



Hawkesbury City Council

Attachment 11
to
item 002

Bushfire Hazard Assessment Report
dated 13 May 2019

date of meeting: 18 February 2020
location: council chambers
time: 6:30 p.m.

Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

REF No. 19.05.133

Address

Lot 121 DP 1067098
144 Mountain View Close
Kurrajong Hills NSW 2758

For

P. Finley

The site was inspected on 13th May 2019

Report Preparation

Craig Burley

Grad Dip Design for Bushfire Prone Areas
FPAA Certified BPAD – Level 3 Practitioner



SCANNED



Bushfire Risk Assessment Certificate

As required by legislation under section 79BA of the *Environmental Planning and Assessment Act 1979* No 203

Property Address:	Lot 121 DP 1067098 144 Mountain View Close Kurrajong Hills NSW 2758
Description of Proposal	New Class 1a dwelling
Plan Reference: [Relied upon in report preparation]	This assessment is based on plans prepared by: Eden Brae Homes Dated: 12.04.19 Issue D Drawing Ref No: AND - 30524
Bushfire Hazard Assessment Report Ref. No.	19.05.133
Report Date:	16.05.2019
BAL Rating:	BAL 19
Does the proposal comply with the requirements of <i>Planning for Bush Fire Protection 2006</i> ?	YES with incorporation of the recommendations included contained in the attached Bushfire Hazard Assessment Report
Does the proposal require referral to the NSW Rural Fire Service?	NO
Does the proposal rely on Alternate Solutions?	NO

I Craig Burley of Control Line Consulting have carried out a bushfire risk assessment on the above-mentioned proposal and property.

A detailed Bushfire Hazard Assessment Report has been prepared in accordance to the submission requirements as set out in *Appendix 4 of Planning for Bush Fire Protection 2006* together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with *79BA of the Environmental Planning and Assessment Act 1979* No 203:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Hazard Assessment Report the proposed development conforms to the relevant specifications and requirements.

I am aware that the Bushfire Hazard Assessment Report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Hawkesbury City Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2006*.

Yours faithfully



Craig Burley
Grad Dip Design in Bushfire Prone Areas
FPA Australia BPAD – Level 3 Certified Practitioner



Executive Summary

We have been engaged by P. Finley, the owner of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Hawkesbury City Council, for the proposed construction of a new Class 1a dwelling upon the subject land.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development are applicable.

The proposed development is an infill development as defined within *Planning for Bush Fire Protection* 2006 and this report has been prepared in accordance with the requirements of *Section 79BA of the Environmental Planning and Assessment Act 1979*.

The objectives and performance requirements for the proposed development as required by the Building Code of Australia Volume 2 and the document *Planning for Bush Fire Protection* 2006 will be achieved by the incorporation of the recommendations contained within this report.

Bushfire Attack Summary

Lot 121 DP 1067098

144 Mountain View Close Kurrajong Hills NSW 2758

Vegetation Formation	Forest to the south	Grassland to southeast
Vegetation Slope	Downslope > 5 to 10 degrees	Downslope > 5 to 10 degrees
Building Separation Distance metres	63	20
Separation Slope	Downslope > 5 to 10 degrees	Downslope > 5 to 10 degrees
Fire Danger Index	100	100
Category of Bushfire Attack	Moderate	Moderate
AS 3959 Construction Standard	BAL 19	BAL 19

The proposal and the recommendations contained within this report can provide for conformity to *Planning for Bush Fire Protection* 2006 and therefore will assist in providing a reasonable level of bushfire protection and improve but not guarantee the chances of building survival, or provision for the occupants with a safe refuge during the passage of a bushfire front and or the provision of a defensible space for fire fighters.

Table of Contents

1.0	Introduction	1
1.1	Purpose of Report	1
1.2	Scope of Report	1
1.3	Regulatory Controls	1
1.4	Methodology	2
1.5	The Proposal	2
2.0	Site and Adjacent Developments	4
2.1	Site Description	4
2.2	Description of Adjoining Lands	6
3.0	Environmental Considerations	7
4.0	Bushfire Hazard Assessment	8
4.1	Classification of Vegetation and Separation Distance from Proposed Development	8
4.2	Slope Assessment	9
4.3	Category of Bushfire Attack	10
5.0	Assessment of the extent to which the development conforms or deviates from Chapter 4 of <i>Planning for Bush Fire Protection</i> 2006	10
5.1	Asset Protection Zones	11
5.2	Siting and Design of Proposed Development	12
5.3	Construction Level	12
5.4	Access / Egress	12
5.5	Utility Supplies	13
5.6	Landscaping	15
6.0	Bushfire Hazard Assessment Recommendations	16
7.0	Conclusion	18
	References	19

Appendix 1 – Proposed dwelling plans ex Eden Brae Homes

1.0 Introduction

We have been engaged by P. Finley the owner of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Hawkesbury City Council for the proposed construction of a new Class 1a dwelling upon the subject land.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development are applicable.

The proposed development is an infill development as defined within *Planning for Bush Fire Protection* 2006 and this report has been prepared in accordance with the requirements of *Section 79BA of the Environmental Planning and Assessment Act 1979*.

1.1 Purpose of Report

- To determine the vegetation type, the expected fire behaviour and the threat to the proposal; and
- To assess the proposal with reference to *Planning for Bush Fire Protection* 2006; and
- To assess the proposed construction with reference to the Building Code of Australia Volume 2; and
- To determine the level of construction with reference to AS 3959-2009 *Construction of buildings in bushfire prone areas*; and
- To identify any other such measures as to improve the chances of building survival during a bushfire event; and
- To assist the consent authority Hawkesbury City Council in the determination of the development application subject to this proposal.

1.2 Scope of Report

The scope of this report is limited to the Bushfire Hazard Assessment for the proposed development and only contains recommendations for the subject property. Where reference is made to adjacent or adjoining lands, this report does not purport to assess those lands; rather it may discuss bushfire progression on and through those lands with the possible bushfire impact to the subject property and the proposed development.

1.3 Regulatory Controls

The preparation of this report has given consideration to the various legislative and regulatory requirements including the *Environmental Planning and Assessment Act 1979*, the Building Code of Australia, *Planning for Bush Fire Protection* 2006 and AS 3959-2009 *Construction of buildings in bushfire prone areas*.

1.4 Methodology

A site inspection for the purpose of assessing bushfire related matters affecting this site was conducted on the 13th May 2019 and a review of the proposed construction plans as supplied by the owner and prepared by Eden Brae Homes has taken place.

An assessment of slope was conducted out to a distance of 100 metres and assessment of vegetation to a distance of 140 metres from the proposed development.

The findings were related and assessed with reference to *Planning for Bush Fire Protection* 2006 Addendum to Appendix 3 and section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas* for the formulation of the Bushfire Hazard Assessment.

1.5 The Proposal

The proposal as indicated by consultation with the proponents and perusal of plans supplied, shows for the construction of a new single storey Class 1a dwelling.

The building footprint for the dwelling has been positioned upon the plans supplied and detail on such plans shows the new dwelling shall be located approximately 16 metres from the northern (road frontage) boundary, 14 metres from the eastern boundary and 4 metres from the western boundary.

The following is a summary of the construction details as shown for the proposal upon the plans supplied by the proponent and as prepared by Eden Brae Homes.

Roof	Concrete tiles
Flooring System	On ground concrete slab
Supporting columns, posts, etc	Masonry
External wall cladding	Brick veneer
External doors	Hinged PA entry doors *2 northwest elevation & sectional garage door, 2 aluminium framed sliding doors (2) to northeast elevation, aluminium framed sliding door to southwest elevation and aluminium framed sliding doors (3) to southeast elevation
Windows	Aluminium framed
Screens	Not specified
Vents and weep holes	Not specified
Roof mounted evaporative cooler or skylights, etc	Rotating roof ventilator
Fascia	Colorbond
Gutters	Colorbond
Verandas and decks	Alfresco to southeast corner of dwelling

Further details of construction are shown upon plans included within appendix 1 of this report.

However, it must be noted that the plans supplied may not fully satisfy the recommendations included within this report and subject to actual consent conditions issued by the consent authority some modifications or changes may need to occur to achieve the required compliance.

