

INTERNAL ILLUMINANCE ANALYSIS

in connection with the proposed development at

**SIKH TEMPLE SITE
CLARENCE PLACE, GRAVESEND
DA12 1LD**

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EXECUTIVE SUMMARY

- 1.1 This Report has been commissioned by Messrs. Guru Nanak Darbar Gurdwara Gravesend to accompany the Planning Permission Application for the conversion of the existing building to accommodate 14 residential apartments together with ancillary cycle and bin storage facilities.
- 1.2 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the Building Research Establishment in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued October 2011. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly.
- 1.3 Within Paragraph 1.6 of the *BRE Second Edition 2011* it states, *inter alia*, '*The advice given here (see BRE Second Edition 2011) is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design*'.
- 1.4 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design*.
- 1.5 The technical analysis, carried out in accordance with *Appendix C* of the *Building Research Establishment Guidance "Site Layout planning for daylight and sunlight: A guide to good practice" Second Edition* issued October 2011, demonstrates that, whilst the existing internal configuration of the property makes conversion into residential units difficult, the proposals generally accord with guidance and provide acceptable levels of internal illuminance to the proposed units.

INTRODUCTION

- 2.1 This Report has been commissioned by Messrs. Guru Nanak Darbar Gurdwara Gravesend to accompany the Planning Permission Application for the conversion of the existing building to accommodate 14 residential apartments together with ancillary cycle and bin storage facilities.
- 2.2 I would confirm that I am a Chartered Building Surveyor working predominately in the field of rights of light including daylight and sunlight assessments. I have an extensive and highly specialised knowledge, in these areas having worked in the past for both Anstey Horne & Co. for five years and Schatunowski Brooks (formerly known as Michael Brooks Associates as it was when I joined, then known as GVA Schatunowski Brooks and now part of Avison Young) for three years, as well as Delva Patman Associates - now known as Delva Patman Redler LLP - for four years prior to joining in Partnership Dixon Payne in 2001. All are acknowledged Experts in these fields; I now act under my own banner.
- 2.3 I regularly provide Expert Witness advice in respect of Planning Applications in respect of daylight and sunlight at Planning Inquiries acting for both Appellants and Planning Authorities. I was consulted by the *Building Research Establishment* prior to the revision of their guidelines in 2011 and am part of the further consultation about further revisions currently being considered following the publication of *BS EN 17037:2018*.
- 2.4 The analysis and assessments are described in more detail in subsequent sections of this Report.
- 2.5 The appropriate drawings are those prepared by Messrs. Haskin Design Limited and are attached to this Report.
- 2.6 For the detailed technical analysis, in accordance with the *BRE Second Edition 2011*, I have constructed the 3D model of the proposals and surrounding properties produced by Messrs. Haskin Design Limited, Planning Authority records and Google Earth images.

INTERNAL ILLUMINANCE

- 3.1 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the *Building Research Establishment* in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued *October 2011*. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly. Paragraph 1.6 of the *BRE Second Edition 2011* states in entirety "*The guide is intended for building designers and their clients, consultants and planning officials. The advice given here (sic BRE Second Edition 2011) is not mandatory and the guide should not be an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or on an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings. Alternatively, where natural light is of special importance in a building, less obstruction and hence more sunlight and daylight may be deemed necessary. The calculation methods in Appendices A, B and G are entirely flexible in this regard. Appendix F gives advice on how to develop a consistent set of target values for skylight under such circumstances, and Appendix C shows how to relate these to interior daylighting requirements.*
- 3.2 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design*. The guide states that where a predominately daylit appearance is required, the *ADF* should be at least 5% or more if there is no supplementary electric lighting or 2% or more there is. In respect of kitchens, living rooms and bedrooms there are additional recommendations of 2%, 1.5% and 1% respectively. *BS8206-2* further advises that achieving 2% if in living room will give an improved daylight provision whilst 3% - 4% would improve the situation further.
- 3.3 For the detailed technical analysis, in accordance with the *BRE Second Edition 2011*, the 3D model as previously described was utilized and, using specialist computer programmes, calculated the quantum of daylight received to the proposed fenestration of property and individual flats calculated by way of *Waldram* analysis as detailed within *Appendix B* of the *BRE Second Edition 2011*.

