Sunlight & Daylight Impact Study

Project: 248 Kilburn High Road, London

Report reference:Kilburn_Sunlight_Daylight_rep_300107

Date:30th / January / 2007

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1.0 PROJECT DETAILS

• **REPORT REF /DATE:** Kilburn_Sunlight_Daylight_rep_300107
• **REPORT AUTHORS:** J W Associates – Building Performance Consultants
• **PROJECT NAME / LOCATION:** 248 Kilburn High Road, London

1.1 EXISITNG TARGET BUILDING(s) TO BE CONSIDERED

• Specific existing occupied buildings immediately adjacent to development site
• See target façade map in Appendices.

1.2 DAYLIGHT & SUNLIGHT STUDY OVERVIEW

Prepare a risk assessment in the first instance (stage 1 analysis) to compare daylight and sunlight distribution indicators on the target buildings / open spaces before and after the inclusion of the proposed development.

1.3 FACADES TO BE ANALYSED ON TARGET BUILDING(S)

• Specific façades likely to be impacted by proposed development

1.4 STATUTORY REQUIREMENTS FOR SUNLIGHT / DAYLIGHT STUDY (as defined by BS 8206 Part 2)

• Any surrounding buildings that maybe entitled to Rights to Light should be assessed with the assistance of a lawyer versed in this area of law in case of any doubt. Rights to Light is not included in this report
• Right to sunlight: Not established in English Law
• Right to a view: No prescriptive right

1.5 DOCUMENTS CONSULTED DURING THIS DAYLIGHT & SUNLIGHT STUDY

• BS 8206 Part 2: Lighting for buildings: Code of practice for daylighting
• BRE Site layout planning daylight and sunlight: A guide to good practice.(NON MANDATORY)
• Daylighting and window design: CIBSE Lighting guide LG10 1999

1.6 SOFTWARE USED WITHIN STUDY

• IES < Virtual Environment> Ltd.

1.7 SPECIFIC DAYLIGHT AND SUNLIGHT CALCULATIONS

All calculations use IES software as the primary evaluation tool for the daylight and sunlight indicator calculations instead of manual charts and formula offered in BS8206 part 2 or CIBSE LG10 or the BRE report. CIBSE LG10 provides a detailed section on the use of computer programs for undertaking such studies.

1.8 DAYLIGHT CALCULATIONS

• Skylight indicators: Vertical sky component calculated external to the facades of the target buildings as the measurement of daylight.
• Refer to Appendix A for results

1.9 SUNLIGHT CALCULATIONS

• Sunlight and sunpath indicators - Uses software to predict the times of day, year and duration of varying sunlight patterns to assess the difference in sunlit percentages on each target façade before and after the inclusion of the proposed development.

• Simulated shadow paths: Computer images produced for 9am, 12 midday and 3pm on 22 Dec (winter solstice – lowest sunpath), 22 June (summer solstice – highest sunpath), 21 March / 23 Sept (equinox when sun rises in the east at 6am and sets in the west at 6pm).
• Refer to Appendix C

2.0 EXECUTIVE SUMMARY

This report provides a technical risk assessment for the sunlight and daylight impact caused by the proposed development at 248 Kilburn High Road, London.

The BRE Site layout planning daylight and sunlight: A guide to good practice has been used as the benchmark document to present "passes" or "failures".It should be noted that the BRE guidelines are not mandatory and should be used to inform rather than lead design solutions.

A summary of the results is tabulated below, although these should be read in conjunction with the detailed results in Appendices A and B.

The proposed development is larger (in overall bulk mass) than the existing building, however the sunlight and daylight impact on the existing buildings is not, in our opinion, unreasonable and the scheme is not considered to be over developed for the size of site available.

The BRE guidance suggests that any loss of daylight or increased overshadowing greater than 20% of the existing condition is likely to be noticeable to existing residents within affected properties. The results show that the impact is generally within 20%, although there is some minor exceptions to this as listed below.

The proposed scheme provides very good levels of sunlight availability on the new roof terraces.

Test Point	Address Site Ref	Daylight Analysis	
		Impact from existing building	Impact from proposed building
TP1	Existing bldg adjacent to No 246	External daylight satisfies BRE criteria on façade tested	External daylight marginally fails to satisfy BRE criteria Impact is within 20% of former condition
TP2	First floor No 246 at rear of site	External daylight satisfies BRE criteria on façade tested	External daylight does not satisfy BRE criteria Impact is not within 20% of former condition (38.5% loss)
TP3	Rear of No's 250 & 252	External daylight satisfies BRE criteria on façade tested	External daylight satisfies BRE criteria on façade tested Impact is within 20% of former condition
TP4	Rear of No 256	External daylight satisfies BRE criteria on façade tested	External daylight satisfies BRE criteria on façade tested Impact is within 20% of former condition