2.0 Site and Adjacent Developments

The following seeks to describe the site, the adjoining lands and land uses effective upon the development proposal.

2.1 Site Description

The site is identified as Lot 121 DP 1067098
 144 Mountain View Close
 Kurrajong Hills NSW 2758
 LGA Hawkesbury City Council



Figure 1: Address validation ex Dept of Lands

The subject allotment was created prior to the current subdivisional requirements contained within *Planning for Bush Fire Protection* 2006.

The site is a rural lifestyle allotment of approximately 4.175 hectares located at the south eastern extent of Mountain View Close. The area in which the proposal is located is generally similar development that has been established for many years.

The subject allotment is located within an area that should be considered as having a direct interface to bushfire hazardous vegetation.

The subject allotment is positioned upon the south easterly aspect slopes of a west to east ridgeline. The allotment is to the northwest of a naturally occurring

topographical drainage feature identified as Little Wheeny Creek that descends in a northerly direction along the south eastern boundary.

The parcel of land is quite irregular in shape and the northern boundary is a narrow road frontage for the subject site.

At present the site has no structural improvements and should be considered as being vacant land.

In terms of vegetation the majority of the site is managed grasslands used for cattle grazing with a section of forest on the steeply descending slopes above Little Wheeny Creek in the southern and eastern portions of the overall site.

The site is shown upon the Hawkesbury Bushfire Prone Land Map (Figure 2) to be within a combination of category 1 vegetation (shown red) and category 3 vegetation (shown dark orange). The site inspection and interpretation of aerial photography for the site confirms that the subject allotment is reasonably depicted upon this image although large areas of land on adjoining parcels are also mapped as category 3 vegetation are actually managed lands with no sections of hazard.



Figure 2; Section Hawkesbury LGA Bushfire Prone Land Map

Provision of electricity and phone is available to the proposal by existing infrastructure. The site is not serviced by reticulated water system and the provision of water for the subject development will be principally by rainwater collection.

2.2 Description of Adjoining Lands

To the north of the subject allotment is considered to be managed lands within the mandated study area.

To the east of the subject allotment is initially managed lands that transition into being open grasslands and then forest vegetation on either side of Little Wheeny Creek.

To the south of the subject allotments is relatively large area of forest vegetation located on the ascending slopes above Little Wheeny Creek.

To the west of the subject allotment is a combination of managed lands directly located adjacent to the proposed dwelling location that transitions into being forest vegetation on the slopes above Little Wheeny Creek.



Figure 3: Aerial photo depicting localised terrain and adjoining allotments

3.0 Environmental Considerations

The scope of this report has not been to provide an environmental survey although this report will be a supplement to a Statement of Environmental Effects as part of the development application process.

The proposed scope of works does necessitate the removal of some limited sections of vegetation to satisfy the recommendations for asset protection zones. It is also our opinion that the bushfire protection measures as recommended within this report will have little or no adverse environmental effects.

The proposal is located on a site that has been developed for many years and this proposal does not change the current land use or increase the level of occupancy.

4.0 Bushfire Hazard Assessment

The bushfire hazard assessment was conducted for the proposed development, using the procedures as outlined in *Planning for Bush Fire Protection* 2006, Addendum to Appendix 3 and section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas* procedure to determine the bushfire attack level (BAL) likely upon the development.

The assessment was conducted on the assumption of the building footprint being positioned as described in section 1.5 The Proposal of this report and the site plan.

4.1 Classification of Vegetation and Separation Distance from Proposed Development

The vegetation was assessed for a distance of 140 metres from the proposed development building footprint in each of the following directions. To the north, east, south and west being the general direction adjacent and away from the proposed building elevations within such building footprint.



Figure 4: Vegetation study area



140 metre radius approx. Image ex Dept Lands



Proposed dwelling location



Forest



Grassland

To the south of the proposed dwelling is the effective bushfire hazardous vegetation and this area should be classified as being a vegetation formation of **Forest** and an area of **Grassland** hazard to the southeast

The closest section of consistent forest vegetation is located approximately 63 metres to the south and after consideration of the asset protection zones recommended by this report the Grassland will be located 20 metres to the southeast of the proposed construction.

4.2 Slope Assessment

The slope was assessed for a distance of 100 meters within the bushfire hazardous vegetation and reference to slope classifications has been undertaken considering the procedure specified within section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas*.



Figure 5; Slope assessment study area Image ex Dept Lands

The **effective slope** of the land, out to a distance of 100 metres from the proposed scope of works (that is, the slope of the land most likely to influence bushfire behaviour for the purposes of calculating the Category of Bushfire Attack and Asset Protection Zones, has been assessed (using a clinometer) and desktop analysis as being;

- Area A – Forest - > 5 to 10 degrees downslope (assumed) (elevation 16 met / dist. 135 met = 6.76 degrees)
- Area B – Grassland - > 5 to 10 degrees downslope (assumed) (elevation 12 met / dist. 100 met = 6.84 degrees)

4.3 Category of Bushfire Attack

The bushfire attack level (BAL) for the proposed development was determined by using the information gathered with respect to the classification of the vegetation, the effective slope and provision of asset protection zones specified in this report with reference given to the Addendum to Appendix 3 of *Planning for Bush Fire Protection* 2006 and the procedures within section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas*.

It is the determination of the site inspection, the assessment procedure with incorporation of the recommendations in this report that the proposed development could experience a **Moderate** category of bushfire attack. The proposed development is most likely to be subject to the greatest bushfire attack from any area to the **south** from the proposed development location.

Bushfire Attack Summary

Vegetation Formation	Forest to the south	Grassland to southeast
Vegetation Slope	Downslope > 5 to 10 degrees	Downslope > 5 to 10 degrees
Building Separation Distance metres	63	20
Separation Slope	Downslope > 5 to 10 degrees	Downslope > 5 to 10 degrees
Fire Danger Index	100	100
Category of Bushfire Attack	Moderate	Moderate
AS 3959 Construction Standard	BAL 19	BAL 19

5.0 Assessment of the extent to which the development conforms or deviates from Chapter 4 of *Planning for Bush Fire Protection 2006*

The proposed development being the construction of a new Class 1a dwelling will conform to the requirements of *Planning for Bush Fire Protection 2006* when considered in conjunction with both the proposal supplied for this assessment and the recommendations arising from this bushfire hazard assessment report.

5.1 Asset Protection Zones

The provision of asset protection zones for the proposed building footprint cannot be fully provided for onsite to satisfy the requirements of *Planning for Bush Fire Protection 2006* but is improved by the utilization of the adjoining developments.

The maintenance of the majority of area upon the subject allotment in the general area of the dwelling proposed location currently would mostly satisfy the requirements of an inner protection area of an asset protection zone as contained in *Planning for Bush Fire Protection 2006*.

This report will recommend that the site where not built upon is maintained to the requirements of an inner protection area of an asset protection zone and managed to these provisions for the lifetime of the development as follows;

- From the north western, north eastern and south western elevations of the proposed dwelling to the adjacent sections of the allotment boundaries; and
- From the south eastern elevation of the proposed dwelling for a distance of 20 metres.

The following is a summary of the requirements for an asset protection zone inner protection area as described within the documents *Planning for Bush Fire Protection 2006* and *NSW RFS Standards for Asset Protection Zones*.

Inner Protection Area

An IPA should provide a tree canopy cover of less than 15% and the tree canopy should be located greater than 2.0 metres from any part of the roof line of a dwelling. Garden beds of flammable shrubs should not be located under trees and should be located not closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2.0 metres above the ground.

Ground fuels such as fallen leaves, twigs (less than 6mm in diameter) and branches should be removed on a regular basis, and grass needs to be kept closely mown and where possible green.

The creation and continued maintenance of the full asset protection zone is one of the primary factors in bushfire protection measures for developments in bushfire prone areas.

5.2 Position and Design of Proposed Development

The design and siting of the proposed dwelling must take into consideration the actual bushfire risk and this report contains recommendations to assist in mitigating the mechanisms of bushfire attack.