- 3.4 By way of explanation, Percy J. Waldram invented the Waldram diagram as a method of showing on a 2d image the curved and three-dimensional view of the sky from a fixed point. The area of a Waldram diagram drawn to scale is 396cm² which represents the total amount of unobscured sky that can be seen from a vertical plane. The vertical edges of any obstructions are plotted as vertical lines on the diagrams by reference to their angle from the reference point. The head of any obstruction are plotted along the droop line corresponding to their altitudes above the horizontal measured in the section perpendicular to the reference point.

- 3.5 The ADF of a room is calculated using the following formula:-

$$ADF = \frac{TM A_w \Theta}{A(1-R_{sq})}$$

T = Diffuse visible transmittance of the glazing; assumed 0.68 for clear double glazing

M = Maintenance factor 0.8

A_w = Area of glazing

A = Total surface area of room

R = Average reflectance; 0.5 for assumed light coloured surfaces

Theta = Vertical sky component of window in average daylight factor.

- 3.6 The technical analysis, carried out in accordance with *Appendix C* of the *Building Research Establishment Guidance "Site Layout planning for daylight and sunlight: A guide to good practice" Second Edition* issued October 2011, demonstrates that, whilst the existing internal configuration of the property makes conversion into residential units difficult, the proposals generally accord with guidance and provide acceptable levels of internal illuminance to the proposed units.
- 3.7 By way of clarification, *Paragraph 2.1.14* of the *BRE Second Edition 2011* provides that a small internal galley-type kitchen can be provided, but it should be directly linked to a well daylight living room. These have been utilized where appropriate to overcome the difficulties with daylight penetration to centrally in the building which do not benefit from dual aspects.

CONCLUSION

- 5.1 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the *Building Research Establishment* in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued October 2011. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly. Paragraph 1.6 of the *BRE Second Edition 2011* states in entirety "*The guide is intended for building designers and their clients, consultants and planning officials. The advice given here (sic BRE Second Edition 2011) is not mandatory and the guide should not be an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or on an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings. Alternatively, where natural light is of special importance in a building, less obstruction and hence more sunlight and daylight may be deemed necessary. The calculation methods in Appendices A, B and G are entirely flexible in this regard. Appendix F gives advice on how to develop a consistent set of target values for skylight under such circumstances, and Appendix C shows how to relate these to interior daylighting requirements.*
- 5.2 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design* and the technical analysis confirms that the internal illuminances of the proposed residential dwellings accord with that guidance.

June 28, 2022

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APPENDIX – LAYOUT DRAWING, RESULTS & WALDRAM DIAGRAMS

Gravesham Borough Council

Do Not Scale. Use only figured dimensions.
All dimensions to be checked on site prior to construction.
Any discrepancies to be notified to the architect.

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FLAT 1	1B2P	72m ²
FLAT 2	2B4P	86m ²
FLAT 3	1B2P	58m ²
FLAT 4	2B4P	109m ²
FLAT 5	2B4P	170m ²
FLAT 6	2B4P	74m ²
FLAT 7	2B4P	107m ²
FLAT 8	2B4P	87m ²
FLAT 9	1B2P	51m ²
FLAT 10	1B2P	61m ²
FLAT 11	1B2P	59m ²
FLAT 12	1B2P	69m ²
FLAT 13	1B2P	55m ²
FLAT 14	1B2P	55m ²



- | | |
|---|-----------------------------|
| D | Amendments for D & S |
| C | Reducing 19 units to 14 |
| B | Pre-Application |
| A | Issued for comment 16.12.21 |

Slav	Date	Comments
Client		
Guru Nanak Darbar Gurdwara Gravesend		

Guru Nanak Darbar Gurdwara Gravesend

Project	Proposed Development Site
	Sikh Temple Site
	Clarence Place
	Gravesend
	DA12 1LD

