BEZONNINGSSTUDIE
INVLOED NIEUWBOUW ZOHO
TE ROTTERDAM

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1. INLEIDING

Deze rapportage vervangt de bezonningsstudie met kenmerk 4617.146.ur.bvu d.d. 1 mei 2023.

LS ZOHO C.V. ontwikkelt in Rotterdam het Zomerhofkwartier (ZOHO). Er wordt voorzien in woningbouw in zowel de huur- als koopsector in verschillende segmenten van de markt. Tevens wordt er voorzien in collectieve voorzieningen waaronder horeca en parkeren.

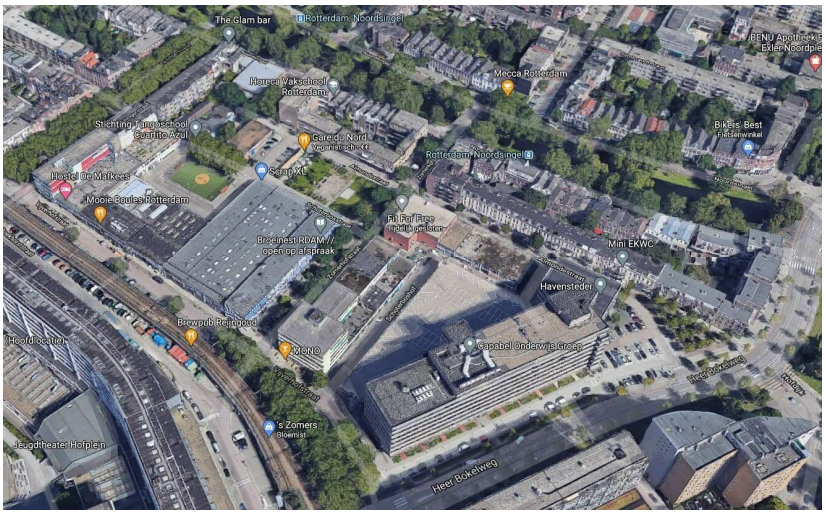
De gevolgen van deze nieuwbouw op de bezonning van de gebouwen in de omgeving zijn middels een bezonningsstudie in beeld gebracht. In deze rapportage is in beeld gebracht wat de gevolgen van de ontwikkeling Zomerhofkwartier te Rotterdam zijn op de bezonning van de gebouwen in de omgeving.

afwegingskader
Er is getoetst aan het “Afwegingskader Bezonning” van de gemeente Rotterdam d.d. juni 2021. In hoofdstuk 2 wordt nader ingegaan op de toets criteria zoals in het Afwegingskader vermeld.

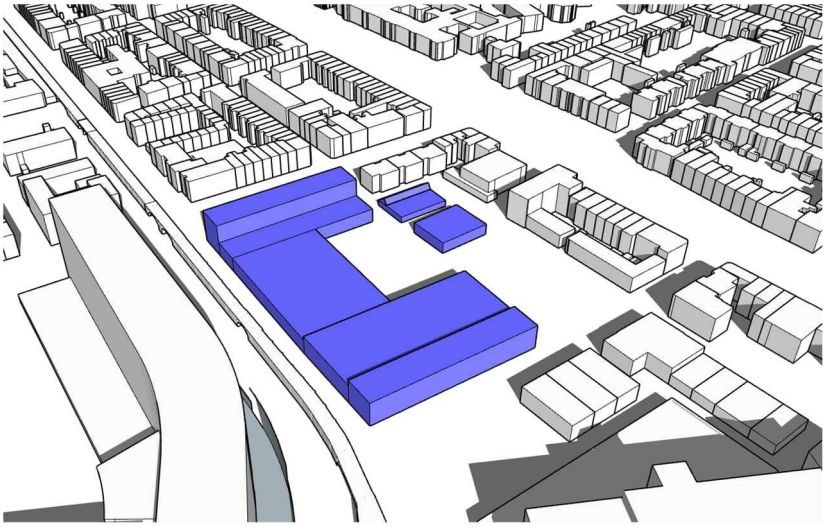
algemene uitgangspunten
De bezonningsstudie is uitgevoerd op basis van de volgende uitgangspunten om te beoordelen of voldaan wordt aan de gestelde norm:

- Sketchup-model t.b.v. de bezonningsstudie “ZOHO_Zonnestudie_Huidige_situatie” d.d.27 juni 2022 van Leyten Bouwplanontwikkeling met aangepaste situatie conform mail Leyten Bouwplanontwikkeling BV d.d. 25-04-2023
- Sketchup-model t.b.v. de bezonningsstudie “ZOHO_Model_Bezonning_en_Wind” d.d.12 oktober 2021 van Leyten Bouwplanontwikkeling met aangepaste hoogten conform het ontwerp-bestemmingsplan "Zomerhofkwartier" (dat vanaf vrijdag 1 september 2023 ter inzage is gelegd)
- Google Maps ter bepaling van de oriëntatie en de situatie, d.d. februari 2024

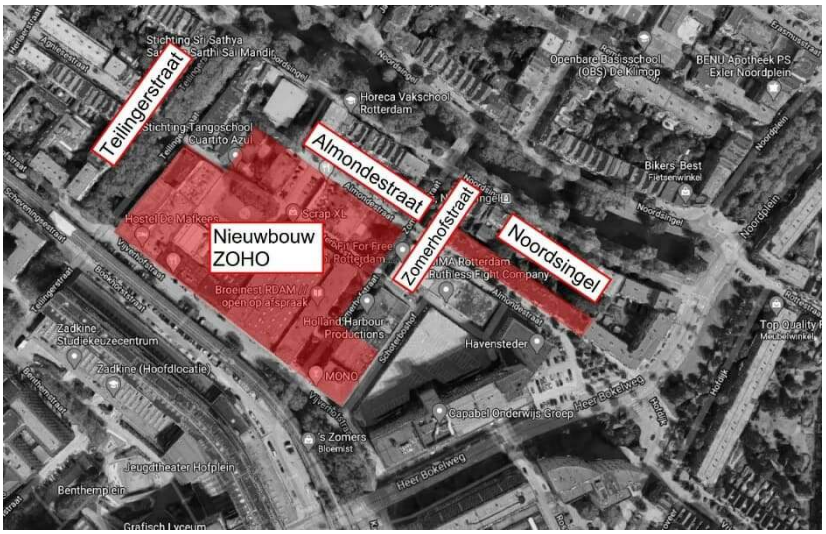
Onderstaand is in figuur 1a. de bestaande situatie op de locatie in beeld gebracht en in figuur 1b. de bouwvolumes in het model “ZOHO_Zonnestudie_Huidige_situatie”. Figuur 1c. is de nieuwe situatie op locatie aangegeven en figuur 1d. de toekomstige bouwvolumes.



Figuur 1a. Bestaande situatie. Het plot is grotendeels bebouwd met gemiddeld maximaal ca. 16 m hoge bebouwing [bron afbeelding: Google].

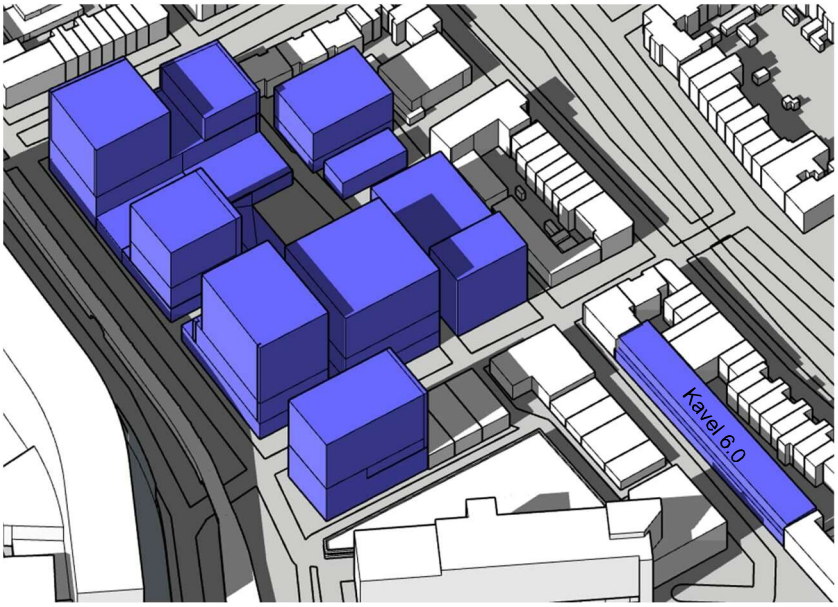


Figuur 1b. Huidige situatie bouwvolumes op het plot van ZOHO



Figuur 1c. Nieuwe situatie.

Het plan ZOHO bestaat uit in hoogte variërende bouwblokken. Het hoogste hoogteaccent mag maximaal 54 m bedragen.



Figuur 1d. de maximale bouwcontouren. Kavel 6.0 valt buiten de scope van de bezonningsstudie.

2. BEZONNINGSSTUDIE

2.1. beoordelingscriteria afwegingskader

Er zijn geen wettelijke normen als het gaat om bezonningseffecten van nieuwbouw op bestaande woningen. Dit maakt dat gemeenten hun eigen normen kunnen vaststellen. Rotterdam heeft in haar beleid vastgelegd wanneer zij bezonningsonderzoek verplicht stelt bij nieuwbouwplannen en aan welke normen zij toetst. Dit beleid is het 'Afwegingskader bezonning', vastgesteld door de gemeenteraad in 2021. Met de vaststelling van het Afwegingskader is er beleid voor om de bezonningseffecten van nieuwbouw op bestaande woningen te kunnen afwegen.

De uitgangspunten uit het Afwegingskader, waarop deze bezonningsstudie ook is gebaseerd, zijn als volgt:

- primair wordt aangesloten op de lichte TNO-richtlijn waarbij o.a. geldt:
  - er wordt alleen gekeken naar de eerste woonlaag van een gebouw;
  - de toetspunten liggen op een hoogte van 0,75 m in het midden van de gevel;
  - er mag geen verslechtering ontstaan voor die situaties waarin minder dan 2 mogelijke bezonnings-uren mogelijk zijn;
  - de norm wordt alleen toegepast op gevels die zon kunnen ontvangen. Noordgevels ontvangen nooit direct zonlicht;
  - het is geen vereiste dat de bezonning aansluitend plaatsvindt.
- **toetsingsdata** conform Hoogbouwvisie 2019: maatgevende periode 21 maart tot en met 21 september; alleen 21 september hoeft te worden bepaald.
- **bouwhoogte**: omdat de geplande nieuwbouw op posities binnen het plan hoger is dan 1,5 maal de gemiddelde gebouwhoogte van de omliggende bebouwing (in een straal van 1 maal de bouwhoogte van de nieuwbouw) is het effect op de bezonning van de bestaande woningen onderzocht.
- **afstand tot omliggende bebouwing**: de bezonningssituatie van alle woningen die binnen een afstand van 3 maal de bouwhoogte van de nieuwbouw vallen zijn in beeld gebracht in dit onderzoek. De woningen ten zuiden van het plan zijn hierin niet meegenomen, aangezien deze niet belemmerd kunnen worden door de nieuwbouw. In Figuur 2a is weergegeven welke bouwblokken in deze bezonningsstudie zijn meegenomen. De relevante bouwblokken binnen een afstand van 3x de maximale bouwhoogte zijn hierop weergegeven. 'Worst case' is gekozen om de afstand van het hoogste hoogteaccent (3x54= 162 meter) rondom de uiterste gebouwcontouren in beeld te brengen. Deze162 m omtrek is met rode stippellijn weergegeven in de figuur.
  - **toetspunten:** Er is gekeken naar alleen de eerste woonlaag van een gebouw. Daar waar onbekend is of er woningen op de begane grond aanwezig zijn, is er van uitgegaan dat deze aanwezig kunnen zijn en zijn de toetspunten op de begane grond gelegd.
- **lengte meting**: De studie is uitgevoerd voor 21 september tussen zonsopkomst (06:32 uur) en zonsondergang (18:36 uur).



Figuur 2a. nieuwbouw plan ZOHO en de omliggende bebouwing die getoetst is [bron afbeelding: Google]

Enkele opmerkingen bij bovenstaand figuur:

- de woningen gelegen achter Noordsingel 39 – 65 zijn niet meegenomen in de beschouwing omdat de woningen aan de Noordsingel 39 – 65 reeds ruim voldoen in de nieuwe situatie met ZOHO
- woningen ten zuiden van het plan (binnen de gele markering) worden in hun mogelijke bezonning niet belemmerd door ZOHO in de tijdsbeschouwing vanwege hun oriëntatie en ligging
- de noordzijde van de beschouwde woningblokken is conform het Afwegingskader bezonning niet meegenomen omdat de noordzijde nooit direct zonlicht ontvangt

2.2. simulatie

Voor de beoordeling van de bezonningssituatie is gebruik gemaakt van computerberekeningen. Conform de uitgangspunten zoals beschreven in hoofdstuk 1 is het massamodel van het plan geïmporteerd in Sketchup. Het 3D model is gekoppeld aan een geolocatie bestand om oriëntatie en de zonnestanden voor die specifieke locatie te verkrijgen.

