

Fyrklöver, Upplands Väsby

STUDY AIM

The purpose of this study is to assess two alternatives for the proposed development in terms of (1) daylight access BBR chapter 6:322 (2) direct solar access BBR kap 6:323 and (3) access to direct sun on the courtyards.

METHOD

Beräkningar för VSC tar hänsyn till himlens ljushet, himmelsavskärmningen, omkringliggande Buildinger och utvändiga skuggande byggnadsdelar, fasta skärmar etc. Beräkningarna är utförda med 'Berkeley Laboratory's Radiance software' (Radiance) med 'Grasshopper/Honeybee'. Renderingsmotorn 'Radiance render engine' är betraktad som 'industristandard' mjukvara för fysiskt korrekt beräkning av ljus. Shading effects from plants and other vegetation are not considered in the calculations.

Assessment of the impact on daylight inside the rooms for the adjacent existing buildings has been done, using the daylight factor metric as per the allmänna rådet for BBR 6:322. Three alternative conditions have been studied for the current buildings adjacent to the new development: (1) Existing conditions, (2) Alternative 1 and (3) Alternative 2.

VSC THRESHOLDS FOR FACADE DAYLIGHT ACCESS

>20%

Good daylight access. Typical rooms proportions with typical window sizes should easily comply with BBR Daylight requirements

11 - 20%

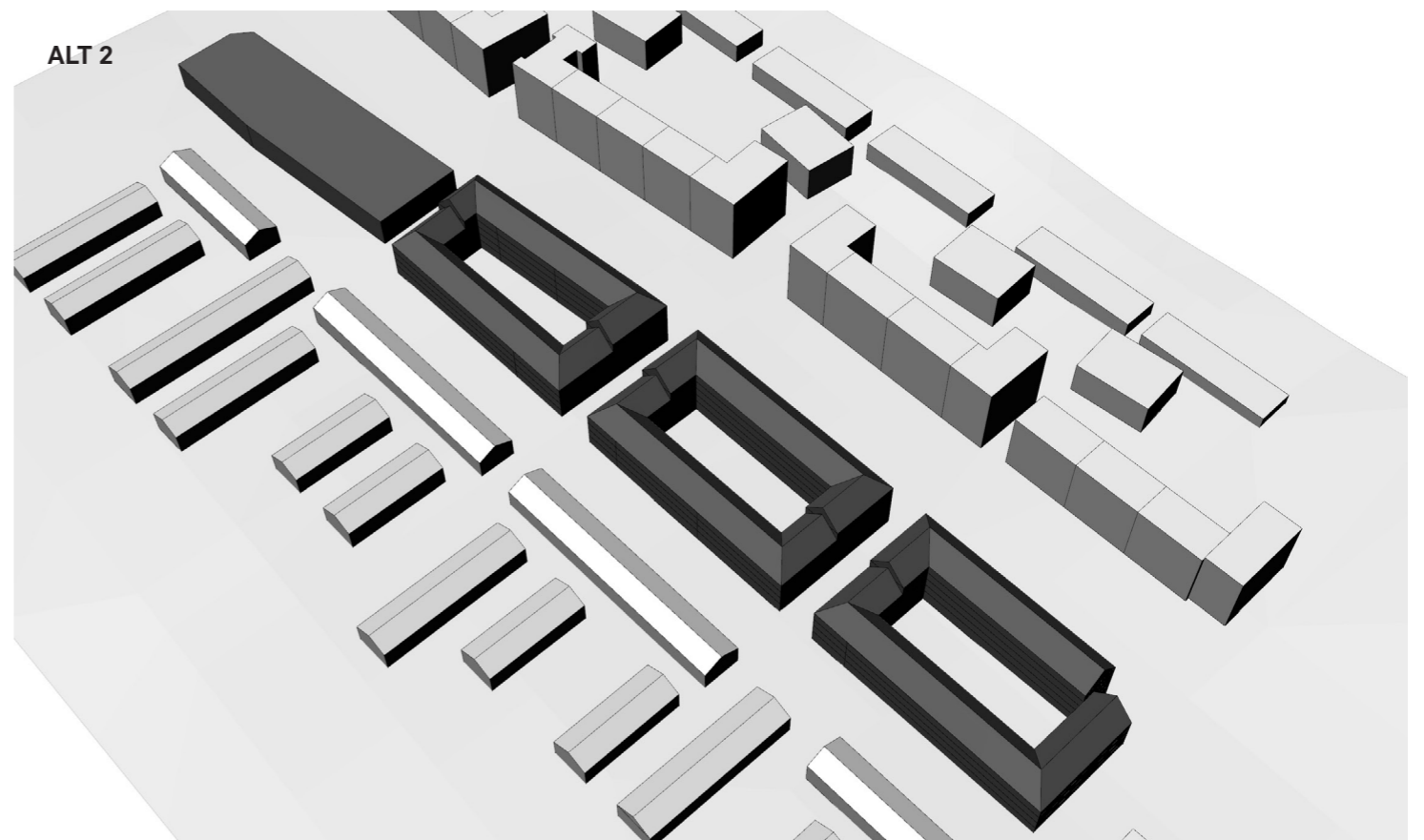
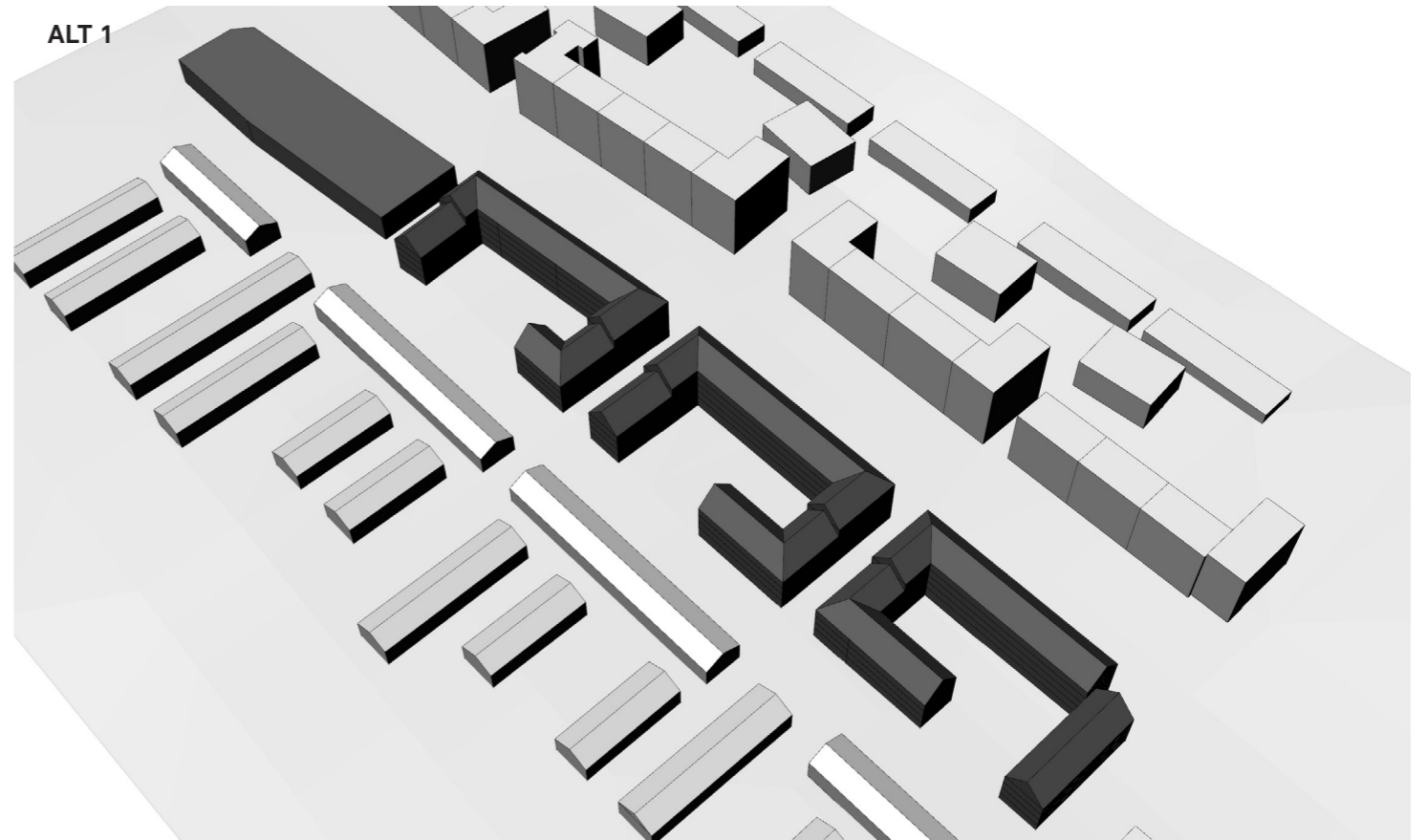
Limited daylight access. Compliance with BBR Daylight requirements is possible but attention to room depth, balcony size, material selection and window sizes and building materials is required.