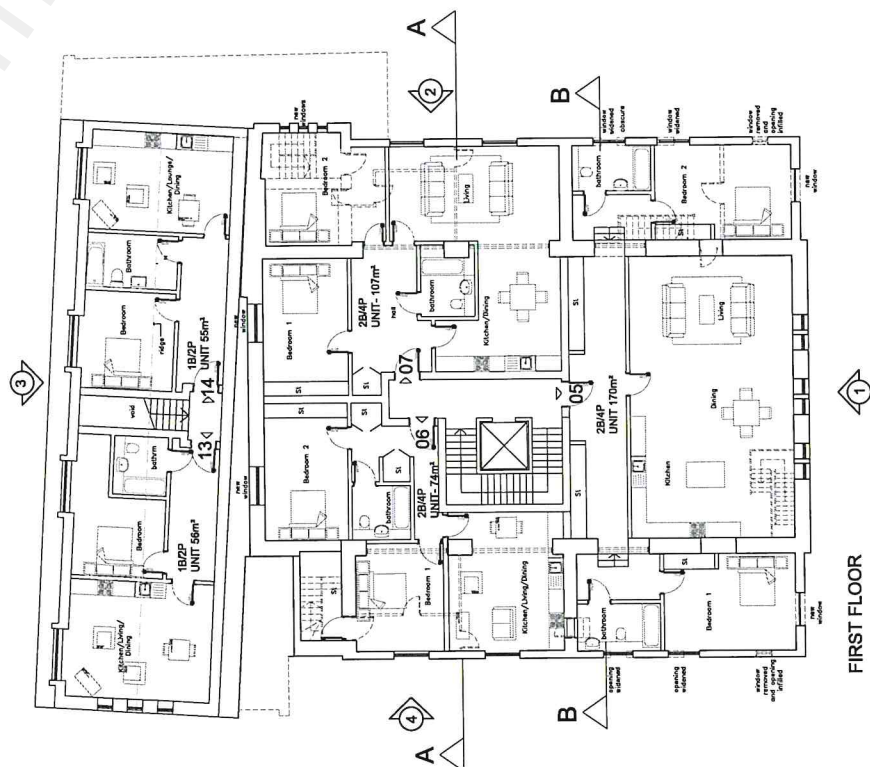
DATE	TIME	Tide	Proposed Plans and Accommodation Schedule
	</		

Project No.	Date
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Drawing No	Revision
181-PD11	D
Scale	Drawn
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	Check
	JH