De studie is uitgevoerd voor 21 september tussen zonsopkomst (06:32 uur) en zonsondergang (18:36 uur). Om gedurende de dag het verloop van de beschaduwing zichtbaar te maken is voor de beschaduwing gevisualiseerd van 06:00 tot 19:00 uur met tijdstappen van een half uur.

Er is gekeken naar alleen de eerste woonlaag van een gebouw. Daar waar onbekend is of er woningen op de begane grond aanwezig zijn, is er van uitgegaan dat deze aanwezig kunnen zijn en zijn de toetspunten op de begane grond gelegd.

De nieuwe situatie is eerst beoordeeld. Toetspunten die voldoen aan 2 bezonningsuren per dag hoeven niet verder te worden onderzocht. Van punten die niet voldoen aan minimaal 2 bezonningsuren per dag is onderzocht of deze wel voldoen in de huidige situatie. Wanneer de huidige situatie ook niet voldoet aan 2 bezonningsuren per dag is een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen.

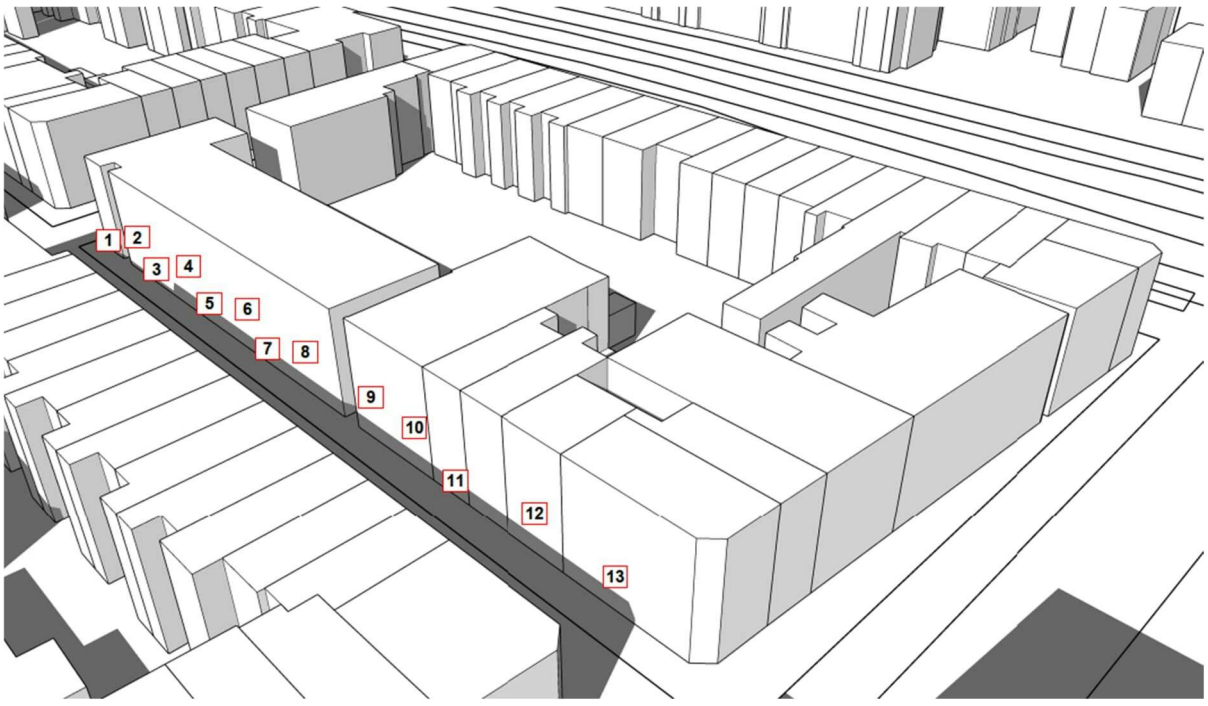
3. RESULTATEN AANVULLENDE BEZONNINGSSTUDIE

3.1. omliggende bebouwing

In de bezonningsstudie is de beschaduwing ten gevolge van de nieuwbouw ZOHO beoordeeld. In bijlage 1. is een overzicht van de locatie bijgevoegd. In bijlage 2. tot en met bijlage 15. zijn de resultaten weergegeven van de bezonningsstudie op 21 september voor het plan ZOHO. Op basis van deze resultaten is op de gevel van de gebouwen in de omgeving per geveldeel de bezonning geanalyseerd (paragraaf 3.2. t/m 3.15). In de analyse van de bezonningsuren is de beschaduwing ten gevolge van de nieuwbouw van ZOHO en de bestaande bebouwing in de omgeving beoordeeld.

3.2. Agniesestraat Noord

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 13 toetspunten (toetspunt 1 t/m 13). De toetspunten zijn voor de Agniesestraat Noord op 0,75m hoogte boven de vloer van de begane grond of eerste verdieping geplaatst omdat niet overal op de begane grond een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.1. weergegeven.



figuur 3.1: positie toetspunten op gevel Agniesestraat Noord

3.2.1. stap 1 afwegingskader

In bijlage 2. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.1. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

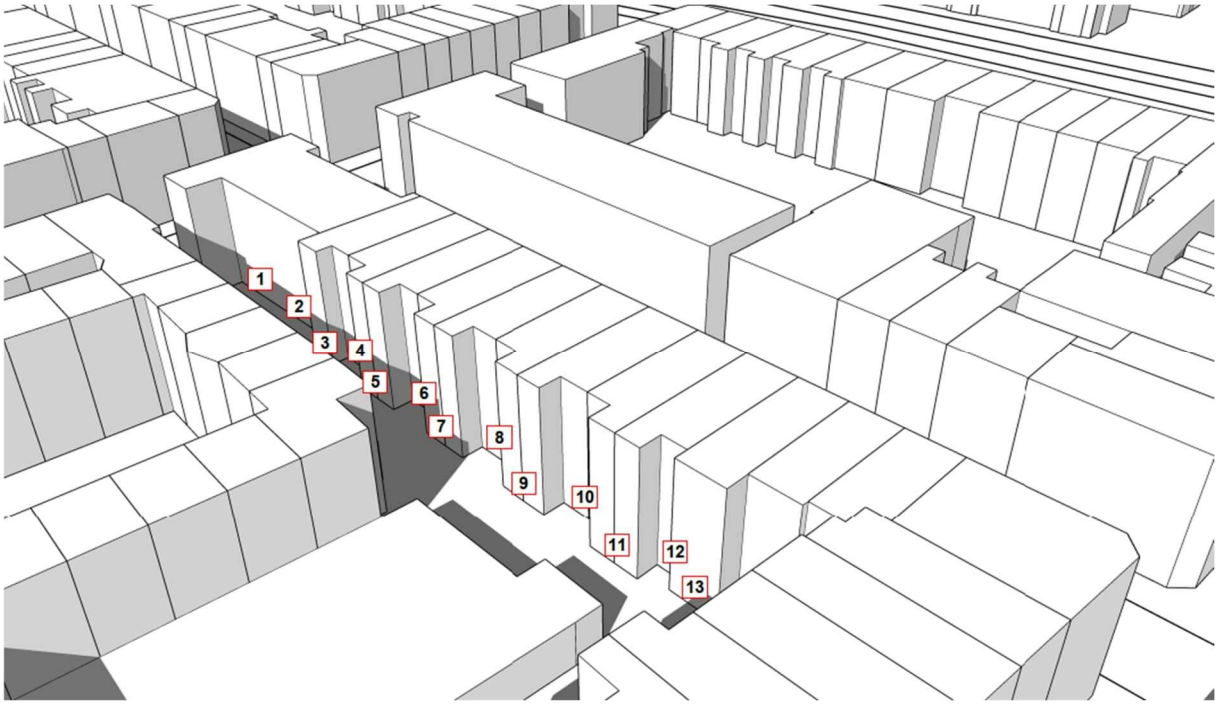
tabel 3.1.: bezonning Angiesestraat Noord per toetspunt op 21 september

situatie	toetspunt												
	1	2	3	4	5	6	7	8	9	10	11	12	13
huidig	3 u; 30 min.	6 u	3 u; 30 min.	6 u	3 u	4 u; 30 min.	3 u	4 u; 30 min.	3 u; 30 min.	4 u; 30 min.	3 u	4 u; 30 min.	4 u
nieuw	3 u; 30 min.	6 u	3 u; 30 min.	6 u	3 u	4 u; 30 min.	3 u	4 u; 30 min.	3 u; 30 min.	4 u; 30 min.	3 u	4 u; 30 min.	3 u; 30 min.

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. Met uitzondering van toetspunt 13 heeft ZOHO geen invloed op de bezonning van de toetspunten. Er is geen nader onderzoek nodig.

3.3. Agniesestraat Zuid

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 13 toetspunten (toetspunt 1 t/m 13). De toetspunten zijn voor de Agniesestraat Zuid op 0,75m hoogte boven de vloer van de begane grond geplaats omdat niet duidelijk is of hier een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.2. weergegeven.



figuur 3.2: positie toetspunten op gevel Agniesestraat Zuid

3.3.1. stap 1 afwegingskader

In bijlage 3. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de huidige situatie voldoen niet alle punten aan de minimale bezonningsuren. Toetspunt 2, 4, 5 en 6 voldoen niet omdat deze worden belemmerd door de bestaande bebouwing van de Vijverhofstraat. In tabel 3.2. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.2.: bezonning Angiesestraat Zuid per toetspunt op 21 september

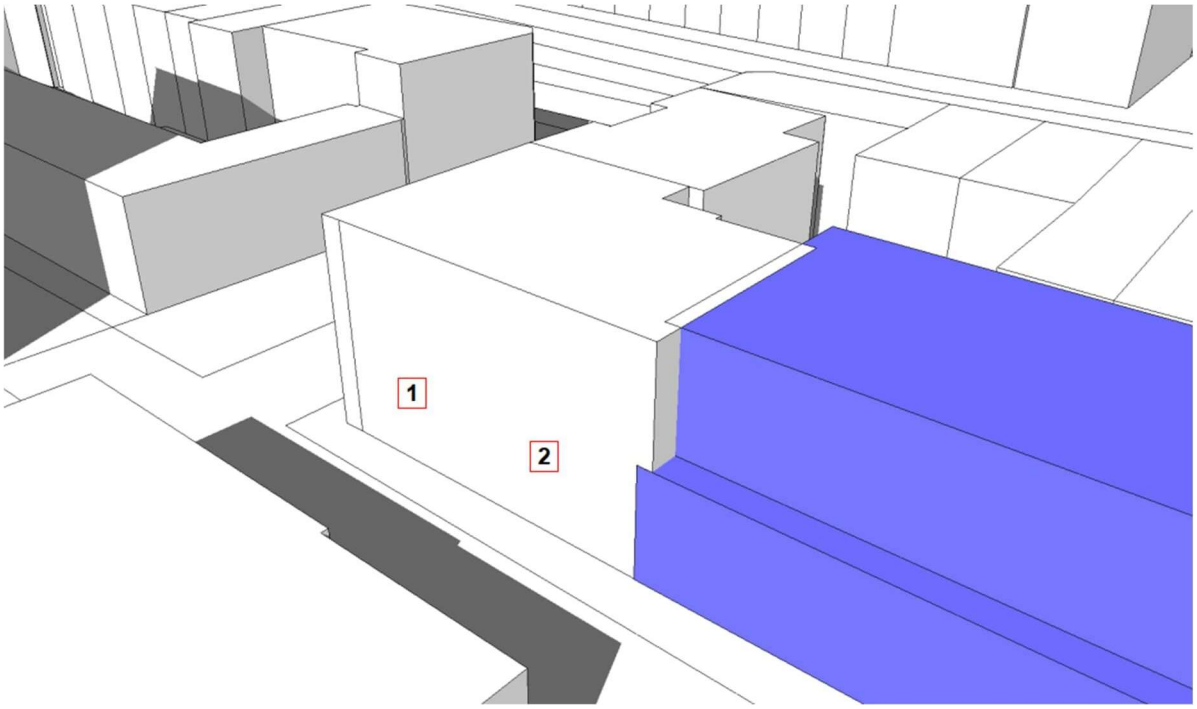
situatie	toetspunt												
	1	2	3	4	5	6	7	8	9	10	11	12	13
bestaand	2 u; 30 min.	1 u; 30 min.	2 u; 30 min.	30 min.	2 u; 30 min.	30 min.	2 u; 30 min.	2 u; 30 min.	5 u	4 u	5 u	4 u; 30 min.	3 u; 30 min.
nieuw	2 u; 30 min.	1 u; 30 min.	2 u; 30 min.	30 min.	2 u; 30 min.	30 min.	2 u; 30 min.	2 u; 30 min.	5 u	4 u	5 u	4 u; 30 min.	3 u; 30 min.