0 - 10%

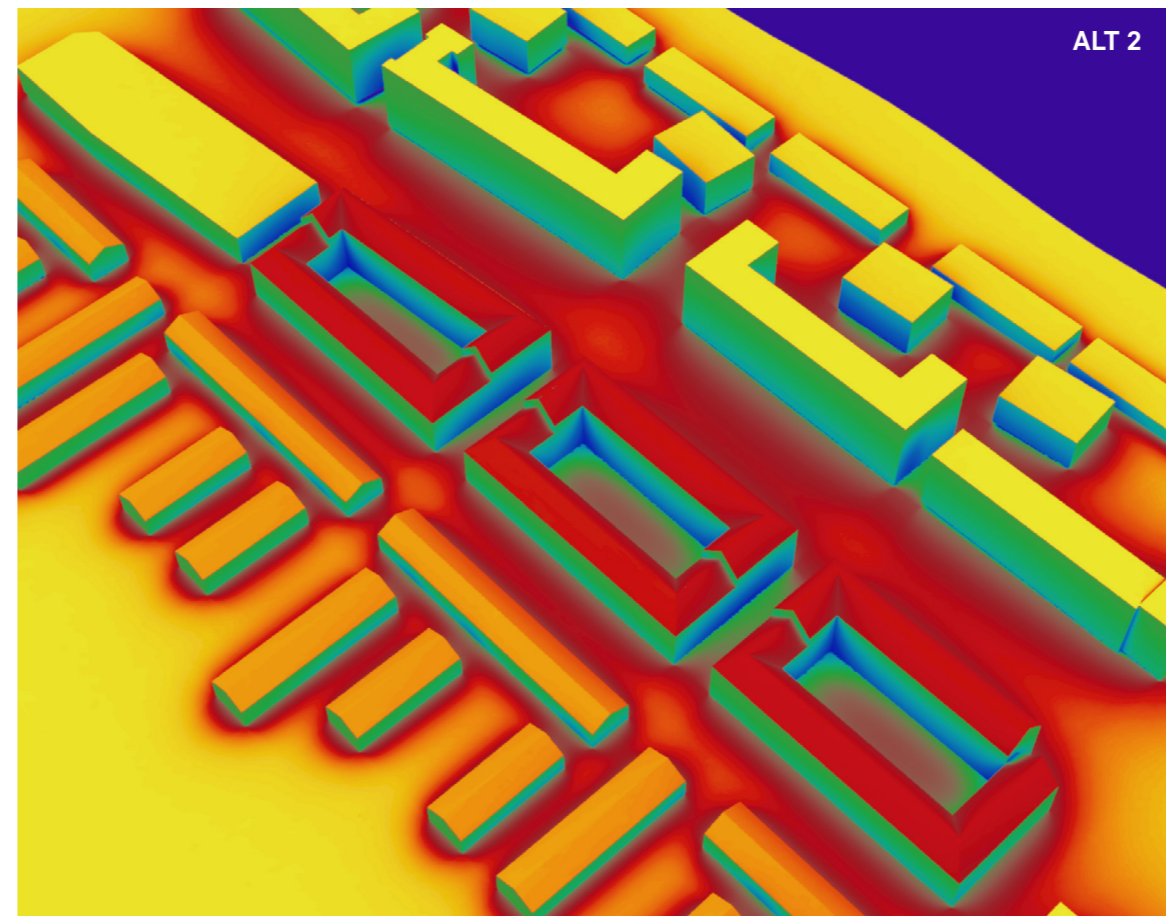
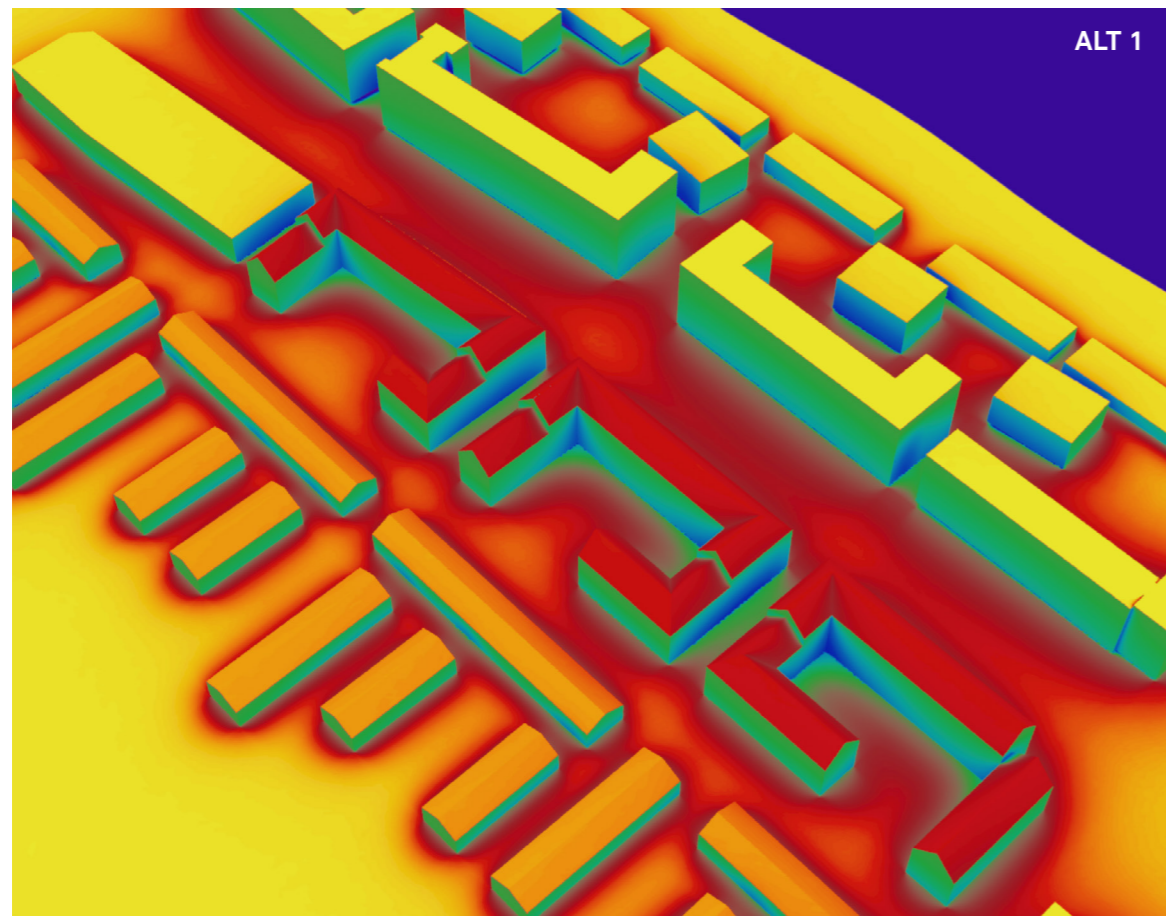
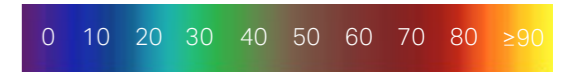
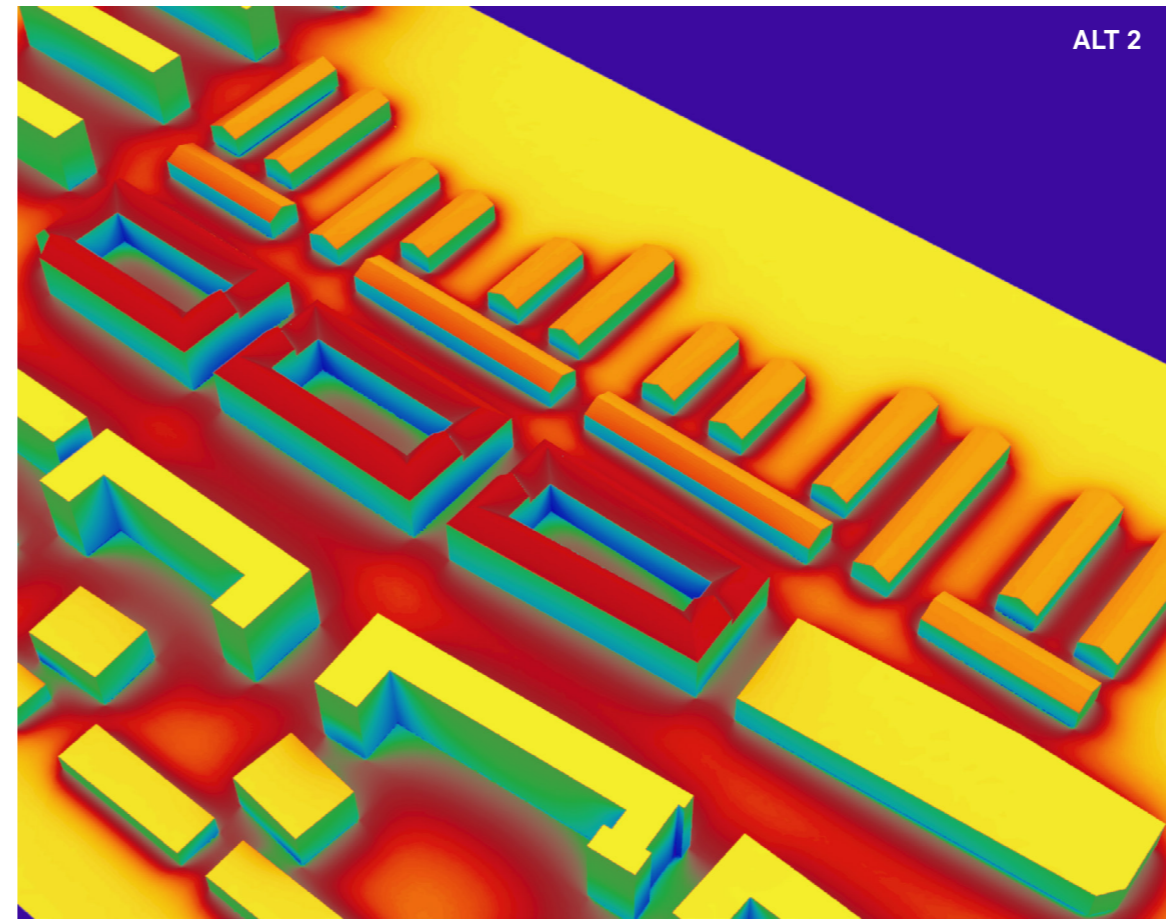
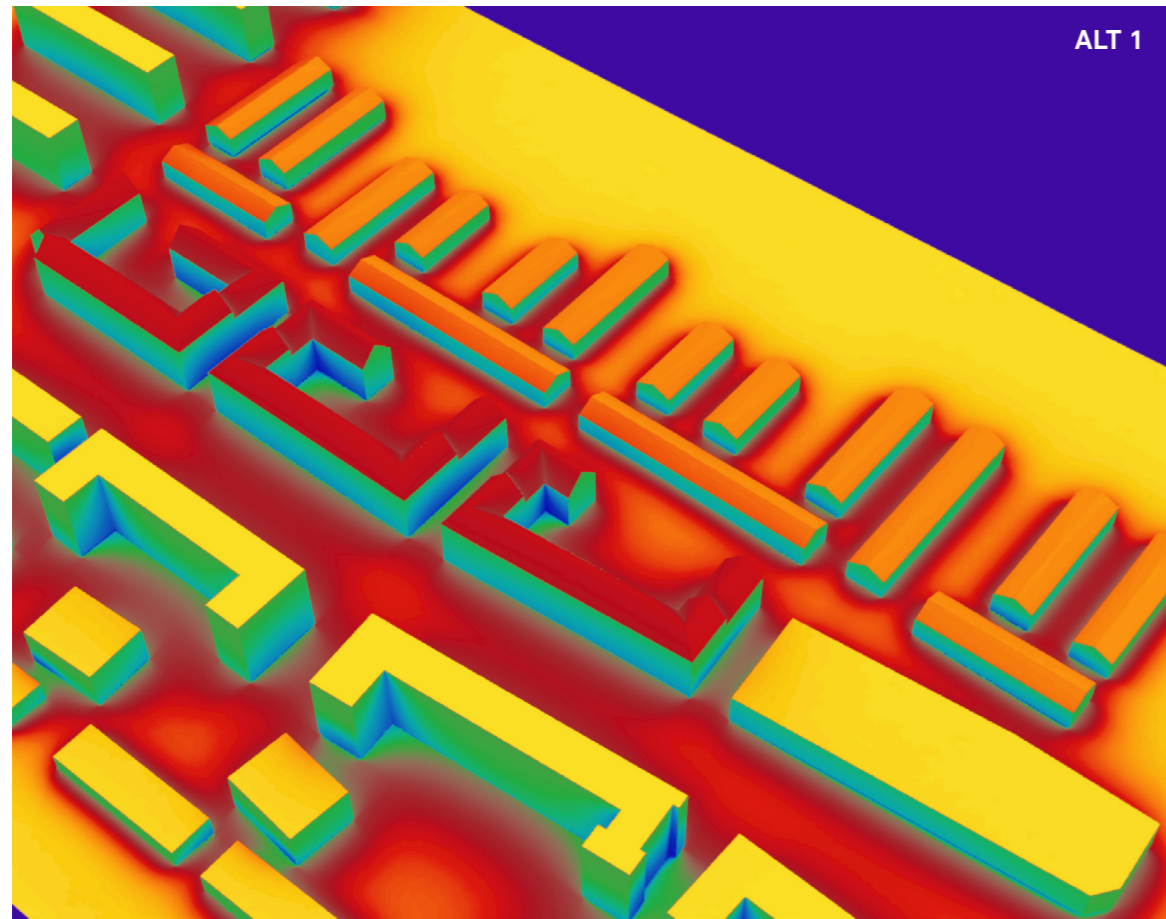
Dark. Compliance with BBR Daylight requirements is unlikely.

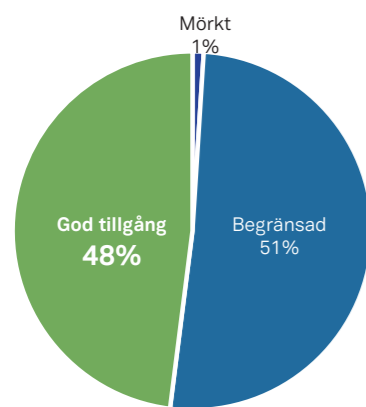
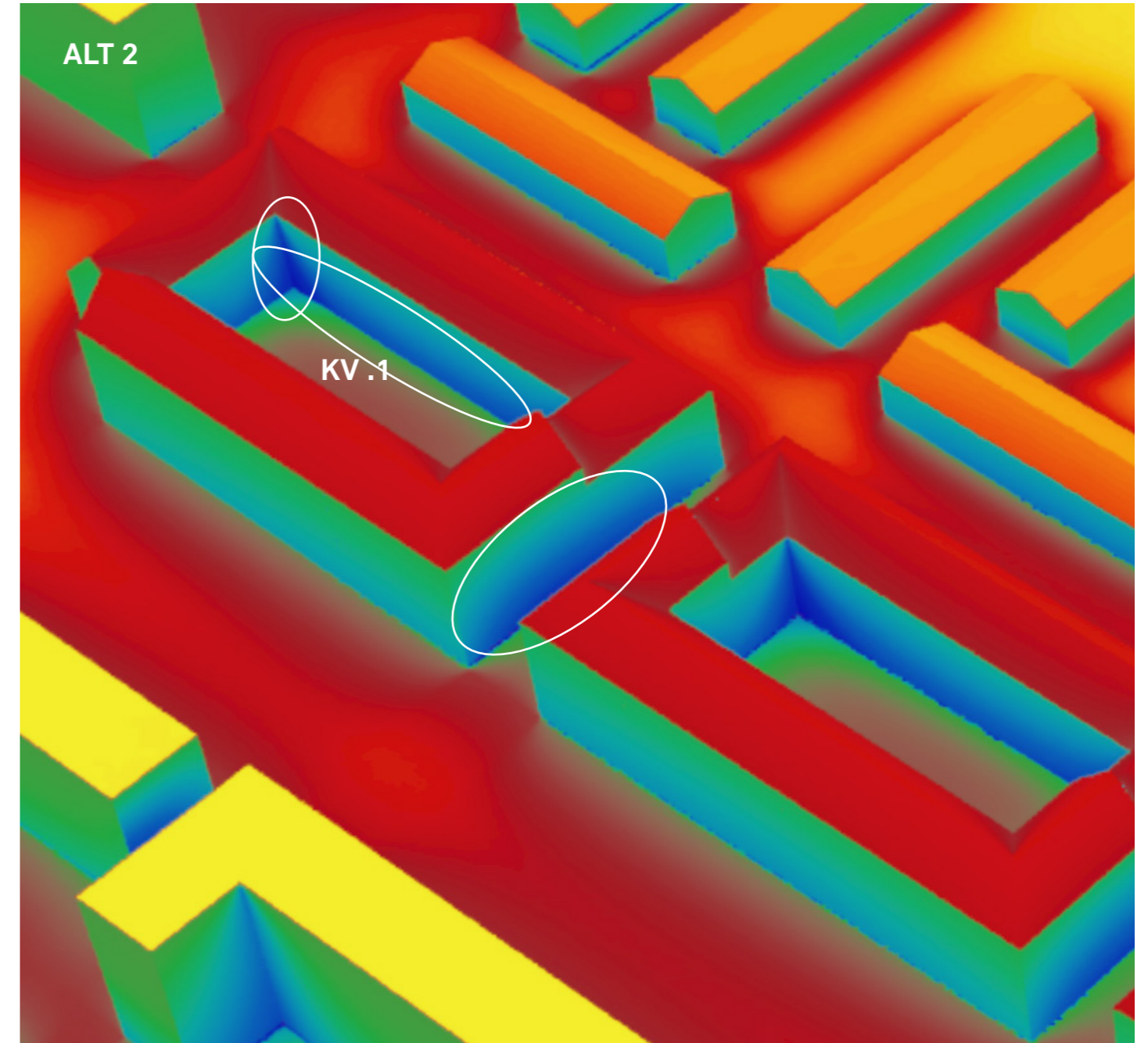
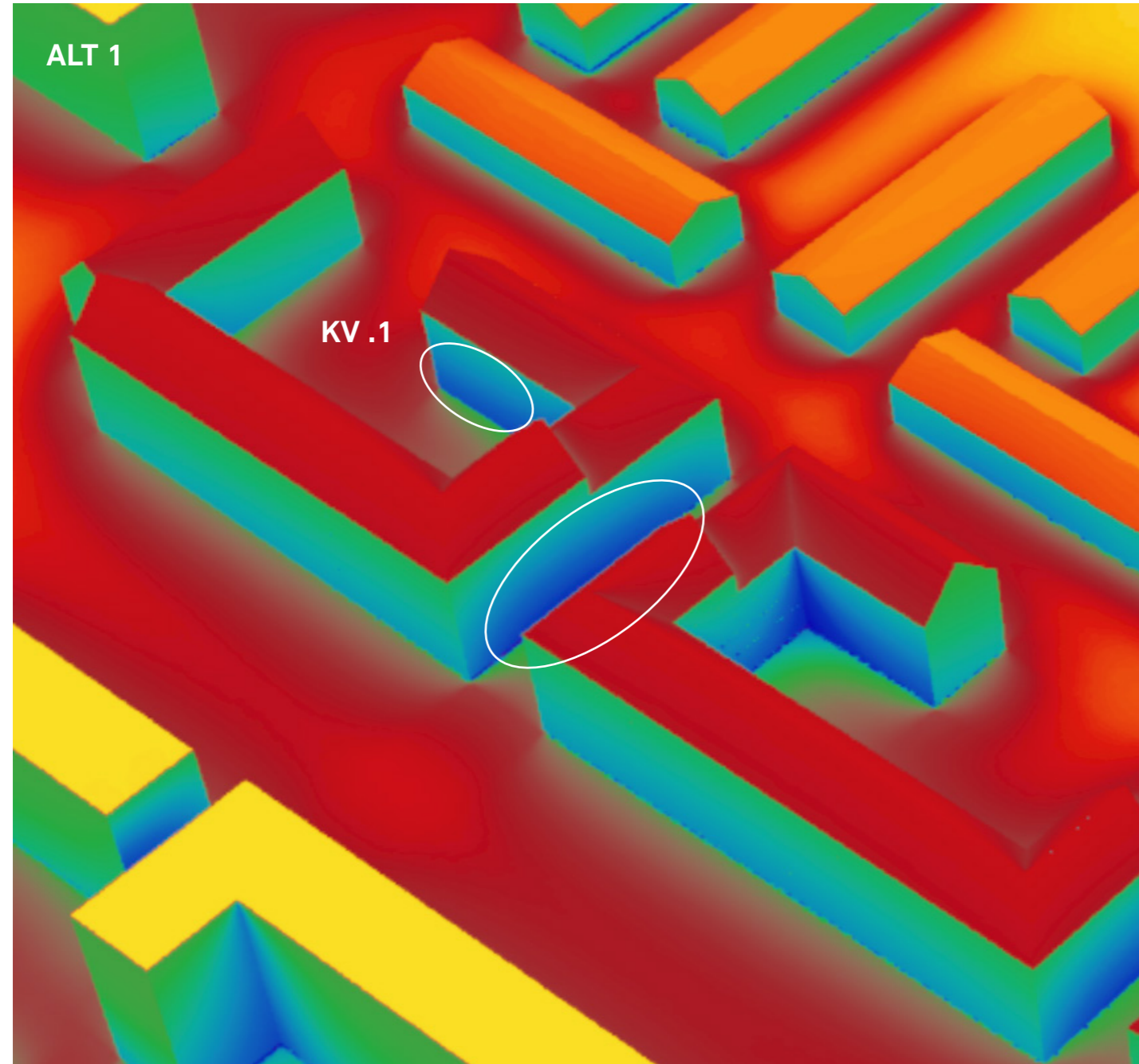
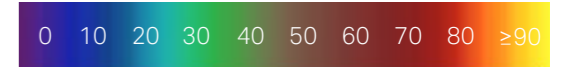
For direct sun access on courtyards a, specific periods of interest can easily be calculated for the time of year when people generally find themselves staying outside: March 21 to September 21. For this study the three periods of interest are defined as:

(A) Daytime	08:00 – 20:00
(B) Lunchtid	11:00 – 15:00
(C) 'Afterwork'	15:00 – 19:00



1. DAYLIGHT ACCESS

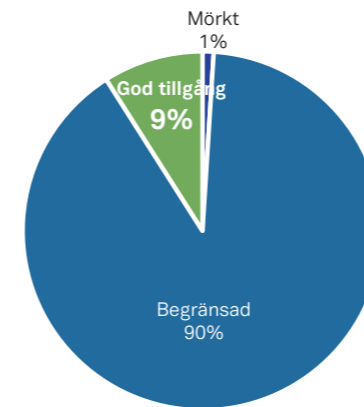




Daylight access (VSC) on the lowest habitable floor for internal courtyard

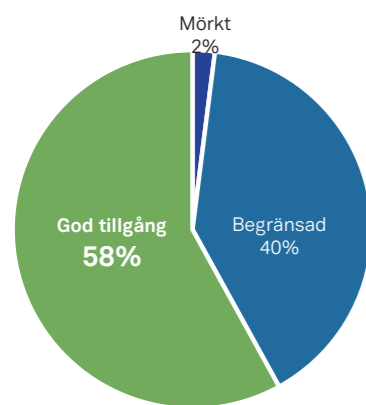
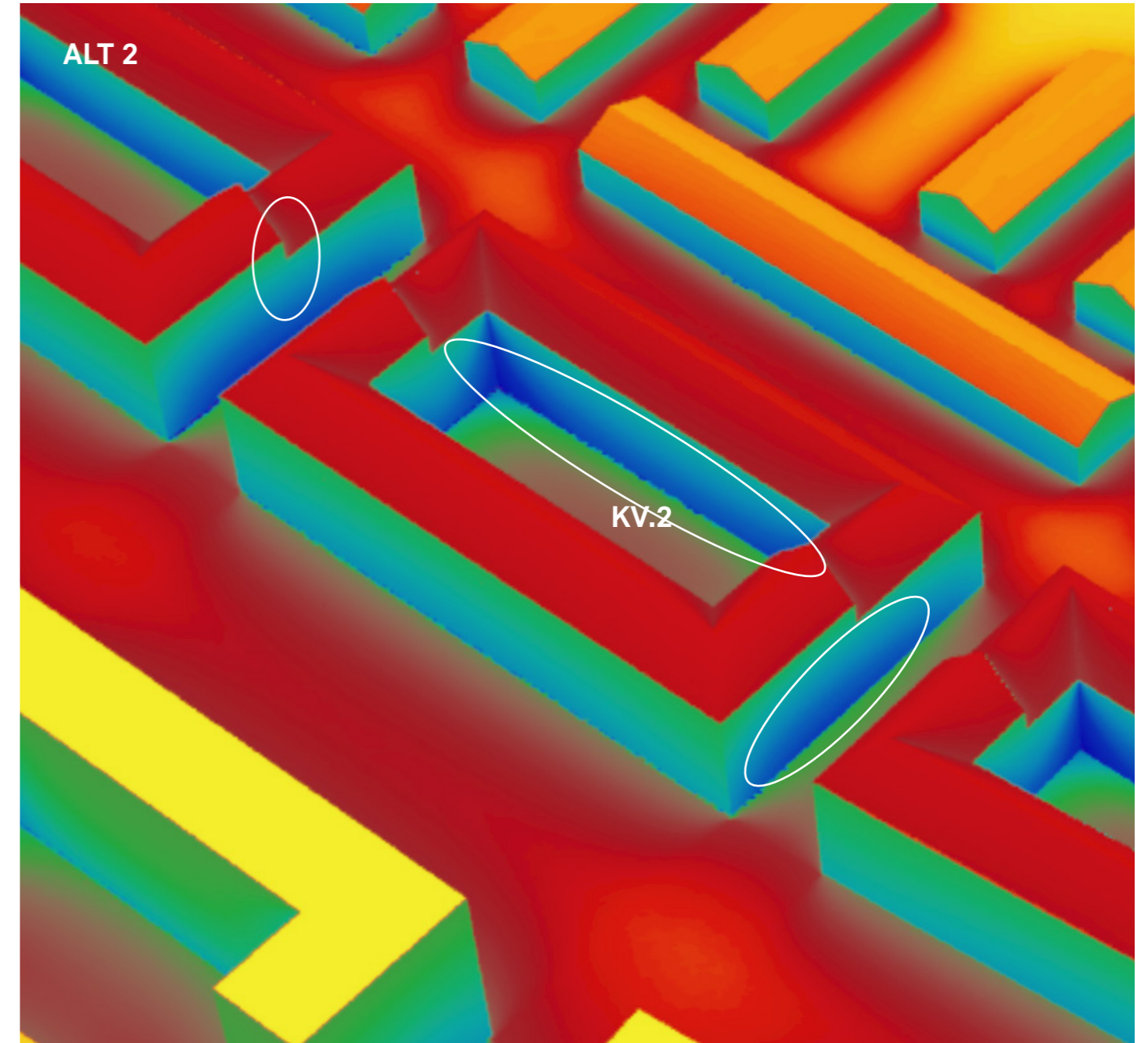
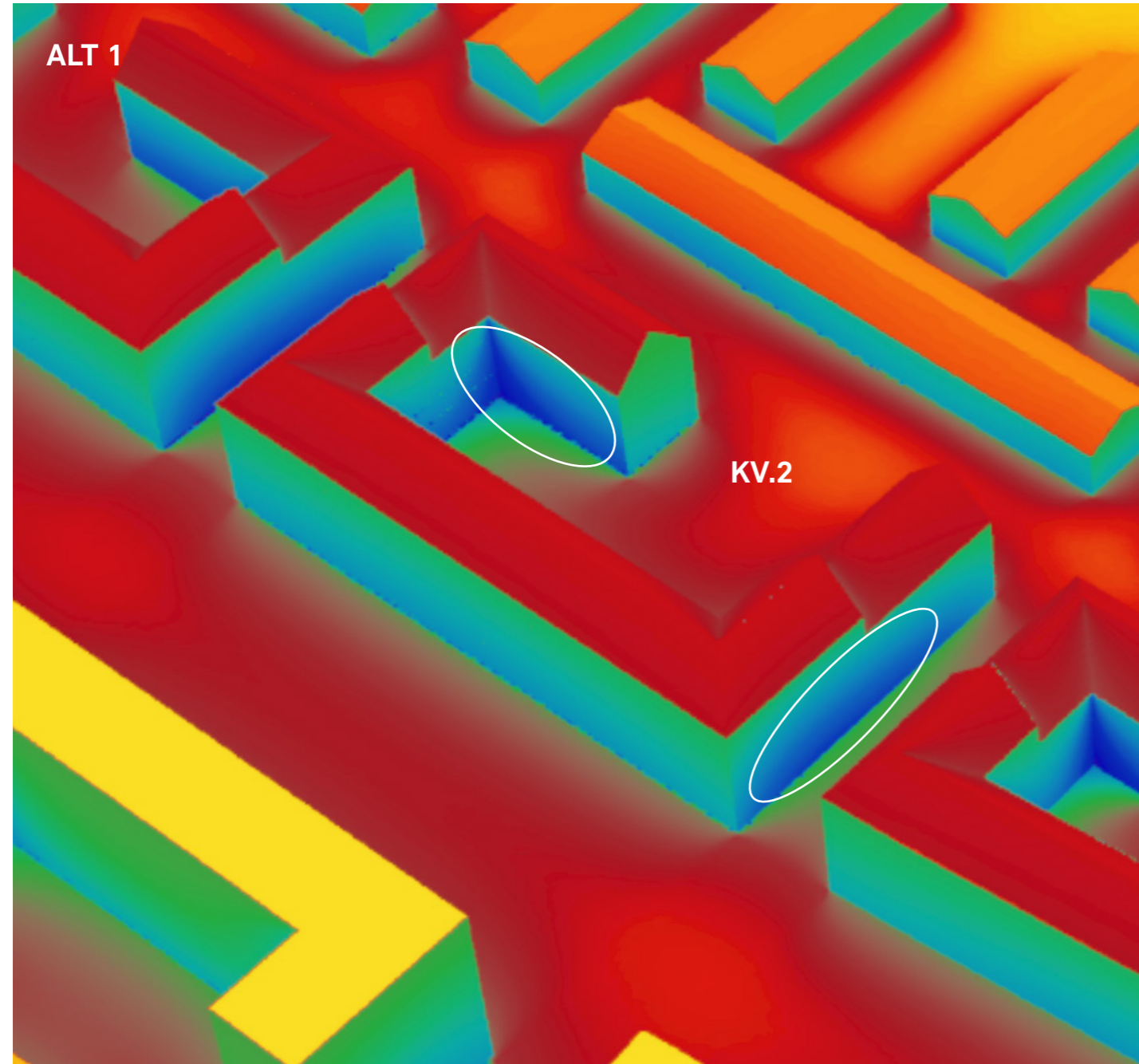
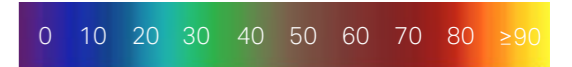
Kv 1 (Alt 1) generally has sufficient daylight access along the streetsides. The facade facing Kv 2 however is an exception to this with lower floors in this area having limited to poor daylight access (marked in white circle). Within the courtyards, a large portion of the bottom floor has limited daylight access meaning that some some failing rooms in these areas can be expected.

Areas marked in the above diagrams pose a challenge when meeting BBR 6:322. Particularly so for rooms deeper than 4m or with AF < 10%.



Daylight access (VSC) on the lowest habitable floor for internal courtyard

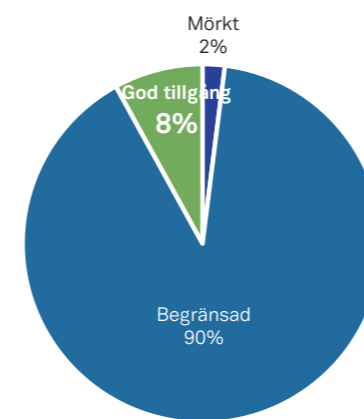
Along the streetsides, Alt 2 performance is similar to Alt 1 with facades facing Kv 2 having limited to poor daylight access. For Alt 2, the facades facing the interior courtyard have largely limited daylight access however, and this implies a significant number of additional failing rooms when compared to Alt 1.



Daylight access (VSC) on the lowest habitable floor for internal courtyard

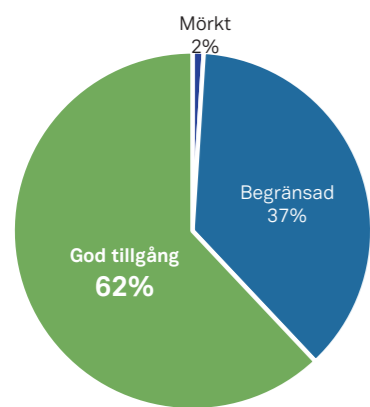
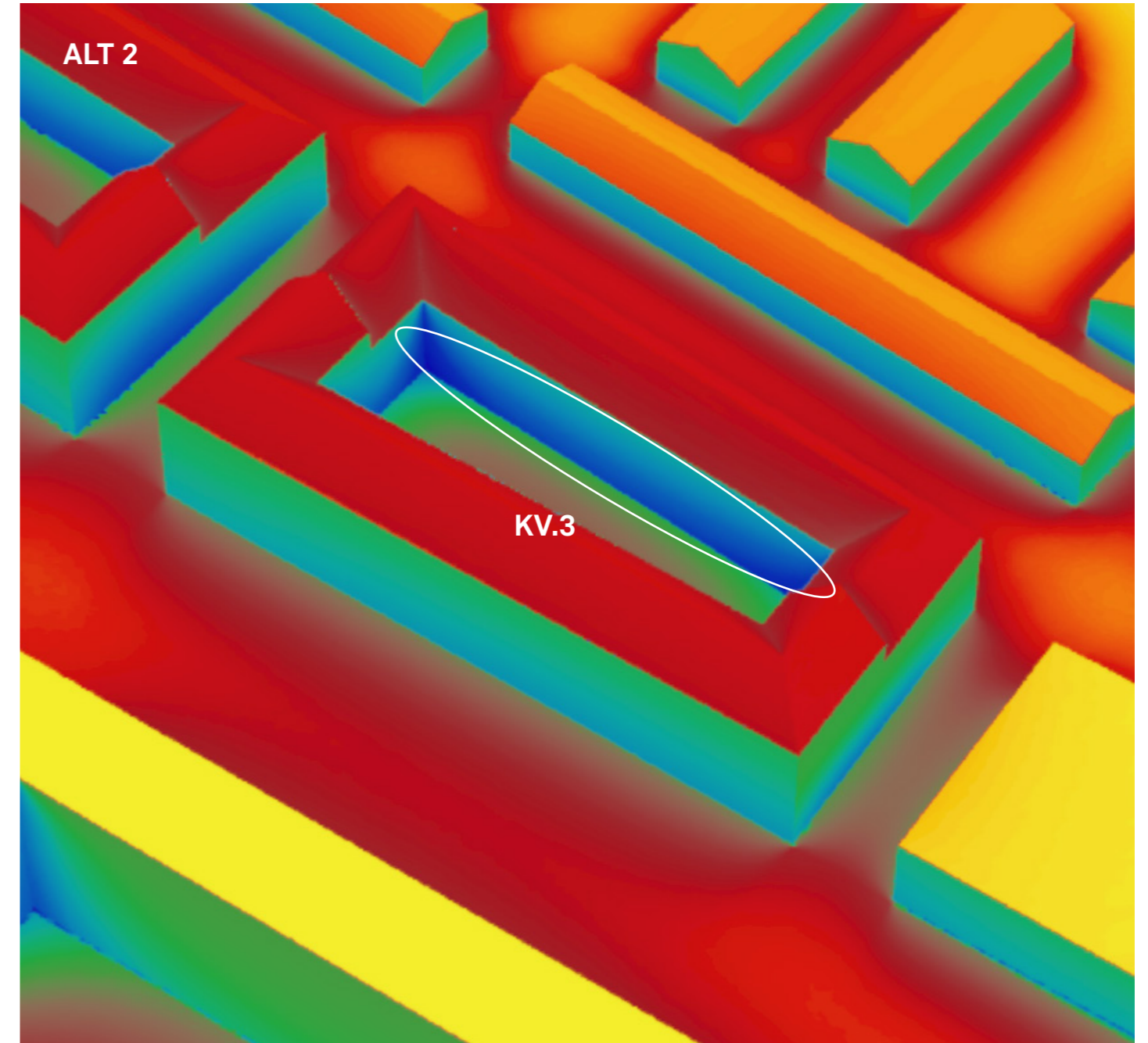
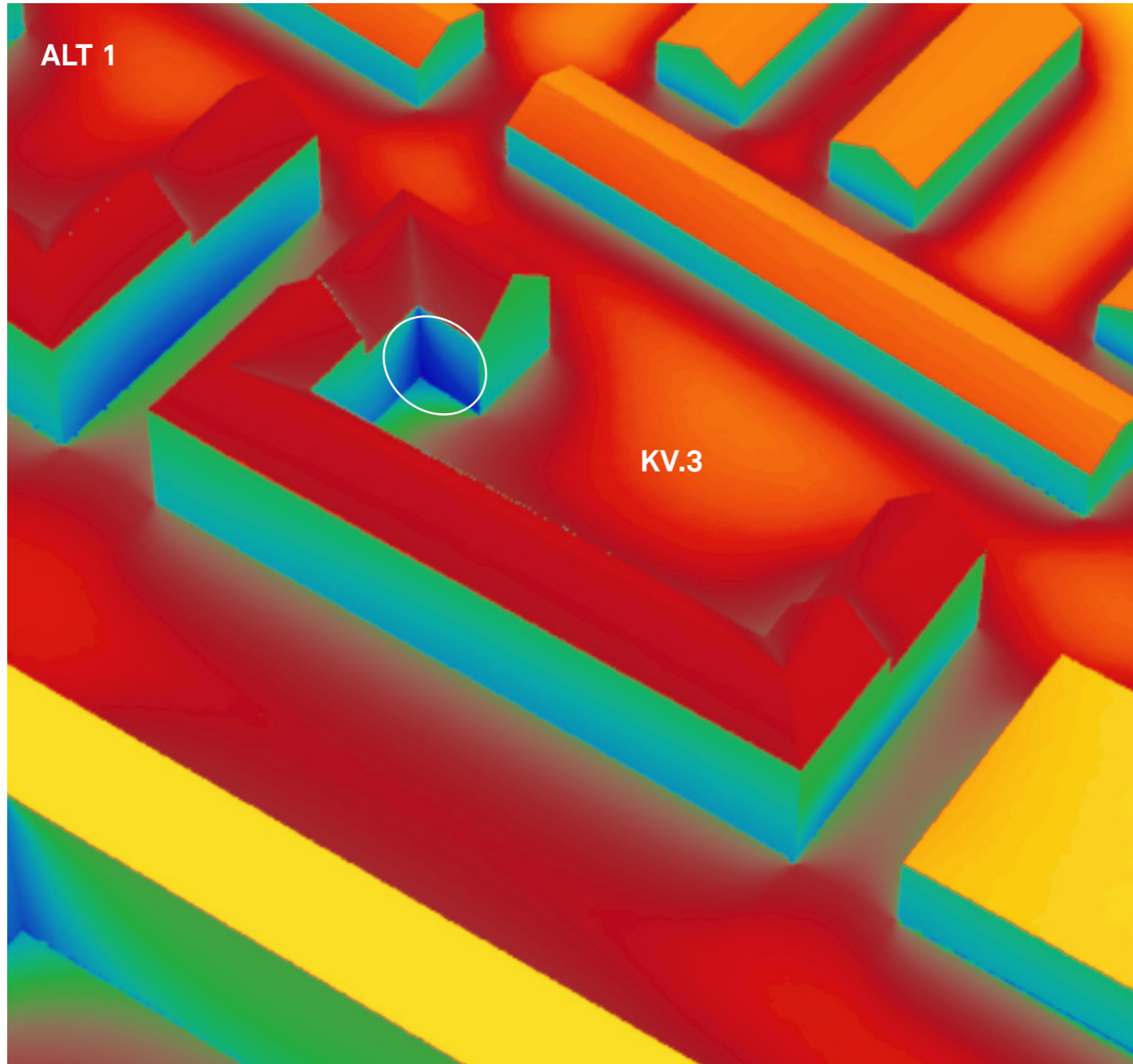
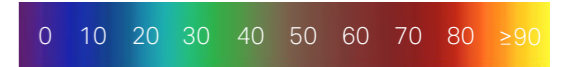
The daylight access of Kv. 2, Alt 1 is very good towards the streets, with the exception of the facade facing Kv 1 and Kv 3. The facades facing the interior courtyard have limited access to daylight in the corners and the south-facing facade marked in white circle. The lowest floor, being the one with the worst daylight access, has a good ratio of good daylight access.