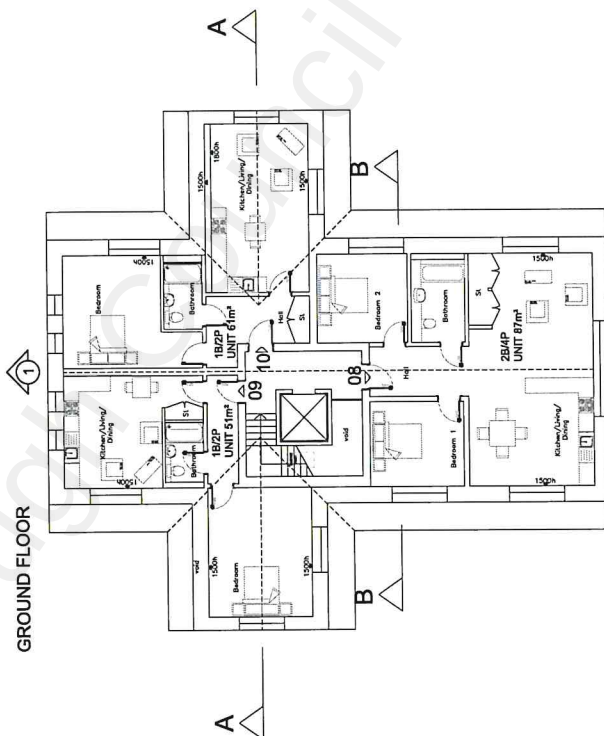


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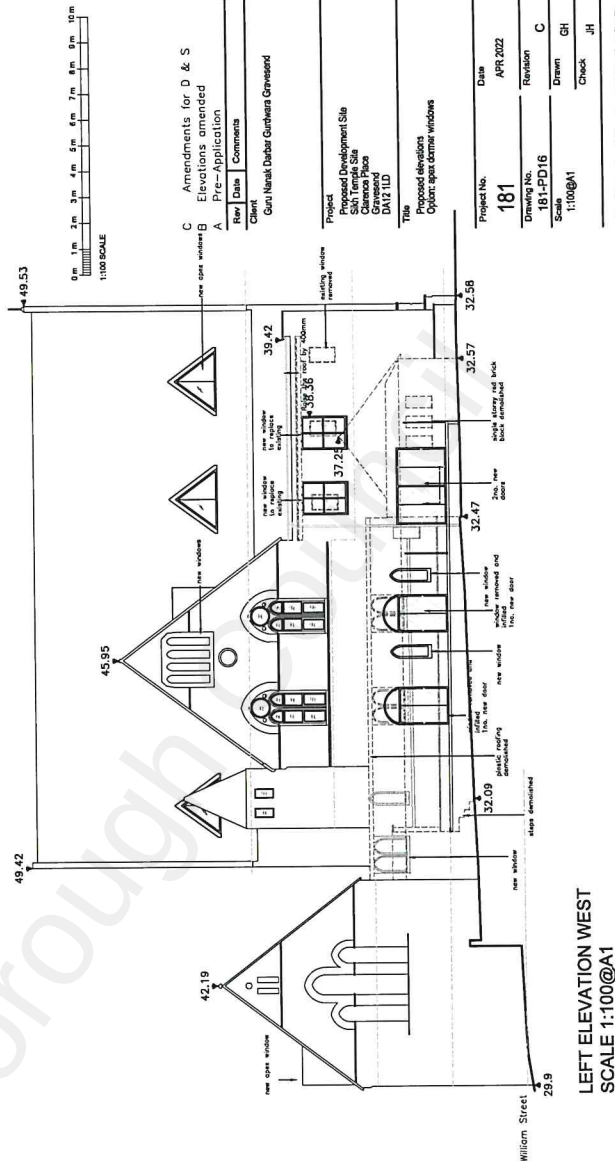
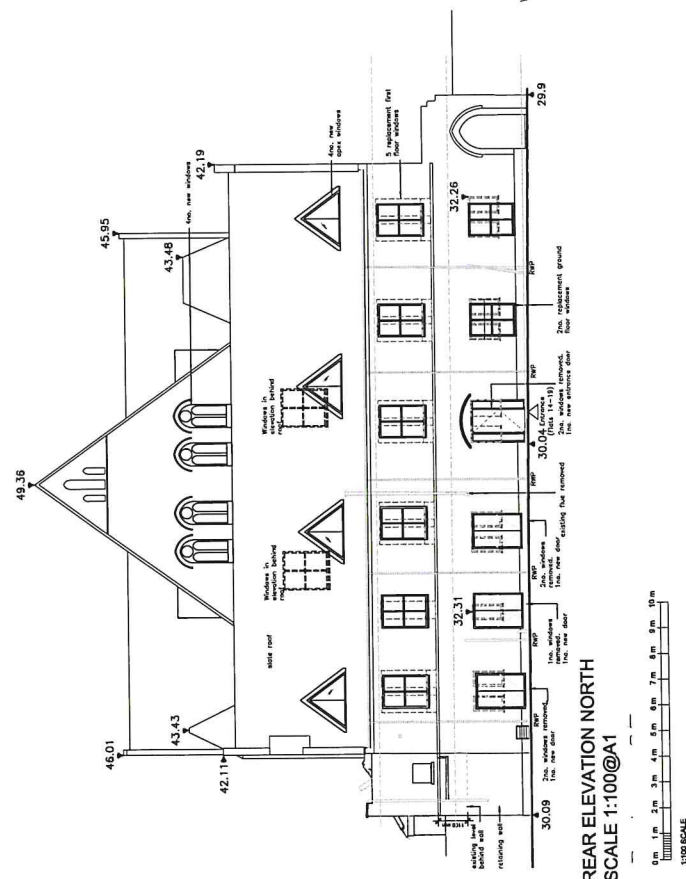
