

Shadow Study of Family Courts, Hammond Lane, Dublin 7.

Applicant: Office of Public Works

Date: 16th November 2023

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MSc Environmental Design of Buildings**

1. Shadow Diagrams

1.1 BR209 (2022) - Site Layout Planning for Daylight and Sunlight, guidance on shadow studies

Shadow diagrams are a visual aid to understand where possible shading may occur. The BRE guidelines recommend using the March Equinox due the equal length of the day and night time. It states:

"If a space is used all year round, the equinox (21 March) is the best date for which to prepare shadow plots as it gives an average level of shadowing. Lengths of shadows at the autumn equinox (21 September) will be the same as those for 21 March, so a separate set of plots for September is not required."

The shadows cast on the September equinox are the same as the March Equinox. They are included here with the Daylight Saving Time (DST) applied, as with the Summer Solstice diagrams.

June 21st and December 21st are provided below for information but it should be noted that the summer solstice is the best case scenario with shadows at their shortest. The summer solstice diagrams are included here with the Daylight Saving Time (UTC+1) applied. In Winter even low buildings will cast long shadows and it is common for large areas of the ground to be in shadow throughout the day especially in a built up area and sun barely rises above an altitude of 10° during the course of the day. The guidelines recommends that Sunlight at an altitude of 10° or less does not count. Below are the times for the Equinox and Solstice that the sun is above 10° altitude rounded to the nearest half hour.

Equinox: between 8:30 and 17:30

Summer Solstice: Between 6:30 and 20:00

Winter Solstice: Between 10:30 and 14:00

Section 1.2 shows the existing and proposed shadow diagrams for the Equinox on the 21st March at 2 hourly intervals during the day between 09:00 and 17:00.

Section 1.3 shows the existing and proposed shadow diagrams for the Summer Solstice on the 21st June at 2 hourly intervals during the day between 09:00 and 20:00.

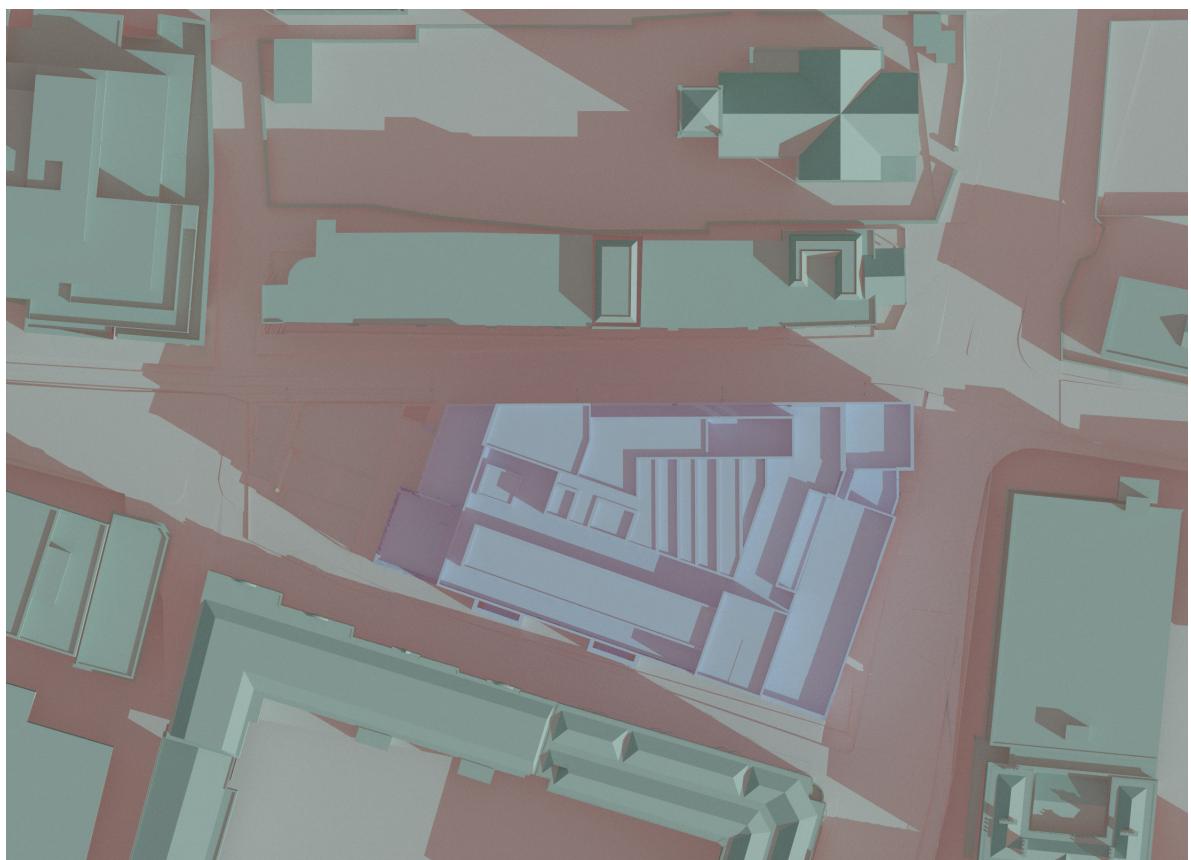
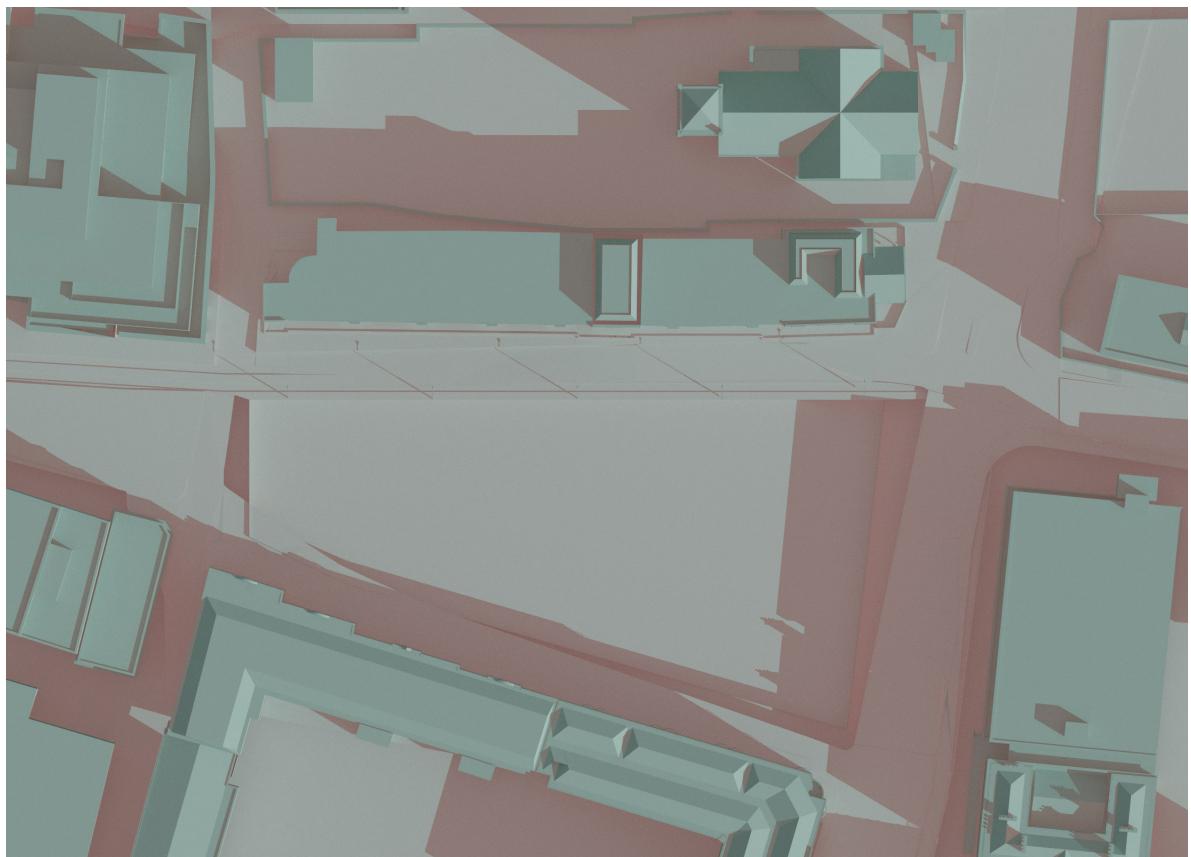
Section 1.4 shows the existing and proposed shadow diagrams for the Equinox on the 21st September at 2 hourly intervals during the day between 09:00 and 17:00.

Section 1.5 shows the existing and proposed shadow diagrams for the Winter Solstice on the 21st December at 2 hourly intervals during the day between 09:00 and 15:00.

The site is vacant with no shadow cast from any structures in the existing. Shadow diagrams are a visual aid to understand where possible shading may occur. The use of shadow diagrams as an assessment method should be taken over the course of the day and not a specific time due to the transient nature of the sun and the shade caused by obstructions.

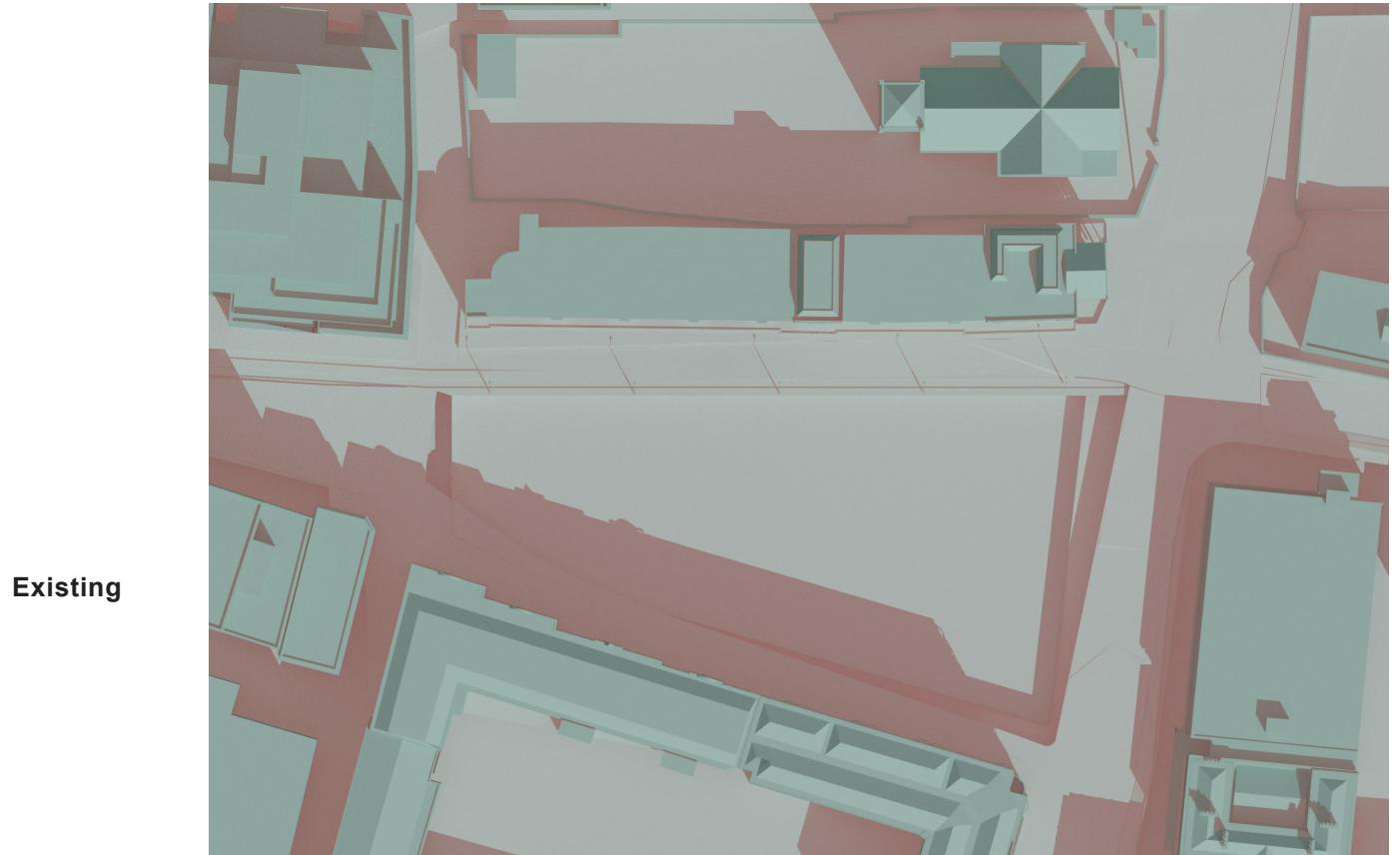
1.2 Shadow Casting diagrams March Equinox