Areas marked in the above diagrams pose a challenge when meeting BBR 6:322. Particularly so for rooms deeper than 4m or with AF < 10%.



Daylight access (VSC) on the lowest habitable floor for internal courtyard

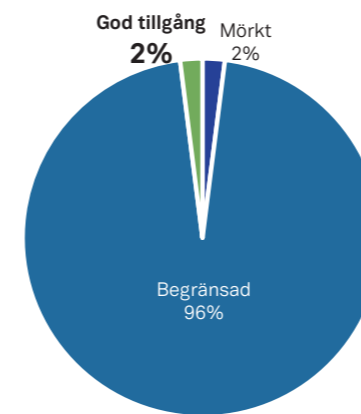
Along the streetsides, Alt 2 performance is similar to Alt 1 with facades facing Kv 1 and Kv 3 having limited to poor daylight access. For Alt 2, the facades facing the interior courtyard have largely limited daylight access however, and this implies a significant number of additional failing rooms when compared to Alt 1.



Daylight access (VSC) on the lowest habitable floor for internal courtyard

For Kv 3 (Alt 1), with the exception of the facade facing Kv. 2, daylight access is very good towards the streets. Some areas of the facades in the interior courtyard have limited access to daylight (along south-facing facade and in the corners). Generally speaking however, the lowest floor has a good daylight access. The courtyard open enough to give relatively good conditions for compliance.

Areas marked in the above diagrams pose a challenge when meeting BBR 6:322. Particularly so for rooms deeper than 4m or with AF < 10%.

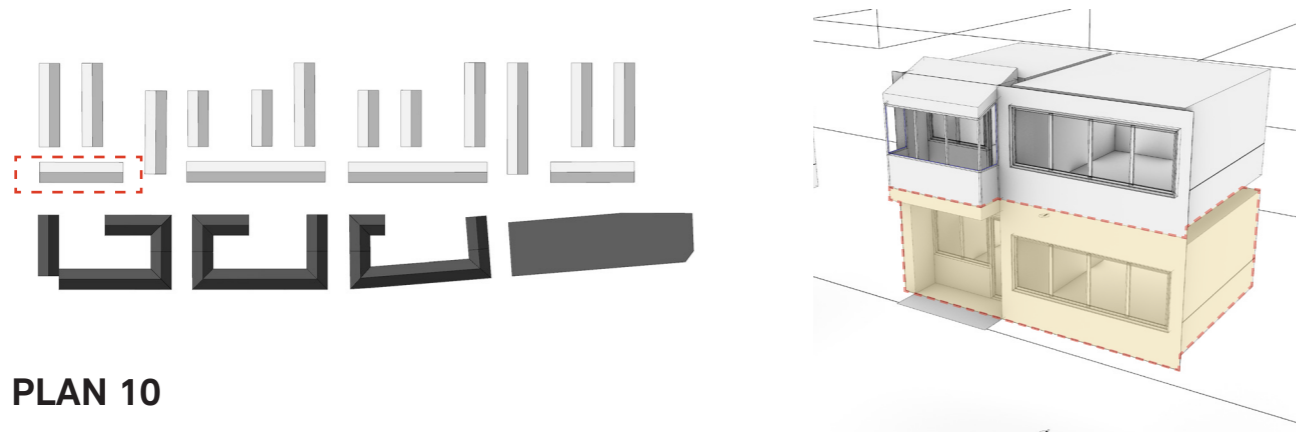


Daylight access (VSC) on the lowest habitable floor for internal courtyard

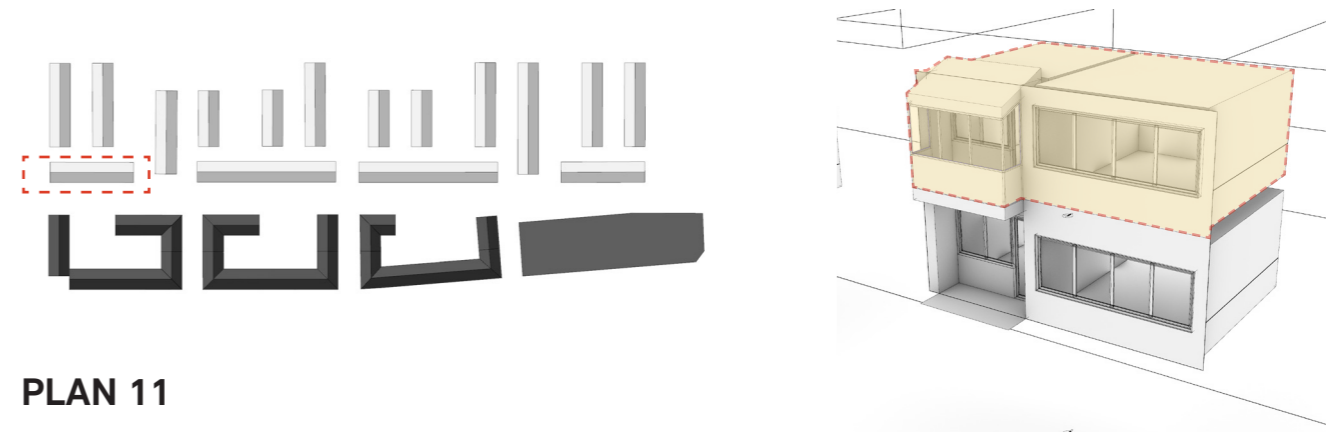
Along the streetsides, Alt 2 performance is similar to Alt 1 with facades facing Kv 2 having limited to poor daylight access. For Alt 2, the facades facing the interior courtyard have largely limited daylight access however, and this implies a significant number of additional failing rooms when compared to Alt 1.

