BULK AND LOCATION ANALYSIS

Boffa Miskell

23 NOVEMBER 2021

#### DOCUMENT QUALITY ASSURANCE

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2.1M + 45°

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APPENDIX: COMPLETE SET OF SUNLIGHT EXPOSURE DIAGRAMS

EXISTING CONTROLS	40%	page 6
3 STOREYS - 11M	50%	
4 STOREYS - 14M	50%	
	60%	
6 STOREYS - 20M	50%	
	60%	
12 STOREYS - 40M	50%	
	60%	

### MODELLING OUTPUT CONTENT

6M + 60°	8M + 60°	NONE
page 7	page 8	page 9
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#### **INTRODUCTION**

#### **APPROACH**

#### NOTES

Boffa Miskell Ltd was commissioned by the Kāpiti Coast District Council (KCDC) to provide advice on appropriate bulk and location standards within the zones that have been identified for intensification in the Kāpiti Coast Urban Development Intensification Assessment.

The following heights and associated height limits have been considered:

- Metropolitan Centre Zone up to 12 storeys,
- Zones around rapid transit stops up to 6 storeys,
- Town Centre Zones up to 6 storeys,
- Local Centre Zones up to 4 storeys,
- General Residential Zone around Town and Local Centres up to 4 storeys.

This report focusses on the modelling of potential amenity provisions in response to the increase in population and dwelling density within existing residential and commercial areas across the Kāpiti Coast District as anticipated by the Draft Kāpiti Coast District Growth Strategy and national directions on urban development issued by central government.

Based on this, we have undertaken the following:

- · Analysed typical site dimensions for each of the zones and identified one typical site for modelling purposes. This was done by an in-depth GIS analysis of the median site widths and fronts within each of the zones.
- The site context that was chosen for modelling purposes is based on existing site layouts in the District that match the typical site dimensions resulting from the GIS analysis. As the site is used for modelling purposes only its exact location has been kept anonymous for sensitivity reasons.
- · 3D building envelopes were modelled on typical site for an existing scenario and future scenarios of different heights. Per height limit, models were developed with a combination of:
  - different recession plane controls
  - different site coverage controls.
- Prepared sunlight access diagrams for each model indicating the average sunlight hours over the course of a day in mid-winter, autumn equinox and mid-summer

- outdoor open space in the back.

- on the outcome of the shading analysis.
- the bottom left corner.

· All 3D diagrams show the time of the year where the shadow effect is the worst of the year, a mid-winter day at 9am.

• The 3D and shading diagrams are based on a building envelope excluding setbacks. The application of the full suite of planning standards, design guidelines and architectural building design considerations on the development will mean that buildings will unlikely be built to the full extent of the building envelope. Therefore, the diagrams shown are indicative of a worst case scenario.

• No consideration has been given in the modelling analysis to any potential provisions with regards to driveways or on-site parking.

· All modelled building envelopes assume buildings are built towards the front of the site (including front set back rules) with potential for

· The options and suggestions in this analysis are suggestions that are a result from the undertaken GIS and modelling analysis as well as from comparisons with other New Zealand (second generation) District Plans, Final conclusions and the use of suggested metrics (or combinations therefore) are at the Council's discretion.

• The standards as specified in the 'Resource Management (Enabling Housing Supply and Other Matters) Amendment Bill' (dated 19 October 2021) have been taken as a minimum standard.

· All diagrams are based on a typical site configuration representative of the current development pattern within the analysed zones. Note that the form and location of these neighbouring buildings have an effect

The indicative cross sections show a grid of 3mx3m with an origin in

### TYPICAL SITE ANALYSIS

			1		
				TYPICAL SITE	(IN METRES)
			# OF PROPERTIES	MEDIAN WIDTH	MEDIAN DEPTH
METROPOLITAN CENTRE	PARAPARAUMU METROPOLITAN CENTRE AND RAILWAY STATION	PA-05	974	18	38
RAPID TRANSIT STOPS	WAIKANAE TOWN CENTRE AND RAILWAY STATION	WA	834	19	40
	PAEKAKARIKI LOCAL CENTRE AND RAILWAY STATION	PK	301	15	46
	MAZENGARB LOCAL CENTRE	PA-02	13	18	26
TOWN CENTRES	ŌTAKI MAIN STREET / MILL ROAD	OT-01	393	18	37
	ŌTAKI RAILWAY	OT-02	217	18	38
	PARAPARAUMU BEACH TOWN CENTRE	PA-03	327	16	41
	RAUMATI BEACH TOWN CENTRE	RB	307	17	41
LOCAL CENTRES	WAIKANAE BEACH LOCAL CENTRE	WB	83	19	42
	KENA KENA LOCAL CENTRE	PA-01	62	18	43
	MEADOWS LOCAL CENTRE	PA-04	42	21	29
	RAUMATI SOUTH LOCAL CENTRE	RS	59	20	38
	ALL (EX PAEKAKARIKI LOCAL CENTRE AND RAILWAY STATION)		3928	18	40

