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Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

REF No. 23.07.240

Address Lot 10 Sect 11 DP 758016

30 Corkery Crescent

Allambie Heights NSW 2100

For Liorra Projects Pty Ltd

The site was inspected on 3rd August 2023

Report Preparation

Craig Burley

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







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Bushfire Risk Assessment Certificate

As required by legislation under section 4.14 of the *Environmental Planning and*Assessment Act 1979

Property Address:	Lot 10 Sect 11 DP 758016 30 Corkery Crescent Allambie Heights NSW 2100
Description of Proposal	New Class 10a building being a carport
Plan Reference: [Relied upon in report preparation]	This assessment is based on plans prepared by: G & G Drafting Services Dated: February 2023 Drawing No: 2301/1 to 3
Bushfire Hazard Assessment Report Ref. No.	23.07.240
Report Date:	12.08.2023
BAL Rating:	BAL Flamezone
Does the proposal comply with the requirements of Planning for Bush Fire Protection 2019?	NO
Does the proposal require referral to the NSW Rural Fire Service?	YES
Does the proposal rely on Alternate Solutions?	YES – Construction to be noncombustible

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 Planning for Bush Fire Protection 2019 together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with section 4.14 of the Environmental Planning and Assessment Act 1979:

- 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 development as contained in the attached Bushfire Hazard Assessment Report does not conform to the relevant specifications and requirements due to the potential exposure of the dwelling to Bushfire Attack Level (BAL) Flamezone.

I am aware that the Bushfire Hazard Assessment Report, prepared for the abovementioned site is to be submitted in support of a development application for this site and will be relied upon by Northern Beaches 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* 2019.

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 Liorra Projects Pty Ltd on behalf of the owners of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Northern Beaches Council, for the proposed construction of a new Class 10a building being a carport 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* 2019 and this report has been prepared in accordance with the requirements of *Section 4.14 of the Environmental Planning and Assessment Act 1979.*

Bushfire Attack Summary Lot 10 Sect 11 DP 758016 30 Corkery Crescent Allambie Heights NSW 2100

Northeast

Vegetation Formation	Forest (Area A)
Vegetation Slope	Downslope > 15 to 20 degrees
Building Separation Distance metres	16.5
Separation Slope	Downslope > 5 to 10 degrees
Fire Danger Index	100
AS 3959 Construction Standard	BAL Flamezone

The proposal contained within this report cannot provide for conformity to *Planning for Bush Fire Protection* 2019 and therefore includes an *alternate solution* which 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 defendable space for fire fighters.

Table of Contents

1.0	Intro	oduction1			
	1.1 1.2 1.3 1.4 1.5	Purpose of Report1Scope of Report1Regulatory Controls1Methodology2The Proposal2			
2.0	Site	Site and Adjacent Developments 3			
	2.1 2.2	Site Description			
3.0	Environmental Considerations 6				
4.0	Bushfire Hazard Assessment				
	4.1	Classification of Vegetation and Separation Distance from Proposed Development			
	4.2 4.3	Slope Assessment			
5.0 Assessment of the extent to which the development conforms or d from <i>Planning for Bush Fire Protection</i> 20199					
	5.1 5.2 5.3 5.4 5.5 5.6	Asset Protection Zones			
6.0	Bush	nfire Hazard Assessment Recommendations14			
7.0	Con	Conclusion			
Refe	renc	es16			

Appendix 1 – Proposed development plans ex G & G Drafting Services

Document Control

Revision No.	Author	Status	Date
01	Craig Burley	Final	12.08.2023

1.0 Introduction

We have been engaged by Liorra Projects Pty Ltd on behalf of the owners of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Northern Beaches Council, for the proposed construction of a new Class 10a building being a carport 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* 2019 and this report has been prepared in accordance with the requirements of *Section 4.14 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 2019;
 and
- To assess the proposed construction with reference to the National Construction Code of Australia Volume 2; and
- To determine the level of construction with reference to AS 3959-2018 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 Northern Beaches 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 National Construction Code of Australia, *Planning for Bush Fire Protection* 2019 and AS 3959-2018 *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 3rd August 2023 and a review of the proposed construction plans as supplied by Liorra Projects Pty Ltd and prepared by G & G Drafting Services 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* 2019 and AS 3959-2018 *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 Class 10a building being a carport to be located directly adjacent to the south western elevation of the existing Class 1a dwelling.

It should be noted that the proposed carport does not attach to or penetrate any areas of the existing dwelling.

The carport is to be constructed using all steel products with no combustible building materials.

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 10 Sect 11 DP 758016

30 Corkery Crescent

Allambie Heights NSW 2100 LGA Northern Beaches Council



Figure 1: Address validation ex NSW Planning Portal

The subject allotment was created prior to the current subdivisional requirements contained within *Planning for Bush Fire Protection* 2019.