5.3 Construction Level

The Building Code of Australia contains both the performance requirements and the 'deemed to satisfy' provisions relating to construction of class 1, 2 & 3 buildings that are proposed for *construction in bushfire prone areas*. To satisfy the performance provision P2.3.4 of the Building Code of Australia Vol. 2, a Class1a building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.

Australian Standard 3959-2009 *Construction of buildings in bushfire prone areas* is referenced by the BCA as the deemed to satisfy construction standard for residential dwellings in designated bushfire prone areas with the exception that in NSW the requirements shall be varied to comply with the Addendum to Appendix 3 of *Planning for Bushfire Protection* 2006.

Given that the category of bushfire attack that could be anticipated for such development is Moderate from vegetative fuels to the south and southeast, this proposed dwellings roof and eaves section, and the north eastern, north western and south western external elevations should therefore be designed and constructed to the requirements of AS 3959-2009 and must be constructed to comply with section 3 Construction General and section 6 BAL 19 of such standard apart from as varied to comply with the Addendum to Appendix 3 of *Planning for Bushfire Protection* 2006.

Due to the effects of shielding and with reference to AS 3959-2009 section 3.5 *Reduction in Construction Requirements Due To Shielding*, this report recommends that it is appropriate to construct the south eastern elevation of the proposed dwelling to satisfy section 3 Construction General and section 5 BAL 12.5 of such standard apart from as varied to comply with the Addendum to Appendix 3 of *Planning for Bushfire Protection* 2006.

5.4 Access / Egress

5.4.1 To the Proposed Development

The access to the subject site is from Mountain View Close which is a sealed two lane road in a well maintained condition and under most conditions should provide adequate access and egress for both residents and emergency service vehicles.

Mountain View Close is a no through road with sections of connecting roads very exposed to large areas of forest vegetation which may compromise the ability of residents to leave during a bushfire event.

5.4.2 Within the Site

The site plan for the proposal does show that vehicle access may not be possible to all elevations of the dwelling, although a fire tanker will be able to park in close proximity

to the north western building elevation upon the Mountain View Close carriageway and foot access will be available to each of the other building elevations.

It should be considered by the residents that during a major bushfire event the following may occur;

- The suppression or defensive operations by fire authorities may not be possible in the general area of the development due to safety considerations for fire fighters; and
- That there may not be adequate fire authority resources to protect this development or others in the general area.

Whilst all fire authorities will endeavour to assist all occupants and protect all buildings during major bushfire events this is not always possible and cannot be guaranteed.

5.5 Utility Supplies

5.5.1 Water

The locality of Kurrajong Hills is not serviced by a mains reticulated water supply and the provision of potable water for the dwelling will be principally supplied by the collection of rain water.

The availability of water for use during a bushfire event is a significant component of the overall bushfire protection measures for any residential dwelling in a bushfire prone area.

Therefore the proposed development must be able to integrate suitable measures that ensure an independent, reliable water supply for use during a bushfire event by the occupants or a firefighting authority tanker, and should have the following key objectives:

- To enable a suitably prepared, able bodied person or persons to undertake first aid fire suppression of small ignitions near or on the external elevations of the building that may occur before and after the passing of a bushfire front.
- To be able to replenish bushfire tankers that may be in attendance during a bushfire event
- To be able to operate independently of the mains power supply so as to be able to fully function if an electrical mains power failure occurred
- To be able to supply an adequate amount of water at the required pressure to firefighting hose or hoses

To satisfy the requirements of *Planning for Bush Fire Protection* 2006 it is a recommendation of this report that a reserve Static Water Supply (SWS) of not less than 20,000 litres be permanently maintained on the subject allotment within

noncombustible tanks located within the inner protection area of the asset protection zone.

The reserve Static Water Supply (SWS) should be permanently plumbed to a petrol or diesel firefighting water pump of not less than 5 hp. The pump must be shielded from the direct effects of a bushfire event.

The site restrictions may not allow for a bushfire tanker to have direct and clear access to the reserve Static Water Supply (SWS) and as such the proposed development should provide a delivery line of not less than 50mm diameter from the firefighting water pump to an outlet point located directly on the northern road frontage boundary. This outlet point should be fitted with a ball or gate valve and a 65 to 38mm Storz reducer fitting.

The water pump should also be connected to and supply water to kink resistant hose or hoses with a minimum diameter of not less than 19mm and firefighting nozzle capable of reaching all building elevations.

All plumbing and fittings associated with reserve water supply, the first aid fire hoses, the tanker refill outlet point and firefighting pump that is above the ground or below the ground for less than 300mm shall be metal.

The installation and ongoing maintenance of the plumbing and water pump must be undertaken to the manufacturer specifications.

The site shall provide NSW RFS Static Water Supply (SWS) approved signage fitted in the approved locations to enable fire fighters clear indication of the location of the reserve water and the outlet point.

The NSW RFS district office can assist with the procurement of these signs and the guidelines for suitable installation.

5.5.2 Electricity

The methodology for the connection of electricity shall be by overhead wire connection from the mains service supply to a pole that will be located just inside the road frontage boundary and from that point it shall travel underground to the metre box upon the external wall of the dwelling. This connection should not increase to a large extent the likelihood of bushfire ignition or be the cause of electrical failure to the subject site under most conditions due to the limited overhead distance to be spanned by the wiring.

5.5.3 Gas

At the time of report preparation it was not known if it is proposed to connect gas supply to the subject dwelling. However, any future connection to either mains or portable gas supply should be undertaken and maintained to the provisions of AS 1596-2002 *Storage and handling of LP Gas*. All piping associated with the installation must be metal.

5.6 Landscaping

A formal landscaping plan was not supplied for perusal at the time of formulating this report however recommendations are made with respect to the maintenance of the area on the site.

It is highly probable that in the future landscaping and garden establishment may occur on the site. However no future planting of trees or shrubs, or combustible landscaping features should be undertaken or constructed in a manner which creates a path for bushfire progression towards the dwelling or allows for a potential compromise to the integrity of the asset protection zone.

5.7 Emergency Procedures

Preparation of procedures and actions by individuals and occupants of lands within bushfire prone areas has clearly been shown to increase chances of personal safety and building survival should a bushfire event occur.

The NSW Rural Fire Service and the NSW Fire Brigades have formulated a Bush Fire Survival Plan and this is readily available from either the NSW RFS website or the local district office.

This document should be completed by the residents in conjunction with all occupants of the household so as to better prepare all persons for a bushfire event.

After completion it should be regularly reviewed (at least once a year) and stored in a location as to be easily accessible for reference during a bushfire emergency.

6.0 Bushfire Hazard Assessment Recommendations

1. That the site where not built upon shall have the vegetation reduced where necessary to satisfy the requirements of *Planning for Bush Fire Protection* 2006 and the NSW Rural Fire Service document "Standards for Asset Protection Zones" for an inner protection area of an asset protection zone and this area shall be maintained at this vegetation level for the lifetime of the development as described below;
 - From the north western, north eastern and south western elevations of the proposed dwelling to the adjacent sections of the allotment boundaries; and
 - From the south eastern elevation of the proposed dwelling for a distance of 20 metres.

These areas are to form a continuous and linked buffer around the entire dwelling.

2. That no future landscaping features, planting of shrubs, trees or other vegetation shall occur in such a manner as to compromise the integrity of the asset protection zone.
3. That the proposed dwellings roof and eaves section, and the north western, north eastern and south western elevations shall be constructed to section 3 Construction General and section 6 BAL 19 of AS3959-2009 *Construction of buildings in bushfire prone areas* with the exception that the construction requirements shall be varied to comply with the requirements of the NSW Rural Fire Service Addendum to Appendix 3 Table A3.7 of *Planning for Bush Fire Protection* 2006.
4. That the proposed dwellings south eastern elevation shall be constructed to section 3 Construction General and section 5 BAL 12.5 of AS3959-2009 *Construction of buildings in bushfire prone areas* with the exception that the construction requirements shall be varied to comply with the requirements of the NSW Rural Fire Service Addendum to Appendix 3 Table A3.7 of *Planning for Bush Fire Protection* 2006.
5. That the dwelling shall maintain a reserve Static Water Supply (SWS) for use during a bushfire event of not less than 20,000 litres stored in a non combustible tank within the area of recommended asset protection zone.
6. The reserve Static Water Supply shall be permanently plumbed to a petrol or diesel fire fighting water pump with a minimum of 5hp. The pump shall be regularly maintained as per the manufacturer specifications. The pump must be located in such a position to be shielded from the direct mechanisms of bushfire attack.