Existing

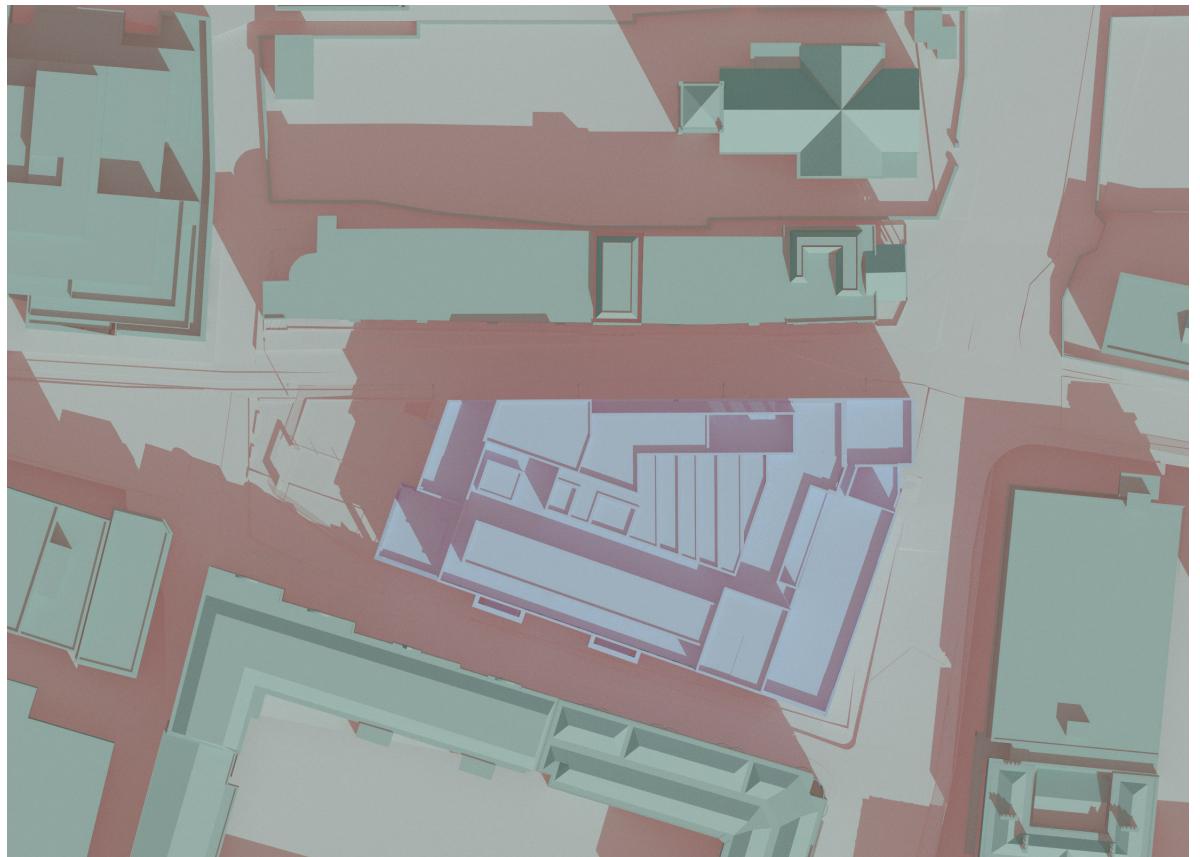


Proposed

Figure 1: Shadow diagrams 21 March 09:00 UTC

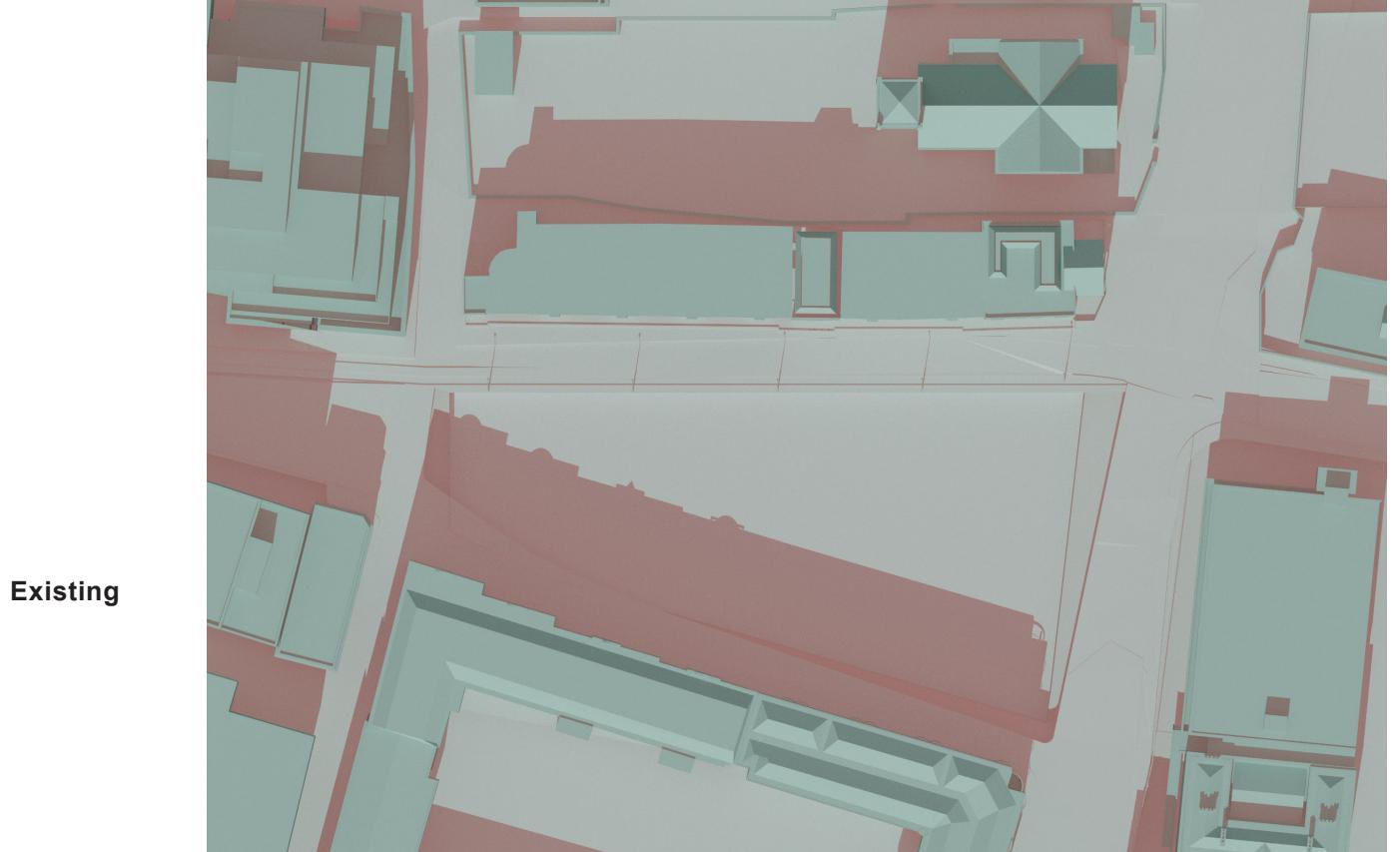


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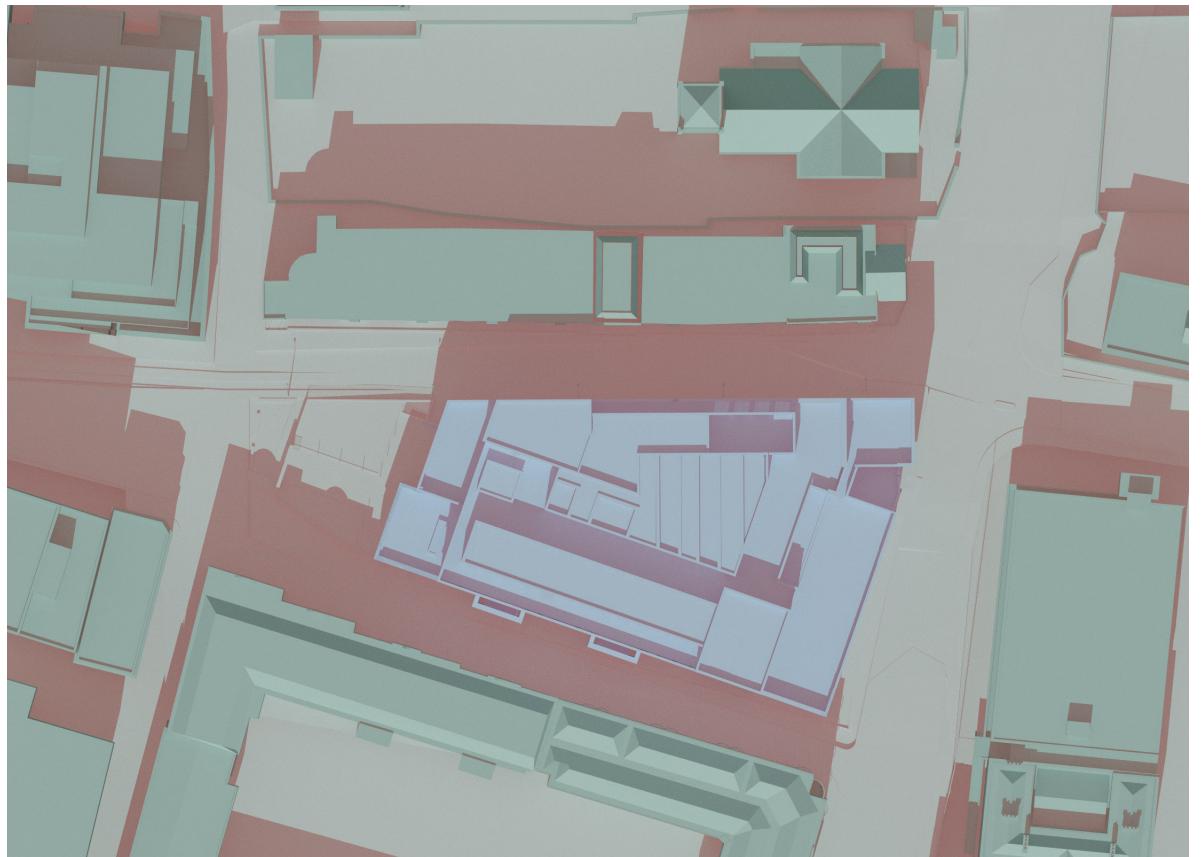


Proposed

Figure 2: Shadow diagrams 21 March 11:00 UTC

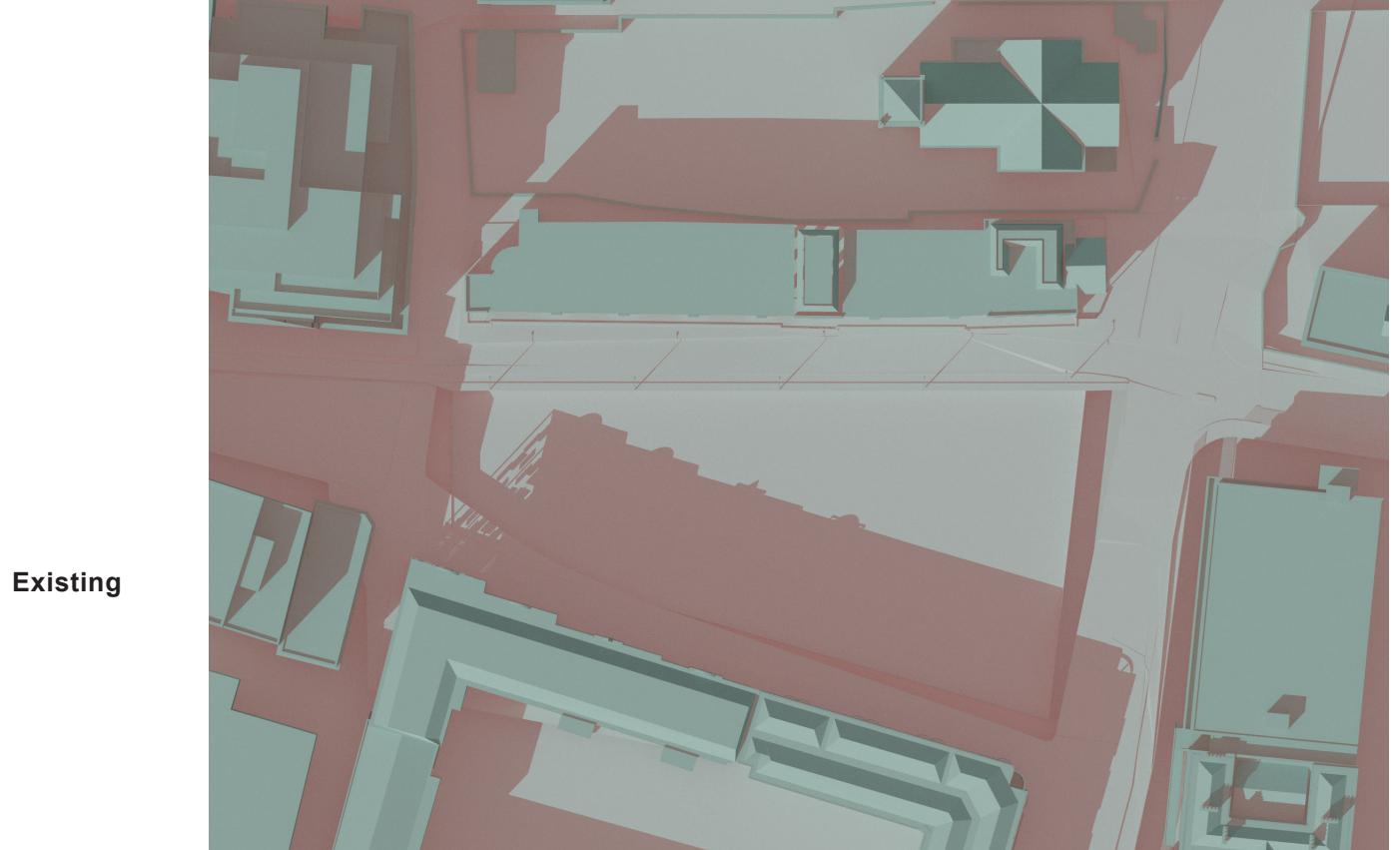


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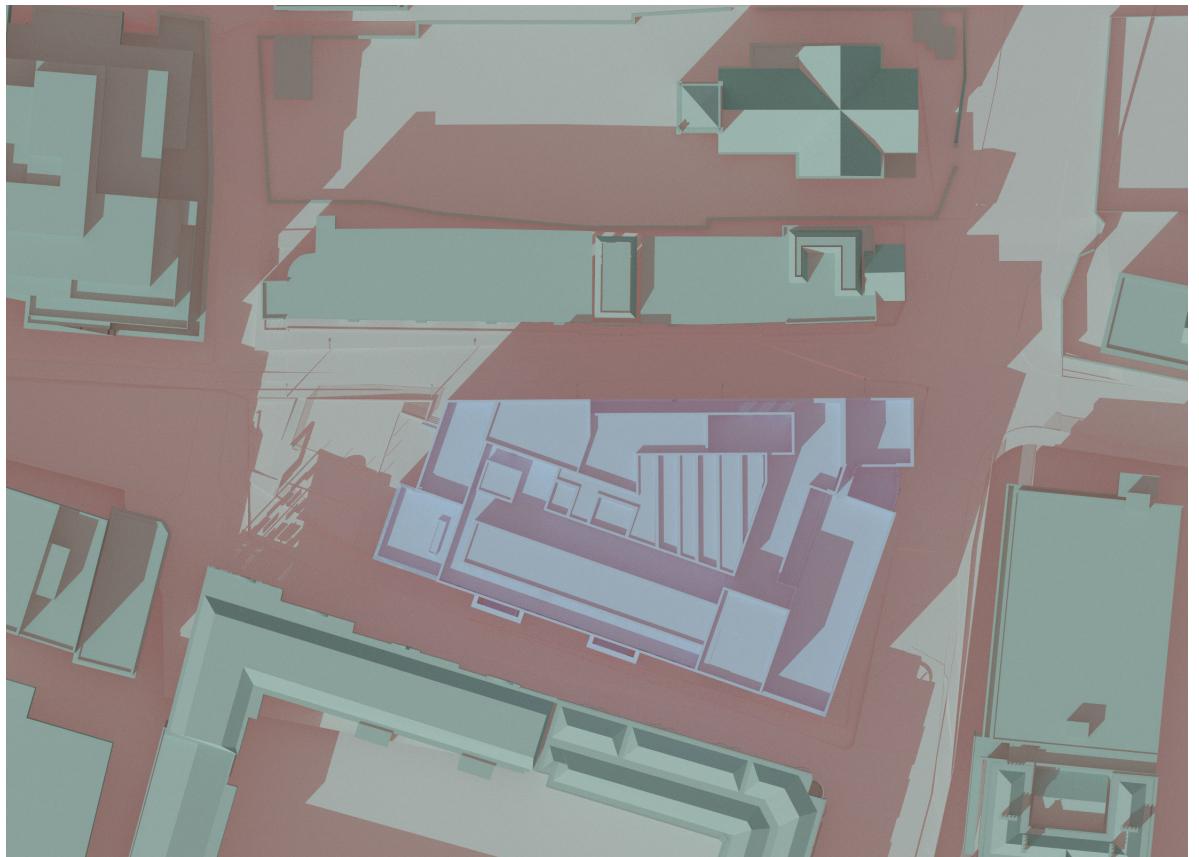


