COMMERCIAL - IN - CONFIDENCE

BMT Fluid Mechanics Limited

Project No. 46086/00

Camden High Street Roof Extension, London
Sunlight & Daylight Study

(05 March 2007)

for

Oberon Properties Ltd.

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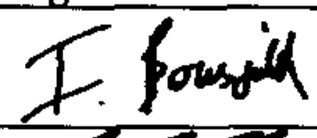
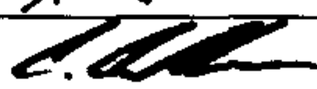
Report Title	**Camden High Street Roof Extension, London Sunlight & Daylight Study**		
Client:	**Oberon Properties Ltd.**		
Document No:	**46086rep2v3**	**Release: 3**	**Copy No:**
Status	**Draft Report for Client Review**		
Report Date:	**05 March 2007**		
Holds:			

	Name:	**Signature:**	**Date:**
Prepared by:	**I Bousfield**		**05 March, 2007**
Checked by:	**Dr C Craddock**		**05 March, 2007**
Approved by:	**Dr C Craddock**		**05 March, 2007**

Distribution:	**Copy no.**	**to Client**
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Previous Release History:	**Release No:**	**Status:**	**Date:**
46086rep2v1	**1**	**Draft Report for Internal Review**	**22 February 2007**
46086rep2v2	**2**	**Draft Report for Client Review**	**23 February 2007**

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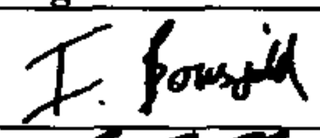
Prepared by:	**I Bousfield**		**05 March, 2007**
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EXECUTIVE SUMMARY

Background

BMT Fluid Mechanics Ltd. (BMT) has conducted a sunlight and daylight impact assessment for the proposed redevelopment and extension of a commercial property on the Western side of Camden High Street, North London. The study considered both the existing site and proposed development and has provided an assessment of the impact of the proposed building on adjacent properties.

Summary of Design Guidance

Natural light has been assessed in terms of two quantities as described by best practice guidelines for sunlight and daylight provision:

1) The percentage of Annual Probable Sunlight Hours - the average number of hours that a particular location receives direct sunlight accounting for cloud cover compared to that for an unobstructed location;

2) Vertical Sky Component - the amount of daylight available at a location on a vertical façade relative to the amount of daylight available at a location on an unobstructed horizontal plane.

In summary, planning guidelines require the Annual Probable Sunlight Hours (see 1 above) to be at least 25% on an annual basis and at least 5% during the winter months of September to March. This quantifies the availability of direct sunlight at a particular location and is a measure of the impact of overshadowing. A further planning requirement is for the Vertical Sky Component (see 2 above) to be at least 27%. This quantifies access to daylight (diffused light) at a particular location and is a measure of obstruction to daylight (or enclosure) caused by buildings or other structures surrounding that location.

If the impact of a proposed development is such that the above design guidance is achieved, then it is likely that adequate sunlight and daylight will be available in the relevant areas and that no further measures will be necessary for improvement. If the proposed development causes a degradation of conditions such that the above guidance is not achieved in areas where previously it had been achieved under existing site conditions, it is likely that occupants of those areas will notice the impact and may give cause for complaint. A similar perception will arise in areas where the existing site conditions do not achieve the above guidance and the impact of the proposed development reduces the sunlight and daylight availability to less than 80% of the existing conditions.

It is possible for a proposed development to result in an adverse impact relative to existing conditions, yet still comply with best practice guidelines if the recommended minimum quantities of direct sunlight and daylight are achieved.

Design Guidance in Practice

The above design guidance describes best practice for site layout planning and should not be interpreted as a mandatory requirement. The guidance is flexible and should be applied with due consideration to the general site location and the intended use of local areas around the site. For example, long periods of overshadowing and reduced daylight availability are likely to be more acceptable in a city centre environment compared to residential developments in sub-urban or rural areas. Similarly, in the close proximity of a development, a car park is likely to be less sensitive to good quality natural lighting compared to a café area with outdoor seating.

As far as possible, areas sensitive to sunlight/daylight requirements should be located on the south side of the development but not adjacent to a neighbouring structure. In some cases it may be possible to improve the availability of natural light through design changes, e.g. layout changes, building orientation etc. In areas where it is not possible to meet the design guidance, consideration should be given to practical measures to provide a perception of better natural lighting, e.g. by avoiding use of dark coloured material on external walls and minimising dense landscaping which could exacerbate overshadowing.

Sunlight

The impact assessment for the proposed four storey commercial development showed that recommendations of best practice guidelines for sunlight availability are met at all ground assessment points on neighbouring properties.

Best practice recommendations for sunlight availability on an annual basis were met at all façade assessment locations except at four façades to the east of the development site at the rear of the neighbouring terraced housing. However, the reduction of sunlight availability at these locations was only marginal. All façade assessment locations meet the recommendations of best practice during winter.

Daylight

Best practice guidelines for daylight availability were achieved at all façade assessment locations except at five façades to the east of the development site at the rear of the neighbouring terraced housing, and three to the west of the development site on a commercial building. Of the five façade locations to the east of the development, four were subject to only a marginal impact on daylight availability and one a moderate impact. However, the façade assessment location with a moderate impact represents a large glass double door that will allow a large amount of light to penetrate the interior of the affected room.

Contents Page

1. INTRODUCTION

1.1. Background

This report summarises the results of a study commissioned by Oberon Properties Ltd. to provide an impact assessment of sunlight and daylight availability for the proposed redevelopment and extension of a commercial property on the Western side of Camden High Street, North London. Planning approval is being sought for a four story mixed residential and commercial office development.

1.2. Site Description

1.2.1. Location

The proposed development is located in Camden, North London. It is on a site bounded on the east by a block of terraced commercial/residential housing running along the west side of Camden High Street, a multi storey commercial property to the west and Symes Mews to the North. Figure 1 shows the location of the commercial development site.

1.2.2. Surrounding Area

The area surrounding the site consists of predominantly three to four storey terraced housing along Camden High Street, Mornington Crescent and Arlington Road. There are two large buildings nearby - to the northwest is a five storey mixed commercial/residential property and to the west, Cobden House, which is a six storey residential property. There is no significant topography in the surrounding area.

1.2.3. Baseline

The baseline for the purpose of this study was the existing commercial building on the site that varies in height from two to three stories from north to south.

Figure 2 shows a view of the model used for the analysis of the existing site.

1.2.4. Proposed Development

A proposal has been put forward for a four storey mixed residential and commercial office property. The proposed development will be situated parallel to Camden High Street from Symes Mews to 13 Camden High Street. Figure 3 shows a view of the four storey model used for the analysis of the proposed development.

1.3. Requirements for Sunlight and Daylight Assessment

Natural light is defined as comprising two components; sunlight and daylight. Sunlight relates to direct exposure to solar radiation while daylight refers to diffused skylight. Criteria for assessing the quality of natural light are outlined in BR 209, "Site layout planning for daylight and sunlight" [1]. Sunlight and daylight are assessed in terms of the Annual Probable Sunlight Hours (APSH) and Vertical Sky Component (VSC) respectively. Details of the requirements for sunlight and daylight availability are given in APPENDIX A .

2. SCOPE AND METHODOLOGY

2.1. Scope of Work

The scope of work agreed between Stephen Davy Peter Smith Architects Ltd. and BMT for the sunlight and daylight study is as follows:

2.1.1. Model

- Construct numerical models of the existing site and proposed schemes (both 4 storey and 5 storey schemes) for the purpose of conducting sunlight, daylight and shadow analysis.

2.1.2. Numerical Simulations

- Conduct overshadowing simulations to provide shadow animations for the 21st day of each month

- Determine the levels of direct sunlight (Annual Probable Sunlight Hours - APSH) at up to 20 ground and 30 facade target locations for the existing site and proposed schemes (including adjoining properties)

- Determine the levels of daylight (Vertical Sky Component - VSC) at up to 20 ground and 30 facade locations for the existing site and proposed schemes (including adjoining properties)

- Analyse APSH and VSC for the existing and proposed schemes with respect to industry standard guidelines relevant to site layout planning for daylight and sunlight to quantify the impact of proposed scheme

2.1.3. Report

- Summarise the main conclusions of the sunlight and daylight study in a technical report highlighting any significant impact caused by the proposed scheme relative to existing site conditions.

2.2. Methodology

2.2.1. Climate Data

Typical sunlight hours for each month of the year for Greenwich, London (approximately 7 miles south east of the site) were used in the analysis (averaged over the period 1971 to 2000). Climate data was obtained from the UK Met Office.

2.2.2. Model Detail

Computational models were constructed to represent the baseline existing site conditions and the proposed developments. The models included a detailed representation of adjacent buildings up to a distance judged to have an influence on the availability of natural light. The models of the proposed commercial development were constructed based on drawings supplied to BMT. Figure 2 and Figure 3 show models of the existing site and proposed four storey development respectively.

2.2.3. Sunlight and Daylight Analysis [APPENDIX A]

Façades and ground locations were assessed with respect to guidelines for site layout planning for natural lighting, a brief description of which is given in APPENDIX A . Several façades were assessed at different heights, corresponding to windows on different floors of adjacent buildings.

Sunlight hours were calculated by simulating the movement of sun for each hour of the day, for the full year using accurate sun paths for the geographical coordinates of the site. Annual and winter sunlight hours were obtained from the appropriate hours that represent these periods.

Daylight was calculated by constructing a so-called Waldram diagram at each location of interest. Waldram diagrams plot surrounding obstructions viewed from that location on a vertical plane. Daylight availability is a function of the view of the sky on this vertical plane.

2.2.4. Impact Rating [APPENDIX A]

BMT classifies the impact of the development on sunlight and daylight availability at each assessment location according to the severity ratings given in APPENDIX A . The impact ratings are based on the percentage change in the quality of natural light from existing site conditions.

3. ASSESSMENT OF IMPACTS

3.1. Presentation of Results

Results are provided for the existing and proposed schemes as follows.

3.1.1. Sunlight (APSH)

The Annual Probable Sunlight Hours (APSH) was assessed at 25 ground locations and 86 façade locations, as shown in Figure 4 to Figure 15. Table 1 to Table 5 provide a summary of APSH at these locations for the existing and proposed four storey schemes.

3.1.2. Daylight (VSC)

The Vertical Sky Component (VSC) was assessed at 86 façade locations. Table 6 and Table 7 provide a summary of VSC at each façade location for the existing and proposed four storey schemes.

3.1.3. Impact Ratings

Table 1 to Table 7 give impact severity ratings at each assessment location for sunlight and daylight. The impact severity categories are described in APPENDIX A .

3.2. Proposed Development

3.2.1. Impact on Sunlight

3.2.1.1. Ground Assessment Points - Table 1

The impact assessment for the proposed four storey commercial development showed that recommendations of best practice guidelines for sunlight availability are met at all ground assessment points on neighbouring properties on an annual basis and during the winter months.

3.2.1.2. Façade Assessment Locations – Table 2 to Table 5

Best practice recommendations for sunlight availability on an annual basis were met at all façade assessment locations except at four façades (F11, F13, F14, and F29) to the east of the development site at the rear of neighbouring terraced housing.

Sunlight availability at façade assessment locations F11, F13, F14 and F29 is only marginally reduced below recommended guidelines.

All of the façades meet the recommendations of best practice during winter.

3.2.2. Impact on Daylight - Table 6 & Table 7

Best practice guidelines for daylight availability were achieved at all façade assessment locations except at five façades to the east of the development site at the rear of the neighbouring terraced housing (F11, F28, F29, F30, F31), and three to the west of the development site on a commercial building (F69, F70, F71).

The three of the commercial property façade assessment locations (F69, F70 and F71) that did not meet the recommendations of best practice daylight availability are unlikely to be sensitive to the reduction in available daylight.

The impact of the proposed development on façade location F11 is minimal since it fails to comply with best practice guidelines by only 1%. Similarly, the impact on daylight availability for facades F28, F29, and F30 is only marginally adverse in terms of failing to meet best practice guidelines.

There is a moderately adverse reduction in daylight availability at assessment façade location F31. However, this location represents a large glass double door that will allow a large amount of light to penetrate the interior of the affected room.

4. SUMMARY AND CONCLUSIONS

The following conclusions are drawn from the sunlight and daylight assessment for the proposed redevelopment and extension of a commercial property on the Western side of Camden High Street, North London. The study considered both the existing site and proposed development and has provided an assessment of the impact of the proposed building on adjacent properties. The conclusions are based on industry standard guidelines for site layout planning in relation to natural light.