Note:
BRE Good Practice value for external Vertical Sky Component (VSC) is 27%

2.0 EXECUTIVE SUMMARY

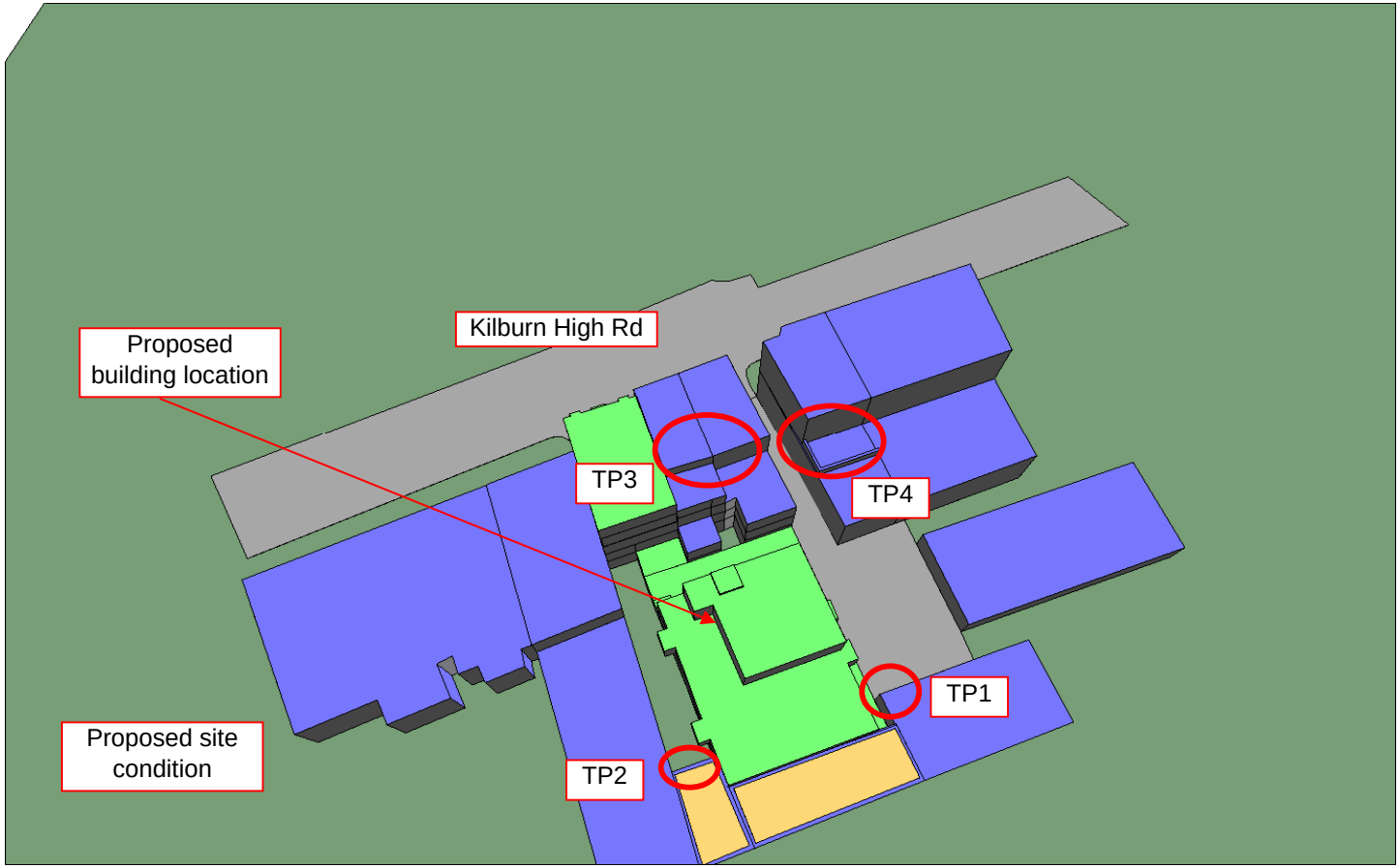
Test Point	Address Site Ref	Sunlight Availability & Overshadowing Analysis	
		Impact from existing building	**Impact from proposed building**
TP1	Existing bldg adjacent to No 246	Annual sunshine availability satisfies BRE Autumn & winter sunshine availability satisfies BRE	Annual sunshine availability satisfies BRE Autumn sunshine availability satisfies BRE Winter sunshine does not satisfy BRE Impact is within 20% during summer only
TP2	First floor No 246 at rear of site	Annual sunshine does not satisfy BRE Autumn & winter sunshine does not satisfy BRE	Annual sunshine does not satisfy BRE Autumn & winter sunshine does not satisfy BRE Impact is unchanged from existing condition
TP3	Rear of No's 250 & 252	Annual sunshine availability satisfies BRE Autumn & winter sunshine availability satisfies BRE	Annual sunshine availability satisfies BRE Autumn & winter sunshine availability satisfies BRE Impact is within 20% except in summer (45% loss in summer)
TP4	Rear of No 256	Annual sunshine availability satisfies BRE Autumn & winter sunshine availability satisfies BRE	Annual sunshine availability satisfies BRE (borderline pass) Autumn sunshine availability satisfies BRE Winter sunshine does not satisfy BRE Impact is within 20% throughout the year
Roof terrace 1	New build No 248	Not applicable	BRE sunlight availability for March 21st is satisfied
Roof terrace 2	New build No 248	Not applicable	BRE sunlight availability for March 21st is satisfied

Note:
BRE Good Practice states that December (winter) and September (autumn) should receive not less than 5% of available sunlit hours
BRE Good Practice states that target facades should receive not less than 25% of available annual sunlit hours
BRE Good Practice states that for an amenity space to appear adequately sunlit no more 2/5th (40%) or preferably 25% of any garden or amentiy space should be prevented from receiving any sun at all on 21st March

