CERTIFIED SHADOW DIAGRAM



NOTES

- 1. Trees, landscape omitted from calculations
- 2. Side Fence / Existing retaining walls shown as Existing Shadow.
- 3. True north used as solar north.
- 4. Terrain is approximate outside of the site
- 5. Limited survey information available on adjoining sites.
- 6. Winter solstice 21 June
- Time Zone AEST unless noted (Aust. Eastern Standard Time - AEST)

DATA SOURCE (in order of precedence)

- •Registered Survey Embedded into Architectural Plans
- Architectural Plans Du Plessis + Du Plessis (via Drafting Help), Ref; 10 Kangaroo DA DWG file 15/12/20 issue.
- Note: Existing main dwelling has been estimated from secondary sources in regard to roof geometry and gutter/ridge heights.
- Note: Neighbour details are indicative only, no height or detail data available.



































NORTHERN BEACHES COUNCIL

CERTIFICATION OF SHADOW DIAGRAMS

MADE UNDER THE WARRINGAH LOCAL ENVIRONMENTAL PLAN 2000 OR 200

Contact Us		Office U	Office Use Only								
The Genera Customer S	al Manager, 725 Pittwater Road, Dee Why NSW 2099 or Service Centre, Northern Beaches Council DX9118 Dee Why										
Email	council@warringah.nsw.gov.au										
Fax 9942 2606		-									
lf you need (02) 9942 2	help lodging your application call Customer Service on 111 or come in and talk to us at the Civic Centre, Dee Why.										

Part 1: Declaration

1. DECLARATION					
I hereby certify that the shadow	diagrams submitted with the proposal at				
	10 KANGAROO STREET,				
Actiess	MANLY NSW 2095				
	ALTERATIONS & ADDITIONS TO EXISTING 2/3 STOREY SINGLE DWELLING HOUSE.				
For the erection of					
Description of development					
In accordance with the surve	y (prepared by a registered surveyor) which is required to be submitted with the application				
 Drawn to true north 					

- Indicate shadow cast by the proposal at 9am, noon, 3pm, 21 June
- To indicate the shadow cast by existing buildings and structures on the site and in the surrounding area

Part 2: Certification

2. CERTIFIER					
Title	Mr Mrs Ms	O Other			
Full family name (no initials) (or Company)	mcfadzean				
Full given names (no initials) (or A.C.N)	cameron	3			
Phone .	0409243316	Alternate			
Mobile		Fax			
Qualification (i.e. Architect, Planner, Computer Technician, Surveyor)	Registered Architect NSW No. 8750				

Part 3: Signature

3. APPLICANT(S) SIGN	ATURE	
Signature	- AA	
Date	18.12.2020	

northernbeaches.nsw.gov.au





SHADOW DIAGRAM CERTIFICATION

NUMBER:	SDC176401
DATE:	15.12.20
PROJECT:	10 Kangaroo Street Manly NSW
CLIENT:	Peter & Anna Litlleboy - Du Plessis + Du Plessis Architects 8 Artillery Drive Manly NSW 2095

CERTIFICATION FOR :						
DA	L&E	EXPERT	CONSULTAN			
\boxtimes			Primary			
DA council	All Other	Expert Witness	Other			
application	Planning	Statement				
	Documentation					
DOCUMENT CONTENTS:						
CERTIFICATE		Statement	Process			
\square			\boxtimes			
This Page		ITEM 2	ITEM 3			

I hereby certify that the shadow diagrams provided for this proposed design are accurate and in accordance with the following information.

This certification is applicable only to the shadow diagrams produced as listed below.

CERTIFICATION DETAILS FOR SHADOW DIAGRAMS					
Project Details	10 Kangaroo Street Manly. As detailed in DA Plans provided by Du Plessis + Du Plessis Architects ,DuPlesis (Via Drafting Help) Ref 10 Kangaroo DA, DWG File 15.12.20 issue				
Applicable for Shadow Diagrams Numbered	SD 01 +				
Issue	Version 01				
Dated					
ACCURACY DETAILS	DATA	TOLERANCE			
Existing Building					
Neighbouring Buildings	embedded into Architectural Plans	+/- 150mm Replication of Survey data.			
Topography and Site					
Proposed Design	Architectural Plans	+/- 150mm			
RL critical heights	Architectural Plans & Survey	+/- 40mm			
PRECEDENCE RULE - DATA					
1. Survey 2. Architectural Plans 3. Aerial Photography					

CERTIFIER SIGNED:

Cameron McFadzean

Certifier: Cameron McFadzean Registered Architect NSW 8750, BA (Architecture) B Architecture, AssessorABSA, AssocIES Deneb Design

ITEM 1 and 2 not required

ITEM 3. PROCESS OF SHADOW DIAGRAM PRODUCTION - post June 2020 issue

A brief summation of the process of digital shadow production used by Deneb Design follows.

1. 3D Model created from information in typical order of precedence: (refer to specific documents for variation to this order of precedence). Survey Plan 1.1

1.2 Architectural Models (3D) and Elevations

Architectural Plans 1.3

Site Photos / Aerial images. 1.4

The accuracy of the translation of these data sources are provided in the certification document. Where accuracy and validity cannot be determined the tolerances are not stated. The tolerances stated are median figures gathered from self auditing process. It is not uncommon for different data sources to contain discrepancies, hence the precedence rule. 2. Sunlight System

Daylight system – a photometrical physically-based light source, based on IES standards (Illuminating Engineering Society) is positioned within the model using True North orientation (derived from Plans/Survey). Date and Time values are set, and these are processed internally by computer algorithms (MAX) to determine azimuth and altitude. The altitude and azimuth angles are available upon request. Pre June 2020 – Mental Ray raytracing engine is used. Post June 2020 - Vray Brute Force ray tracing engine is used. Shadow Image з.

