



SUN STUDY REPORT

**401-403 Parnell Road,
Parnell**

Prepared for

Andra Trading Ltd

Job Number

PARN401-403

Date

2/26/20

METHODOLOGY

The following dates were looked at: December 22nd, April 22nd, June 21st, September 21st. Sun studies were built using Sun Study tool from GRAPHISOFT Archicad 22 from sunrises to sunsets with 30 mins intervals. Allowed structure and proposed structure were compared and cases where effect from shading on the buildings in question differed were taken for further investigation.

Data from the National Institute of Water and Atmospheric (niwa.co.nz) was researched to find out an average amount of sunshine in Auckland per month.

Mean monthly total sunshine (hours)												
Data are mean monthly values for the 1981-2010 period for locations having at least 5 complete years of data												
Station details are available in separate table												
LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Kaitaia	223.5	201.7	201.1	160.6	143.0	126.8	138.6	161.8	165.3	190.7	192.7	209.9
Auckland	228.8	194.9	189.2	157.3	139.8	110.3	128.1	142.9	148.6	178.1	188.1	197.2
Tauranga	261.5	217.3	214.0	183.9	165.3	135.4	151.0	173.4	174.1	212.7	224.2	232.7
Hamilton	229.8	192.9	193.3	165.1	138.3	112.8	126.4	144.1	147.5	174.8	187.1	207.6
Rotorua	242.9	205.9	199.7	170.5	145.1	119.1	130.7	152.1	155.1	190.8	200.1	215.8
Gisborne	249.9	200.7	190.7	164.9	145.6	128.6	124.1	163.3	180.7	219.4	217.5	232.4
Taupo	224.3	202.6	179.7	156.3	126.3	96.1	116.5	134.6	140.0	179.6	190.4	204.6
New Plymo	248.4	225.0	212.8	177.8	143.9	118.1	138.0	162.7	162.6	189.6	206.9	211.6
Napier	249.3	202.6	201.7	172.4	155.6	130.7	134.7	166.8	181.2	213.9	216.2	233.7
Wanganui	250.2	213.5	192.1	159.4	129.0	99.2	120.7	137.8	147.5	180.1	203.6	221.9
Palmerston	212.4	191.0	173.5	145.6	109.3	79.1	103.8	119.9	124.2	142.6	165.3	176.7
Masterton	238.6	204.4	169.2	155.6	132.0	99.9	114.9	128.6	148.0	184.0	185.6	221.3
Wellington	246.9	210.9	205.2	161.3	132.7	99.1	118.9	147.3	163.2	192.8	209.3	222.8
Nelson	267.5	231.4	230.4	196.2	175.7	143.3	159.0	182.2	189.3	221.4	234.9	241.1
Blenheim	262.2	223.7	230.8	193.7	172.7	151.6	157.1	183.9	189.5	226.7	234.7	248.8
Westport	213.0	174.9	164.2	151.5	114.7	93.4	120.7	118.6	138.9	158.4	171.7	179.4
Kaikoura	247.8	193.8	183.8	173.3	145.8	118.8	136.9	155.7	175.9	194.2	198.7	212.4
Hokitika	219.5	187.4	177.3	146.7	119.1	98.7	126.1	136.7	141.0	167.8	184.0	189.4
Christchurc	237.9	195.0	191.2	162.6	140.8	117.1	127.1	153.9	169.5	203.8	223.7	219.9
Mt Cook	184.8	167.2	151.1	125.3	92.1	66.1	74.5	113.0	130.3	149.4	158.5	168.7
Lake Tekap	253.8	220.9	230.9	199.4	145.4	139.9	149.7	170.1	200.0	231.7	241.5	234.0
Timaru	192.7	170.2	168.6	158.0	130.1	121.0	131.0	151.5	156.5	183.4	189.0	179.7
Queenstow	230.3	207.3	187.0	145.4	87.8	71.8	88.3	120.0	153.6	197.7	216.6	223.5
Alexandra	231.4	199.8	193.7	158.2	121.2	87.1	90.7	135.9	164.7	193.9	214.1	215.0
Te Anau	184.2	178.5	152.9	125.3	84.8	64.9	66.0	115.6	138.4	178.6	192.3	180.1
Dunedin	179.6	158.0	146.1	125.9	108.4	95.3	110.6	122.2	136.8	165.5	166.9	168.3
Invercargill	185.9	167.2	142.6	117.2	87.5	78.7	97.9	123.0	139.8	173.0	181.3	188.2
Chatham Is	191.3	145.5	124.2	106.3	81.2	61.8	74.4	101.0	109.1	129.7	148.9	164.0