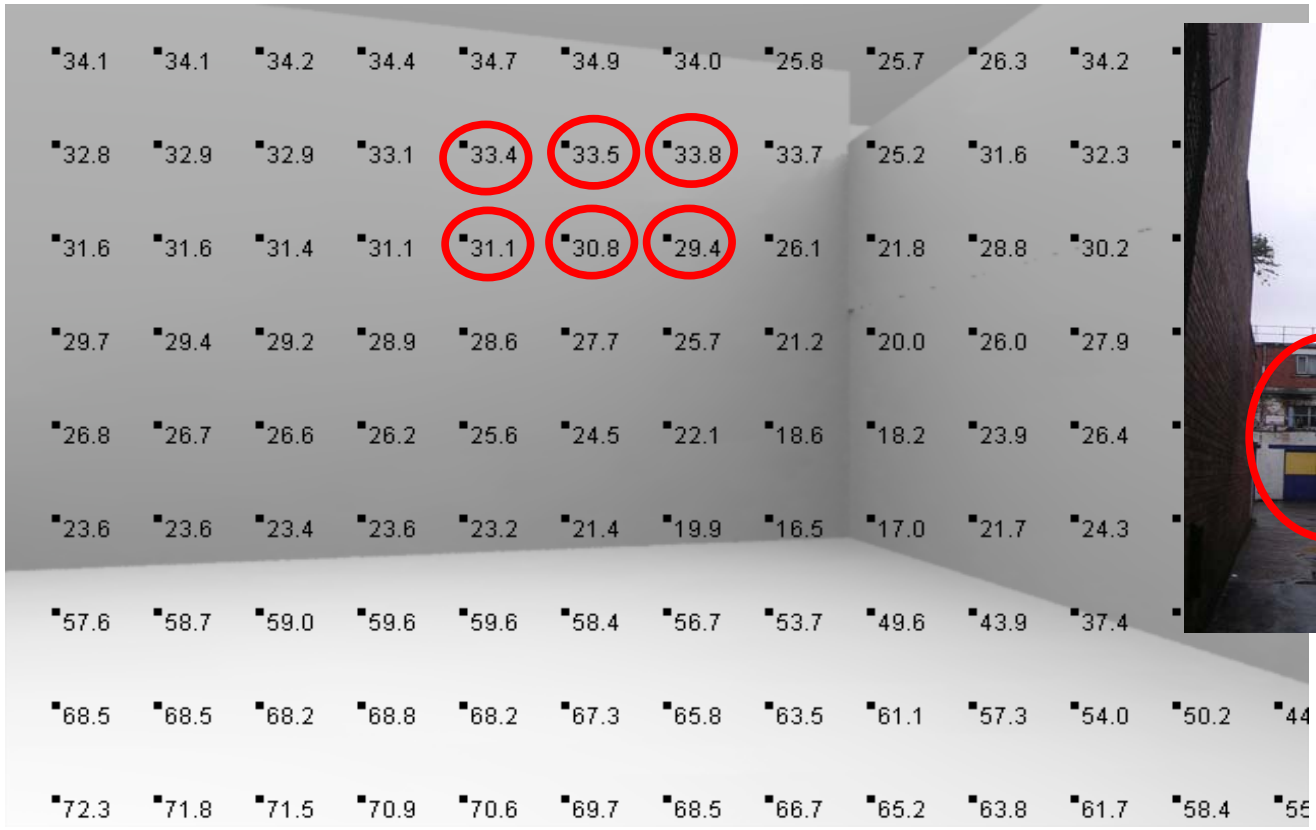
Appendix A: Daylight technical results

Target property map: EXISTING SITE CONDITION

Target property map: PROPOSED SITE CONDITION



Appendix A: Existing development: Vertical Sky Component



Impact under existing condition

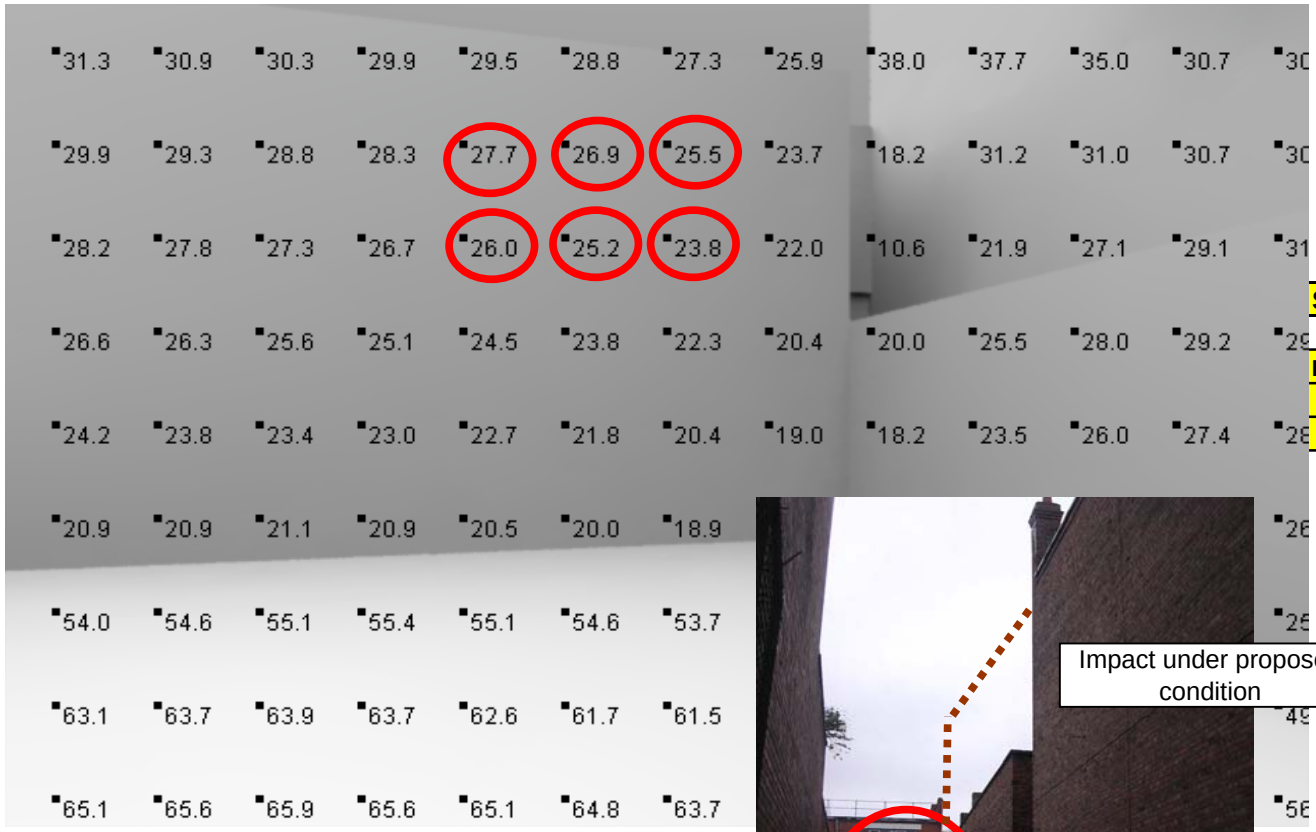
Sample of Vertical Sky Components (VSC's)

33.4	33.5	33.8
31.1	30.8	29.4

TP1:

% VSC
33.57%
30.43%

Appendix A: Proposed development: Vertical Sky Component



SUMMARY

Extg VSCs	New VSCs	Result	% former
33.57%	26.70%	PASS	79.54%
30.43%	25.00%	PASS	82.15%

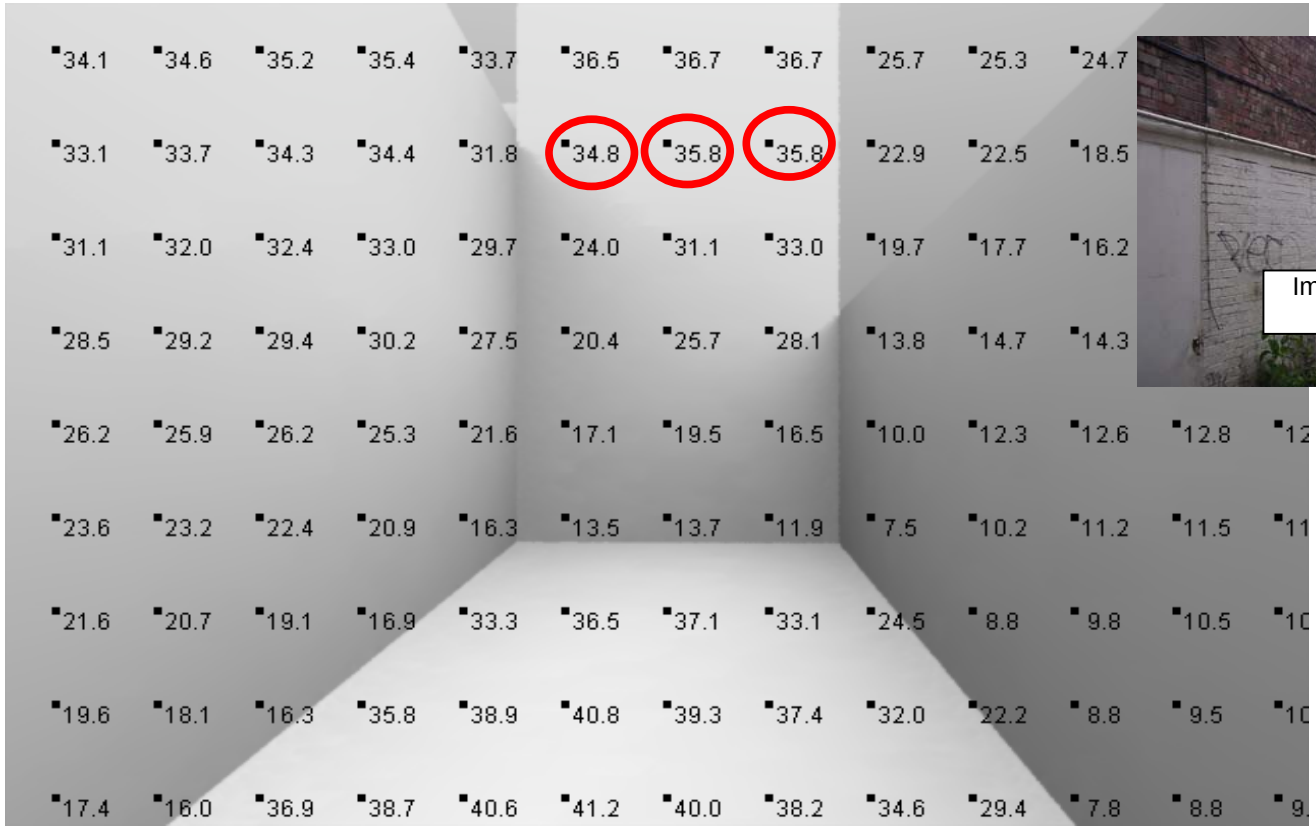
Sample of Vertical Sky Components (VSC's)