Proposed

Figure 3: Shadow diagrams 21 March 13:00 UTC

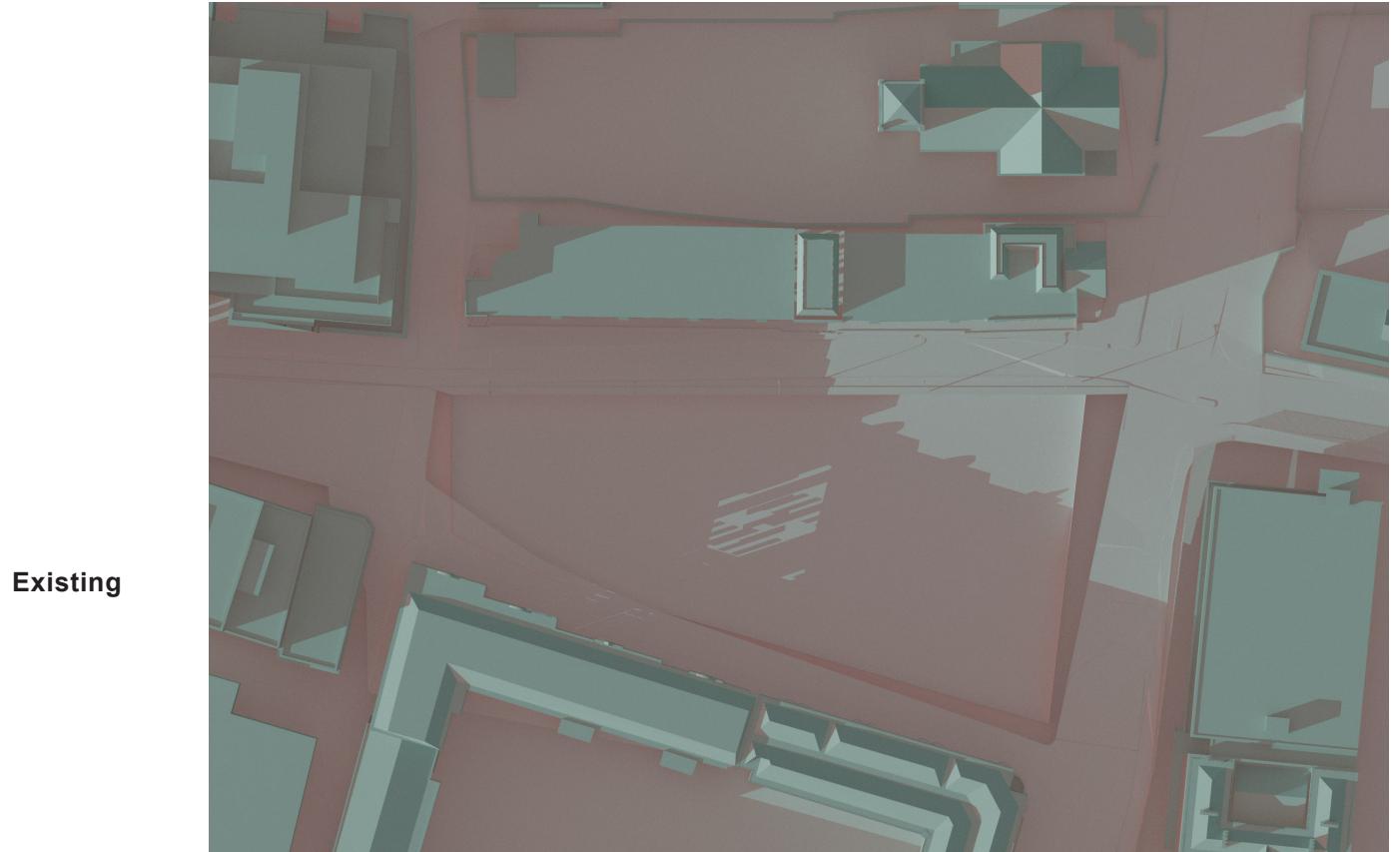


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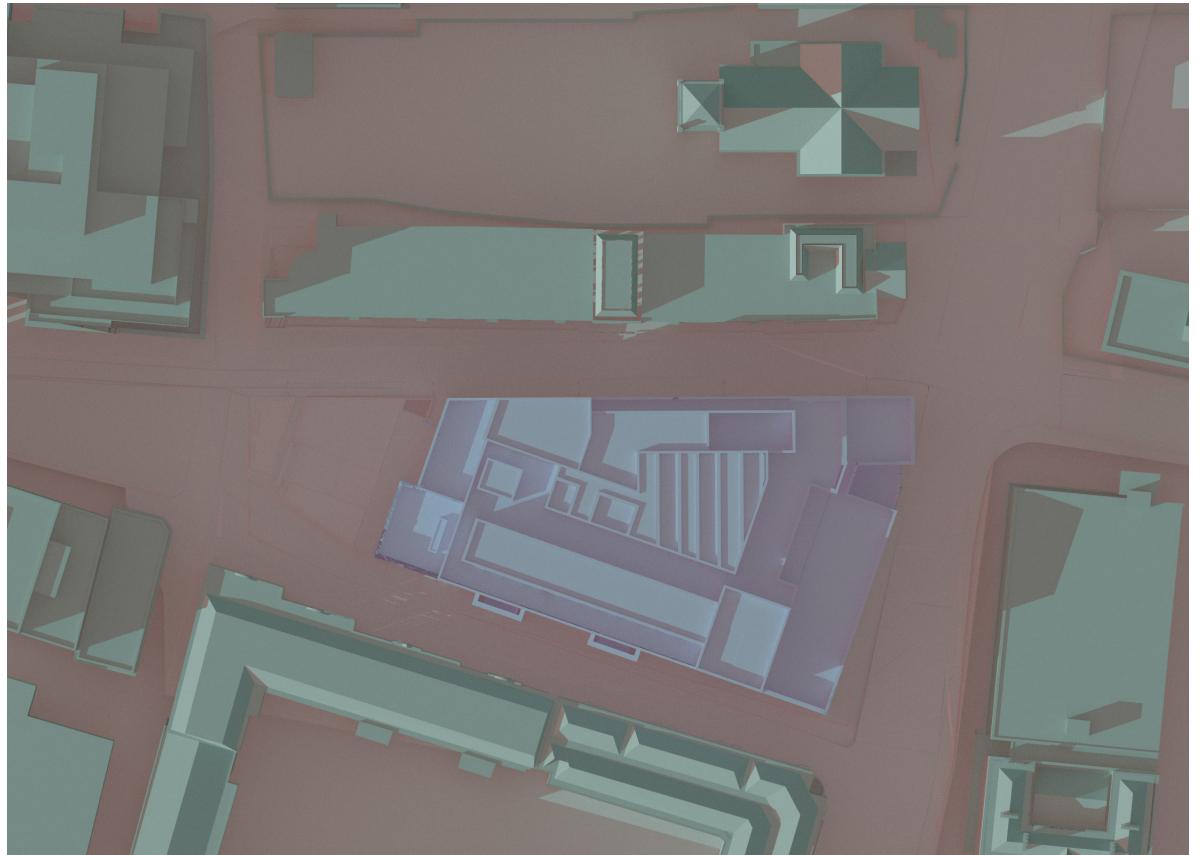
Proposed

Figure 4: Shadow diagrams 21 March 15:00 UTC



Existing

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Proposed

Figure 5: Shadow diagrams 21 March 17:00 UTC

1.3 Shadow Casting diagrams June Solstice

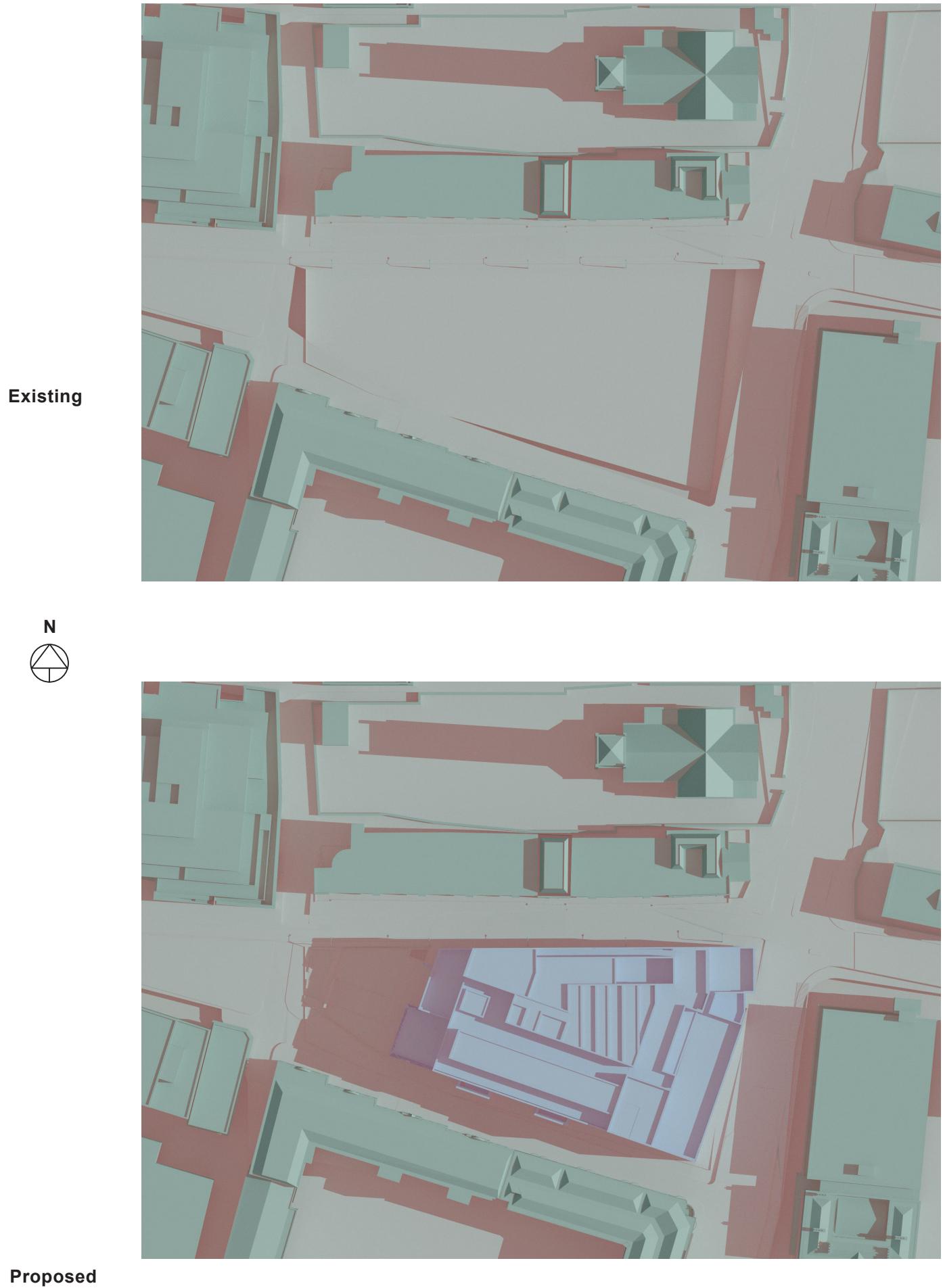
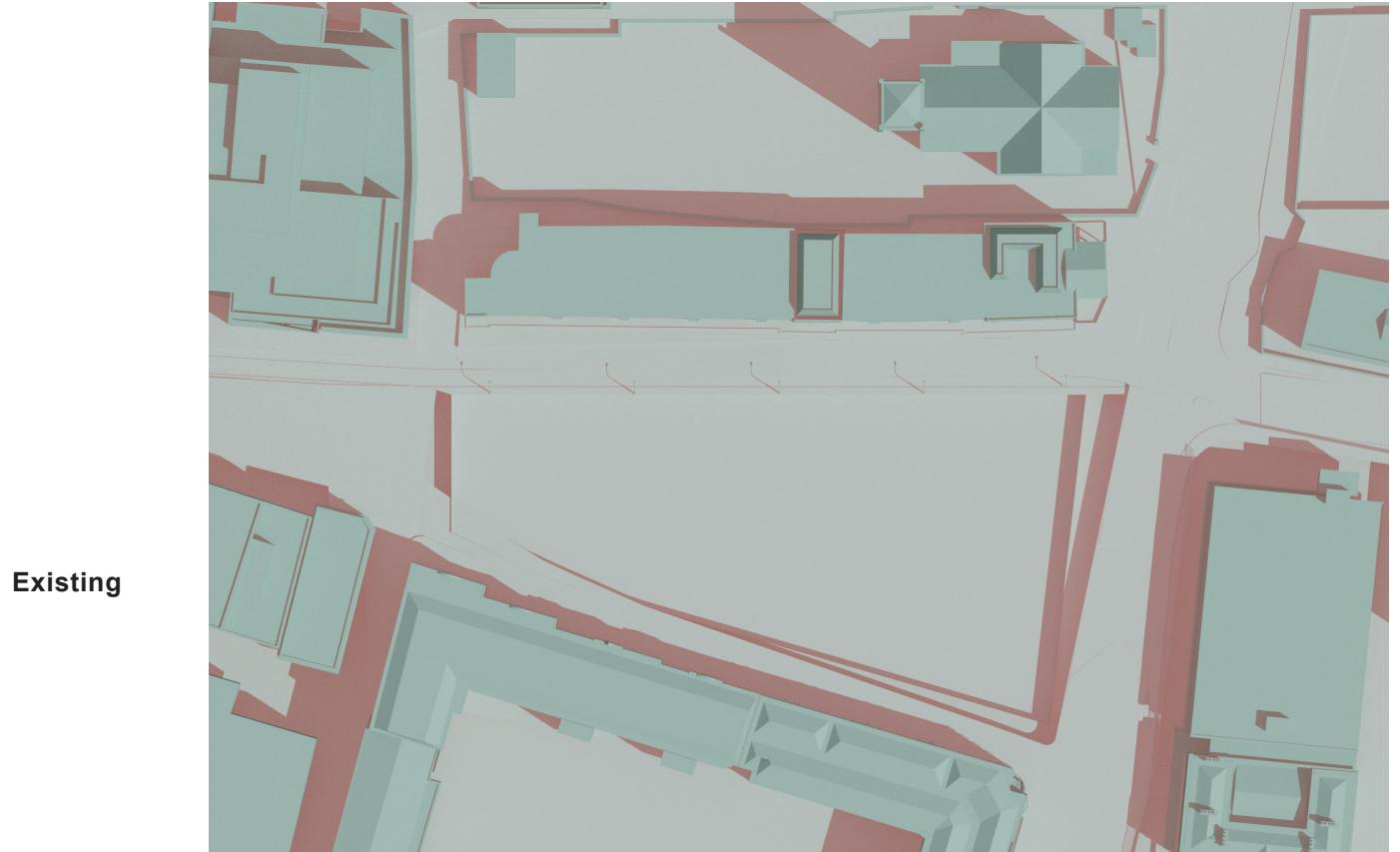
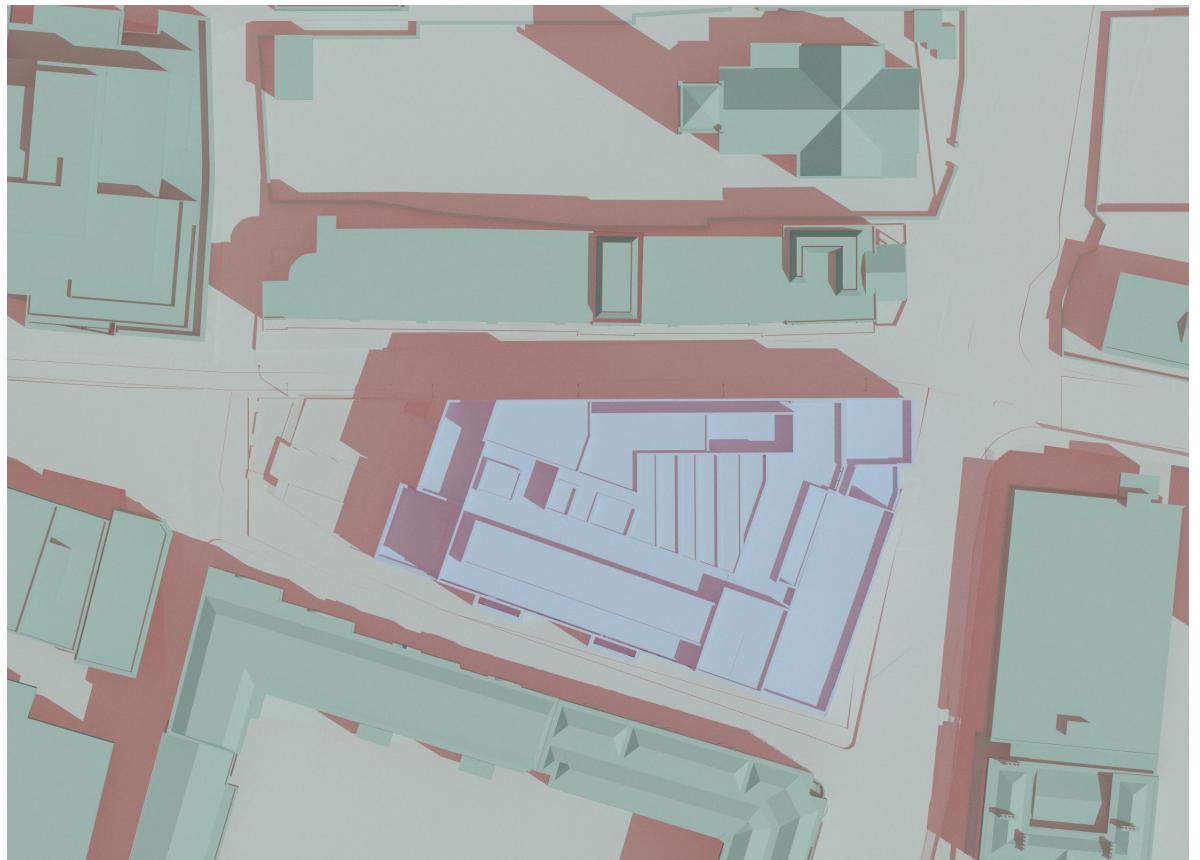