For each and every time slot a image is rendered using the 3D model and daylight system for every component of the shadow set. A single time slot may consist of several (typically 4) shadow types. Due to render resolution and edge bluriness, particularly in low light where the shadow cast becomes difficult to differentiate accuracy tolerance is determined as a percentage across the entire image. This is as low as 0.5%, however due to the number of passes and composition of the final shadow image this tolerance is indicated as a higher figure and shown in the certification document. Refer also to dynamic range and thresholds for more information. Typical image slots:

- 3.1 Neighboring structures and ground / terrain and other features.
- 3.2
- Neighboring shadows cast Existing Building (if present) and existing shadow cast 3.2
 - Proposed Building and proposed shadow cast Other Stages or variations if required.
- 3.3 3.4 Composition

5.2

Composition is the ordering and opacity of the image slots. The rendered image slots are compositioned and coloured/separated to create a shadow diagram showing different shadowing of elements – self, existing, proposed, additional etc. This process is subject to human compositioning error only – ie it is either accurate or has an obvious error related to composition – Deneb Design work procedures determine a sequence of steps which has reduced this compositional error to nearly zero occurrence. This composition can include numerous options as per the clients direction. Algorithms are used to analyse the pixels of each render to determine shadow cast - refer to item 7. Scripts are used to automate the procedure of taking three common shadows – proposed, existing and neighbor, and translating these into more meaningful Reduced, Identical and Additional. 5. Shadow Types – Classifications

A typical shadow diagram has several different shadow types shown. Not all shadow diagrams have all of these types. Existing Building and Shadow - The existing building is 3D modeled and the shadow that is cast is called the existing shadow. 5.1



Proposed Building (Orange) and Shadow – The proposed building is modeled and typically shown in PLAN. The shadow cast from this proposed building is called the proposed shadow. This is typically not show by itself – and is divided into IDENTICAL and REDUCED Shadow types.

and ADDITIONAL shadow types. REDUCED Shadow (Green Dot) – The reduced shadow is determined by comparing the existing shadow and the proposed shadow. The proposed shadow is removed from the existing shadow, with any remaining existing shadow now called the

reduced shadow. (function is: Existing – Proposed = Reduced Shadow) IDENTICAL Shadow (Black Dot) - This is the shadow where the existing and proposed shadows coincide – ie the are both the

Same. (function is: Proposed = Existing) ADDITIONAL Shadow – (Red Dot) - the additional shadow is determined by comparing the existing shadow and the proposed shadow. The existing shadow is removed from the proposed shadow, with any remaining proposed shadow now called the Additional Shadow. (function is: Proposed – Existing = Additional Shadow) Neighbor Buildings – Where these are 3D all shadows will be cast across the 3D building. This is important where the chadow sector except a torong a part that the reader to the well. This will be used to the chadow torong the well is PLAN.

shadow casts across a terrain and then travels up the wall. This will show the shadow terminating at the wall in PLAN. If sufficient shadow cast extends over the top of the wall then it will be shown on the roof (and be visible in PLAN). NEIGHBOR Shadows (grey stripe)- these are shadows cast from neighbor buildings. For clarity of comparison these are shown in combination with all other shadows. Ie We show the existing &/or proposed shadow falling over the top of the neighbor shadow. This is important when considering solar access. Ie the neighbor shadow does not remove the overshadowing of either existing or proposed. This methodology has been brought about by the established "tradition" of not showing any neighbor shadows, and by the complication that not all neighbor buildings can be modeled if they are not on Survey. The methodology of classifying structures into existing, proposed is clearly defined by the architectural plans depicting the

proposed works and existing conditions. Typically the survey is used for the existing conditions. The methodology o classifying structures into the neighbor category has some scope which is typically documented and detailed in the plans themselves. Generally most items not within the site boundary are treated as neighbor structures. Existing fences are typically treated as neighbor structures.

6. Lavout

Each image time slot in composition becomes a single shadow image. These shadow images are positioned in page with time stamps and titles placed alongside. Deneb Design work procedure has a code checking system to assist in ensuring the correct shadow image is placed in the correct place on the page. This procedure is semi-automated and human error can occur. Self auditing has revealed a <1% occurrence. Shadow Parts and edge accuracy.

The daylight system used in the production of the shadows produces photo-real shadows that have a Umbra (dark part) and a Penumbra (gradient from dark to light). This is most obvious in low sun angles, where the shadows are long. As the length of the shadow increases the edge of it becomes "blurry". An algorithm analysis each render for the dynamic range to determine where to classify the shadow – ie it determines a threshold value for the greyscale shadow cast. The notion of dynamic range is important to this algorithm for instance in low light (low sun and terrain sloping away from the light) the dynamic range (difference between black and white) in the render is small – thereby reducing the ability to accurately classify the shadow cast. Pre June2020 - Mental Ray raytracing engine . Post June 2020 - Vray brute force engine - which enables more control of these elements for sharper edge definition when required.

Solar Calculations

8.1 Methodology and accuracy - Where provided the solar calculations provide numerical areas to various shadow areas - ie existing and proposed. Reference to the definitions in this document is required. The areas are calculated by an algorithm analyzing the shadow area (refer to item 7) and returning a pixel count. This pixel count is then scaled to appropriate unit conversion (typically m2). Due to the item 7 consideration and the scaling effect a tolerance expressed as a % of total image is given. A manual system of translating the area values into a presentation table is used and subject to human error. Several formulas are used within the table to express comparative analysis (% change etc) and these are also subject to human error.



8.