27.7	26.9	25.5
26	25.2	23.8

TP1:

% VSC
26.70%
25.00%

Appendix A: Existing development: Vertical Sky Component



Sample of Vertical Sky Components (VSC's)

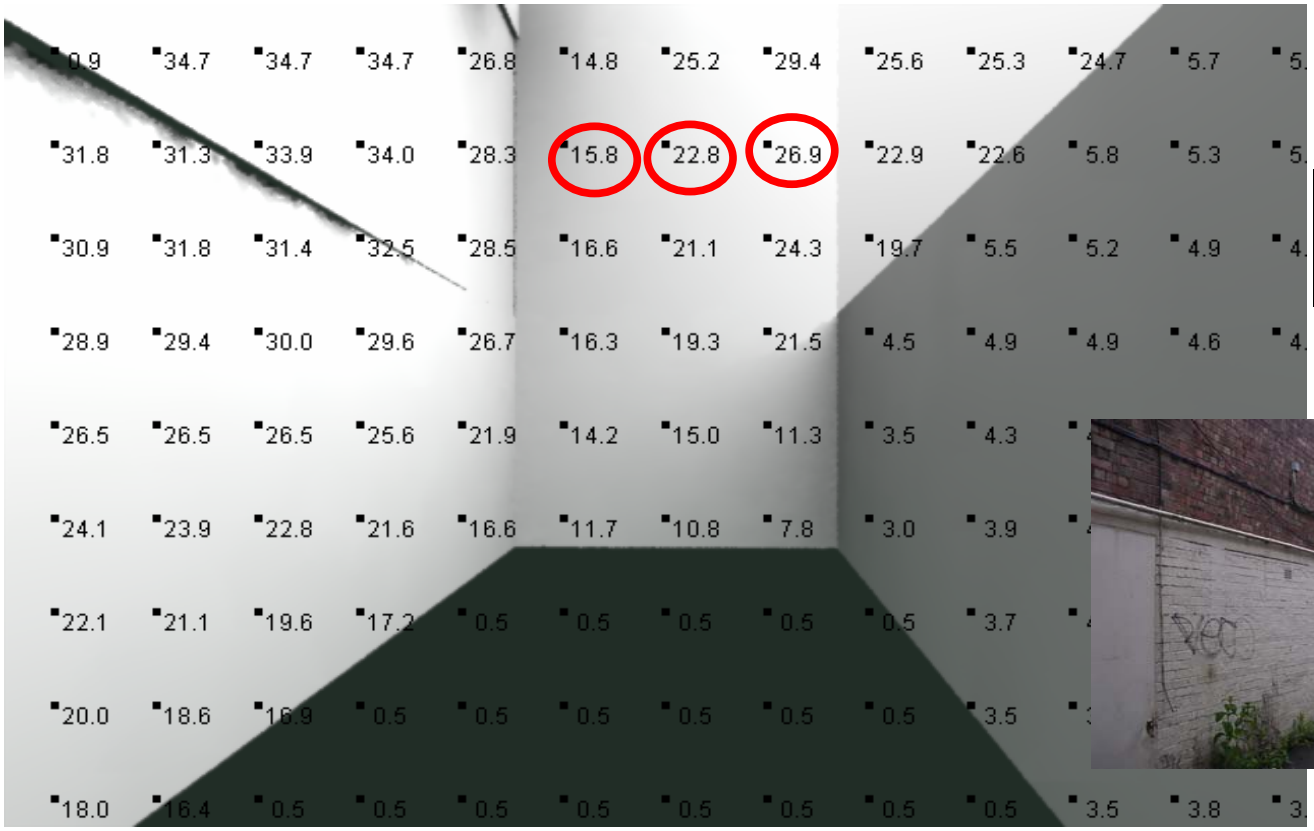
34.8 35.8 35.8

TP2:

% VSC

35.47%

Appendix A: Proposed development: Vertical Sky Components



SUMMARY			
Extg VSCs	New VSCs	Result	% former
35.47%	21.83%	FAIL	61.56%

Impact under proposed condition

Sample of Vertical Sky Components (VSC's)

15.8 22.8 26.9

TP2:

% VSC

21.83%

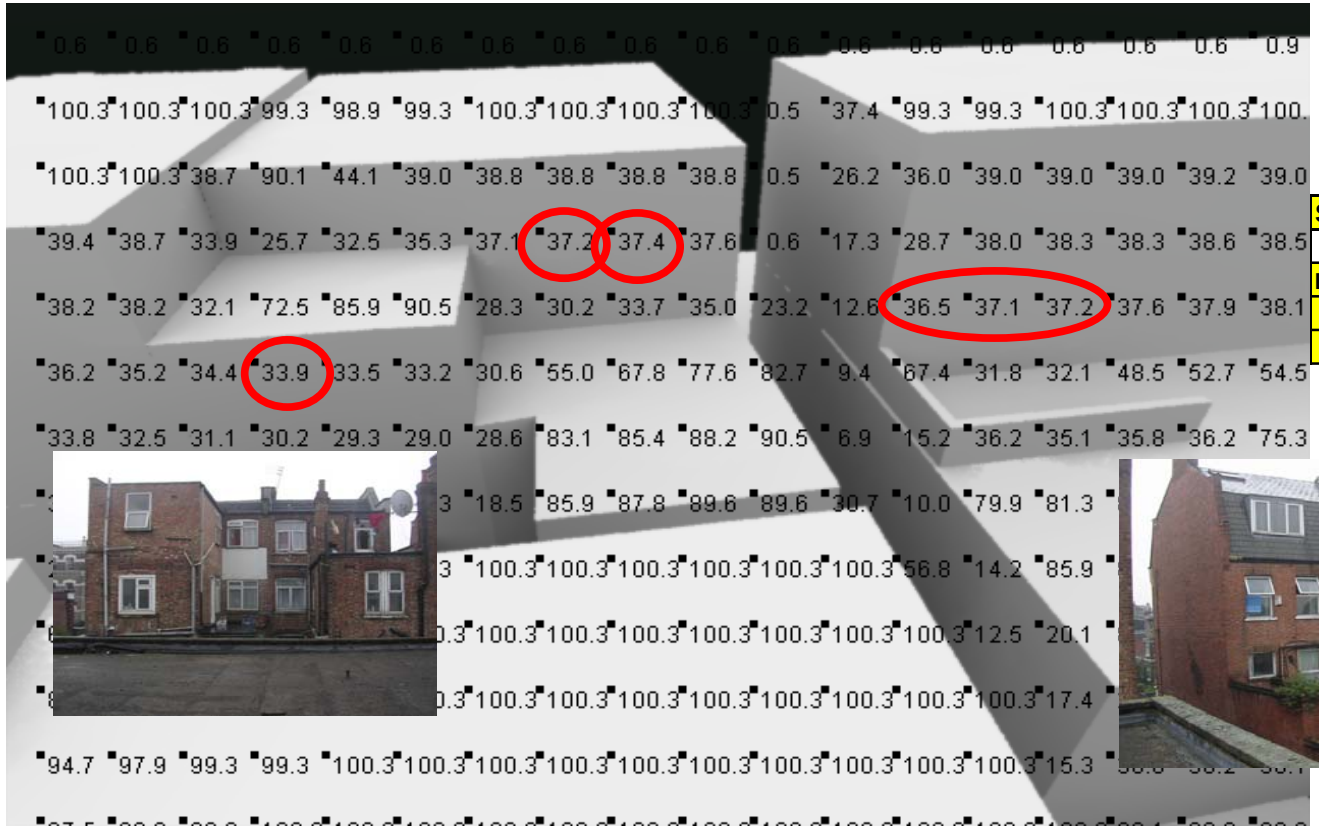
Appendix A: Existing development: Vertical Sky Component