Figure 6: Shadow diagrams 21 June 09.00 UTC +1

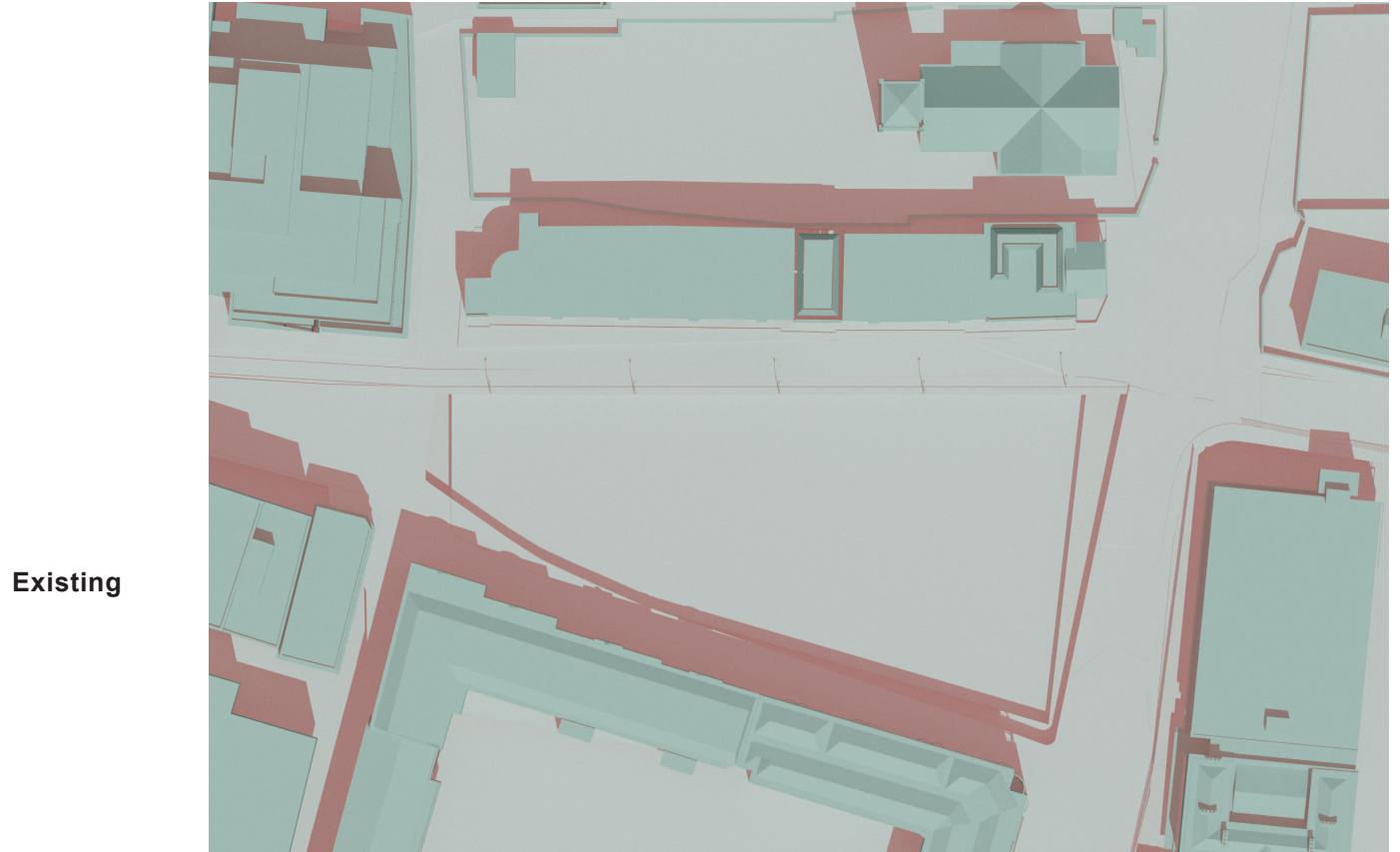


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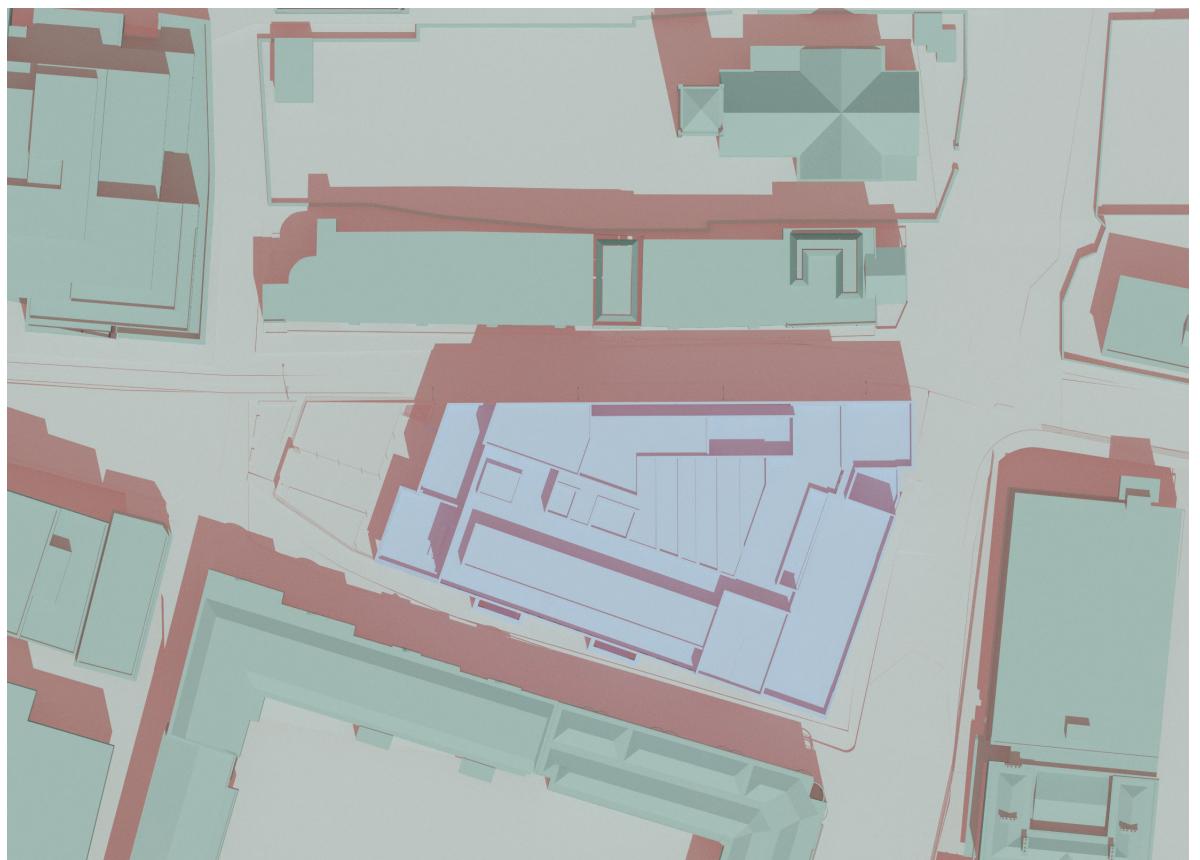