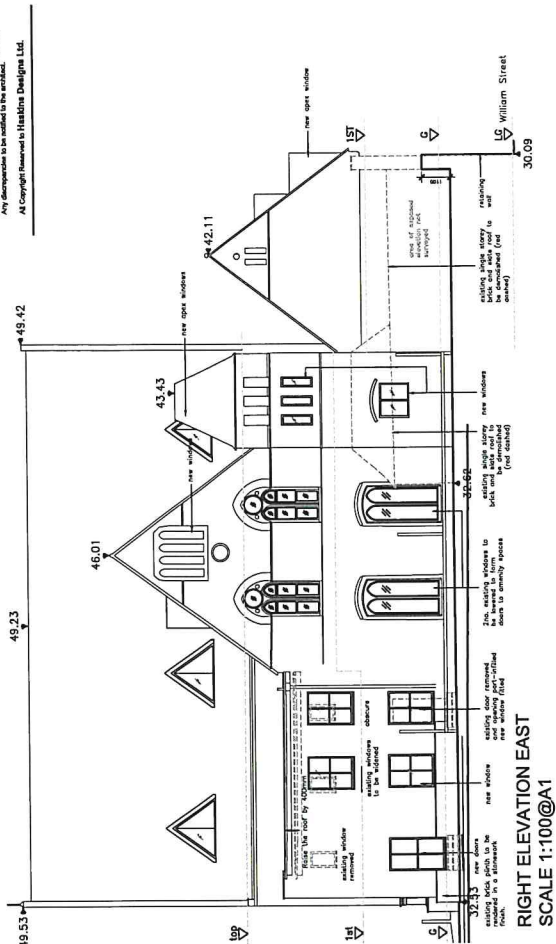
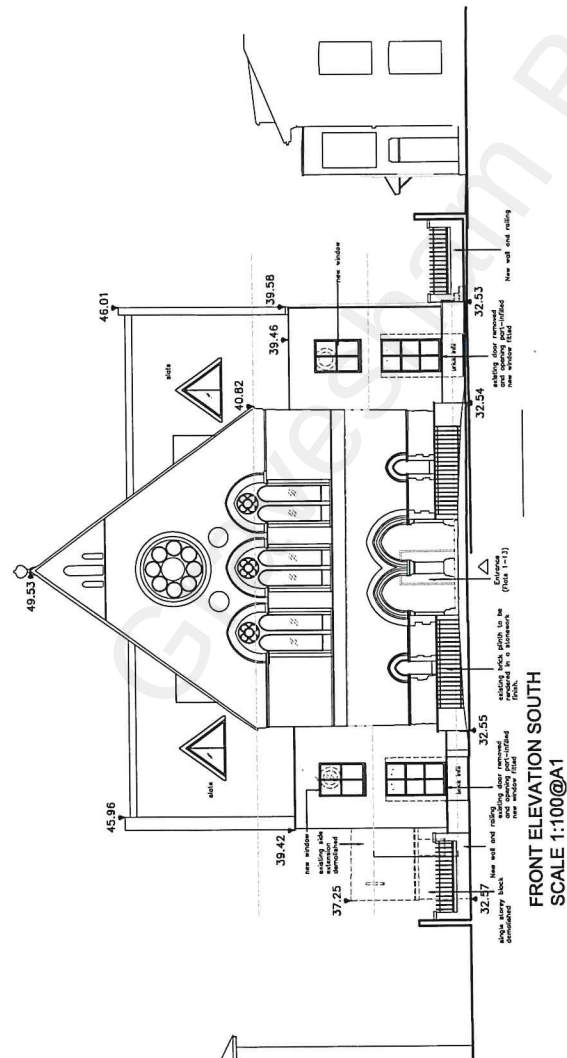
the CMC Centre, 61 Mary's Road, Swanley, Kent, BR8 7BU.
Phone: 01322 479561 Mobile: 07602 182202