Retrieved from: <https://niwa.co.nz/education-and-training/schools/resources/climate/sunshine>

The total amount of daylight for all chosen dates were found using Timeanddate.com (<https://www.timeanddate.com/sun/new-zealand/auckland?month=12>). Average percentage of sunshine in a day was determined with a subsequent determination of an average percentage of sunshine in 30 mins intervals in order to find out the percentage of loss of total available sunshine by a particular window. The found data was then compared between allowed structure and proposed in order to find out a significance of a protruded shadow from a proposed building with significant height infringement.

















Key:

	- non shaded (full sunshine)
	- half shaded (0.5 of full sunshine)
	- non shaded (0 of full sunshine)

Windows labelling:



Video links:

	DECEMBER	APRIL	JUNE	SEPTEMBER
ALLOWED				
				
PROPOSED				
				

14A BIRDWOOD CRESCENT

14A Birdwood Crescent is a 2 storey residential building located at the back of 401-403 Parnell Road. It will be mostly overshadowed by any new building built to allowable boundaries in mornings before 12pm. There are no effects after that time.

As per our study and calculations shown in calculations section, the difference in shading between allowed and proposed structure will be maximum of 2.17% for one window (Window 4 will be receiving 2.17% less sunshine if a proposed structure is erected versus allowed envelope). There is no effect for a majority of other windows.

14A Birdwood Cr				
DIFFERENCE				
	December	April	June	September
W1	0.76%	0.00%	0.00%	0.00%
W2	1.51%	0.00%	0.00%	0.86%
W3	0.76%	0.00%	0.00%	0.00%
W4	0.00%	2.17%	0.00%	0.86%
W5	0.00%	0.00%	0.00%	0.00%

2/16 BIRDWOOD CRESCENT

2/16A Birdwood Crescent is a 2 storey residential building located on the South side to the back of 401-403 Parnell Road. It will be mostly overshadowed by any new building built to allowable boundaries in mornings before 1 pm. There are no effects after that time.

As per our study and calculations shown in calculations section, the difference in shading between allowed and proposed structure will be maximum of 12.22% for Window 4 and 11.20% for window 5 in June (Window 4 will be receiving 11.20% less sunshine in June if a proposed structure is erected versus allowed envelope). There are no major effects for other windows.

2/16 Birdwood Cr				
DIFFERENCE				
	December	April	June	September
W1	0.00%	3.25%	0.00%	3.44%
W2	0.00%	7.58%	0.00%	0.00%
W3	0.00%	3.25%	8.15%	0.00%
W4	0.00%	1.08%	12.22%	0.00%
W5	0.00%	0.00%	11.20%	0.00%
W6	0.00%	3.25%	4.07%	0.00%
W7	0.00%	6.50%	1.02%	0.00%
W8	0.00%	7.58%	0.00%	0.00%
W9	0.00%	1.08%	0.00%	2.58%
W10	0.00%	1.08%	0.00%	2.58%



CALCULATIONS: DECEMBER 22nd

December		
Days per month	31	day
Sunshine hours per month (niwa.co.nz)	197.2	hours

December, 22nd	
Day length, hrs	14.5
Sunshine per day, hrs	6.4
Percentage of sunshine per day	43.87%
Percentage of 30mins intervals from total day length	3.45%
Percentage of total sunshine per day in 30 mins intervals	1.51%

ALLOWED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
DECEMBER	9:28					
	9:58					
	10:28					

PROPOSED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
DECEMBER	9:28					
	9:58					
	10:28					

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	0.76%
W2	0.76%
W3	3.78%
W4	
W5	