Proposed

Figure 7: Shadow diagrams 21 June 11:00 UTC +1

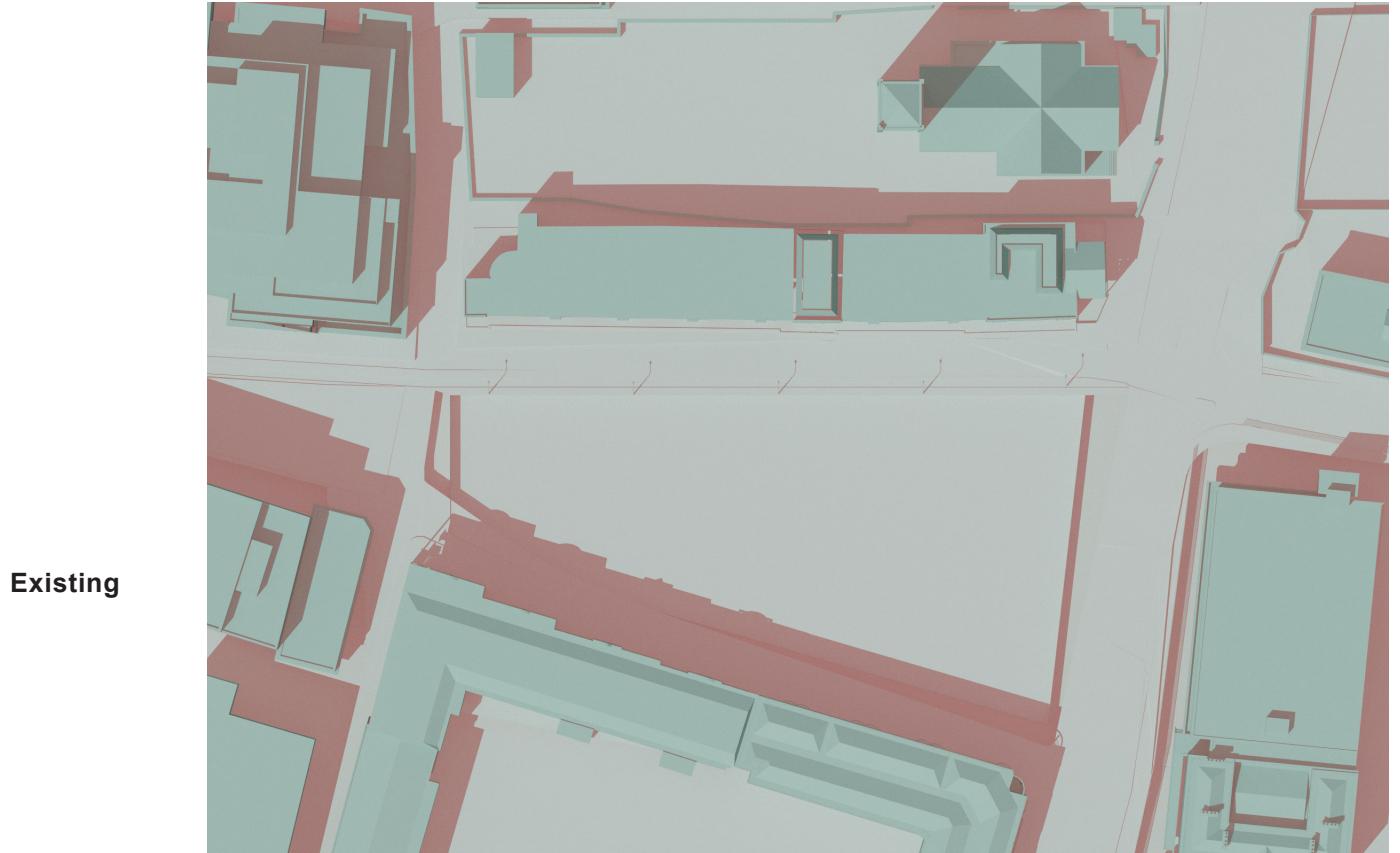


Existing



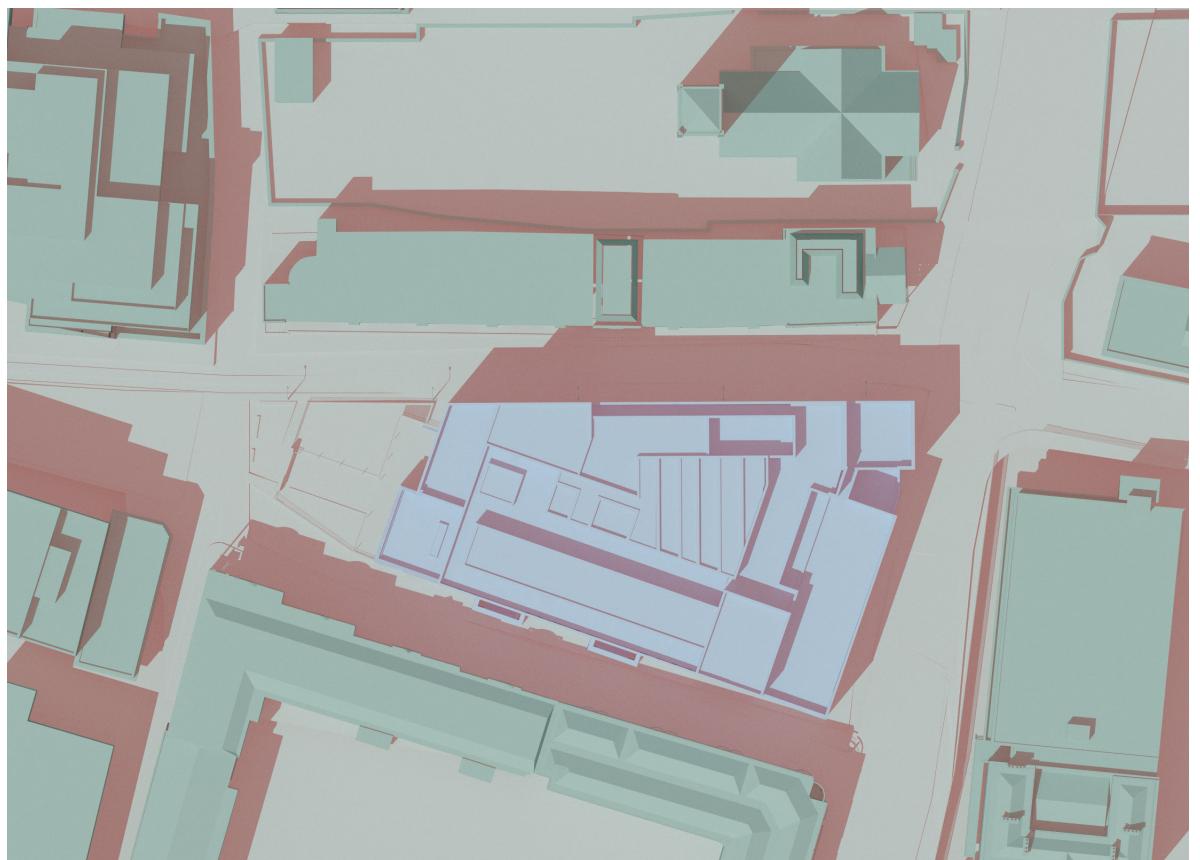
Proposed

Figure 8: Shadow diagrams 21 June 13:00 UTC +1



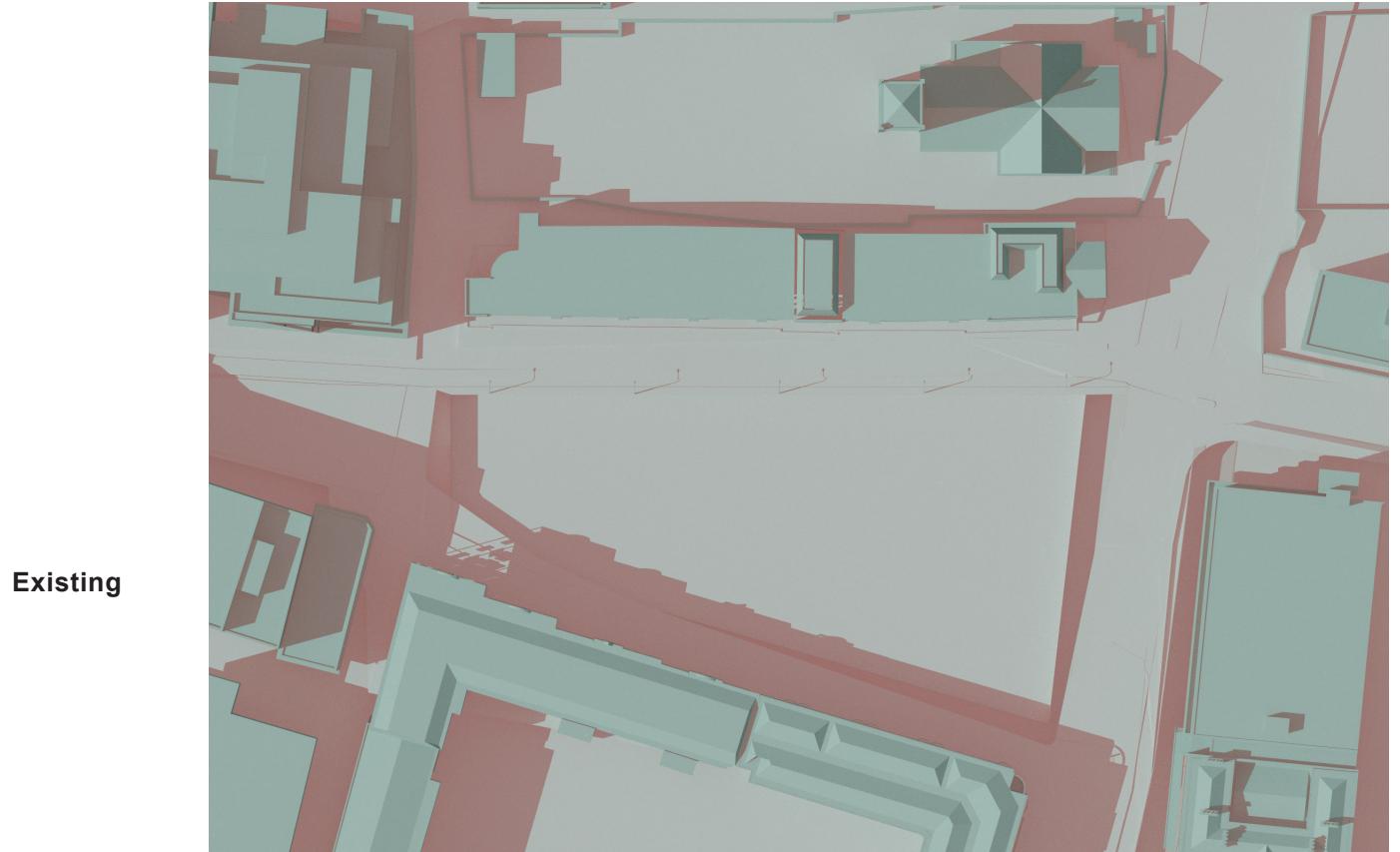
Existing

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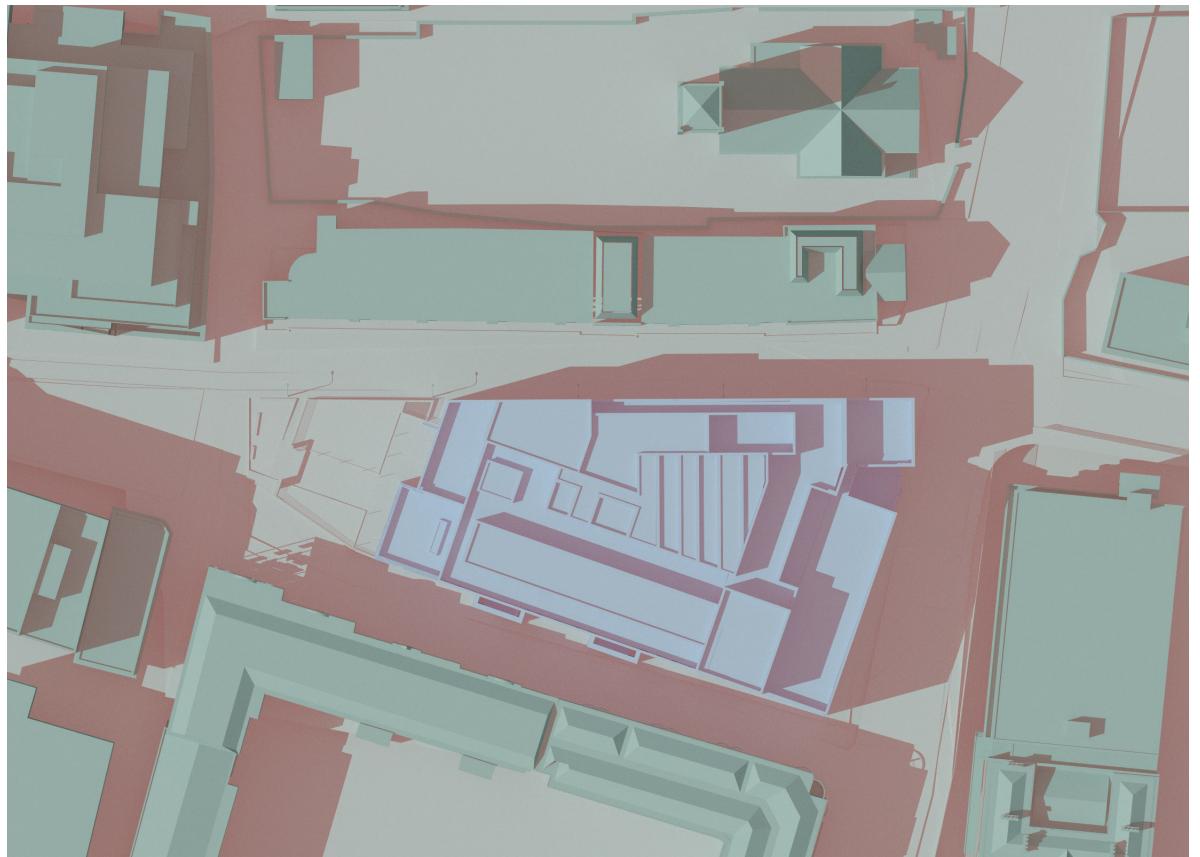


Proposed

Figure 9: Shadow diagrams 21 June 15:00 UTC +1

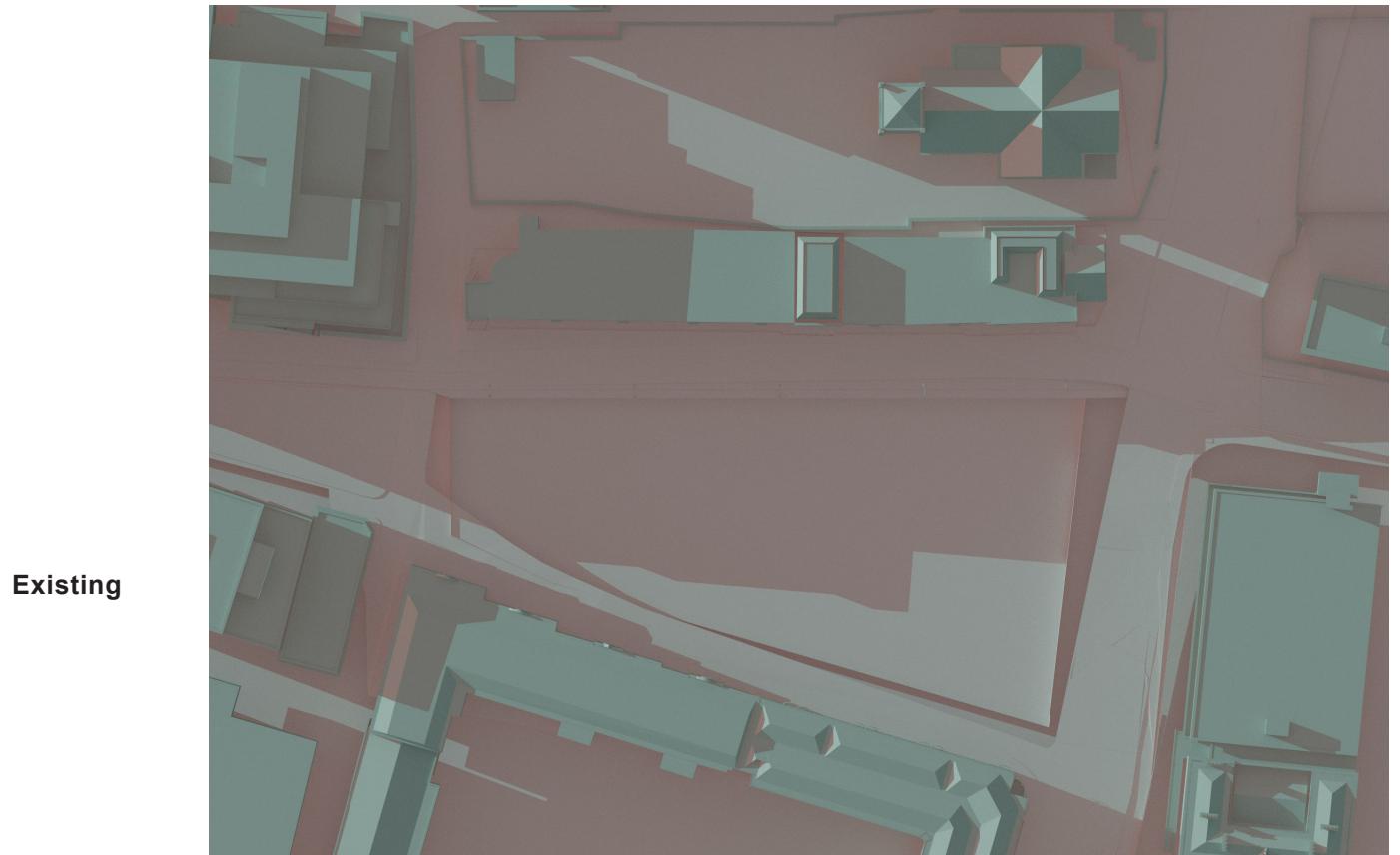


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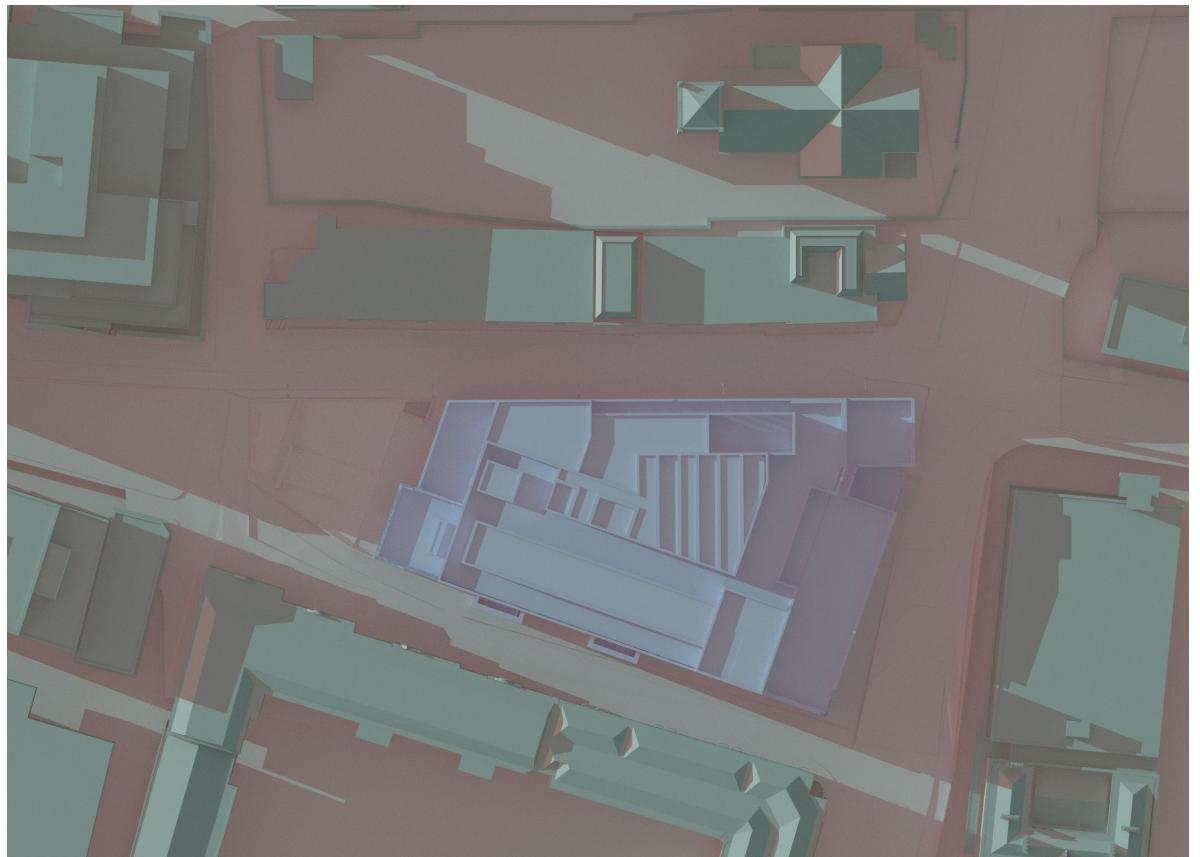
Proposed