The site is a residential allotment of approximately 651.9m² located on the north eastern side of Corkery Crescent. The area in which the proposal is located is generally urban residential 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 north easterly aspect slopes of a southeast to northwest ridgeline.

The parcel of land is slightly irregular in shape and the south western boundary is the road frontage and creates vehicle access to the subject site.

At present the site has structural improvements to be an existing Class 1a dwelling and a swimming pool positioned directly adjacent to the north eastern elevation of the dwelling.

In terms of vegetation the subject allotment contains no significant sections of bushfire hazardous vegetation and currently consists of well maintained gardens and lawns.

The site is shown upon the Northern Beaches Bushfire Prone Land Map (Figure 2) to be wholly within category 1 vegetation buffer zone (shown yellow). The site inspection and interpretation of aerial photography for the site confirms that the subject allotment is reasonably depicted upon this image.

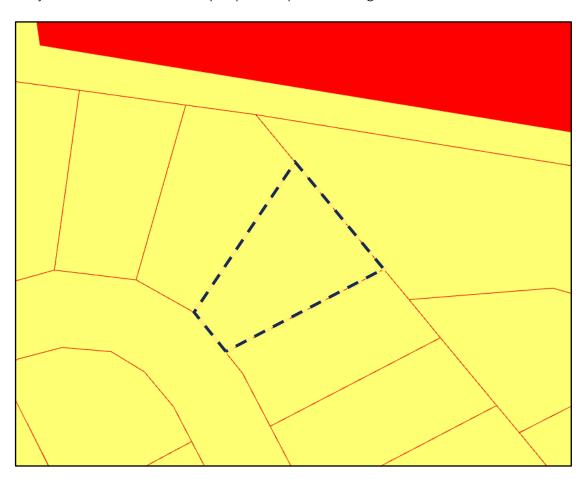


Figure 2; Section Northern Beaches LGA Bushfire Prone Land Map ex NSW Planning Portal

Provision of mains reticulated water supply, electricity and phone is available to the proposal by existing infrastructure.

2.2 Description of Adjoining Lands

To the north of the subject allotment is a large area of forest vegetation on the descending slopes that descend away from the subject allotment.

In each other direction is existing residential development that does not contain any significant sections of bushfire hazardous vegetation.



Figure 3: Aerial photo depicting localised terrain and adjoining allotments ex Nearmap

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 not necessitate the removal 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.

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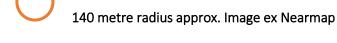
4.0 Bushfire Hazard Assessment

The bushfire hazard assessment was conducted for the proposed development, using the procedures as outlined in *Planning for Bush Fire Protection* 2019 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



Forest

Proposed carport location

To the **northeast** of the subject allotment (Area A) is an area of effective bushfire hazardous vegetation and this area should be classified as being a vegetation formation of **Forest** with a minimum separation distance of **16.5 metres**.

N

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 *Planning for Bush Fire Protection* 2019.



Figure 5; Slope assessment study area contour data ex Geoscience Australia

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 - > 15 to 20 degrees downslope (assumed) (elevation 27.15 met / dist. 83.45 met = 18.02 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 *Planning for Bush Fire Protection* 2019.

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 BAL Flamezone category of bushfire attack. The proposed development is most likely to be subject to the greatest bushfire attack from any area to the northeast from the proposed development location.

Bushfire Attack Summary

Northeast

Vegetation Formation	Forest (Area A)
Vegetation Slope	Downslope > 15 to 20 degrees
Building Separation Distance metres	16.5
Separation Slope	Downslope > 5 to 10 degrees
Fire Danger Index	100
AS 3959 Construction Standard	BAL Flamezone

5.0 Assessment of the extent to which the development conforms or deviates from *Planning for Bush Fire Protection* 2019

The proposed development being the construction of a new Class 10a building being a carport cannot conform to the requirements of *Planning for Bush Fire Protection* 2019 when considered in conjunction of both the proposal supplied for this assessment and the recommendations include *alternate solutions* within this bushfire hazard assessment report.

The subject parcel of land was subdivided prior to the current requirements for developments in bushfire prone areas. If this allotment was proposed to be created under current requirements it would not be approved due to the inability of the site to provide a building envelop with radiant heat < 29kw/m² or eliminate potential flame contact.

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* 2019.

The maintenance of the majority of area upon the subject allotment currently would satisfy the requirements of an inner protection area of an asset protection zone as contained in *Planning for Bush Fire Protection* 2019.

This report will recommend that the entire 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.

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* 2019 and NSW RFS *Standards for Asset Protection Zones*.

Inner Protection Area (IPA)

The IPA is the area closest to the building and creates a fuel management area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 10cm in height and be discontinuous.