3.3.2. stap 2 afwegingskader

Uit tabel 3.2. blijkt dat stap 2 gevolgd moet worden voor de toetspunten 2 en 4 t/m 6; er is nader onderzoek nodig. De genoemde toetspunten voldoen in de bestaande situatie ook al niet aan de richtlijn van meer dan 2 uur bezonning. De bezonningsduur bij deze toetspunten is in de nieuwe situatie gelijk aan de bestaande situatie. De procentuele afname t.o.v. de bestaande situatie is daarmee minder dan 15% op 21 september. Hiermee voldoet het bouwplan aan het Afwegingskader. Een nadere afweging voor deze toetspunten kan achterwege blijven.

3.4. gevel Almondestraat Oost

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 2 toetspunten (toetspunt 1 en 2). De toetspunten zijn voor de Almondestraat Oost op 0,75m hoogte boven de vloer van de eerste verdieping geplaatst omdat op de begane grond aan deze zijde geen verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.3. weergegeven.



figuur 3.3: positie toetspunten op gevel Almondestraat Oost

In bijlage 4. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.3. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

3.4.1. stap 1 afwegingskader

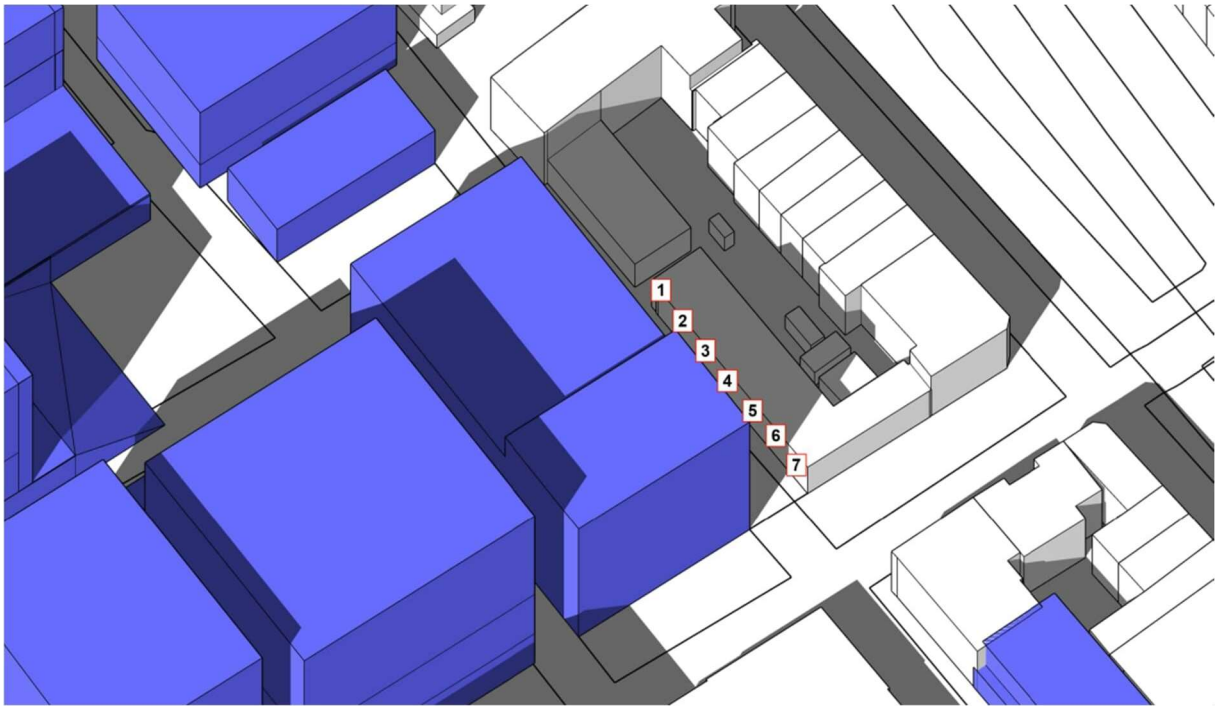
tabel 3.3.: bezonning Almondestraat Oost per toetspunt op 21 september

situatie	toetspunt	
	1	2
huidig	8 u; 30 min.	7 u; 30 min.
nieuw	6 u	6 u

Er wordt voor beide toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. Er is geen nader onderzoek nodig.

3.5. gevel Almondestraat West

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 7 toetspunten (toetspunt 1 t/m 7). De toetspunten zijn voor de Almondestraat West op 0,75m hoogte boven de vloer van de eerste verdieping geplaatst omdat op de begane grond geen verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.4. weergegeven.



figuur 3.4: positie toetspunten op gevel Almondestraat West

In bijlage 5. zijn afbeeldingen van de resultaten weergegeven van zowel de huidige situatie als de situatie met de nieuwbouw ZOHO. In tabel 3.4. zijn de bezonningsuren per toetspunt samengevat voor de beide situaties voor de uitgevoerde studie op 21 september. In de resultaten is te zien dat de toetspunten minder dan 2 bezonningsuren per dag hebben in de nieuwe situatie.

3.5.1. stap 1 afwegingskader

tabel 3.4.: bezonning Almondestraat West per toetspunt op 21 september

situatie	toetspunt						
	1	2	3	4	5	6	7
huidig	8 u	8 u	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.
nieuw	45 min.	1 u	1 u; 15 min.	1 u; 15 min.	1 u; 45 min	2 u; 45 min.	4 u; 15 min.

3.5.2. stap 2 afwegingskader

Uit tabel 3.4. blijkt dat stap 2 gevolgd moet worden voor de toetspunten 1 t/m 5; er is nader onderzoek nodig. Aangezien de toetspunten in de bestaande situatie ruim meer dan 2 uur bezonning hebben op de toetsdatum is de clausule “afname minder dan 15% ten opzichte van de bestaande situatie toegestaan” niet van toepassing.

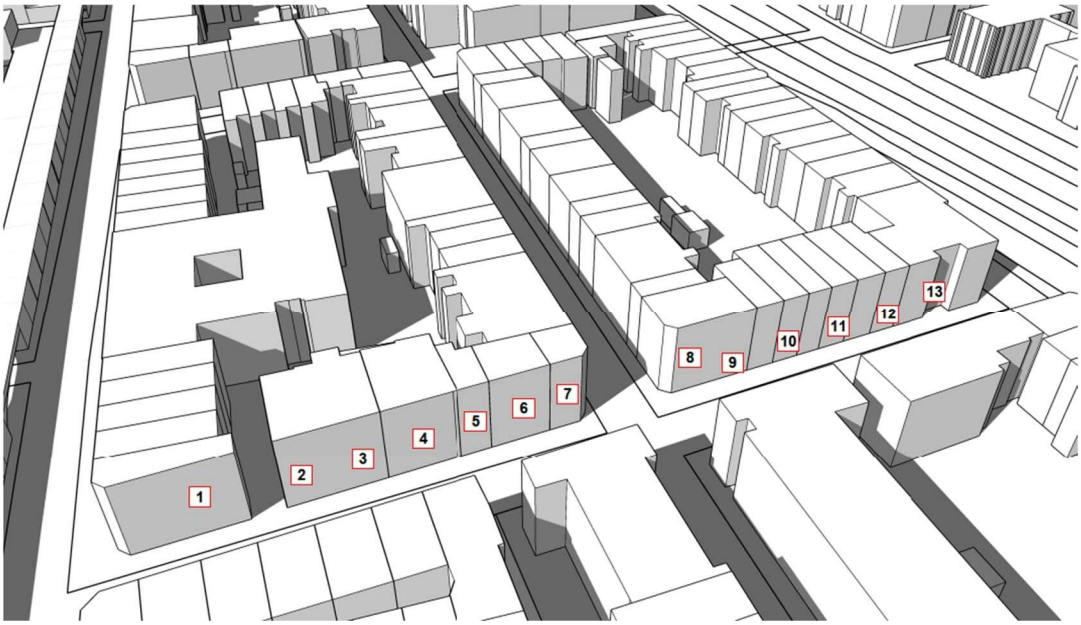
3.5.3. stap 3 afweging bezonning Almondestraat West

Er wordt een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen.

In hoofdstuk 4 Afweging wordt hier nader op ingegaan.

3.6. Herlaerstraat

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 13 toetspunten (toetspunt 1 t/m 13). De toetspunten zijn voor de Herlaerstraat op 0,75m hoogte boven de vloer van de begane grond of eerste verdieping geplaatst omdat niet overal op de begane grond een verblijfruimte van een woning aanwezig is; er zijn voornamelijk bergingen aanwezig. De toetspunten zijn in figuur 3.5. weergegeven.



figuur 3.5: positie toetspunten op gevel Herlaerstraat

3.6.1. stap 1 afwegingskader

In bijlage 6. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.5. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.5.: bezonning Herlaerstraat per toetspunt op 21 september

situatie	toetspunt												
	1	2	3	4	5	6	7	8	9	10	11	12	13
huidig	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	5 u	5 u	4 u; 30 min.	5 u	4 u; 30 min.	3 u	4 u	3 u	3 u	3 u; 30 min.
nieuw	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	5 u	5 u	4 u; 30 min.	5 u	4 u; 30 min.	3 u	4 u	3 u	3 u	3 u; 30 min.

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. ZOHO heeft geen invloed op de bezonning van de toetspunten. Er is geen nader onderzoek nodig.

3.7. Noordsingel 17 – 37

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 11 toetspunten (toetspunt 1 t/m 11). De toetspunten zijn voor de Noordsingel 17 – 37 op 0,75m hoogte boven de vloer geplaatst. Het betreft overwegend souterrains, maar op een aantal punten is op de begane grond een andere functie dan wonen aanwezig, en is het toetspunt op de daarboven gelegen woonlaag geplaatst.



figuur 3.6: positie toetspunten op gevel Noordsingel 17 – 37

3.7.1. stap 1 afwegingskader

In bijlage 7. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.6. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.6.: bezonning Noordsingel 17 – 37 per toetspunt op 21 september

situatie	toetspunt										
	1	2	3	4	5	6	7	8	9	10	11
huidig	9 u	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	9 u	9 u	9 u	9 u	9 u	9 u	9 u
nieuw	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u	8 u	8 u	8 u

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. Er is geen nader onderzoek nodig.

