Ordinary Meeting of Council

13 December 2023

UNDER SEPARATE COVER ATTACHMENTS

ITEM 9.2

Item 9.2 Development Application - DA.2023.0051 - 205 Tudor Valley Road Reidsdale - Construction of a dwelling - two storey

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

13 DECEMBER 2023

ITEM 9.2 DEVELOPMENT APPLICATION - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE - CONSTRUCTION OF A DWELLING - TWO STOREY

ATTACHMENT 1 PLANS - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE

BASIX COMMITMENTS _ Certificate No: 1363443S_02

Water Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Fixtures			
The applicant must install showerheads with a minimum rating of 4 star (> 6 but <= 7.5 L/min plus spray force and/or coverage tests) in all showers in the development.		✔	✔
The applicant must install a toilet flushing system with a minimum rating of 4 star in each toilet in the development.		✔	✔
The applicant must install taps with a minimum rating of 6 star in the kitchen in the development.		✔	
The applicant must install basin taps with a minimum rating of 5 star in each bathroom in the development.		✔	
Alternative water			
Rainwater tank			
The applicant must install a rainwater tank of at least 100000 litres on the site. This rainwater tank must meet, and be installed in accordance with, the requirements of all applicable regulatory authorities.	✔	✔	✔
The applicant must configure the rainwater tank to collect rain runoff from at least 200 square metres of the roof area of the development (excluding the area of the roof which drains to any stormwater tank or private dam).		✔	✔
The applicant must connect the rainwater tank to: • all toilets in the development • the cold water tap that supplies each clothes washer in the development • at least one outdoor tap in the development (Note: NSW Health does not recommend that rainwater be used for human consumption in areas with potable water supply.) • all hot water systems in the development • all indoor cold water taps (not including taps that supply clothes washers) in the development		✔ ✔ ✔ ✔ ✔	✔ ✔ ✔ ✔ ✔

Energy Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Hot water			
The applicant must install the following hot water system in the development, or a system with a higher energy rating: electric heat pump.	✔	✔	✔
Cooling system			
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 living area: evaporative cooling; Energy rating: n/a		✔	✔
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 bedroom: evaporative cooling; Energy rating: n/a		✔	✔
Heating system			
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 living area: wood heater; Energy rating: n/a		✔	✔
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 bedroom: wood heater; Energy rating: n/a		✔	✔
The wood heater must have a compliance plate confirming that it complies with the relevant Australian standards, and must be installed in accordance with the requirements of all applicable regulatory authorities.			✔
Ventilation			
The applicant must install the following exhaust systems in the development: At least 1 Bathroom: individual fan, ducted to façade or roof; Operation control: manual on / timer off Kitchen: individual fan, ducted to façade or roof; Operation control: manual switch on/off Laundry: individual fan, ducted to façade or roof; Operation control: manual on / timer off		 ✔ ✔ ✔	 ✔ ✔ ✔
Artificial lighting			
The applicant must ensure that the "primary type of artificial lighting" is fluorescent or light emitting diode (LED) lighting in each of the following rooms, and where the word "dedicated" appears, the fittings for those lights must only be capable of accepting fluorescent or light emitting diode (LED) lamps: • all hallways; dedicated		 ✔	 ✔
Natural lighting			
The applicant must install a window and/or skylight in the kitchen of the dwelling for natural lighting.	✔	✔	✔
The applicant must install a window and/or skylight in 3 bathroom(s)/toilet(s) in the development for natural lighting.	✔	✔	✔
Alternative energy			
The applicant must install a photovoltaic system with the capacity to generate at least 10 peak kilowatts of electricity as part of the development. The applicant must connect this system to the development's electrical system.	✔	✔	✔
Other			
The applicant must install an induction cooktop & electric oven in the kitchen of the dwelling.		✔	
The applicant must construct each refrigerator space in the development so that it is "well ventilated", as defined in the BASIX definitions.		✔	
The applicant must install a fixed outdoor clothes drying line as part of the development.		✔	
The applicant must install a fixed indoor or sheltered clothes drying line as part of the development.		✔	

Thermal Comfort Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Simulation Method			
The applicant must attach the certificate referred to under "Assessor Details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for an occupation certificate for the proposed development.			
The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX certificate, including the Cooling and Heating loads shown on the front page of this certificate.			
The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Assessor Certificate requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor to certify that this is the case. The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.	✔	✔	✔
The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
The applicant must show on the plans accompanying the development application for the proposed development, the locations of ceiling fans set out in the Assessor Certificate. The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.	✔	✔	✔
The applicant must construct the floors and walls of the dwelling in accordance with the specifications listed in the table below.	✔	✔	✔

Floor and wall construction	Area
floor - concrete slab on ground	All or part of floor area square metres

name of the drawing:	name of the project:	dimensions:	drawing number:	date of issue:
BASIX COMMITMENTS	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	NIL	A 000	28.12.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

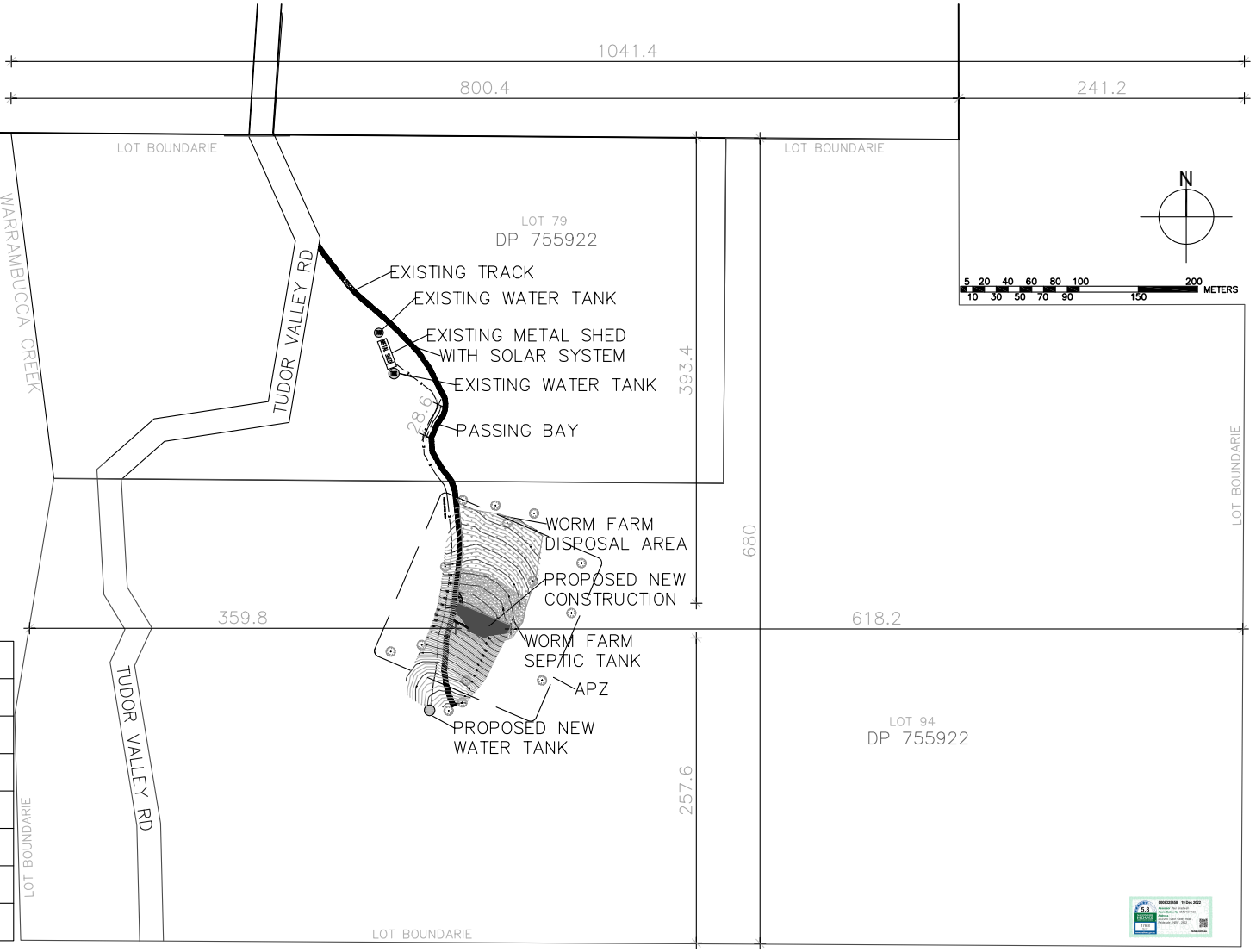
DESCRIPTION

The proposed house site is in an area without vegetation of approximatly120 meters long (South North) by 80 meters large (East West)

The existing shed is holding the solar system and is surrounded by 2 water tanks of 109,000 Liters each. Electricity and water go then through an underground trench to the house for up to 200 meters. A new water tank connected to the 2 lower ones is proposed just after the ridge line to serve the house.

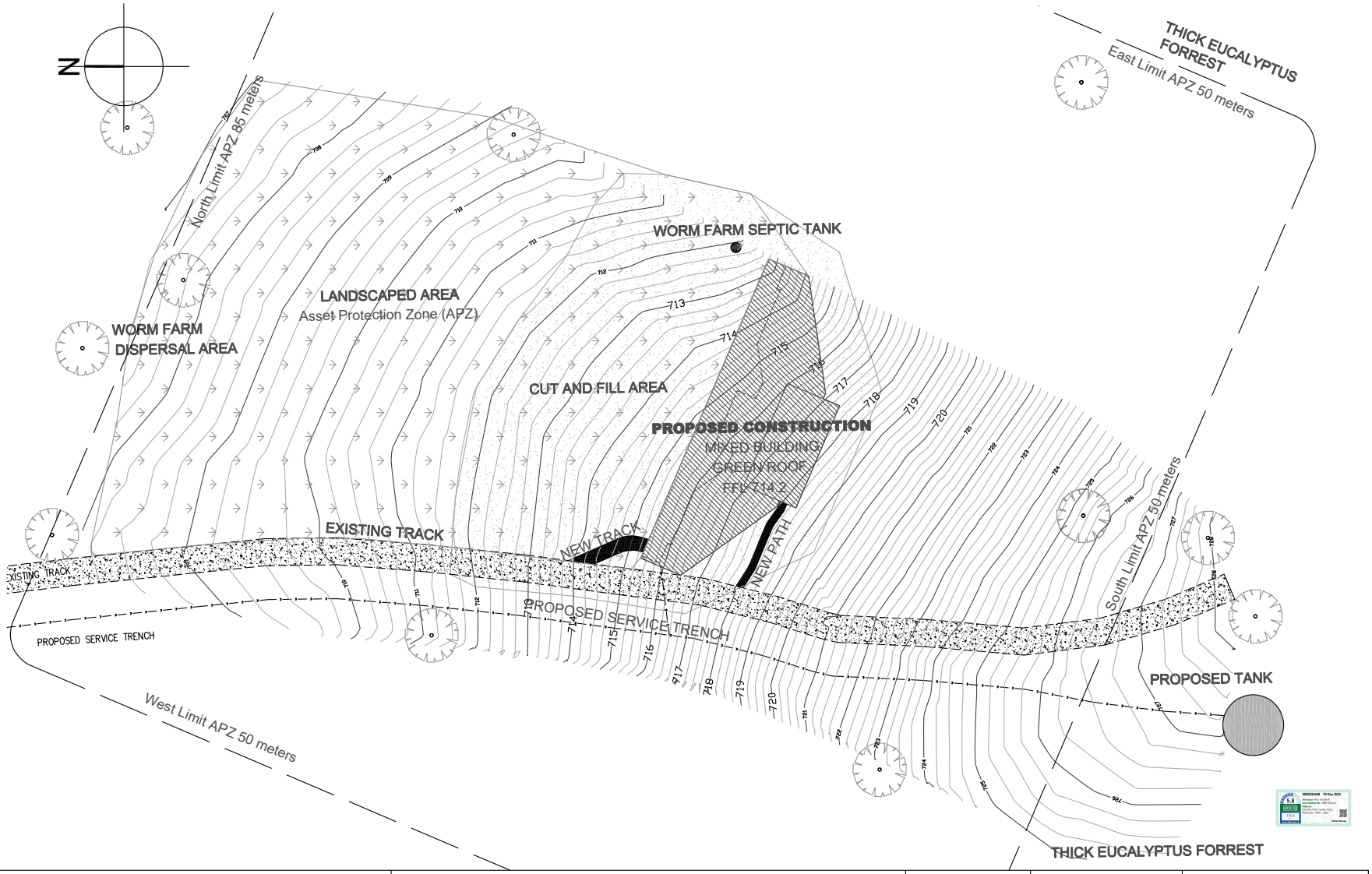
the existing access road of 380 meters will allow a 20 meters passing bay at its middle.

the house area is cut into the hill, and then fill, redistributed and landscape to leveled out 30 meters around the house footprint.



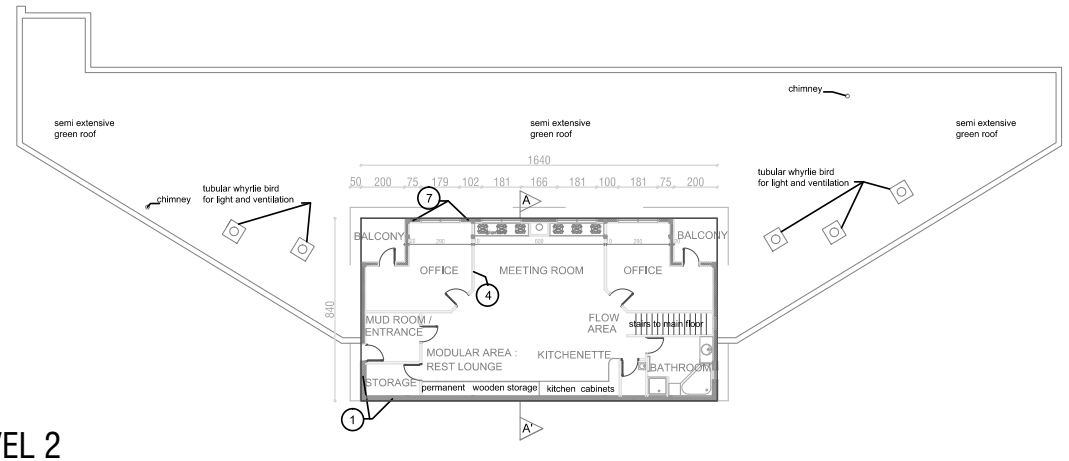
SCHEDULE OF DRAWINGS :	
A001	location plan
A002	site plan
A101	floor plan
A102	roof plan
A201	elevation NS plan
A202	elevation WE plan
A300	section plan

name of the drawing:	name of the project:	dimensions:	drawing number:	date of issue:
LOCATION PLAN	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	in meters or as shown	A 001	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer



name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
SITE PLAN	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1:500	A 001	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

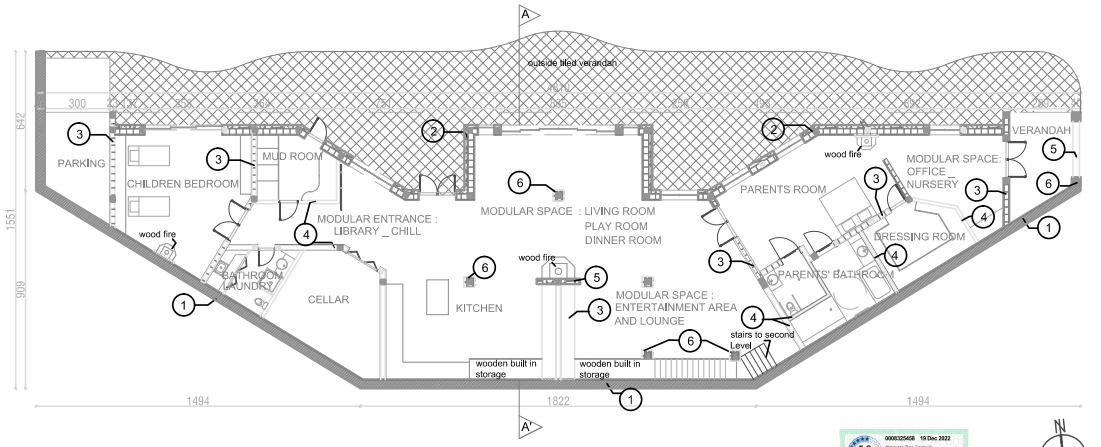
AREA SCHEDULE _ LEVEL 2 :	
name	m2
OFFICE (x2)	15.3
MUD ROOM	5.6
STORAGE	3.8
MEETING AREA	25.4
REST AREA	20.8
FLOW	4.0
KITCHENETTE	12.1
BATHROOM	10.3
BALCONY(x2)	4.0
TOTAL NFA:	120.6
TOTAL GFA:	137.7



LEVEL 2

AREA SCHEDULE _ LEVEL 1 :	
name	m2
CHILDREN BEDROOM	32.9
ENTRANCE	10.1
BATHROOM/LAUNDRY	7.3
LIVING ROOM	79.8
KITCHEN	36.2
LOUNGE / ENTERTAIN	39.0
PARENTS' ROOM	31.9
PARENTS' BATHROOM	17.0
DRESSING	12.9
NURSERY	18.6
PARENT'S VERANDAH	12.3
PARKING / STORAGE	12.9
TOTAL NFA:	310.9
TOTAL GFA:	421.2

1 dincell concrete retaining wall
2 external stone wall veneer earth rubble and CEB backing
3 CEB wall
4 wood frame insulated wall
5 stone wall
6 concrete column with stone cladding
7 light framing steel wall



LEVEL 1

name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
FLOOR PLAN _ LEVEL 1 and 2	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1 : 200	A 100	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

SEMI EXTENSIVE GREEN ROOF:

PROFIL DEPTH: 210mm
WEIGHT ALLOWANCE: 210 kg/m2

DRIP IRRIGATION SYSTEM REQUIRED

FULL METAL RISERS FOR BUSH FIRE SUPPRESION SPRINKLERS

ROOF GARDEN PLANTED WITH SPECIFICALLY FIRE RETARDANT NATIVE GROUND COVER

Typical Specification:

1. Waterproofing membrane
2. R2.7 Insulation
3. Roof Garden

3.1: LDPE layer
3.2: drainage cell
3.3: Geofabric
3.4: Hydrocell Extensive media
3.5: Stone mulch layer
3.6: Sub Surface drip irrigation

Insulated Roof Membrane Assembly (IRMA) principle:

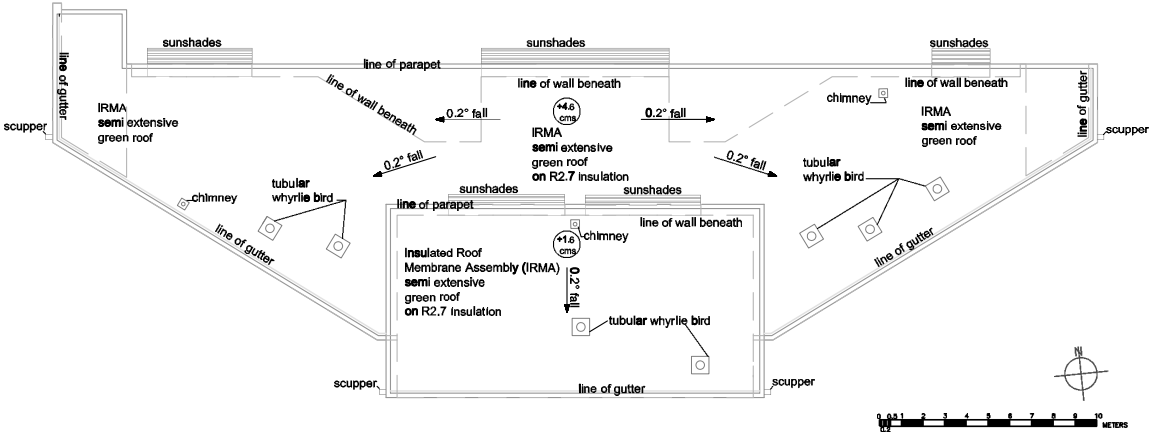
LEVEL 1 : green roof on concret deck

LEVEL 2: green roof on metal deck

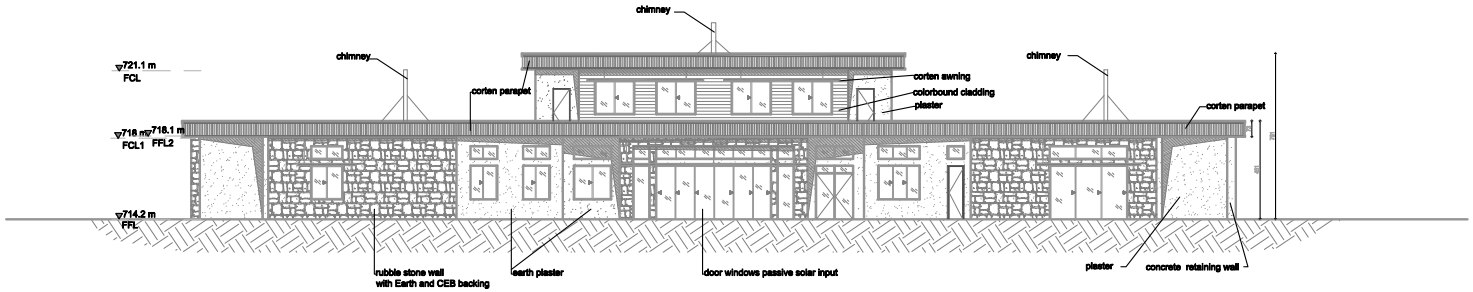
Example of semi extensive roof garden

Example of solar passive awnings

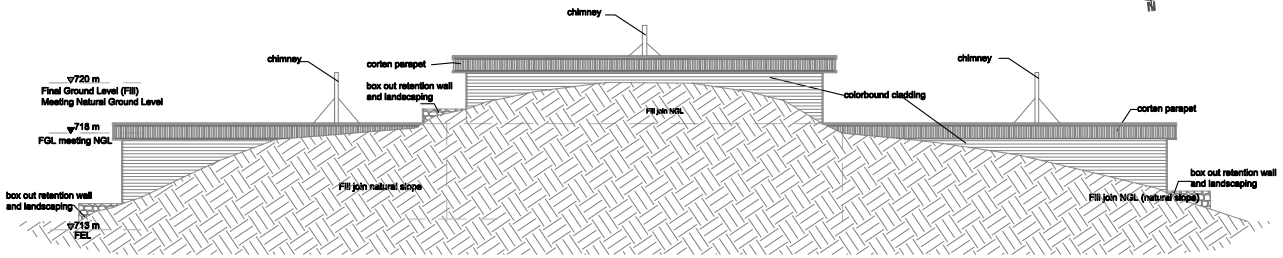
Example of chimney



name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
ROOF PLAN	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1 : 200	A 102	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer



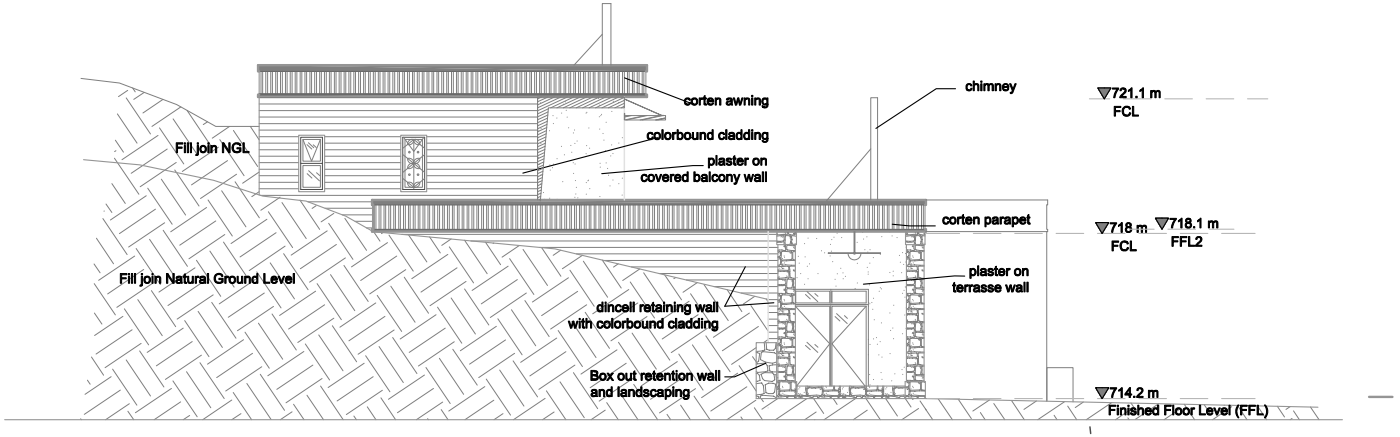
ELEVATIONS NORTH



ELEVATION SOUTH

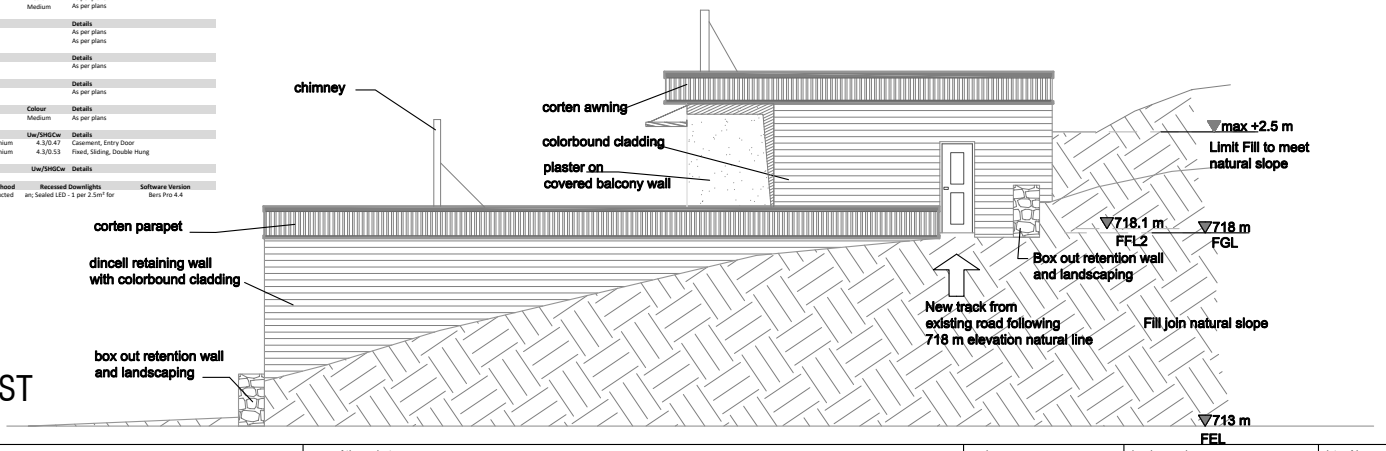
name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
ELEVATIONS NORTH AND SOUTH	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1 : 200	A 200	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

ELEVATIONS EAST

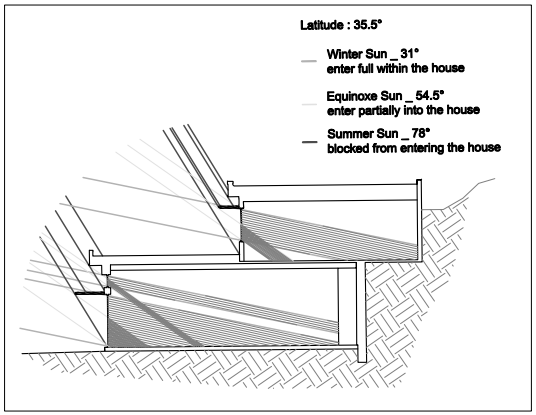


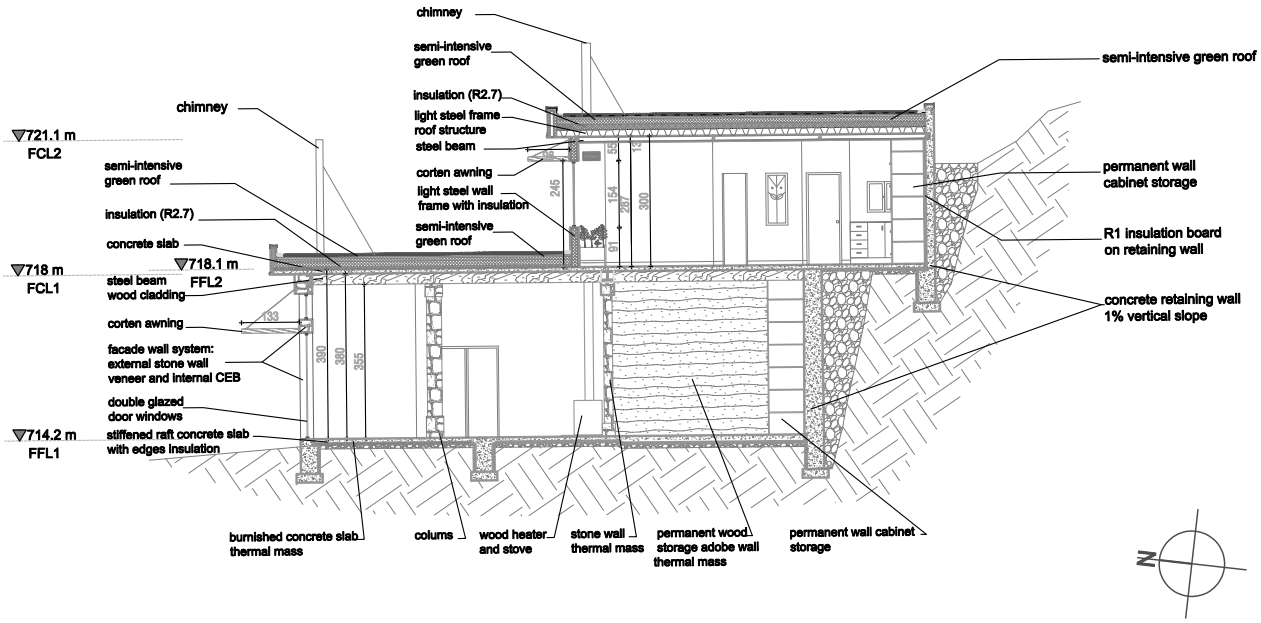
Project:	**Address:**	203/205 Tudor Valley Road Reidsdale NSW 2622				**File Ref:**	HEC1122
Applicant:	**Name:**	Lorba Drewry			**Designer:**	Lorba Drewry	
Assessor:	**Name:**	Paul Gradwell			**Company:**	House Energy Certified	
	Address:	PO BOX 3136 Tamarama NSW 2026			**Number:**	DMN/18/4423	
	Contact:	02 9130 2068			**Email:**	paul@houseenergycertified.com	
Ext. Walls:	**Construction**	**Insulation**			**Colour**	**Details**	
	Stone + C.E.B	None			Medium	As per plans	
	Concrete 275mm	R1.0 added			Medium	As per plans	
	Metal Clad	R2.0 added			Medium	As per plans	
Int. Walls:	**Construction**	**Insulation**				**Details**	
	CEB 250mm	None				As per plans	
	Plasterboard on Stud	None				As per plans	
Floors:	**Construction**	**Insulation**				**Details**	
	Concrete	None				As per plans	
Ceilings:	**Construction**	**Insulation**				**Details**	
	Plasterboard	None				As per plans	
Roof:	**Construction**	**Insulation**			**Colour**	**Details**	
	Concrete	60mm PIR or equiv (R2.7)			Medium	As per plans	
Windows:	**Product ID**	**Glass**	**Frame**	**Uw/SHGCw**	**Details**		
Group A	ALM-003-03 A	Double Clear	Aluminium	4.3/0.47	Casement, Entry Door		
Group B	ALM-004-03 A	Double Clear	Aluminium	4.3/0.53	Fixed, Sliding, Double Hung		
Skylights:	**Product ID**	**Glass**	**Type**	**Uw/SHGCw**	**Details**		
Other:	**Orientation**	**Terrain**	**Rangehood**	**Recessed Downlights**		**Software Version**	
	6	Open	Ducted	an; Sealed LED - 1 per 2.5m² for		Bers Pro 4.4	

ELEVATION WEST



name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
ELEVATIONS WEST and EAST	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1 : 100	A 201	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer





name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
SECTION AA'	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1 : 100	A 300	30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

SWITCHES :

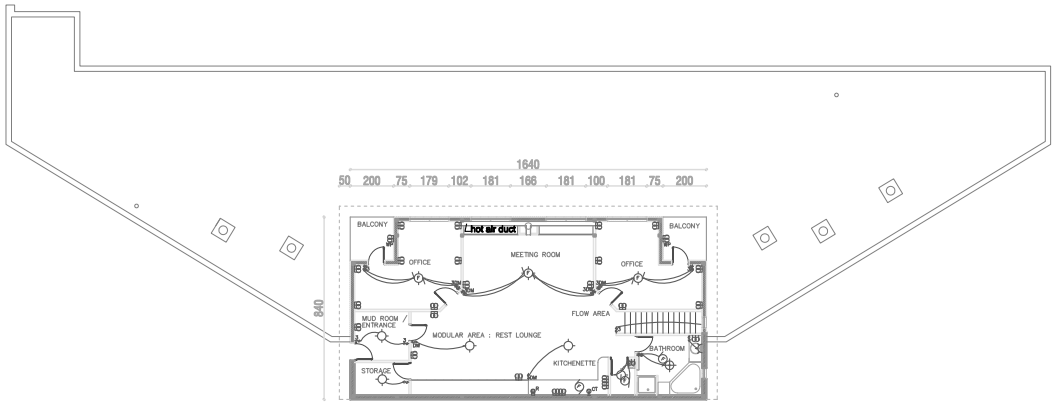
- toggle switch
- 3 — 3-way switch
- DM — dimmable switch
- 3DM — 3-way dimmable switch
- M — movement switch
- 3M — 3-way movement switch

PLUGS :

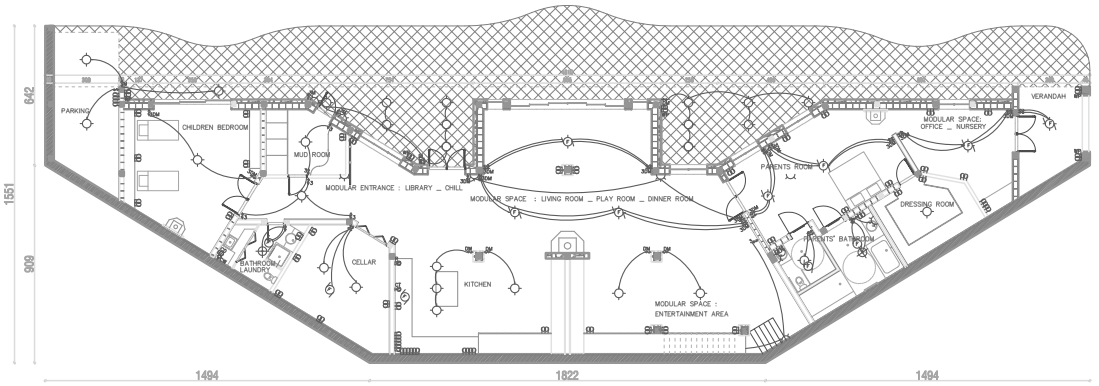
- standard duplex
- CD — clothes dryer
- CW — clothes washer
- CT — cooktop
- R — refrigerator
- WP — waterproof duplex

LIGHTS :

- ceiling light
- F — fan extractor
- F — ceiling light and fan
- heat lamp
- scone light



LEVEL 2



LEVEL 1

name of the drawing: ELECTRICAL PLAN _ LEVEL 1 and 2	name of the project: HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	scale: 1 : 200	drawing number: A 400	date of issue: 30.11.2022
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.1	by: Lorba Drewry designer

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

13 DECEMBER 2023

ITEM 9.2 DEVELOPMENT APPLICATION - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE - CONSTRUCTION OF A DWELLING - TWO STOREY

ATTACHMENT 2 4.15 ASSESSMENT REPORT

DELEGATED REPORT - DA.2023.0051

SUMMARY

Proposal:	Construction of a dwelling house - two storey
Address:	205 Tudor Valley Road REIDSDALE NSW 2622
Property description:	Lot 79 DP 755922 Lot 94 DP 755922
Applicant:	Lorba Kelly Drewry
Owner:	James Lachlan Godbee & Lorba Kelly Drewry
Date of lodgement:	07/02/2023
Notification period:	06/03/2023 to 20/03/2023
Submissions received:	0
Assessment officer:	Ranganathan Ravi
Estimated cost of works:	$1,078,750.00
Zoning:	RU1 Primary Production
Heritage:	No
Flood affected:	**No**
Bushfire prone:	**Yes**
Recommendation of officer:	**Approval, subject to conditions**

EXECUTIVE SUMMARY

The application seeks Council approval for the construction of a dwelling house – two storey in height and associated site works.

The application was notified, and no submissions were received.

The principal issue with the proposed development is the amount of clearing that has been undertaken in anticipation of a consent. The issue was first identified by the Departments Rural Housing Flying Squad when they inspected the site and recorded the amount of clearing and conveyed the information to Councils planning officers. The site in general and area of proposed dwelling has been thinned / partially cleared by the owners and forestry crews under an established forestry management plan.

The application is satisfactory for an approval, subject to recommended conditions of consent.

BACKGROUND

No relevant history to the subject lot.

DESCRIPTION OF THE SITE AND LOCALITY

The subject site is legally described as Lot 79 DP 755922 & Lot 94 DP 755922 and is commonly known as 205 Tudor Valley Road REIDSDALE. The site is located on the east side of Tudor Valley Road REIDSDALE and has a cumulative area of 65.03Ha (Lot 79 is 16.55 Ha and Lot 94 is 48.48 Ha)

The site is irregular in shape, bisected by Tudor Valley Road which splits the two lots into four different quadrants (Refer to Figure 1 below). The site is undulating in nature and is not characterised by a general slope against any particular direction. The site is generally predominated by native vegetation (Refer to Figure

The site currently comprises of a shed and rainwater tanks. Vehicular access is provided to the site via an existing driveway from Tudor Valley Road on the west.

Existing development within the locality consists of primarily large rural lots with sparse developments spread across the larger locality.

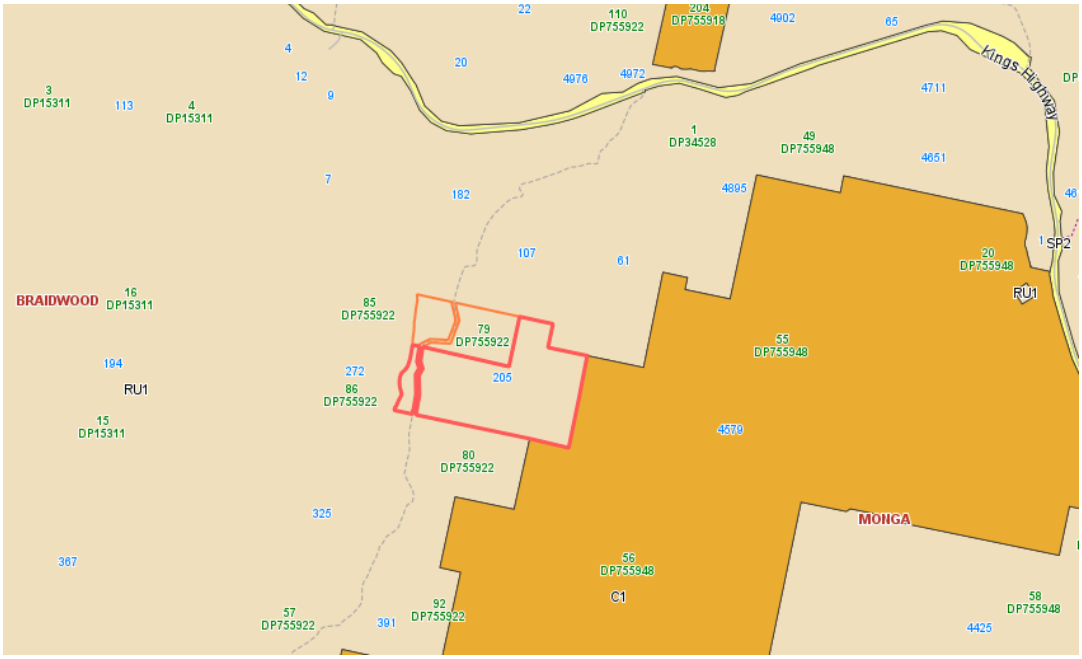


Figure 1: Locality plan

Figure 2: Satellite Imagery of the site

Figure 3: Location of the proposed dwelling facing north

Figure 4: Location of the proposed dwelling facing south

Figure 5: Location of the proposed dwelling facing west

Figure 6: Location of the proposed dwelling facing east

PROPERTY BURDENS AND CONSTRAINTS

There are no easements or burdens on the land which could affect, or be affected by, the proposed development.

DESCRIPTION OF THE PROPOSED DEVELOPMENT

The application seeks Council approval for the construction of a dwelling house – two storey.

The specific elements of the proposal are:

- Two storey dwelling accommodating multiple bedrooms and three office rooms.
- Southern side of dwelling excavated below ground level (due to underlying slope of land)
- Green Roofs
- Installation of an effluent system to support the dwelling

- Installation of three solid fuel heaters

CONSENT AUTHORITY

In accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) the proposal is considered to be local development and Council is the Consent Authority.

SECTION 4.10 DESIGNATED DEVELOPMENT – EP&A Act, 1979

The proposal is not designated development.

SECTION 4.47 INTEGRATED DEVELOPMENT – EP&A Act, 1979

The proposal is not integrated development.

REFERRALS

INTERNAL REFERRALS

Engineering Comments

Council's Development Engineer has commented on the proposal as follows:

Water:
Rainwater supply from water tank will be the alternatives for water supply system to the lot.

Sewer:
On-Site sewer management system will be utilised for the proposed dwelling.

Storm Water:
The proposed dwelling will accumulate the roof water. Roof water from proposed dual occupancy that is not connected to a rainwater storage tank, any overflow from any storage tank and hard stand area must be discharged into an absorption trench or through a stormwater outlet device with scour protection into an overland flow path, at least 3 metres clear of any building and the boundaries of the site.

Traffic and Parking:
3.0 m wide door opening for attached single garage has adequate space for single vehicle parking and it has a side clearance of 300mm which satisfy the requirement of AS/NZS2890.1. The door opening with width and height to be mentioned in the plan. The garage door opening size is to be a minimum of 2.4m wide x 2.2m high.

Access and Driveway Entrance: -

Existing driveway entrance (Date: - 06/04/2023)

A gravel rural entrance must be constructed to the lot in accordance with QPRC D13 vehicular access design specification.

The internal access and drainage structures between the entrance and the building envelope needs to be constructed to the standard of private access road with a minimum compacted pavement thickness of 150mm and as otherwise specified in Table D1.7 of Queanbeyan-Palerang Regional Council's D1 Road Geometry Design Specification.

7.11 Roads:
Development contribution to the provision of access road and bushfire suppresion and control calculated as follows.

Development contribution to the provision of access roads in total of **$7,438.**
Development contribution for bushfire suppresion and control in total of **$576.**

Section 64:
N/A

Flooding:
N/A

Council's Development Engineer offered no objections to the proposal, subject to the imposition of recommended conditions of consent.

Health Comments

Council's Health Officer has commented on the proposal as follows:

Environmental Health supports the development application, subject the following conditions:

Standard conditions:	13.02
Standard conditions (edited):	13.01
Other recommendations:	

Comments

Effluent assessment indicates worm farm with wick system. Area is suitable and Norbe satisfied.

Council's Health Officer offered no objections to the proposal, subject to the imposition of recommended conditions of consent.

EXTERNAL REFERRALS

No external referrals were required.

CONSIDERATION OF THREATENED SPECIES

Council is required under Section 4.15 of the Environmental Planning and Assessment Act 1979 to make an assessment of whether the proposed development will have a significant impact on any threatened species, populations, or ecological communities, or their habitats. Such threatened species in NSW may be protected under the NSW Biodiversity Conservation Act 2016 or under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The subject site identified as containing Biodiversity Values on the Biodiversity Values Map as seen below. The Warrambucca Creek runs along the western boundary of the lot.