TP 3 & 4

Sample of Vertical Sky Components (VSC's)

			% VSC
39.3	36.8	38.7	**38.27%**
38.8	39	39	**38.93%**

Appendix A: Proposed development: Vertical Sky Components



SUMMARY			
Extg VSCs	New VSCs	Result	% former
38.27%	36.17%	PASS	94.51%
38.93%	36.93%	PASS	94.86%

Sample of Vertical Sky Components (VSC's)

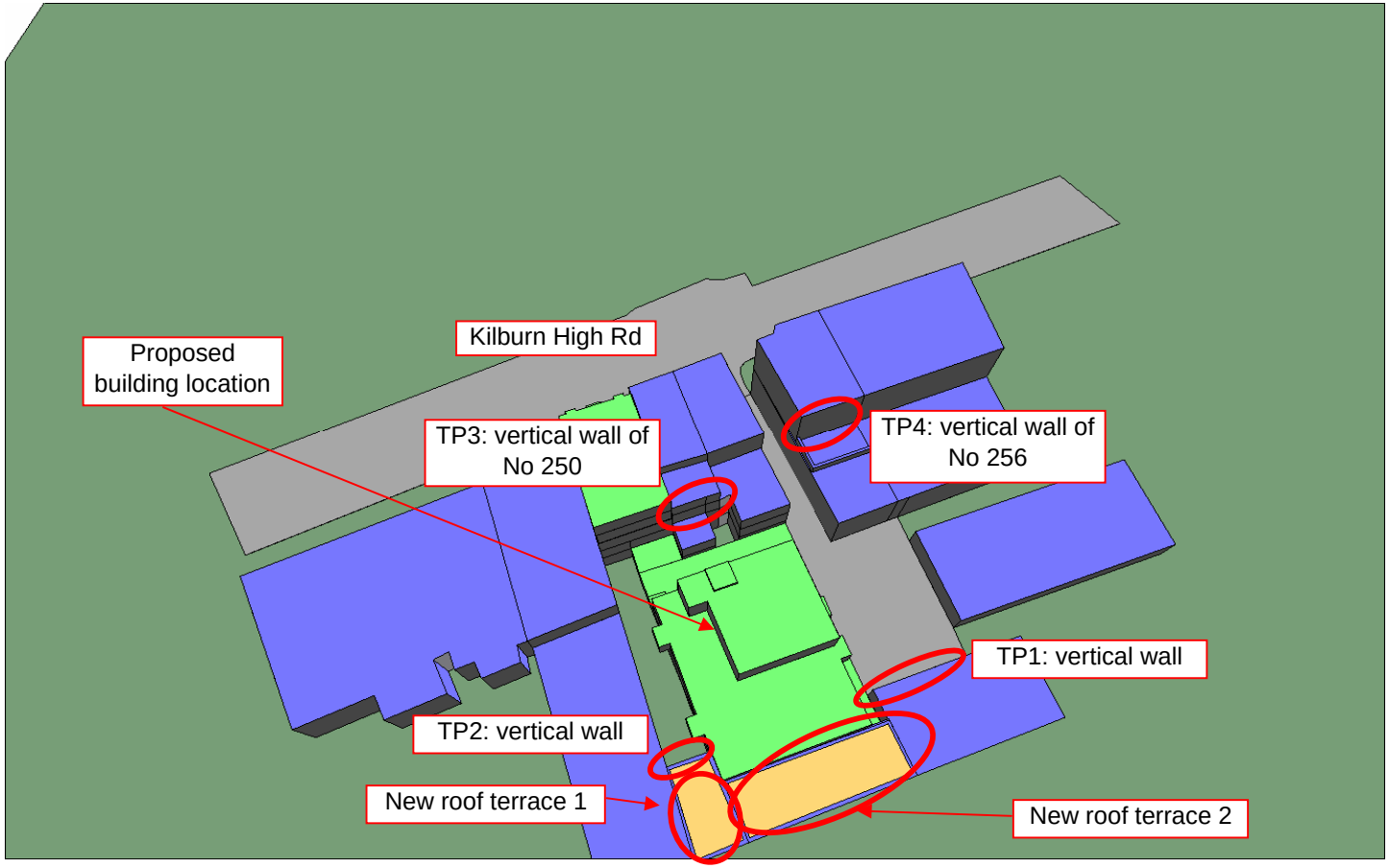
33.9	37.2	37.4
36.5	37.1	37.2

TP 3 & 4

% VSC
36.17%
36.93%

Appendix B: Sunlight statistical results

Appendix B: Sunlight statisitical results : Target property map



Appendix B: Sunlight statisitical results

New roof terrace 1

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	
Mar 21st				100	100	100	100	100	100	100	100	97.1	73.6	0	0			sunlight % reaching open space

IMPACT: BRE PASS

New roof terrace 2

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	
Mar 21st				88.01	90.81	91.27	91.29	84.87	70.48	55.78	40.28	19.36	13.18	15.65	0			sunlight % reaching open space

IMPACT: BRE PASS

BRE criteria for gardens / amenity spaces

For an amenity space to appear adequately sunlit no more 2/5th (40%) or preferably 25% of any garden or amentiy space should be prevented from receiving any sun at all on 21st March