3.8. Noordsingel 39 – 65

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 13 toetspunten (toetspunt 1 t/m 13). De toetspunten zijn voor de Noordsingel 39 – 65 op 0,75m hoogte boven de vloer van de begane grond geplaatst omdat is aangenomen dat hier een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.7. weergegeven.



figuur 3.7: positie toetspunten op gevel Noordsingel 39 – 65

3.8.1. stap 1 afwegingskader

In bijlage 8. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.7. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

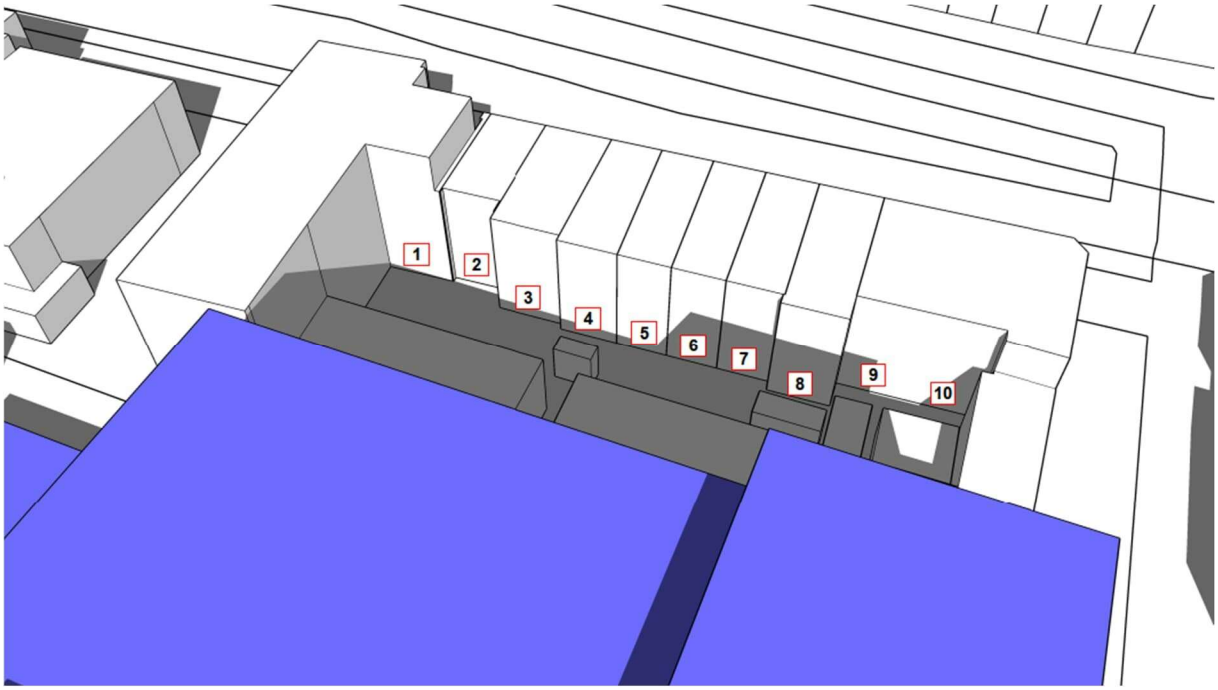
tabel 3.7.: bezonning Noordsingel 36 – 65 per toetspunt op 21 september

situatie	toetspunt												
	1	2	3	4	5	6	7	8	9	10	11	12	13
huidig	8 u; 30 min.	8 u	8 u	8 u	8 u	8 u	8 u; 30 min.	8 u	8 u	7 u; 30 min.	7 u; 30 min.	8 u	8 u
nieuw	8 u; 30 min.	8 u	8 u	8 u	8 u	8 u	8 u; 30 min.	8 u	8 u	7 u; 30 min.	7 u; 30 min.	8 u	8 u

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. ZOHO heeft geen invloed op de bezonning van de toetspunten. Er is geen nader onderzoek nodig.

3.9. Noordsingel 54 – 72

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 10 toetspunten (toetspunt 1 t/m 10). De toetspunten zijn voor de Noordsingel 54 – 72 op 0,75m hoogte boven de vloer van de begane grond geplaats omdat niet duidelijk is of hier een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.8 weergegeven.



figuur 3.8: positie toetspunten op gevel Noordsingel 54 – 72

3.9.1. stap 1 afwegingskader

In bijlage 9. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen niet alle punten aan de minimale bezonningsuren. In tabel 3.8. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.8.: bezonning Noordsingel 54 – 72 per toetspunt op 21 september

situatie	toetspunt									
	1	2	3	4	5	6	7	8	9	10
huidig	5 u	4 u	6 u	5 u; 30 min.	6 u	5 u; 30 min.	5 u	5 u; 30 min.	4 u; 30 min.	1 u; 30 min.
nieuw	4 u; 30 min.	2 u; 30 min.	3 u; 30 min.	2 u; 30 min.	2 u; 30 min.	2 u; 30 min.	2 u	2 u; 30 min.	2 u	0 u

3.9.2. stap 2 afwegingskader

Uit tabel 3.8. blijkt dat stap 2 gevolgd moet worden voor toetspunt 10; er is nader onderzoek nodig. Het genoemde punt voldoet in de bestaande situatie ook al niet aan de richtlijn van meer dan 2 uur bezonning. Echter, de afname in bezonning is meer dan 15% ten opzichte van de bestaande situatie.

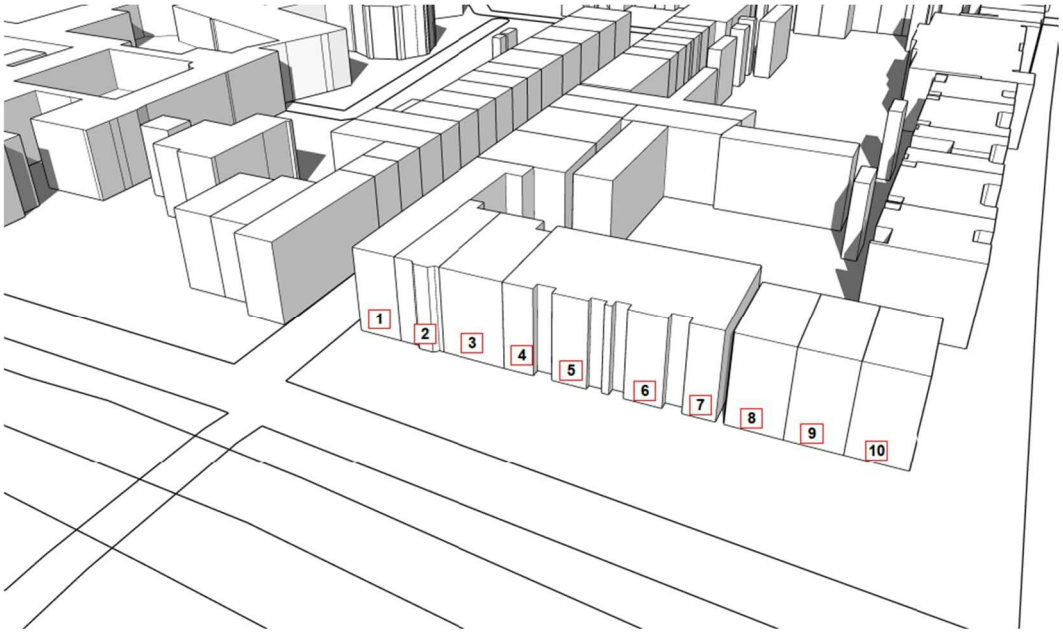
3.9.3. stap 3 afweging bezonning Noordsingel 54 – 72

Er wordt voor toetspunt 10 een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen.

In hoofdstuk 4 Afweging wordt hier nader op ingegaan.

3.10. Noordsingel 77 – 99

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 10 toetspunten (toetspunt 1 t/m 10). De toetspunten zijn voor de Noordsingel 77 – 99 op 0,75m hoogte boven de vloer van de begane grond geplaatst omdat is aangenomen dat hier een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.9. weergegeven.



figuur 3.9: positie toetspunten op gevel Noordsingel 77 – 99

3.10.1. stap 1 afwegingskader

In bijlage 10. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.9. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

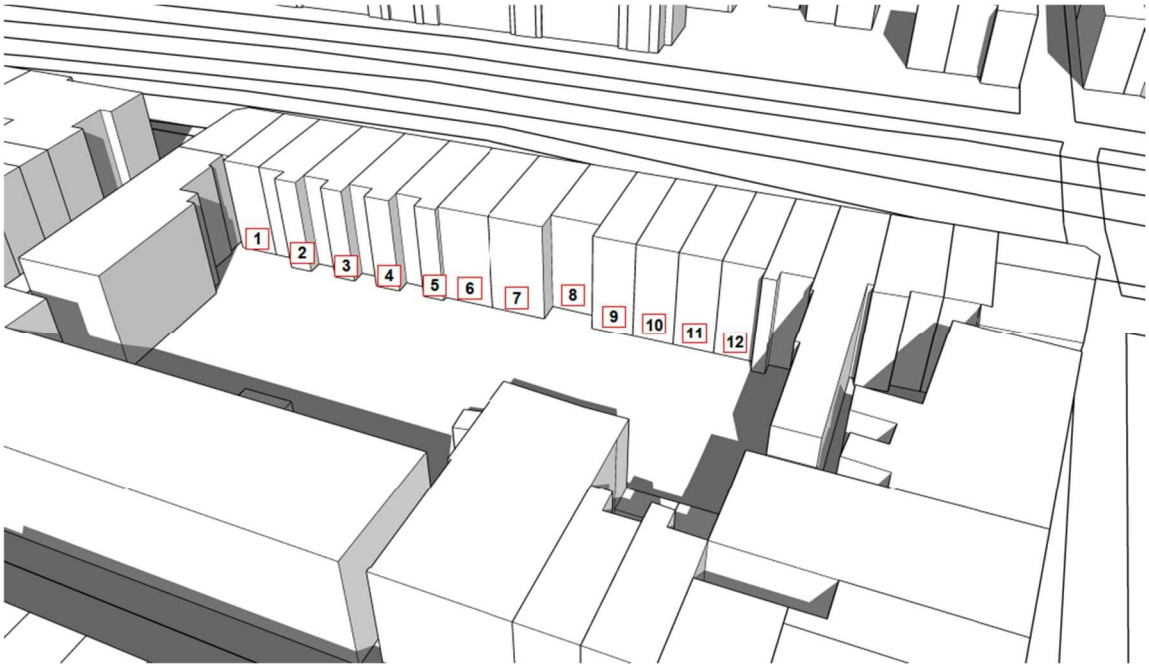
tabel 3.9.: bezonning Noordsingel 77 – 99 per toetspunt op 21 september

situatie	toetspunt									
	1	2	3	4	5	6	7	8	9	10
huidig	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.
nieuw	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.	8 u; 30 min.

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. ZOHO heeft geen invloed op de bezonning van de toetspunten. Er is geen nader onderzoek nodig.

3.11. Noordsingel 108 – 130

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 12 toetspunten (toetspunt 1 t/m 12). De toetspunten zijn voor de Noordsingel 108 – 130 op 0,75m hoogte boven de vloer van de begane grond geplaats omdat niet duidelijk is of hier een verblijfruimte van een woning aanwezig is. De toetspunten zijn in figuur 3.10. weergegeven. Noordsingel 100 – 106 zijn niet meegenomen in de beoordeling omdat deze in de belemmering liggen van aangrenzende gebouwen.



figuur 3.10: positie toetspunten op gevel Noordsingel 108 – 130

In bijlage 11. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.10. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

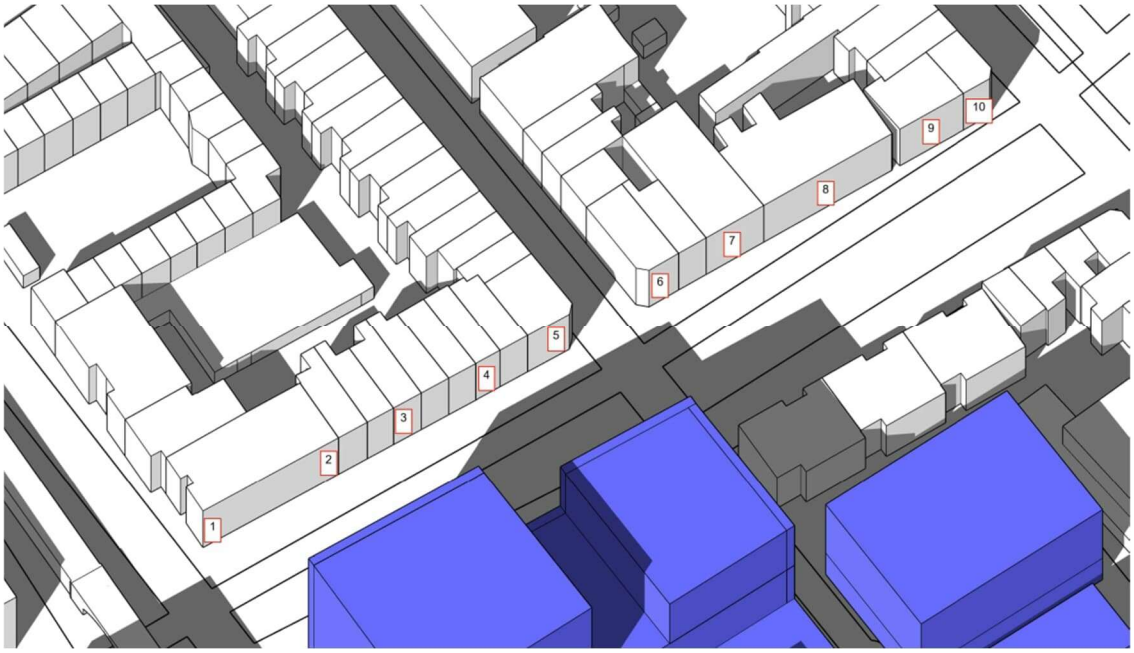
tabel 3.10.: bezonning Noordsingel 102 – 130 per toetspunt op 21 september

	toetspunt											
situatie	1	2	3	4	5	6	7	8	9	10	11	12
huidig	3 u; 30 min.	5 u; 30 min.	6 u	7 u	7 u	7 u; 30 min.	7 u; 30 min.	5 u; 30 min.	7 u; 30 min.	6 u; 30 min.	6 u	5 u
nieuw	3 u; 30 min.	5 u; 30 min.	6 u	7 u	7 u	7 u; 30 min.	7 u; 30 min.	5 u; 30 min.	7 u; 30 min.	6 u; 30 min.	6 u	5 u

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. ZOHO heeft geen invloed op de bezonning van de toetspunten. Er is geen nader onderzoek nodig.