FIRST FLOOR



TOP FLOOR

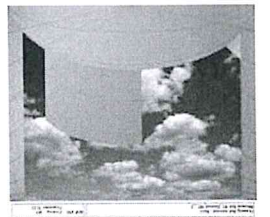


BRE SECOND EDITION 2011
CLARENCE PLACE
INTERNAL ILLUMINANCE

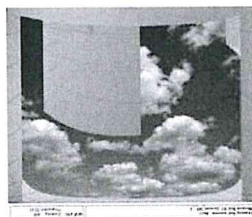
Building Name	Floor Name	Room Name	Room Use	Window Ref	Glass Transmittance	Glazed Area	Clear Sky Pr	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Pr	Guidance Val
FLAT 01	Ground	R1	Living/Dining	W1-L	0.68	2.024684	54.871403	118.439887	0.5	0.15	0.117363	
FLAT 01	Ground	R1	Living/Dining	W1-U	0.68	2.620179	55.938664	118.439887	0.5	1	1.03224	1.5
											1.149603	
FLAT 01	Ground	R2	Bedroom	W2-L	0.68	0.583636	78.941794	72.60584	0.5	0.15	0.079397	
FLAT 01	Ground	R2	Bedroom	W2-U	0.68	2.626156	78.421438	72.60584	0.5	1	2.366025	
FLAT 01	Ground	R2	Bedroom	W3-L	0.68	0.5134	51.162391	72.60584	0.5	0.15	0.045265	
FLAT 01	Ground	R2	Bedroom	W3-U	0.68	0.755	56.179288	72.60584	0.5	1	0.48729	
											2.977976	1
FLAT 02	Ground	R1	LKD	W2-L	0.68	0.088	37.737902	105.405657	0.5	0.15	0.003942	
FLAT 02	Ground	R1	LKD	W2-U	0.68	0.572	37.166908	105.405657	0.5	1	0.168238	
FLAT 02	Ground	R1	LKD	W1-L	0.68	0.952325	52.402922	105.405657	0.5	0.15	0.059238	
FLAT 02	Ground	R1	LKD	W1-U	0.68	1.736592	54.705882	105.405657	0.5	1	0.751802	
FLAT 02	Ground	R1	LKD	W3-L	0.68	0.087999	41.429496	105.405657	0.5	0.15	0.004328	
FLAT 02	Ground	R1	LKD	W3-U	0.68	0.571993	41.48623	105.405657	0.5	1	0.187787	
											1.175335	1.5
FLAT 02	Ground	R2	Bedroom	W4-L	0.68	0.985785	54.721034	73.451547	0.5	0.15	0.091889	
FLAT 02	Ground	R2	Bedroom	W4-U	0.68	1.797609	57.611653	73.451547	0.5	1	1.176089	
											1.267977	1
FLAT 03	Ground	R1	LKD	W1-L	0.68	0.915695	55.542974	85.609957	0.5	0.15	0.074333	
FLAT 03	Ground	R1	LKD	W1-U	0.68	1.992982	65.034079	85.609957	0.5	1	1.262861	
											1.337194	1.5
FLAT 03	Ground	R2	Bedroom	W2	0.68	1.247215	67.314971	64.129241	0.5	1	1.092025	
											1.092025	1
FLAT 04	Ground	R1	LKD	W1	0.68	0.6732	49.80423	174.100028	0.5	1	0.160638	
FLAT 04	Ground	R1	LKD	W4-L	0.68	0.616856	82.226389	174.100028	0.5	0.15	0.036452	
FLAT 04	Ground	R1	LKD	W4-U	0.68	2.566645	80.416502	174.100028	0.5	1	0.988889	
FLAT 04	Ground	R1	LKD	W5-L	0.68	0.8704	58.087018	174.100028	0.5	0.15	0.036335	
FLAT 04	Ground	R1	LKD	W5-U	0.68	1.602435	65.533946	174.100028	0.5	1	0.503134	
FLAT 04	Ground	R1	LKD	W6-L	0.68	0.240765	57.25924	174.100028	0.5	0.15	0.009908	
FLAT 04	Ground	R1	LKD	W6-U	0.68	1.602435	62.041612	174.100028	0.5	1	0.476321	
											2.211676	1.5
FLAT 04	Ground	R2	Bedroom	W2-L	0.68	0.9078	54.830405	91.630387	0.5	0.15	0.067967	
FLAT 04	Ground	R2	Bedroom	W2-U	0.68	1.9758	63.868809	91.630387	0.5	1	1.148756	
											1.216723	1
FLAT 04	Ground	R3	Bedroom	W3-L	0.68	0.240765	57.440452	59.025937	0.5	0.15	0.029315	
FLAT 04	Ground	R3	Bedroom	W3-U	0.68	1.602435	62.671145	59.025937	0.5	1	1.41919	
											1.448506	1
B05	First	R1	LKD	W1	0.68	1.198023	57.396946	233.421728	0.5	1	0.245724	
B05	First	R1	LKD	W2	0.68	1.198023	57.376412	233.421728	0.5	1	0.245636	
B05	First	R1	LKD	W3	0.68	1.198023	57.326745	233.421728	0.5	1	0.245424	
B05	First	R1	LKD	W4	0.68	1.198023	57.296073	233.421728	0.5	1	0.245292	
B05	First	R1	LKD	W5	0.68	1.198023	57.216119	233.421728	0.5	1	0.24495	
B05	First	R1	LKD	W6	0.68	1.198023	57.175565	233.421728	0.5	1	0.244777	
											1.471804	1
B05	First	R2	Bedroom	W7-L	0.68	0.583197	79.68232	86.79767	0.5	0.15	0.066988	
B05	First	R2	Bedroom	W7-U	0.68	1.258477	74.380542	86.79767	0.5	1	0.899564	
B05	First	R2	Bedroom	W8-L	0.68	0.546223	71.685117	86.79767	0.5	0.15	0.056444	