Note that the areas outlined above refer to the Urban Intensification Study Areas outlined in the Boffa Miskell "Kāpiti Coast Urban Development Intensification Assessment" report. Refer to this report for a description of each area.

Existing Option E-40.2.1	HEIGHT LIMIT       8m         SITE COVERAGE       40%         HIRB       2.1m + 45°
TYPICAL SITE	DIMENSIONS AREA
Possible footprint	WIDTH x DEPTH MAX BUILT AREA OPEN SPACE (EX SET BACKS)
EXISTING SETBACKS	FROM BOUNDARY WITH ROAD: 3m FROM OTHER BOUNDARIES: on one side 1.5m, 1.5m on opposing side



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

SINGLE SITE

18m x 40m 720m<sup>2</sup>

13.5m x 21.3m





#### OBSERVATIONS

• The existing controls have been modelled to provide a baseline and comparison with the current building envelope for a typical site.



MULTI SITE

24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

 $\left( \right)$ 

WINTER SOLSTICE - 21 JUNE

### NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













Sola	ar: Exposure
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	14.00 Hours
	15.00 Hours
	16.00 Hours

3 STOREYS OPTION 3-50.6	HEIGHT LIMIT SITE COVERAGE HIRB	11m <b>50%</b> 6m + 60°	Shading at the winter sols single site
TYPICAL SITE	DIMENSIONS		18m x 40m 720m²
POSSIBLE FOOTPRINT	WIDTH x DEPTH MAX BUILT AREA		16.0m x 22.5m 360m²
EXISTING SETBACKS	OPEN SPACE (EX SET FROM BOUNDARY W FROM OTHER BOUND	BACKS) ITH ROAD: 3m IARIES: 1m	261m²/ 36% - max 17.5m deep
	OUTLOOK SPACE: 3m	1	

SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21) SINGLE SITE MULTI SITE

 $\left( \right)$ 

 24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION



1m 60° 3 storeys - 11m 6 1 1 18

#### **OBSERVATIONS**

- Standard is based on the 'Resource • Management (Enabling Housing Supply and Other Matters) Amendment Bill' standards (MDRS) with the exception of a 3m front setback instead of 2.5m as directed by the Bill
- Height limit is 11m +1m for a pitched roof •



- Enables three-storey developments with a high degree of variety in possible building design outcomes
- Due to the national direction, the potential for changes or additions to these • standards are unlikely and therefore this has been excluded from further recommendations











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	15.00 Hours
1	16.00 Hours

3 STOREYS OPTION 3-50.8	HEIGHT LIMIT SITE COVERAGE HIRB	11m <b>50%</b> 8m + 60°
TYPICAL SITE	DIMENSIONS	
	AREA	
POSSIBLE FOOTPRINT	WIDTH x DEPTH	
	MAX BUILT AREA	
	OPEN SPACE (EX SET	BACKS)
EXISTING SETBACKS	FROM BOUNDARY W	ITH ROAD: 3m
	FROM OTHER BOUND	ARIES: 1m



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

MULTI SITE

SINGLE SITE

18m x 40m 720m<sup>2</sup>

16.0m x 22.5m





#### OBSERVATIONS

• Enables three-storey developments with a higher degree of variety in possible building design outcomes compared to Option 3-50.6



Can possibly result in bulky outcomes with higher degree of potential • adverse privacy effects as a result of upper storeys being able to be built closer to the boundary.