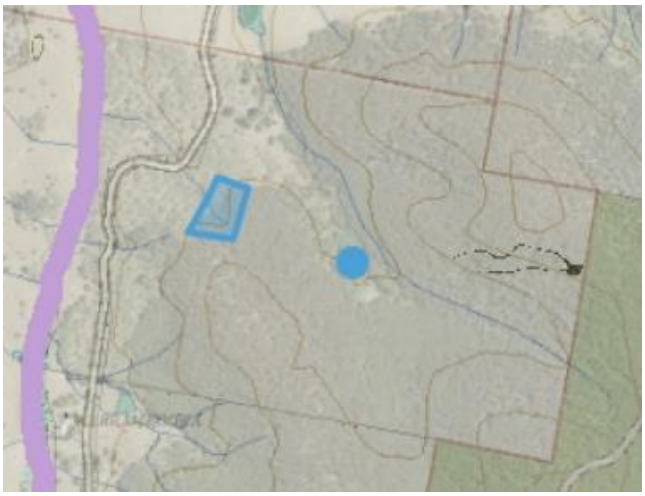


Figure 7: Biodiversity Values Map

The proposed development is located more than 250m away from the identified portions of biodiversity. The proposed development is unlikely to involve any further clearing of vegetation but would generally involve preparation of land for construction purposes. This is likely to amount approximately to 700 sqm and the existing access is likely to be upgraded to relevant standards. The amount of the clearing does not trigger the threshold levels of 1 Ha and therefore, no BDAR is required for the proposed clearing of land. Therefore, the proposal is unlikely to result in any adverse impacts on impacts on any threatened species, ecological communities or their habitats.

SECTION 4.14 CONSULTATION AND DEVELOPMENT CONSENT – CERTAIN BUSHFIRE PRONE LAND – EP&A ACT, 1979

Section 4.14 of the EP&A Act requires an assessment to be made of the proposal against the requirements of the Rural Fire Service document 'Planning for Bushfire Protection 2006'. The Act allows this assessment to be made by the Council or the RFS. Assessments under Section 4.14 against the PBP 2006 need to be made for most development on bushfire prone land which does not require an approval under the Rural Fires Act 1997 as integrated development.

Bushfire prone land on the subject site covers the whole site. The applicant submitted a bushfire assessment report (BAR), prepared by Ember Bushfire Consulting, a BPAD accredited consultant. The bushfire assessment report makes a note that the subject site was burnt during the 2019-20 bushfires and the area around the proposed dwelling, water tank and property access road has

been cleared and thinned by the owners and forestry crews under an established forestry management plan.

With regards to the existing vegetation, slopes and relevant slopes, the bushfire assessment report makes the following commentary.

Aspect:	**North**	**Northeast**	**South**	**Southeast**	**East**	**West**
Vegetation	Dry Sclerophyll Forests	Dry Sclerophyll Forests	Dry Sclerophyll Forests	Dry Sclerophyll Forests	Dry Sclerophyll Forests	Dry Sclerophyll Forests
Slope	0-5° downslope	0-5° downslope	Upslope	Upslope	0-5° downslope	10-15° downslope
BAL for APZ	19	19	19	19	19	19
Required APZ	**40m**	**49m**	**33m**	**33m**	**40m**	**60m**

The report recommends relevant Bal-19 sized APZ and associated Outer Protection Areas in each direction (detailed in the BAR). However, the report recommends a construction standard of BAL-29 due to the history of the site and also makes commentary on how the proposed green roofs should be made compliant with relevant standards.

The report also makes relevant recommendations for *water, landscaping, access and utilities* which is generally considered to be compliant with relevant controls provided under Planning for Bushfire 2019.

In conclusion, the submitted bushfire assessment report, prepared by Ember Bushfire Consulting, is generally considered to be consistent with relevant requirements under PBP 2019 and therefore, the proposed development has been conditioned to comply with the recommendations provided in the bushfire assessment report.

SECTION 4.15 CONSIDERATIONS – EP&A ACT, 1979

In determining a development application, the consent authority is to take into consideration the following matters of consideration contained within section 4.15 of the Environmental Planning and Assessment Act, 1979 as relevant to the development application:

4.15(1)(a) the provisions of:
(i) any environmental planning instrument

STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS) 2021

The State Environmental Planning Policy (Resilience and Hazards) 2021 requires consideration to be given to the suitability of the site for the proposed use. The site inspection did not reveal evidence of potential contamination on the site and no records have been found to indicate potential for contamination. The site is considered suitable for the proposed development.

STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY AND CONSERVATION) 2021

Chapter 4 Koala Habitat Protection 2021
The proposal only involves minor clearing of land for construction purposes and does not include the removal of any tree vegetation. Therefore, this is unlikely to result in any adverse impacts on any koala habitats, if any, or any tree feeding species.

Chapter 6 Water Catchments
Part 6.5 Sydney Drinking Water Catchment

As the proposal is located within the Sydney Catchment Area, a NorBE assessment was undertaken by Council's Health Officer and found that the proposal will result in a neutral or beneficial impact on the water quality.

STATE ENVIRONMENTAL PLANNING POLICY (BUILDING SUSTAINABILITY INDEX: BASIX) 2004

A valid BASIX certificate (Number 1363443S_02, issued on 20 December 2022), was lodged with this application. A condition requiring the development to meet the commitments of this BASIX certificate is included in the conditions of consent.

QUEANBEYAN PALERANG REGIONAL LOCAL ENVIRONMENTAL PLAN 2022

An assessment of the proposal against the general aims of QPRLEP 2022 is included below:

Cl. 1.2(2)	*Aims*	*Complies*
(aa)	*to protect and promote the use and development of land for arts and cultural activity, including music and other performance arts,*	**Yes**
(a)	*to protect and improve the economic, environmental, social and cultural resources and prospects of the community,*	**Yes**
(b)	*to facilitate the orderly and economic use and development of land having regard to ecological sustainability principles,*	**Yes**
(c)	*to provide for a diversity of housing to meet the needs of the community into the future,*	**Yes**
(d)	*to provide for a hierarchy of retail, commercial and industrial land uses that encourage economic and business development that caters for the retail, commercial and service needs of the community,*	**Yes**
(e)	*to keep and protect important natural habitat and biodiversity,*	**Yes**
(f)	*to protect water quality, aquifers and waterways,*	**Yes**
(g)	*to keep, protect and encourage sustainable primary industry and associated commerce in rural areas,*	**Yes**
(h)	*to identify and protect the cultural heritage of the area, including the built heritage and the Aboriginal heritage,*	**Yes**
(i)	*to protect important scenic quality, views and vistas,*	**Yes**
(j)	*to facilitate the orderly growth of urban release areas,*	**Yes**
(k)	*to ensure development does not unreasonably increase the demand for public services or public facilities,*	**Yes**
(l)	*to identify, protect and provide areas for community health and recreational activities.*	**Yes**

Comments: The proposed development is generally found to be consistent with the aims of the plan.

Permissibility

The subject site is Zoned RU1 Primary Production zone under Queanbeyan-Palerang Regional Local Environmental Plan 2022.

Development for the purposes of a *dwelling* such as is proposed is permissible within the zone with consent.

Zone Objectives

An assessment of the proposal against the objectives of the RU1 Primary Production zone is included below:

Objectives	*Complies*
➢ *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*	***Yes***
➢ *To encourage diversity in primary industry enterprises and systems appropriate for the area.*	***Yes***
➢ *To minimise the fragmentation and alienation of resource lands.*	***Yes***
➢ *To minimise conflict between land uses within this zone and land uses within adjoining zones.*	***Yes***
➢ *To minimise the impact of any development on the natural environment.*	***Yes***

➢ *To ensure that development does not unreasonably increase the demand for public services or facilities.*	***Yes***

Comments: The proposed development is generally found to be consistent with the objectives of the zone.

Part 4: Principal development standards

An assessment of the proposal against the relevant provisions contained within Part 4 of the QPRLEP2022is provided below.

Clauses 4.1, 4.1AA, 4.1A, 4.1B, 4.1C, 4.1D, 4.1E, 4.2 of QPLEP 2022 are not applicable as the proposal does **not** involve any plan of subdivision or erection of dwelling on land zoned B2 and IN2 or erection of rural workers dwelling on land zoned RU1 or C3 or any subdivision of community title scheme.

4.2A Erection of dwelling houses on land in certain rural, residential and environmental protection zones

Clause 4.2A of the QPRLEP 2022 provides requirements for the erection of dwellings on rural land.

Comments: The proposed dwelling is located on Lot 94 DP 755922 which has an area of approximately 48.48 Ha. Therefore, pursuant to Clause 4.2A(3)(a), the proposed dwelling is permissible with consent as the subject site meets the minimum lot size criteria of 40Ha.

4.3 Height of building

Cl.	*Standard*	*Controls*	*Proposed*	*Complies*
4.3	*Height of building*	10 m	7.61m	**Yes**

Comments: The proposed dwelling is likely to be viewed as a two-storey dwelling from the northern perspective and a single storey dwelling from the southern side. This is due to the underlying terrain of the land which gradually slopes upwards in the southern direction.

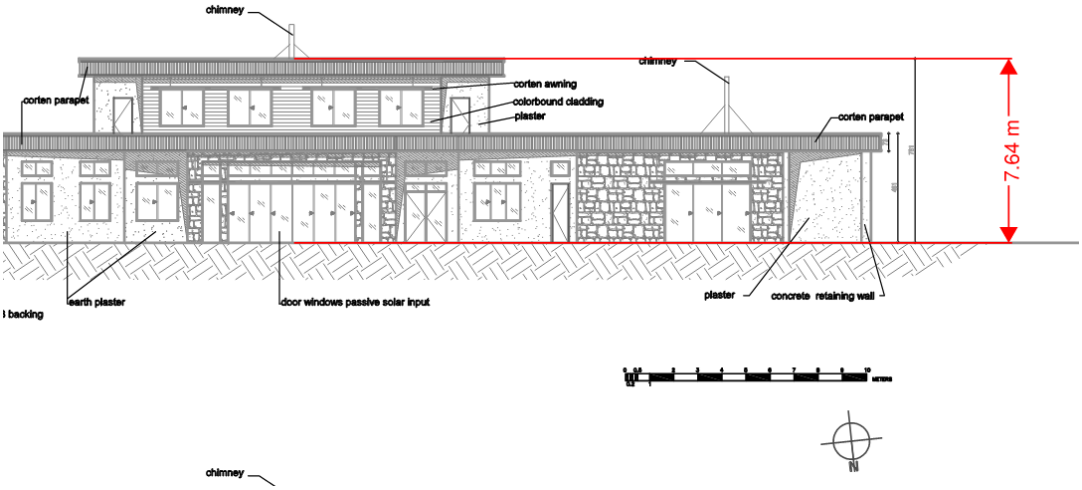


Figure 8: Height of dwelling from northern elevation

4.6 Variations to development standards

The application does not seek any variation to development standards.

Part 5: Miscellaneous Provisions

The relevant provisions contained within Part 5 of the QPRLEP 2022 are addressed below as part of this assessment:

None of the uses under this part is relevant to the proposed development.

Part 7: Local Provisions

The relevant provisions contained within Part 7 of the QPRLEP 2022 are addressed below as part of this assessment:

7.1 Earthworks

Clause 7.1 of the QPRLEP 2022 establishes a number of matters requiring consideration for development involving earthworks. The drawings generally indicate the amount of earthworks that the development is likely to involve. Based on the submitted drawing, it is evident that the development is likely to involve an amount of earthworks to accommodate the proposed dwelling. This is due to the underlying terrain of the land which ranges from 714m AHD to 718m AHD within the building footprint area.

Based on the eastern elevation, the proposal is likely to involve a minimum amount of 2.3m cut and a maximum of 3.8m cut and fill to accommodate the lower level and a maximum cut and fill of 2.34m to accommodate the upper level of the dwelling. It should be noted that the proposed development has been specifically designed in a way to reduce the amount of overall impacts and generally been designed to be built into the contours of the land.

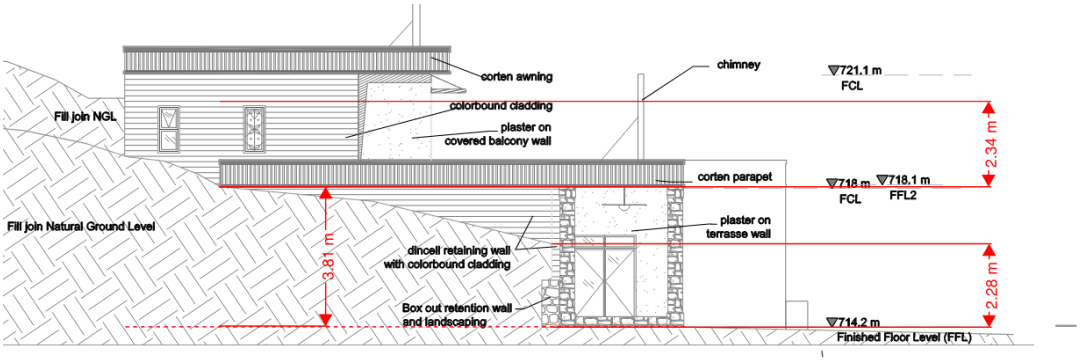


Figure 9: Approximate amounts of cut and fill

While the amount of earthworks involved is relatively high, this is primarily due to the underlying terrain of land which has steep slopes in all directions. Irrespective of where the proposal sits within the lot, it is likely to involve significant higher amount of earthworks. Appropriate conditions included in the consent to ensure soil erosion and sedimentation is mitigated during construction and post construction stages of development.

Considering the notes that the bushfire report makes in terms of the development being sited within the contour and that its likely going to increase its resilience to bushfire, the proposed development is generally considered to result in generally minimal environmental impacts and any adverse impacts are likely to be mitigated with the implementation of the relevant conditions in the consent.

7.2 Terrestrial biodiversity

Clause 7.2 of the QPRLEP 2022 makes for provision for developments that impact on terrestrial biodiversity. This clause **is** considered relevant to the proposed development as the site **is** identified as “Biodiversity” on the Terrestrial Biodiversity Map.

The proposed development is located at an area of the site with very minimal vegetation. The proposal does not involve any clearing and does not involve the removal of trees. It is unlikely that the proposed development will result in any impact on native flora, fauna, their ecosystem or habitats or corridors.

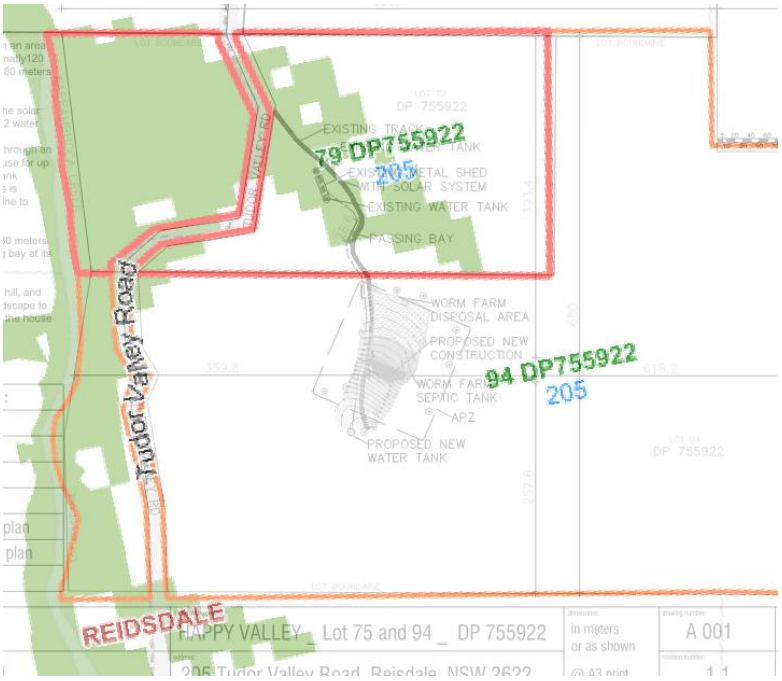


Figure 10: Terrestrial Biodiversity Layer overlay on applicants site plan

7.3 Drinking Water Catchments

Clause 7.3 of the QPRLEP 2022 makes provision for developments within a drinking water catchment. The subject site is located within the Sydney Drinking Water Catchment. A NorBE test was undertaken by the Health Officer who concluded that the proposed will have a neutral or a beneficial impact on the water quality of the area.

7.4 Riparian land and watercourses

Clause 7.4 of the QPRLEP 2022 makes for provision for developments that impact on terrestrial biodiversity. This clause **is** considered relevant to the proposed development as the site **is** identified as “Biodiversity” on the Terrestrial Biodiversity Map. The riparian zone is significantly separated from the proposed dwelling area.

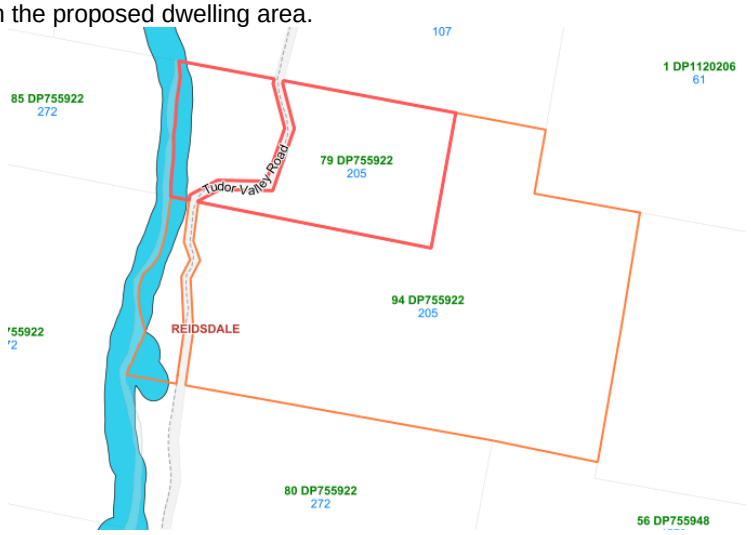


Figure 11: Riparian lands and watercourses Map

7.7 Slopes over 18 degrees

This clause is considered relevant as the subject site is identified on Landscape Map of QPRLEP 2022 as containing lands with slopes over 18 degrees. However, as seen below, the proposed development is sited on non-identified portions of the land. As indicated on the bushfire assessment report, the maximum slopes within 100m of the development sitting varies from 0-5 degrees to 5-10 degrees.

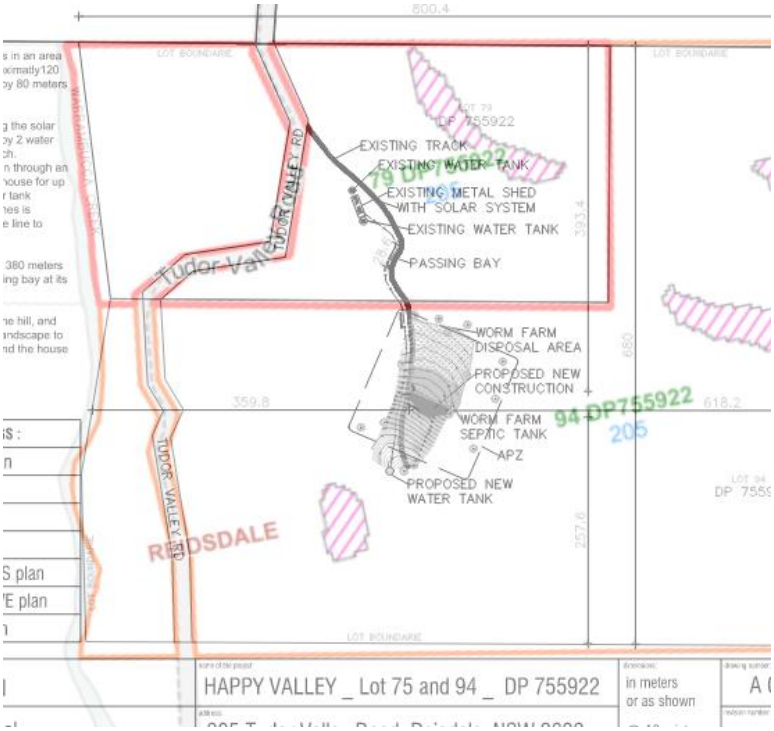


Figure 12: Slopes over 18 degrees overlay on applicants site plan

7.12 Essential services

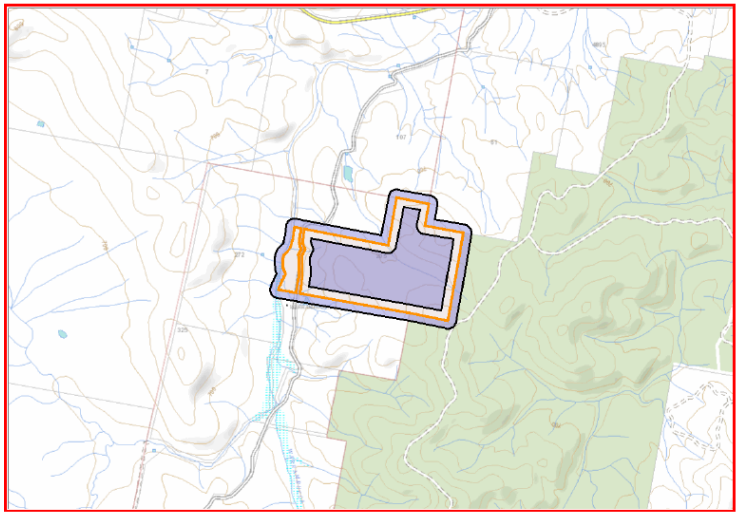
Clause 7.12 of the QPRLEP 2022 requires satisfactory arrangements to be made for water supply, stormwater drainage, solid domestic waste, sewage, and the treatment and disposal of effluent. Along with the supply of electricity and suitable vehicle access. Councils engineer and Councils health officer have assessed proposal and found that the proposed development will have sufficient services to support the dwelling.

4.15(1)(a)(ii) any draft environmental planning instruments

There are no applicable draft planning instruments that are or have been placed on public exhibition, to consider as part of this assessment.