B05	First	R2	Bedroom	W8-U	0.68	1.190864	70.684277	86.79767	0.5	1	0.808932 1.831928
B05	First	R3	Bedroom	W10-L	0.68	0.526923	75.542345	87.893707	0.5	0.15	0.056664
B05	First	R3	Bedroom	W10-U	0.68	1.27894	74.666915	87.893707	0.5	1	0.906267
B05	First	R3	Bedroom	W9-L	0.68	0.583197	80.895751	87.893707	0.5	0.15	0.06716
B05	First	R3	Bedroom	W9-U	0.68	1.258477	75.35006	87.893707	0.5	1	0.899926 1.930016
B06	First	R1	LKD	W1	0.68	2.359411	77.002811	107.785195	0.5	1	1.406004 1.406004
B06	First	R2	Bedroom	W2	0.68	2.366214	78.653149	69.453108	0.5	1	2.235188 2.235188
B06	First	R3	Bedroom	W2	0.68	2.023132	47.808674	80.603805	0.5	1	1.000947 1.000947
B07	First	R1	LKD	W2-L	0.68	0.234021	80.437747	182.717432	0.5	0.15	0.01289
B07	First	R1	LKD	W2-U	0.68	2.079476	80.797431	182.717432	0.5	1	0.76702
B07	First	R1	LKD	W1-L	0.68	0.239354	79.679721	182.717432	0.5	0.15	0.01306
B07	First	R1	LKD	W1-U	0.68	2.126861	80.471344	182.717432	0.5	1	0.781332 1.574303
B07	First	R2	Bedroom	W1	0.68	2.023132	45.583553	81.771821	0.5	1	0.940728 0.940728
B07	First	R3	Bedroom	W3-L	0.68	0.004042	57.090477	89.322573	0.5	0.15	0.00323
B07	First	R3	Bedroom	W3-U	0.68	0.375295	56.800635	89.322573	0.5	1	0.199067
B07	First	R3	Bedroom	W4-L	0.68	0.004042	57.112295	89.322573	0.5	0.15	0.000323
B07	First	R3	Bedroom	W4-U	0.68	0.375295	56.810292	89.322573	0.5	1	0.199101
B07	First	R3	Bedroom	W5-L	0.68	0.004042	57.112295	89.322573	0.5	0.15	0.000323
B07	First	R3	Bedroom	W5-U	0.68	0.375295	56.810292	89.322573	0.5	1	0.199101 0.59824
FLAT 08	Second	R1	LKD	W3	0.68	1.193031	58.684258	162.471255	0.5	1	0.359445
FLAT 08	Second	R1	LKD	W1	0.68	5.224004	82.267985	162.471255	0.5	1	2.206446
FLAT 08	Second	R1	LKD	W2	0.68	1.193031	58.683874	162.471255	0.5	1	0.359443 2.925333
FLAT 08	Second	R2	Bedroom	W4	0.68	1.193032	57.156828	62.387625	0.5	1	0.911711 0.911711
FLAT 08	Second	R3	Bedroom	W5	0.68	1.193032	54.453909	62.450872	0.5	1	0.867717 0.867717
FLAT 09	Second	R1	LKD	W3	0.68	1.193032	56.449428	91.010975	0.5	1	0.617239
FLAT 09	Second	R1	LKD	W4	0.68	0.925878	60.275578	91.010975	0.5	1	0.51149
FLAT 09	Second	R2	Bedroom	W1	0.68	2.088991	78.506361	90.271394	0.5	1	1.128728
FLAT 09	Second	R2	Bedroom	W2	0.68	1.044495	51.636609	90.271394	0.5	1	1.515398 0.498367
FLAT 10	Second	R1	LKD	W3	0.68	1.204304	55.058403	91.509578	0.5	1	2.013765
FLAT 10	Second	R1	LKD	W4	0.68	0.925878	60.275578	91.509578	0.5	1	0.604406 0.508703
FLAT 10	Second	R2	Bedroom	W2	0.68	2.088991	78.503499	110.680804	0.5	1	1.113108 1.235915
FLAT 10	Second	R2	Bedroom	W1	0.68	1.044495	51.686506	110.680804	0.5	1	0.406862 1.642777
FLAT 11	Ground	R2	Bedroom	W5	0.68	1.605889	71.948884	73.33509	0.5	1	1.314205 1.314205
FLAT 12	Ground	R1	LKD	W1	0.68	1.605889	72.499569	79.390633	0.5	1	1.