3.12. Teilingerstraat (noordzijde)

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 10 toetspunten (toetspunt 1 t/m 10). De toetspunten zijn voor de Teilingerstraat (noordzijde) op 0,75m hoogte boven de vloer van de begane grond geplaats omdat hier overwegend woningen aanwezig zijn. De toetspunten zijn in figuur 3.11 weergegeven.



figuur 3.11. positie toetspunten op gevel Teilingerstraat (noordzijde)

3.12.1. stap 1 afwegingskader

In bijlage 12. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen alle punten aan de minimale bezonningsuren. In tabel 3.11. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.11.: bezonning Teilingerstraat (noordzijde) per toetspunt op 21 september

situatie	toetspunt									
	1	2	3	4	5	6	7	8	9	10
huidig	5 u	5 u	5 u	5 u; 30 min.	6 u; 30 min.	6 u	6 u	6 u	5 u; 45 min.	7 u; 30 min.
nieuw	4 u; 15 min.	2 u; 15 min.	2 u	2 u; 15 min.	2 u	3 u; 45 min.	4 u; 45 min.	5 u; 45 min.	5 u; 45 min.	7 u; 15 min.

Er wordt voor alle toetspunten voldaan aan minimaal 2 bezonninguren op de toets datum. Er is geen nader onderzoek nodig.

3.13. Teilingerstraat (zuidzijde; achtergevel en voorgevel)

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 7 toetspunten op de voorgevel (toetspunt V1 t/m V7) en 6 toetspunten op de achtergevel (toetspunt A1 t/m A6). Sommige toetspunten zijn voor de Teilingerstraat (zuidzijde) op 0,75m hoogte boven de vloer van de eerste verdieping geplaatst omdat op de begane grond geen verblijfruimte aanwezig is. De toetspunten zijn in figuur 3.12. weergegeven.



figuur 3.12. positie toetspunten op de voor- en achtergevel van bebouwing aan Teilingerstraat (zuidzijde)

3.13.1. stap 1 afwegingskader

In bijlage 13a. en 13b. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoen niet alle punten aan de minimale bezonningsuren. In tabel 3.12. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.12.: bezonning Teilingerstraat (zuidzijde) per toetspunt op 21 september

	toetspunt					
situatie	1 A1, V7	2 A2, V6	3 A3, V5	4 A4, V4	5 A5, V3	6 A6, V1, V2
bestaand	7 u	7 u; 30 min.	7 u	7 u; 30 min.	7 u	5 u; 30 min.
nieuw	3 u; 30 min.	1 u; 15 min.	3 u	1 u; 15 min.	2 u; 30 min.	4 u; 45 min.

3.13.2. stap 2 afwegingskader

Uit tabel 3.12. blijkt dat stap 2 gevolgd moet worden voor de toetspunten 2 en 4; er is nader onderzoek nodig. Aangezien deze toetspunten in de bestaande situatie meer dan 7 uur bezonning hebben op de toetsdatum is de clausule “afname minder dan 15% ten opzichte van de bestaande situatie toegestaan” niet van toepassing.

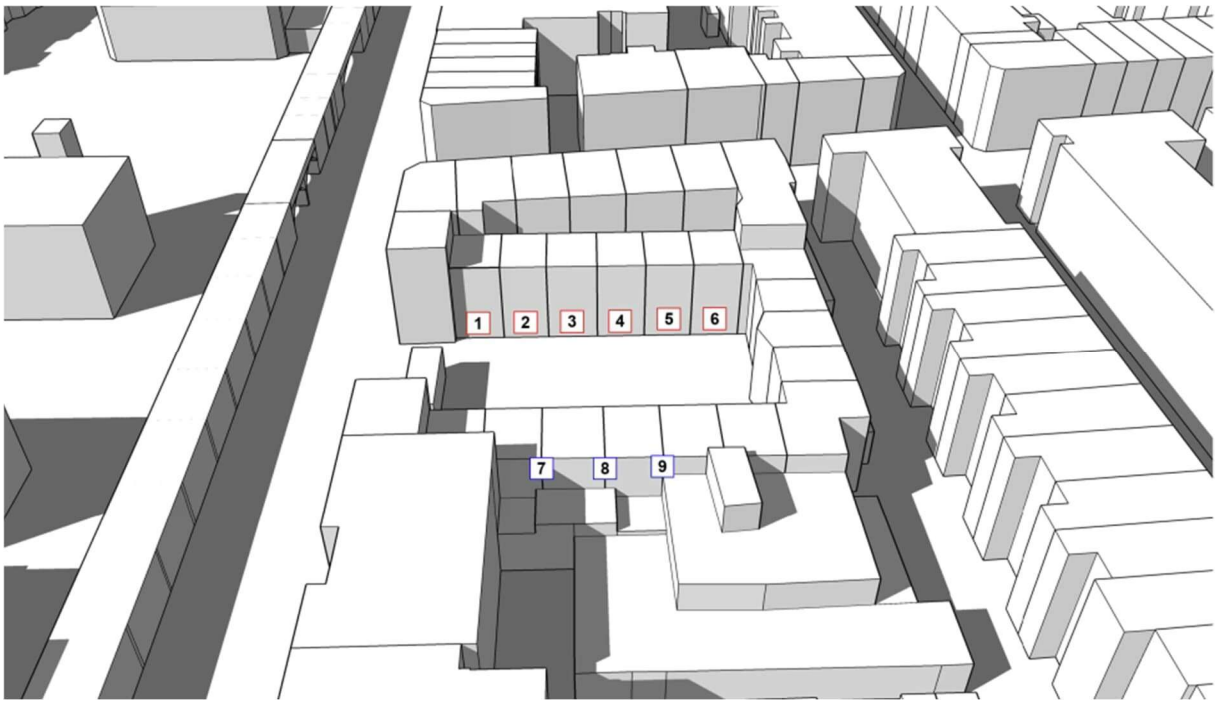
3.13.3. stap 3 afweging bezonning Teilingerstraat (zuidzijde)

Er wordt een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen ter plaatse van toetspunt 2 en 4.

In hoofdstuk 4 Afweging wordt hier nader op ingegaan.

3.14. Vijverhofstraat (Hofje)

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 12 toetspunten (toetspunt 1 t/m 12). De toetspunten zijn voor de Vijverhofstraat (Hofje) op 0,75m hoogte boven de vloer van de begane grond geplaatst. De toetspunten zijn in figuur 3.13. weergegeven. De toetspunten 7 en 8 en 9 zijn indicatief bedoeld en gepositioneerd ter hoogte van de dakramen in de bestaande situatie. Conform het Afwegingskader bezonning hoeven enkel gevels beschouwd te worden, en dient alleen de eerste woonlaag van een gebouw beoordeeld te worden.



figuur 3.13: positie toetspunten op gevel Vijverhofstraat (Hofje)

3.14.1. stap 1 afwegingskader

In bijlage 14. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoet toetspunt 7 aan de minimale bezonningsuren. In tabel 3.13. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.13.: bezonning Vijverhofstraat per toetspunt op 21 september

situatie	toetspunt								
		2	3	4	5	6	7	8	9
huidig	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	4 u; 30 min.	3 u; 30 min.	5 u	5 u
nieuw	4 u	4 u	4 u	4 u	4 u	4 u	0 u	2 u	4 u

3.14.2. stap 2 afwegingskader

Uit tabel 3.13. blijkt dat stap 2 gevolgd moet worden voor toetspunt 7; er is nader onderzoek nodig. Aangezien dit toetspunt in de bestaande situatie 2 uur bezonning heeft op de toetsdatum is de clausule “afname minder dan 15% ten opzichte van de bestaande situatie toegestaan” niet van toepassing.

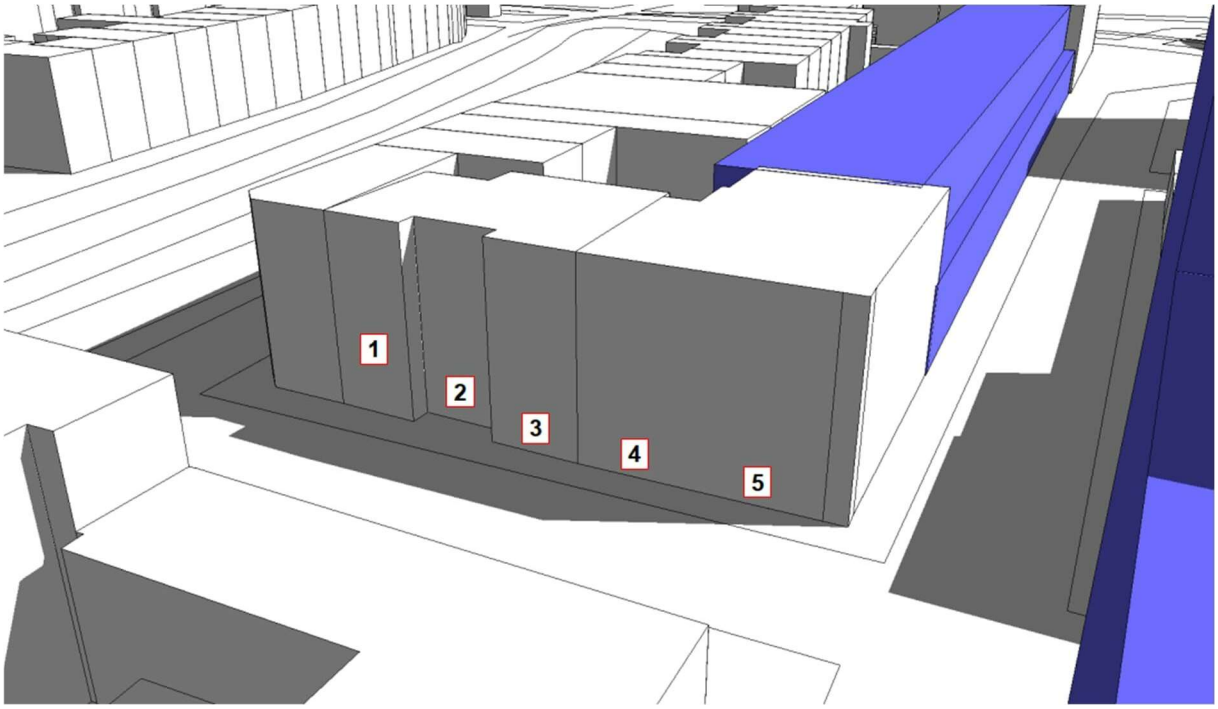
3.14.3. stap 3 afweging bezonning Vijverhofstraat

Er wordt voor toetspunt 7 een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen.

In hoofdstuk 4 Afweging wordt hier nader op ingegaan.

3.15. Zomerhofstraat

Om de bezonning per geveldeel in kaart te brengen, is de gevel opgedeeld in 5 toetspunten (toetspunt 1 t/m 5). Toetspunt 1 voor de Zomerhofstraat is op 0,75m hoogte boven de vloer van de eerste verdieping geplaatst omdat op die positie op de begane grond geen verblijfruimte aanwezig is. De overige toetspunten zijn op de begane grond geplaatst. De toetspunten zijn in figuur 3.14. weergegeven.



figuur 3.14: positie toetspunten op gevel Zomerhofstraat

3.15.1. stap 1 afwegingskader

In bijlage 15. zijn afbeeldingen van de resultaten weergegeven van de situatie met de nieuwbouw ZOHO. In de nieuwe situatie voldoet geen van de toetspunten aan de minimale bezonningsuren. In tabel 3.14. zijn de bezonningsuren per toetspunt samengevat voor de uitgevoerde studie op 21 september.

tabel 3.14.: bezonning Zomerhofstraat per toetspunt op 21 september

	toetspunt				
situatie	1	2	3	4	5
huidig	2 u; 30 min.	1 u; 30 min.	3 u	3 u; 30 min.	3 u; 30 min.
nieuw	30 min.	0 min.	30 min.	30 min.	30 min.

3.15.2. stap 2 afwegingskader

Uit tabel 3.14. blijkt dat stap 2 gevolgd moet worden voor alle toetspunten; er is nader onderzoek nodig. Voor de toetspunten 1 en 3 tot en met 5 geldt dat deze in de bestaande situatie 2,5 tot 3,5 uur bezonning hebben op de toetsdatum waardoor de clausule “afname minder dan 15% ten opzichte van de bestaande situatie toegestaan” niet van toepassing is op deze punten en moet stap 3 van het Afwegingskader doorlopen worden.