4.15(1)(a)(iii) any development control plan

PALERANG DCP 2015 COMMENTS		
Section	**Controls**	**Complies**
PART B – GENERAL PROVISIONS		
B3	**3.1 Terrestrial Biodiversity** The proposed development is located at an area of the site with very minimal vegetation. The proposal is likely to involve clearing of land for construction purposes and does not involve the removal of any trees. It is unlikely that the proposed development will result in any impact on native flora, fauna, their ecosystem or habitats or corridors.	Yes

	3.2 Soils and steep slopes Discussed under Clause 7.7 of QPRLEP 2022. **3.3 Watercourses** As stated under Clause 7.4 of QPRLEP 2022, the proposed development is located beyond the 40m buffer of watercourse areas.	
B4	**Bush fire Prone Land** Conditions included in the consent to ensure the proposed development is compliant with recommendations provided in the bushfire assessment report, prepared by Ember Bushfire Consulting dated 18 May 2023, version 1.1.	Yes
B7	**Engineering Requirements** Refer to comments provided by Councils Development Engineer under Referrals section of the report.	Yes
B8	**Erosion and Sediment control** Conditions included in the consent to ensure soil erosion and sedimentation is mitigated during construction and post construction stages of development. With the implementation of the conditions, the proposal is likely to be compliant with relevant controls under this section of the DCP.	Yes
B10.2	**Aboriginal Heritage** An AHIMS search was carried out and did not indicate any heritage sites within the vicinity of the proposed development, as such it is considered that the proposed development is unlikely to result in the disturbance of any items of aboriginal indigenous cultural heritage. A condition however will be contained within the consent that the development is to proceed with caution and if any Aboriginal objects are found works should stop and DECCW are to be notified.  A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that: 0 Aboriginal sites are recorded in or near the above location. 0 Aboriginal places have been declared in or near the above location. *	Yes
B13	**On-site System of Sewage Management (OSSM)** The application was referred to Council's health officer, who offered no objections to the proposal, subject to recommended conditions of consent.	Yes
B14	**Potentially contaminated land** The site inspection did not reveal evidence of potential contamination on the site and no records have been found to indicate potential for contamination. The site is considered suitable for the proposed development	Yes
B15	**Waste management**	Yes

	The consent will contain a condition for waste management to ensure that adequate measures are in place during the construction phase.	
B17	**Rainwater tanks** Conditions included in the consent to ensure the dwelling is provided with a 90,000 litre rainwater tank.	Yes
B18	**Solid Fuel Heater** The applicant has shown a wood heater on the plans and also provided a manufacturers details of the same. It complies with this section of the DCP.	Yes
B19	**Sydney Drinking water catchment** Councils health officer reviewed the proposed effluent system and has confirmed that the proposal is likely to result in a neutral or a beneficial impact on water quality.	Yes
PALERANG DCP 2015 COMMENTS		
Section	**Controls**	**Complies**
PART C2 – RESIDENTIAL DEVELOPMENT		
C2.1	**Objectives and controls applicable to all land use zones and dwelling types** Subject to the recommended conditions of consent, it is considered that the development is consistent with the objectives and controls of the DCP. The development is consistent with the residential character of the locality and it is considered that the proposal will not detract from the existing built and landscape environment or the existing amenity of the area.	Yes
C2.1.1	**Acoustic privacy** It is considered that the development will not result in any adverse impacts on the acoustic privacy of the dwelling. The development is set back a suitable distance from adjoining owners that the impacts will be minimal.	Yes
C2.1.2	**Visual privacy** It is considered that the development will not result in any adverse impacts on the visual privacy of the dwelling or adjoining owners.	Yes
C2.1.3	**Dwelling Articulation** It is considered that the development will not detract from the existing character of the area.	Yes
C2.1.4	**Dwelling Exteriors** It is considered that the proposed development will not detract from the existing character of the locality. The consent will contain a condition that the structures are to be finished in materials that have low reflectivity and muted colours.	Yes
C2.1.6	**Driveways, Entrances, Access, Parking and Utilities** Refer to Engineering comments.	Yes
C2.1.7	**Energy and water efficiency** The alterations and additions are to comply with BASIX Certificate Number: 1363443S_02, issued on 20 December 2022.	Yes
C2.1.9	**Height** The structure is two storey and complies with the height map requirements of 10m set out in the QPRLEP 2022.	Yes
C2.1.11	**Overshadowing** It is considered that the development will not result in any adverse overshadowing impacts on adjoining properties; the dwelling is two storey and setback at more than 100m from the boundaries and therefore no overshadowing impacts are likely to	Yes
C2.1.12	**Solar Access** It is considered that the development will not result in any adverse impact on the solar access of the site or existing dwelling.	Yes

<table>
<tr><td>C2.1.13</td><td>Siting and orientation
It is considered that the orientation and siting of the development will not detract from the existing characteristic pattern.</td><td>Yes</td></tr>
<tr><td>C2.1.14</td><td>Roof form (shape)
It is considered that the roof of the dwelling will not significantly add to the bulk and scale of the building. The proposal includes a flat roof over the dwelling and this is unlikely to exceed the DCP allowance of 32 degrees.</td><td>Yes</td></tr>
<tr><td>C2.1.15</td><td>Street frontage
No impact on street frontage.</td><td>Yes</td></tr>
<tr><td>C2.1.16</td><td>Streetscape
No impact on streetscape.</td><td>Yes</td></tr>
<tr><td>C2.1.19</td><td>Potable water and sewage disposal
Refer to internal referrals.</td><td>Yes</td></tr>
<tr><td>C2.5</td><td>Dwellings in RU1 Primary Production and C3 Environmental Management and C4 Environmental Living land use zones.
Objectives
Subject to the recommended conditions of consent, it is considered that the proposed development is consistent with the objectives and controls of the DCP. The development is consistent with the residential character of the locality and it is considered that the proposal will not detract from the existing built and landscape environment or the existing amenity of the area.</td><td>Yes</td></tr>
<tr><td>C2.5.1</td><td>Setbacks
<table>
<tr><th>Setbacks</th><th>Permitted</th><th>Proposed</th><th>Compliant</th></tr>
<tr><td>Front Boundary (west)</td><td>50m</td><td>>300m</td><td>Yes</td></tr>
<tr><td>Rear Boundary</td><td>25m</td><td>>600m</td><td>Yes</td></tr>
<tr><td>North Side Setback</td><td>25m</td><td>>300m</td><td>Yes</td></tr>
<tr><td>South side setback</td><td>25m</td><td>>250m</td><td>Yes</td></tr>
</table></td><td>Yes</td></tr>
<tr><td>C2.5.2</td><td>Potable water supply
Conditions included in the consent to ensure a 90,000 litre water tank is provided for the dwelling.</td><td>Yes</td></tr>
</table>

4.15(1)(a)(iiia) any planning agreement or draft planning agreement

No planning agreement has been entered into under section 7.4 of the *Environmental Planning and Assessment Act 1979*.

4.15(1)(a)(iv) matters prescribed by the regulations

Clause 92 of the *Environmental Planning and Assessment (EP&A) Regulation 2000* requires Council to take into consideration Australian Standard *AS2601–1991: The Demolition of Structures*, in the determination of a development application.

Having regard to this prescribed matters, the proposed development does not involve the demolition of a building for the purposes of *AS 2601 – 1991: The Demolition of Structures*.

Should this application be approved, appropriate conditions of consent are included within the recommended to ensure compliance with any relevant regulations.

4.15(1)(a)(v) any coastal zone management plan

Council is not subject to a coastal zone management plan.

4.15(1)(b) the likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality

The Likely Impacts of the Development	
Context and Setting – The proposed development is considered to be consistent with the context and setting.	Yes
Access, Transport and Traffic - The proposed development's impact in relation to access, transport and traffic is considered to be acceptable as assessed by Council's Development Engineer.	Yes
Public Domain – The public domain refers to public spaces. Unlikely to result in any impacts on public domain.	Yes
Utilities - The site is likely to be serviced with water, sewer, electricity and telecommunications as part of the consent.	Yes
Heritage – The subject site is not within a heritage conservation area. The proposal does not impact upon heritage values and is supported.	Yes
Other Land Resources - The proposed development will not adversely impact on valuable land resources for productive agricultural land and mineral and extractive resources.	Yes
Water - The proposed development will have minimal impact on the conservation of water resources and the water cycle.	Yes
Soils - The proposed development will have minimal impact on soils.	Yes
Air and Microclimate - The proposed development will have minimal impact on air quality and microclimatic conditions and will be conditions to prevent air pollution such as dust where required.	Yes
Flora and Fauna - (8 point test from Threatened Species Act to be completed where relevant). The proposed development will have a minimal impact in relation to the maintenance of biodiversity in the area.	Yes
Waste – It is anticipated that adequate waste facilities could be made available should the use proceed.	Yes
Energy – a BASIX Certificate was submitted with the application and is considered satisfactory.	Yes
Noise and Vibration – The proposed use is not considered to increase potential noise impacts on adjoining development.	Yes
Natural Hazards – The subject site is bushfire prone and appropriate conditions	Yes

included in the consent to ensure that minimal protection is provided against potential bushfire hazards in the future.	
Technological Hazards - No technological hazards are known to affect the site.	Yes
Safety, Security and Crime Prevention – The site is large rural lot and therefore this does not apply.	N/A
Aboriginal Heritage – The Aboriginal Cultural Heritage Due Diligence process was followed as part of the assessment. A basic AHIMS search was carried out and no recorded or declared Aboriginal sites were found in or near the subject site. There are not any other sources of information of which a person is already aware and the landscape does not contain features which are likely to indicate the presence of Aboriginal objects. Subject to the conditions of consent, the proposed development is considered acceptable as it will not result in any significant impacts on the natural or built environments and will not result in any social or economic impacts on the locality.	Yes

4.15(1)(c) the suitability of the site for the development

The subject site is relatively unconstrained and is considered to be suitable in its current state for the purposes of the proposed development.

4.15(1)(d) any submissions made in accordance with this Act or the regulations

The application was notified in accordance with Councils Community Engagement and Participation Plan from 06/03/2023 to 20/03/2023, with **0** submissions received.

4.15(1)(e) the public interest

The public interest is served through the detailed assessment of this development application under the relevant local planning controls and legislation and consideration of any submissions received relating to it by Council. The proposed development is not considered to be contrary to the public interest.

SECTION 64 CONTRIBUTIONS

Section 64 of the Local Government Act 1993 allows contributions to be levied towards the provision of water, sewerage and stormwater infrastructure.

Section 64 Contributions are not applicable to the proposed development.

SECTION 7.11 CONTRIBUTIONS

Section 7.11 of the *Environmental Planning & Assessment Act 1979* permits councils to require as a condition of development consent, the reasonable dedication of land or the payment of monies, or both, for development that is likely to require the provision of, or increase the demand for public amenities and public services within the area.

Section 7.11 Contributions are applicable to the proposed development as follows:

> Development contribution to the provision of access road and bushfire suppresion and control calculated as follows.
>
> Development contribution to the provision of access roads in total of **$7,438.**
> Development contribution for bushfire suppresion and control in total of **$576.**

QUEANBEYAN-PALERANG REGIONAL COUNCIL
CONTRIBUTION TO PROVISION OF ACCESS ROADS UNDER
TALLAGANDA SECTION 7.11 (94) PLAN No. 3

Base Contribution	$4,700
Reduction (10% >10km)	$0
Contribution per Lot/E.T. (unindexed)	$4,700
CPI Adjustment (for 2020/21)	+58.26%
Contribution (indexed)	$7,438
Applicable Number of Lots/E.T.	1.0
Ledger	42236
Code	TSC P3 TUDVA
Total Payment Due:	**$7,438**

QUEANBEYAN-PALERANG REGIONAL COUNCIL
CONTRIBUTION TO BUSHFIRE SUPPRESSION AND CONTROL UNDER
TALLAGANDA SECTION 7.11 (94) PLAN No. 4

Project	Ledger	Code	Base Contribution	Indexation	Lots	Amount
Bushfire Facilities – Central-Braidwood	42123	TSC P4 C BRAI	$364	+58.26%	1	**$576**

CONCLUSION

The application has been assessed having regard to **Section 4.15** of the Environmental Planning and Assessment Act 1979, and is considered to be satisfactory for an approval, subject to recommended conditions of consent.

CONDITIONS OF CONSENT

See Notice of Determination

Signed: **Date:** 21/11/2023

Assessing Officer: Ranganathan Ravi

Determination: DA.2023.0051 be **Approved** under delegated authority pursuant to Section 4.16(1) of the Environmental Planning and Assessment Act 1979.

Signed: _____ **Date:** 24/11/2023

Delegated Authority: Graeme Harlor

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

13 DECEMBER 2023

ITEM 9.2 DEVELOPMENT APPLICATION - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE - CONSTRUCTION OF A DWELLING - TWO STOREY

ATTACHMENT 3 DRAFT NOTICE OF DETERMINATION

Application Number: DA.2023.0051

21 November 2023

Lorba K Drewry
203 Tudor Valley Road
REIDSDALE NSW 2622

Dear Madam

Council is pleased to advise that your Development Application DA.2023.0051 relating to Lot 79 DP 755922
Lot 94 DP 755922, No. 205 Tudor Valley Road REIDSDALE NSW 2622 has been approved. The 'Notice of Determination' is attached.

It is important that you carefully read the notice and the accompanying notes, and that any requirements and rights are fully understood before proceeding with the development.

You are advised that a Construction Certificate (Building) **must** also be issued prior to the commencement of any work on the development. In this regard, you may choose Council to issue the Certificate or, alternatively, it may be issued by a private certifier.

You **must not** occupy or use the premises until you have obtained an Occupation Certificate from your Principal Certifying Authority.

Should you have any further enquiries please contact Ranganathan Ravi of Council's Development and Environment Section on 1300 735025.

Yours faithfully

Ruth Ormella
Director
Development and Environment

Per……G. Harlor……

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ABN 95 933 070 982

Notice of Determination of Development Application

Issued under Section 4.18 of the Environmental Planning and Assessment Act 1979

Development Application No. PAN No.	**DA.2023.0051** **PAN-293904**
Property	**Lot 79 DP 755922** **Lot 94 DP 755922,** **205 Tudor Valley Road REIDSDALE NSW 2622**
Description of Proposed Development	**Construction of a dwelling - two storey**
Applicant's Details	**Lorba K Drewry** **203 Tudor Valley Road** **REIDSDALE NSW 2622**
Date of Determination	**21 November 2023**
Consent granted subject to the conditions in the attached schedule of conditions and in accordance with approved plans.	
Date from which Consent operates	**21 November 2023**
Date on which Consent lapses	**21 November 2028**
Approval bodies that have given general terms of approval	Nil
Court Case name LEC Number	Not applicable
Independent Planning Commission public hearing	Not applicable
Approvals granted under the Local Government Act 1993	**Solid Fuel Heaters** **On Site Sewerage Management**

Under section 4.18(1) of the EP&A Act, notice is given that the above development application has been determined by the granting of consent using the power in section 4.16(1)(a) of the EP&A Act, subject to the conditions specified in this notice.

REASONS FOR APPROVAL

1. The development was found to be consistent with the provisions of the relevant State Environmental Planning Policies;

2. The development was found to be consistent with the relevant provisions of the Queanbeyan-Palerang Regional Council Local Environmental Plan 2022;

3. The development is consistent with the relevant provisions of the Palerang Development Control Plan 2015;

4. The development was found to be unlikely to result in any adverse environmental, social or economic impacts in the locality;

5. The subject site was found to be suitable for development and

6. The development was found to be in the public interest.

COMMUNITY CONSULTATION

7. The application was notified from "06/03/2023" to "20/03/2023". No submissions were received.

RIGHT OF APPEAL / REQUEST A REVIEW OF THE DETERMINATION

If you are dissatisfied with this determination:

Request a review
You may request a review of the consent authority's decision under section 8.3(1) of the EP&A Act. The application must be made to the consent authority within 6 months from the date that you received the original determination notice provided that an appeal under section 8.7 of the EP&A Act has not been disposed of by the Court.

Rights to appeal
You have a right under section 8.7 of the EP&A Act to appeal to the Court within 6 month after the date on which the determination appealed against is notified or registered on the NSW planning portal.

Objector's right of appeal against the determination
An objector who is dissatisfied with the consent authority's determination to grant consent, has the right to appeal to the Court against the determination under section 8.8 of the EP&A Act within 28 days after the date that the objector was notified of the determination appealed against.

The Dictionary at the end of this consent defines words and expressions for the purposes of this determination.

Signed by Consent Authority **Date of this Notice: 21 November 2023**

Ruth Ormella
Director
Development and Environment
Per……G. Harlor……

Person on behalf of the consent authority

Terms and Reasons for Conditions
Under section 88(1)(c) of the EP&A Regulation, the consent authority must provide the terms of all conditions and reasons for imposing the conditions other than the conditions prescribed under section 4.17(11) of the EP&A Act. The terms of the conditions and reasons are set out below.

APPROVED DEVELOPMENT AND PLANS

1. Plans and documents

The development referred to in the application is to be carried out in accordance with the approved plans and documents including the following:

Title / Description	Prepared by	Issue/Revision & Date	Date received by Council
BASIX Commitments (Sheet A000)	Lorba Drewry	Rev 1.1, 28/12/2022	07/02/2023
Site Plan (Sheet 001)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Floor Plan (Sheet A101)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Roof Plan (Sheet A102)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Elevation NS Plan (Sheet A200)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Elevation WE Plan (Sheet A201)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Section Plan (Sheet A300)	Lorba Drewry	Rev 1.1, 30/11/2022	07/02/2023
Bushfire Assessment Report	Ember Bushfire Consulting	Version 1.1 18/05/2023	12/10/2023
BASIX Certificate	Lorba Drewry	20/12/2022	07/02/2023
NatHERS Certificate	Paul Gradwell	19/12/2022	07/02/2023
On Site Sewage Management Report	Allan Mills	10/05/2021	07/02/2023
Solid Fuel Heater Specifications	Unnamed	Undated	07/02/2023
NSW Health Accreditation Certificate	NSW Health	25/05/2021	07/02/2023

except as modified by any of the following conditions of consent.

Reason: Development is undertaken in accordance with this consent & is used for the approved purpose only.

SPECIAL CONDITIONS

2. Bushfire Protection

The development is to comply with the recommendations provided in the Bushfire Assessment Report, prepared by Ember Bushfire Consulting, dated 18 May 2023, version 1.1, ref: RM.64.24.

Reason: To provide minimal protection against bushfire hazards.

GENERAL CONDITIONS

3. Obtain Construction Certificate

Obtain a construction certificate from Queanbeyan-Palerang Regional Council or an appropriately accredited private certifier before undertaking any work. Forward a copy of any construction certificate issued by a private certifier to Queanbeyan-Palerang Regional Council at least 2 days before undertaking any work in accordance with that construction certificate.

Reason: Work is undertaken in accordance this consent & relevant construction standards.

4. Obtain Occupation Certificate

Do not occupy or use the premises until an occupation certificate has been issued by Queanbeyan-Palerang Regional Council or an appropriately accredited private certifier. Provide a copy of any occupation certificate, issued by a private certifier, to Queanbeyan-Palerang Regional Council no later than 2 days after the occupation certificate is issued.

Reason: Ensure that the building complies with relevant standards.

5. Comply with the Building Code of Australia

All work is to comply with the current edition of the Building Code of Australia.

Reason: All building work is carried out in accordance with relevant construction standards.

6. Construction within Boundaries

The development including but not limited to footings, walls, roof barges and guttering must be constructed wholly within the boundary of the premises. No portion of the proposed structure shall encroach onto the adjoining properties. Gates must be installed so they do not open onto any footpath or adjoining land.

Reason: Approved works are to be contained wholly within the subject site.

7. Retaining Walls

Any retaining wall greater than 1000 mm is to be designed and constructed to structural engineer's details. Prior to issue of any construction certificate provide a certified copy of the design to Queanbeyan-Palerang Regional Council.

Reason: Retaining walls are structurally strong enough to bear the loads put on them.

8. Batters

No batter is to have a gradient greater than 1:4. Batters greater than 1:4 must be retained.

Reason: Prevent soil erosion, water pollution and the discharge of loose sediment on surrounding land.

9. Imported Fill

All fill delivered to site has to be certified Virgin Excavated Natural Material (VENM).

Reason: Only clean and non-contaminated fill is used on site.

10. Unauthorised Use of Public Land

No building materials are to be stored or construction activities undertaken on public or adjoining land without prior written approval from Council.

Reason: To prevent unnecessary disturbance to public land.

11. Work on Adjoining Land Is Limited

The verge and other adjoining lands must not be used for storage of materials, trade/construction vehicle parking or disturbed by construction activities with the exception of;

a. Installation of a temporary, stabilised construction access across the verge,

b. Installation of services,

c. Construction of an approved permanent verge crossing.

Reason: To minimise interference with the verge and its accessibility by pedestrians.

CONDITIONS TO BE SATISFIED PRIOR TO COMMENCEMENT OF WORKS

12. Appoint PCA (Building)

Appoint a principal certifying authority before any work is undertaken. Provide details of the appointed principal certifying authority (if not Queanbeyan-Palerang Regional Council) to Queanbeyan-Palerang Regional Council at least 2 days prior to any work being undertaken.

Reason: To provide for supervision of the development works.

13. Development Contributions to be Paid

Prior to the lodgement of the Notice to Commence Work and Appointment of a Principal Certifying Authority the contributions specified in Schedule 1 of this consent must be paid to Council under the provisions of Section 7.11 or 7.12 of the *Environmental Planning and Assessment Act 1979*.

Reason: To provide for the funding of augmentation and provision of services and community facilities.

14. Home Building Act Requirements

Residential building work within the meaning of the Home Building Act 1989 must not be carried out unless the Principal Certifying Authority for the development to which the work relates (not being the council) has given Council written notice of the following information:

(a) In the case of work for which a principal contractor is required to be appointed:
  (i) The name and licence number of the principal contractor.
  (ii) The name of the insurer by which the work is insured under Part 6 of that Act.

(b) In the case of work to be done by an owner-builder:
  (i) The name of the owner-builder.
  (ii) If the owner-builder is required to hold an owner-builder permit under that Act, the number of the owner-builder permit.

Reason: This is a prescribed condition under the provisions of clause 98B of the Environmental Planning and Assessment Regulation 2000.

15. Sediment and Erosion Control

A Sediment and Erosion Control Plan (S&ECP) for all site works, including road works and access, is to be approved by the principal certifying authority prior to work commencing. The plan is to cover all measures to control erosion and sediment transport in accordance with the

NSW Landcom publication *Managing Urban Stormwater - Soils and Construction (4th Edition 2004 - "Blue Book"*).

Erosion and sediment controls are to be in place before the disturbance of any soils on the site, and are to be maintained during the works and for as long as necessary after the completion to prevent sediment and dirty water leaving the site and/or entering the surface water system outside of the site as follows:

(a) divert uncontaminated run-off around cleared or disturbed areas,

(b) erect a silt fence to prevent debris escaping into drainage systems or waterways,

(c) prevent tracking of sediment by vehicles on roads, and

(d) stockpile topsoil, excavated material, construction and landscaping supplies and debris within the site.

Reason: To minimise environmental impact associated with any works & to prevent soil erosion/water pollution.

CONDITIONS TO BE SATISFIED DURING BUILDING WORKS

16. Hours of Operation for Works

All works associated with the construction and/or demolition of this development must be carried out between the following hours unless Queanbeyan-Palerang Regional Council agrees in writing. A written application shall be made to Queanbeyan-Palerang Regional Council if a variation of hours is required.

Weekdays:	7.00am to 6.00pm
Saturdays:	8.00am to 4.00pm
Sundays and Public Holidays:	NIL

Reason: To reduce the chance of offensive noise being created and to minimise the impacts of the development in its locality.