Appendix B: Sunlight statisitical results

TP1: Existing site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				0	0	0	0	70.9	76.3	81.6	87.5	95.1	37.8	0	2.6			Mar	**37.65**
Jun	0	0	0	0	0	0	0	86.5	89.6	93.2	97.7	99.2	98.1	94.2	85.9	68.6	52.2	June	**50.89**
Sep			0	0	0	0	65.7	71.8	77.2	82.6	89	85.1	18.3	0				Sept	**40.81**
Dec						0	30.6	37	42.2	38.1	1.2	3.4						Dec	**21.79**

TP1: Proposed site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				0	0	0	0	39.25	21.33	39	65.72	90.28	34.96	0	2.41			Mar	**24.45**
Jun	0	0	0	0	0	0	0	77.4	84.37	[illegible]	91.35	91.74	90.65	87.11	79.42	63.47	48.27	June	**47.04**
Sep			0	0	0	0	28.08	35.76	22.61	4[illegible]59	73.09	79.22	16.87	0				Sept	**24.94**
Dec						0	0	0	0	0.22	0	3.1						Dec	**0.47**
																		Annual av	24.22

Is impact from Proposed within 20% of the existing site condition?		
Mar	64.9%	No
June	92.4%	Yes
Sept	61.1%	No
Dec	2.2%	No
Average	55.2%	

Other BRE ompliance checks

Is Dec value > 5%? **0.47** **No**

Is Sep value > 5%? **24.94** **Yes**

Does the target façade receive 25% of annual sunlit hours **24.22** **Borderline yes**

Appendix B: Sunlight statisitical results

TP2: Existing site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				0	0	0	0	0	0	0	0	0	0	0	0			Mar	**0.00**
Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	June	**0.00**
Sep			0	0	0	0	0	0	0	0	0	0	0	0				Sept	**0.00**
Dec						0	0	0	0	0	0	0						Dec	**0.00**

TP2: Proposed site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				0	0	0	0	0	0	0	0	0	0	0	0			Mar	**0.00**
Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	June	**0.00**
Sep			0	0	0	0	0	0	0	0	0	0	0	0				Sept	**0.00**
Dec						0	0	0	0	0	0	0						Dec	**0.00**
																		Annual av	0.00

Is impact from Proposed within 20% of the existing site condition?		
Mar	100.0%	Yes
June	100.0%	Yes
Sept	100.0%	Yes
Dec	100.0%	Yes
Average	100.0%	

Other BRE ompliance checks

Is Dec value > 5%? **0.00** **No although same as existing condition**

Is Sep value > 5%? **0.00** **No although same as existing condition**

Does the target façade receive 25% of annual sunlit hours **0.00** **No although same as existing condition**

Appendix B: Sunlight statisitical results

TP3: Existing site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				100	100	100	100	0	0	0		0	0	0	0			Mar	**33.33**
Jun	95.2	100	100	100	100	100	100	0	0	0		0	0	0	0	0	0	June	**40.89**
Sep			100	100	100	100	0	0	0	0	0	0	0	0				Sept	**25.00**
Dec						100	0	0	0	0	0	0						Dec	**14.29**

TP3: Proposed site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				88	100	100	100	0	0	0	0	0	0	0	0			Mar	**32.33**
Jun	0	0	8	65.3	100	100	100	0	0	0	0	0	0	0	0	0	0	June	**21.96**
Sep			22.5	100	100	100	0	0	0	0	0	0	0	0				Sept	**25.00**
Dec						100	0	0	0	0	0	0						Dec	**14.29**
																		Annual av	23.39

Is impact from Proposed within 20% of the existing site condition?		
Mar	97.0%	Yes
June	53.7%	No
Sept	100.0%	Yes
Dec	100.0%	Yes
Average	87.7%	

Other BRE ompliance checks

Is Dec value > 5%? **14.29** **Yes**

Is Sep value > 5%? **25.00** **Yes**

Does the target façade receive 25% of annual sunlit hours **23.39** **Borderline yes**

Appendix B: Sunlight statisitical results

TP4: Existing site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				83.4	93.8	95.9	79	0	0	0		0	0	0	0			Mar	**29.34**
Jun	83.8	89.8	97.2	97.6	97.7	97.9	98.2	0	0	0		0	0	0	0	0	0	June	**38.95**
Sep			77.9	85	94.9	96.1	0	0	0	0	0	0	0	0				Sept	**23.00**
Dec						42.9	0	0	0	0	0	0						Dec	**6.13**

TP4: Proposed site condition

Month / Time	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		sunlit % Av
Mar				33.1	89.4	95.9	79	0	0	0	0	0	0	0	0			Mar	**24.78**
Jun	83.8	89.8	97.2	97.6	97.7	97.9	98.2	0	0	0	0	0	0	0	0	0	0	June	**38.95**
Sep			3.2	42.7	94.9	96.1	0	0	0	0	0	0	0	0				Sept	**19.48**
Dec						18.5	0	0	0	0	0	0						Dec	**2.64**
																		Annual av	21.46

Is impact from Proposed within 20% of the existing site condition?		
Mar	84.5%	Yes
June	100.0%	Yes
Sept	84.7%	Yes
Dec	43.1%	Yes
Average	78.1%	

Other BRE ompliance checks

Is Dec value > 5%? **2.64** **No**

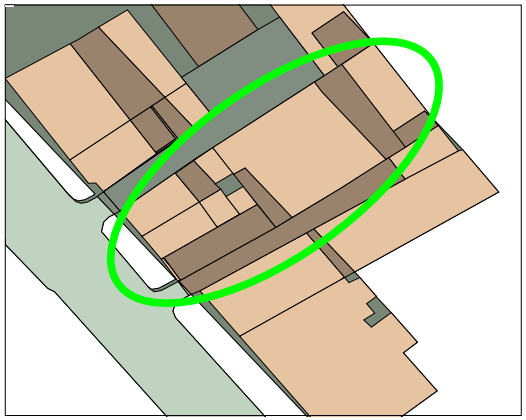
Is Sep value > 5%? **19.48** **Yes**

Does the target façade receive 25% of annual sunlit hours **21.46** **Borderline**

Appendix C: Shadow Impact on Site

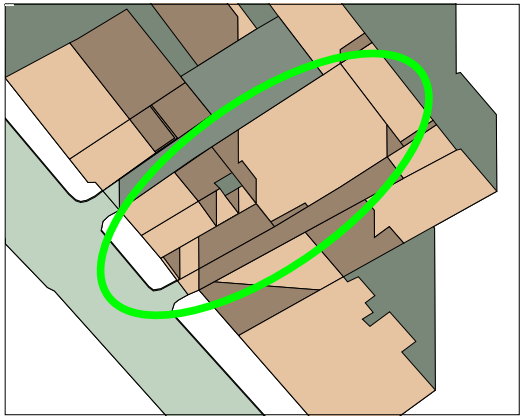
Appendix C: Shadow impact on site

Suncast image:
View time = 22 Dec 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 139.09 alt = 5.20
Eye: azi = 140.00 alt = 90.00