Sunlight

- Recommendations of best practice guidelines for sunlight availability were met at all ground assessment points.
- Best practice recommendations for sunlight availability on an annual basis were met at all façade assessment locations except at four façades to the east of the development site at the rear of the neighbouring terraced housing. However, the reduction of sunlight availability at these locations was only marginal.
- All façade assessment locations meet the best practice recommendations for sunlight during winter.

Daylight

- Best practice guidelines for daylight availability were achieved at all façade assessment locations except at five façades to the east of the development site at the rear of the neighbouring terraced housing. There were also an additional three façade assessment locations that failed to meet the best practice guidelines to the west of the development site on a commercial building. However, the commercial property is unlikely to be sensitive to the reduction in available daylight.
- Four of the terraced housing facades were subject to only a marginally adverse impact on daylight availability and one a moderate impact. However, the façade assessment location with a moderate impact represents a large glass double door that will allow a large amount of light to penetrate the interior of the affected room.

5. REFERENCES

[1] BR 209, "Site layout planning for daylight and sunlight. A guide to good practice." P J Littlefair, 1991.

TABLES

Location	Annual APSH (%)			Impact	Guidelines Satisfied	Winter APSH (%)			Impact	Guidelines Satisfied
	Exist.	Prop.	Ratio**			Exist.	Prop.	Ratio**		
G1	22	21	0.95	Negligible Adverse	Yes	11	9	0.82	Slight Adverse	Yes
G2	35	35	1.00	None	Yes	23	22	0.96	Negligible Adverse	Yes
G3	29	28	0.97	Negligible Adverse	Yes	18	17	0.94	Negligible Adverse	Yes
G4	13	13	1.00	None	Yes	1	1	1.00	None	Yes
G5	34	33	0.97	Negligible Adverse	Yes	27	25	0.93	Negligible Adverse	Yes
G6	31	30	0.97	Negligible Adverse	Yes	20	18	0.90	Negligible Adverse	Yes
G7	36	35	0.97	Negligible Adverse	Yes	16	14	0.88	Slight Adverse	Yes
G8	35	34	0.97	Negligible Adverse	Yes	13	12	0.92	Negligible Adverse	Yes
G9	13	13	1.00	None	Yes	12	12	1.00	None	Yes
G10	25	25	1.00	None	Yes	13	13	1.00	None	Yes
G11	32	32	1.00	None	Yes	16	16	1.00	None	Yes
G12	50	49	0.98	Negligible Adverse	Yes	35	35	1.00	None	Yes
G13	51	50	0.98	Negligible Adverse	Yes	32	32	1.00	None	Yes
G14	39	39	1.00	None	Yes	24	24	1.00	None	Yes
G15	27	27	1.00	None	Yes	12	12	1.00	None	Yes
G16	24	24	1.00	None	Yes	17	17	1.00	None	Yes
G17	23	23	1.00	None	Yes	9	9	1.00	None	Yes
G18	28	28	1.00	None	Yes	23	23	1.00	None	Yes
G19	23	23	1.00	None	Yes	6	6	1.00	None	Yes
G20	16	16	1.00	None	Yes	5	5	1.00	None	Yes
G21	62	62	1.00	None	Yes	70	70	1.00	None	Yes
G22	53	53	1.00	None	Yes	57	57	1.00	None	Yes
G23	49	49	1.00	None	Yes	45	45	1.00	None	Yes
G24	45	45	1.00	None	Yes	41	41	1.00	None	Yes
G25	48	48	1.00	None	Yes	39	39	1.00	None	Yes

** Ratio of Existing to Proposed APSH
(Note that the impact of a proposed development on direct sunlight at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of sunlight levels below the recommended guidelines)

Table 1: Sunlight Availability - Summary of APSH - Ground Locations (Figure 4 to Figure 6)

Location	Annual APSH (%)			Impact	Guidelines Satisfied	Winter APSH (%)			Impact	Guidelines Satisfied
	Exist.	Prop.	Ratio**			Exist.	Prop.	Ratio**		
F1	41	41	1.00	None	Yes	39	39	1.00	None	Yes
F2	34	33	0.97	Negligible Adverse	Yes	28	25	0.89	Slight Adverse	Yes
F3	44	44	1.00	None	Yes	40	41	1.03	Negligible Beneficial	Yes
F4	36	35	0.97	Negligible Adverse	Yes	30	27	0.90	Negligible Adverse	Yes
F5	45	44	0.98	Negligible Adverse	Yes	47	45	0.96	Negligible Adverse	Yes
F6	35	35	1.00	None	Yes	32	30	0.94	Negligible Adverse	Yes
F7	46	45	0.98	Negligible Adverse	Yes	54	50	0.93	Negligible Adverse	Yes
F8	34	34	1.00	None	Yes	31	29	0.94	Negligible Adverse	Yes
F9	32	30	0.94	Negligible Adverse	Yes	33	29	0.88	Slight Adverse	Yes
F10	33	28	0.85	Slight Adverse	Yes	22	18	0.82	Slight Adverse	Yes
F11	24	17	0.71	Marginal Adverse	No	13	9	0.69	Moderate Adverse	Yes
F12	36	33	0.92	Negligible Adverse	Yes	25	22	0.88	Slight Adverse	Yes
F13	29	21	0.72	Marginal Adverse	No	16	12	0.75	Marginal Adverse	Yes
F14	20	14	0.70	Marginal Adverse	No	10	6	0.60	Moderate Adverse	Yes
F15	49	47	0.96	Negligible Adverse	Yes	47	47	1.00	None	Yes
F16	42	37	0.88	Slight Adverse	Yes	37	36	0.97	Negligible Adverse	Yes
F17	29	24	0.83	Slight Adverse	Yes	11	7	0.64	Moderate Adverse	Yes
F18	42	38	0.90	Negligible Adverse	Yes	38	35	0.92	Negligible Adverse	Yes
F19	40	37	0.93	Negligible Adverse	Yes	35	30	0.86	Slight Adverse	Yes
F20	34	31	0.91	Negligible Adverse	Yes	28	22	0.79	Marginal Adverse	Yes

* Guideline not strictly applicable because façade does not face within 90° of South
** Ratio of Existing to Proposed APSH
(Note that the impact of a proposed development on direct sunlight at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of sunlight levels below the recommended guidelines)

Table 2: Sunlight Availability - Summary of APSH - Façade Locations on Surrounding Buildings (Figure 7 and Figure 8)

Location	Annual APSH (%)			Impact	Guidelines Satisfied	Winter APSH (%)			Impact	Guidelines Satisfied
	Exist.	Prop.	Ratio**			Exist.	Prop.	Ratio**		
F21	36	33	0.92	Negligible Adverse	Yes	34	25	0.74	Marginal Adverse	Yes
F22	25	22	0.88	Slight Adverse	Yes	15	7	0.47	Strong Adverse	Yes
F23	9	11	1.22	Marginal Beneficial	Yes	1	1	1.00	None	Yes
F24	48	44	0.92	Negligible Adverse	Yes	51	40	0.78	Marginal Adverse	Yes
F25	35	32	0.91	Negligible Adverse	Yes	31	26	0.84	Slight Adverse	Yes
F26	19	20	1.05	Negligible Beneficial	Yes	18	16	0.89	Slight Adverse	Yes
F27	51	47	0.92	Negligible Adverse	Yes	59	48	0.81	Slight Adverse	Yes
F28	43	33	0.77	Marginal Adverse	Yes	51	34	0.67	Moderate Adverse	Yes
F29	24	17	0.71	Marginal Adverse	No	16	6	0.38	Strong Adverse	Yes
F30	45	34	0.76	Marginal Adverse	Yes	53	45	0.85	Slight Adverse	Yes
F31	39	27	0.69	Moderate Adverse	Yes	37	36	0.97	Negligible Adverse	Yes
F32	46	46	1.00	None	Yes	49	49	1.00	None	Yes
F33	39	38	0.97	Negligible Adverse	Yes	35	35	1.00	None	Yes
F34	47	47	1.00	None	Yes	49	49	1.00	None	Yes
F35	35	35	1.00	None	Yes	25	25	1.00	None	Yes
F36	45	45	1.00	None	Yes*	47	47	1.00	None	Yes*
F37	23	23	1.00	None	Yes*	1	1	1.00	None	Yes*
F38	37	36	0.97	Negligible Adverse	Yes*	32	32	1.00	None	Yes*
F39	27	26	0.96	Negligible Adverse	Yes*	25	25	1.00	None	Yes*
F40	21	21	1.00	None	Yes*	14	14	1.00	None	Yes*
F41	9	9	1.00	None	Yes*	2	2	1.00	None	Yes*
F42	24	24	1.00	None	Yes*	18	18	1.00	None	Yes*
F43	15	15	1.00	None	Yes*	7	7	1.00	None	Yes*

* Guideline not strictly applicable because façade does not face within 90° of South
** Ratio of Existing to Proposed APSH
(Note that the impact of a proposed development on direct sunlight at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of sunlight levels below the recommended guidelines)

Table 3: Sunlight Availability - Summary of APSH - Façade Locations on Surrounding Buildings (Figure 9 and Figure 10)

Location	Annual APSH (%)			Impact	Guidelines Satisfied	Winter APSH (%)			Impact	Guidelines Satisfied
	Exist.	Prop.	Ratio**			Exist.	Prop.	Ratio**		
F44	19	18	0.95	Negligible Adverse	Yes*	6	6	1.00	None	Yes*
F45	16	16	1.00	None	Yes*	6	6	1.00	None	Yes*
F46	15	15	1.00	None	Yes*	6	6	1.00	None	Yes*
F47	18	18	1.00	None	Yes*	6	6	1.00	None	Yes*
F48	16	16	1.00	None	Yes*	6	6	1.00	None	Yes*
F49	14	14	1.00	None	Yes*	6	6	1.00	None	Yes*
F50	18	18	1.00	None	Yes*	6	6	1.00	None	Yes*
F51	16	16	1.00	None	Yes*	6	6	1.00	None	Yes*
F52	13	13	1.00	None	Yes*	6	6	1.00	None	Yes*
F53	74	74	1.00	None	Yes	90	90	1.00	None	Yes
F54	69	69	1.00	None	Yes	78	79	1.01	Negligible Beneficial	Yes
F55	73	73	1.00	None	Yes	89	89	1.00	None	Yes
F56	69	68	0.99	Negligible Adverse	Yes	79	79	1.00	None	Yes
F57	73	73	1.00	None	Yes	90	90	1.00	None	Yes
F58	69	68	0.99	Negligible Adverse	Yes	81	81	1.00	None	Yes
F59	75	74	0.99	Negligible Adverse	Yes	92	90	0.98	Negligible Adverse	Yes
F60	69	63	0.91	Negligible Adverse	Yes	78	79	1.01	Negligible Beneficial	Yes
F61	75	75	1.00	None	Yes	93	93	1.00	None	Yes
F62	57	57	1.00	None	Yes	65	62	0.95	Negligible Adverse	Yes
F63	68	57	0.84	Slight Adverse	Yes	76	73	0.96	Negligible Adverse	Yes
F64	75	68	0.91	Negligible Adverse	Yes	92	83	0.90	Negligible Adverse	Yes
F65	67	49	0.73	Marginal Adverse	Yes	76	66	0.87	Slight Adverse	Yes

* Guideline not strictly applicable because façade does not face within 90° of South
** Ratio of Existing to Proposed APSH
(Note that the impact of a proposed development on direct sunlight at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of sunlight levels below the recommended guidelines)

Table 4: Sunlight Availability - Summary of APSH - Façade Locations on Surrounding Buildings (Figure 11 and Figure 12)