Op toetspunt 2 wordt ook niet voldaan aan 2 uur bezonning, noch in de bestaande noch in de nieuwe situatie. Omdat de afname meer dan 15% is zal ook voor toetspunt 2 stap 3 van het Afwegingskader doorlopen moeten worden.

3.15.3. stap 3 afweging bezonning Zomerhofstraat

Er wordt voor de toetspunten 1 tot en met 5 een afweging gemaakt of de voordelen van het nieuwbouwplan opwegen tegen de afname van bezonning van bestaande woningen.

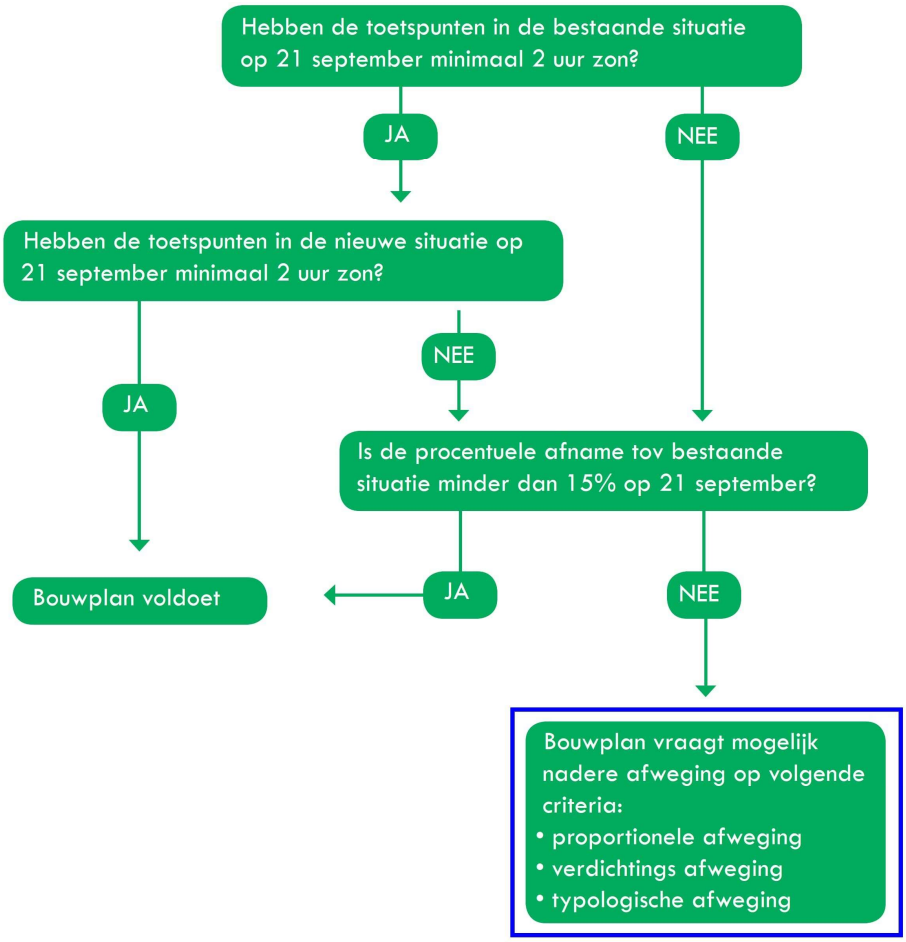
In hoofdstuk 4 Afweging wordt hier nader op ingegaan.

4. AFWEGING

Zoals in de resultaten is terug te vinden voldoet het merendeel van de toetspunten aan de minimale 2 uur bezonning op de toets datum.

Op basis van het Afwegingskader (zie afbeelding 4.1) moet een nadere afweging gemaakt worden voor de toetspunten waarbij de afname in bezonning meer dan 15% is. Dit betreft de volgende 14 toetspunten:

- Almondestraat West: toetspunten 1 tot en met 5
- Noordsingel 54-72: toetspunt 10
- Teilingerstraat Zuid: toetspunten 2 en 4
- Vijverhofstraat: toetspunt 7
- Zomerhofstraat: toetspunten 1 tot en met 5



Afbeelding 4.1. schematische weergave van het Afwegingskader bezonning

5. CONCLUSIE

Voor de nieuwbouw ZOHO te Rotterdam is een bezonningsstudie uitgevoerd om inzicht te verkrijgen in de gevolgen van de nieuwbouw voor de omgeving. Er is onderzocht hoeveel mogelijke uren bezonning de omliggende woningen hebben in de huidige en in de nieuwe situatie met de nieuwbouw ZOHO, en wat hierbij de invloed van nieuwbouw is. Hierbij is uitgegaan van Sketchup-model t.b.v. de bezonningsstudie “ZOHO_Zonnestudie_Huidige_situatie” d.d.27 juni 2022 van Leyten Bouwplanontwikkeling met aangepaste situatie conform mail Leyten Bouwplanontwikkeling BV d.d. 25-04-2023, en “ZOHO_Model_Bezonning_en_Wind” d.d.12 oktober 2021 van Leyten Bouwplanontwikkeling met aangepaste hoogten conform conform het ontwerp-bestemmingsplan "Zomerhofkwartier" (dat vanaf vrijdag 1 september 2023 ter inzage is gelegd).

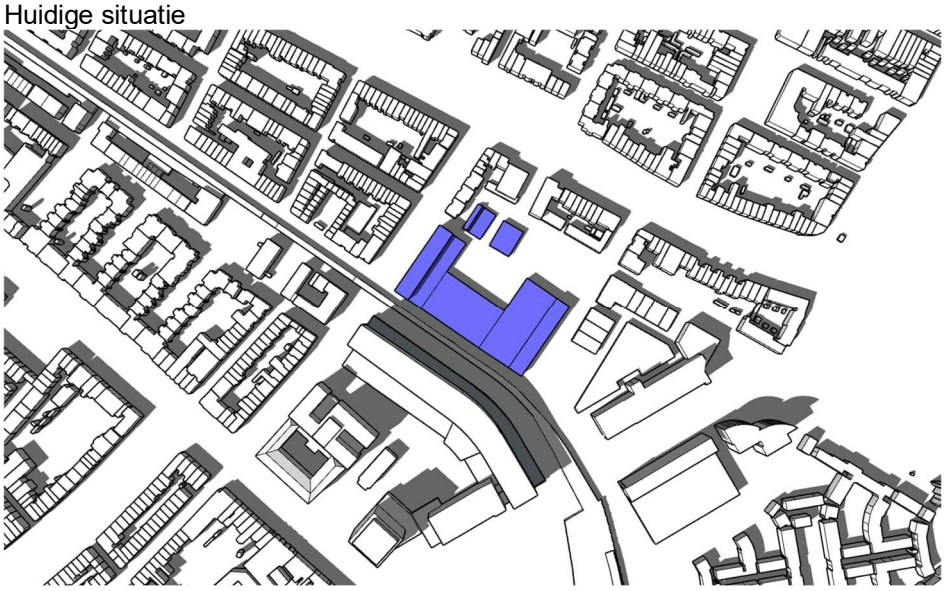
Er zijn geen wettelijke eisen waaraan de bezonning of beschaduwing ten gevolge van een nieuw te bouwen gebouw dient te voldoen. In deze rapportage wordt het Afwegingskader Bezonning van de gemeente Rotterdam gevolgd, welke gebaseerd is op de lichte norm van de TNO-richtlijn met enkele toevoegingen. Een gebouw voldoet aan deze norm wanneer er gedurende twee uren per etmaal bezonning mogelijk is op meetdatum 21 september.

In hoofdstuk 4 is samengevat voor welke punten op basis van het Afwegingskader stap 3 een afweging gemaakt dient te worden.

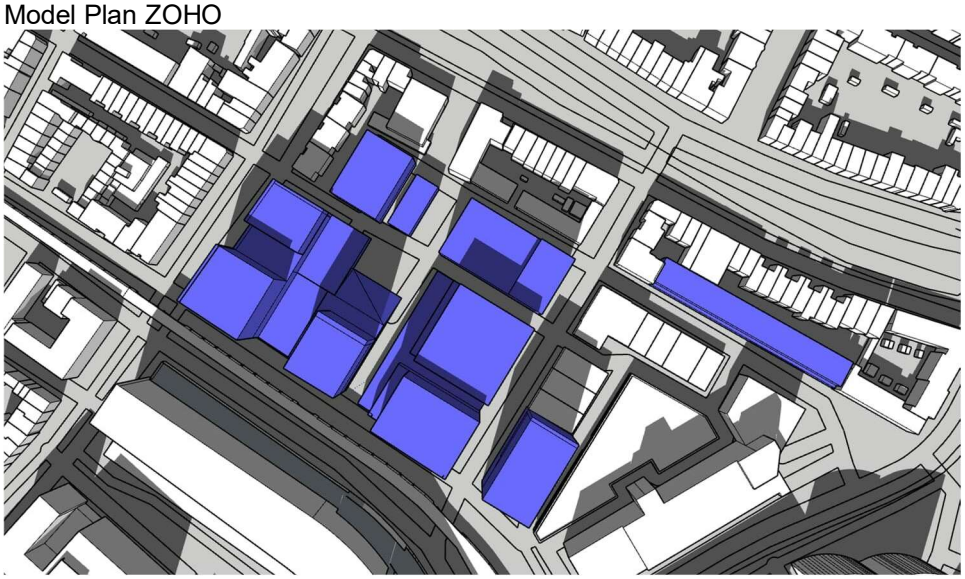
De resultaten van deze bezonningsstudie zijn in tabel 3.1. tot en met 3.16. opgenomen. De afbeeldingen waarop deze tabellen gebaseerd zijn, zijn opgenomen in bijlage 2. tot en met bijlage 15. van deze rapportage.