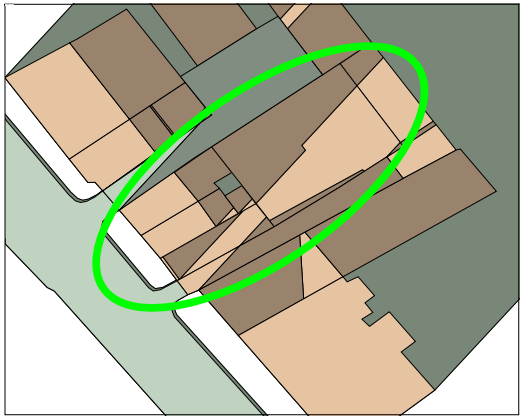
Dec 22 at 9am
Existing site layout

Suncast image:
View time = 22 Dec 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 179.71 alt = 15.07
Eye: azi = 140.00 alt = 90.00



Dec 22 at midday
Existing site layout

Suncast image:
View time = 22 Dec 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 220.40 alt = 5.45
Eye: azi = 140.00 alt = 90.00



Dec 22 at 3pm
Existing site layout

Appendix C: Shadow impact on site

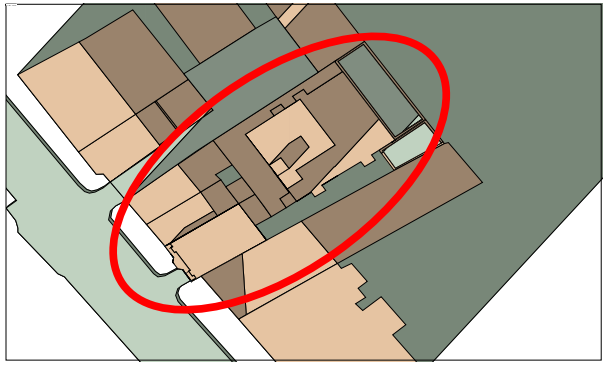
Suncast image:
View time = 22 Dec 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 139.09 alt = 5.20
Eye: azi = 140.00 alt = 90.00

Dec 22 at 9am
Proposed site layout

Suncast image:
View time = 22 Dec 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 179.71 alt = 15.07
Eye: azi = 140.00 alt = 90.00

Dec 22 at midday
Proposed site layout

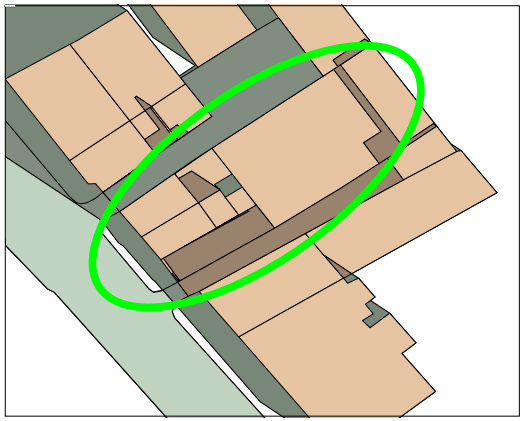
Suncast image:
View time = 22 Dec 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 220.40 alt = 5.45
Eye: azi = 140.00 alt = 90.00



Dec 22 at 3pm
Proposed site layout

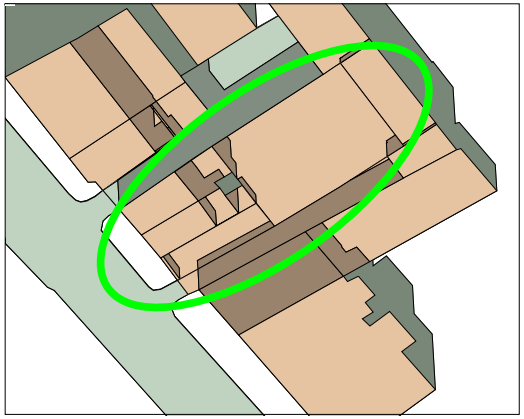
Appendix C: Shadow impact on site

Suncast image:
View time = 21 Mar 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 125.95 alt = 24.58
Eye: azi = 140.00 alt = 90.00



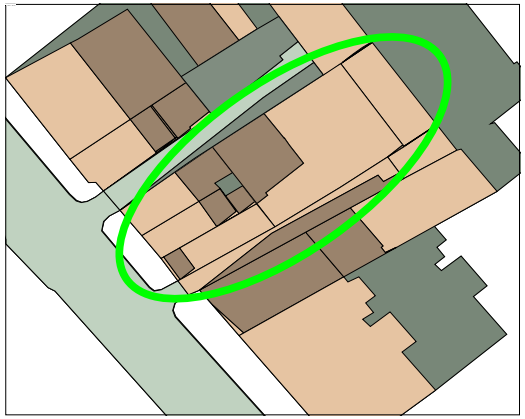
Mar 21 at 9am
Existing site layout

Suncast image:
View time = 21 Mar 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 176.94 alt = 38.07
Eye: azi = 140.00 alt = 90.00



Mar 21 at midday
Existing site layout

Suncast image:
View time = 21 Mar 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 229.38 alt = 26.93
Eye: azi = 140.00 alt = 90.00



Mar 21 at 3pm
Existing site layout

Appendix C: Shadow impact on site

Suncast image:
View time = 21 Mar 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 125.95 alt = 24.58
Eye: azi = 140.00 alt = 90.00

Mar 21st 9am
Proposed site layout

Suncast image:
View time = 21 Mar 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 176.94 alt = 38.07
Eye: azi = 140.00 alt = 90.00

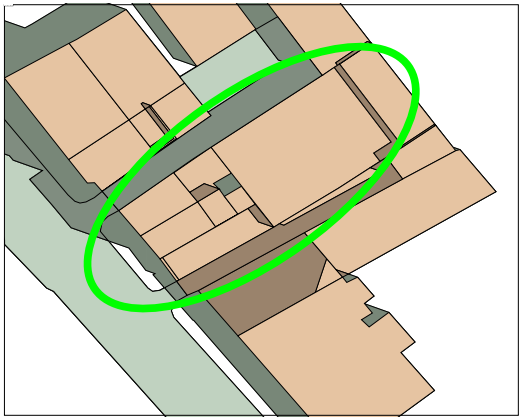
Mar 21 at midday
Proposed site layout

Suncast image:
View time = 21 Mar 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 229.38 alt = 26.93
Eye: azi = 140.00 alt = 90.00

Mar 21 at 3pm
Proposed site layout

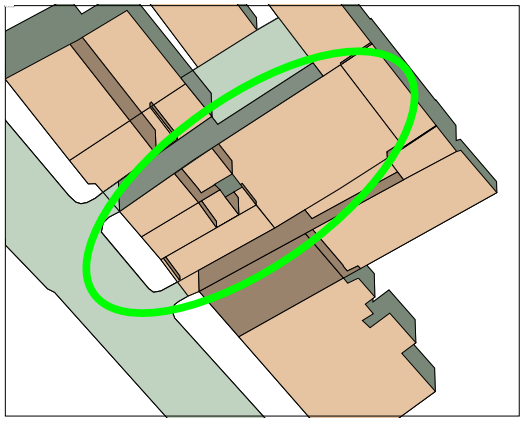
Appendix C: Shadow impact on site

Suncast image:
View time = 22 Jun 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 110.93 alt = 45.16
Eye: azi = 140.00 alt = 90.00