24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













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3 STOREYS OPTION 3-50.N	HEIGHT LIMIT SITE COVERAGE HIRB	11m <b>50%</b> NONE
TYPICAL SITE	DIMENSIONS	
	AREA	
POSSIBLE FOOTPRINT	WIDTH X DEPTH	
	MAX BUILI AREA	
	OPEN SPACE (EX SET BA	CKS)
EXISTING SETBACKS	FROM BOUNDARY WITH	ROAD: 3m
	FROM OTHER BOUNDAR	IES: 1m



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

MULTI SITE

SINGLE SITE

18m x 40m 720m<sup>2</sup>



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SINGLE SITE

WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION

3 storeys - 11m 1 1 -18

#### OBSERVATIONS

• Potential to build up to three storeys close to boundary - high degree of variability in possible design outcomes



EAST / WEST ORIENTATION



### 24 HOUR CUMULATIVE SUN EXPOSURE









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2	16.00 Hours

4 STOREYS OPTION 4-50.6	HEIGHT LIMIT SITE COVERAGE HIRB	14m <b>50%</b> 6m + 60°
TYPICAL SITE	DIMENSIONS	
	AREA	
POSSIBLE FOOTPRINT	WIDTH x DEPTH	
	MAX BUILT AREA	
	OPEN SPACE (EX SET BACKS	)
EXISTING SETBACKS	FROM BOUNDARY WITH ROA	AD: 3m
	FROM OTHER BOUNDARIES:	lm



#### OBSERVATIONS

• Potential to build two storeys close to boundary and up to three or four storeys further away from the boundary.



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

MULTI SITE

SINGLE SITE

18m x 40m 720m<sup>2</sup>

16.0m x 22.5m





24 HOUR CUMULATIVE SUN EXPOSURE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













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	14.00 Hours
	15.00 Hours
1	16.00 Hours

4 STOREYS OPTION 4-60.6	HEIGHT LIMIT SITE COVERAGE HIRB	14m <b>60%</b> 6m + 60°
TYPICAL SITE	DIMENSIONS	
	AREA WIDTH y DEPTH	
POSSIBLE POOIPRINI	MAX BUILT AREA	
	OPEN SPACE (EX SET I	BACKS)
EXISTING SETBACKS	FROM BOUNDARY WI	TH ROAD: 3m
	FROM OTHER BOUND	ARIES: 1m



MULTI SITE

SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

SINGLE SITE

18m x 40m 720m<sup>2</sup>

16.0m x 27.0m



#### OBSERVATIONS

- Potential to build two storeys close to boundary and up to three or four storeys further away from the boundary.
- Likely to end up with longer buildings than the previous option.



24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION



















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	14.00 Hours
	15.00 Hours
2	16.00 Hours

4 STOREYS OPTION 4-60.8	HEIGHT LIMIT SITE COVERAGE HIRB	14m <b>60%</b> 8m + 60°	SHADING AT THE WINTER SOLSTICE SINGLE SITE	(9AM, JUNE 21) MULTI SITE	24 HOUR CUMULATIVE SUN EXPO SINGLE SITE
TYPICAL SITE POSSIBLE FOOTPRINT	DIMENSIONS AREA WIDTH x DEPTH MAX BUILT AREA OPEN SPACE (EX SET	BACKS)	18m x 40m 720m <sup>2</sup> 16.0m x 27.0m 432m <sup>2</sup> 180m <sup>2</sup> / 25%		WINTER SOLSTICE - 21 JUNE NORTH / SOUTH ORIENTATION
EXISTING SETBACKS	FROM BOUNDARY W	/ITH ROAD: 3m DARIES: 1m			
4 storeys - 14m 8					EAST / WEST ORIENTATION



#### OBSERVATIONS

• Likely to end up with longer and more bulky buildings than Option 4-50.8.





### SURE









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	14.00 Hours
	15.00 Hours
	16.00 Hours

boundary - high degree of variability in possible

design outcomes

4 STOREYS OPTION 4-50.N	HEIGHT LIMIT SITE COVERAGE HIRB	14m <b>50%</b> NONE	SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21) SINGLE SITE MULTI SITE		24 HOUR CUMULATIVE SUN EXPO SINGLE SITE
TYPICAL SITE POSSIBLE FOOTPRINT EXISTING SETBACKS	DIMENSIONS AREA WIDTH x DEPTH MAX BUILT AREA OPEN SPACE (EX SET BAC FROM BOUNDARY WITH R FROM OTHER BOUNDARIE	:KS) ROAD: 3m ES: 1m	18m x 40m 720m <sup>2</sup> 16.0m x 22.5m 360m <sup>2</sup> 261m <sup>2</sup> / 36%		WINTER SOLSTICE - 21 JUNE NORTH / SOUTH ORIENTATION
					EAST / WEST ORIENTATION
4 storeys - 14m	18				
OBSERVATIONS	up to four storage class to		Only marginal difference in shading compared to Options 4.50.6 op	d 4-50 8	
	up to tour storeys close to		i sinduliy compared to Options 4-30.0 all	u 4-00.0.	1