7. That a water delivery line of not less than 50 mm diameter be plumbed from the fire fighting water pump plumbed to the reserve Static Water Supply tank, to an outlet point directly on the northern road frontage boundary of the subject allotment to enable fire fighting tankers to refill. The outlet of this line shall be fitted with a ball or gate valve and a 65 to 38mm reducer Storz fitting.
8. That the development must provide and have readily available kink resistant hose or hoses with a diameter of not less than 19mm and a fire fighting nozzle, capable of reaching all elevations of the dwelling, and fittings suitable for connection to the fire fighting water pump.
9. That all plumbing associated with the reserve water supply above the ground or for a depth of not less than 300mm below the ground shall be metal.
10. That approved NSW Rural Fire Service; Static Water Supply signage is installed at approved locations for the proposed development.
11. That the supply of electricity and telephone to the dwelling shall be under ground where at all possible.
12. That if the supply of gas to the subject dwelling is undertaken it shall be installed and maintained in accordance with AS 1596-2002 and requirements of relevant authorities.
13. The residents should complete a *Bush Fire Survival Plan* as formulated by the NSW Rural Fire Service and the NSW Fire Brigades.

These recommendations are the opinions of the author of this report and are compiled to assist the consent authority and the NSW Rural Fire Service in the assessment of this proposed development and that the final conditions as imposed by the consent authority must be adhered to at all stages and where required for the lifetime of the development.

7.0 Conclusion

The objectives and performance requirements for the proposed development as required by the Building Code of Australia Volume 2 and the document *Planning for Bush Fire Protection 2006* will be achieved by the incorporation of the 13 recommendations contained within this report.

The recommendations contained within this report will assist in providing a reasonable level of bushfire protection and improve but not guarantee the chances of building survival, or provision for the occupants with a safe refuge during the passage of a bushfire front and or the provision of a defensible space for fire fighters.



Craig Burley
Grad.Dip. Building in Bushfire Prone Areas (UWS)
FPA Australia Certified BPAD – Level 3 Practitioner



Caveat

Quote from *Planning for Bush Fire Protection 2006*, '*notwithstanding the precautions adopted, it should always be remembered that bushfire burn under a wide range of conditions and an element of risk, no matter how small always remains.*'

Quote from Standards Australia, '*Although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.*'

References

Planning for Bush Fire Protection 2006 Planning NSW in conjunction with NSW Rural Fire Service

Building Code of Australia Volume 2 2005 Australian Building Codes Board

AS 3959 –2009 Construction of buildings in bushfire prone areas Standards Australia & Australian Building Codes Board

Landscape and building Design for Bushfire Areas Ramsay C. & Rudolph L. CSIRO 2003

Quantifying bushfire penetration into urban areas in Australia Keping Chan & McNeney J. Geophysical Research Letters, Volume 31, L12212, doi:10.1029/2004GL020244,2004

Bushfires in Australia Luke R.H. & McArthur CSIRO 1978

Performance of Building Elements in Bushfire Prone Areas Poon S.L. & England J.P. Warrington Fire Research Australia

Address Validation Search Department of Lands www.maps.nsw.gov.au

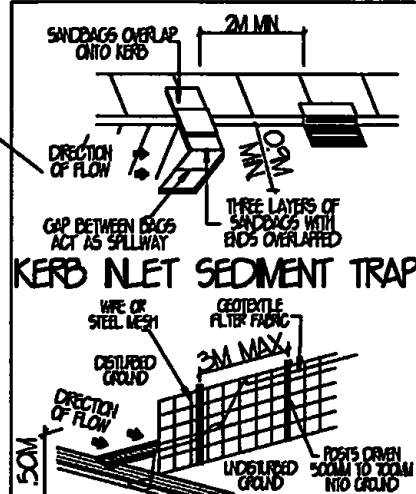
Standards for Asset Protection Zones NSW Rural Fire Service 2005

Ocean Shores to Dessert Dunes Keith D. Department of Environment and Conservation Sydney 2004

Appendix 1- Proposed dwelling plans ex Eden Brae Homes

LITTLE WHEENY CREEK

LOT 121
DP 1067096
4.175 HA
PROPOSED
RESIDENCE
KEW 21
HARVARD
FACADE



SILT FENCE DETAIL

SEDIMENT CONTROL NOTES

ALL EROSION AND SEDIMENTATION CONTROL MEASUREMENTS INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL SHALL BE SUBMITTED TO THE STANDARDS OF THE SOIL CONSERVATION OF NSW.

ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AROUND AND STABILISED AS EARLY AS POSSIBLE DURING DEVELOPMENT.

SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL NLET FITS CONSISTING OF 300MM WIDE X 300MM DEEP TRENCH.

ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEARED WHEN THE STRUCTURES ARE A MAXIMUM OF 60% FULL OF MATERIALS FOLLOWING THE MAINTENANCE PERIOD.

ALL DISTURBED AREAS SHALL BE REVEGETATED AS SOON AS THE RELEVANT WORKS ARE COMPLETED.

SOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREA WHERE WATER MAY CONCENTRATE.

FILTER FABRIC SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC PROPEL OR APPROVED EQUIVALENT BETWEEN POSTS AT 2M CENTRES. FABRIC SHALL BE BURIED 50MM ALONG ITS LOWER EDGE.

LOT 111
DP 1197837

SITE DATA

SITE DATA: 41750 M²

PRIVATE OPEN SPACE
REQUIRED: 8350 M² OF 20%
PROVIDED: 40345 M² OF 45-62

LANDSCAPED AREA
REQUIRED: 301 OR 12525 M²
PROVIDED: 98 OR 41281 M²

FLOOR AREAS

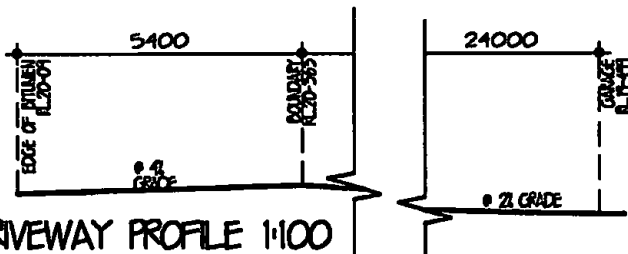
GROUND FLOOR AREA = 246 M²
(NOT INCLUDING GARAGE)
GARAGE FLOOR AREA = 52.4 M²
PORCH FLOOR AREA = 2.9 M²
ALFRESCO FLOOR AREA = 21 M²

TOTAL FLOOR AREA = 323.3 M² OR 348.505

GENERAL NOTES

- STORMWATER TO DISCHARGE INTO DESIGNATED DISCHARGE POINT TO PCA REQUIREMENTS
- SEWER TO LOCAL AUTHORITIES REQUIREMENTS
- ALL GROUND LINES ARE TO BE VERIFIED ON-SITE BY THE BUILDER
- FINAL LOCATION OF BUILDINGS TO BE VERIFIED ON-SITE BY A REGISTERED SURVEYOR
- WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALING ANY PLAN DISCREPANCIES TO BE REFERRED BACK TO A/N DESIGN BEFORE PROCEEDING
- SITE CLASSIFICATION H1
- CUT AND FILL HOUSE PLATFORM APPROXIMATELY TO RL14-2 GARAGE TO RL14-2
- HOUSE FLOOR LEVEL RL14-505, 300MM ABOVE PLATFORM LEVEL. GARAGE FLOOR LEVEL APPROX. RL14-491, 270MM ABOVE PLATFORM LEVEL
- TOTAL ROOF AREA = 358.3 M²