Location	Annual APSH (%)			Impact	Guidelines Satisfied	Winter APSH (%)			Impact	Guidelines Satisfied
	Exist.	Prop.	Ratio**			Exist.	Prop.	Ratio**		
F66	41	41	1.00	None	Yes*	36	36	1.00	None	Yes*
F67	41	41	1.00	None	Yes*	36	36	1.00	None	Yes*
F68	41	41	1.00	None	Yes*	36	36	1.00	None	Yes*
F69	31	7	0.23	Strong Adverse	Acceptable*	16	2	0.13	Strong Adverse	Acceptable*
F70	35	5	0.14	Strong Adverse	Acceptable*	25	3	0.12	Strong Adverse	Acceptable*
F71	29	13	0.45	Strong Adverse	Acceptable*	16	0	0.00	Strong Adverse	Acceptable*
F72	75	75	1.00	None	Yes	91	91	1.00	None	Yes
F73	68	63	0.93	Negligible Adverse	Yes	71	55	0.77	Marginal Adverse	Yes
F74	48	46	0.96	Negligible Adverse	Yes	33	30	0.91	Negligible Adverse	Yes
F75	74	73	0.99	Negligible Adverse	Yes	87	84	0.97	Negligible Adverse	Yes
F76	67	63	0.94	Negligible Adverse	Yes	68	59	0.87	Slight Adverse	Yes
F77	54	52	0.96	Negligible Adverse	Yes	38	35	0.92	Negligible Adverse	Yes
F78	72	72	1.00	None	Yes	81	81	1.00	None	Yes
F79	65	63	0.97	Negligible Adverse	Yes	61	59	0.97	Negligible Adverse	Yes
F80	54	52	0.96	Negligible Adverse	Yes	35	35	1.00	None	Yes
F81	73	73	1.00	None	Yes	93	93	1.00	None	Yes
F82	74	75	1.01	Negligible Beneficial	Yes	93	93	1.00	None	Yes
F83	74	75	1.01	Negligible Beneficial	Yes	92	92	1.00	None	Yes
F84	60	60	1.00	None	Yes*	50	50	1.00	None	Yes*
F85	60	60	1.00	None	Yes*	49	49	1.00	None	Yes*
F86	60	60	1.00	None	Yes*	49	49	1.00	None	Yes*

* Guideline not strictly applicable because façade does not face within 90° of South
** Ratio of Existing to Proposed APSH
(Note that the impact of a proposed development on direct sunlight at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of sunlight levels below the recommended guidelines)

Table 5: Sunlight Availability - Summary of APSH - Façade Locations on Surrounding Buildings (Figure 13 and Figure 15)

Location	VSC			Impact	Guideline Satisfied
	Exist.	Prop.	Ratio**		
F1	25	25	1.00	None	Yes
F2	18	18	1.00	None	Yes
F3	28	28	1.00	None	Yes
F4	22	22	1.00	None	Yes
F5	29	28	0.97	Negligible Adverse	Yes
F6	24	23	0.96	Negligible Adverse	Yes
F7	30	30	1.00	None	Yes
F8	25	24	0.96	Negligible Adverse	Yes
F9	25	22	0.88	Slight Adverse	Yes
F10	30	27	0.90	Negligible Adverse	Yes
F11	24	19	0.79	Marginal Adverse	No
F12	31	29	0.94	Negligible Adverse	Yes
F13	27	23	0.85	Slight Adverse	Yes
F14	20	16	0.80	Slight Adverse	Yes
F15	31	31	1.00	None	Yes
F16	27	24	0.89	Slight Adverse	Yes
F17	21	17	0.81	Slight Adverse	Yes
F18	30	27	0.90	Negligible Adverse	Yes
F19	30	28	0.93	Negligible Adverse	Yes
F20	29	27	0.93	Negligible Adverse	Yes
F21	33	30	0.91	Negligible Adverse	Yes
F22	26	23	0.88	Slight Adverse	Yes
F23	13	14	1.08	Negligible Beneficial	Yes
F24	32	30	0.94	Negligible Adverse	Yes
F25	25	22	0.88	Slight Adverse	Yes
F26	13	15	1.15	Slight Beneficial	Yes
F27	35	33	0.94	Negligible Adverse	Yes
F28	31	24	0.77	Marginal Adverse	No
F29	19	15	0.79	Marginal Adverse	No
F30	33	24	0.73	Marginal Adverse	No
F31	26	17	0.65	Moderate Adverse	No
F32	38	38	1.00	None	Yes
F33	33	31	0.94	Negligible Adverse	Yes
F34	38	38	1.00	None	Yes
F35	33	32	0.97	Negligible Adverse	Yes
F36	38	38	1.00	None	Yes
F37	29	28	0.97	Negligible Adverse	Yes
F38	35	34	0.97	Negligible Adverse	Yes
F39	28	28	1.00	None	Yes
F40	27	27	1.00	None	Yes
F41	17	17	1.00	None	Yes
F42	30	30	1.00	None	Yes
F43	22	22	1.00	None	Yes

** Ratio of Existing to Proposed VSC
(Note that the impact of a proposed development on daylight availability at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of daylight availability levels below the recommended guidelines.)

Table 6: Daylight Availability - Summary of VSC - Façade Locations on Surrounding Buildings (Figure 7 to Figure 10)

Location	VSC			Impact	Guideline Satisfied
	Exist.	Prop.	Ratio**		
F44	34	33	0.97	Negligible Adverse	Yes
F45	31	30	0.97	Negligible Adverse	Yes
F46	27	27	1.00	None	Yes
F47	33	33	1.00	None	Yes
F48	30	30	1.00	None	Yes
F49	27	26	0.96	Negligible Adverse	Yes
F50	33	33	1.00	None	Yes
F51	30	30	1.00	None	Yes
F52	27	27	1.00	None	Yes
F53	40	40	1.00	None	Yes
F54	36	36	1.00	None	Yes
F55	40	40	1.00	None	Yes
F56	36	36	1.00	None	Yes
F57	40	40	1.00	None	Yes
F58	36	36	1.00	None	Yes
F59	40	40	1.00	None	Yes
F60	35	34	0.97	Negligible Adverse	Yes
F61	40	40	1.00	None	Yes
F62	36	36	1.00	None	Yes
F63	35	32	0.91	Negligible Adverse	Yes
F64	40	38	0.95	Negligible Adverse	Yes
F65	34	27	0.79	Marginal Adverse	Yes
F66	40	40	1.00	None	Yes
F67	40	40	1.00	None	Yes
F68	40	40	1.00	None	Yes
F69	35	3	0.09	Strong Adverse	No
F70	35	2	0.06	Strong Adverse	No
F71	35	16	0.46	Strong Adverse	No
F72	38	38	1.00	None	Yes
F73	33	30	0.91	Negligible Adverse	Yes
F74	22	21	0.95	Negligible Adverse	Yes
F75	37	36	0.97	Negligible Adverse	Yes
F76	32	30	0.94	Negligible Adverse	Yes
F77	25	24	0.96	Negligible Adverse	Yes
F78	36	36	1.00	None	Yes
F79	31	31	1.00	None	Yes
F80	25	25	1.00	None	Yes
F81	39	39	1.00	None	Yes
F82	39	39	1.00	None	Yes
F83	39	39	1.00	None	Yes
F84	37	32	0.86	Slight Adverse	Yes
F85	37	35	0.95	Negligible Adverse	Yes
F86	36	36	1.00	None	Yes

** Ratio of Existing to Proposed VSC
(Note that the impact of a proposed development on daylight availability at a particular location may be adverse, however, the guidelines may still be met at this location as long as the impact does not result in a reduction of daylight availability levels below the recommended guidelines.)

Table 7: Daylight Availability - Summary of VSC - Façade Locations on Surrounding Buildings (Figure 11 to Figure 15)