1. DAYLIGHT FACTOR SIMULATION - EXISTING BUILDINGS

BUILDING 1

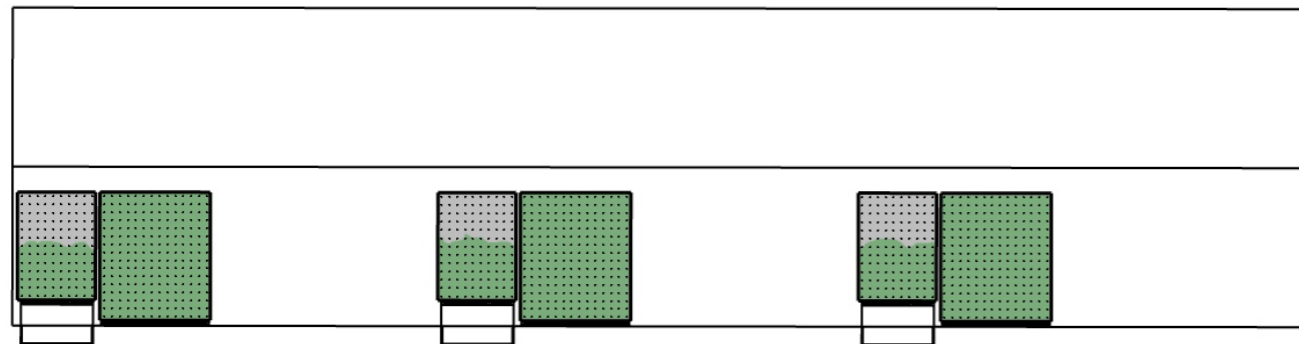


PLAN 10

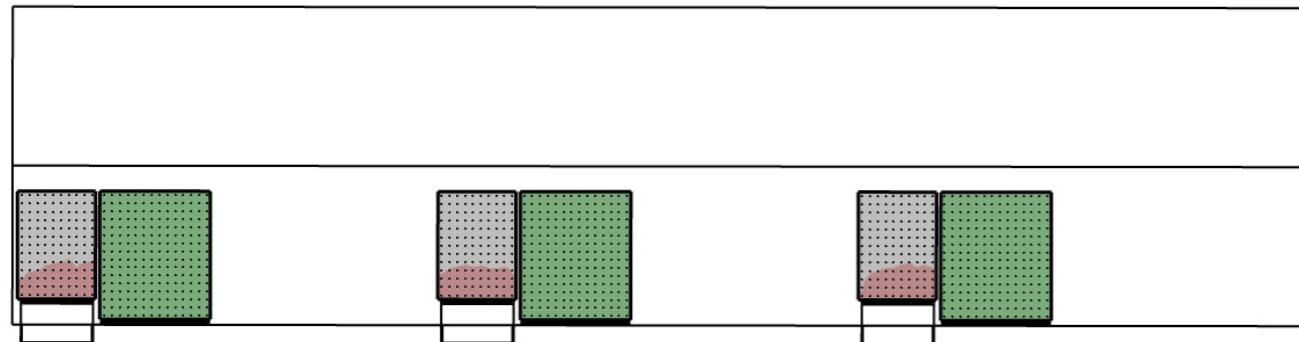


PLAN 11

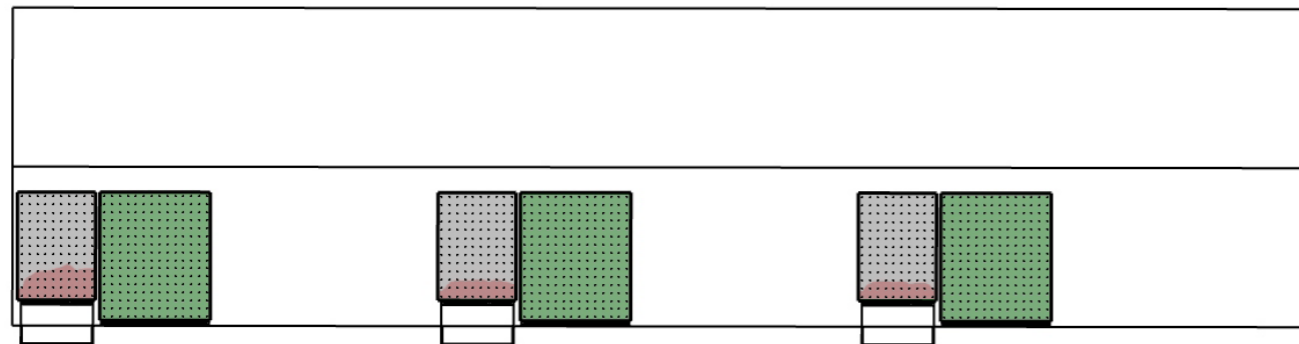
EXISTING



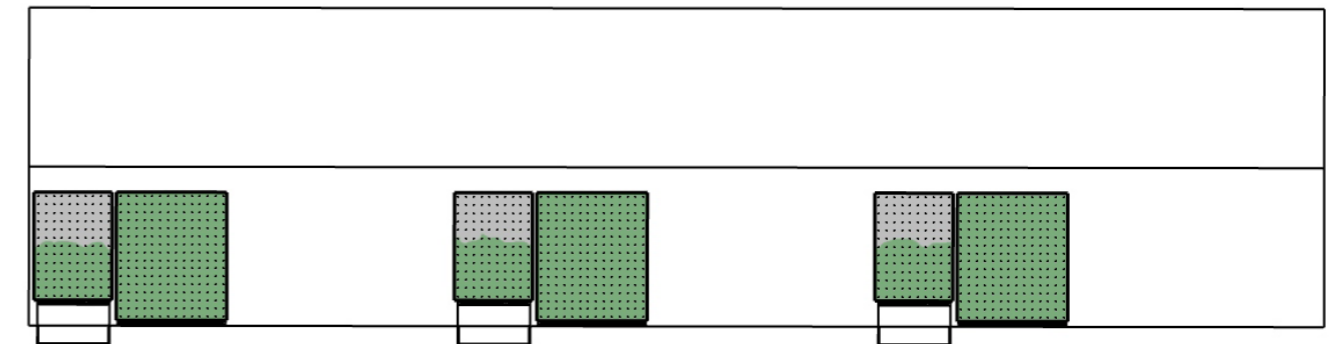
ALTERNATIVE 1



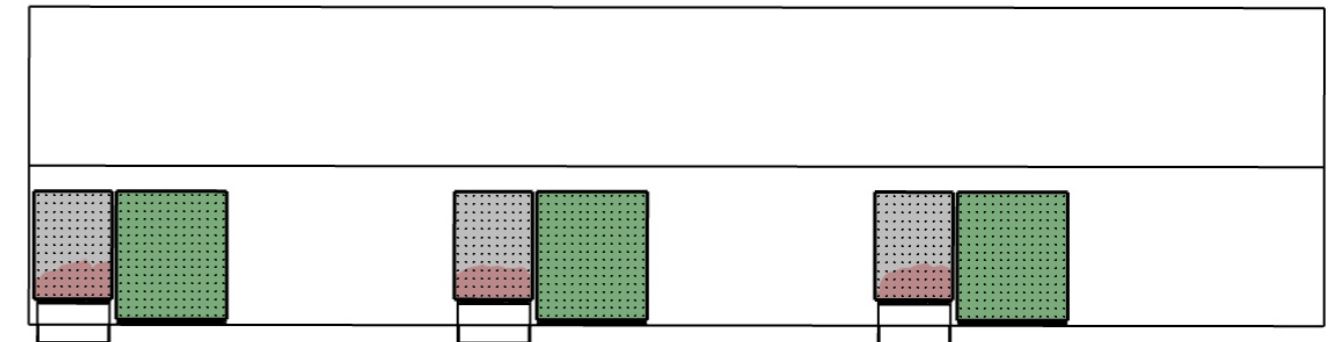
ALTERNATIVE 2



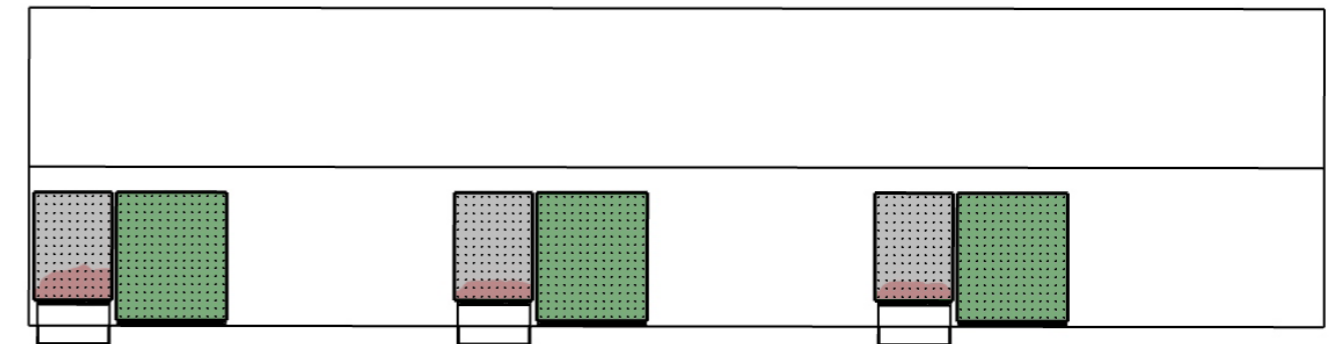
EXISTING



ALTERNATIVE 1

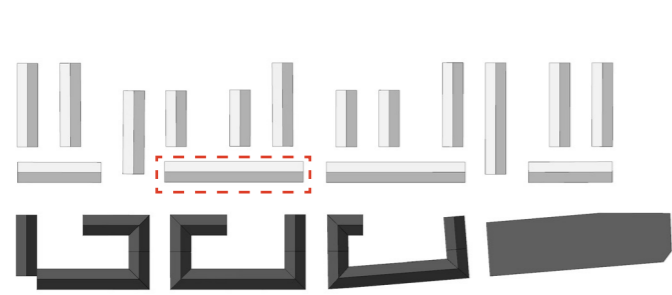


ALTERNATIVE 2

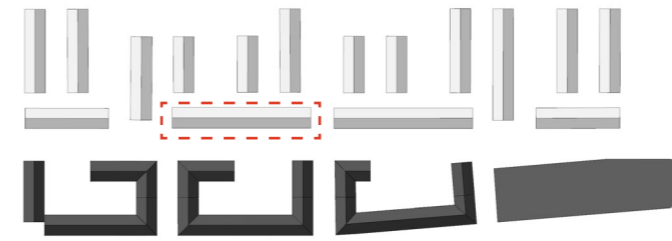
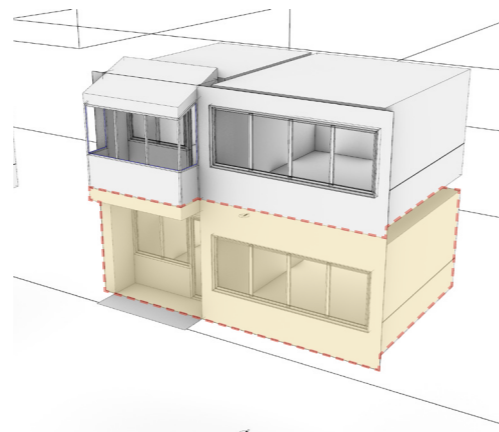


1. DAYLIGHT FACTOR SIMULATION - EXISTING BUILDINGS

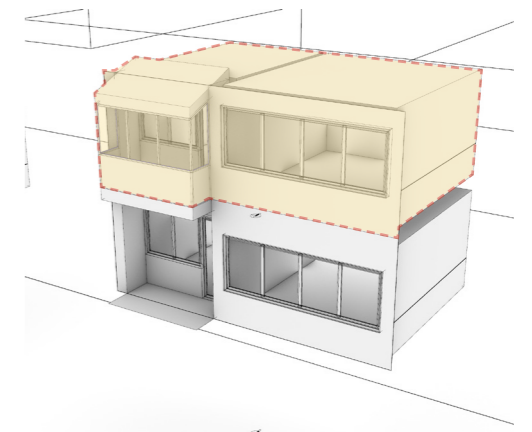
BUILDING 2



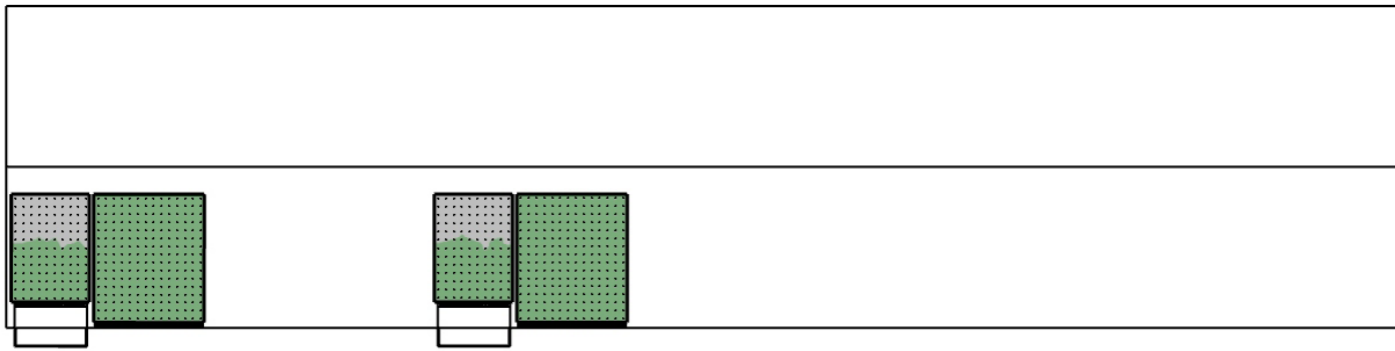
PLAN 10



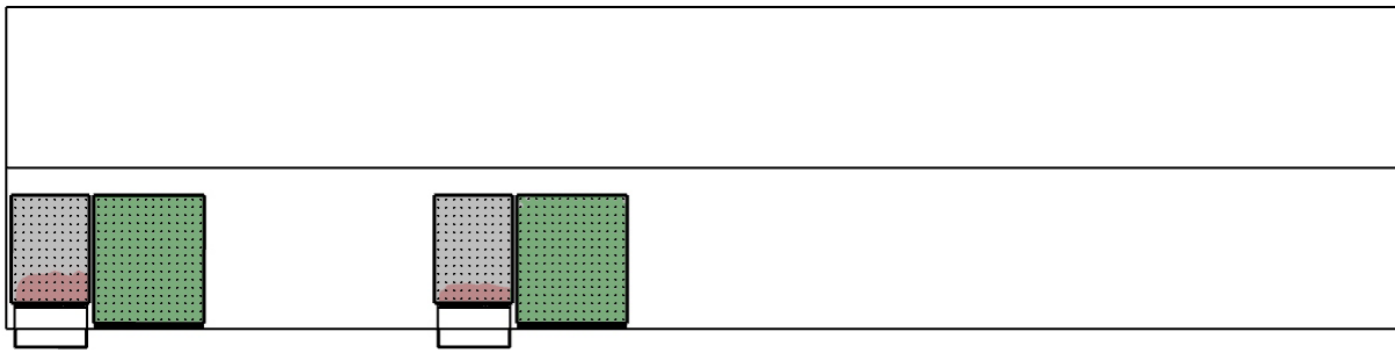
PLAN 11



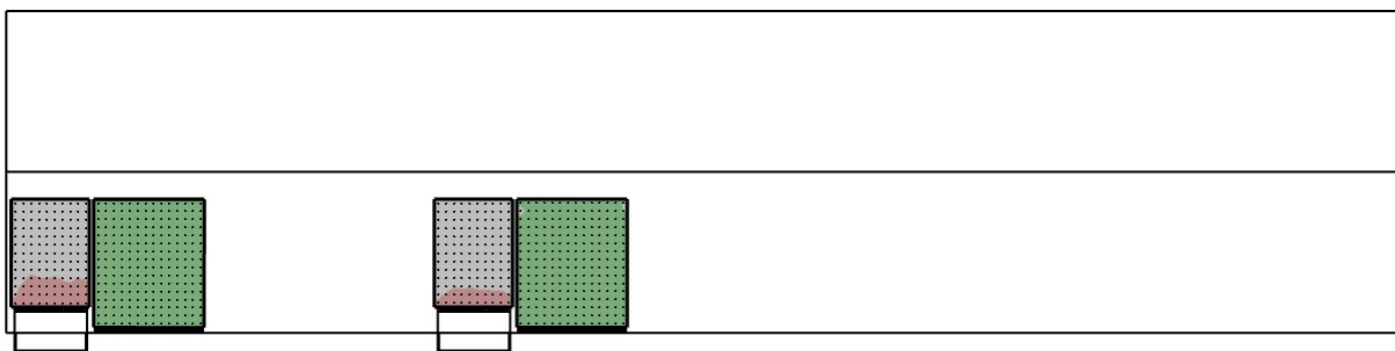
EXISTING



ALTERNATIVE 1

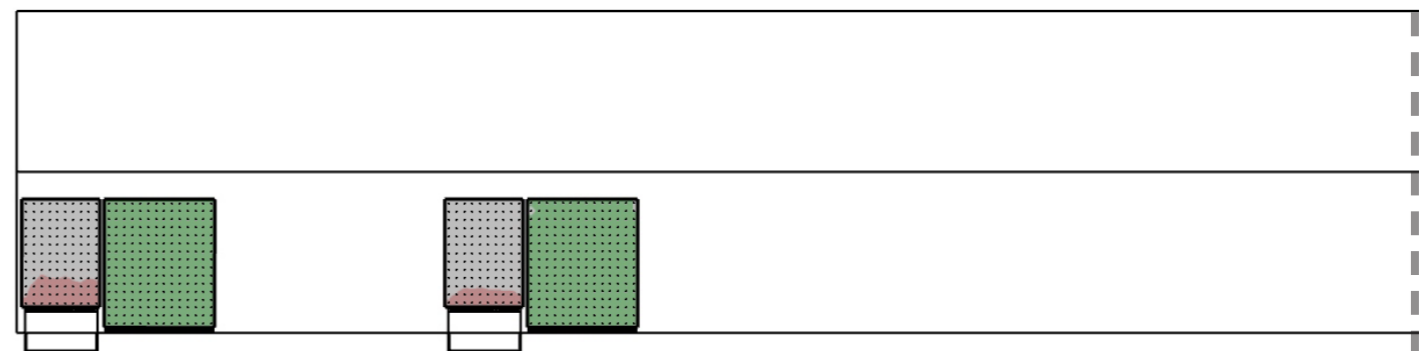
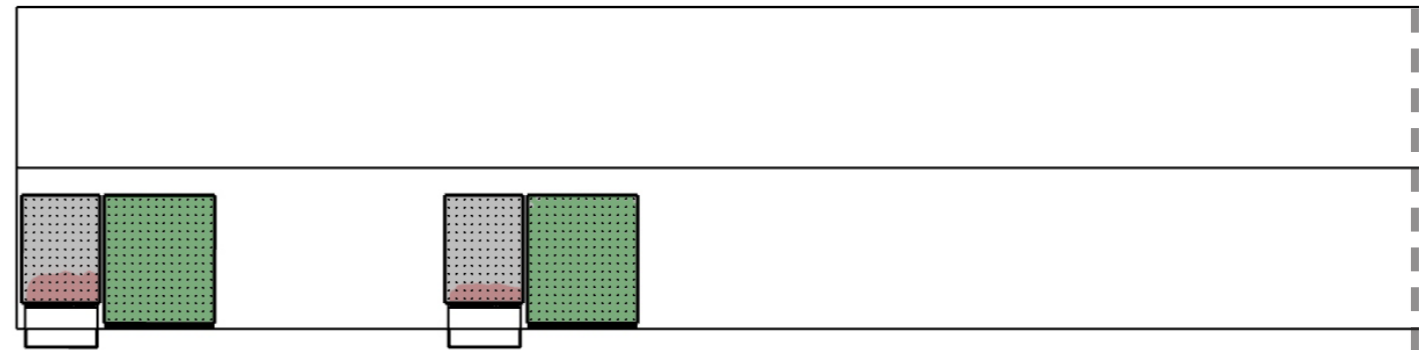
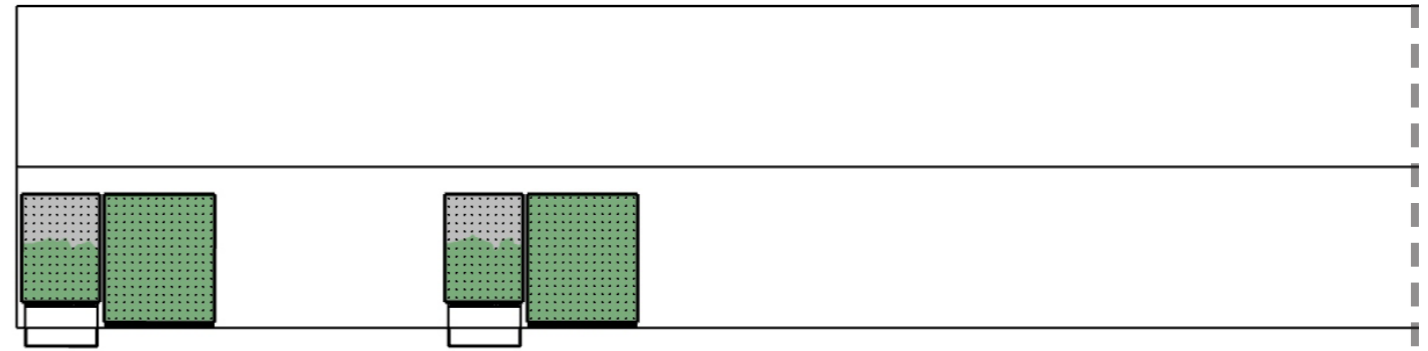