MOUNTAIN VIEW CLOSE
LOCALITY PLAN
1:1500



DRIVEWAY PROFILE 1:100

eden brose homes
To whom you would like to

LEVEL 3/22
BROOKLYN AVENUE
NORWEST BUSINESS PARK
CALLOUP HILLS NSW 2530
TEL: 02 8860 3222
FAX: 02 8860 3233

FOR **MR P. S. FINEY**

AT **LOT 121, 144 MOUNTAIN VIEW CLOSE KURRAJONG HILLS**

TYPE **KEW 21** LBS NO. **0023600**

FACADE **HARVARD** HWD **RH**

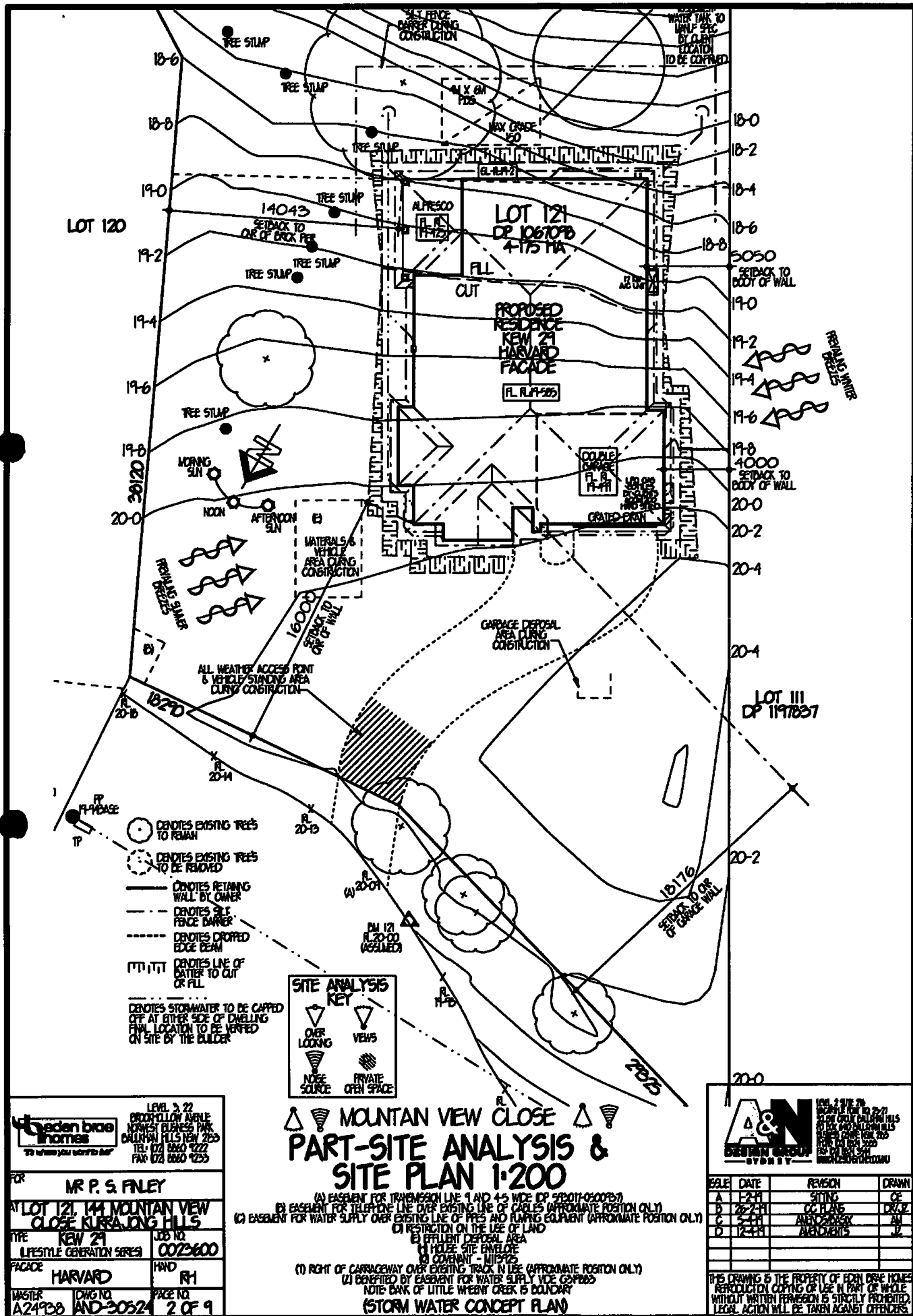
MASTER **A24938** DWG NO. **AND-30524** PAGE NO. **1 OF 9**

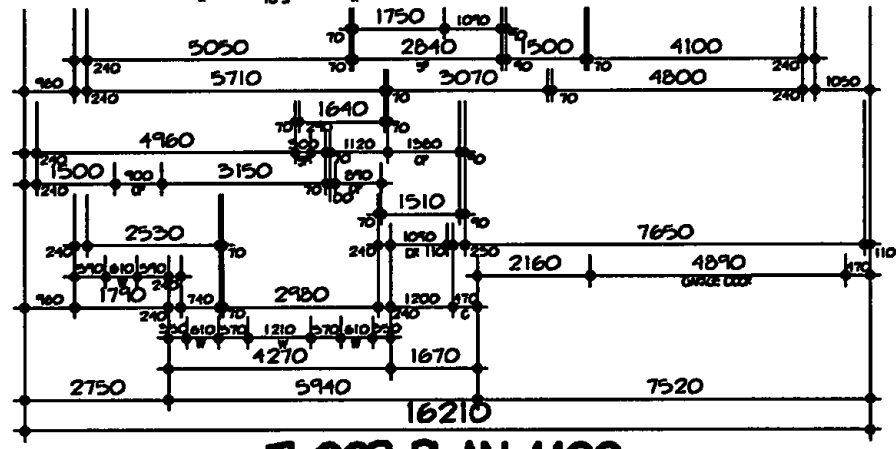
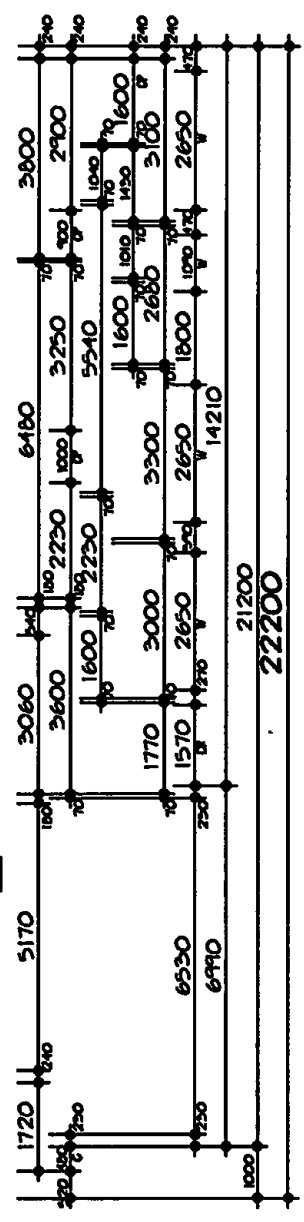
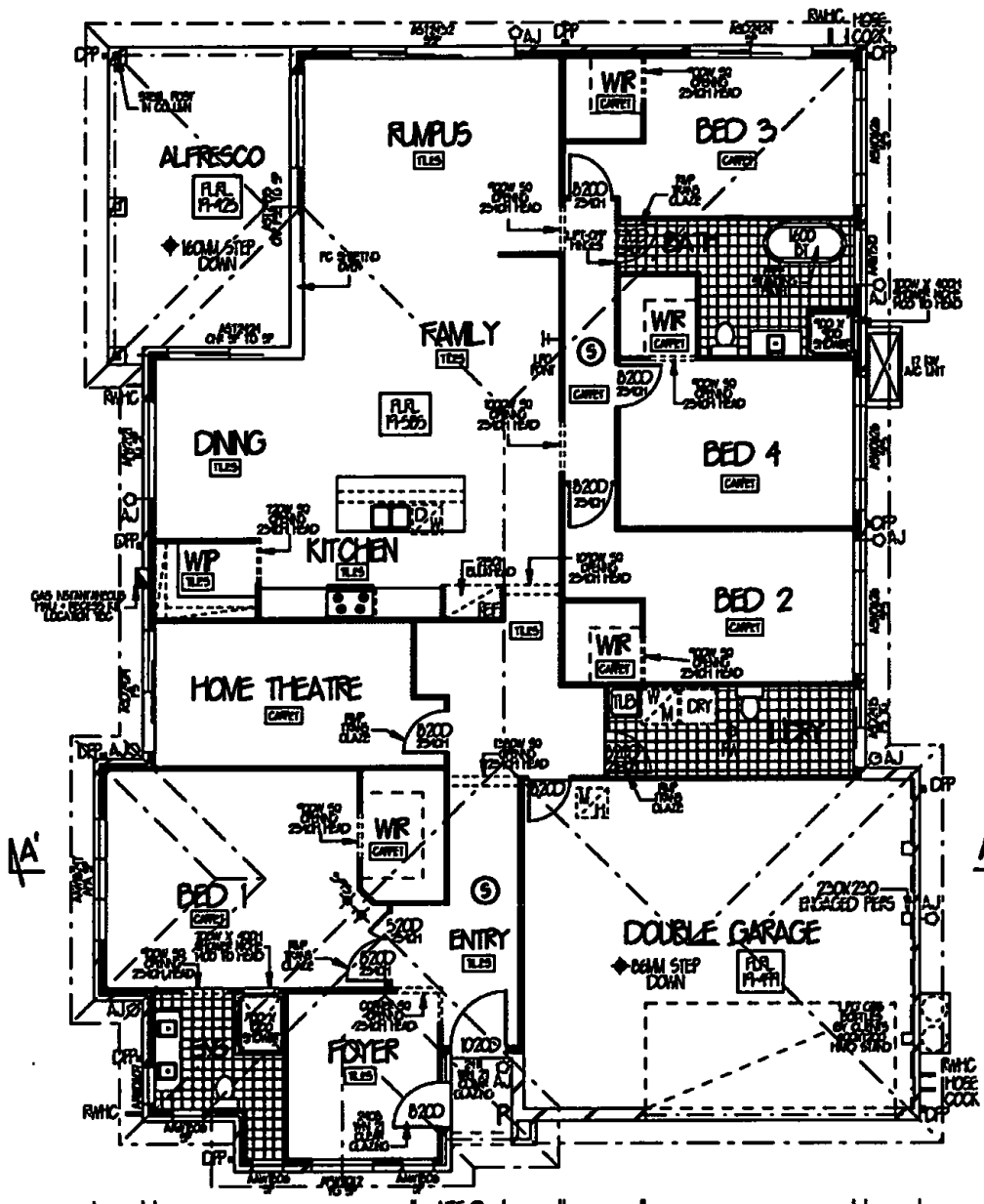
A&N DESIGN GROUP
SYDNEY

