulating to hilly terrain.	
10.1 Spotted gum dominated open forests	20.8
10.2 Spotted gum dominated woodlands	18.0

6.PROFILES

ELDON BOTTCHER

EDUCATION AND QUALIFICATIONS

Graduate Diploma in Design in Bushfire Prone Areas
University of Western Sydney

Diploma in Architecture
Queensland Institute of Technology

Certificate of Rural Fire Management
University of Southern Queensland

Registered Architect
Queensland

A+ Architect
Australian Institute of Architects

FPA Australia Certified Practitioner (BPAD-Level 3-16935)
Bushfire Planning and Design (BPAD-Level 3), Alternate Solutions & DTS

PROFESSIONAL MEMBERSHIPS

Fellow
Australian Institute of Architects

Member
Australian Institute of Emergency Services

Member
Australian Institute of Engineers Society of Fire Safety

Corporate Member
Fire Protection Association of Australia

Member
Urban Development Institute of Australia

Associate Member
Institution of Fire Engineers

PROFESSIONAL EXPERIENCE

Director
Eldon Bottcher Architect Pty Ltd since 1978

Bushfire Assessment and Planning Consultant since 1998

Group Officer
Albert Rural Fire Brigades Group
Queensland Fire and Rescue Service

Group Officer
Gold Coast Rural Fire Brigades Group
Queensland Fire and Rescue Service

Group Officer
South East Regional Support Group
Queensland Fire and Rescue Service

Planning Officer
Gold Coast Rural Fire Brigades Group
Queensland Fire and Rescue Service

Member Practice Committee AIA Qld Chapter

OTHER BUSHFIRE RELATED COURSES AND TRAINING

I.C.S./AIIMS (40 hr. course) in Incident Command Systems

Certificate 4 (Workplace Training and Assessment)

RFSQ Level 1

RFSQ Level 2 (Officer)

RFSQ Fire Management 1

RFSQ Crew Leader

Certificate II in Public Safety (Firefighting Operations)

BUSHFIRE RELATED AWARDS

National Planning Award
State Planning Award
Planning Institute of Australia
Gold Coast Bushfire Management Strategy
(Co-Initiator and Member of Preparation Committee)

Australian Government
National Medal
Long and Distinguished Service to Fire fighting

Queensland Fire and Recue Service
Diligent and Ethical Service Medal + Clasp
Service to Fire fighting

Queensland Government
Australia Day Medallion
Services to Rural Fire Fighting

Queensland Government
Year of the Volunteer Medallion
Services to Fire fighting

UDIA
Best Consultancy Team Award in 2007.

SERVICES OFFERED

Bushfire management Reports

Bushfire Safety Engineering

Bushfire Planning and Design

Bushfire Hazard Assessment

Alternative Solutions

Expert Witnessing
(See Planning and Environment Court of Queensland Determination
File No. BD 624 of 2005 sections 28 to 35)

Continuing Professional Development Lectures

Tertiary Education Lectures and Tutorials

Town Planning Bushfire Codes for Local Authorities

Bushfire Burn Planning

General consultancy relating to all aspects of Bushfire