Figure 10: Shadow diagrams 21 June 17:00 UTC +1



Existing

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Proposed

Figure 11: Shadow diagrams 21 June 20:00 UTC +1

1.4 Shadow Casting diagrams September Equinox

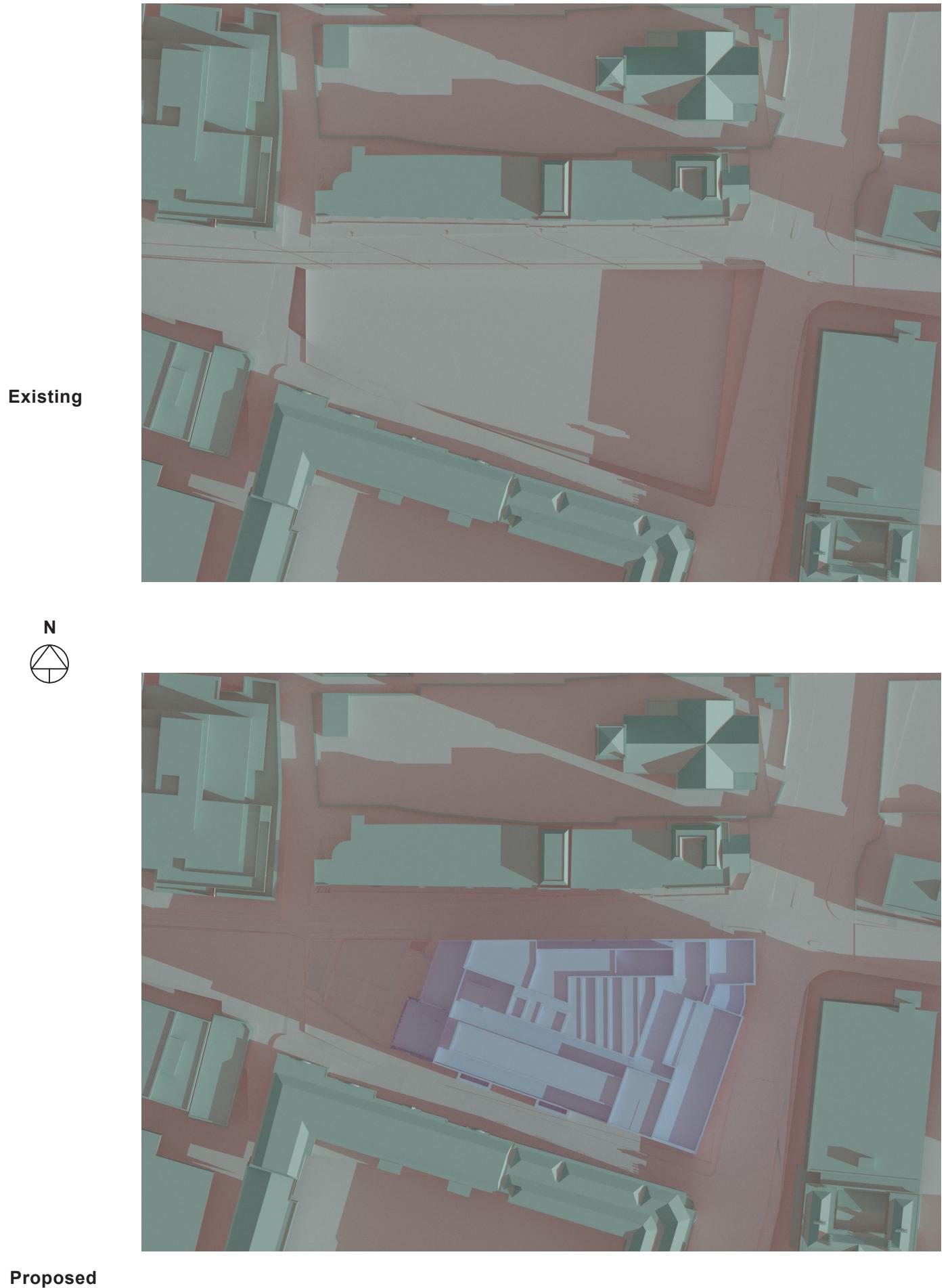
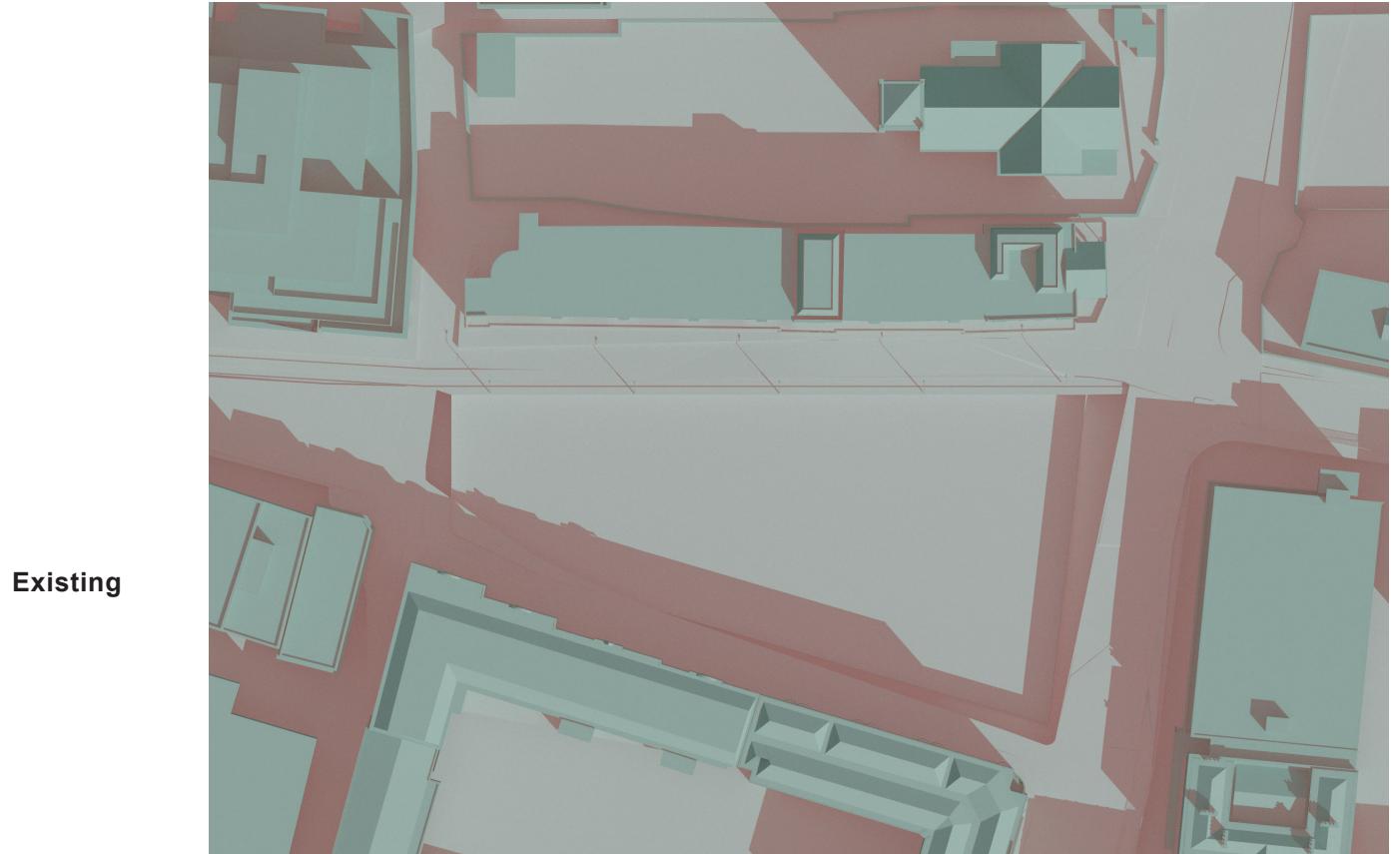
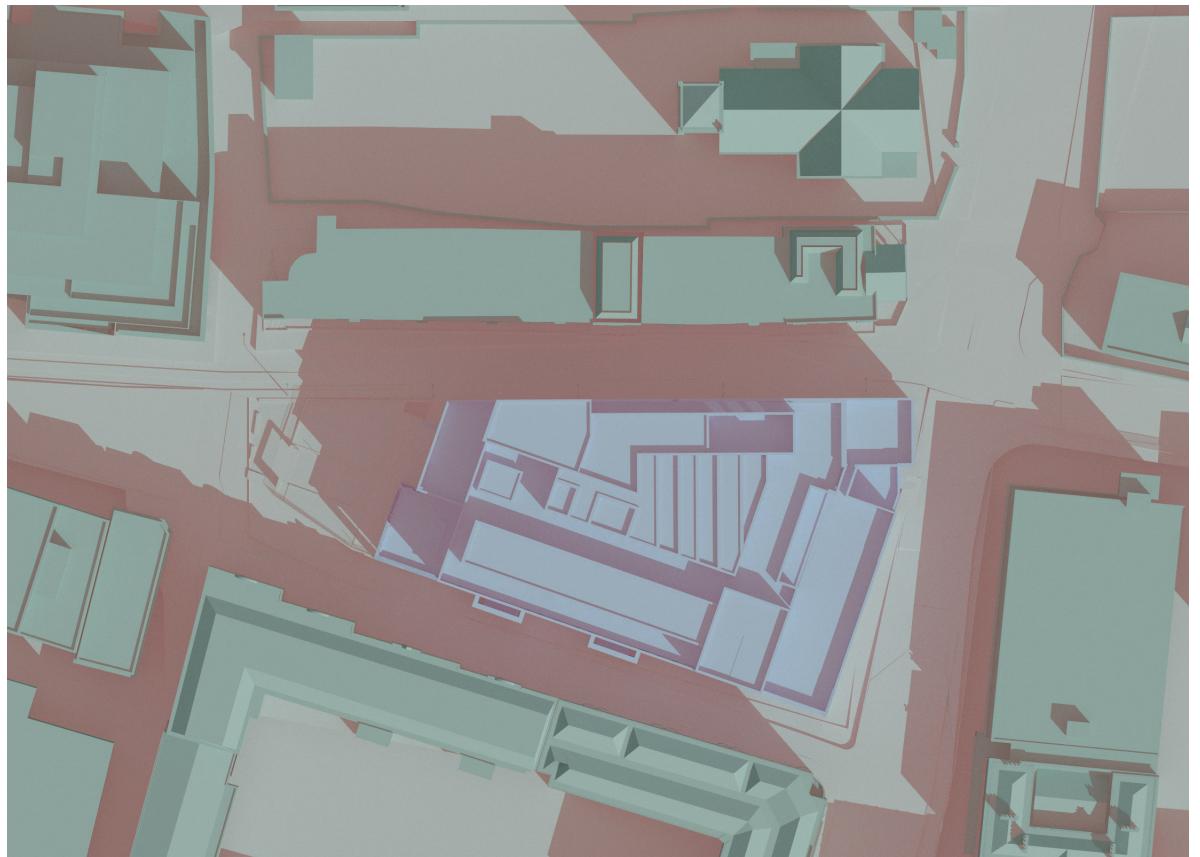


Figure 12: Shadow diagrams 21 September 09:00 UTC +1

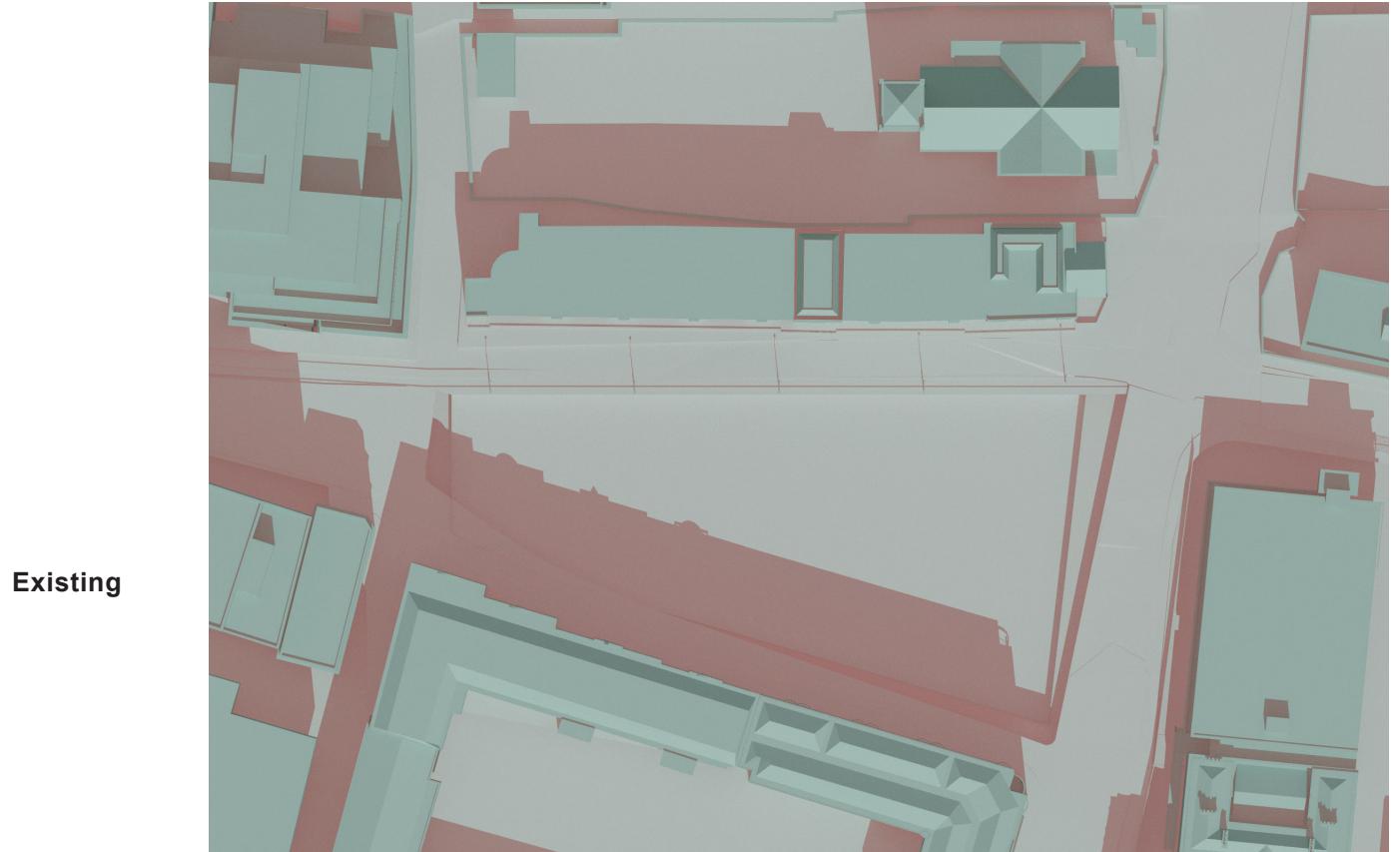


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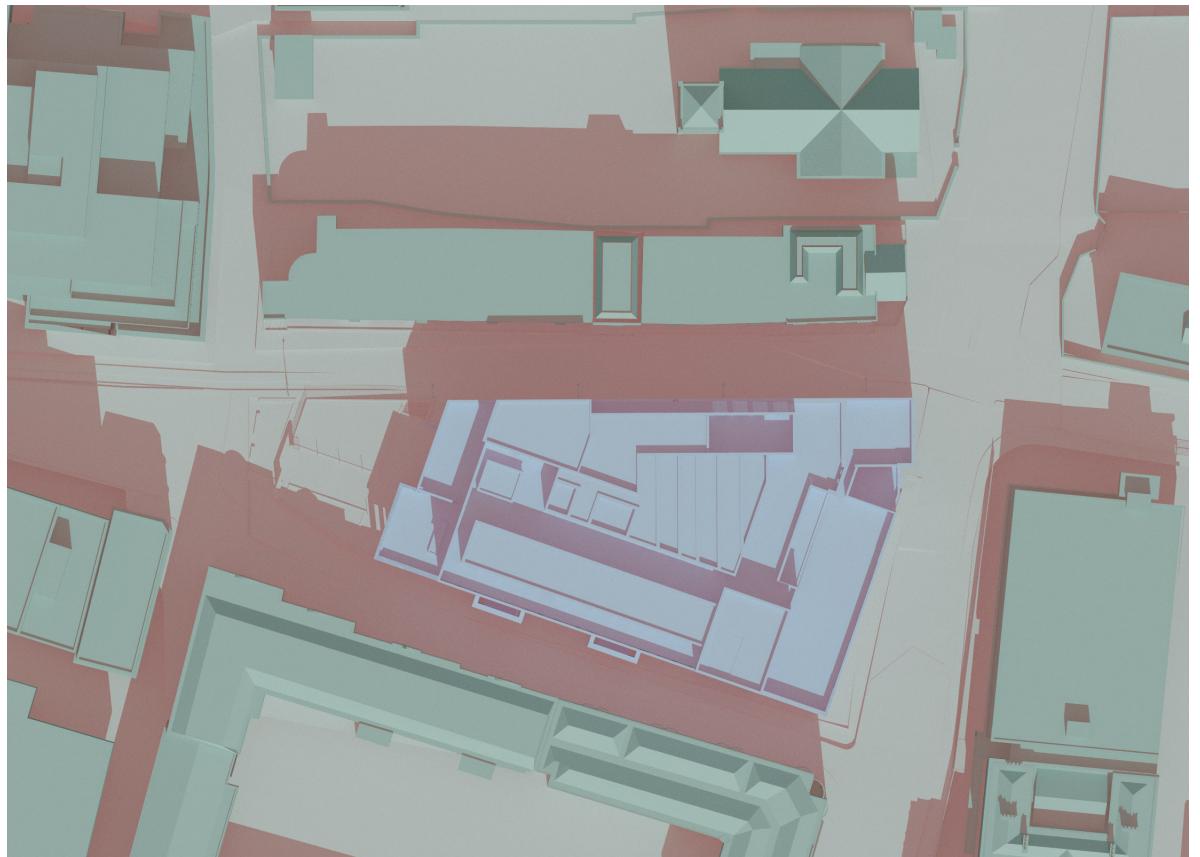