17. Approval Documents

Keep a copy of all stamped approved plans, specifications and documents on site while work is being undertaken.

Reason: Relevant documentation is available for perusal on site by a council officer, for compliance check.

18. Construction Facilities

Toilet facilities are to be provided at or in the close vicinity of the work site on which work involved in the erection or demolition of a building is being carried out.

Reason: To provide adequate facilities to the work site.

19. Unexpected Finds

The development is to proceed with caution. If any Aboriginal objects are found, works should stop and DECCW notified. If human remains are found work is to stop, the site is to be secured and the NSW Police and NSW Office of Environment and Heritage are to be notified.

Reason: To ensure objects discovered during construction are protected and notified in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

20. All Works to Be Confined to the Site

All demolition, excavation, backfilling, construction and other activities associated with the development must:

a) Be carried out entirely within the allotment boundaries unless otherwise approved by Council.

b) Comply with the requirements of AS 2601-2001 - The demolition of structures.

c) If within one metre of the verge, the site must be protected by a hoarding which must be erected prior to the commencement of the demolition works.

d) Be kept clear of stormwater, sewer manholes and service easements on the site.

e) Any gates must be installed so they do not open onto any footpath or adjoining land.

Reason: To ensure that all development activity associated with the development does not pose a hazard to life or property and that the effectiveness of public services is not impaired.

21. Construction Waste Management

All waste materials generated on-site during construction are to be stored in enclosed containers and deposited in an approved landfill at regular periods.

Reason: To ensure adequate waste management practices are in place during the construction phase.

22. Excavation and Backfilling

All excavations and backfilling associated with the erection or demolition of a building must be executed in accordance with the requirements of SafeWork.

Reason: To ensure excavation does not impact on adjoining property and compliance with SafeWork requirements.

23. Maintenance of Erosion Control Measures

All measures to control erosion and sediment transport are to be maintained during the works in accordance with the NSW Landcom publication *Managing Urban Stormwater - Soils and Construction* (4th Edition 2004- "Blue Book") and for as along as necessary after the completion to prevent sediment and dirty water leaving the site and/or entering the surface water system outside of the site.

Reason: To minimise environmental impact associated with any works & to prevent soil erosion/water pollution.

CONDITIONS TO BE SATISFIED PRIOR TO ISSUE OF OCCUPATION CERTIFICATE

24. Occupation Certificate

The occupation certificate must not be issued until all conditions of consent have been satisfactorily complied with and all mandatory stage/required plumbing inspections undertaken. Plumbing and drainage must be inspected by Queanbeyan-Palerang Regional Council at the relevant stages of construction in accordance with the attached inspection schedule and a final plumbing certificate obtained prior to issue of any occupation certificate.

Reason: Development is safe & appropriate for occupation and is completed in accordance with the consent.

25. BASIX Commitments

Comply with all commitments listed on BASIX Certificate No. 1363443S_02, or any subsequent modifications, before occupying the premises.

Reason: To ensure compliance with the requirements of the NSW BASIX certification process.

26. Colours and Material Finishes

The dwelling is to be finished in materials that have a low reflectivity. Colours are to incorporate the use of muted, natural colours that will blend with, rather than stand out from, the landscape for major features such as walls, roof and fencing.

Reason: The building is not visually intrusive in the landscape and does not cause glare.

27. Stormwater Management

Roof water that is not connected to a rain water storage tank, and any overflow from any storage tank, must be discharged into an absorption trench or through a stormwater outlet device with scour protection into an overland flow path, at least three (3) metres clear of any building and the boundaries of the site.

Reason: Stormwater disposal does not impact on the building.

28. Potable Water Supply

The dwelling is to be provided with a water storage tank(s) with minimum capacity of 90 000 litres.

Reason: To ensure that a suitable water supply is available.

29. Power Supply

The building shall be connected to a suitable power supply.

Reason: To allow for a power supply to be available.

30. Driveway Application Form

A driveway application form must be submitted to and approved by Council prior to commencement of driveway works and construction of the driveway across Council's footway area must be undertaken by a Council approved contractor, at no cost to the Council.

Reason: To ensure the construction of the driveway on public land meets Council's requirements.

31. Repair Damaged Public and Private Property

All damage caused to public and private property during the construction operations and associated activities must be repaired or reinstated prior to Council accepting any Certificate of Completion.

Reason: To ensure that all public and neighbouring private property in the vicinity of the development is maintained in its pre-development condition.

32. Internal Road Access

Construct the internal access road and drainage structures between the entrance and the building envelope, to the standard of "Private Access" road with a minimum compacted pavement thickness of 150mm and as otherwise specified in Table D1.7 of Queanbeyan-Palerang Regional Council's D1 Road Geometry Design Specification.
Bitumen sealing of the Internal Road Access will be required to address dust impacts where the centreline of the road is within 50m of the near edge of a building envelop or an existing or proposed dwelling.
The access road is to comply in perpetuity with the performance criteria and acceptable solutions set out in Rural Fire Service NSW document Planning for Bushfire Protection.

Note: *Crossings of prescribed streams are to be referred to the NSW Office of Water for Controlled Activity Approval where required.*

Reason: Roads created allow for environmental protection and requirements for bushfire planning.

33. Rural Driveway Entrance

A gravel rural entrance must be constructed to the lot as required in accordance with QPRC's D13 Vehicular Access Design Specification.
Longitudinal grading is to ensure ground clearance for standard passenger vehicles and in accordance with QPRC's D1 Geometric Road Design Specification.
Rural entrance construction to be carried out by a Council approved contractor.

Reason: To ensure safe entry and exit to the lot from the road.

CONDITIONS TO BE SATISFIED DURING THE ONGOING USE OF THE PREMISES

34. Surface Water

Do not re-direct surface water onto adjoining private land. Alterations to the surface contours must not impede or divert natural surface water run-off, so as to cause a nuisance to adjoining property owners or create an erosion or sediment problem.

Reason: Stormwater disposal does not impact on the building or neighbouring properties.

ACTIVITY APPROVAL - SECTION 68 OF LOCAL GOVERNMENT ACT 1993

35. Local approval - on-site sewage management system

The wastewater management system is to be designed, installed and maintained in accordance with the principles of *'On-site Sewage Management for Single Households', AS/NZS 1547-2012 'On-site Domestic Wastewater Management*' and the site report prepared by Watercheck Testing (10 May 2021 No. 202125) except with the following amendments;

Reason: To ensure that the on-site effluent management system will have a neutral or beneficial effect on water quality, that it will be sustainable over the long term and will not have detrimental impacts on the health of occupants of the land.

All effluent is to be assimilated within the boundaries of the property.

No effluent management areas are to be located within 100 m of any creek, watercourse or bore whether perennial or intermittent, or within 40 m of a drainage depression.

All stormwater collected from roofs and other hard surface areas is to be diverted away from any effluent management area, with provision for energy dissipation at the outlet to prevent scouring or erosion.

Reason: To ensure that the on-site effluent management system will have a neutral or beneficial effect on water quality and that it will be sustainable over the long term.

Install surface water diversion upslope of the land application disposal area.

All wastewater (black and grey) is to be directed to the on-site sewage management system for treatment.

Fence off the effluent management area prior to any construction work commencing and maintain in fencing in perpetuity to prevent human, vehicle and stock access.

Trenches are to be no longer than 20m and a distribution box installed to allow equal distribution between the trenches.

No water supply or any source of water supply to be used for drinking, domestic purposes or for stock is to be polluted or rendered unwholesome by the land application of the effluent from the proposed on-site sewage system.

Reason: Compliance with AS1547-2012 On-site Domestic Wastewater Management.

36. Septic tank

The septic tank is to be located at least 3 m from any building and have adequate access for desludging.

Liquid trade wastes, generated on the premises, must not be discharged into the septic tank or collection well.

The contents of the existing system are to be removed to the Council's treatment works in an approved vehicle and the disconnected system is to be either demolished or filled with clean soil and garden lime.

The disposal area is to be constructed parallel with the contour of the land in the approximate position indicated on the plan.

Reason: To ensure compliance with AS1547-2012 On-site Domestic Wastewater Management.

37. Local Approval - Solid Fuel Heater

1. Location of the solid fuel heater must comply with the provisions of *AS2918 - Domestic Solid Fuel Burning Appliances - Installation* and the manufacturer's specifications.

   Reason: To ensure the safety of the occupants of the building.

2. Notification of completion of installation from the installer must be given to Council at least 48 hours before firing appliance and arrangements made for access and inspection by Council.

   Reason: To ensure the appliance has been correctly installed for the safety of the occupants and for compliance with the legislation.

3. The Solid Fuel Heater must be installed by an appropriately licenced installer and a compliance certificate provided to Council prior to the issuing of the completion certificate for the heater.

Reason: To ensure the safety of the occupants of the building.

38. Provide Rain Excluder to Flue

The heating appliance flue must terminate with a concentric shroud rain excluder or other approved vertical discharge cowl.

Reason: To ensure the vertical discharge of flue gases so as to minimise smoke nuisance to neighbours, to maintain efficient operation of the appliance and to avoid the build-up of dangerous and flammable materials in the flue.

General advisory notes

This consent contains the conditions imposed by the consent authority which are to be complied with when carrying out the approved development. However, this consent is not an exhaustive list of all obligations which may relate to the carrying out of the development under the EP&A Act, EP&A Regulation and other legislation. Some of these additional obligations are set out in the *Conditions of development consent: advisory notes*. The consent should be read together with the *Conditions of development consent: advisory notes* to ensure the development is carried out lawfully.

The approved development must be carried out in accordance with the conditions of this consent. It is an offence under the EP&A Act to carry out development that is not in accordance with this consent.

Building work or subdivision work must not be carried out until a construction certificate or subdivision works certificate, respectively, has been issued and a principal certifier has been appointed.

A document referred to in this consent is taken to be a reference to the version of that document which applies at the date the consent is issued, unless otherwise stated in the conditions of this consent.

Dial Before You Dig

Underground assets may exist in the area that is subject to your application. In the interests of health and safety and in order to protect damage to third party assets please contact Dial before you dig at www.1100.com.au or telephone on 1100 before excavating or erecting structures (This is the law in NSW). If alterations are required to the configuration, size, form or design of the development upon contacting the Dial before You Dig service, an amendment to the development consent (or a new development application) may be necessary. Individuals owe asset owners a duty of care that must be observed when working in the vicinity of plant or assets. It is the individual's responsibility to anticipate and request the nominal location of plant or assets on the relevant property via contacting the Dial before you dig service in advance of any construction or planning activities.

Telecommunications Act 1997 (Commonwealth)
Telstra (and its authorized contractors) are the only companies that are permitted to conduct works on Telstra's network and assets. Any person interfering with a facility or installation owned by Telstra is committing an offence under the *Criminal Code Act 1995 (Cth)* and is liable for prosecution. Furthermore, damage to Telstra's infrastructure may result in interruption to the provision of essential services and significant costs. If you are aware of any works or proposed works which may affect or impact on Telstra's assets in any way, you are required to contact: Telstra's Network Integrity Team on Phone Number 1800810443.

Dictionary

The following terms have the following meanings for the purpose of this determination (except where the context clearly indicates otherwise):

Approved plans and documents means the plans and documents endorsed by the consent authority, a copy of which is included in this notice of determination.

AS means Australian Standard published by Standards Australia International Limited and means the current standard which applies at the time the consent is issued.

Building work means any physical activity involved in the erection of a building.

Certifier means a council or a person that is registered to carry out certification work under the *Building and Development Certifiers Act 2018*.

Construction certificate means a certificate to the effect that building work completed in accordance with specified plans and specifications or standards will comply with the requirements of the EP&A Regulation and *Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021*.

Council means Queanbeyan-Palerang Regional Council

Court means the Land and Environment Court of NSW.

EPA means the NSW Environment Protection Authority.

EP&A Act means the *Environmental Planning and Assessment Act 1979.*

EP&A Regulation means the *Environmental Planning and Assessment Regulation 2021.*

Independent Planning Commission means Independent Planning Commission of New South Wales constituted by section 2.7 of the EP&A Act.

Local planning panel Nil for Queanbeyan-Palerang Regional Council

Occupation certificate means a certificate that authorises the occupation and use of a new building or a change of building use for an existing building in accordance with this consent.

Principal certifier means the certifier appointed as the principal certifier for building work or subdivision work under section 6.6(1) or 6.12(1) of the EP&A Act respectively.

Site work means any work that is physically carried out on the land to which the development the subject of this development consent is to be carried out, including but not limited to building work, subdivision work, demolition work, clearing of vegetation or remediation work.

Stormwater drainage system means all works and facilities relating to:
the collection of stormwater,

the reuse of stormwater,

the detention of stormwater,

the controlled release of stormwater, and

connections to easements and public stormwater systems.

Strata certificate means a certificate in the approved form issued under Part 4 of the *Strata Schemes Development Act 2015* that authorises the registration of a strata plan, strata plan of subdivision or notice of conversion.

Subdivision certificate means a certificate that authorises the registration of a plan of subdivision under Part 23 of the *Conveyancing Act 1919*.

Subdivision works certificate means a certificate to the effect that subdivision work completed in accordance with specified plans and specifications will comply with the requirements of the EP&A Regulation.

Sydney district or regional planning panel means Southern Regional Planning Panel (SRRP)

SCHEDULE 1

NOTICE OF CONTRIBUTIONS & CHARGES ASSOCIATED WITH DEVELOPMENT

PROJECT ADDRESS	205 TUDOR VALLEY ROAD REIDSDALE NSW 2622 Lot 79 DP 755922 Lot 94 DP 755922
PROJECT DESCRIPTION	Construction of a dwelling - two storey
APPLICATION NO	DA.2023.0051
NAME OF APPLICANT	Lorba Kelly Drewry

Important
The following contribution rates are those that apply at the date of issue of this consent. Rates are reviewed quarterly. Contributions will only be accepted at the rate applying at the date of payment. Council's Development and Environment section should be contacted to receive a current contribution notice of charges.

Fee Description	**Fee Due**
Contribution Plan	
Tallaganda Section 7.11 (94) Plan No 3 – Provision of Access Roads	$7,438.00
Tallaganada Section 7.11 (94) Plan No 4 – Bushfire Suppression and Control	$576.00
Total Contributions Payable	***$8014.00***

Relevant Criteria on which these calculations were made:

No equivalent tenements have been credited to this development.

Date Generated: 21 November 2023

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

13 DECEMBER 2023

ITEM 9.2 DEVELOPMENT APPLICATION - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE - CONSTRUCTION OF A DWELLING - TWO STOREY

ATTACHMENT 4 BUSHFIRE ASSESSMENT REPORT - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE

BUSHFIRE ASSESSMENT REPORT

205 TUDOR VALLEY ROAD, REISDALE

Lot 75&94 DP 755922

New dwelling

Prepared for Lorba Drewry & James Godbee

Ref: RM.64.24

Version 1.1

ember
bushfire consulting

May 18, 2023

1. INTRODUCTION AND OVERVIEW

BACKGROUND

Lorba Drewry and James Godbee have engaged EMBER Bushfire Consulting to prepare a bushfire assessment report (BFAR) for a proposed new dwelling at *Happy Valley,* 205 Tudor Valley Road, Reisdale (*the subject site*).

The development proposal is located on declared bushfire-prone land and, as a result, is subject to Section 4.14 of the Environmental Planning and Assessment Act (1979) (EP&A Act) and the NSW Rural Fire Service (NSW RFS) document *Planning for Bushfire Protection* (PBP 2019). This BFAR is the certification required to satisfy Section 4.14 EPA Act (1979).

The *subject site* was burnt during the 2019-20 bushfires. The area around the proposed dwelling, water tank and property access road has been cleared and thinned by the owners and forestry crews under an established forestry management plan. Enhanced bushfire protection measures (BPM) will be recommended in this report.

AIM AND OBJECTIVES

This report aims to:

- Evaluate the potential bushfire threat to the subject site, and
- Assess the capacity of the proposed development to provide the minimum bushfire protection necessary to offer life safety to the occupants, improve property protection and facilitate fire service intervention during a bushfire event.

The proposed development's objectives are detailed in Chapter 7 – *Residential Infill Development*, PBP (2019).

These objectives for the development are to:

- Provide a defendable space to enable unimpeded access for firefighting around all elevations of the building,
- provide better bush fire outcomes on a redevelopment site than currently exists, commensurate with the scale of works proposed,
- design and construct buildings commensurate with the bush fire risk,
- provide access, services and landscaping to aid firefighting operations,
- not impose an increased bush fire management and maintenance responsibility on adjoining landowners, and
- increase the level of bush fire protection to existing dwellings based on the scale of the proposed work and the level of potential risk.

Accordingly, the following bushfire protection measures (BPM) are to be assessed:

- Asset Protection Zones (APZs), landscaping,
- construction standards, services (water and utility services),
- access requirements and emergency management.

Document Control

Information	Detail
Document Title:	Bushfire Assessment Report (BFAR)
EMBER Reference:	RM.64.24
Other Reference:	N/A
Version:	Version 1.1
Valid to date:	11.10.24
Prepared by:	Rob McGregor (BPAD- 33130) L2

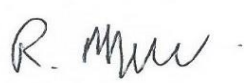
Limitations and disclaimer

This report is primarily concerned with assessing the capacity of the proposed development to withstand the impacts of a bushfire, including ember attack, radiant heat exposure and flame contact.

Where necessary, bushfire protection measures will be recommended to afford a level of protection to the occupants and the structures themselves.

It should be kept in mind that the measures prescribed cannot guarantee the proposed development will survive a bushfire event on every occasion. This is primarily due to the dependence on ongoing vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information in this report has been gathered from field investigations of the site, plans provided by the building designer, and discussions held with the property owner.

Report Details	
Report number:	Reisdale.s4.14.Drewry.RM.64.24
Report version:	Version 1.1
Site assessment date:	03.10.23
Report date:	11.10.23
Site Details	
Clients:	Lorba Drewry & James Godbee
Subject lot details:	Lot 75&94 DP 755922
Subject lot address	205 Tudor Valley Road
Suburb/locality:	Reisdale
LGA:	Queanbeyan Palerang Regional Council
Proposed works:	New dwelling
Practitioner Details	
Bushfire practitioner:	Robert McGregor
Accreditation number:	BPAD – 33130 L-2
Accreditation expiry:	May 2024
Signature:	
Date:	11.10.23

2. DEVELOPMENT LOCATION

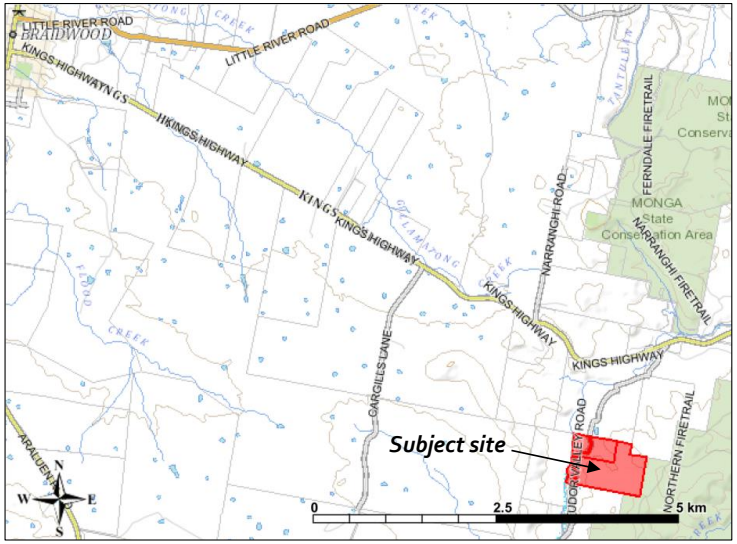


Figure 1 – Regional context of ***subject site*** to Braidwood. FireMaps FPAA (2023)

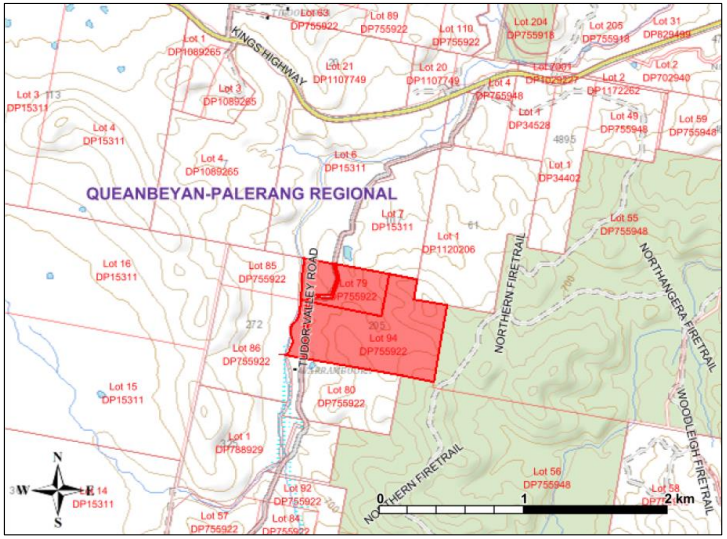


Figure 2 – Local context of ***subject site*** (Red block) FireMaps FPAA (2023)