ALTERNATIVE 2



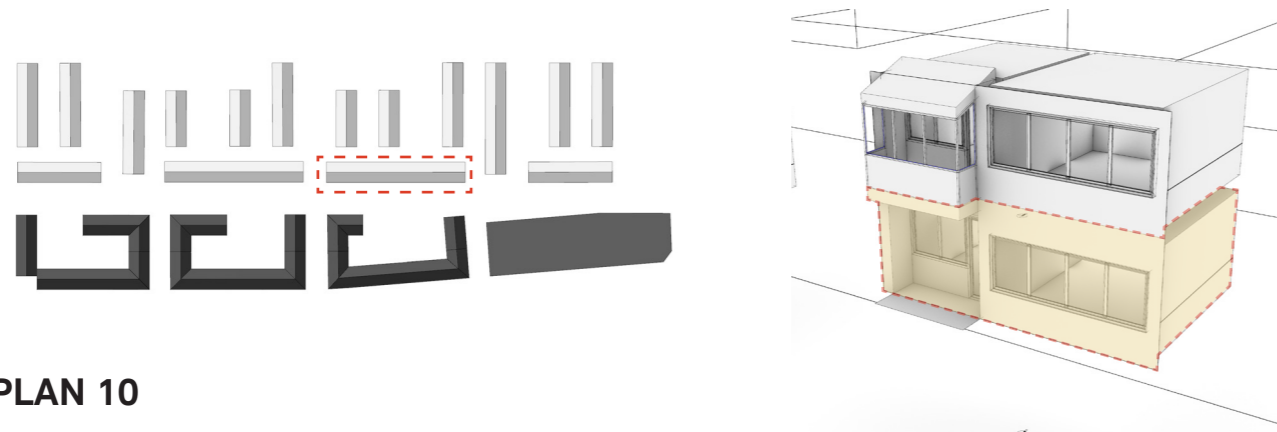
FAIL

PASS

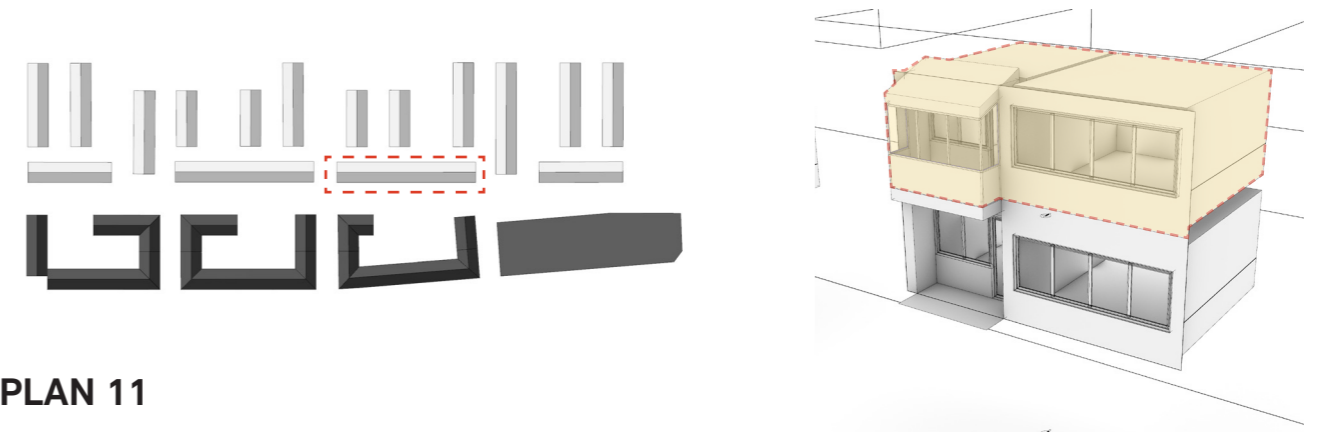


1. DAYLIGHT FACTOR SIMULATION - EXISTING BUILDINGS

BUILDING 3

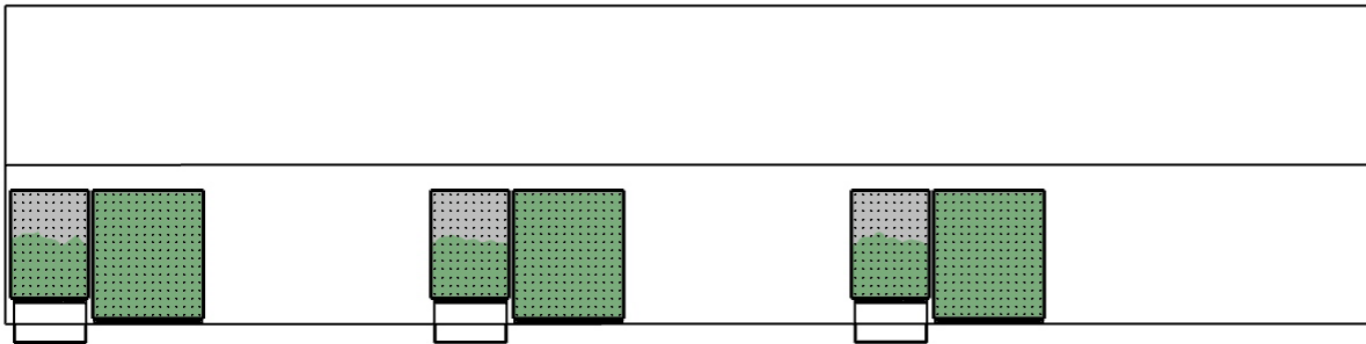


PLAN 10

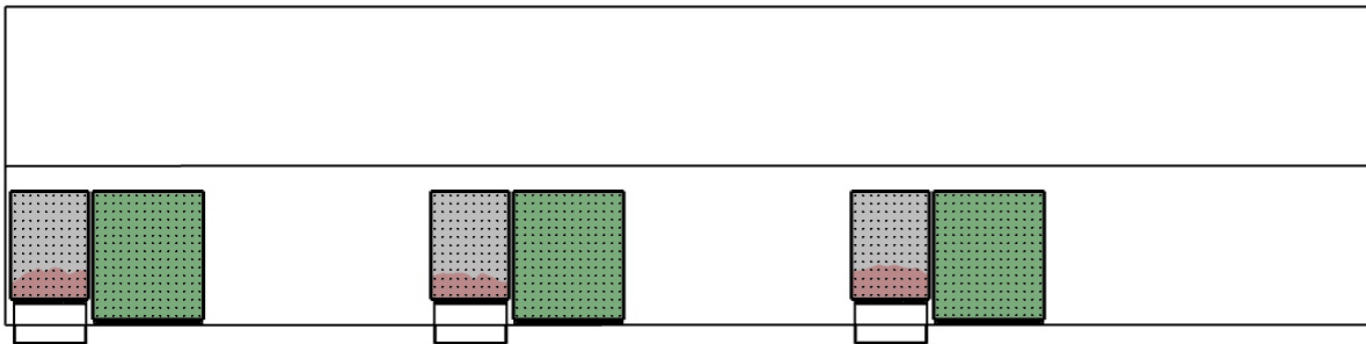


PLAN 11

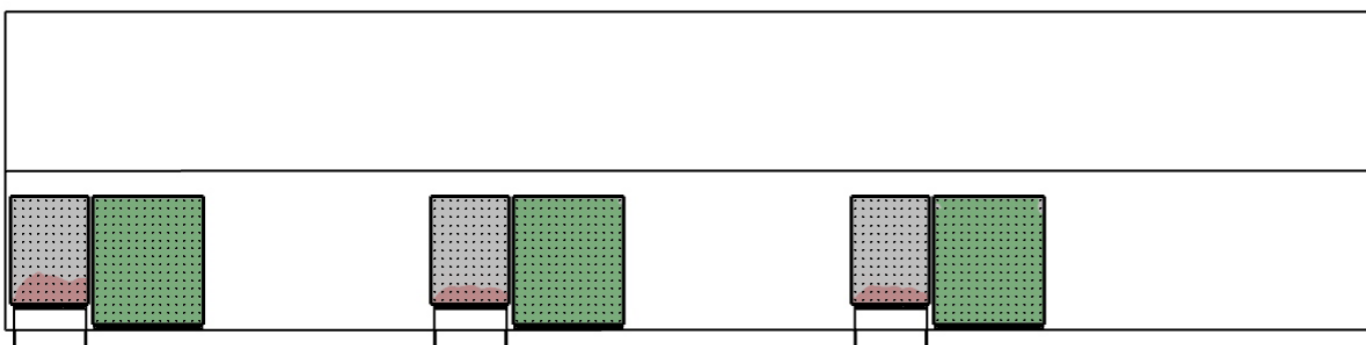
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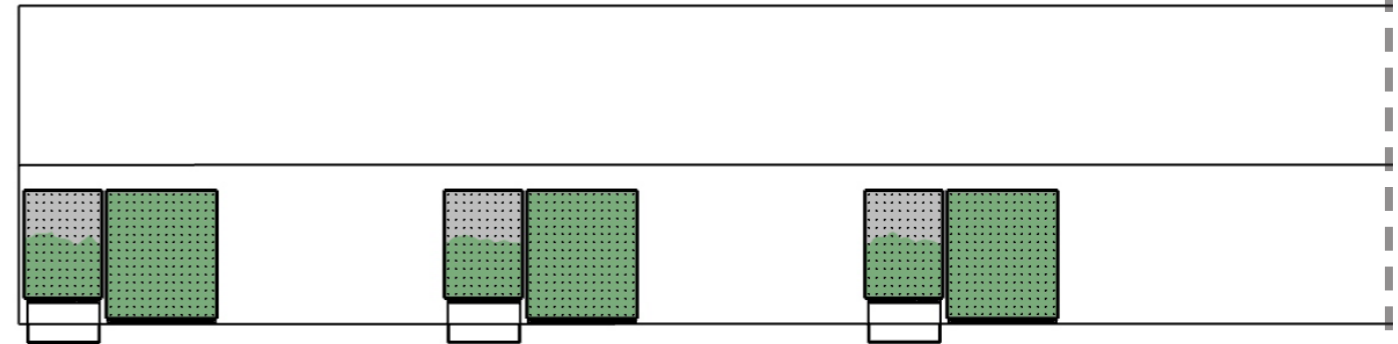
ALTERNATIVE 1



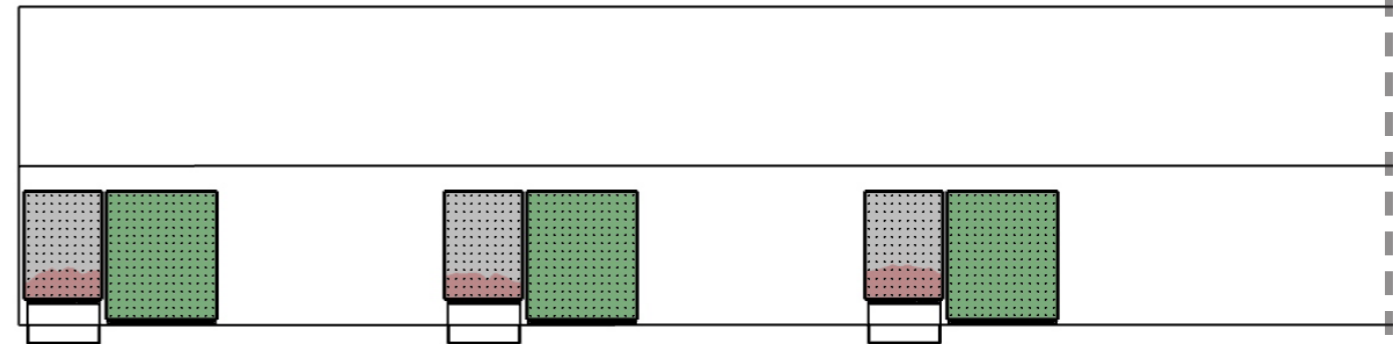
ALTERNATIVE 2



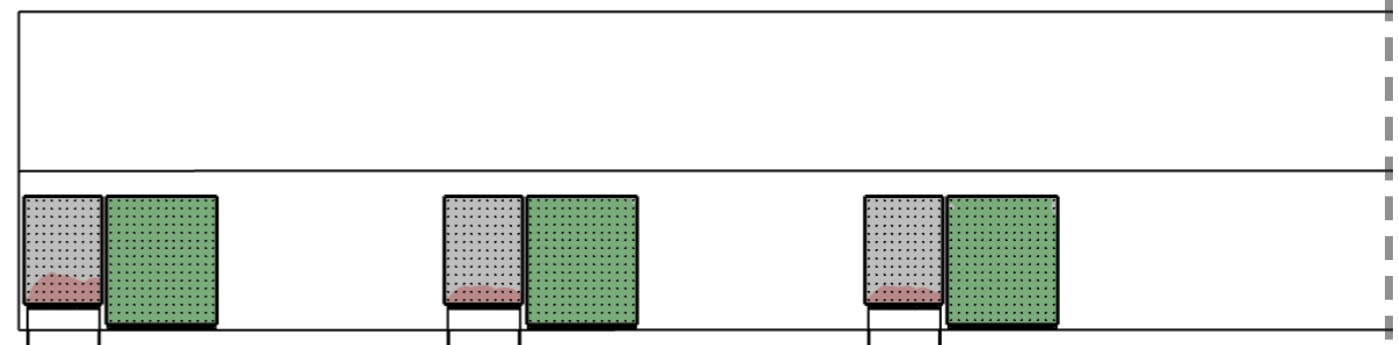
EXISTING



ALTERNATIVE 1

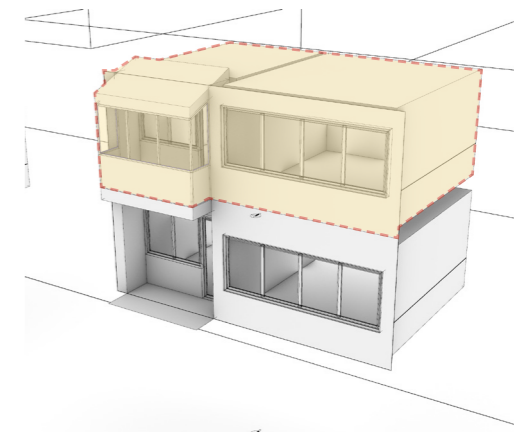
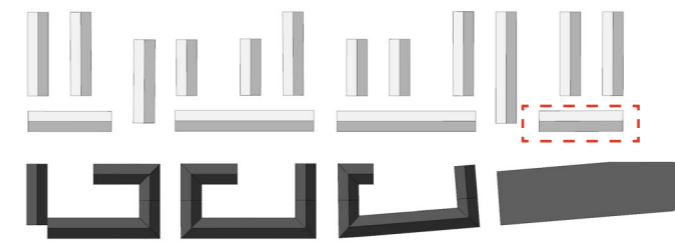
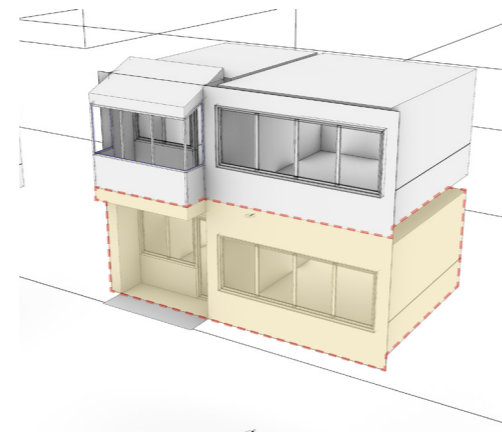
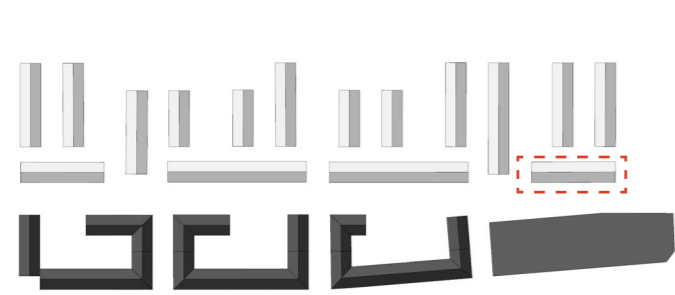