- Only marginal difference in shading compared to Options 4-50.6 and 4-50.8.
- In an established area, a development with habitable rooms that have outlook (of 3 metres) to the side have the potential to result in a higher degree of adverse privacy effects on neighbouring properties. Particularly in the short term while the area is in transformation to a more fully intensified future scenario.
- Quality of the outcome is highly dependent on the design and configuration of • the units, e.g. with habitable rooms that have outlook either to the front or the rear.

#### OSURE









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	16.00 Hours

•

outcomes

High degree of variability in possible design

4 STOREYS OPTION 4-60.N	HEIGHT LIMIT SITE COVERAGE HIRB	14m <b>60%</b> NONE	SHADING AT THE WINTER SOLSTICE SINGLE SITE	(9AM, JUNE 21) MULTI SITE		24 HOUR CUMULATIVE SUN EXPO SINGLE SITE
TYPICAL SITE POSSIBLE FOOTPRINT EXISTING SETBACKS	DIMENSIONS AREA WIDTH x DEPTH MAX BUILT AREA OPEN SPACE (EX SET BAG FROM BOUNDARY WITH FROM OTHER BOUNDAR	CKS) ROAD: 3m IES: 1m	18m x 40m 720m <sup>2</sup> 16.0m x 27.0m 432m <sup>2</sup> 180m <sup>2</sup> / 28%			WINTER SOLSTICE - 21 JUNE NORTH / SOUTH ORIENTATION
4 storeys - 14m DBSERVATIONS • Potential to build up boundary and a lon	18 18 p to four storeys close to ager building than 4-50.N		<ul> <li>Only marginal difference in shadi 4-50.N.</li> </ul>	ing compared to Options 4-	50.6, 4-50.8 and	EAST / WEST ORIENTATION

- In an established area, a development with habitable rooms that have outlook (of 3 metres) to the side have the potential to result in a higher degree of adverse privacy effects on neighbouring properties. Particularly in the short term while the area is in transformation to a more fully intensified future scenario.
- Quality of the outcome is highly dependent on the design and configuration of the units, e.g. with habitable rooms that have outlook either to the front or the rear.

#### OSURE









6 STOREYS OPTION 6-50.6	HEIGHT LIMIT SITE COVERAGE HIRB	20m <b>50%</b> 6m + 60°
TYPICAL SITE		
POSSIBLE FOOTPRINT	WIDTH x DEPTH MAX BUILT AREA	
	OPEN SPACE (EX SET I	BACKS)
EXISTING SETBACKS	FROM BOUNDARY WI	TH ROAD: 3m ARIES: 1m

SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)SINGLE SITEMULTI SITE

18m x 40m 720m<sup>2</sup>

16.0m x 22.5m

MULTI SITE

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 24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE M

WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION





#### OBSERVATIONS

• Allows the development of two storeys relatively close to the boundary. On a typical site this is unlikely to result in six storey developments due to the site width.





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### OSURE MULTI SITE









Solar	: Exposure
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	15.00 Hours
	16.00 Hours

6 STOREYS OPTION 6-60.6	HEIGHT LIMIT SITE COVERAGE HIRB	20m <b>60%</b> 6m + 60°
TYPICAL SITE	DIMENSIONS	
POSSIBLE FOOTPRINT	WIDTH x DEPTH MAX BUILT AREA	
EXISTING SETRACKS	OPEN SPACE (EX SET	BACKS) TH ROAD: 3m
	FROM OTHER BOUND	ARIES: 1m

SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21) SINGLE SITE

18m x 40m 720m<sup>2</sup> 16.0m x 27.0m 432m<sup>2</sup>

180m<sup>2</sup> / 25%





24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION





#### OBSERVATIONS

• Allows the development of two storeys relatively close to the boundary. On a typical site this is unlikely to result in six storey developments due to the site width.