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

When establishing and maintaining in IPA the following requirements apply; Trees

- tree canopy cover should be listed 15% at maturity;
- trees at maturity should not touch your overhang the building;
- lower limbs should be removed to a height of two metres above the ground;
- preference should be given to smooth bark and Evergreen trees

Shrubs

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

Grass

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

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 carport 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 National Construction Code 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 National Construction Code of Australia Vol. 2, a Class 1a 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 3959-2018 Construction of buildings in bushfire prone areas is referenced by the NCC 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 section 7.5.2 Additional construction requirements of *Planning for Bushfire Protection* 2019.

However, the Flamezone category of bushfire attack in NSW is beyond the scope of the standard and as such the proposed dwelling construction must incorporate by means of alternate solutions such measures to improve the likelihood of building survival and satisfy the performance requirements of the National Construction Code.

In this instance the proposed carport is totally shielded from the vegetation hazard by the existing dwelling and the plans show that the structure will be built using steel materials. The carport also does not attach to or in any way penetrate thy external fabric of the existing dwelling.

In this instance the application of AS 3959-2018 *Construction of buildings in bushfire prone areas* is not appropriate and this report will only recommend that the new carport is constructed using non-combustible materials.

5.4 Access / Egress

5.4.1 To the Proposed Development

The access to the subject site is from Corkery Crescent 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.

Corkery Crescent links to other through roads at each end which would afford the residents the ability to evacuate the area to a location not being directly implicated by the mechanisms of bushfire attack, although under most bushfire conditions this would generally not be required.

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 south western building elevation upon the Corkery Crescent 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

This section of Allambie Heights is serviced by a mains reticulated water system and a search of the mains reticulated water supply layout plans (see figure 6 below) indicates that a hydrant is located approximately 12 metres to the northwest from the subject allotment on the footpath area of Corkery Crescent. The site inspection confirmed the location of this hydrant.

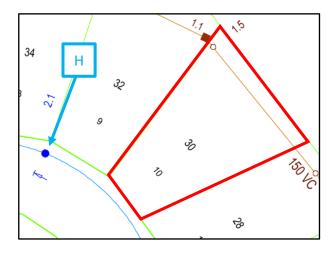


Figure 6: Section Sydney Water Reticulated Mains Water Supply Layout Plans

The location of this hydrant and the distance to the furthest point of the dwelling satisfies the requirements of *Planning for Bush Fire Protection* 2019 and the provisions of AS 2419.1-2005 *Fire hydrant installations*.

5.5.2 Electricity

The existing dwelling is connected to the mains electricity supply from overhead wiring within the carriageway of Corkery Crescent. The wiring is also brought to the house by overhead wiring and the proposed scope of works does not alter or modify this connection methodology.

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 and Rescue 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 entire site where not built upon shall have the vegetation reduced where or if necessary to satisfy the requirements of *Planning for Bush Fire Protection* 2019 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.
- 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 new carport is constructed using non combustible building materials.

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 National Construction Code Volume 2 and the document *Planning for Bush Fire Protection* 2019 will be achieved by the incorporation of the 3 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 defendable space for fire fighters.



Craig Burley
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FPA Australia Certified BPAD – Level 3 Practitioner



Caveat

Quote from Planning for Bush Fire Protection 2006, 'not withstanding 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

<u>Planning for Bush Fire Protection 2019</u> Planning NSW in conjunction with NSW Rural Fire Service

Building Code of Australia Volume 2 2013 Australian Building Codes Board

AS 3959 –2018 Construction of buildings in bushfire prone areas Standards Australia & Australian Building Codes Board

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

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

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

<u>Performance of Building Elements in Bushfire Prone Areas</u> 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

<u>Ocean Shores to Dessert Dunes</u> Keith D. Department of Environment and Conservation Sydney 2004

Appendix 1- Proposed development plans ex G & G Drafting Services

3 10 SITE AREA 651.9m² CONCRETE 10600 CORKERY SITE PLAN proposed carport

NOTE TO BUILDER

I. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ATTACHED BASIX CERTIFICATE, BUILDER TO OBSERVE ALL COMMITTMENTS LISTED WITHIN.

ALL BOUNDARIES ARE TO BE IDENTIFIED AND OFFSETS TO BOUNDARY ARE TO BE CONFIRMED PRIOR TO CONSTRUCTION.

ALL DIMENSIONS ARE TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

REV. No DESCRIPTION DATE

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PROJECT: PROPOSED NEW CARPORT AT

30 CORKERY CRESCENT

ALLAMBIE HEIGHTS

Dwg. No: 2301/1	Date: FEB. '23
2301/1	Scale: 1:200
	SHEET 1 OF 3