ALTERNATIVE 2



1. DAYLIGHT FACTOR SIMULATION - EXISTING BUILDINGS

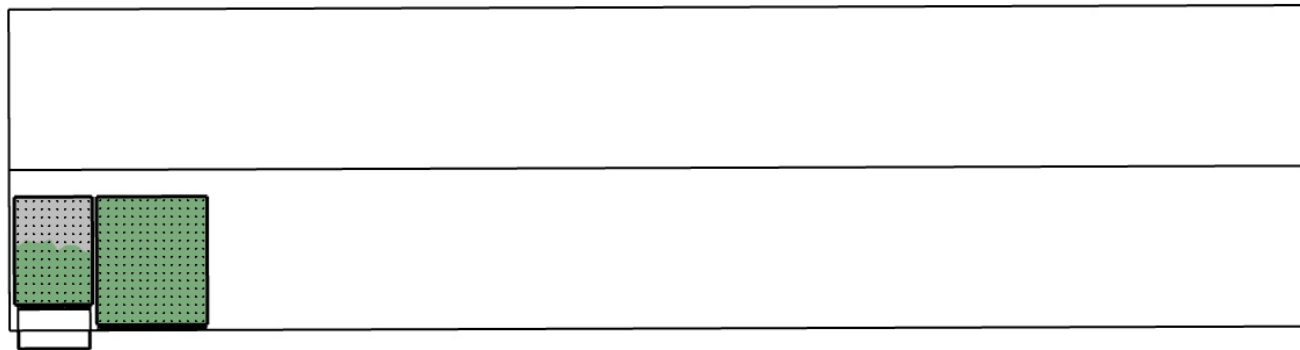
BUILDING 4



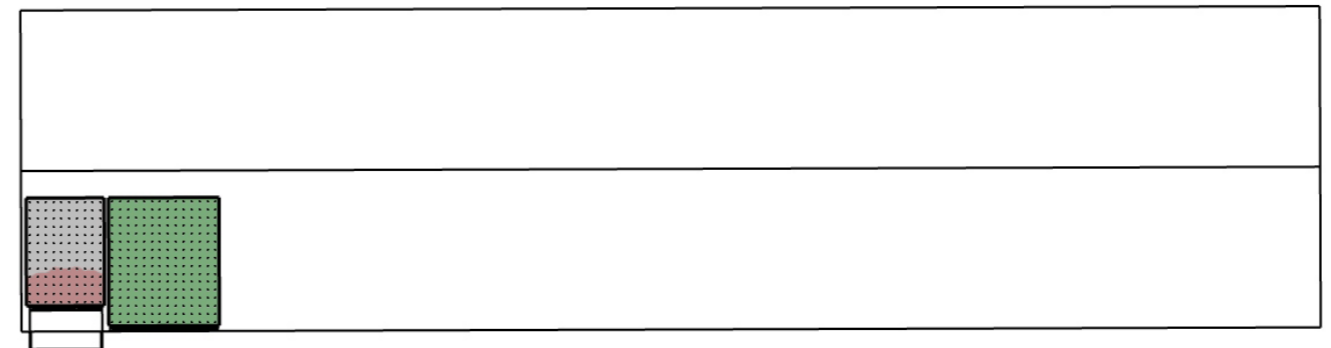
PLAN 10

PLAN 11

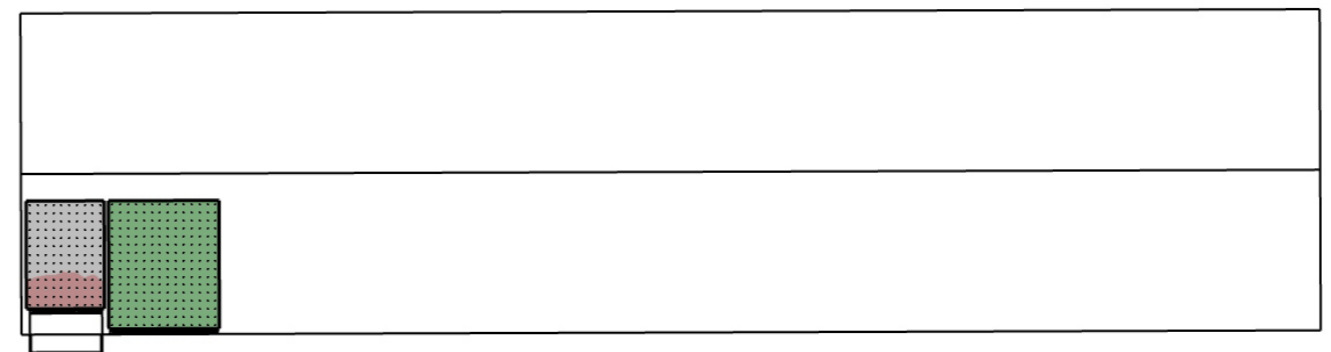
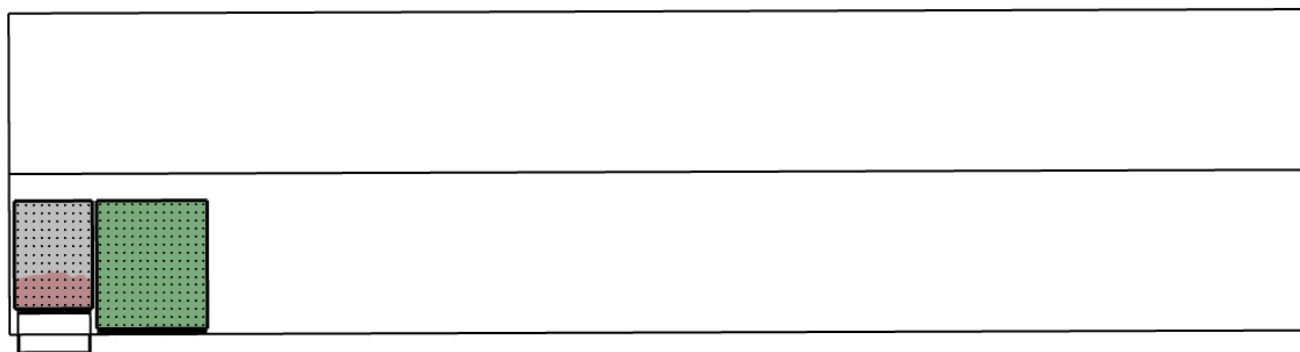
EXISTING



ALTERNATIVE 1



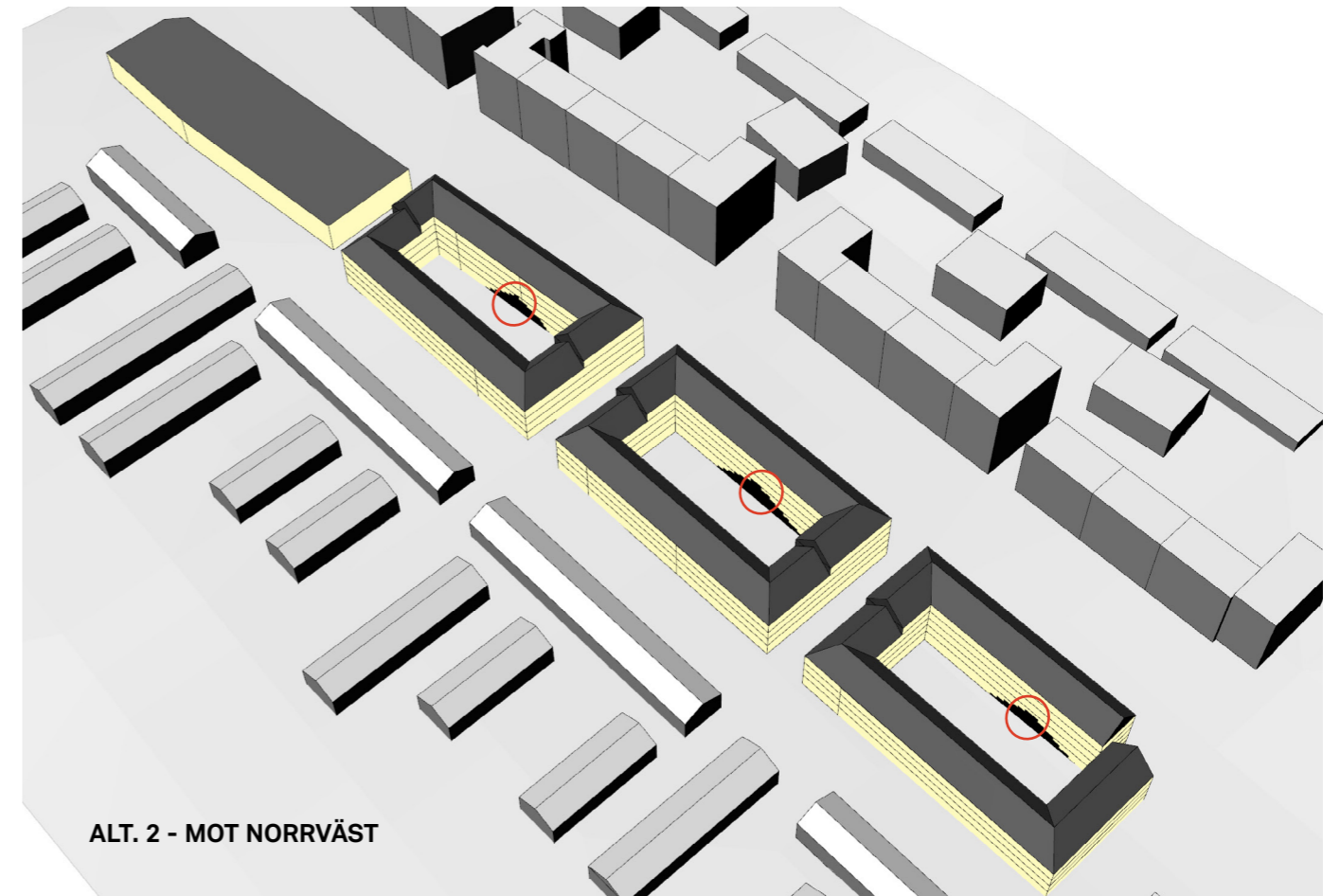
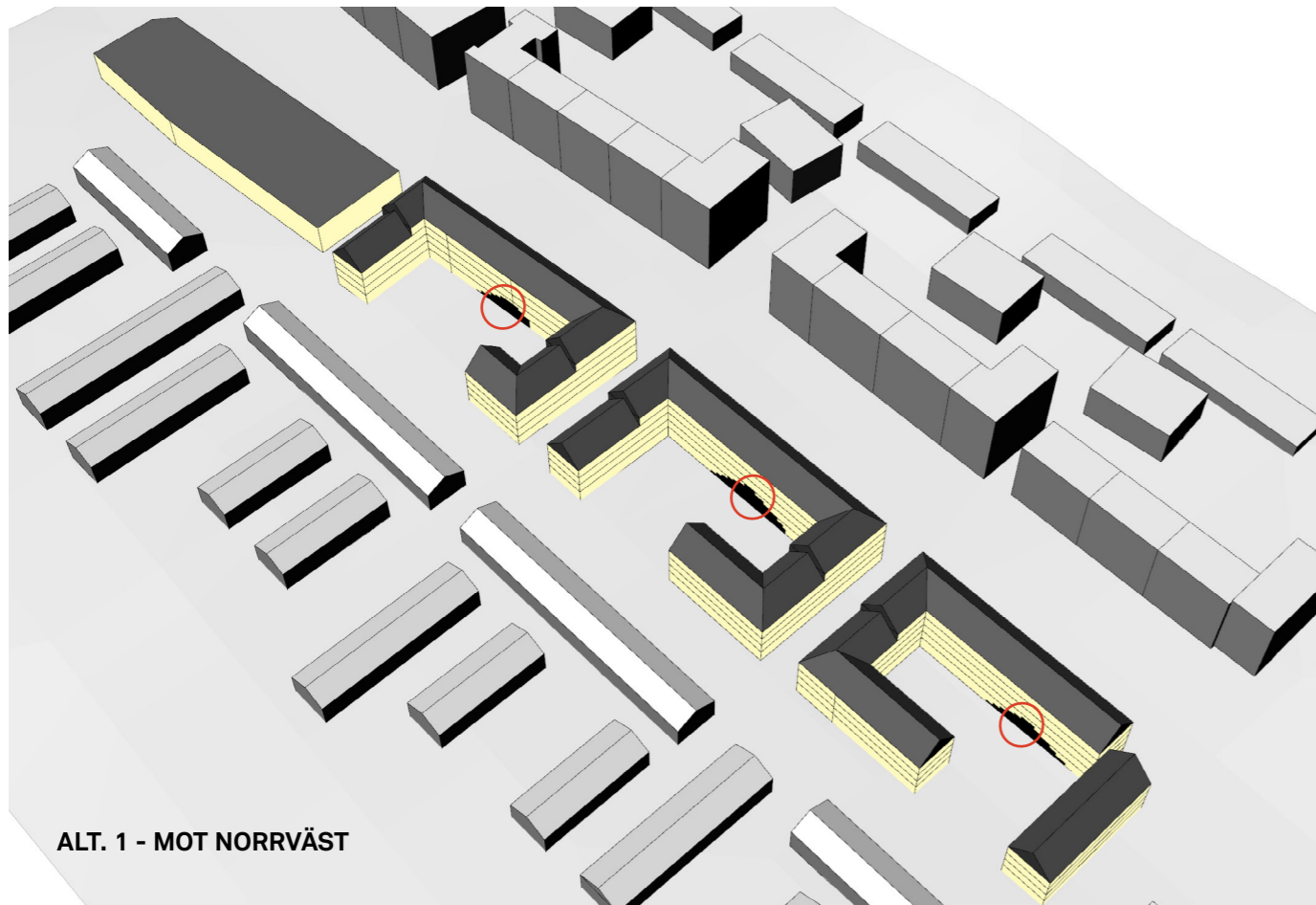
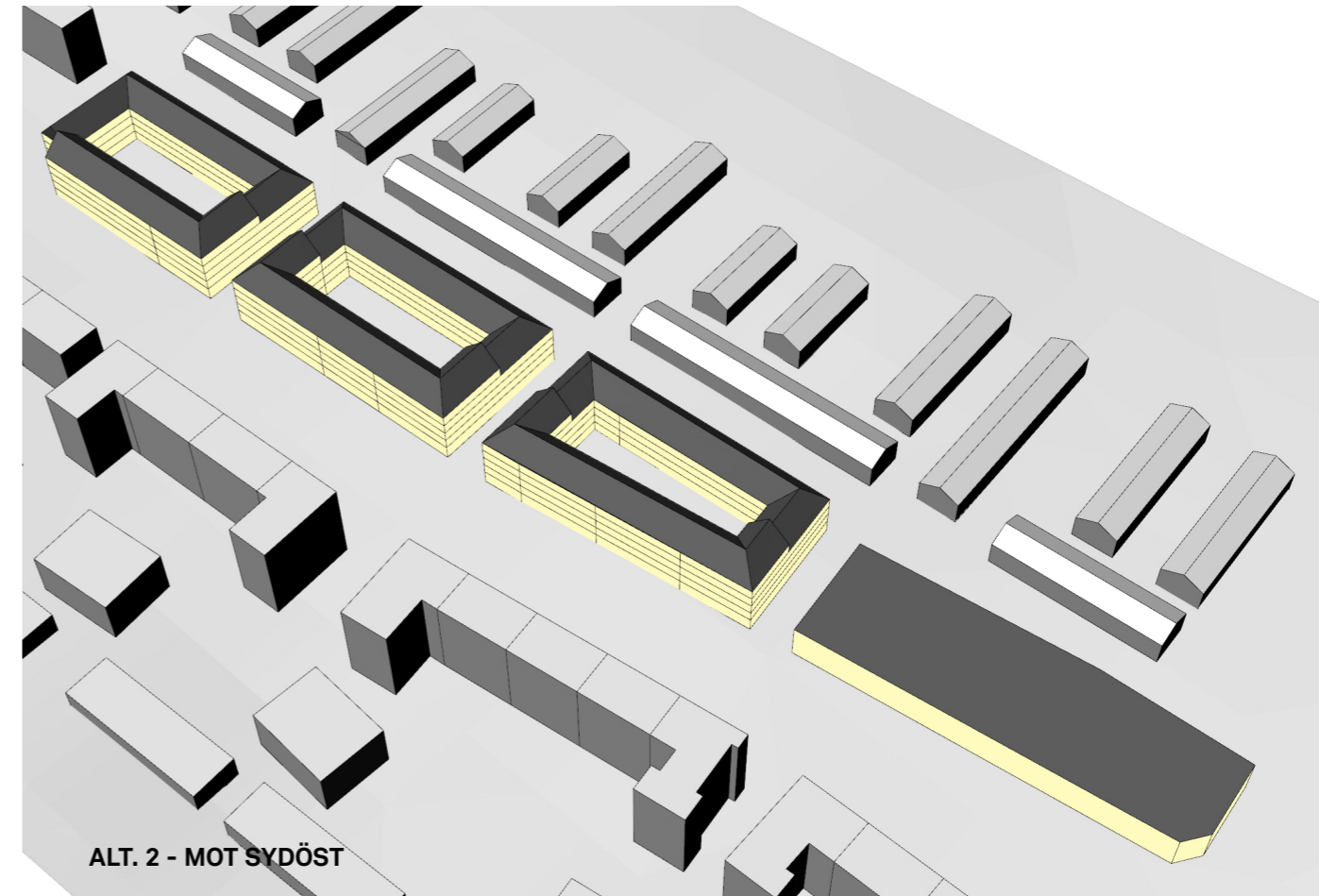
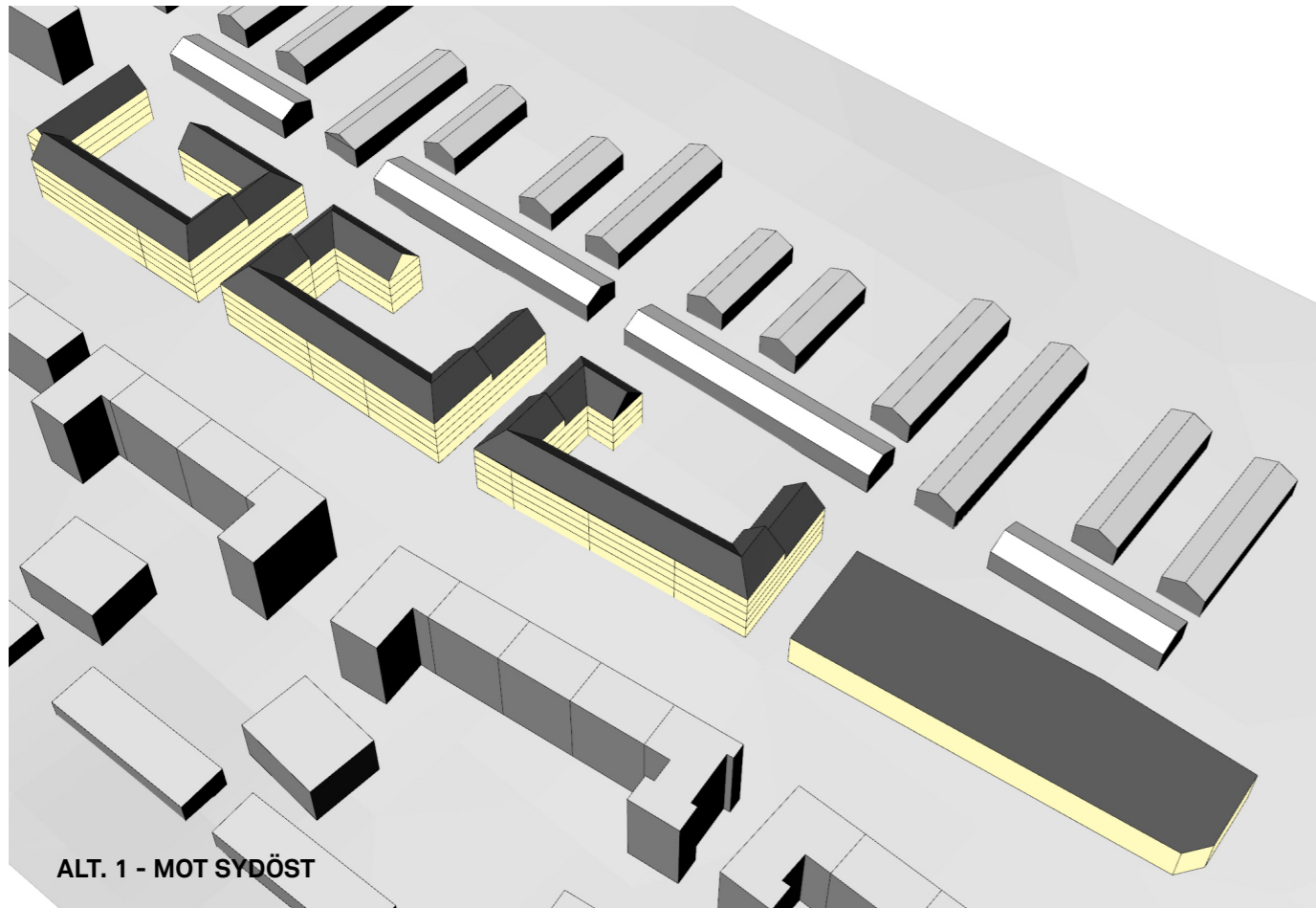
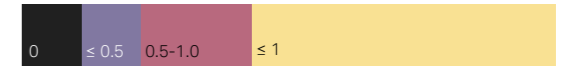
ALTERNATIVE 2