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	16.00 Hours

6 STOREYS OPTION 6-50.8	HEIGHT LIMIT SITE COVERAGE HIRB	20m <b>50%</b> 8m + 60°
TYPICAL SITE	DIMENSIONS	
POSSIBLE FOOTPRINT	WIDTH x DEPTH MAX BUILT AREA	
EXISTING SETBACKS	OPEN SPACE (EX SET I FROM BOUNDARY WI	3ACKS) TH ROAD: 3m
	FROM OTHER BOUND	ARIES: 1m

6 storeys - 20m - 1 - 18

#### OBSERVATIONS

• Allows the development of two to three storeys relatively close to the boundary. On a typical site this is unlikely to result in six storey developments due to the site width.



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

MULTI SITE

SINGLE SITE

18m x 40m 720m<sup>2</sup>

16.0m x 22.5m





24 HOUR CUMULATIVE SUN EXPOSURE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













Sola	ar: Exposure
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	14.00 Hours
	15.00 Hours
	16.00 Hours

6 STOREYS OPTION 6-60.8	HEIGHT LIMIT SITE COVERAGE HIRB	20m <b>60%</b> 8m + 60°	Shading at the winter solstice single site	(9AM, JUNE 21) MULTI SITE
TYPICAL SITE	DIMENSIONS		18m x 40m	
	AREA		720m <sup>2</sup>	
POSSIBLE FOOTPRINT	WIDTH x DEPTH		16.0m x 27.0m	
	MAX BUILT AREA		432m <sup>2</sup>	
	OPEN SPACE (EX SET	BACKS)	180m² / <b>25%</b>	
EXISTING SETBACKS	FROM BOUNDARY W	ITH ROAD: 3m		
	FROM OTHER BOUND	ARIES: 1m		



#### OBSERVATIONS

• Allows the development of two to three storeys relatively close to the boundary. On a typical site this is unlikely to result in six storey developments due to the site width.





24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













Sola	ar: Exposure
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2	16.00 Hours



#### OBSERVATIONS

• Potential to build up to six storeys close to boundary - high degree of variability in possible design outcomes





Sola	ar: Exposure
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	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
2	16.00 Hours

6 STOREYS OPTION 6-60.N	HEIGHT LIMIT SITE COVERAGE HIRB	20m <b>60%</b> NONE	SHADING AT THE WINTER SOLSTICE (S	AM, JUNE 21) MULTI SITE	$\bigoplus$	24 HOUR CUMULATIVE SUN EXPO SINGLE SITE
TYPICAL SITE POSSIBLE FOOTPRINT	DIMENSIONS AREA WIDTH x DEPTH MAX BUILT AREA		18m x 40m 720m <sup>2</sup> 16.0m x 27.0m 432m <sup>2</sup>			WINTER SOLSTICE - 21 JUNE
EXISTING SETBACKS	OPEN SPACE (EX SET BAC	KS) OAD: 3m S: 1m				NORTH / SOUTH ORIENTATION
6 storeys - 20m	18					EAST / WEST ORIENTATION

#### OBSERVATIONS

 Potential to build up to six storeys close to boundary
 high degree of variability in possible design outcomes

### OSURE









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	14.00 Hours
	15.00 Hours
	16.00 Hours

SINGLE SITE

18m x 40m

16.0m x 22.5m

720m<sup>2</sup>



OBSERVATIONS

• Allows the development two storeys relatively close to the boundary. A typical site has insufficient width to accommodate twelve storeys and is likely to result in four to five-storey buildings.

18

1

1

360m<sup>2</sup> 261m<sup>2</sup> / 36%



MULTI SITE





24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE

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WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION











Sola	ar: Exposure
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	16.00 Hours

12 Store Option 7	:YS 12-60.6	HEI SITE HIR	GHT LIMIT COVERAGE B	40m <b>60</b> % 6m + 60°
TYPICAL SI	TE		DIMENSIONS	
POSSIBLE F	OOTPRINT		WIDTH x DEPTH MAX BUILT AREA	
EXISTING S	SETBACKS		OPEN SPACE (EX SET E FROM BOUNDARY WIT FROM OTHER BOUND	BACKS) IH ROAD: 3m ARIES: 1m



• Allows the development two storeys relatively close to the boundary. A typical site has insufficient width to accommodate twelve storeys and is likely to result in four to five-storey buildings.