FIGURES

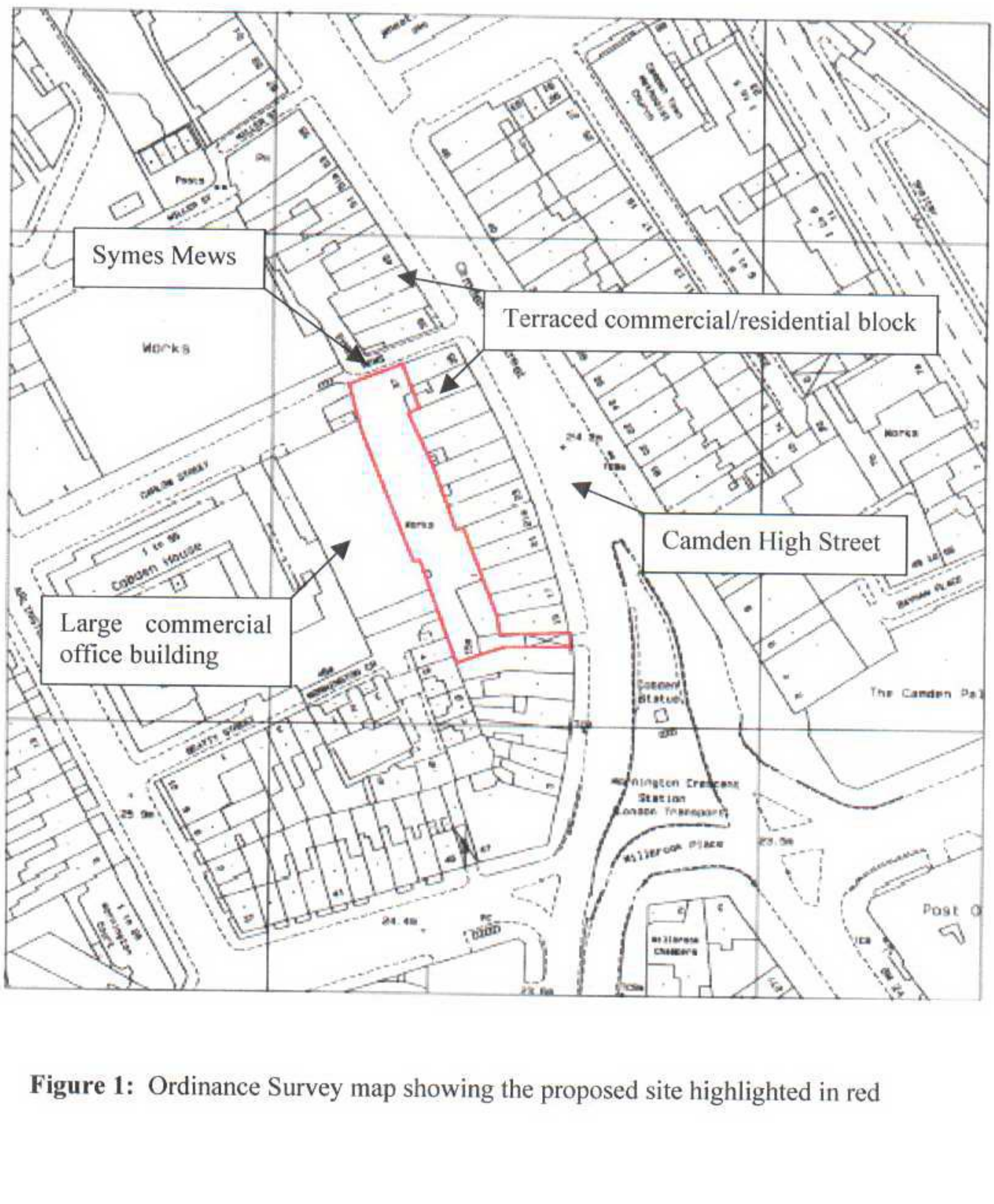

Figure 1: Ordinance Survey map showing the proposed site highlighted in red

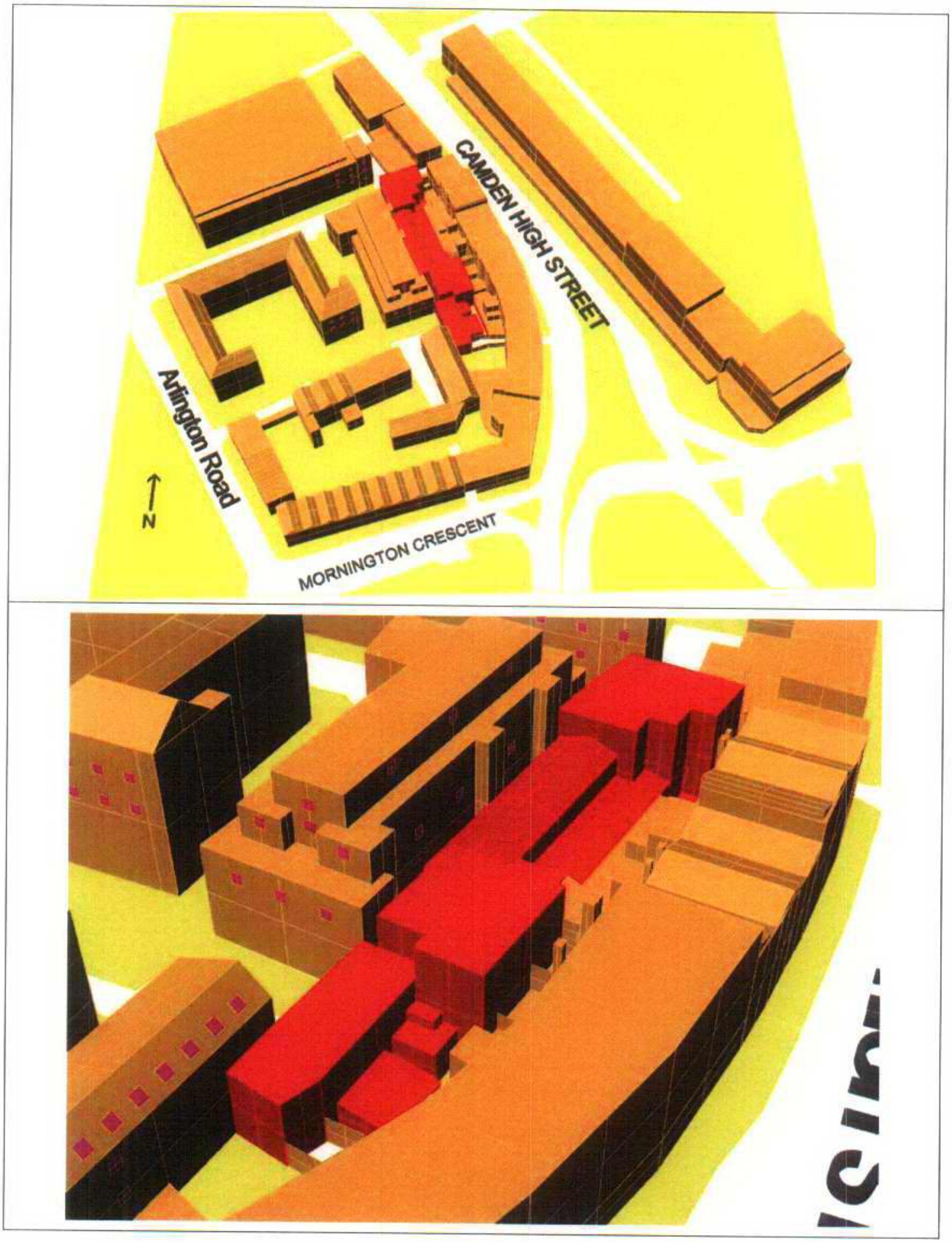

Figure 2: Sunlight/Daylight model for existing development (existing commercial property shown in red).

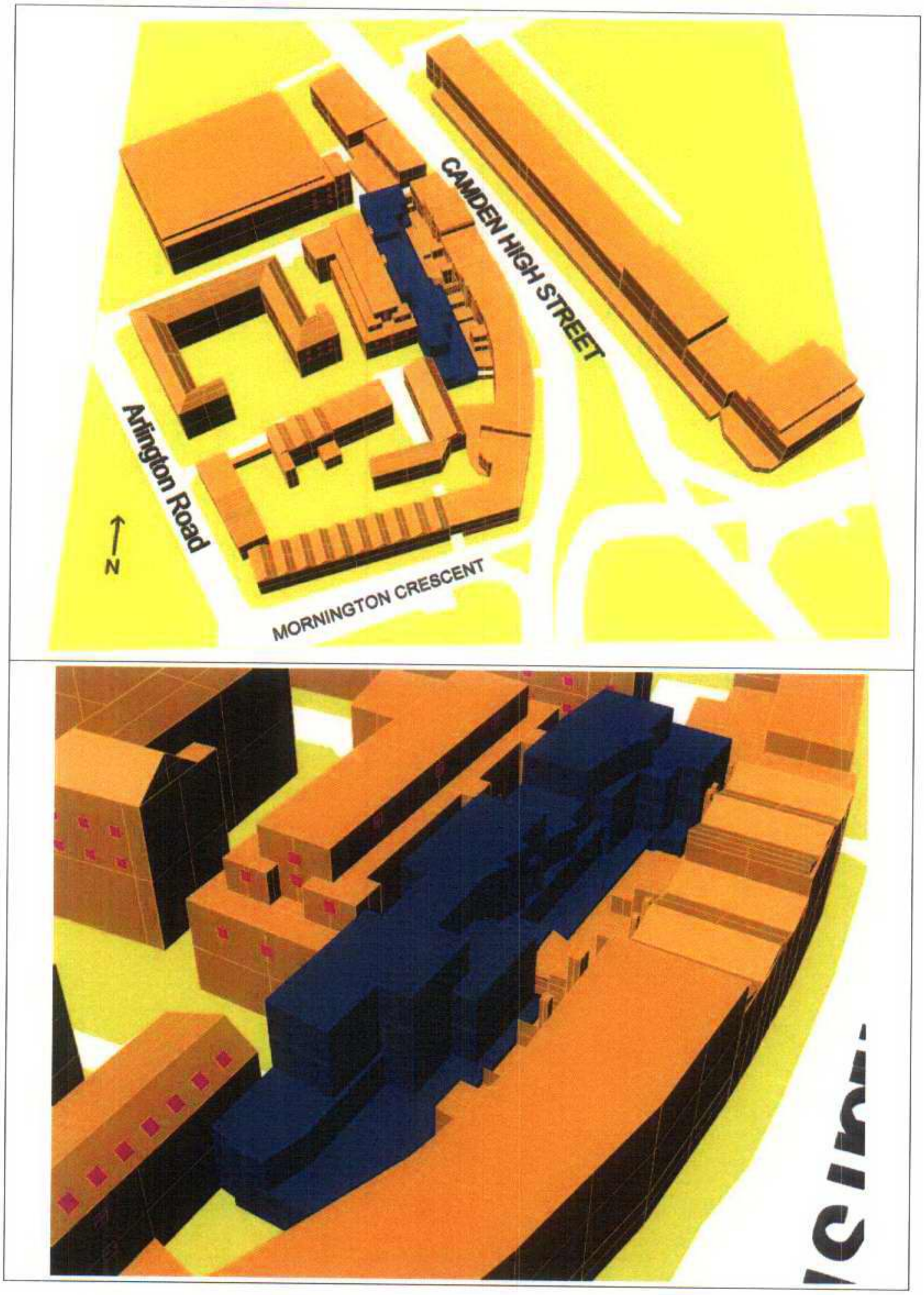

Figure 3: Sunlight/Daylight model for proposed 4 storey commercial development (shown in blue).