3. BUSHFIRE PRONE MAPPING

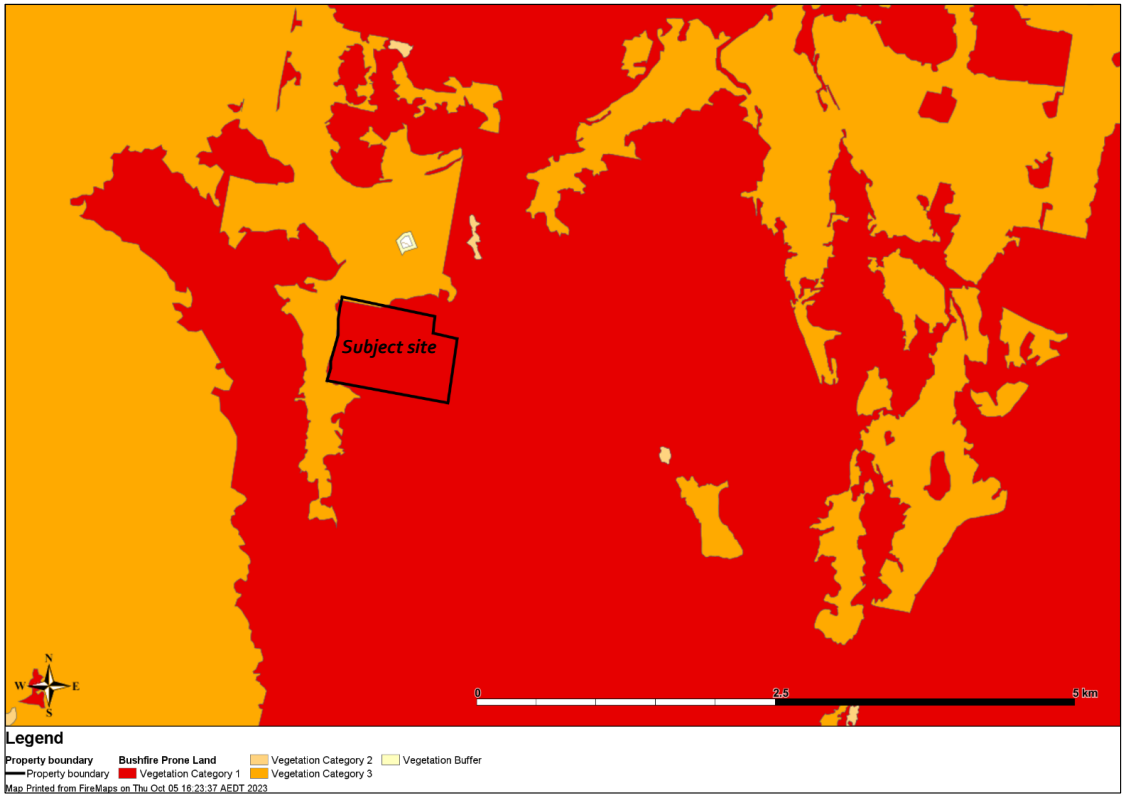


Figure 3 – *Subject site* bushfire prone land map. FireMaps FPAA (2023)

4. *SUBJECT SITE* VEGETATION FORMATIONS

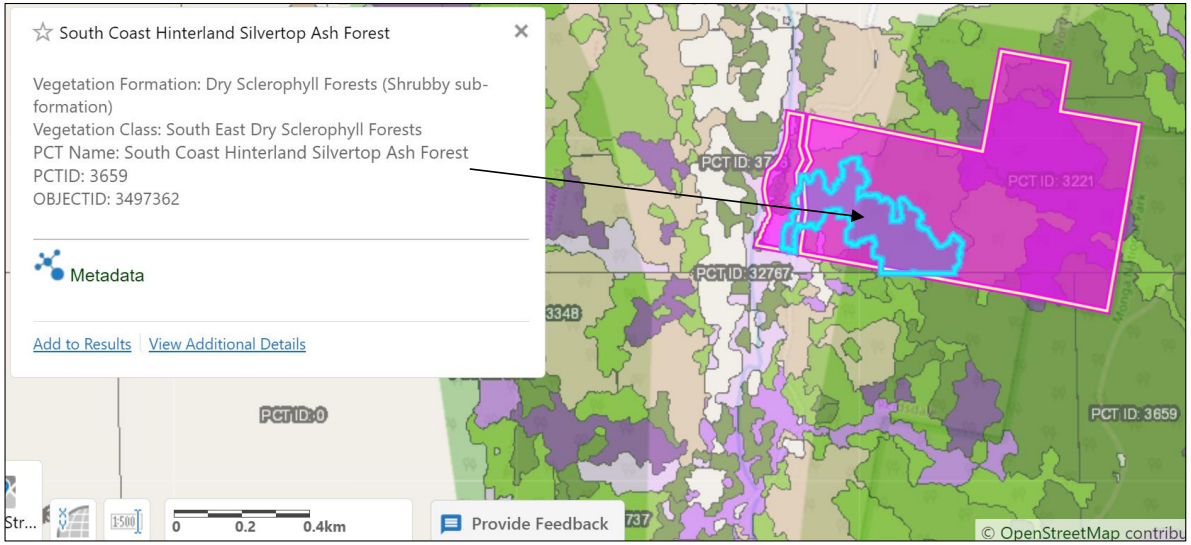


Figure 4 – *Subject site* vegetation classification. SEED (NSW Gov. 2023)

5. ACCESS

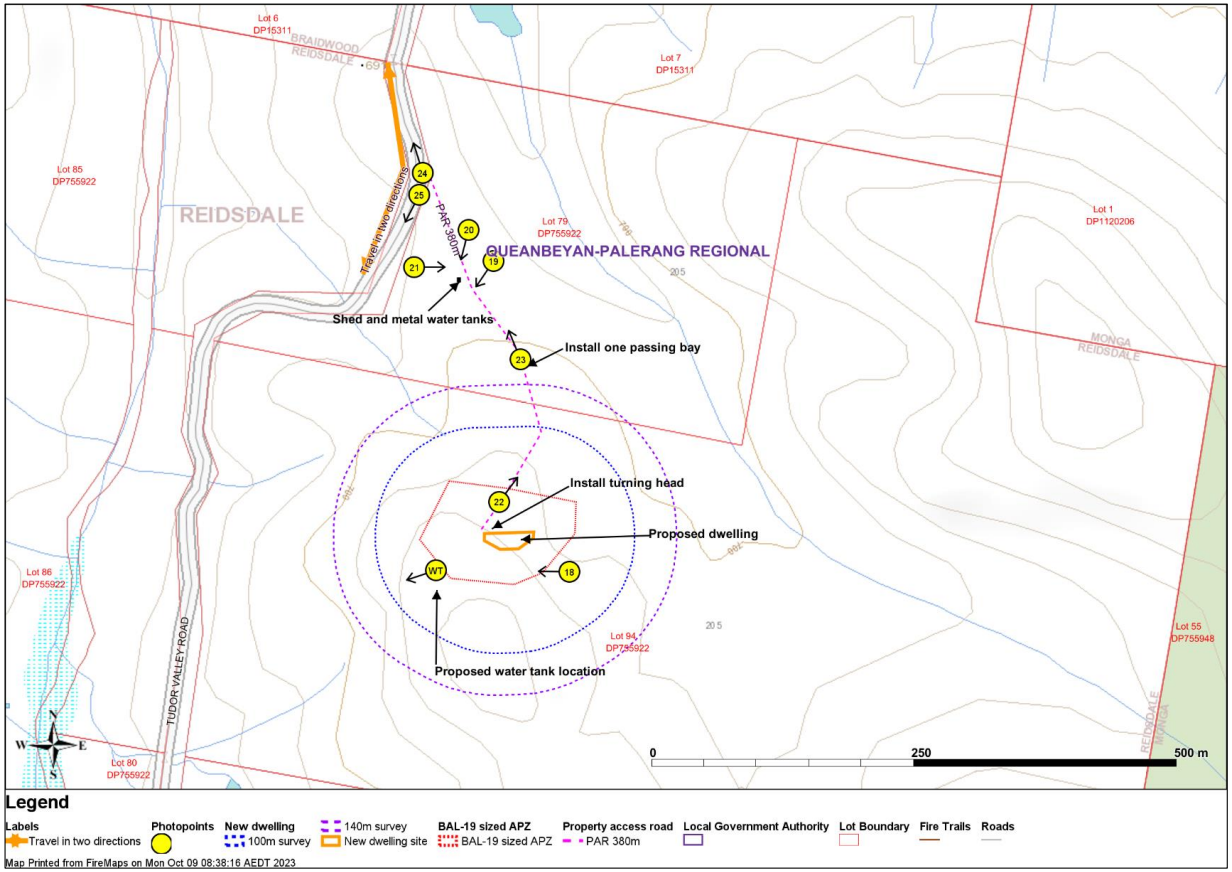


Figure 5 – Property access road (PAR) to the proposed dwelling. FireMaps FPAA (2023) McGregor(2023). Photo points 18-25 relate to photos 18-25 below.

6. LOCATION PLAN

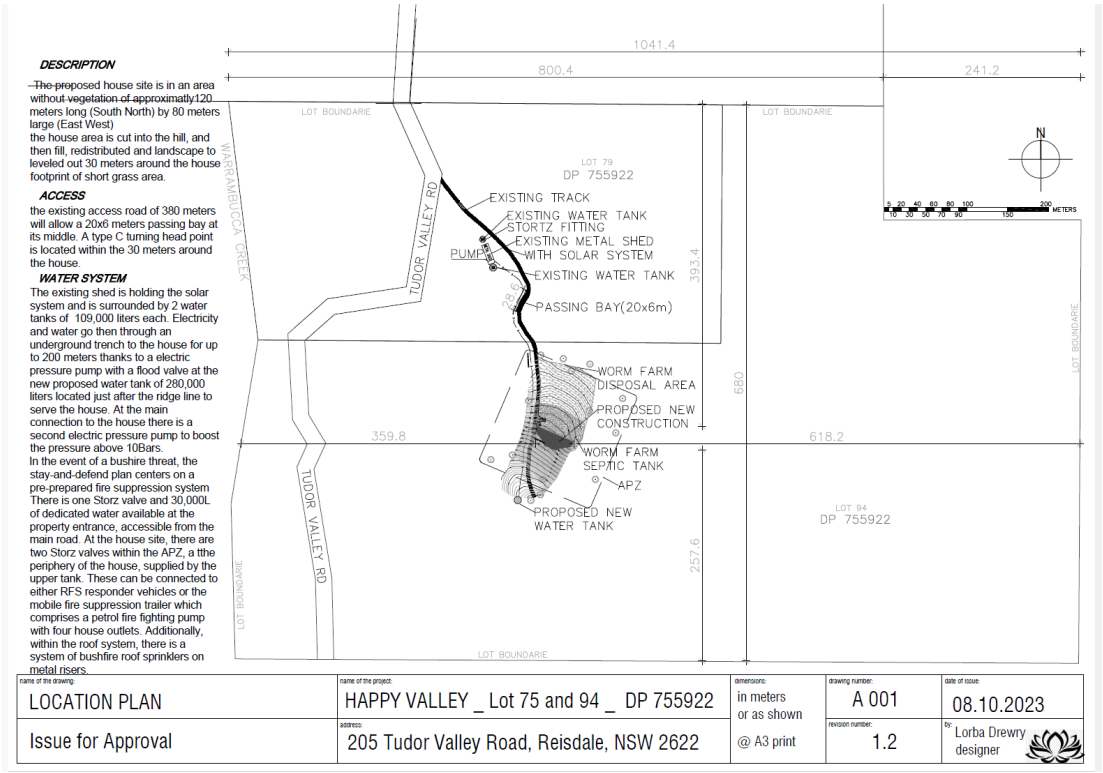
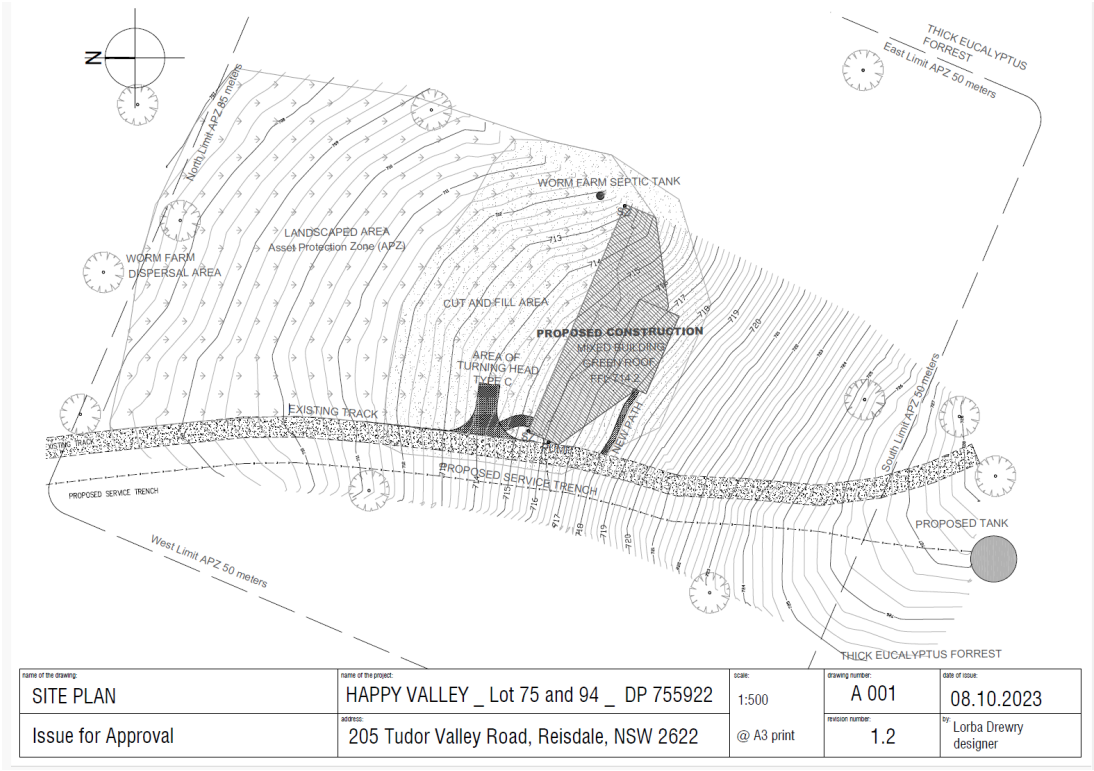


Figure 6 -Location plan (Lorba Drewry designer, 2023)

6A. SITE PLAN



name of the drawing:	name of the project:	scale:	drawing number:	date of issue:
SITE PLAN	HAPPY VALLEY _ Lot 75 and 94 _ DP 755922	1:500	A 001	08.10.2023
Issue for Approval	address: 205 Tudor Valley Road, Reisdale, NSW 2622	@ A3 print	revision number: 1.2	by: Lorba Drewry designer

Figure 6a - Proposed site plan (Lorba Drewry designer, 2023)

7. DWELLING FOOTPRINT WITH APZ

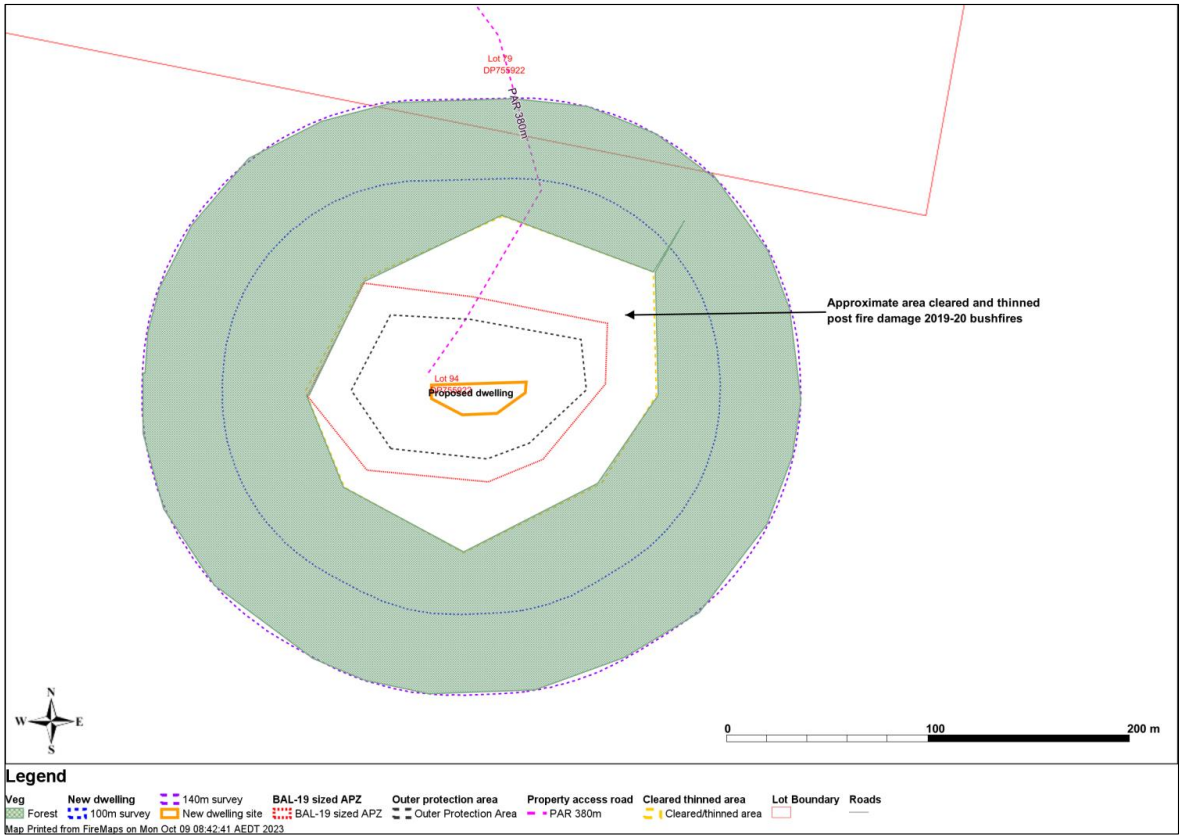


Figure 7 - Showing the proposed dwelling, predominate vegetation class & BAL-19 sized APZ. FireMaps FPAA (2023) (McGregor, 2023)

8. SLOPE AND PHOTO POINTS

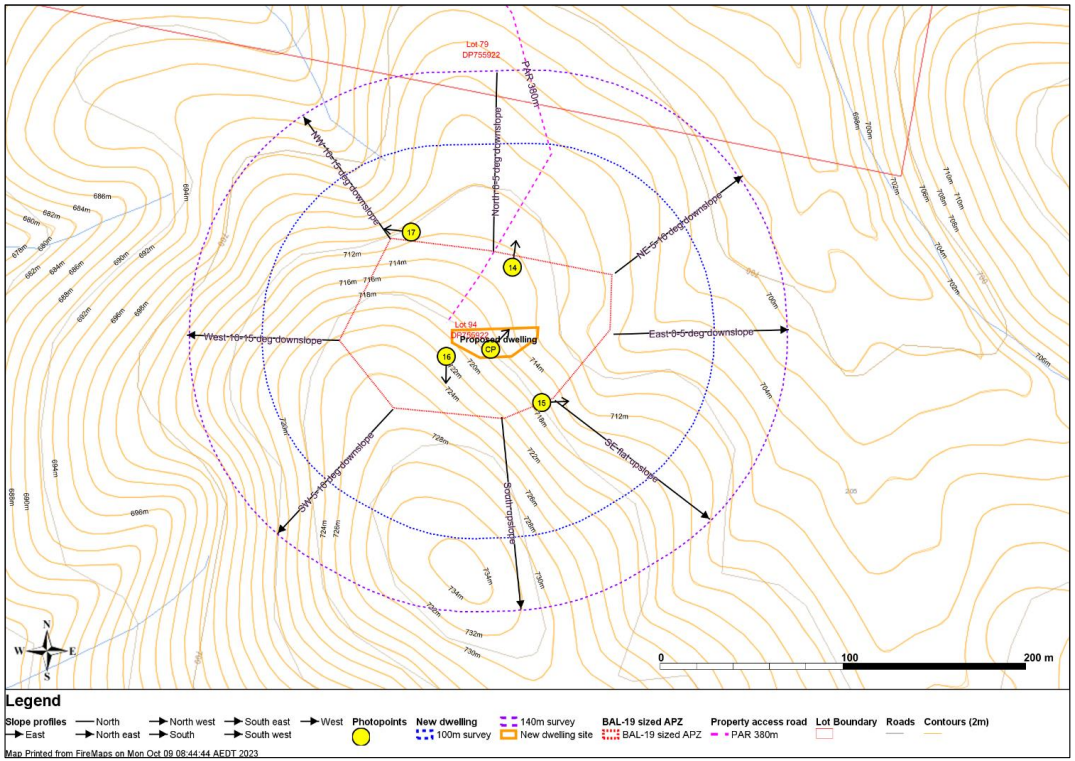


Figure 8 – Effective slope and photo points. Fire Maps (FPAA 2023) McGregor (2023). Photo point Central Point (CP) refers to Figures 10-13 below. Photo points 14-17 relate to Figures 14-17 below.

9. APZ DETAIL

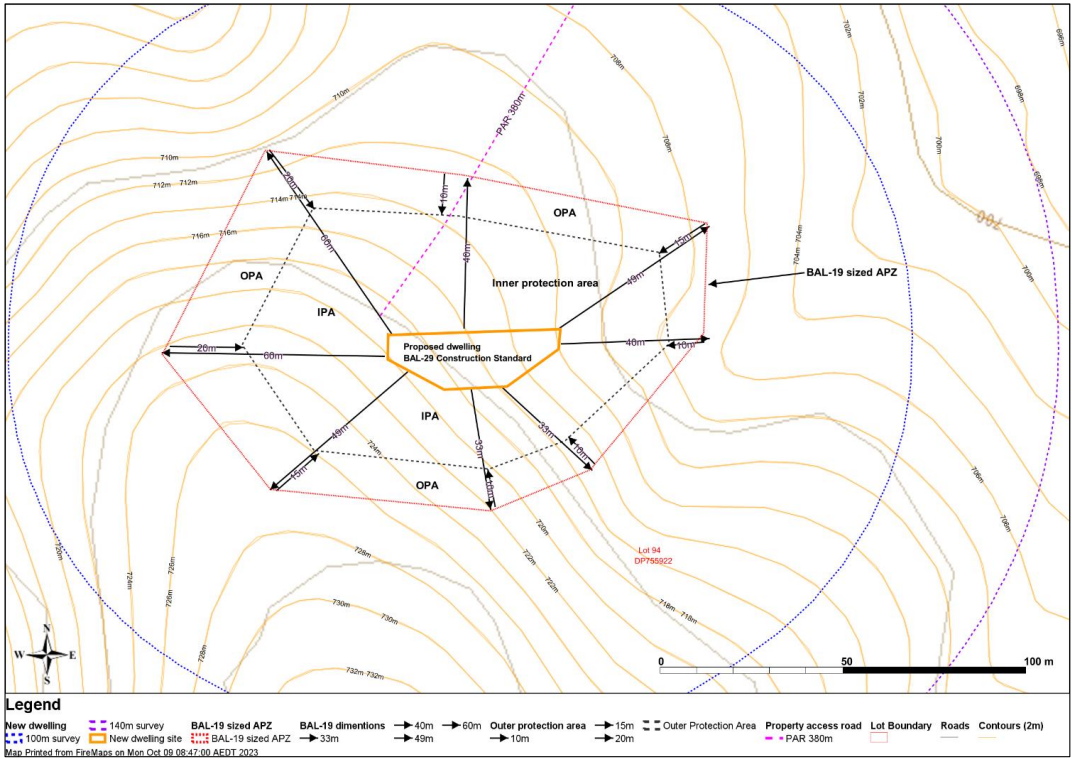


Figure 9 – BAL-19 sized APZ details with IPA & OPA. Fire Maps (FPAA 2023) McGregor (2023)

10. AIR PHOTOS FROM THE PROPOSED DWELLING FOOTPRINT

Figure 10 – Looking north from central point proposed dwelling footprint (McGregor, 2023)

Figure 11 – Looking east from central point proposed dwelling footprint (McGregor, 2023)

Figure 12 – Looking south from central point proposed dwelling footprint (McGregor, 2023)

Figure 13 – Looking west from central point proposed dwelling footprint (McGregor, 2023)

11. THEODOLITE PHOTOS FROM APZ

Figure 14 – Looking north, showing 0-5 ° downslope (McGregor 2023)

Figure 16 – Looking south, upslope (McGregor, 2023)

Figure 15 – Looking east, showing 0-5 ° downslope (McGregor 2023

Figure 17 – Looking west showing 10-15 ° downslope. (McGregor, 2023)

12. STATIC WATER SUPPLY PHOTOS

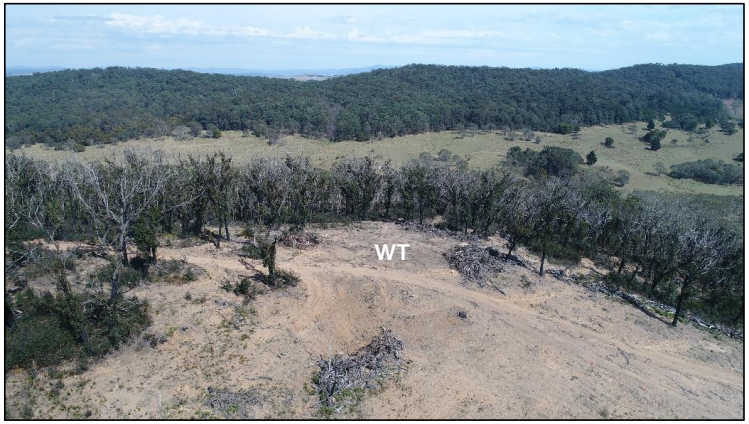


Figure 18 – Location of proposed 280,000L metal water tank. (McGregor 2023)

Figure 19 – Existing 109,000L metal water tank fed from shed roof. (McGregor, 2023)

Figure 20 – Second interconnected 109,000L metal water tank with Stortz fitting.