Proposed

Figure 13: Shadow diagrams 21 September 11:00 UTC +1



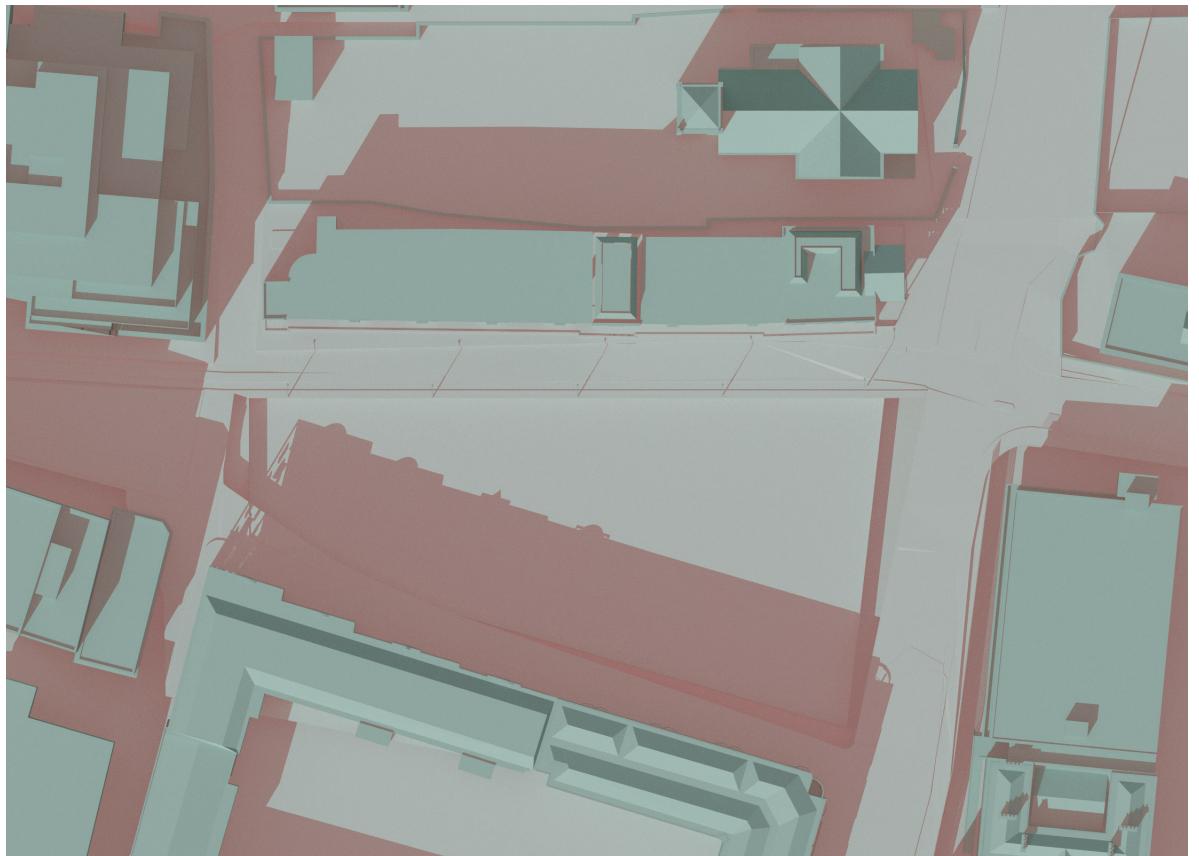
Existing



Proposed

Figure 14: Shadow diagrams 21 September 13:00 UTC +1

Existing



Proposed

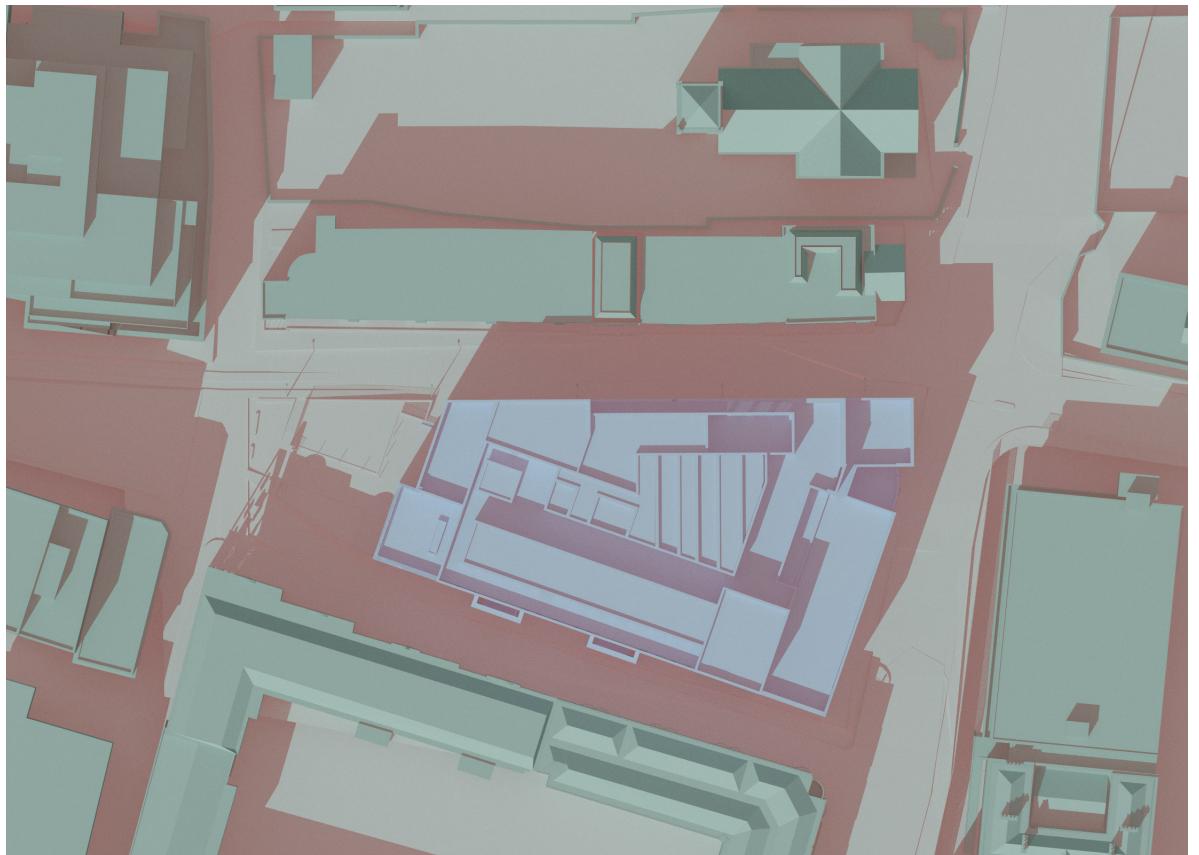
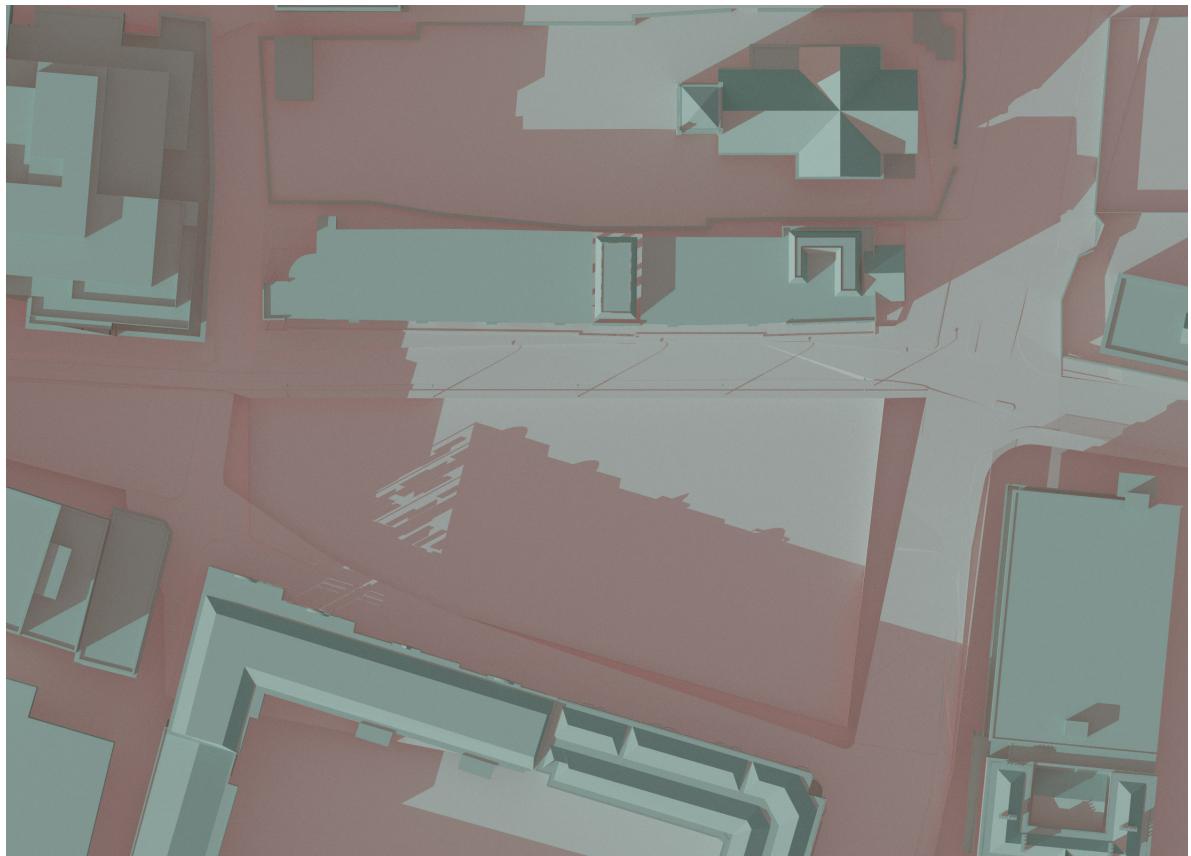


Figure 15: Shadow diagrams 21 September 15:00 UTC +1

Existing



N
 A north arrow symbol consisting of a circle with a crosshair inside, pointing upwards.