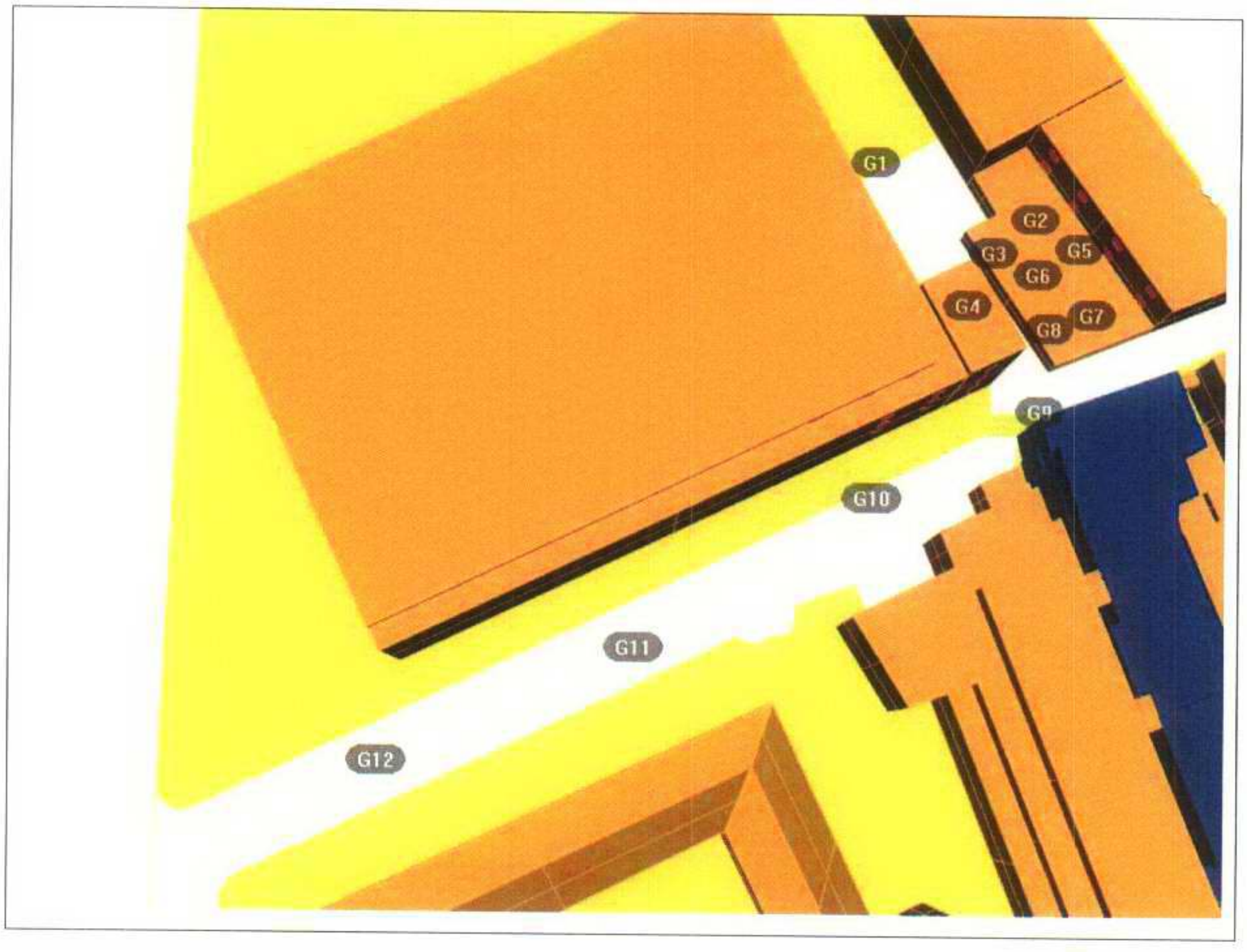

Figure 4: Ground assessment locations G1 – G12

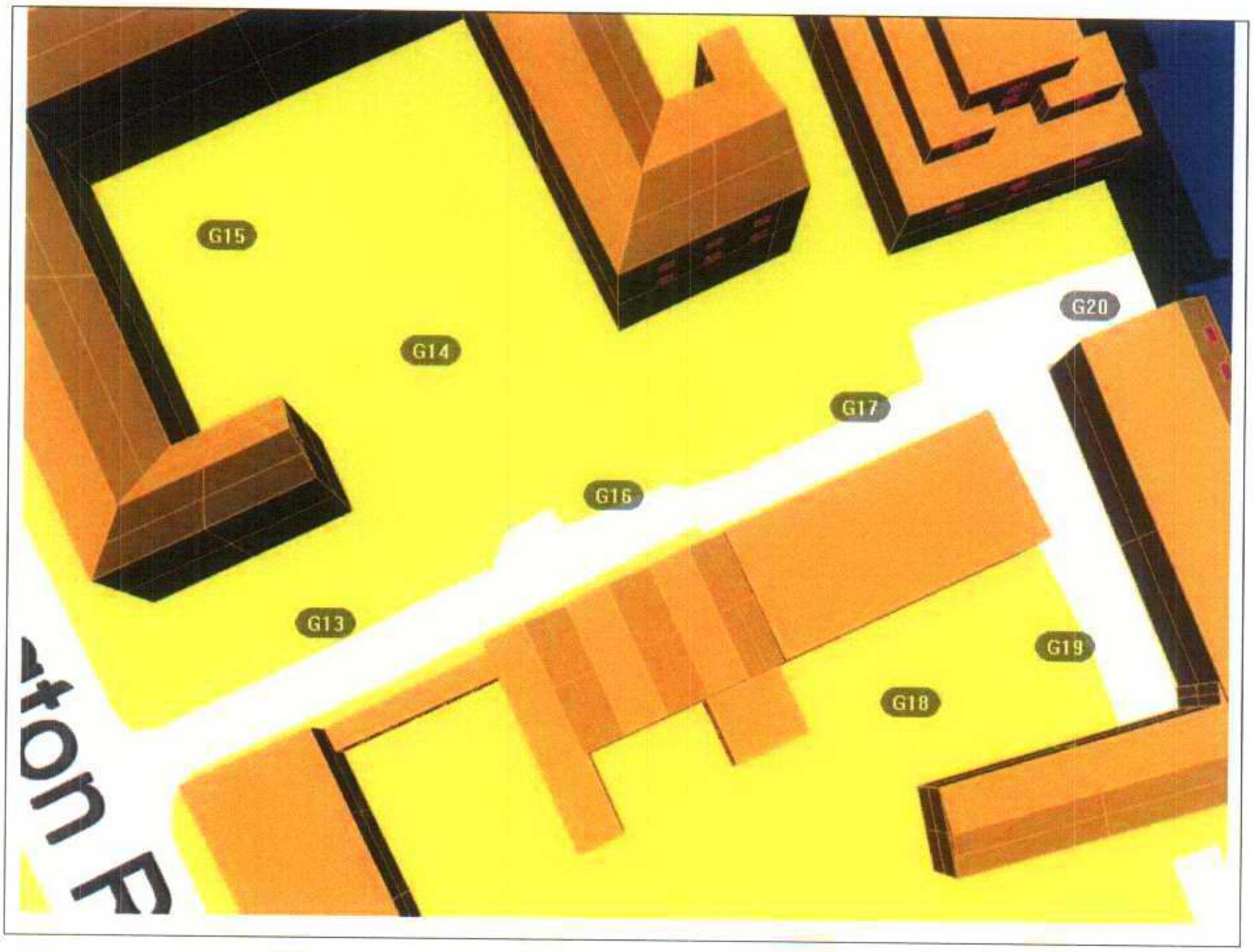

Figure 5: Ground assessment locations G13 – G20

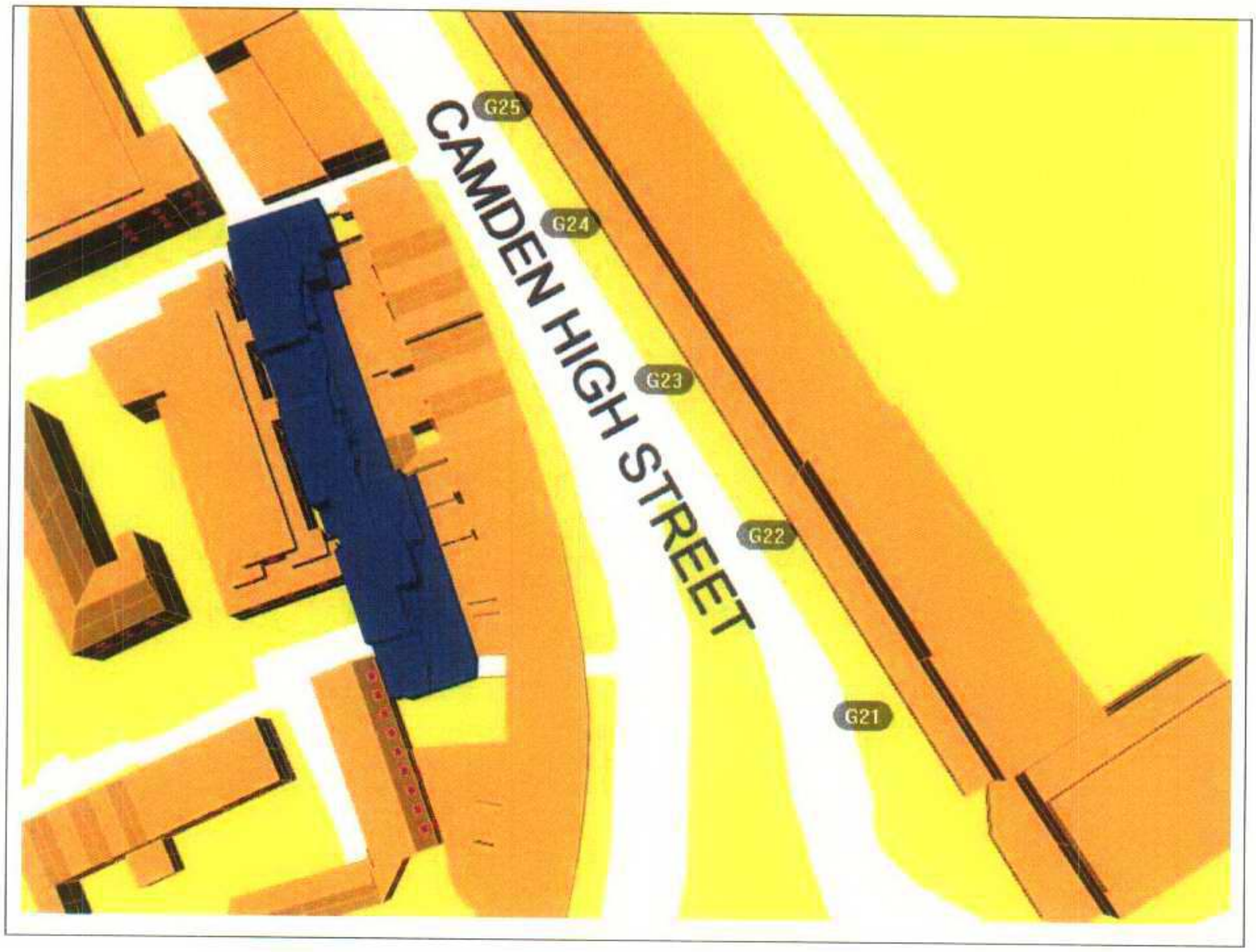

Figure 6: Ground assessment locations G20 – G25

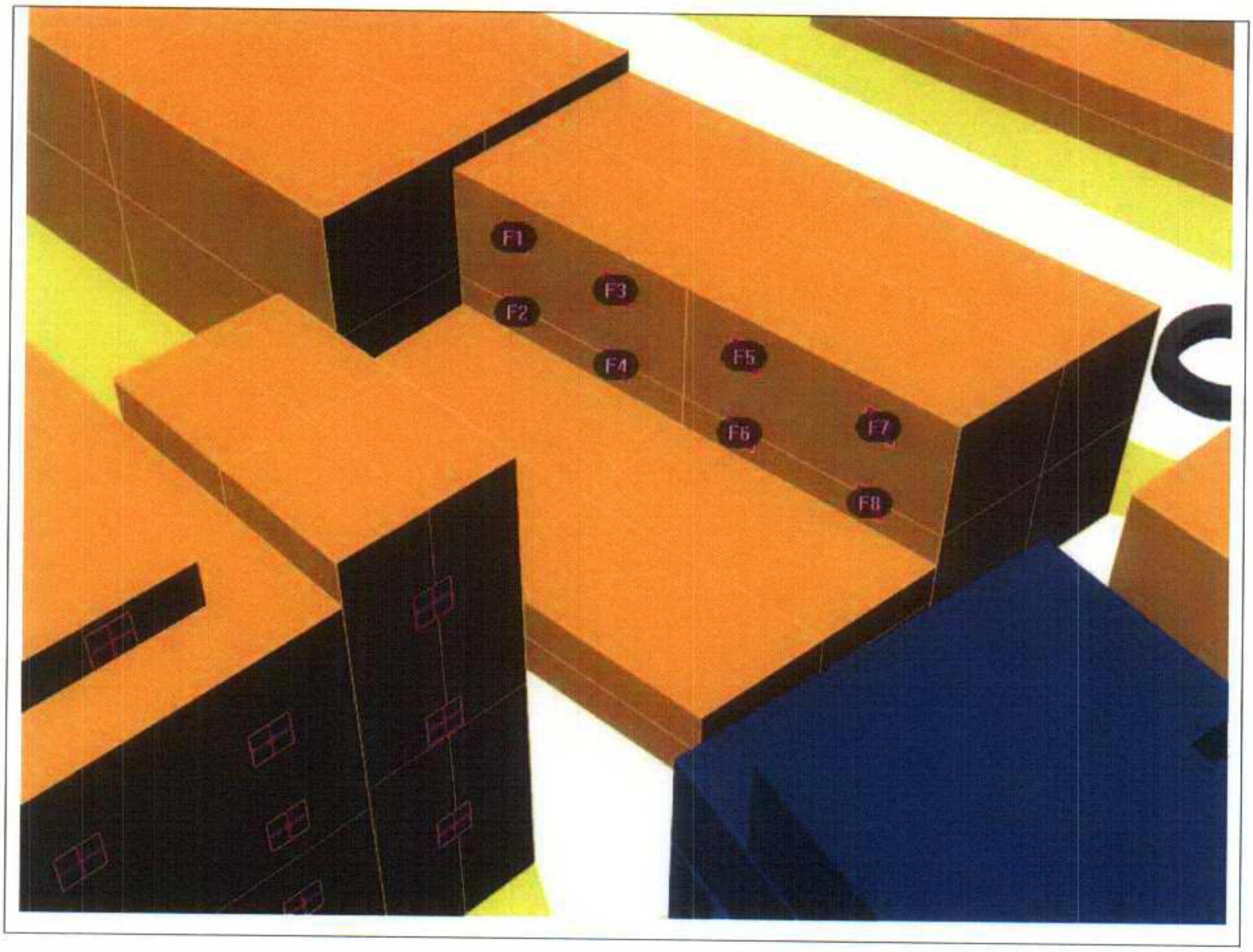

Figure 7: Existing façade assessment locations F1 to F8

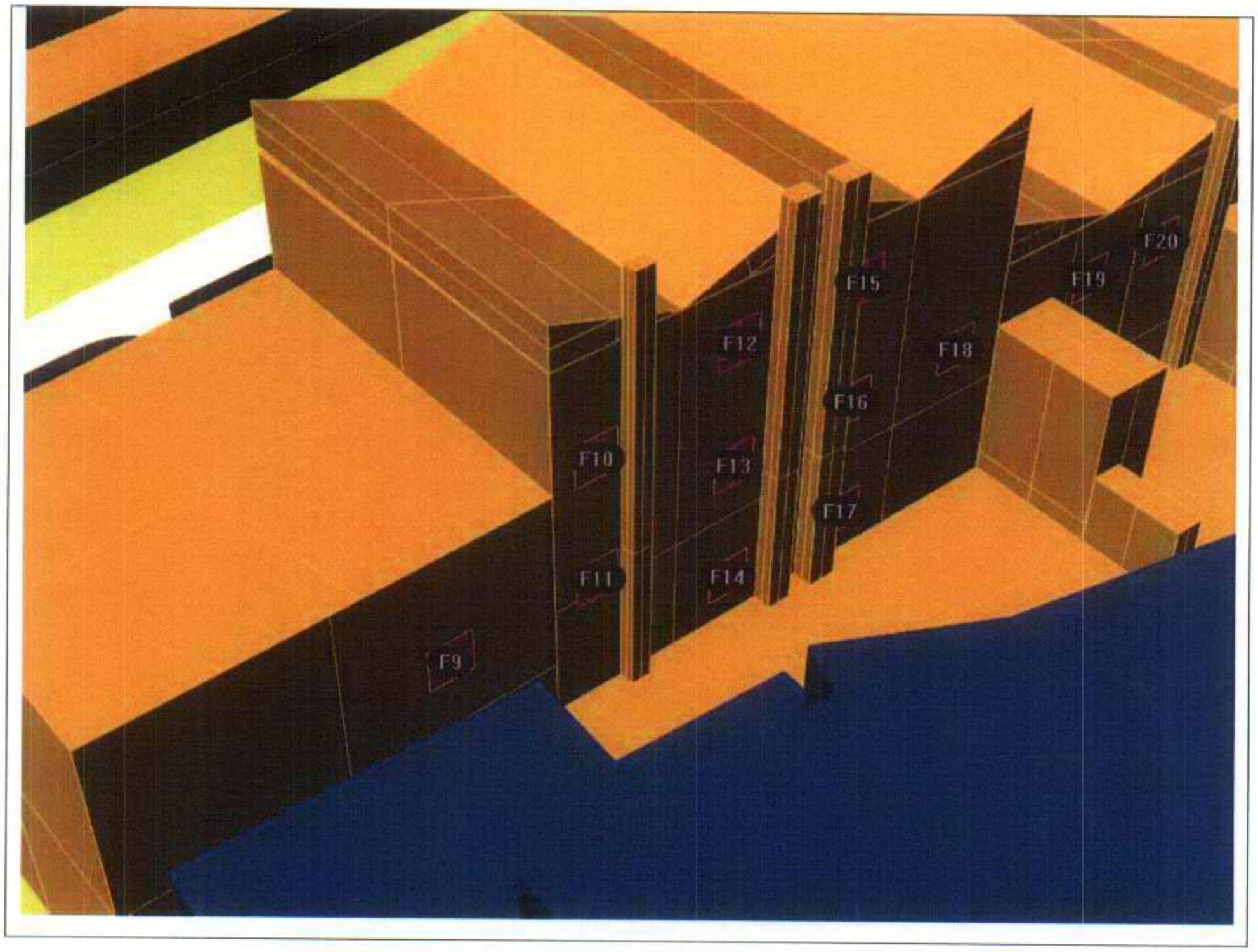

Figure 8: Existing façade assessment locations F9 to F20

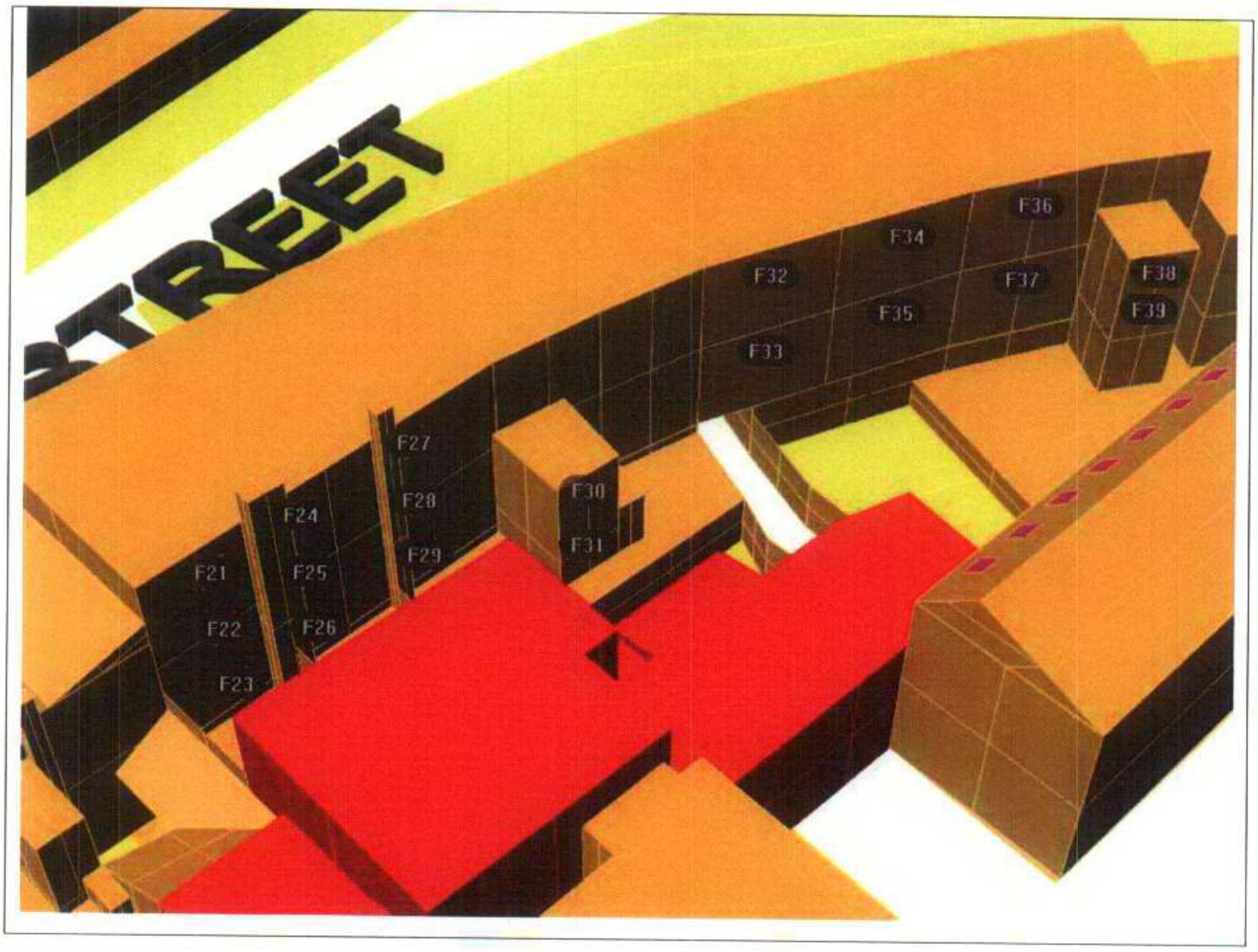

Figure 9: Existing façade assessment locations F21 to F39

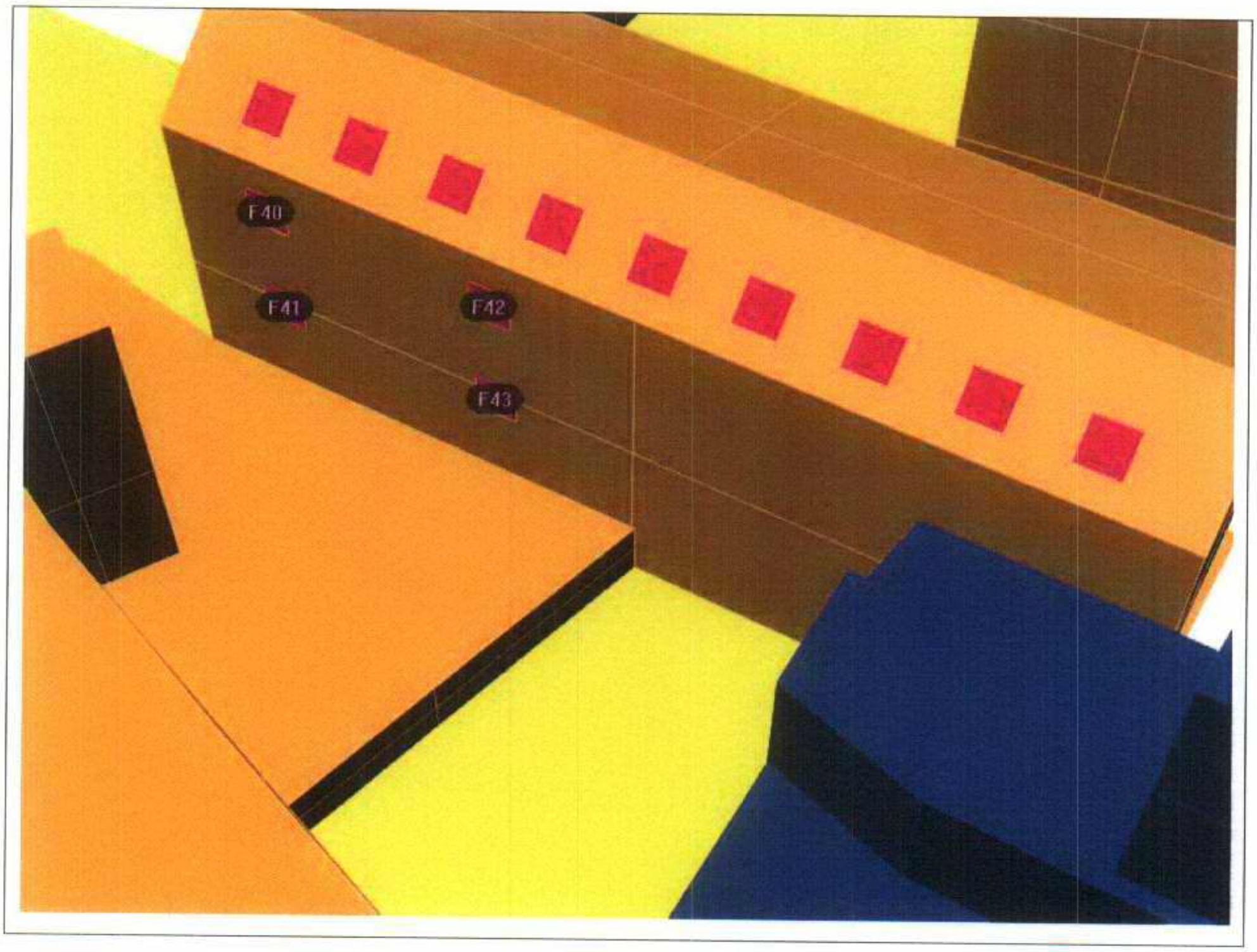

Figure 10: Existing façade assessment locations F40 to F43

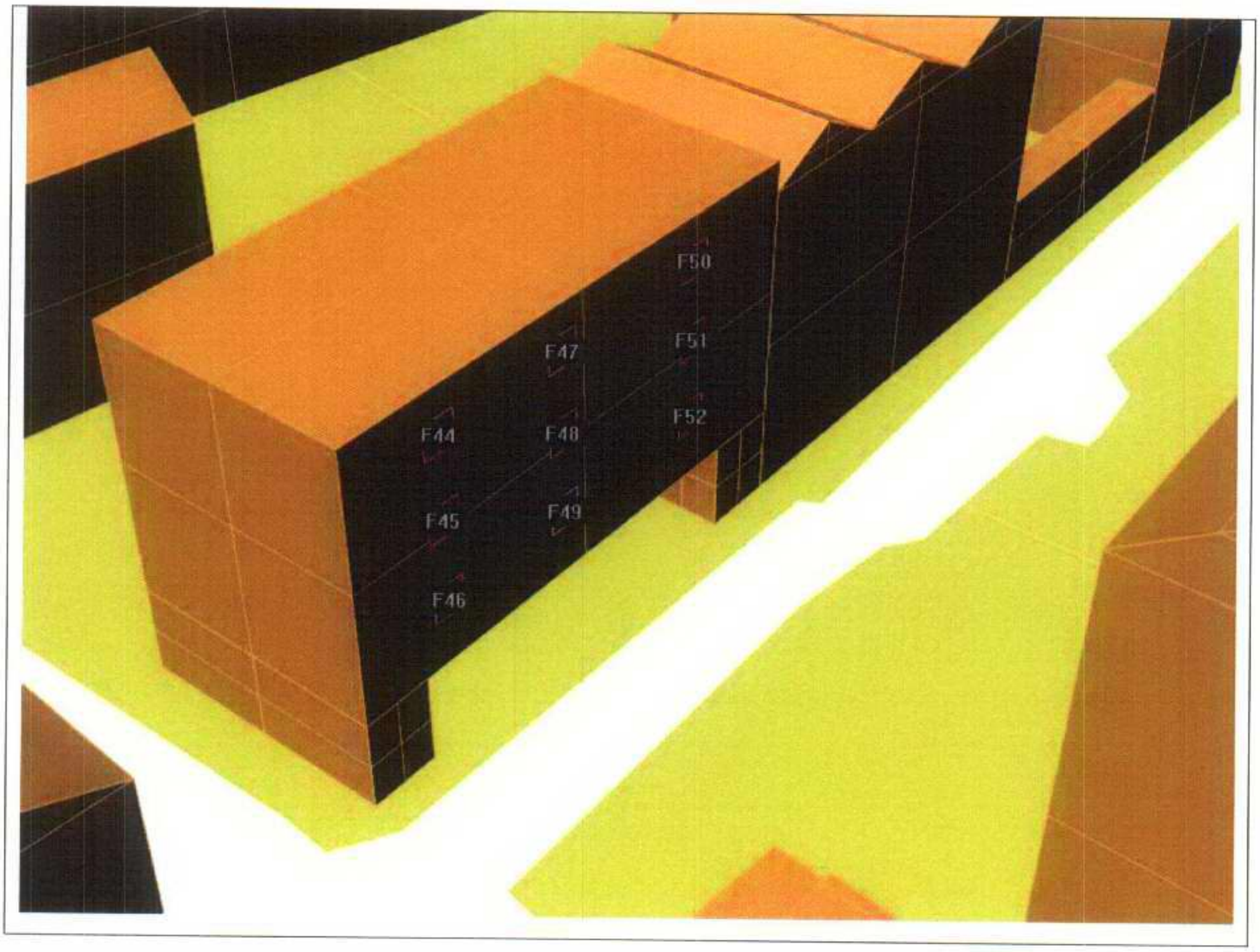

Figure 11: Existing façade assessment locations F44 to F52

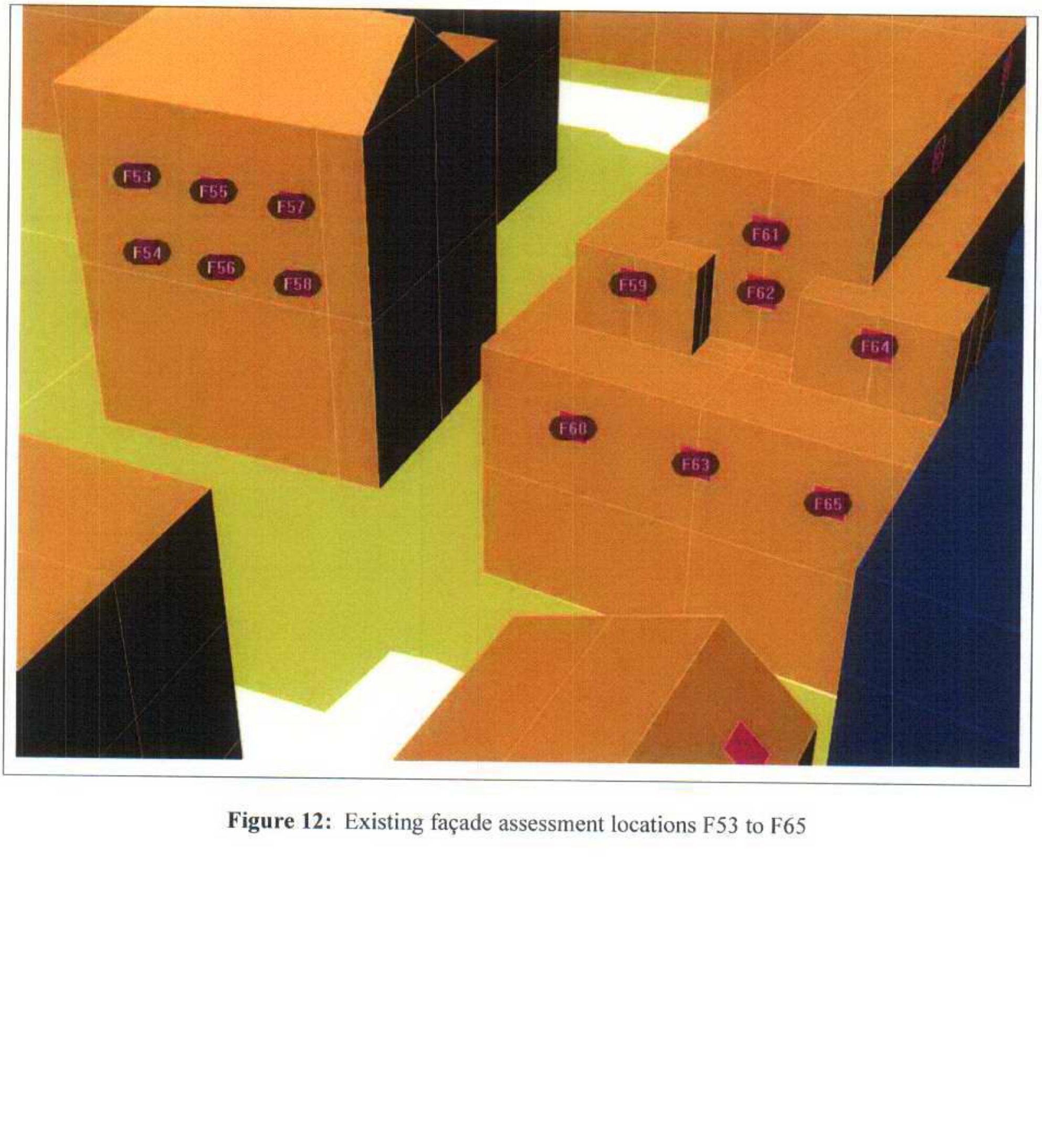

Figure 12: Existing façade assessment locations F53 to F65

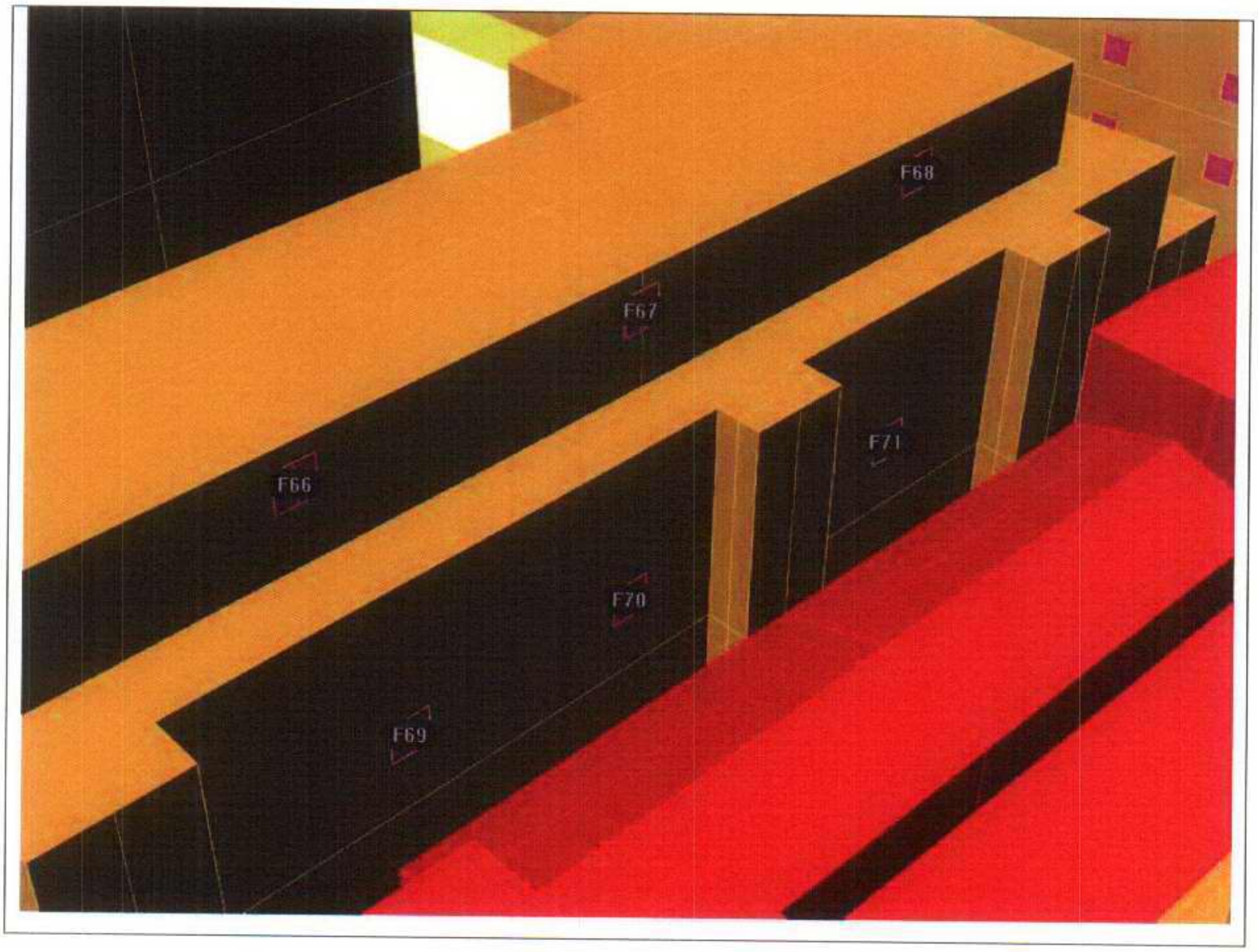

Figure 13: Existing façade assessment locations F66 to F71

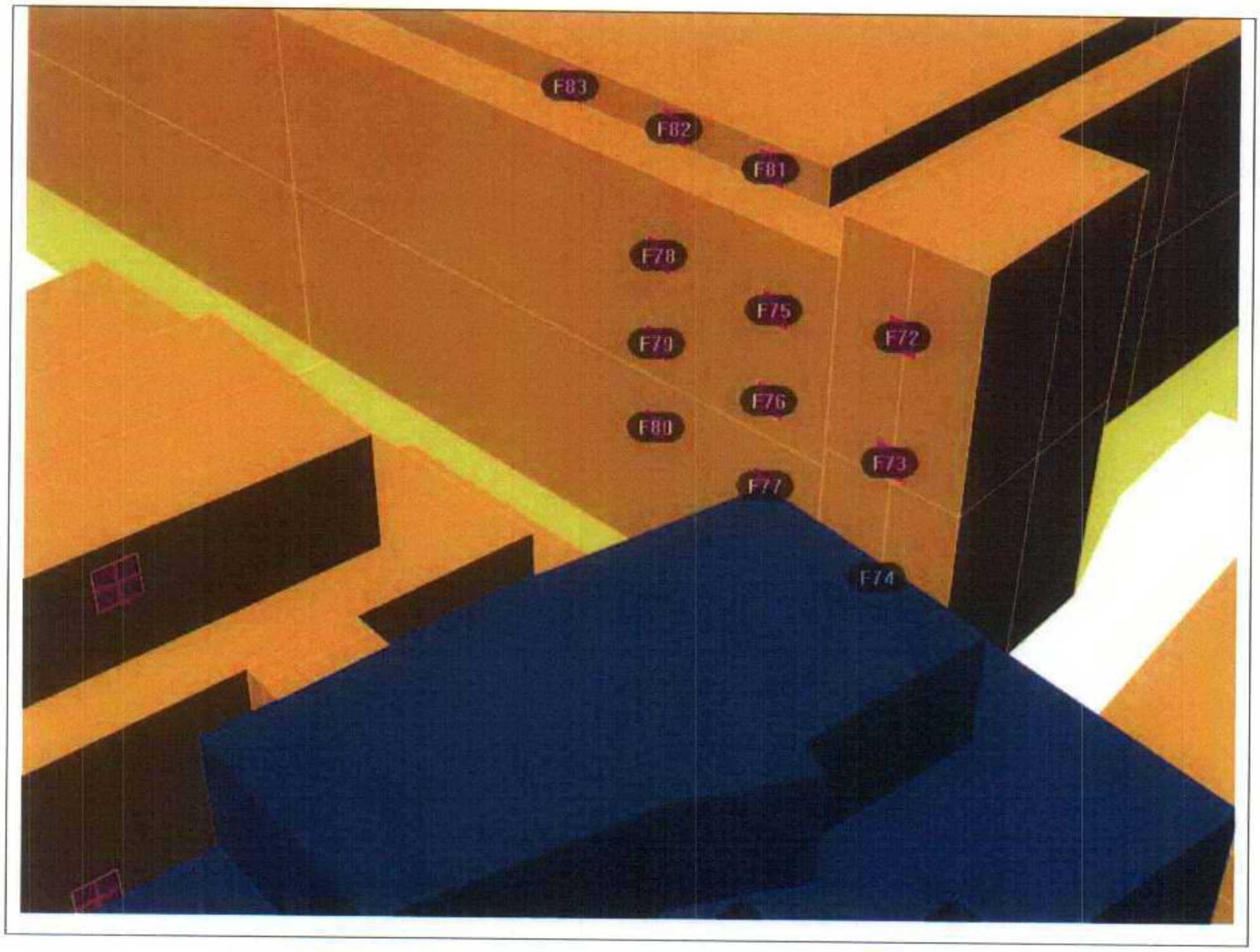

