Lawful Development Certificate: Proposed Loft Volume Calculations

Property:	36 Reginald Road, Northwood
Drawing Reference:	PL-253.1 (Rev R1)
Proposed Development:	Roof space conversion to include hip-to-gable conversion, rear L-shaped dormer, and front-facing rooflights.
Legislative Reference:	Class B & Class C, Part 1, Schedule 2 of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended).

Table of Contents

Table of Contents 1

1. Executive Summary & Compliance Overview 2

2. Official Volume Calculation Table 2

3. Step-by-Step Geometric Verification Proofs 3

3.1 Hip-to-Gable Conversion (Triangular Pyramid) 3

3.2 Rear Dormer Segment 2.1 (Outrigger Uniform Prism) 3

3.3 Rear Dormer Segment 2.2 (Outrigger Valley Wedge) 3

3.4 Rear Dormer Segment 2.3 (Main Roof Uniform Prism) 3

3.5 Rear Dormer Segment 2.4 (Main Roof Pitch Wedge) 3

4. Permitted Development Compliance Statement 4

1. Executive Summary & Compliance Overview

This document provides the formal mathematical proof and compliance verification for the proposed roof enlargement at 36 Reginald Road, Northwood. The calculations strictly utilize the verified survey and architectural data shown on drawing sheet PL-253.1 (Rev R1).

To provide a robust, bulletproof submission that represents the geometric reality of the roof junctions and transitions, the calculations employ a highly detailed, four-part segmented approach for the rear dormer. This method models both the uniform slopes and the valley transitions, ensuring absolute geometric accuracy.

Key Compliance Metrics

- Total Proposed Volume Increase: **44.23 m³**
- Statutory Maximum Allowance (Class B): **50.00 m³ (for a semi-detached dwellinghouse)**
- Remaining Safety Margin: **+5.77 m³ (Fully Compliant)**

2. Official Volume Calculation Table

This schedule details the dimensions, mathematical formulas, and step-by-step calculations for each proposed roof element. It has been prepared for direct inclusion on drawing sheet PL-253.1 or within the Lawful Development Certificate (LDC) application statement.

Ref	Roof Element	Geometric Formula	Survey Dimensions (W × D × H)	Step-by-Step Calculation	Calculated Volume
1.0	Hip-to-Gable Conversion	(Width × Depth × Height) / 6 (Pyramid)	3.78 m × 7.56 m × 2.50 m	(3.779 × 7.558 × 2.50) / 6	11.90 m³
2.1	Outrigger Dormer (Uniform)	(Width × Depth × Height) / 2 (Prism)	1.81 m × 3.09 m × 2.19 m	(1.810 × 3.090 × 2.191) / 2	6.13 m³
2.2	Outrigger Dormer (Valley)	(Width × Depth × Height) / 4 (Wedge)	3.19 m × 3.09 m × 2.19 m	(3.190 × 3.090 × 2.191) / 4	5.40 m³
2.3	Main Roof Dormer (Uniform)	(Width × Depth × Height) / 2 (Prism)	3.19 m × 4.36 m × 2.19 m	(3.190 × 4.360 × 2.191) / 2	15.24 m³
2.4	Main Roof Dormer (Pitch)	(Width × Depth × Height) / 4 (Wedge)	3.37 m × 3.01 m × 2.19 m	(3.370 × 3.010 × 2.191) / 4	5.56 m³
-	**Total Proposed Volume Increase**	**Cumulative Sum of Rows 1.0 to 2.4**	**-**	**11.90 + 6.13 + 5.40 + 15.24 + 5.56**	**44.23 m³**

Note: All linear dimensions are taken from survey drawing PL-253.1 and converted from millimetres (mm) to metres (m). Rounded to two decimal places for representation.

3. Step-by-Step Geometric Verification Proofs

To enable immediate, effortless verification by the Case Officer, the mathematical proof for each section is detailed below:

3.1 Hip-to-Gable Conversion (Triangular Pyramid)

```
Volume = (Width × Depth × Height) / 6
Volume = (3.779 m × 7.558 m × 2.50 m) / 6 = 11.90 m³
```

- **Width (3.78m)** corresponds to half the building width, spanning the hipped roof slope.
- **Height (2.50m)** represents the vertical rise from the eaves / wall plate level to the main ridge apex.

3.2 Rear Dormer Segment 2.1 (Outrigger Uniform Prism)

```
Volume = (Width × Depth × Height) / 2
Volume = (1.810 m × 3.090 m × 2.191 m) / 2 = 6.13 m³
```

3.3 Rear Dormer Segment 2.2 (Outrigger Valley Wedge)

```
Volume = (Width × Depth × Height) / 4
Volume = (3.190 m × 3.090 m × 2.191 m) / 4 = 5.40 m³
```

3.4 Rear Dormer Segment 2.3 (Main Roof Uniform Prism)

```
Volume = (Width × Depth × Height) / 2
Volume = (3.190 m × 4.360 m × 2.191 m) / 2 = 15.24 m³
```

3.5 Rear Dormer Segment 2.4 (Main Roof Pitch Wedge)

```
Volume = (Width × Depth × Height) / 4
Volume = (3.370 m × 3.010 m × 2.191 m) / 4 = 5.56 m³
```

4. Permitted Development Compliance Statement

The proposed development is designed to comply fully with all parts of the General Permitted Development Order (GPDO) 2015:

1. **Volume Allowance (B.1(d)):** The cumulative proposed volume increase of 44.23 m³ does not exceed the maximum allowance of 50.00 m³ for a semi-detached property.
2. **Ridge Height (B.1(c)):** Neither the flat roof of the rear L-shaped dormer nor the raised gable exceeds the height of the highest part of the existing roof.
3. **Eaves Setback (B.2(b)):** Drawing PL-253.1 explicitly details a setback of 200 mm and 224 mm from the original roof eaves line, satisfying the requirement that the dormer walls sit at least 0.20 metres back when measured along the slope.
4. **Highway Frontage (B.1(b)):** No roof enlargement or alterations are proposed on the principal roof slope fronting Reginald Road.
5. **Front Rooflights (Class C):** The proposed three front Velux windows will not protrude more than 150 mm beyond the plane of the roof slope, fully complying with Class C.1(b).
6. **Materials & Side Glazing (B.2):** All materials used for the exterior cheeks and gable will match the existing dwellinghouse. Any side-facing windows will be obscure-glazed and non-opening below 1.70 m from the finished floor level.