SHADING AT THE WINTER SOLSTICE (9AM, JUNE 21)

MULTI SITE

SINGLE SITE

18m x 40m 720m<sup>2</sup>

16.0m x 27.0m





24 HOUR CUMULATIVE SUN EXPOSURE SINGLE SITE N

WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION













Sola	ar: Exposure
	3.00 Hours
(	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
	16.00 Hours



• Allows the development two to three storeys relatively close to the boundary. A typical site has insufficient width to accommodate twelve storeys and is likely to result in five-storey buildings.











Solar	: Exposure
	3.00 Hours
1	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
	16.00 Hours











Sola	r: Exposure
	3.00 Hours
1	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
	16.00 Hours



• Potential to build up to 12 storeys close to boundary - high degree of variability in possible design outcomes. Recommended to consider provisions that ensure that a sense of human scale in the street is retained.





(+)



WINTER SOLSTICE - 21 JUNE

NORTH / SOUTH ORIENTATION



EAST / WEST ORIENTATION











Sola	r: Exposure
	3.00 Hours
ſ	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
	16.00 Hours



• Potential to build up to 12 storeys close to boundary - high degree of variability in possible design outcomes. Recommended to consider provisions that ensure that a sense of human scale in the street is retained.

> BOFFA MISKELL | KĀPITI COAST INTENSIFICATION EVALUATION 27









Sol	ar: Exposure
	3.00 Hours
	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
1	- 16.00 Hours

#### **OBSERVATIONS**

#### **BUILT FORM**

- As noted on page 4, the shading and sunlight analysis are based on ٠ building envelopes and not actual built forms.
- In an established area, a development with habitable rooms that has outlook to the side (i.e. a minimum of 3 metres as dictated by the Housing Supply Bill Standards) will have the potential to result in a higher degree of adverse privacy effects on neighbouring properties. Particularly in the short term while the area is in transformation to a more fully intensified future scenario.
- The quality of the outcome is highly dependent on the design and configuration of the units, e.g. with habitable rooms that have outlook either to the front or the rear.

#### EFFECT OF DIFFERENT RECESSION PLANE OPTIONS

- The different heights of the recession plane at the boundary (6m vs 8m) have a negligble effect on the shading. However, the differences in recession plane metrics are likely to dictate the realistic built form outcome that fits within the building envelope and therefore will have an indirect effect on the shading.
- The building envelope that allows 8m height at the boundary is more likely to to result in a three storey building that is closer to the boundary than the building envelope that allows 6m height at the boundary, which is likely to result in a wider side setback or a double storey closer to the boundary.
- The differences in shading effects between the modelled envelope options are predominantly the result of different height limits, or the height of a building envelope where it does not reach the height limit as a result of the width of the site and the recession plane metric.
- Removing the recession plane standard enables the highest diversity in built outcomes, however also requires a higher degree of design consideration to minimise potential adverse effects on bulk, privacy and shading. In the 'recommendations' section, one example is given on how removing the recession plane (for the front part of the site) can result in an acceptable outcome.

- Removing the recession plane can also be a more acceptable outcome in a commercial setting where shading and privacy are less of a consideration.
- The height recession plane provisions that have been modelled do not accommodate a twelve-storey building on a typical site unless the recession plane is removed altogether. A steeper angle or increased height at the boundary might allow for taller buildings on a site, however this will question the purpose of applying a recession plane as its effect on sunlight access, privacy or dominance will be substantially reduced.

#### EFFECT OF DIFFERENT SITE COVERAGES

- The sunlight diagrams show that in both the 50% and 60% site coverage scenarios it is unrealistic to expect all-year sun access to the area south of the development and large part of the property as well as neighbouring properties will be shaded throughout the winter.
- The main differences in shading between the different options are predominantly dependent on the height limit and site coverage, while, as discussed previously, different recession plane metrics only result in a marginal difference. At 60% site coverage, the potential building length is 4.5m longer than in a 50% site coverage scenario, which will extend the length of the shading.
- The site coverage metric will in part dictate the realistic built form outcome. On a typical Kapiti Coast site, higher site coverages will likely result in longer buildings, and as a result is likely to have the main access and primary oulook to the side, rather than to the street front.
- Additionaly, higher site coverages will result in a smaller area of usable ground floor open space. Due to the typical site shape, this ground floor open space is more likely to be disconnected from individual units and therefore better designed as a shared space.
- Due to constraints on open space, a higher site coverage is more suitable for a high density setting that includes retail in the ground floor. Private outdoor space could potentially primarily be managed through balconies without the need for ground floor open space.

