

Engineering Shadow and Light Study Report

Executive Summary

This Shadow and Light Study has been prepared in support of a **Special Exception** application before the District of Columbia **Board of Zoning Adjustment (BZA)** for the proposed two-story residential development at **630 Randolph Road, NW, Washington, DC**. The purpose of this study is to evaluate whether the proposed development would result in undue adverse impacts on surrounding properties or the public realm with respect to access to natural light and the casting of shadows.

The proposed development consists of a **two-story residential building with a maximum height of 26 feet above grade**, which is consistent with the scale and character of surrounding residential development. The analysis evaluates shadow conditions for representative seasonal dates, including the spring and fall equinoxes as well as the summer and winter solstices, at typical review times of 9:00 AM, 12:00 PM, and 3:00 PM.

The study demonstrates that incremental shadows introduced by the proposed development are **limited in duration and extent** and are primarily confined to early morning and late afternoon periods. The greatest shadow lengths occur during the winter solstice, as expected for structures of this height; however, these shadows do not result in unreasonable obstruction of light to adjacent residential properties, streets, or sidewalks. Midday solar access to neighboring properties is largely maintained throughout the year.

Based on the analysis conducted, the proposed development **meets the applicable Special Exception performance standards of Title 11 DCMR** related to light and air. From an engineering and zoning perspective, the project will not tend to adversely affect the use of neighboring property and is consistent with the purpose and intent of the DC Zoning Regulations. Accordingly, the findings of this Shadow and Light Study support approval of the requested Special Exception by the Board of Zoning Adjustment.

1. Introduction

This Shadow and Light Study Report has been prepared in support of a **Special Exception** application before the District of Columbia **Board of Zoning Adjustment (BZA)** for the proposed residential development at 630 Randolph Road, NW. The purpose of this report is to clearly and concisely describe potential shadow and light impacts in a manner that supports efficient review by the Zoning Examiner and the Board. The analysis evaluates whether the proposed development meets the applicable **Title 11 DCMR** performance standards related to light and air and whether it avoids undue adverse impacts on surrounding properties.

2. Project Description

- **Project Name:** 630 Randolph Road NW Residential Development
- **Project Address / Location:** 630 Randolph Road, NW, Washington, District of Columbia
- **Proposed Development:** Two-story residential building with a maximum height of 26 feet above grade

- **Primary Use:** Residential
- **Zoning Review Authority:** District of Columbia Board of Zoning Adjustment (BZA)
- **Applicant / Owner:** Adetokunbo Harrison
- **Prepared By:** SAFE Engineering Firm
- **Report Date:** January 24, 2026

3. Study Objectives

The objectives of this shadow and light study are to:

- Identify the extent and duration of shadows cast by the proposed development.
- Evaluate impacts on adjacent properties, streets, sidewalks, parks, and open spaces.
- Assess changes to solar access for neighboring buildings.
- Determine consistency with applicable municipal or regulatory requirements.

4. Methodology

4.1 Data Sources

- Architectural drawings and 3D massing models provided by the project team.
- Site survey and surrounding context data.
- Geographic location and orientation (latitude, longitude, true north).

4.2 Analysis Tools

- Industry-standard 3D modeling and simulation software.
- Solar position calculations based on astronomical data.

4.3 Assumptions

- Clear-sky conditions.
- No consideration of vegetation growth beyond existing conditions unless otherwise noted.
- Surrounding buildings modeled to representative heights and footprints.

5. Study Dates and Times

Shadow impacts were analyzed on the following representative dates consistent with DC Office of Planning guidance:

- **January 22 (Winter Solstice)**
- **January 24 (Winter Solstice)**

Shadows were evaluated at the following times:

- 9:00 AM
- 12:00 PM
- 3:00 PM

These dates and times are commonly requested for Board of Zoning Adjustment (BZA) review to assess seasonal and daily shadow impacts.

6. Existing Conditions

Under existing conditions, shadows are primarily cast by current buildings and site features. These shadows vary seasonally and are longest during winter months. Public sidewalks and neighboring properties currently receive [adequate/limited] sunlight depending on time of day and season.

7. Proposed Conditions

With the proposed development in place, additional shadows will be introduced. Key observations include:

- Increased shadow length during early morning and late afternoon hours.
- Greatest shadow impacts occurring during winter solstice.
- Minimal additional shadowing during summer midday periods.

8. Impact Assessment

8.1 Adjacent Properties

- Duration and extent of new shadows

8.2 Public Realm

- Sidewalks: N/A
- Streets: N/A
- Parks/Open Spaces: N/A

8.3 Solar Access

- Residential windows: N/A
- Commercial facades: N/A
- Rooftop solar considerations- N/A

9. Compliance Review

9.1 Applicable Special Exception Criteria

The proposed development was reviewed for consistency with the applicable Special Exception standards of the DC Zoning Regulations (Title 11 DCMR), including but not limited to:

- General performance standards for light and air applicable to residential zones
- Criteria requiring that a Special Exception not tend to adversely affect the use of neighboring property
- Criteria requiring that a Special Exception be in harmony with the general purpose and intent of the Zoning Regulations and Zoning Map

9.2 Findings Related to Shadow and Light

Based on the analysis conducted:

- The proposed two-story, 26-foot-tall residential building is consistent with the prevailing scale of development in the surrounding residential context.
- Incremental shadows introduced by the proposed development are limited in duration and primarily occur during early morning and late afternoon hours.
- The most pronounced shadow conditions occur during the winter solstice; however, these shadows are typical of residential structures of similar height and do not result in unreasonable obstruction of light to adjacent properties.
- Midday solar access to neighboring properties and public rights-of-way is largely maintained throughout the year.

9.3 Special Exception Conclusion

The shadow and light impacts associated with the proposed development do not rise to the level of an undue adverse effect on neighboring properties or the public realm. Accordingly, the project satisfies the applicable Special Exception criteria related to light and air.

Compliance Summary:

The proposed development meets the relevant Special Exception standards of Title 11 DCMR and is appropriate for approval by the Board of Zoning Adjustment from a shadow and light impact perspective.

10. Mitigation Measures (If Required)

Where impacts exceed recommended thresholds, the following mitigation measures may be considered:

- Building step-backs or massing adjustments
- Façade articulation or orientation changes
- Reduction in building height at sensitive edges

11. Conclusions

Based on the shadow and light analysis conducted for representative seasonal dates and times, the proposed two-story, 26-foot-tall residential building at 630 Randolph Road, NW will not result in undue adverse shadow or light impacts on adjacent properties or the public realm. Shadow conditions introduced by the development are typical for residential structures of similar height and occur primarily during early morning and late afternoon hours, with limited midday impacts.

From a zoning and engineering perspective, the proposed development is consistent with the intent of the DC Zoning Regulations and satisfies the applicable **Special Exception** standards related to light and air. The findings presented herein support approval of the Special Exception by the Board of Zoning Adjustment.

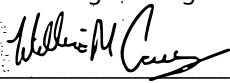
12. Limitations

This study is based on available information at the time of preparation.

13. Certification

I hereby certify that this shadow and light study has been prepared in accordance with generally accepted engineering practices.

Prepared by: SAFE Engineering Firm

Signature: 

Date: January 25, 2026