bijlage 1. locatie overzicht

Huidige situatie

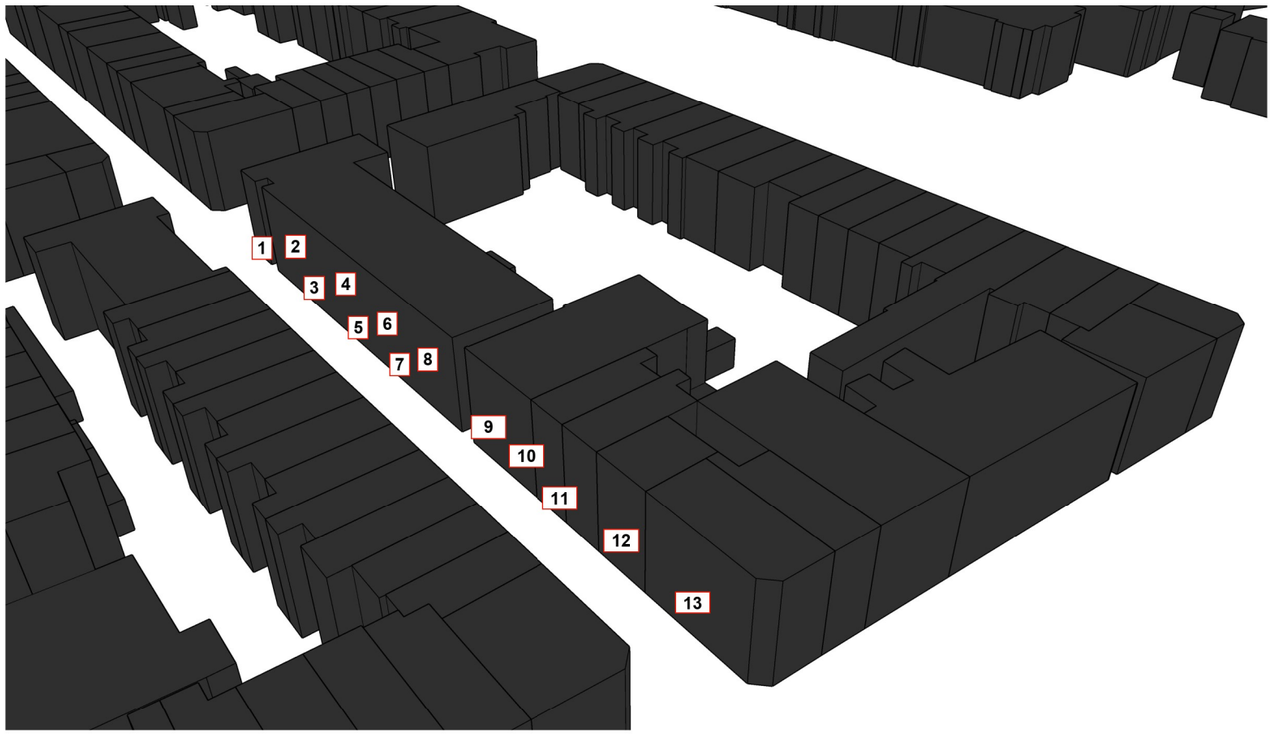


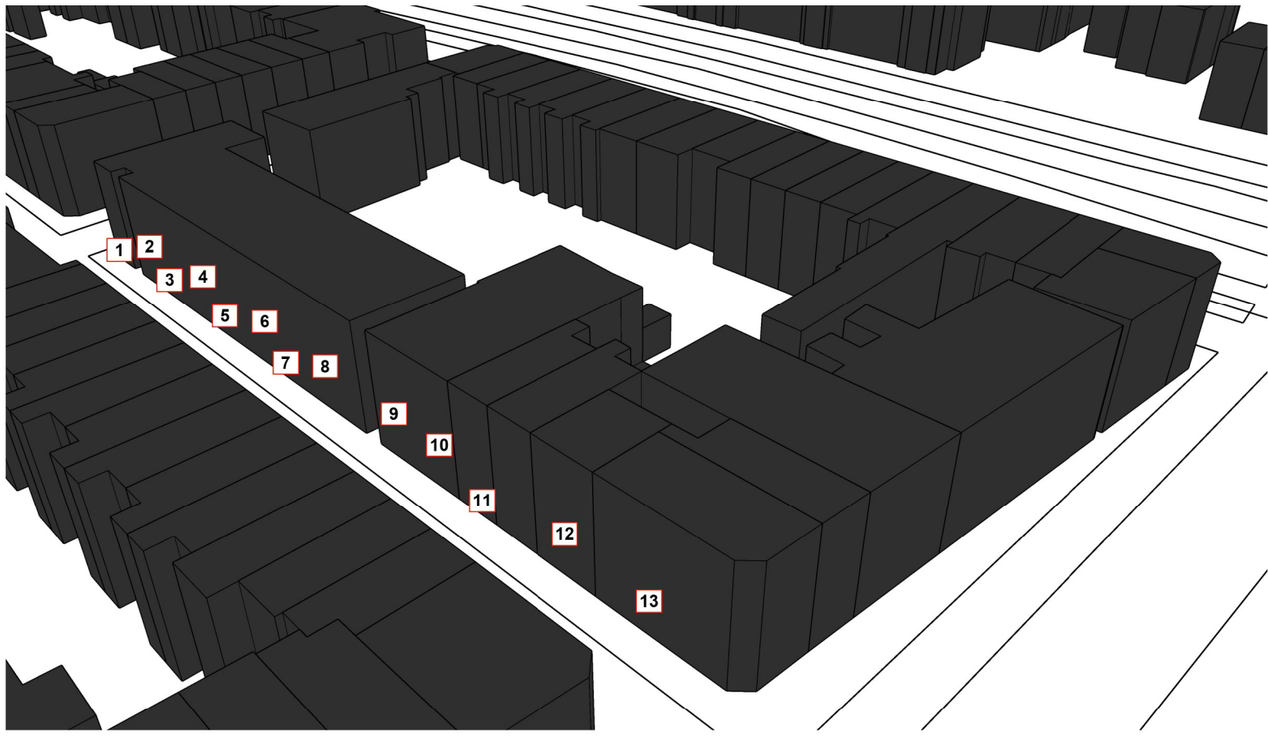
Model Plan ZOHO



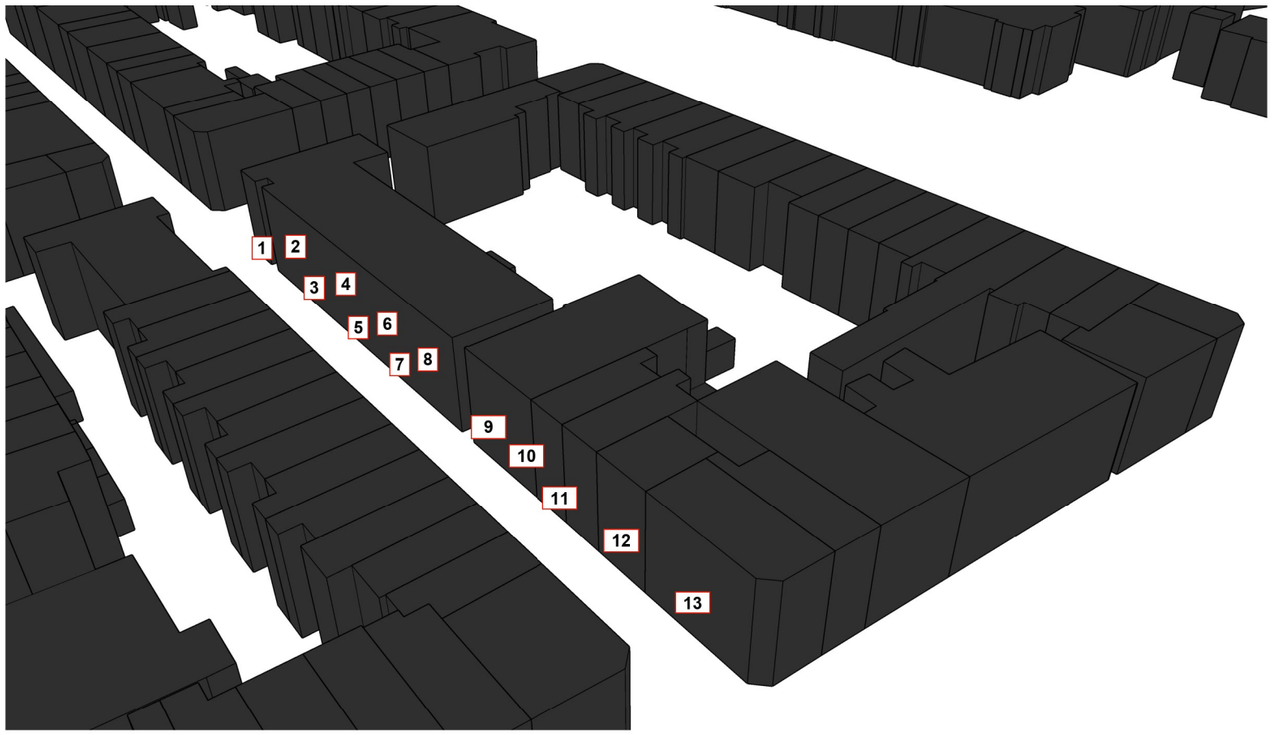
bijlage 2. resultaten 21 september Agniesestraat Noord huidig vs. nieuw

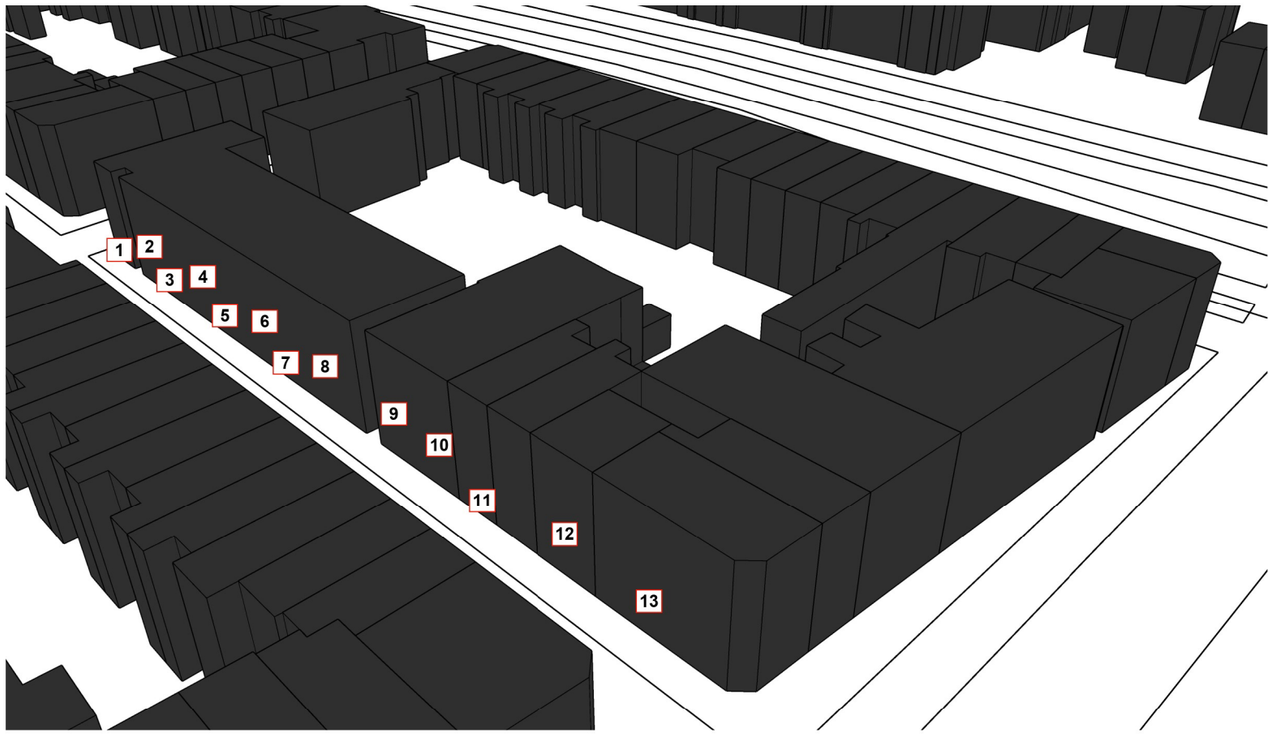
Agniesestraat Noordzijde
21 september
06.00