PROPOSED	
W1	1.51%
W2	2.27%
W3	4.54%
W4	
W5	

CALCULATIONS: APRIL 22nd

April		
Days per month	30	days
Sunshine hours per month (niwa.co.nz)	157.3	hours

April, 22 nd		
Day length, hrs	11	
Sunshine per day, hrs	5.2	
Percentage of sunshine per day		47.67%
Percentage of 30mins intervals from total day length		4.55%
Percentage of total sunshine per day in 30 mins intervals		2.17%

ALLOWED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
APRIL	9:22					
	9:52					
	10:22					
	10:52					

PROPOSED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
APRIL	9:22					
	9:52					
	10:22					
	10:52					

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	5.42%
W2	6.50%
W3	6.50%
W4	5.42%
W5	6.50%

PROPOSED	
W1	5.42%
W2	6.50%
W3	6.50%
W4	7.58%
W5	6.50%

ALLOWED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
APRIL	9:22										
	9:52										
	10:22										
	10:52										
	11:22										
	11:52										
	12:22										
	12:52										

PROPOSED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
APRIL	9:22										
	9:52										
	10:22										
	10:52										
	11:22										
	11:52										
	12:22										
	12:52										

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	9.75%
W2	2.17%
W3	
W4	
W5	
W6	
W7	1.08%
W8	3.25%
W9	10.83%
W10	14.08%

PROPOSED	
W1	13.00%
W2	9.75%
W3	3.25%
W4	1.08%
W5	
W6	3.25%
W7	7.58%
W8	10.83%
W9	11.92%
W10	15.17%

CALCULATIONS: JUNE 21st

JUNE		
Days per month	30	days
Sunshine hours per month (niwa.co.nz)	110.3	hours

June, 21st		
Day length, hrs	9.5	
Sunshine per day, hrs	3.7	
Percentage of sunshine per day		38.70%
Percentage of 30mins intervals from total day length		5.26%
Percentage of total sunshine per day in 30 mins intervals		2.04%

ALLOWED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
JUNE	9:33										
	10:03										
	10:33										
	11:03										
	11:33										
	12:03										
	12:33										
	1:03										
	1:33										

PROPOSED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
JUNE	9:33										
	10:03										
	10:33										
	11:03										
	11:33										
	12:03										
	12:33										
	1:03										
	1:33										

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	14.26%
W2	14.26%
W3	6.11%
W4	1.02%
W5	
W6	12.22%
W7	15.28%
W8	16.30%
W9	16.30%
W10	16.30%

PROPOSED	
W1	14.26%
W2	14.26%
W3	14.26%
W4	13.24%
W5	11.20%
W6	16.30%
W7	16.30%
W8	16.30%
W9	16.30%
W10	16.30%

CALCULATIONS: SEPTEMBER 21st

September		
Days per month	30	days
Sunshine hours per month (niwa.co.nz)	148.6	hours

September, 21st		
Day length, hrs	12	
Sunshine per day, hrs	5.0	
Percentage of sunshine per day		41.28%
Percentage of 30mins intervals from total day length		4.17%
Percentage of total sunshine per day in 30 mins intervals		1.72%

ALLOWED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
SEPTEMBER	10:11					
	10:41					
	11:11					

PROPOSED						
		14A Birdwood Cr				
		W1	W2	W3	W4	W5
SEPTEMBER	10:11					
	10:41					
	11:11					

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	
W2	4.30%
W3	5.16%
W4	
W5	2.58%

PROPOSED	
W1	
W2	5.16%
W3	5.16%
W4	0.86%
W5	2.58%

ALLOWED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
SEPTEMBER	10:11										
	10:41										
	11:11										
	11:41										
	12:11										

PROPOSED											
		2/16 Birdwood Cr									
		W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
SEPTEMBER	10:11										
	10:41										
	11:11										
	11:41										
	12:11										

TOTAL LOSS OF SUNSHINE PER DAY

ALLOWED	
W1	0.86%
W2	
W3	
W4	
W5	
W6	
W7	
W8	
W9	
W10	4.30%

PROPOSED	
W1	4.30%
W2	
W3	
W4	
W5	
W6	
W7	
W8	
W9	2.58%
W10	6.88%