THIS SITE IS A DESIGN FOR A 2-3 BED HOUSE WITH 2 BATHS, 2 TOILETS AND 2 CAR SPACES. THE HOUSE IS A 2-3 BED HOUSE WITH 2 BATHS, 2 TOILETS AND 2 CAR SPACES.

REVISION	DATE	BY	CHKD
A	12-11	SITING	CE
B	26-11	CC PLANS	DAV
C	5-12	ARCHITECTURAL	JM
D	12-11	ARCHITECTURAL	JL

THIS DRAWING IS THE PROPERTY OF EDEN BROSE HOMES. REPRODUCTION, COPYING OR USE IN PART OR WHOLE WITHOUT WRITTEN PERMISSION IS STRICTLY PROHIBITED. LEGAL ACTION WILL BE TAKEN AGAINST OFFENDERS.





FLOOR PLAN 1:100

- ⊕ DENOTES ARTICULATION JOINT IN BRICK WORK. FINAL LOCATION TO BE VERIFIED ON SITE BY THE BUILDER IN ACCORDANCE WITH CLAUSE 5.5.4.5 OF THE DCA
- ⊕ DENOTES EXHAUST FAN OVER CONNECTED TO LIGHT SWITCH AND DUCTED EXTERNALLY
- ALL WET AREAS TO BE PROVIDED WITH FLOOR WASTE
- ⑨ DENOTES LOCATION OF SMOKE ALARM

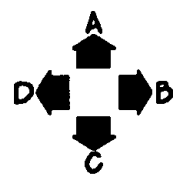
eden brose
 79 where you want to live

LEVEL 3, 22
 BROOKHOLLOW AVENUE
 MONMOUTH BUSINESS PARK
 BULLHORN HILLS NSW 2563
 TEL: (02) 8660 4222
 FAX: (02) 8660 4233

FOR **MR P. S. FINLEY**
 AT LOT 121, 144 MOUNTAIN VIEW
 CLOSE KURRAJONG HILLS

TYPE **NEW 29** JOB NO **0023600**
 LIFESTYLE GENERATION SERIES
 FACADE **HARVARD** HAND **RH**

MASTER **A24938** DWG NO **AND-30524** PAGE NO **3 OF 9**



DRAINAGE POINTS THROUGH WALL & ALLOW ADDITIONAL BRACING FOR FLOATING VANITIES

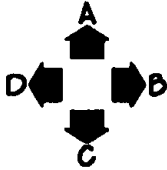
BATHROOM AND ENSUITE SHOWERS TO BE ROOFLESS

A&N
 DESIGN GROUP
 SYDNEY

100% 3 YEAR
 WARRANTY TO 2-27
 10% OFF TOTAL BILLING
 10% OFF TOTAL BILLING
 10% OFF TOTAL BILLING
 10% OFF TOTAL BILLING
 10% OFF TOTAL BILLING