Figure 21 – Tap fitting showing 30,000L of dedicater firefighting water below.

13. BUSHFIRE THREAT ANALYSIS

INTRODUCTION

The *subject site* was burnt during the 2019-20 bushfires. The area around the proposed dwelling, water tank and property access road has been cleared and thinned by the owners and forestry crews under an established forestry management plan. This bushfire threat analysis recommends several enhanced bushfire protection measures (BPM) due to the area's fire history, terrain and forest vegetation. These enhancements include:

- A BAL-29 construction standard with a BAL-19-sized APZ.
- A multifaceted static water supply system.
- A water spray system on the green roof of the proposed dwelling.
- The proposed dwelling is to be cut into the hillside to reduce the impact of the radiant heat from a bushfire.

Note: At the time of this BFAR, the owners are proposing a green roof system designed by *Fytogreen Australia (Australia, nation wide), green infrastructure specialists*, who have experience designing green roofs to BAL-29 construction standards. Research suggests that a well-designed, built and maintained green roofs will enhance bushfire resilience. At the construction certificate phase, the owner may have to demonstrate that the green roof system will satisfy the requirements of AS:3959 BAL-29.

VEGETATION FORMATIONS

Predominant vegetation formations within 140 m of the proposed dwelling are identified and classified in accordance with Appendix A1.2 of PBP (2019). A bushfire-prone land vegetation determination of vegetation category one can be seen in Figure 3, and Forest PCT formations (SEED) can be seen in Figure 4. Figure 7 shows the determined forest formations.

RELEVANT FIRE DANGER INDEX

The site's fire danger index has been determined per the NSW Rural Fire Service.

NSW Fire Weather District	Fire Danger Index (FDI)
Southern Ranges	100

SLOPE, APZ AND BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

Effective slope and APZ (currently available and those required to be established) were assessed. The BAL ratings (Table 1) were determined under Table A1.12.5 of PBP (2019).

Table 1 - Slope assessment and BAL-19 sized APZ to the proposed dwelling.

Aspect	Predominate Vegetation Formation	Effective Slope	APZ is required to be developed	OPA *
North	Forest	0° - 5° downslope	40m	10m
NE	Forest	5° - 10° downslope	49m	10m
East	Forest	0° - 5° downslope	40m	10m

SE	Forest	Upslope	33m	10m
South	Forest	Upslope	33m	10m
SW	Forest	5° - 10° downslope	49m	10m
West	Forest	10° - 15° downslope	60m	15m
NW	Forest	10° - 15° downslope	60m	15m

***NOTE: FOREST VEGETATION ALLOWABLE OUTER PROTECTION AREAS (OPA) RELEVANT TO EFFECTIVE SLOPE CAN BE SEEN IN ATTACHMENT E.**

BUSHFIRE PROTECTION MEASURES

In response to the bushfire threat analysis, the following six Bushfire Protection Measures (BPMs) are to be adopted by the proposed development to provide a minimum level of life safety, property protection and resilience to the community. Where appropriate, each BPM will be enhanced with a performance-based assessment or design to improve bushfire resilience above the performance criteria and acceptable solutions provided by PBP (2019).

13.1 ASSET PROTECTION ZONES (APZ)

Discussion:

Table 1 details the enhanced APZ dimensions (BAL-19) required for the proposed dwelling to achieve the BAL- 29 construction standard per Table A1.12.5 PBP (2019).

Statement of compliance (APZs):

Table 2 - APZ compliance report from Table 7.4a PBP (2019)

Acceptable solutions	Compliance
APZs are provided in accordance with TablesA1.12.2 and A1.12.3 in Appendix 1	Yes
APZs are managed in accordance with the requirements of Appendix 4 of PBP	Yes
APZs are wholly within the boundaries of the development site	Yes
APZs are located on lands with a slope less than 18 degrees.	Yes

The following points are **recommendations** for the APZs shown in Table 1.

- To maintain the allocated BAL rating, vegetation within the specified APZ will require maintenance in perpetuity.
- The owners should consider developing a defendable space around the proposed dwelling.
- A defendable space is defined as 'An area adjoining a building (dwelling) that is managed to reduce combustible elements free from constructed impediments. It is a safe working environment in which efforts can be undertaken to defend the structure before and after the passage of a bushfire'. PBP (2019)

Therefore, the compliant acceptable solutions are capable of satisfying the performance criteria of 7.4a *Asset Protection Zones* PBP (2019).

13.2 LANDSCAPING

Table 3 - Landscaping compliance report from Table 7.4a PBP (2019)

Acceptable solutions	Compliance
Compliance with the NSW RFS "*Asset protection zone standards*" (Appendix 4)	Yes

A clear area of lo-cut lawn or pavement is maintained adjacent to the house	Yes
Fencing is constructed in accordance with section 7.6	Yes
Trees and shrubs are located so that: • The branches will not overhang the roof, • The tree canopy is not continuous, and • Any proposed windbreak is located on the elevation from which fires are likely to approach	Yes

The following points are **recommendations** for future landscaping:

- To comply with all the applicable acceptable solutions shown in Table 3.

Therefore, the compliant acceptable solutions are capable of satisfying the performance criteria of 7.4a Landscaping PBP (2019). See Attachment-D.

13.3 CONSTRUCTION STANDARDS

Table 4– Construction Standards compliance report from Table 7.4a PBP (2019)

Acceptable solutions	Compliance
BAL is determined in accordance with Tables A1.12.5 to A1.12.7	Yes
Construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone)	Yes
Fencing and gates are constructed in accordance with section 7.6	Yes
Class 10a buildings are constructed in accordance with section 8.3.2	Yes
Home-based childcare	
An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure, and The existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.	N/A

RECOMMENDATIONS:

- The construction standard for the future dwelling is fixed at **BAL-29** as per AS3959-2018 (Amd 2-2020) or
- NASH Standard (2014) *Steel Framed Construction in Bushfire Areas,* and,
- The *Additional Construction Requirements* found in 7.5 PBP (2019).
- Fencing and gates are to be constructed in accordance with Attachment D & G.

13.4 ACCESS REQUIREMENTS

Discussion:

Table 5 below is a compliance report for access, as shown in Figures 5,6,6a and 21-25.

Table 5 - Access compliance report from Table 7.4a PBP (2019)

Acceptable Solution	Compliance
Property access roads are two-wheel drive, all-weather roads.	Yes
The capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating	Yes
Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005	N/A

There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available	Yes
At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a **public through road**	Performance-based assessment
There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kpm) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: Minimum 4 m carriageway width	NA
In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay	Yes
A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches	Yes
Property access must provide suitable turning area in accordance with Appendix 3	Yes
Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress	Yes
The crossfall is not more than 10 degrees	Yes
The minimum distance between inner and outer curves is 6m	Yes
Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads	Yes
A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way	NA

Discussion – Performance-Based Assessment:

Proposed access arrangements for the *subject site* will meet most of the acceptable solutions provided in PBP (2019) except for the following element:

- At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a **public through road.**

Figure 5 shows the property access road to Tudor Valley Road being ~380m long. Tudor Valley Road (a 4-6m wide unsealed two-way public through road) offers travel in two directions. Travel to the north for ~ 2km to the Kings Highway (a 6m wide sealed two-way public through road) offering travel in two directions. Braidwood is ~10km northeast of this intersection. Travel to the south on Tudor Valley Road for ~7km to an intersection offering travel in several directions.

In place of adopting the acceptable solutions offered in PBP (2019), an assessment of the performance of the PAR is made to demonstrate compliance with PBP (2019).

The intent of the requirement for a secondary property access road, when the proposed dwelling is greater than 200 m from a **public through road,** should be understood to assess the acceptability of the performance-based assessment. In the context of a bushfire event, 200 m is deemed the accepted allowable egress distance to the relative safety of a public through road, which offers travel in two directions. Over this distance, in a typical bushfire-prone environment, there is the potential risk to evacuating residents or responding fire crews from radiant heat exposure, flame contact,

reduced visibility, and the prospect of a blocked road from falling trees or oncoming traffic, all of which could lead to entrapment.

Performance-Based Assessment

- The location of the proposed dwelling offers good vision over the PAR to Tudor Valley Road.
- The PAR will incorporate managed verges, a compliant passing bay and turning head.
- The entry to the property is broad, allowing large vehicles to turn around if needed (see cover photo).
- The PAR will comply with all other applicable acceptable solutions.
- A secondary PAR would unnecessarily impact flora and fauna on the *subject site*.

The proposed PAR and travel on the public road system offers:

- Firefighters safe access to structures and water supplies,
- Evacuation routes for both residents and firefighters,
- Access to APZ for ongoing maintenance, and
- Access to areas of bushfire hazard for firefighting and hazard mitigation purposes.

Therefore, the proposed performance-based assessment demonstrates that the PAR satisfy the performance criteria of *Access* 5.3.2 and the intent of 3.4 *Access Arrangements* PBP (2019). Attachment-C

13.5 WATER SUPPLIES, ELECTRICITY AND GAS SERVICES

Discussion

A multifaceted static water supply is proposed. See the detailed description of the water system in Figure 6- Location Plan.

Statement of compliance:

Table 6 – Water Supplies compliance report from Table 7.4a PBP (2019)

Acceptable Solution	Compliance
Water supplies	
Reticulated water is to be provided to the development where available	N/A
A static water supply is provided where no reticulated water is available	Yes
Fire hydrant, spacing, design and sizing complies with the relevant clauses of AS 2419.1.2005	N/A
Hydrants are not located within any road carriageway	N/A
Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads	N/A
Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1.2005	N/A
All above-ground water service pipes are metal, including and up to any taps	Yes
Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d	Yes
A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure: 65mm Storz outlet with a ball valve is fitted to the outlet	Yes
Ball valve and pipes are adequate for water flow and are metal	Yes
Supply pipes from tank to ball valve have the same bore size to ensure flow volume	Yes
Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank	Yes, if applicable
A hardened ground surface for truck access is supplied within 4m	Yes
Above-ground tanks are manufactured from concrete or metal	Yes

Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959)	Yes, if applicable
Unobstructed access can be provided at all times	Yes
Underground tanks are clearly marked	Yes, if applicable
Tanks on the hazard side of a building are provided with adequate shielding for the protections of firefighters	Yes
All exposed water pipes external to the building are metal, including any fittings	Yes
Where pumps are provided, they are a minimum 5hp or 3kw petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter	N/A
Fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005	N/A

Recommendations:

- Install a 280,000L (metal, concrete, or underground) firefighting water tank with an underground, remote feed to two 65mm Stortz coupling and shutoff valves at the proposed dwelling. The tanks location is shown in the site plan in Figures 5, 6 and 6a.
- Where possible, maintain a 10m fuel-reduced area around the tank.
- Install transfer pumps, spray system and underground supply lines as per the description of the water system Figure 6.
- Install a static water supply sign at the entry to the property (See local RFS Captain).

Additional Static Water Supply

- The two interconnected metal (109,000L) water tanks, fed from rainwater off the existing shed, offer 30,000L of dedicated static water for firefighting. Fitted with a Stortz coupling and shutoff, these tanks are located near the entry to the *subject site.*, This additional water will enable fire crews and occupants to undertake active protection for an extended period if they choose to. The two existing tank locations are shown in Figures 5& 6.

Therefore, the compliant acceptable solutions are <u>capable</u> of satisfying the performance criteria of Water Supplies Table 7.4a PBP (2019)

4a. Electricity and Gas Services

<u>Statement of compliance:</u>

Table 7 – Electrical and Gas Services compliance report from Table 7.4a PBP (2019)

Acceptable solutions	Compliance
Electrical	
Where practicable, electrical transmission lines are underground	Yes
Where overhead, electrical transmission lines are proposed as follows:	
Lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas	Yes if applicable
No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*	Yes if applicable
Gas (if used)	
Reticulated or bottles gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of the relevant authorities, and metal piping is used	Yes, bottled gas

All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side	Yes
Connections to and from gas cylinders are metal	Yes
Polymer-sheathed flexible gas supply lines are not used	Yes
Above-ground gas service pipes are metal, including and up to any outlets	Yes

The electricity and gas services for the *subject site* are capable of complying with the acceptable solutions and, therefore, the performance criteria of Table 7.4a PBP (2019). See Attachment B.

13.6 Emergency Management

The following point is a recommendation for emergency management:

- Develop an *NSWRFS Bushfire Survival Plan* before occupation.

14. ACCESS PHOTOS (PHOTO POINTS FIGURE 5)

Figure 22–North on formed PAR from proposed dwelling (McGregor, 2023)

Figure 23 – PAR looking to Tudor Valley Road with shed and water tanks on left.

Figure 24 – Looking north on Tudor Valley Road to Kings Highway. (McGregor, 2023)

Figure 25 – Looking south on Tudor Valley Road. (McGregor, 2023)

15. CONCLUSION

This bushfire assessment report (BFAR) documents a bushfire assessment for Lorba Drewry and James Godbee for a proposed new dwelling at 205 Tudor Valley Road, Reisdale. The assessment finds that the development proposal meets the necessary infill development performance requirements. Therefore, satisfying the specific objectives of Planning for Bushfire Protection (2019).

On this basis, the development proposal is fit for DA approval from a bushfire protection perspective.

METHODOLOGY

- The methodology adopted for this assessment is based on the development proposal following a complete Development Application (DA) process. *Planning for Bushfire Protection* PBP (2019) and AS3959-(2019) *Construction of buildings in bushfire-prone areas* have been the reference document for the assessment.
- All distance and slope measurements were taken during an on-site survey of the block using a "Tru-Pulse 200" laser range finder and further validated using plans, data from NSW Spatial Services, FireMaps FPAA (2021) and Google Earth tools.
- Aerial imagery, if used, is captured with a DJI drone.

16. RECOMMENDATIONS BPM

ASSET PROTECTION ZONES (PAGE 16)

Table 2 - Slope assessment and BAL-19-sized APZ to the proposed dwelling.

Aspect	Predominate Vegetation Formation	Effective Slope	APZ is required to be developed	OPA *
North	Forest	0° - 5° downslope	40m	10m
NE	Forest	5° - 10° downslope	49m	10m
East	Forest	0° - 5° downslope	40m	10m
SE	Forest	Upslope	33m	10m
South	Forest	Upslope	33m	10m
SW	Forest	5° - 10° downslope	49m	10m
West	Forest	10° - 15° downslope	60m	15m
NW	Forest	10° - 15° downslope	60m	15m

***NOTE: FOREST VEGETATION ALLOWABLE OUTER PROTECTION AREAS (OPA) RELEVANT TO EFFECTIVE SLOPE CAN BE SEEN IN ATTACHMENT E.**

LANDSCAPING (PAGE 16)

- To comply with all the applicable acceptable solutions shown in Table 3.
- Landscaping to comply with NSW RFS *Asset Protection Zone Standards.*

CONSTRUCTION STANDARDS (PAGE 17)

- The construction standard for the proposed dwelling is **BAL-29** as per AS3959-2018 (Amd 2-2020) or
- NASH Standard (2014) *Steel Framed Construction in Bushfire Areas*, and,
- The *Additional Construction Requirements* found in 7.5 PBP(2019).
- Fencing and gates are constructed in accordance with Attachment D & G.
- Any Class 10a buildings are to be constructed in accordance with Attachment F.

ACCESS (PAGE 17)

- The PAR is to comply with all applicable acceptable solutions, Table 7.4a PBP (2019)
- Install a compliant passing bay and turning head.

WATER SUPPLIES, GAS AND ELECTRICITY SERVICES (PAGE 20)

- Install a 280,000L (metal, concrete, or underground) firefighting water tank with an underground, remote feed to two 65mm Stortz coupling and shutoff valves at the proposed dwelling.
- Where possible, maintain a 10m fuel-reduced area around the tank.
- Install transfer pumps, spray system and underground supply lines as per the description of the water system Figure 6.

- Install a static water supply sign at the entry to the property (See local RFS Captain).

EMERGENCY PLANNING (PAGE 21)

- Develop an NSWRFS *Bushfire Survival Plan* before the occupation

17. REFERENCES

Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.

NASH (2014), *Steel Framed Construction in Bushfire Areas (2014),* National Association of Steel Framed Housing Inc.

SEED, NSW Government, (2023) viewed on 05.10.23 https://geo.seed.nsw.gov.au/Html5Viewer412/index.html?viewer=SEED.SEED&local=en-au&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.317.Plant%20Community%20Type%20with%20object%20labels,SEED_Catalog.318.Flora%20Sites,SEED_Catalog.317.NSW_VegetationFormation_5m,SEED_Catalog.317.NSW_VegetationClass_5m,SEED_Catalog.317.NSW_PlantCommunityType_5m,SEED_Catalog.317.Plant%20Community%20Type%20with%20labels

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NSW Rural Fire Service, 0914, *Upgrading of Existing Buildings*, Sydney http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0018/4365/Building-Best-Practice-Guide.pdf

Standards Australia, (2018) "AS/NZS 3959-2009 Construction of buildings in bush fire prone areas."

18. ATTACHMENT A – APZ

APPENDIX 4

ASSET PROTECTION ZONE STANDARDS

In Australia, bush fires are a natural and essential aspect of the landscape as many plants and animals have adapted to fire as part of their life cycle. However, development adjacent to bush land areas has increased the risk of fire impacting on people and their assets. The impact on property and life can be reduced with responsible preparation and management of bush fire hazards.

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps in reducing vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset protection zones

An APZ is a fuel-reduced area surrounding a built asset or structure.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at: www.rfs.nsw.gov.au/resources/publications.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset
- an area of reduced bush fire fuel that allows suppression of fire
- an area from which backburning or hazard reduction can be conducted,
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset
- damage to the built asset from intense radiant heat
- ember attack.

The APZ should be located between an asset and the bush fire hazard.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an inner protection area (IPA) and an outer protection area (OPA).

Inner protection areas (IPAs)

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- canopy cover should be less than 15% (at maturity)
- trees (at maturity) should not touch or overhang the building
- lower limbs should be removed up to a height of 2m above ground
- canopies should be separated by 2 to 5m
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings
- shrubs should not be located under trees
- shrubs should not form more than 10% ground cover
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaves and vegetation debris should be removed.

Outer protection areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- tree canopy cover should be less than 30%
- trees should have canopy separation
- canopies should be separated by 2 to 5m

Shrubs:

- shrubs should not form a continuous canopy
- shrubs should form no more than 20% of ground cover

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

19. ATTACHMENT B – SERVICES

Table 7.4a *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
WATER SUPPLIES	an adequate water supply is provided for firefighting purposes.	reticulated water is to be provided to the development, where available; and a static water supply is provided where no reticulated water is available.
	water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.	fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; hydrants are not located within any road carriageway; and reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
	flows and pressure are appropriate.	fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.
	the integrity of the water supply is maintained.	all above-ground water service pipes external to the building are metal, including and up to any taps.
	a static water supply is provided for firefighting purposes in areas where reticulated water is not available.	where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d; a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet; ball valve and pipes are adequate for water flow and are metal; supply pipes from tank to ball valve have the same bore size to ensure flow volume; underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank; a hardened ground surface for truck access is supplied within 4m; above-ground tanks are manufactured from concrete or metal; raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959); unobstructed access can be provided at all times; underground tanks are clearly marked; tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; all exposed water pipes external to the building are metal, including any fittings; where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.

Table 7.4a *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
ELECTRICITY SERVICES	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	where practicable, electrical transmission lines are underground; and where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.
GAS SERVICES	location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used; all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side; connections to and from gas cylinders are metal; polymer-sheathed flexible gas supply lines are not used; and above-ground gas service pipes are metal, including and up to any outlets.
CONSTRUCTION STANDARDS	the proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).
	proposed fences and gates are designed to minimise the spread of bush fire.	fencing and gates are constructed in accordance with section 7.6.
	proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.
	Home-based child care: the proposed building can withstand bush fire attack in the form of wind, localised smoke, embers and expected levels of radiant heat.	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure; and the existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.