#### SHADING EFFECTS

- affected.

· In the north / south orientation there is a substantial shading effect on the area south of any development (both on-site as well as neighbouring properties). The defining parameter that has the largest impact is the height limit. Differences in recession plane or site coverage only have a marginal effect.

· Therefore it can be expected that the shading effects will increase in any case of intensification where the height limit is increased. For high density residential, sunlight access into private outdoor space is best considered primarily as balconies or rooftops that are north, east or west facing, reducing the need for ground floor open space.

In an east / west configuration the sunlight access into ground floor open space is mostly acceptable. In the modelled scenarios, the property south / south east of the development site is the most

#### RECOMMENDATIONS

- As the standards of the three-storey option are likely to be directed the national MDRS Housing Supply Bill, the below recommendations are relevant for the four, six and twelve storey scenarios.
- A good design outcome requires consideration of multiple factors associated with the design of a development in a site specific way. Design guides are recommended as a useful tool to assist with this.
- Note that while the below recommendations focus on site specific considerations, creating quality neighbourhoods that have good amenity levels are also dependent on planning considerations at a neighbhourhood and District wide scale (e.g. parks, street trees, street widths etc).

#### **BUILDING LENGTH**

- Developments on a typical site can potentialy result in lengthy buildings with a 22.5m deep facade at 50% site coverage and 27m at 60% site coverage. To encourage better design outcomes it is recommended to either require a substantial recess of the facade every x metres or a maximum building length (e.g. 20m).
- It is recommended to discourage the potential for development of ٠ buildings that are deeper than 20m due to massing and privacy effects.
- Limiting building depth with 50% site coverage allows the ٠ development of two separate buildings on a site, each consisting of one or more units, with a suitably sized shared open space in between buildings. On a 40m deep site this could approximately result in two 11m deep buildings with a 12m deep communal space and a 3m setback from the rear boundary.



- Limiting the total building depth could result in the development having their access on the streetfront and primary outlook either to the front or to the communal space, instead of to the sides, reducing potential adverse effects on the neighbours privacy.
- At 60% site coverage, the scenario described above would only be possible on sites that are deeper or wider than typical. The balance open space between two building blocks on a typical site would not be deep enough to provide for sufficient privacy between the two blocks, or sunlight access into the communal space depending on the building height and orientation.
- · A 60% site coverage on a typical site would result in an undesirable outcome of a building of at least 27.5m deep, as this would encourage the access and primary outlook to the sides, increasing the potential for adverse privacy effects.
- A development that maximises 60% site coverage that would result in a more acceptable building depth outcome of 20m would have to be on a lot of at least 22m wide. Note that areas like driveways are excluded from the calculation. Including these would result in a longer building or a wider site.
- An alternative method to managing bulk, privacy and shading effects is by encouraging development in the front of the site and keeping the side setbacks to a minimum (or remove altogether). One way of managing this is to remove any height in relation to boundary rules for the first 20 metres from the street and apply a stricter recession plane (e.g. 3m + 45deg\*) to the rear of the site. Additionaly, removing setback requirements for the front and side can be considered for the front portion of the site.

\*Note that the application of a 'stricter recession plane' is dependent on the baseline that is set by central Government as a result of the Housing Supply Bill.



#### COMMERCIAL AT GROUND FLOOR

- - width of the street
  - pedestrians and residents

street width / podium height.

• always necessary.

By keeping the side setbacks minimal it is encouraged to maximally use the width of the site at the street front and have the main outlook space towards the front or the rear rather than to the side to keep potential privacy effects minimal.