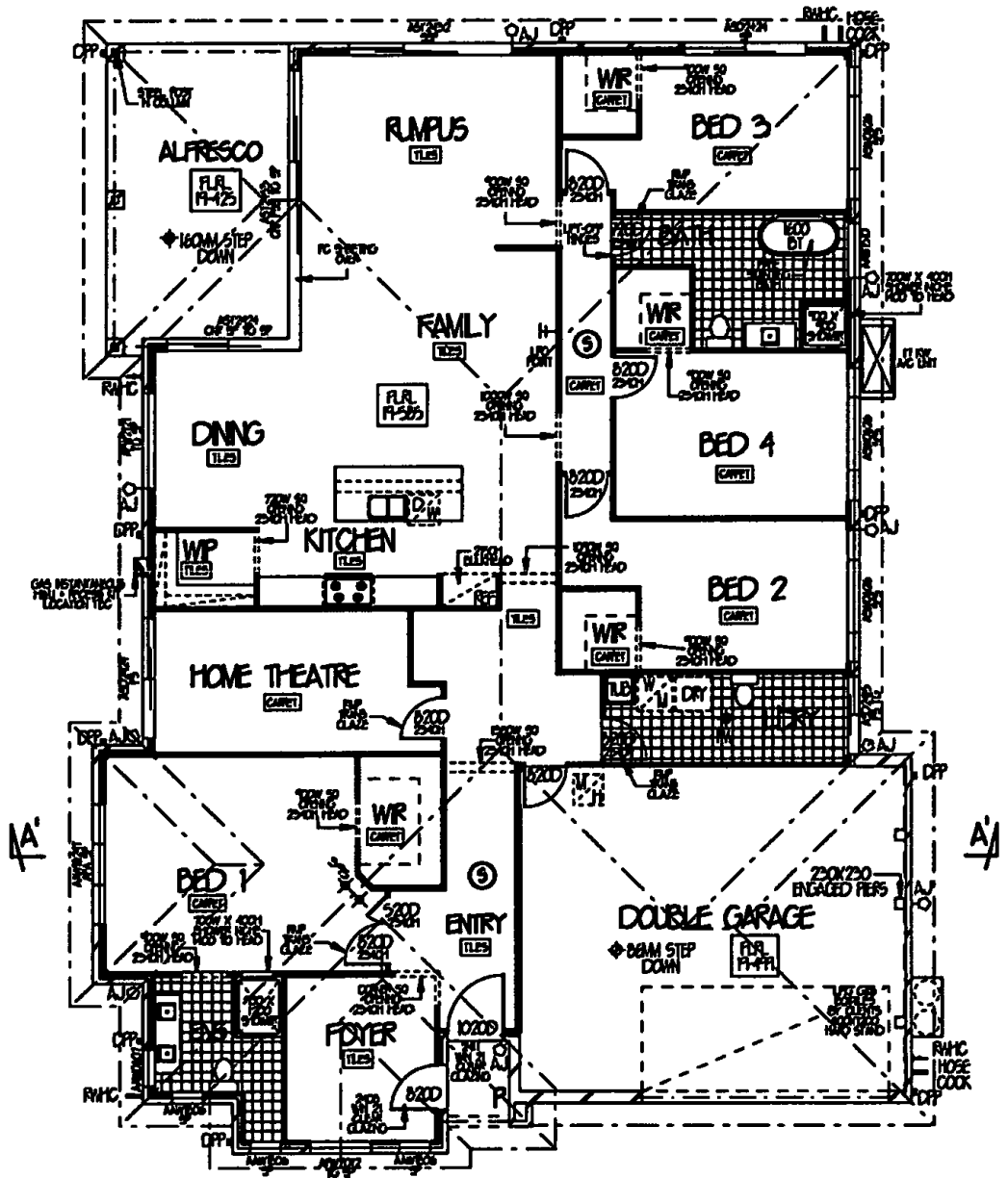
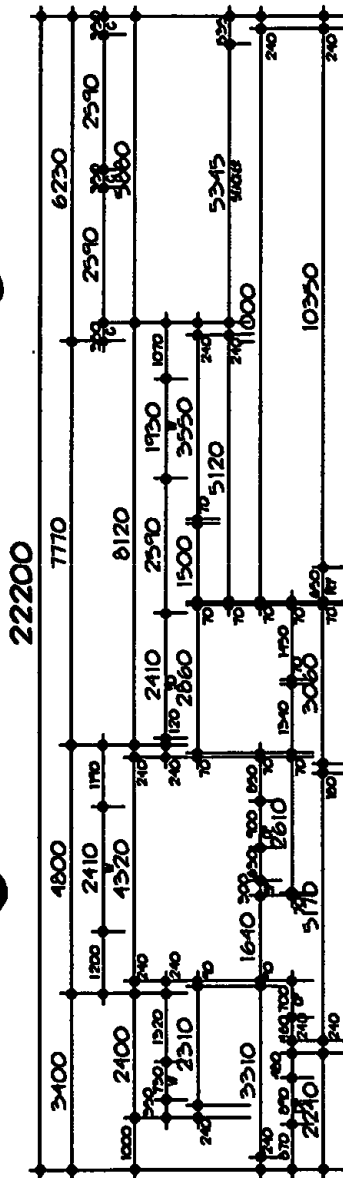
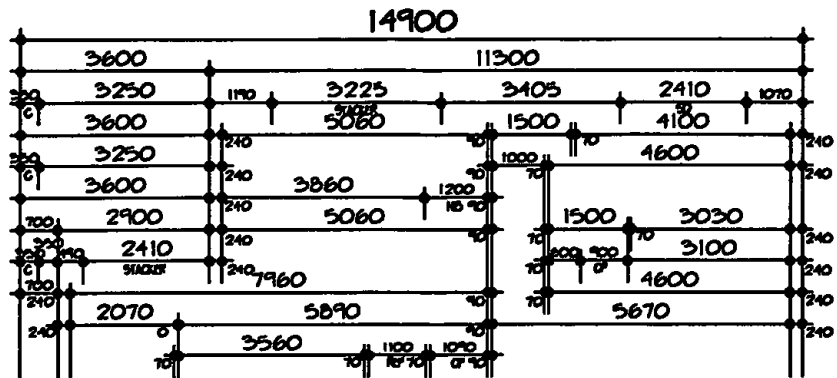
FILE	DATE	REVISION	DRAWN
A	12-21	91111	CE
B	26-21	CC PLANS	DR12
C	2-21	AMENDMENTS	AM
D	12-21	AMENDMENTS	JL

THIS DRAWING IS THE PROPERTY OF EDEN BROSE HOMES. REPRODUCTION COPYING OR USE IN PART OR WHOLE WITHOUT WRITTEN PERMISSION IS STRICTLY PROHIBITED. LEGAL ACTION WILL BE TAKEN AGAINST OFFENDERS.



DRAINAGE POINTS THROUGH WALL & ALLOW ADDITIONAL BRACING FOR FLOATING VANITIES

BATHROOM AND BEDS TO BE FLOORLESS



FLOOR PLAN 1:100

beden brose
 101 WILSON AVENUE
 BULLYHILL HILLS NSW 2153
 TEL: 02 8860 1222
 FAX: 02 8860 1223

LBL 3 22
 BROOKLYN AVENUE
 HOMESIDE BUSINESS PARK
 BULLYHILL HILLS NSW 2153
 TEL: 02 8860 1222
 FAX: 02 8860 1223

FOR **MR P. S. FINLEY**
 AT LOT 121, 144 MOUNTAIN VIEW
 CLOSE KURAJONG HILLS

TYPE **NEW 21** JOB NO **0023600**
 LIFESTYLE GENERATION SERIES
 FACADE **HARVARD** FWD **R1**

MASTER **A24938** DWG NO **AND-30524** PAGE NO **4 OF 9**

A/Q
 DENOTES ARTICULATION JOINT IN
 BRICK WORK FINAL LOCATION TO
 BE VERIFIED ON SITE BY THE
 BUILDER IN ACCORDANCE WITH
 CLAUSE 3-3-1-6 OF THE DCA

DENOTES EXHAUST FAN OVER
 CONNECTED TO LIGHT SWITCH
 AND DUCTED EXTERNALLY

ALL WET AREAS TO BE PROVIDED WITH FLOOR WASTE

⑤ DENOTES LOCATION
 OF SMOKE ALARM



LBL 3 22
 BROOKLYN AVENUE
 HOMESIDE BUSINESS PARK
 BULLYHILL HILLS NSW 2153
 TEL: 02 8860 1222
 FAX: 02 8860 1223

SCALE	DATE	REVISION	DRAWN
A	1-2-11	SITING	CE
B	26-2-11	CC PLANS	DR/JL
C	5-4-11	ALUMINUM	AU
D	12-4-11	APPROVALS	JL

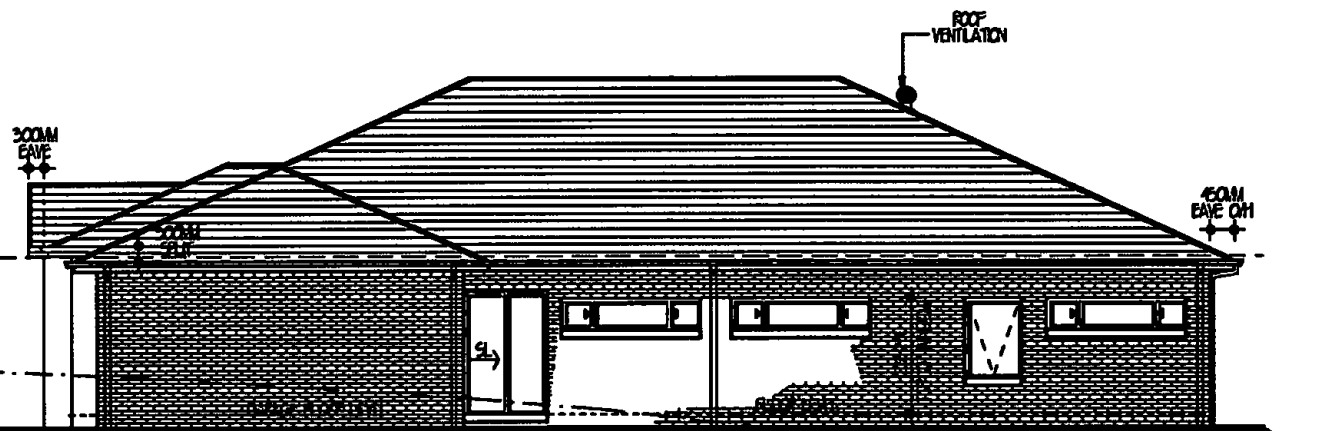
THIS DRAWING IS THE PROPERTY OF BORN DRIVE HOMES
 REPRODUCTION COPYING OR USE IN PART OR WHOLE
 WITHOUT WRITTEN PERMISSION IS STRICTLY PROHIBITED.
 LEGAL ACTION WILL BE TAKEN AGAINST OFFENDERS.