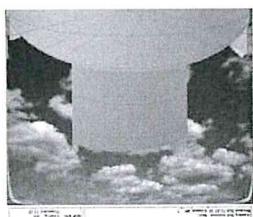
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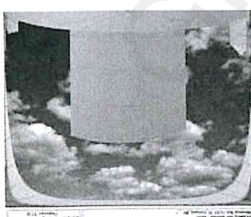
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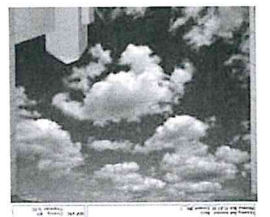
ADFVSC-FLAT



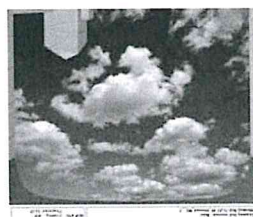
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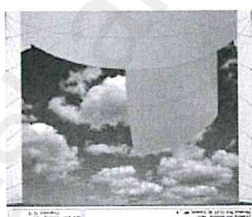
ADFVSC-FLAT



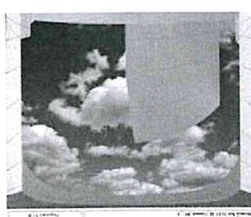
ADFVSC-FLAT



ADFVSC-FLAT



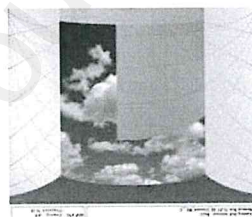
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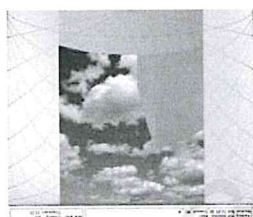
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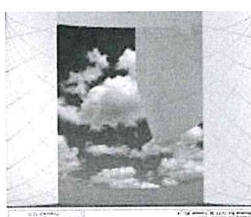
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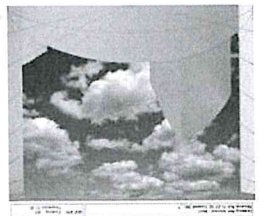
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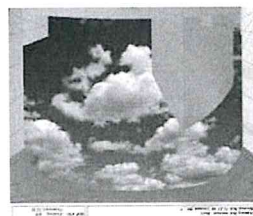
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ADFVSC-FLAT



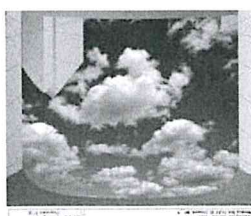
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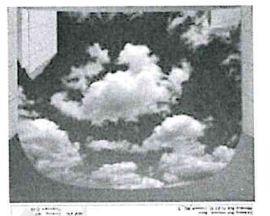
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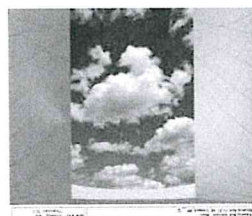
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ADFVSC-FLAT



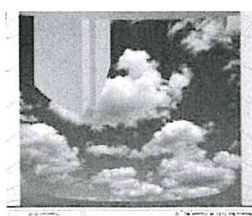
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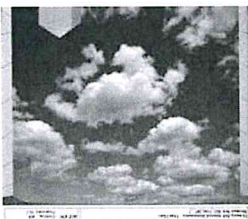
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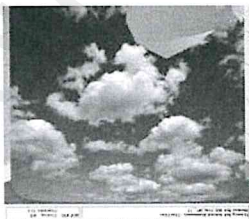


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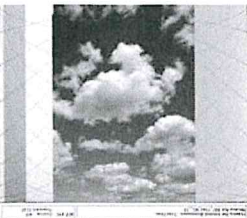
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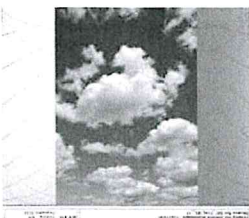
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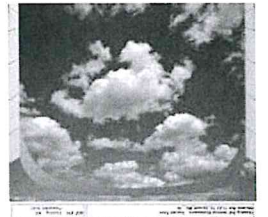


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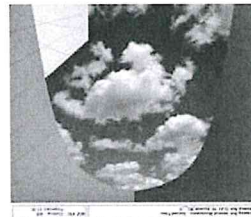




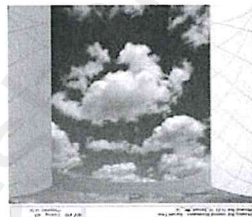
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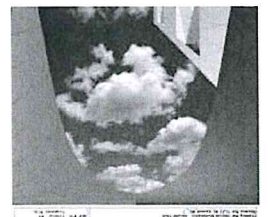
ADFVSC-FLAT



ADFVSC-FLAT



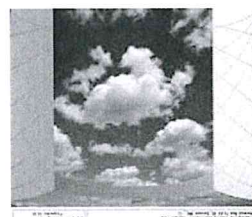
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ADFVSC-FLAT



ADFVSC-FLAT



ADFVSC-FLAT