20. ATTACHMENT C – ACCESS

Table 7.4a *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
ACCESS	› firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	› property access roads are two-wheel drive, all-weather roads.
	› the capacity of access roads is adequate for firefighting vehicles.	› the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.
	› there is appropriate access to water supply.	› hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; › There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
	› firefighting vehicles can access the dwelling and exit the property safely.	› at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road; › There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: › minimum 4m carriageway width; › in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay; › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; › property access must provide a suitable turning area in accordance with Appendix 3; › curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; › the minimum distance between inner and outer curves is 6m; › the crossfall is not more than 10 degrees; › maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and › a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

21. ATTACHMENT D-LANDSCAPING

Table 7.4a *Continued*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	The intent may be achieved where:	
LANDSCAPING	› landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	› compliance with the NSW RFS *'Asset protection zone standards'* (see Appendix 4); › a clear area of low-cut lawn or pavement is maintained adjacent to the house; › fencing is constructed in accordance with section 7.6; and › trees and shrubs are located so that: › the branches will not overhang the roof; › the tree canopy is not continuous; and › any proposed windbreak is located on the elevation from which fires are likely to approach.
EMERGENCY MANAGEMENT	**Home-based child care**: a bush fire emergency and evacuation management plan is prepared.	› a Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*, and the AS 3745:2010.

Note: the above specifications and requirements apply in relation to residential infill developments but may be used to guide the application of BPMs for 'other' developments (see Chapter 8).

22. ATTACHMENT E- OPA

Table A1.12.4

Allowable Outer Protection Area distances (m), within an APZ for forest vegetation

VEGETATION	UPSLOPE/FLAT	>0°-5°	>5°-10°	>10°-15°	>15°-20°
Forests FFDI 100 - subdivision	10	10	15	20	25
Forests FFDI 80 - subdivision	10	10	15	15	20
Forests SFPP	20	25	25	25	15

23. ATTACHMENT F-CLASS 10

8.3.2 Class 10 structures

The NCC defines a Class 10 building as a non-habitable building or structure such as a:

a. Class 10a – a non-habitable building being a private garage, carport, shed or the like; or
b. Class 10b – a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like; or
c. Class 10c – a private bush fire shelter

There is no bush fire protection requirements for Class 10a buildings located more than 6m from a dwelling in bush fire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the NCC.

24. ATTACHMENT G-FENCES

7.6 Fences and gates

Fences and gates in bush fire prone areas may play a significant role in the vulnerability of structures during bush fires. In this regard, all fences in bush fire prone areas should be made of either hardwood or non-combustible material.

However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

13 DECEMBER 2023

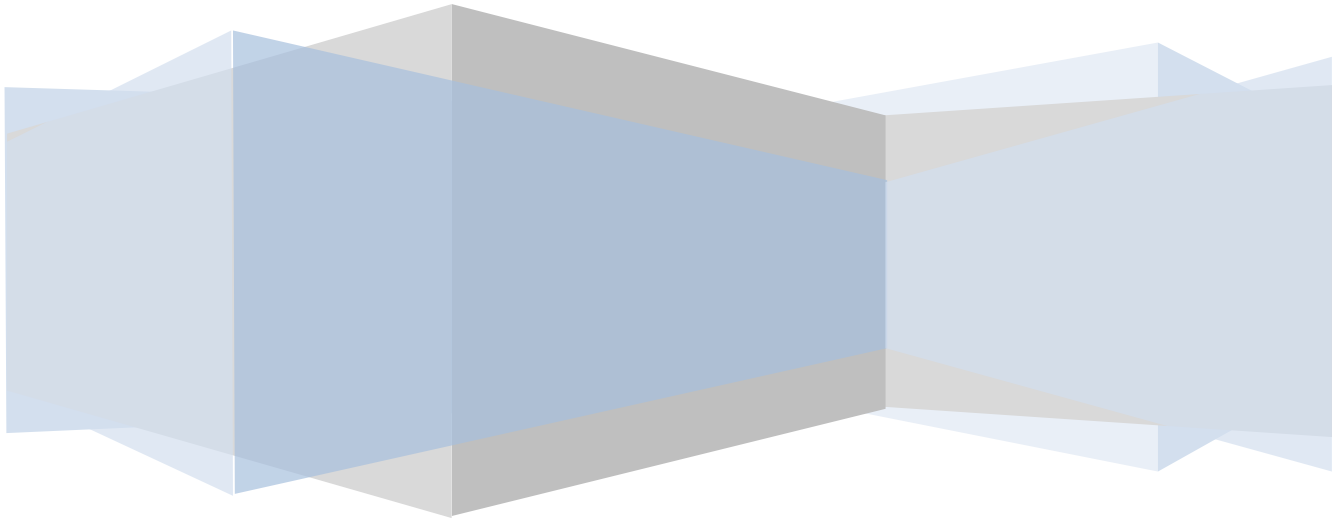
ITEM 9.2 DEVELOPMENT APPLICATION - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE - CONSTRUCTION OF A DWELLING - TWO STOREY

ATTACHMENT 5 ON-SITE SEWAGE MANAGEMENT ASSESSMENT - DA.2023.0051 - 205 TUDOR VALLEY ROAD REIDSDALE

WATERCHECK TESTING
ON SITE SEWAGE MANAGEMENT ASSESSMENTS

New System Installation

203 Tudor Valley Rd Reidsdale



On Site Sewage Management Report
New System Installation
203 Tudor Valley Rd
Reidsdale

Prepared For: James & Lorba Godbee

Prepared By: Allan Mills Certificate On Site Sewage Management:
TAFE
Centre for Environment Training Newcastle

Report No: 202125

Date of Assessment 10-5-2021

Watercheck Testing

ABN 28651038342

Postal Address

PO Box 352 Terrigal 2260

M : 0409 125 271

Email: amills44@bigpond.net.au

CONTENTS **PAGE**

SITE INFORMATION

Client James & Lorba Godbee

Address james.godbee@gmail.com

Site 203 Tudor Valley Road Reidsdale

Proposal For On Site Sewage Management Overview
The proposed development is situated within the Sydney Drinking Water Catchment Area and the relevant guidelines have been taken into consideration in the following assessment.
The proposed development will consist of a four bedroom dwelling
It will have the potential to house eight persons in total
An A&A PT3300 A&A Worm Farm Tank is to be installed with effluent pumped to
4 x 20m "Wick" trenches

Site Plan Attached
A site diagram is attached and with aerial photos also attached for additional identification

Intended Water Supply
The proposed water supply will be from tank water.

Expected wastewater generation 120 litres per person per day
The expected maximum waste water generation is 960 litres per day

Local experience (information regarding on-site sewage management systems installed in the locality).

A&A Worm Farm Systems are installed in the locality

SITE ASSESSMENT

Climate

Reidsdale has a low rainfall and high evaporation rate with an average rainfall of 635mm a year.
Average daytime temperatures reaching 31 degrees in the summer and 19 degrees in the winter.
Average night-time temperatures can get down to below zero degrees in the winter.

Where appropriate

Land application area calculation attached Yes

Wet weather storage area calculation attached N/A

Flood potential

Land application area above 1 in 20 year flood level Yes

Land application area above 1 in 100 year flood level Yes

Electrical components above 1 in 100 year flood level Yes

Exposure

Effluent disposal area faces north and is partially exposed to sun and wind.

Slope

4 degrees linear planar across the proposed effluent disposal area

Landform

Mid slope

Run on and seepage

No springs or soaks in the vicinity

Erosion Potential

There is no potential for erosion in the effluent disposal area.

Fill

Natural ground

Ground water encountered

Test pits were dug to 1200mm ground water was not encountered.
There are no bores within 500m

Buffer distances from wastewater management system to:

Permanent waters
Warrambucca Creek is situated 400m east but is not in the flow path of the effluent disposal area

Other waters
There are no other waters within 300m of the effluent disposal area

Other sensitive environments
The nearest dry gully is situated 100m down gradient northeast

Boundary of premises (m)
The nearest boundary is further than 50m away

Swimming pools (m)
There are no swimming pools

Buildings (m)
The nearest building is situated 50m up gradient south

Roads (m)
Access roads should be a minimum of 3m up gradient and 6m down gradient

Is there sufficient land area available for application system including buffer distances?
Yes

Reserve application area including buffer distances?
There is reserve application area including buffer distances

Surface rocks
There are no surface rocks in the proposed effluent disposal area

SOIL ASSESSMENT

Soil sampling details

Three test pits were dug across the proposed application area. Two soil samples were collected from each test pit for testing. The following results are from the clay loam layer as these soils are the most limiting

Collection date

13th April 2021

Sampling Method

Auger

Laboratory number

202125

Depth to bedrock or hardpan (mm)

Test pits dug were dug to 1200mm. Hardpan or bedrock was not encountered

Depth to high soil water table (mm)

Test pits dug were dug to 1200mm. High soil water table was not encountered

Soil texture structure and permeability category

Texture Sandy Loam/Loam 100mm - 800mm, clay loam 800mm – 1200mm

Structure Weakly structured

Design Load Rates mm/d 8mm

Permeability category 2a

Coarse Fragments 9% <5mm

Ph CaCl2 5.9

EC mS/cm <1

Bulk Density: 1.35 g/cm3

Indicative Permeability (ksat**):** 0.5 m/day

Phosphorus Sorption: > 6000 kg/ha

Dispersion Class 2 slight dispersive soil

Presence of discontinuities None present

Presence of fractured subsoil Not detected

GENERAL COMMENTS & RECOMMENDATIONS

Due to the clay soils, it is recommended that standard absorption trenches not be installed.
"Wick" Trenches which combine absorption and evapotranspiration are to be installed.
"Wick" Trench calculations and design are attached below.
The proposed effluent disposal area has been set back from sensitive environments in the vicinity
It is important that the designated setbacks from these environments are adhered to.
Nutrient uptake has been considered but due to the installation of a system with low nutrient output and disposal into absorption trenches it was deemed to be a minor limitation.
A&A Worm Farm Systems will improve soil structure of the clay soils, but it is recommended that Gypsum be spread on the base of the main trench at a rate of 1Kg per square metre
Suitable plants or shrubs that don't exceed more than a metre high when fully grown can be planted a minimum of 1.5m set back from effluent disposal area
All buffer distances setbacks have been achieved
It is very important that all surface water from upslope be diverted around the disposal area.
The effluent disposal area should be maintained, and grass cut regularly.
If heavy hooved animals are to be in the vicinity the disposal area should be fenced adequately to keep animals off the disposal area. Particular care should be taken when clearing trees for the asset protection area that the soils in and around the effluent disposal area are left as natural as possible

I have considered the site constraints to effluent disposal and have provided recommendations for effluent treatment.
The proposed development should have a neutral impact on the receiving areas if all recommendations are adhered to

Land Application area calculation
The required total length of the trenches was calculated using the daily design wastewater load (L/day) and the design load rates (DLR) for absorption trenches and evapotranspiration beds in AS/NZS:2012
L = Q/(DLRxW)

Where L = Length of trench required in metres

Q = Total design daily wastewater load in litres a day 960 litres per

DLR = design loading rate for trenches in mm per m2 per day (8mm/day)

W = total width of "Wick trench, arch trench 0.6m + 1.2m "Wick" bed = 1.8m

L = 960/ (8 x (1.8/1.2))

L = 960/12

L= 80m = 4 x 20m "Wick" Trenches

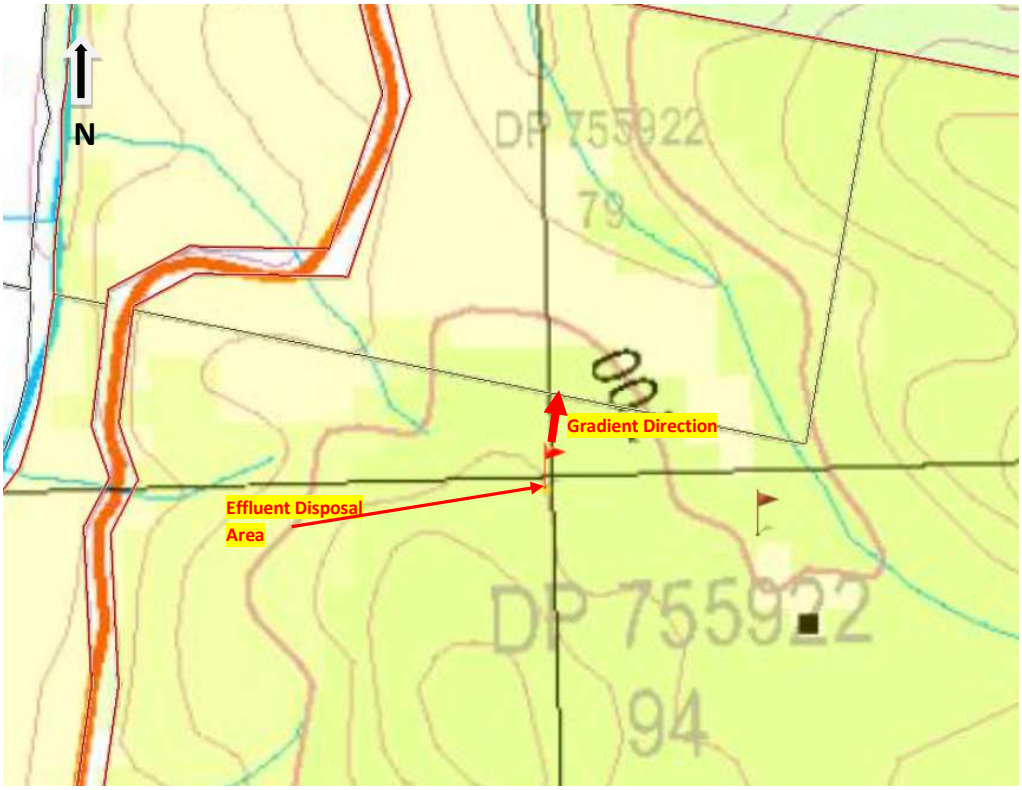
Photos Of Proposed Effluent Disposal Area


Effluent Disposal Area
Goodbee Sth

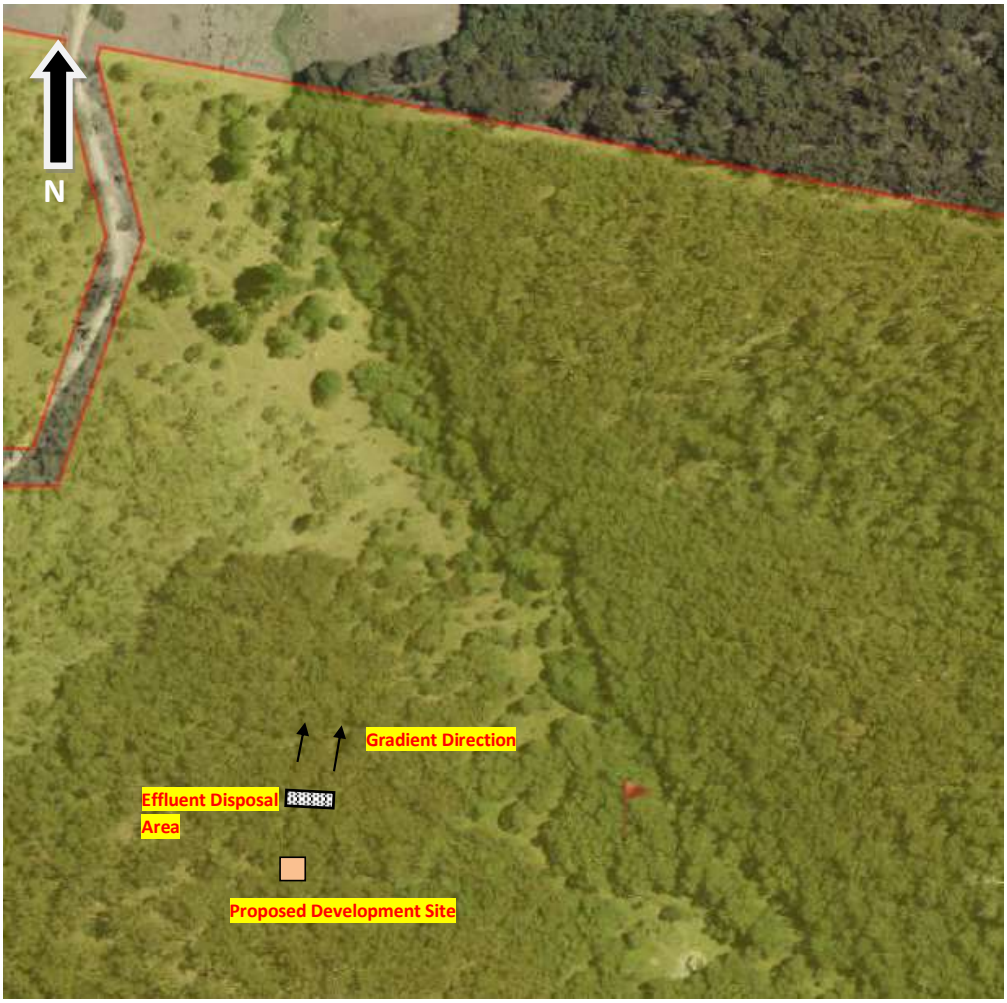

Effluent Disposal Area
Goodbee East


Effluent Disposal Area
Goodbee West

Topographic Map



Aerial View Images



Site Diagram
On Site Sewage Management
203 Tudor Valley Rd
Reidsdale

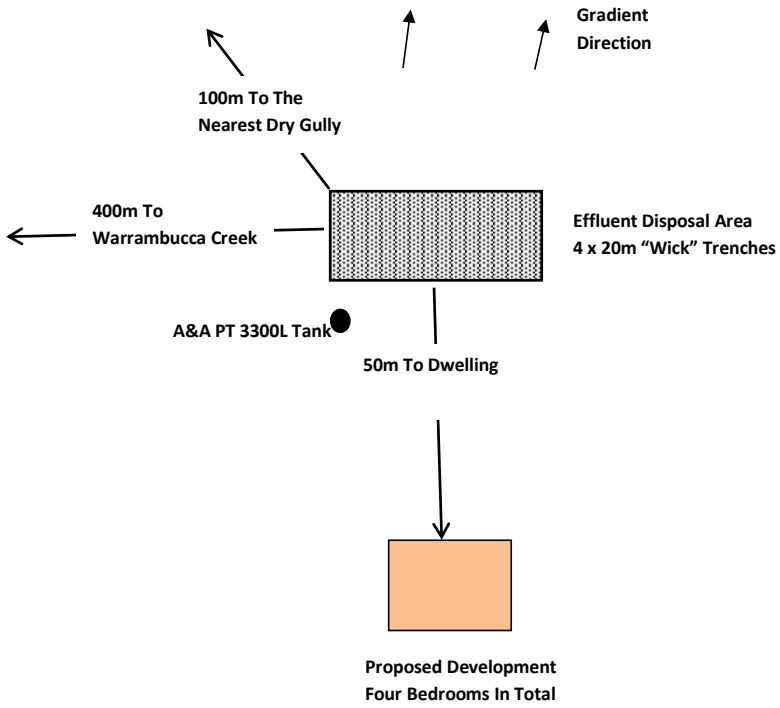


Diagram Only
Plan Not To Scale
Watercheck 10-5-2021
Note: This Is Not A Sewage Diagram

"Wick" Trench Information

2) For a 'Wick' trench comprising an arch trench of 0.6m width with a 1.2m 'Wick' bed.

L = 600 / (10 x (1.8/1.2))
L = 600 / (10 x 1.5) Example Only
L = 600 / 15
L = 40 m

Therefore 3 x 14 m 'Wick' trenches are recommended.

The following points should be noted when installing a 'Wick' trench:

- NSW Health non-disinfected effluent to be disposed of at a soil depth of more than 300 millimetres for both trenches and beds (NSW Health, 2008).
- Avoid uneven areas when choosing where to put the trench. If a level area cannot be used, terrace the area for the trench.
- Ensure the trench has a uniform depth of soil across the finished surface for even, uniform performance along the trench.
- Avoid filling hollows across the contour as this may interfere with effluent distribution.
- The original ground level of the land application area should be 100 to 150 millimetres below the invert of the tank outlet. If the tank outlet invert is 400 millimetres from the top of the tank, the ground level where the trench will be built must be at least 550 millimetres lower than the ground where the tank is located.
- Where it is impossible to achieve 550 millimetres height separation between the tank and trench, use a pump and pump well to load the trench
- The septic tank must be desludged at appropriate intervals to ensure that sludge does not flow into the trench, reducing trench performance.

'Wick' trench installation

1. Set out the trench area and instruct the excavator operator where to cut (Figures 10.13 and 10.14).

Figure 10.13 and 10.14 Excavation of the bed of the "Wick" trench

trench also allows reserve in the design. It can be used on sloping sites by creating terraces for each trench.

'Wick' trench sizing

Typically the 'Wick' trench will be built with an evapotranspiration bed approximately twice the width of the trench. For example, a bed 1,200 millimetres wide with a 600 millimetre wide trench as shown in Figure 10.12. The trench is built using an arch trench that is a plastic self supporting arch 410 millimetres wide and 1,500 millimetres long.

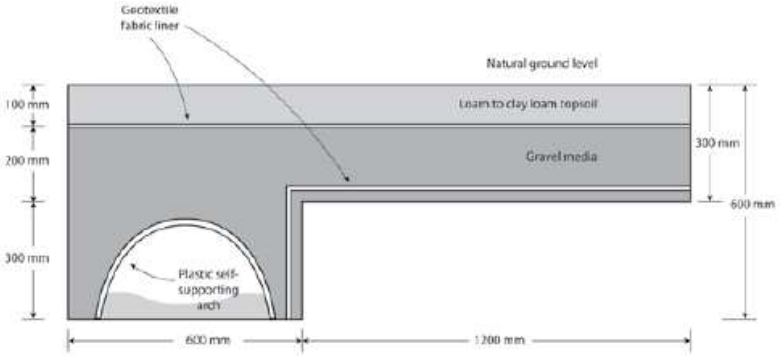


Figure 10.12 Cross section of a "Wick" trench

The required length of 'Wick' trench can be calculated using the daily design wastewater load (L/day) and the design loading rates (DLR) for absorption trenches and evapotranspiration beds in AS/NZS 1547:2012.

For a conservative design, the designer recommends using the formula:

L = Q / DLR x (W/1.2)

Where: L = total length of 'Wick' trench required in metres
Q = design daily wastewater load in litres a day
DLR = design loading rate for trenches in mm per m^2 per day
W = total width of trench and bed in the combined 'Wick' trench

Example

To size a 'Wick' trench for a typical three bedroom, five person home on a Category 4 clay loam soil with tank water supply:

Design daily wastewater load Q = 3 x 200 L = 600 L
Design loading rate = 10 mm/m^2/day for primary treated effluent

1) For an arch trench of 0.6 m width alone, the required trench length is determined by

L = 600 / (10 x 0.6)
L = 600/6
L = 100 m

Example Only

Therefore 5 X 20 m arch trenches are recommended.