2. DIRECT SOLAR ACCESS - FACADES

ANNUAL (01 JAN TO 31 DEC)

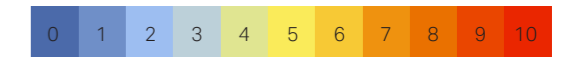
SOLLJUS tim/dag



3. DIRECT SOLAR ACCESS - OUTDOOR SPACES

MARCH 21 TO SEPTEMBER 21 08:00 – 20:00 - DAYTIME

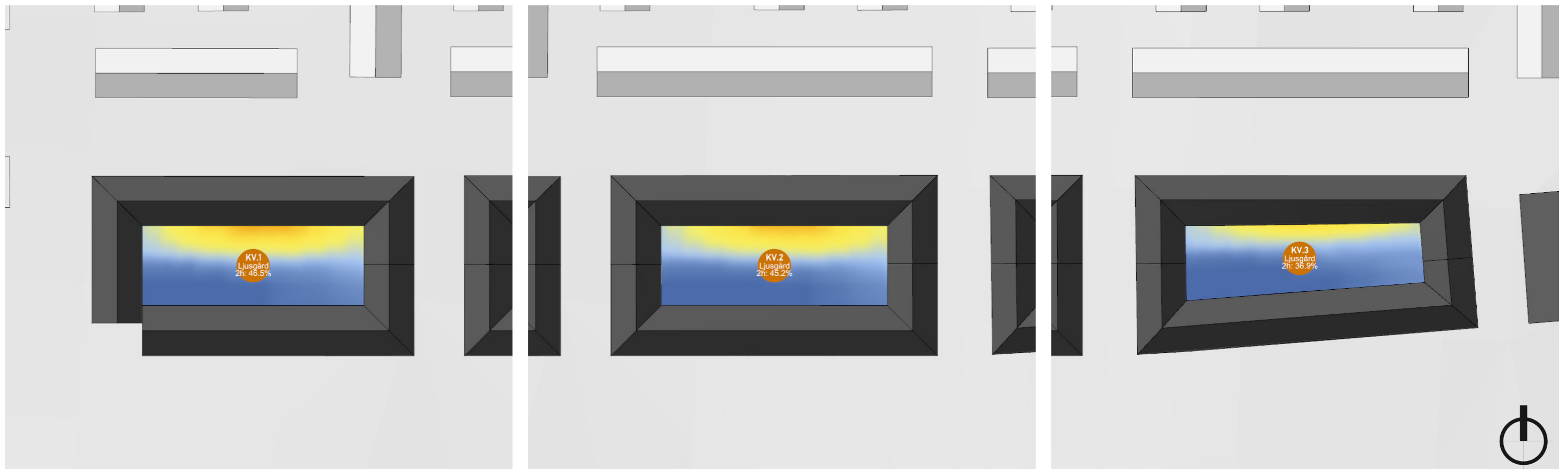
Solar hours h/d



ALT 1



ALT 2



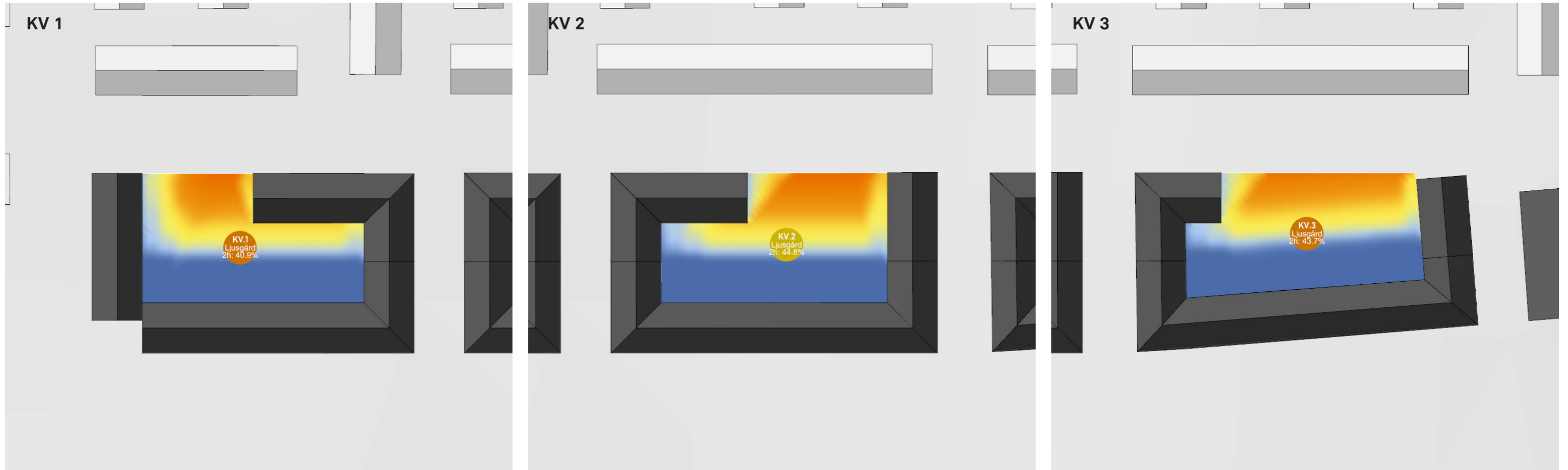
3. DIRECT SOLAR ACCESS - OUTDOOR SPACES

MARCH 21 TO SEPTEMBER 21 11:00 – 15:00 - LUNCHTIME

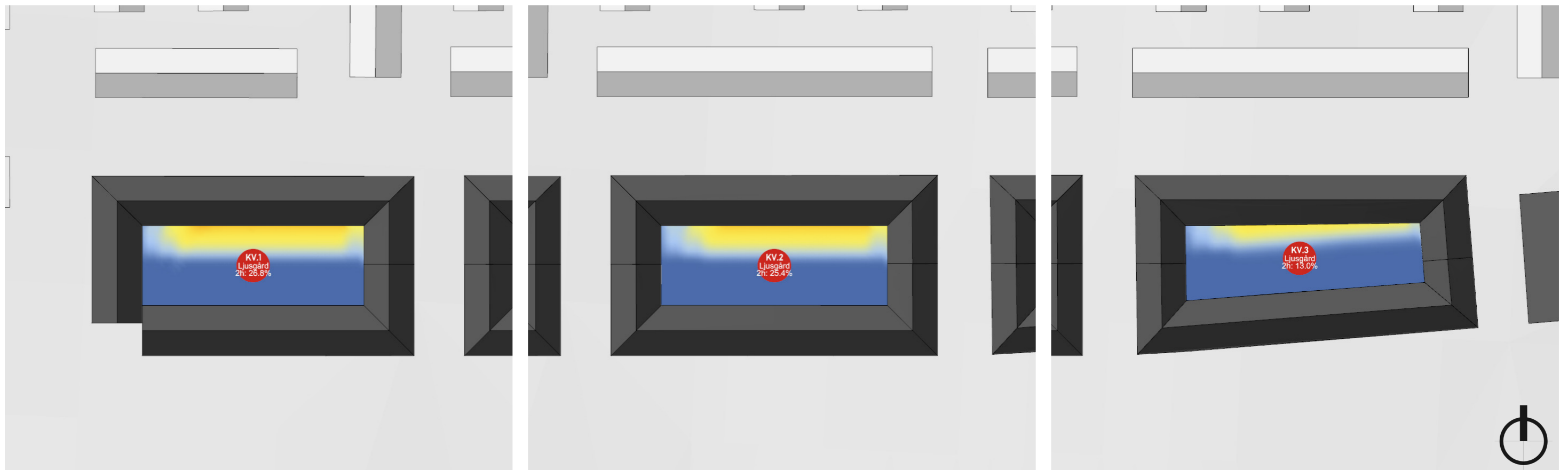
Solar hours h/d



ALT 1



ALT 2



3. DIRECT SOLAR ACCESS - OUTDOOR SPACES

MARCH 21 TO SEPTEMBER 21 15:00 – 19:00 - AFTERWORK

Solar hours h/d



ALT 1



ALT 2