Proposed

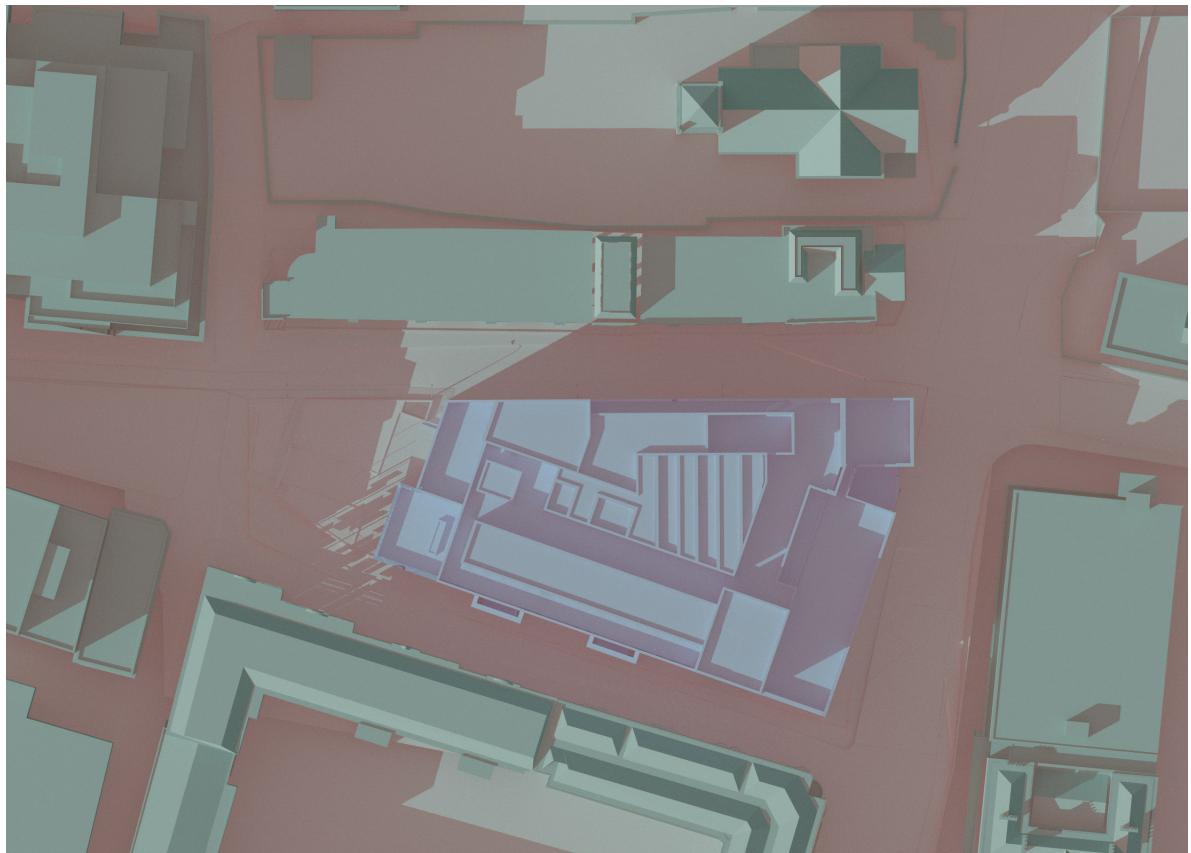


Figure 16: Shadow diagrams 21 September 17:00 UTC +1

1.5 Shadow Casting diagrams December Solstice

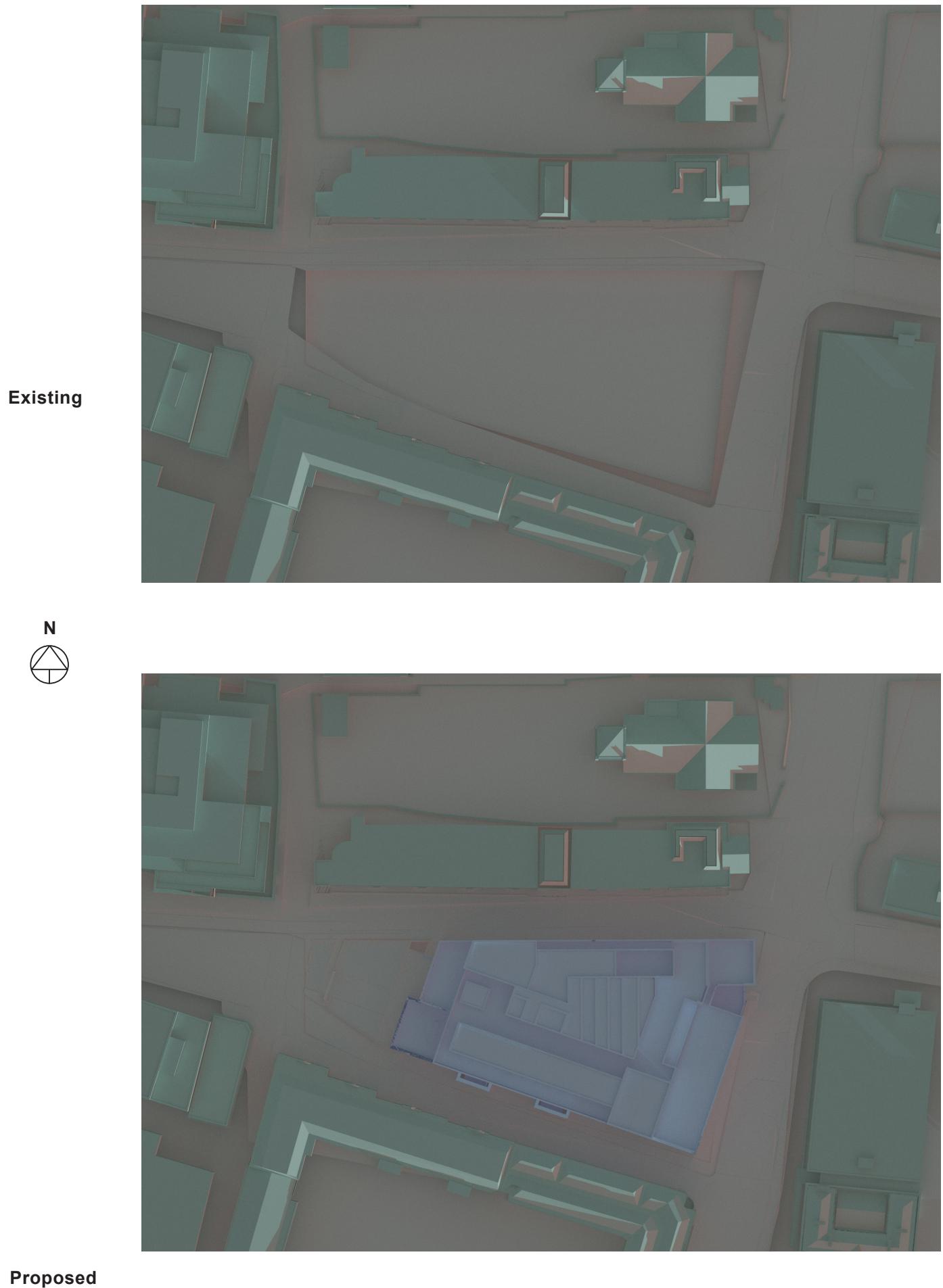
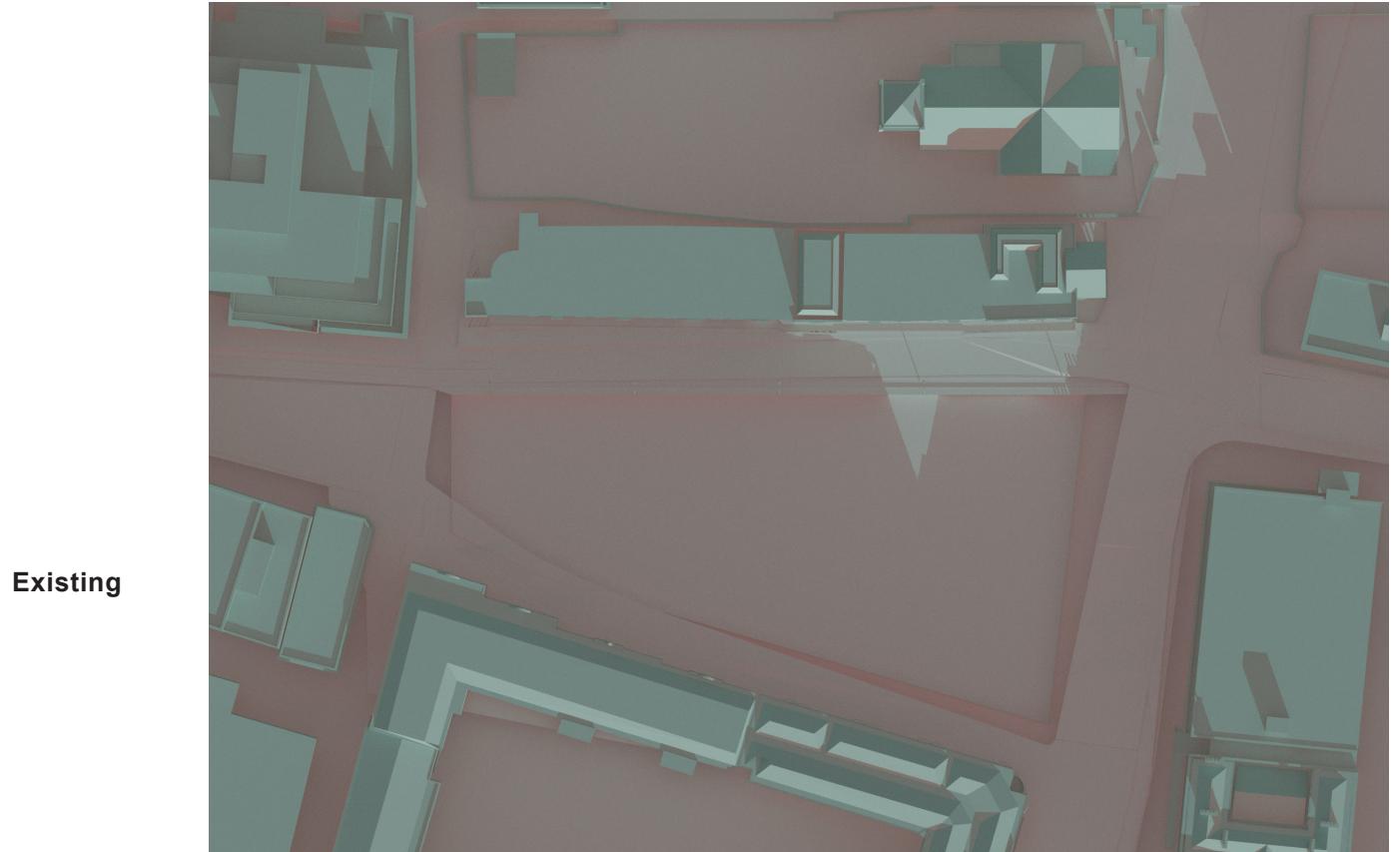
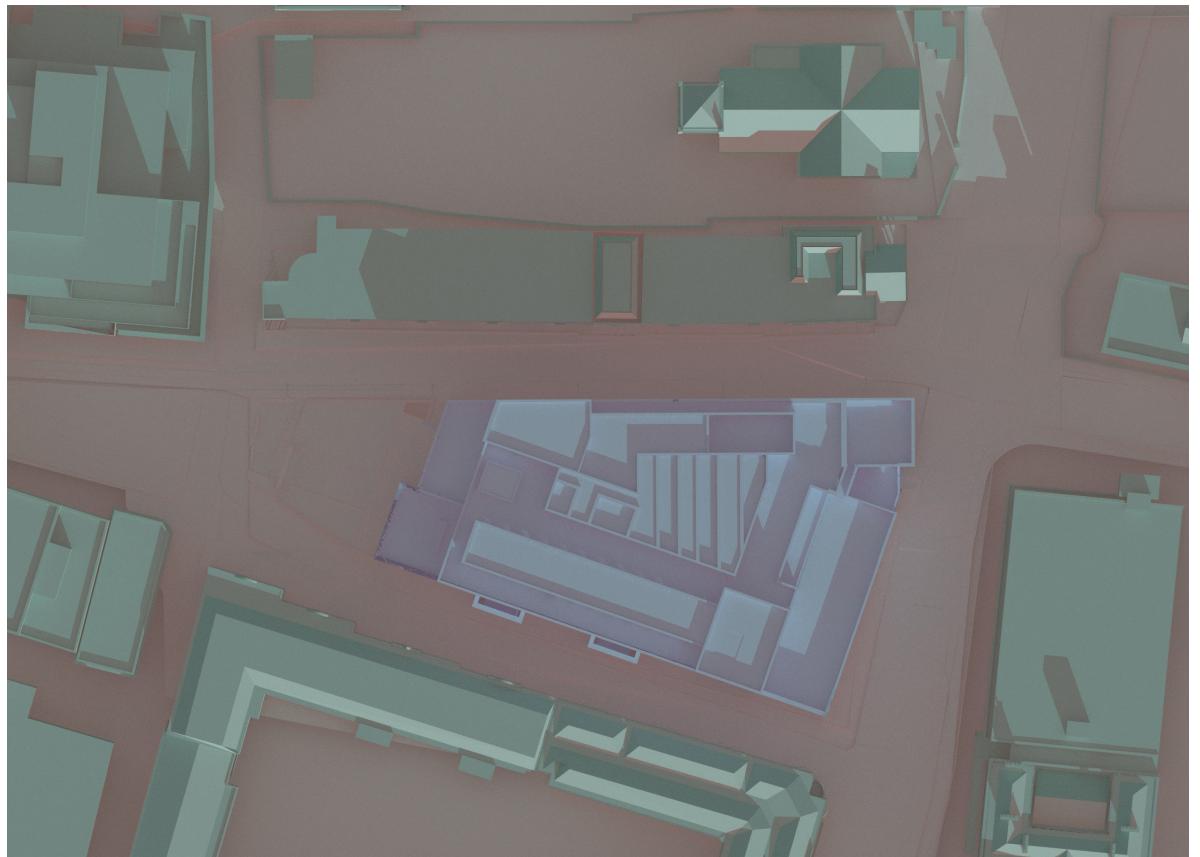


Figure 17: Shadow diagrams 21 December 09:00 UTC



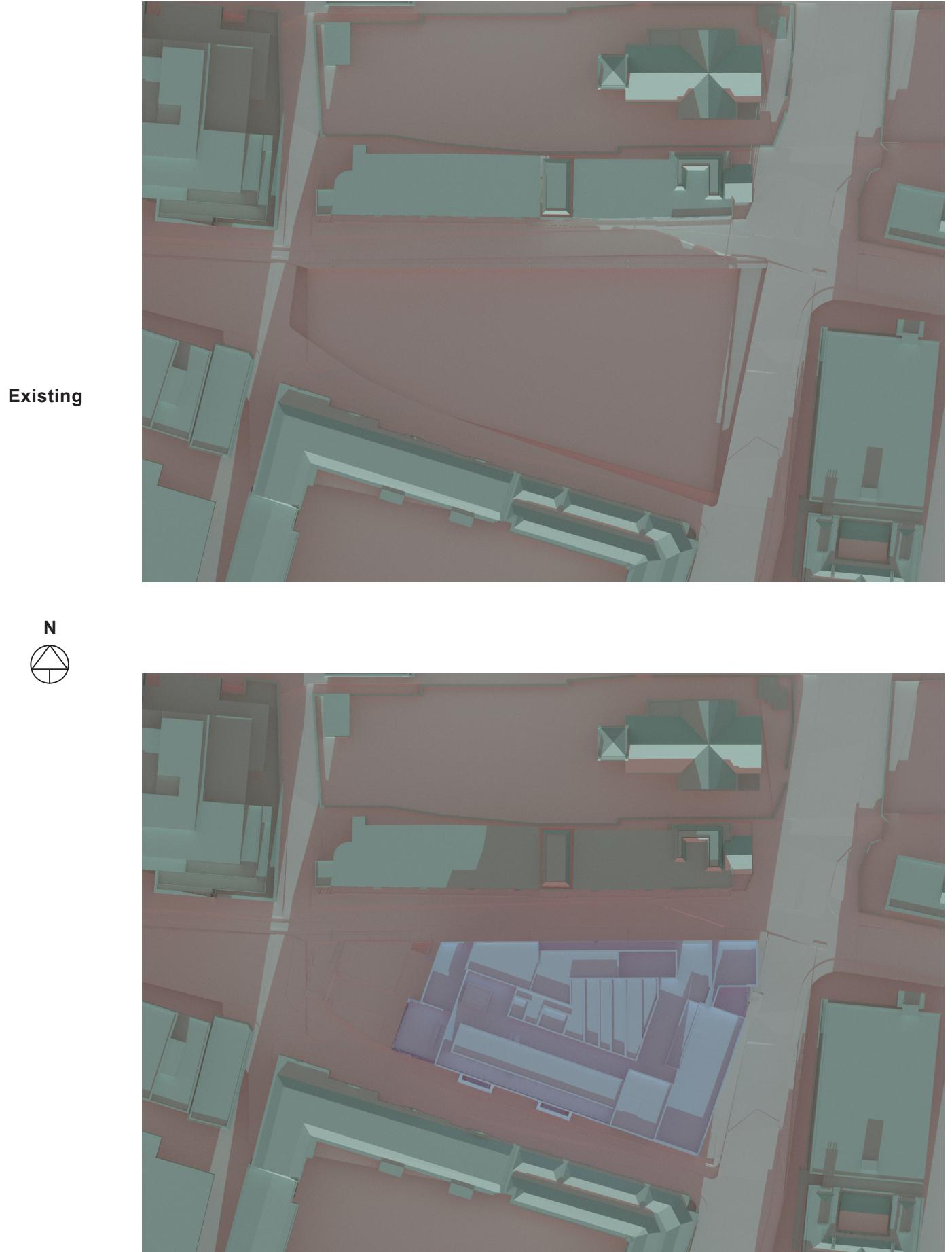
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Figure 18: Shadow diagrams 21 December 11:00 UTC



Proposed

Figure 19: Shadow diagrams 21 December 13:00 UTC

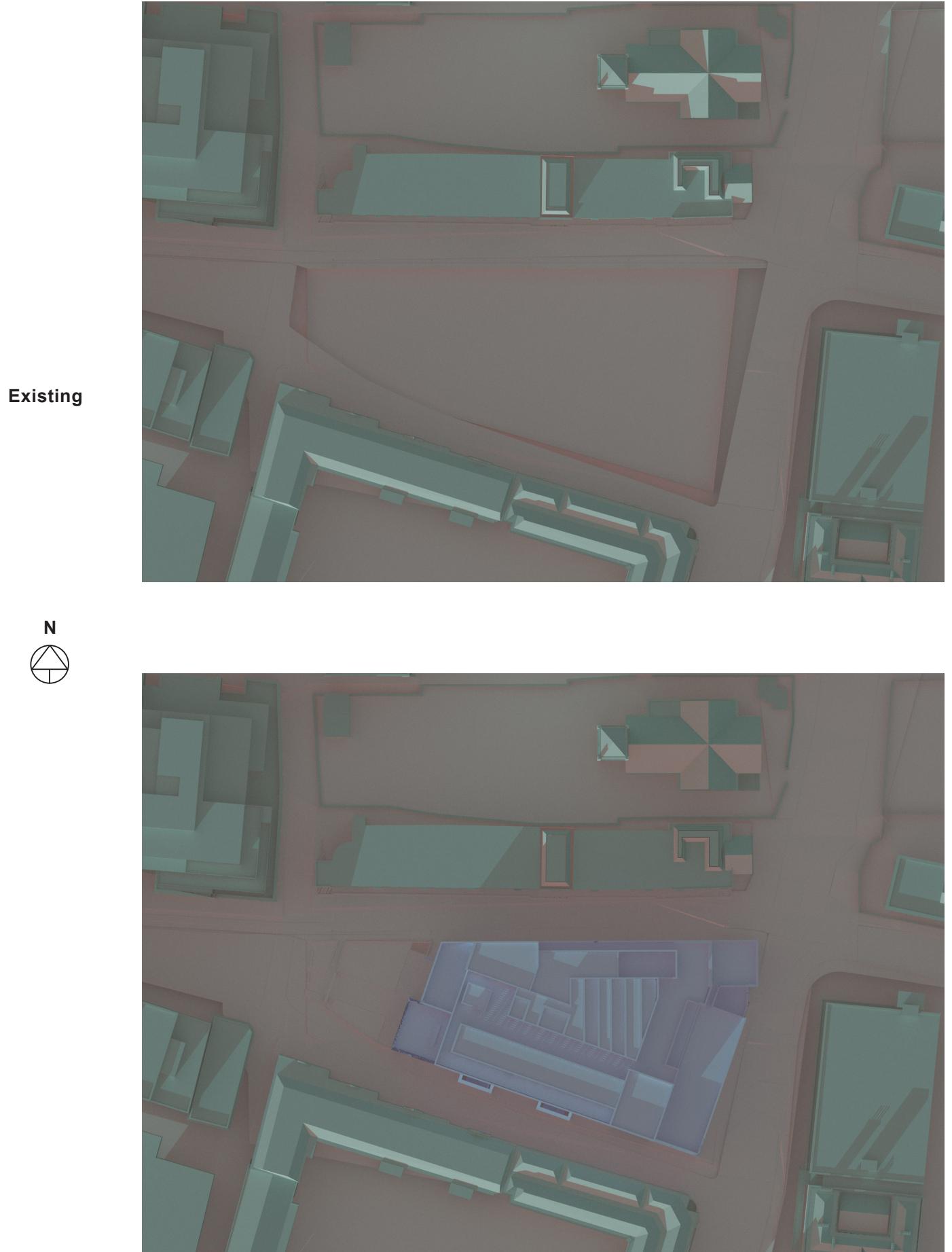


Figure 20: Shadow diagrams 21 December 15:00 UTC