NORTH WEST ELEVATION 1:100




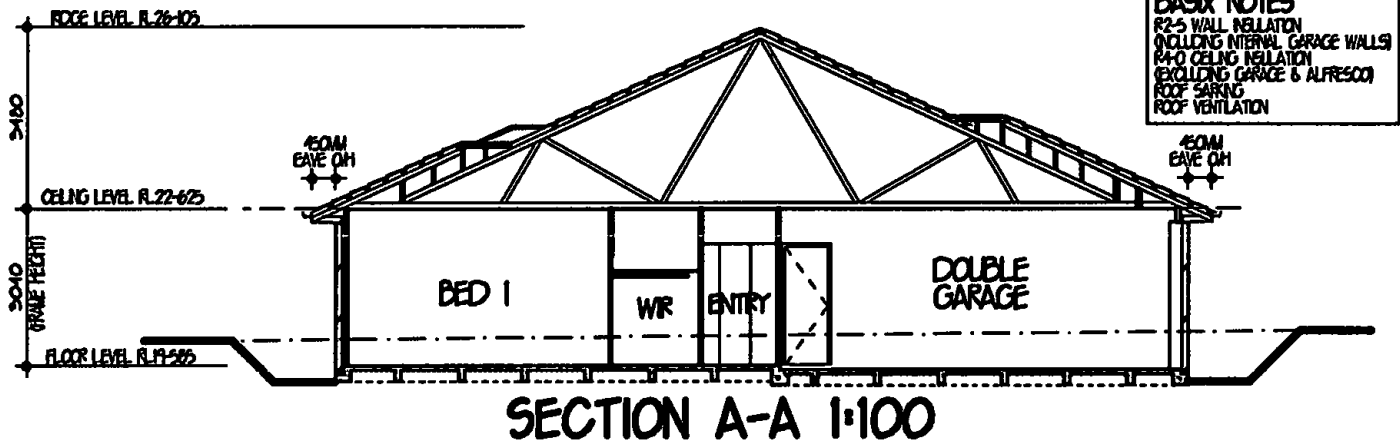
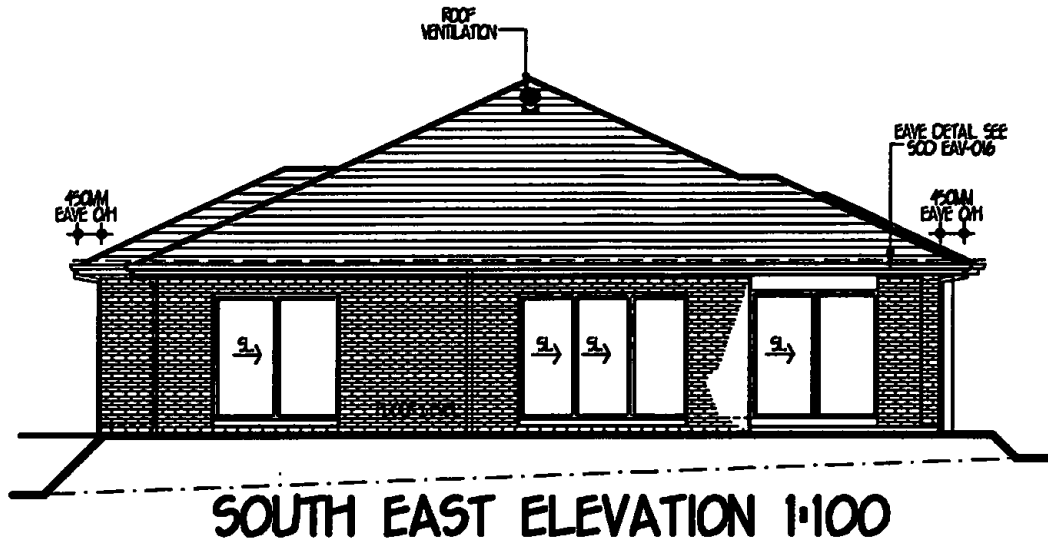
NORTH EAST ELEVATION 1:100



SOUTH WEST ELEVATION 1:100

 <p>LEVEL 3, 22 BROOKHOLLOW AVENUE NORTHWEST BUSINESS PARK BALMAIN HILLS NSW 2630 TEL: (02) 8660 9222 FAX: (02) 8660 9255</p>	
FOR MR P. S. FINLEY	
AT LOT 121, 144 MOUNTAIN VIEW CLOSE KURRAJONG HILLS	
TYPE NEW 21	JOB NO. 0023600
LIFESTYLE GENERATION SERIES	
FACADE HARVARD	PLAN RH
MASTER A24938	PAGE NO. 5 OF 9

 <p>LEVEL 2 SITE 26 BROOKHOLLOW AVENUE NORTHWEST BUSINESS PARK BALMAIN HILLS NSW 2630 TEL: (02) 8660 9222 FAX: (02) 8660 9255</p>			
ISSUE	DATE	REVISION	DRAWN
A	1-2-11	SITING	OF
B	26-2-11	CC PLANS	DAV/AL
C	5-4-11	ARCHITECTURAL	AN
D	12-4-11	ARCHITECTURAL	JL
THIS DRAWING IS THE PROPERTY OF EDEN BRAE HOMES. REPRODUCTION, COPYING OR USE IN PART OR WHOLE WITHOUT WRITTEN PERMISSION IS STRICTLY PROHIBITED. LEGAL ACTION WILL BE TAKEN AGAINST OFFENDERS.			



SUMMARY OF MATERIALS

- 25° ROOF PITCH TERRACOTTA ROOF TILES
- COLORBOND GUTTER & FASCIA
- COLORBOND DOWNPIPES TO BE PAINTED
- PRE-FABRICATED FRAMES & ROOF TRUSSES TO MANUFACTURE SPECIFICATIONS
- DIMENSIONS ARE TO FRAME SIZES ONLY EXCLUDES GYPSOCK & SKIRTINGS THEREFORE THEY ARE NOT FINISHED ROOM SIZES
- FACE BRICKWORK
- ALUMINUM WINDOWS & DOORS
- FRONT ENTRY DOOR & FRAME TO BE STAIN GRADE & STAIN FINISH
- FOYER ENTRY DOOR & FRAME TO BE STAIN GRADE & STAIN FINISH
- SECTIONAL OVERHEAD GARAGE DOOR

LEVEL 3, 22 BROOKLYN AVENUE HOMES BUSINESS PARK BULLHORN HILLS NSW 2153 TEL: 02 8560 9222 FAX: 02 8560 9225	
FOR MR P. S. FINLEY	
AT LOT 121, 144 MOUNTAIN VIEW CLOSE KURRAJONG HILLS	
TYPE KEW 21 LIFESTYLE GENERATION SERIES	JOB NO. 0023600
FACADE HARVARD	HWD RH
MASTER A24938	PAGE NO. 6 OF 9

LEVEL 2 SITE 24 BULLHORN HILLS NSW 2153 TEL: 02 8560 9222 FAX: 02 8560 9225	
SCALE A 1:2-H B 1:2-H C 1:4-H D 1:2-H	DATE 12-11-11 28-11-11 12-11-11 12-11-11
REVISION SITING CC PLANS AMENDMENTS	DRAWN CE DNV AW JL
THIS DRAWING IS THE PROPERTY OF EDEN BROS HOMES REPRODUCTION COPYING OR USE IN PART OR WHOLE WITHOUT WRITTEN PERMISSION IS STRICTLY PROHIBITED. LEGAL ACTION WILL BE TAKEN AGAINST OFFENDERS	