Figure 14: Existing façade assessment locations F72 to F83

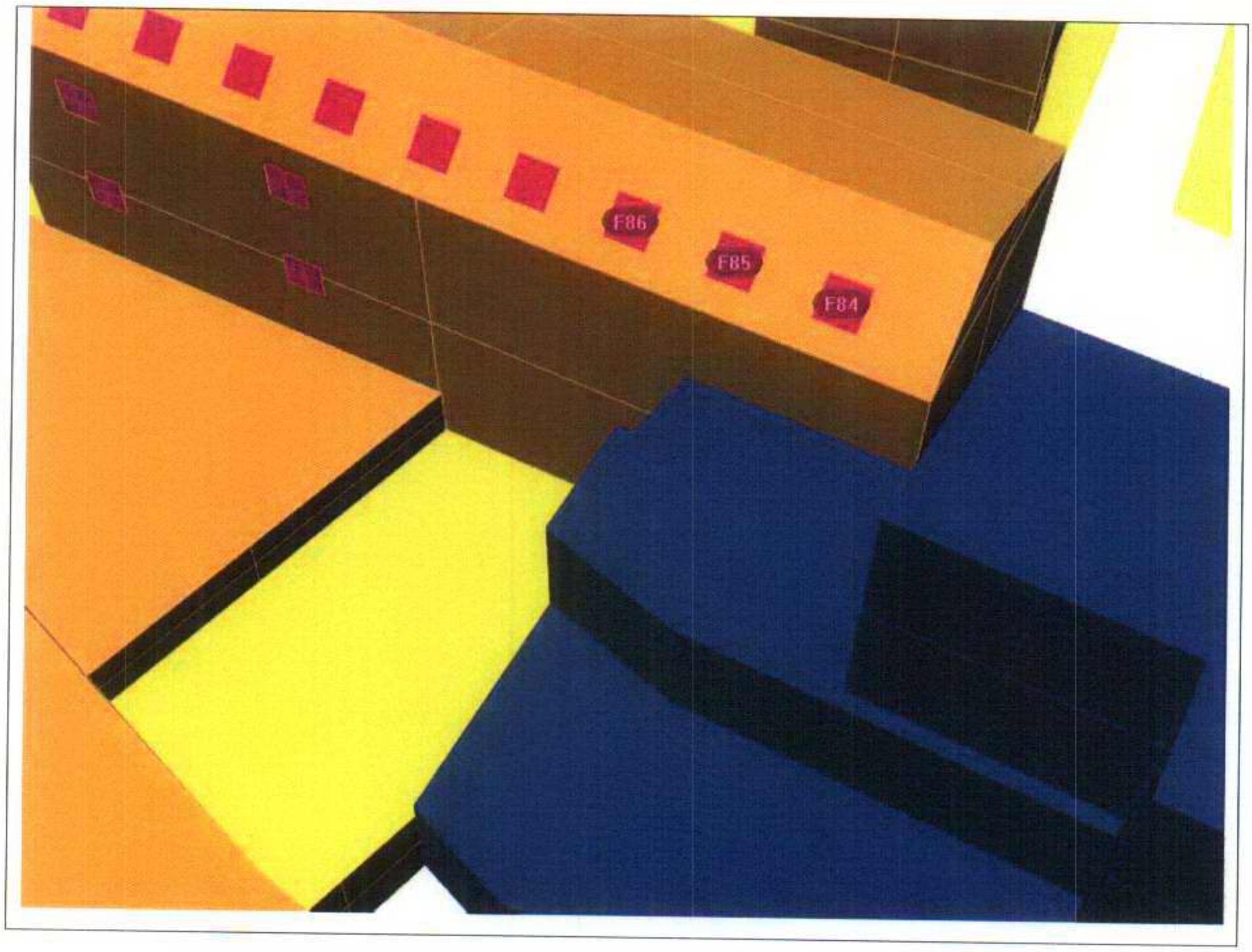

Figure 15: Existing façade assessment locations F72 to F86

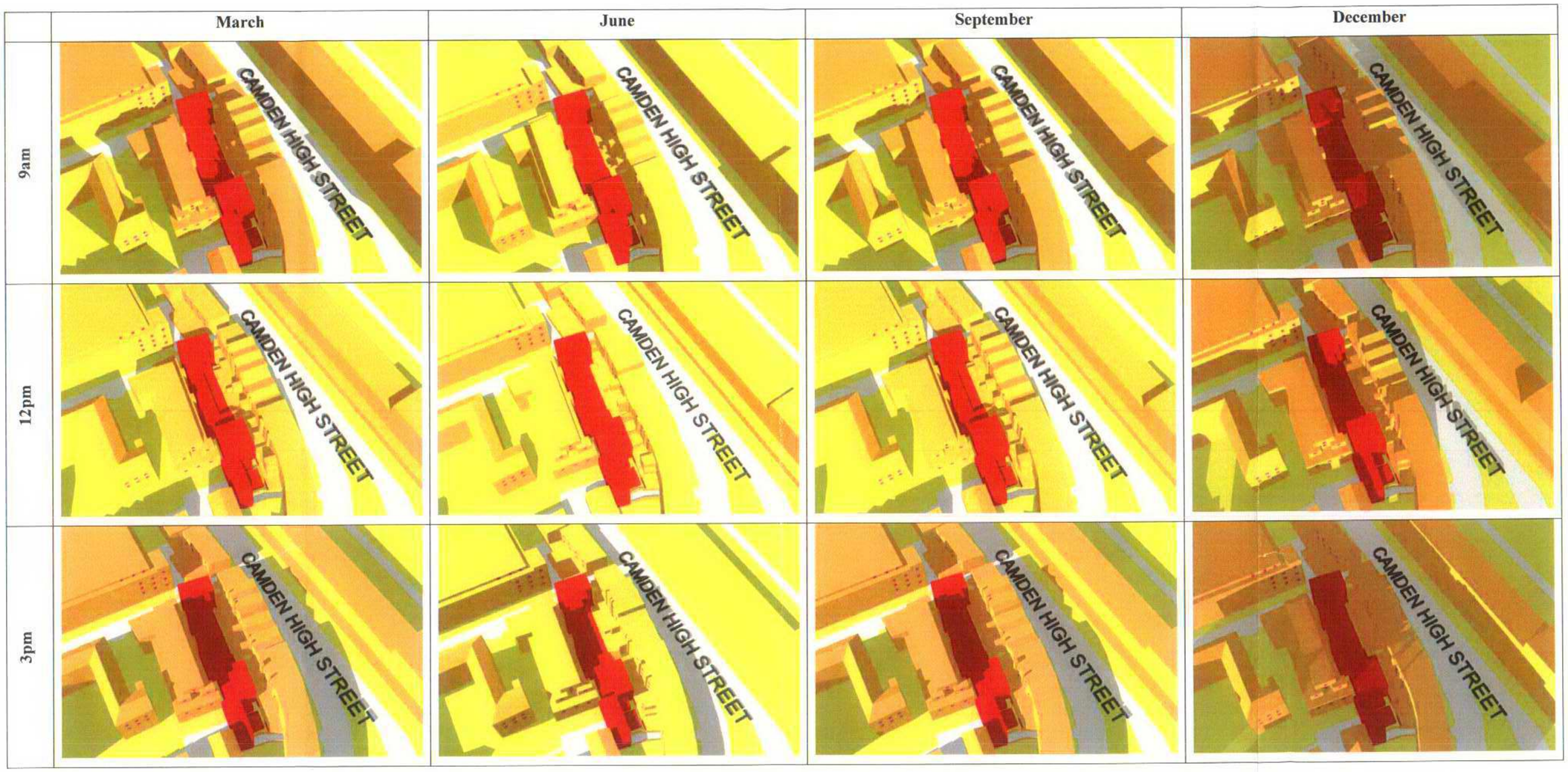

Figure 16: Shadow Plots - Baseline Scheme

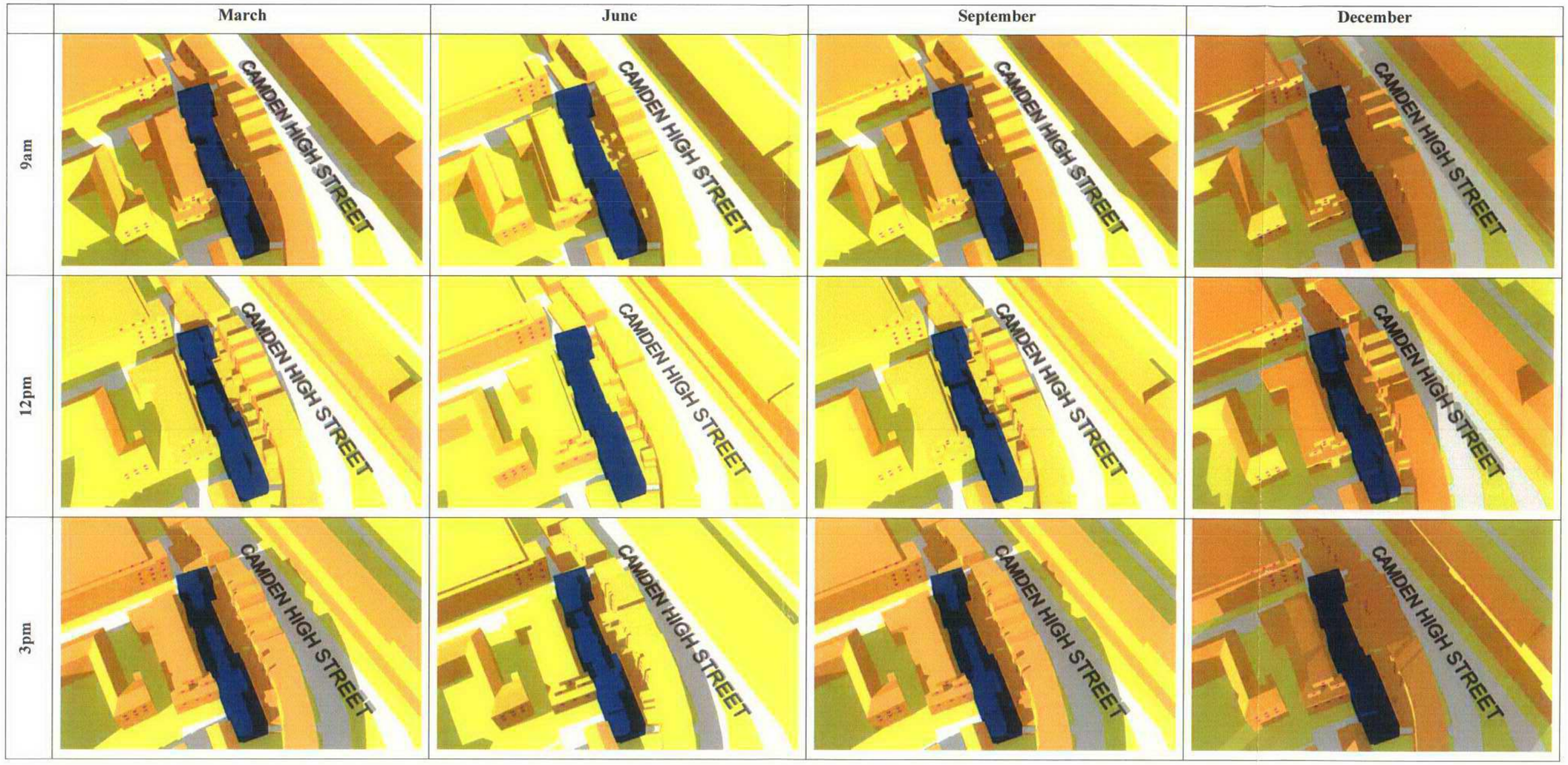

Figure 17: Shadow Plots - Proposed Scheme (4 Storey)

APPENDIX A : SUNLIGHT AND DAYLIGHT ANALYSIS

A.1 General

Two assessment parameters were used to quantify sunlight and daylight levels at each key location, corresponding to the requirements outlined in BR 209, " Site layout planning for sunlight and daylight" [1]. The two parameters are Annual Probable Sunlight Hours and Vertical Sky Component. Reduction of either measurement below the planning recommendations will result in a noticeable reduction in daylight or sunlight availability respectively.

A.2 Annual Probable Sunlight Hours

Annual Probable Sunlight Hours (APSH) is defined as the duration for which a location receives direct ***sunlight***. Assessment of APSH takes into account the