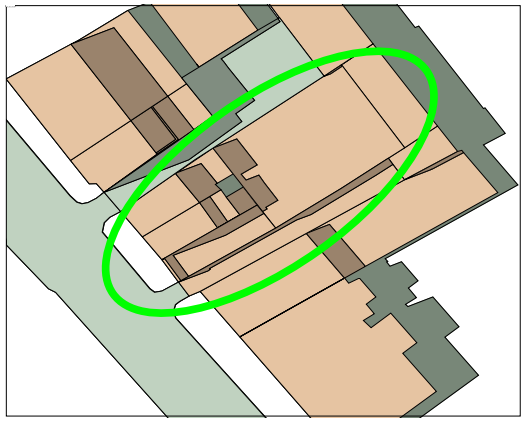
June 22 at 9am
Existing site layout

Suncast image:
View time = 22 Jun 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 178.29 alt = 61.96
Eye: azi = 140.00 alt = 90.00



June 22 at midday
Existing site layout

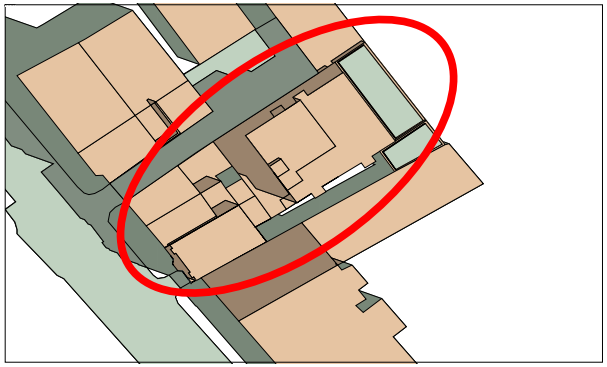
Suncast image:
View time = 22 Jun 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 247.28 alt = 46.18
Eye: azi = 140.00 alt = 90.00



June 22 at 3pm
Existing site layout

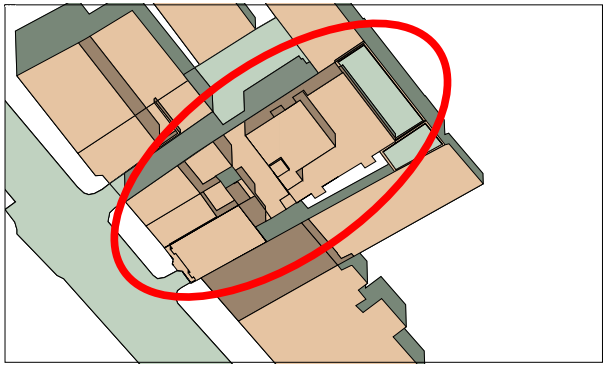
Appendix C: Shadow impact on site

Suncast image:
View time = 22 Jun 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 110.93 alt = 45.16
Eye: azi = 140.00 alt = 90.00



June 22 at 9am
Proposed site layout

Suncast image:
View time = 22 Jun 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 178.29 alt = 61.96
Eye: azi = 140.00 alt = 90.00



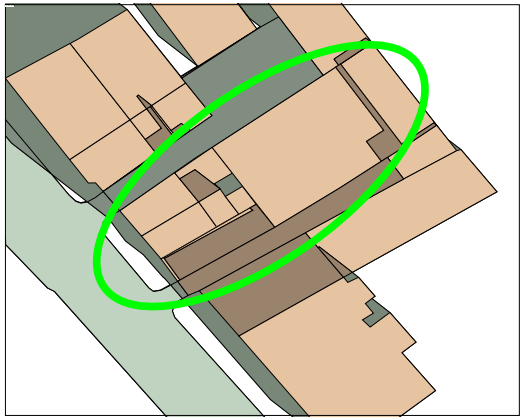
June 22 at midday
Proposed site layout

Suncast image:
View time = 22 Jun 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 247.28 alt = 46.18
Eye: azi = 140.00 alt = 90.00

June 22 at 3pm
Proposed site layout

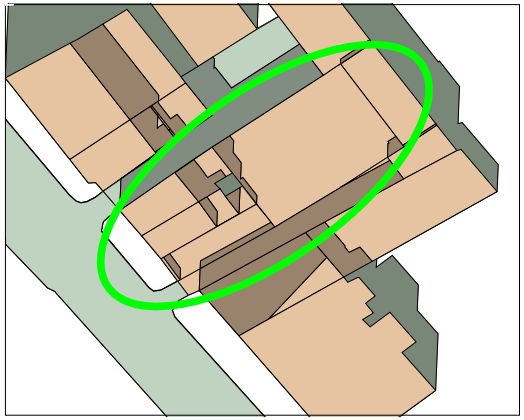
Appendix C: Shadow impact on site

Suncast image:
View time = 23 Sep 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 130.24 alt = 26.07
Eye: azi = 140.00 alt = 90.00



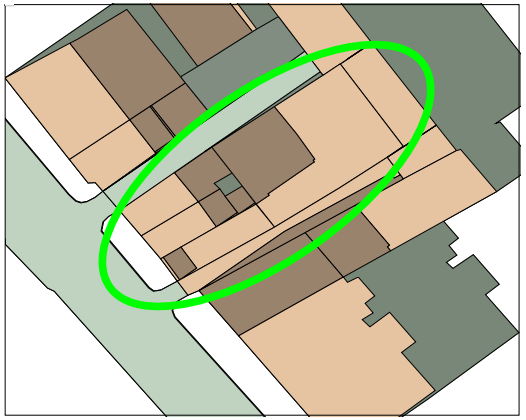
Sept 23 at 9am
Existing site layout

Suncast image:
View time = 23 Sep 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 182.15 alt = 37.50
Eye: azi = 140.00 alt = 90.00



Sept 23 at midday
Existing site layout

Suncast image:
View time = 23 Sep 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 233.05 alt = 24.41
Eye: azi = 140.00 alt = 90.00



Sept 23 at 3pm
Existing site layout

Appendix C: Shadow impact on site

Suncast image:
View time = 23 Sep 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 130.24 alt = 26.07
Eye: azi = 140.00 alt = 90.00

Sept 23 at 9am
Proposed site layout

Suncast image:
View time = 23 Sep 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 182.15 alt = 37.50
Eye: azi = 140.00 alt = 90.00

Sept 23 at midday
Proposed site layout

Suncast image:
View time = 23 Sep 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 233.05 alt = 24.41
Eye: azi = 140.00 alt = 90.00

Sept 23 at 3pm
Proposed site layout