· For commercial or mixed use zones with residential activity in the upper storeys consider a setback rule for upper storeys for the development on the street edge that relates to street width to:

· retain a sense of human scale for pedestrians relative to the

• maintain some level of sunlight access in the street and into the apartments to provide for a comfortable experience for

E.g. for streets narrower than 16 metres, consider limiting the podium height of the adjacent building to three or four storeys. For streets that are wider than 16 metres a 1:1 ratio can be used for

Alternatively, applying a recession plane from the street front that allows for three to four storeys at the street edge could have a similar effect, although would not be related to the street width. Additionaly, a recession plane would also potentially have an effect the setback at the upper parts of the building where that is not



Boffa Miskell is a leading New Zealand professional services consultancy with offices in Auckland, Hamilton, Tauranga, Wellington, Christchurch, Dunedin and Queenstown. We work with a wide range of local and international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, cultural heritage, graphics and mapping. Over the past four decades we have built a reputation for professionalism, innovation and excellence. During this time we have been associated with a significant number of projects that have shaped New Zealand's environment.

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#### About Boffa Miskell

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APPENDIX 1: SUNLIGHT EXPOSURE DIAGRAMS

2.1M + 45° (EXISTING)	NORTH SOUTH
	EAST WEST
6M + 60°	NORTH SOUTH
	EAST WEST
8M + 60°	NORTH SOUTH
	EAST WEST
NONE	NORTH SOUTH

EAST WEST

BOFFA MISKELL | KĀPITI COAST INTENSIFICATION EVALUATION A-1

SINGLE SITE	MULTI-SITE
A-2	A-2
A-2	A-2
A-3	A-4
A-5	A-6
A-7	A-8
A-9	A-10
A-11	A-12
A-13	A-14

#### SINGLE SITE SHADE STUDIES

#### MULTI-SITE SHADE STUDIES



Sola	r: Exposure
	3.00 Hours
1	4.00 Hours
	5.00 Hours
	6.00 Hours
	7.00 Hours
	8.00 Hours
1	9.00 Hours
	10.00 Hours
	11.00 Hours
	12.00 Hours
	13.00 Hours
	14.00 Hours
	15.00 Hours
-	16.00 Hours

#### SINGLE SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION



4 STOREYS - 14m 6m + 60°

6 STOREYS - 20m 6m + 60°

12 STOREYS - 40m 6m + 60°









#### MULTI-SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION



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4 STOREYS - 14m 6m + 60°

6m + 60°

6m + 60°

12 STOREYS - 40m 6m + 60°

A-4





#### SINGLE SITE SHADE STUDIES

#### EAST / WEST ORIENTATION





6 STOREYS - 20m 6m + 60°

12 STOREYS - 40m 6m + 60°



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#### MULTI-SITE SHADE STUDIES

#### EAST / WEST ORIENTATION

6m + 60°

6m + 60°

6m + 60°

6m + 60°







#### SINGLE SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION



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#### MULTI-SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION

	50%			60%	
	SUMMER SOLSTICE 21 DECEMBER	EQUINOX 21 SEPTEMBER	WINTER SOLSTICE 21 JUNE	SUMMER SOLSTICE 21 DECEMBER	EQUINOX 21 SEPTEN
3 STOREYS - 11m 8m + 60°					
4 STOREYS - 14m					
8m + 60°					
	TRO TO			TPO CAL	
6 STOREYS - 20m 8m + 60°					
	TRUCK E		10-410 5	तर्प्रय रकि है	
<b>12 STOREYS - 40m</b> 8m + 60°					
			SARAGE E		Step
	1220 40 3		114445		112X



#### MBER





#### SINGLE SITE SHADE STUDIES

#### EAST / WEST ORIENTATION





6 STOREYS - 20m 8m + 60°

12 STOREYS - 40m 8m + 60°



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#### MULTI-SITE SHADE STUDIES

#### EAST / WEST ORIENTATION

8m + 60°

8m + 60°

8m + 60°

8m + 60°







#### SINGLE SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION



4 STOREYS - 14m no recession plane

6 STOREYS - 20m no recession plane

12 STOREYS - 40m no recession plane









#### MULTI-SITE SHADE STUDIES

#### NORTH/ SOUTH ORIENTATION



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### SINGLE SITE SHADE STUDIES

#### EAST / WEST ORIENTATION



#### 4 STOREYS - 14m no recession plane

6 STOREYS - 20m no recession plane

12 STOREYS - 40m no recession plane







#### MULTI-SITE SHADE STUDIES

#### EAST / WEST ORIENTATION



BOFFA MISKELL | KĀPITI COAST INTENSIFICATION EVALUATION A-14

#### 4 STOREYS - 14m no recession plane

3 STOREYS - 11m no recession plane

6 STOREYS - 20m no recession plane

12 STOREYS - 40m no recession plane