cloudiness at the site. Industry best practice guidelines [1] recommend that the APSH be at least 25% on an annual basis and at least 5% during the winter months (September to March). For the northern hemisphere, the sun travels along a southerly path relative to the ground and, therefore, planning guidelines for APSH only apply to facades that face within 90° of south.

A.3 Vertical Sky Component

Vertical Sky Component (VSC) is the ratio of direct sky illuminance at a vertical wall to the simultaneous horizontal illuminance under an unobstructed sky. VSC provides a measure of ***daylight*** availability. The "Standard Overcast Sky" defined by the CIE (Commission Internationale de l'Eclairage) is used and the ratio is expressed as a percentage which can reach a maximum of 40% for a totally unobstructed facade. Industry best practice guidelines [1] recommend that the VSC for vertical facades should not be less than 27%. If the VSC falls below 27%, then the proposed development should not cause a reduction to less than 0.8 times the existing value (i.e. a reduction of no more than 20%).

A.4 Impact Ratings

The impact on sunlight and daylight availability is rated by BMT according to the severity index described below. The impact is categorised according to an 11-point scale, which is based on the percentage deviation of APSH and VSC from the existing conditions at the site.

Impact Rating	**Deviation of APSH or VSC from Existing Site Conditions**	
Strong Adverse	*Reduction of more than 40%*	
Moderate Adverse	Reduction of between 30% and 40%	
Marginal Adverse	Reduction of between 20% and 30%	
Slight Adverse	Reduction of between 10% and 20%	Best practice *guidelines are* adhered to.
Negligible Adverse	Reduction of between 0.1% and 10%	
None	Deviation less than *0.1%*	
Negligible Beneficial	Improvement of between 0.1% and 10%	
Slight Beneficial	Improvement of between 10% and 20%	
Marginal Beneficial	Improvement of between 20% and 30%	
Moderate Beneficial	Improvement of between 30% and 40%	
Strong Beneficial	Improvement of more than 40%	