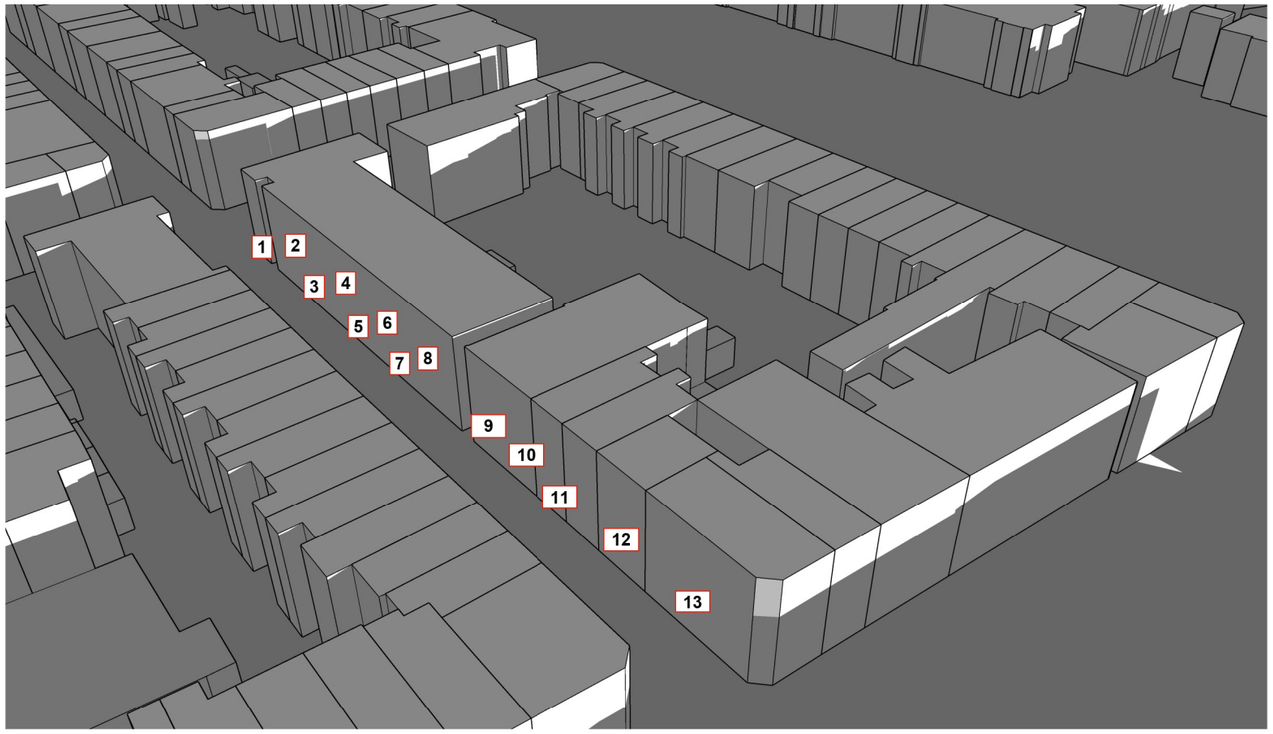


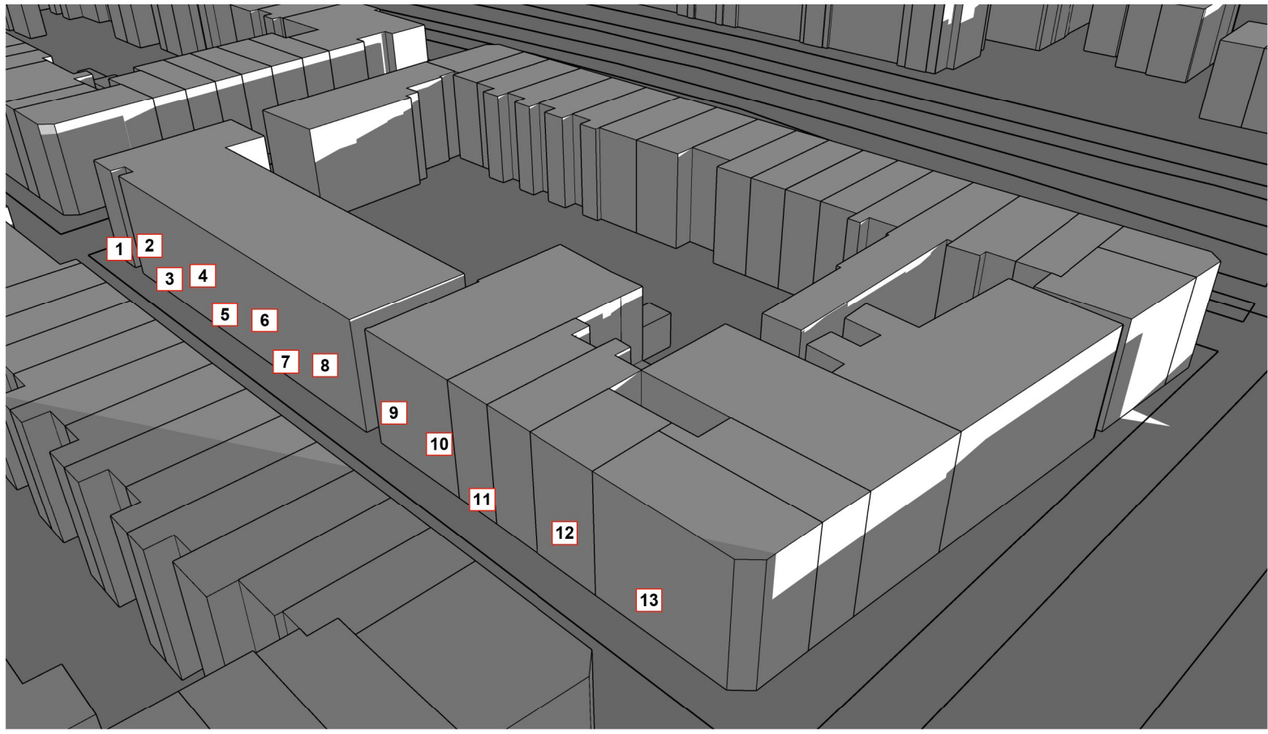
Agniesestraat Noordzijde
21 september
06.30



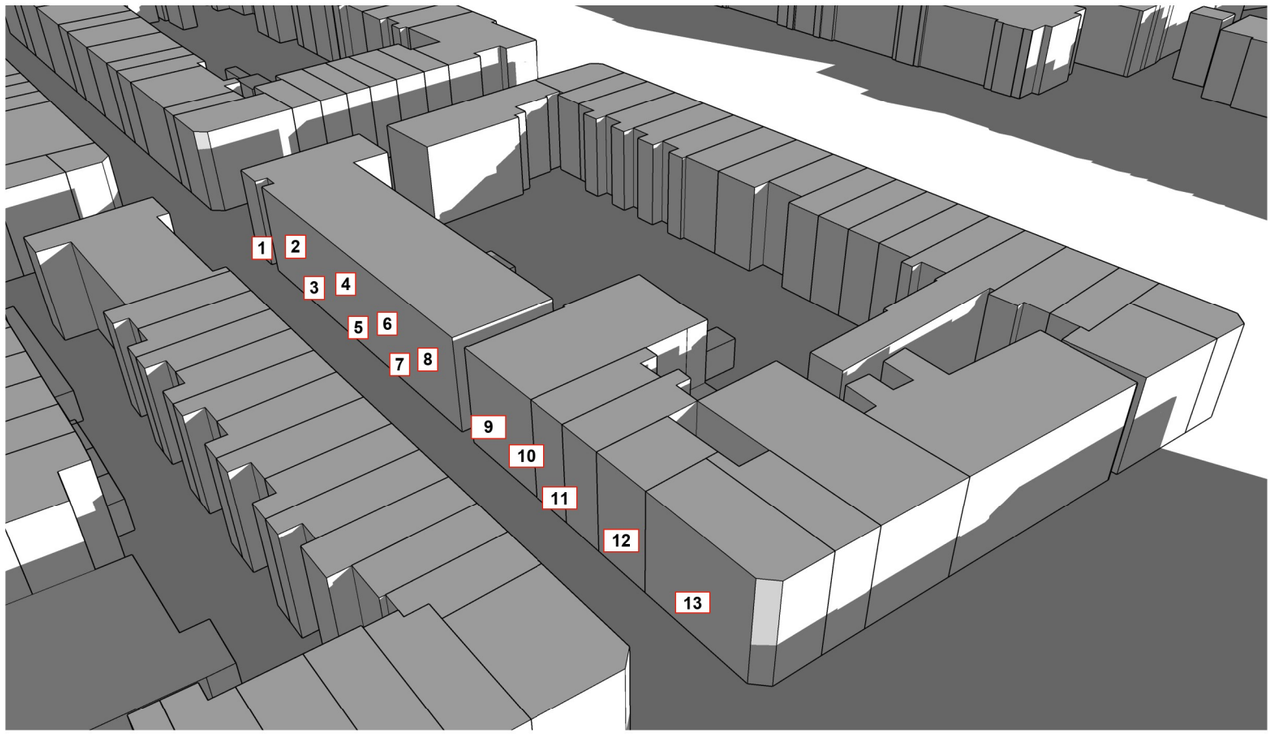


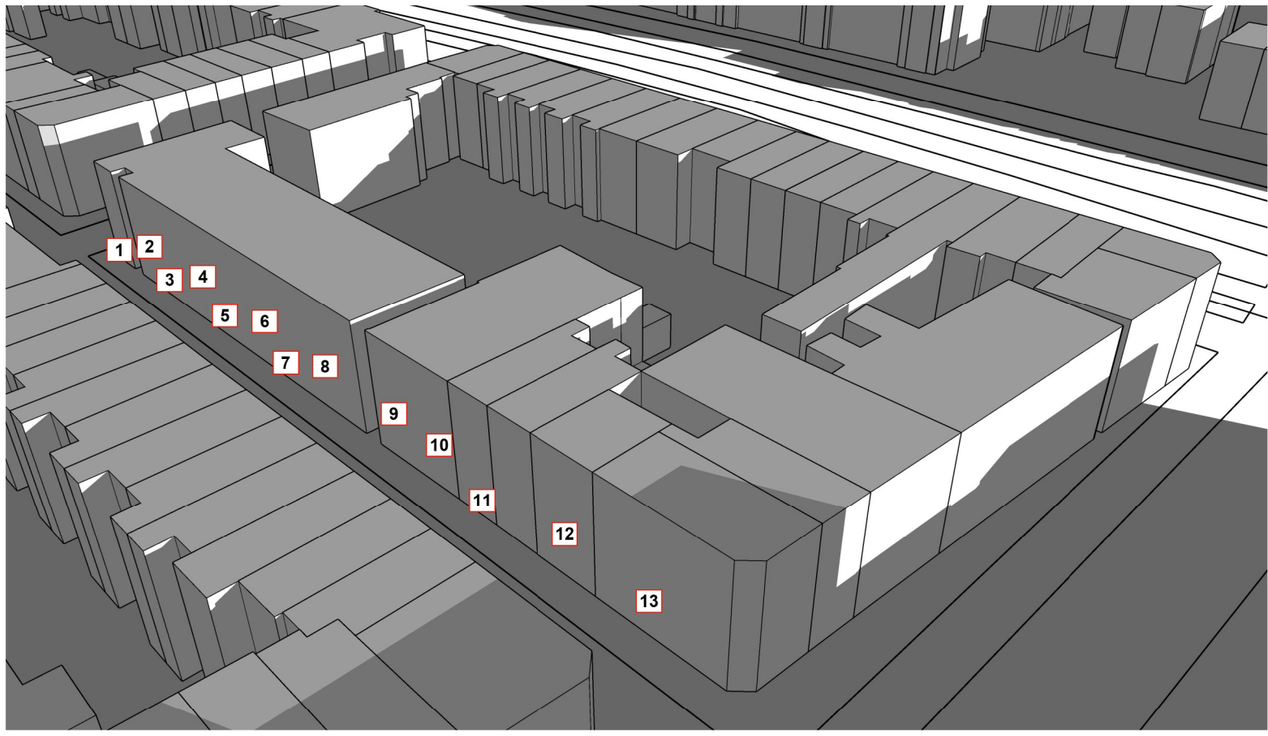
Agniesestraat Noordzijde
21 september
07.00



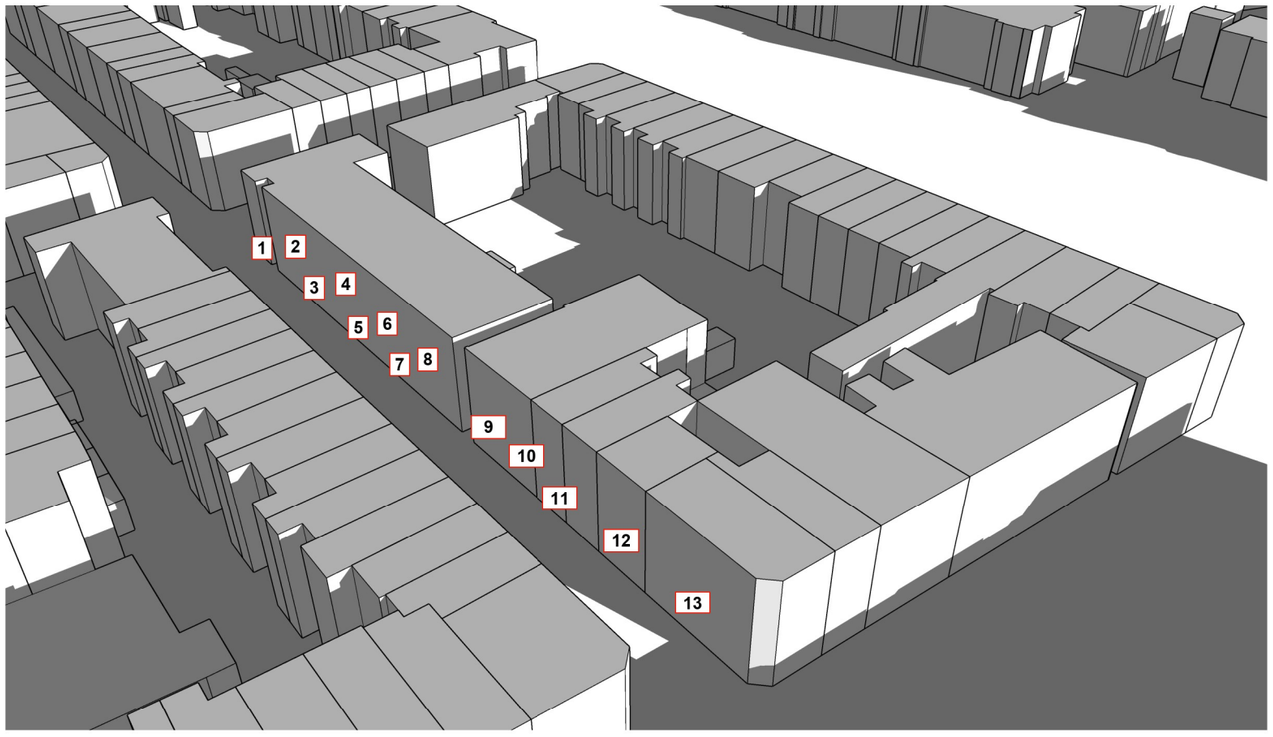


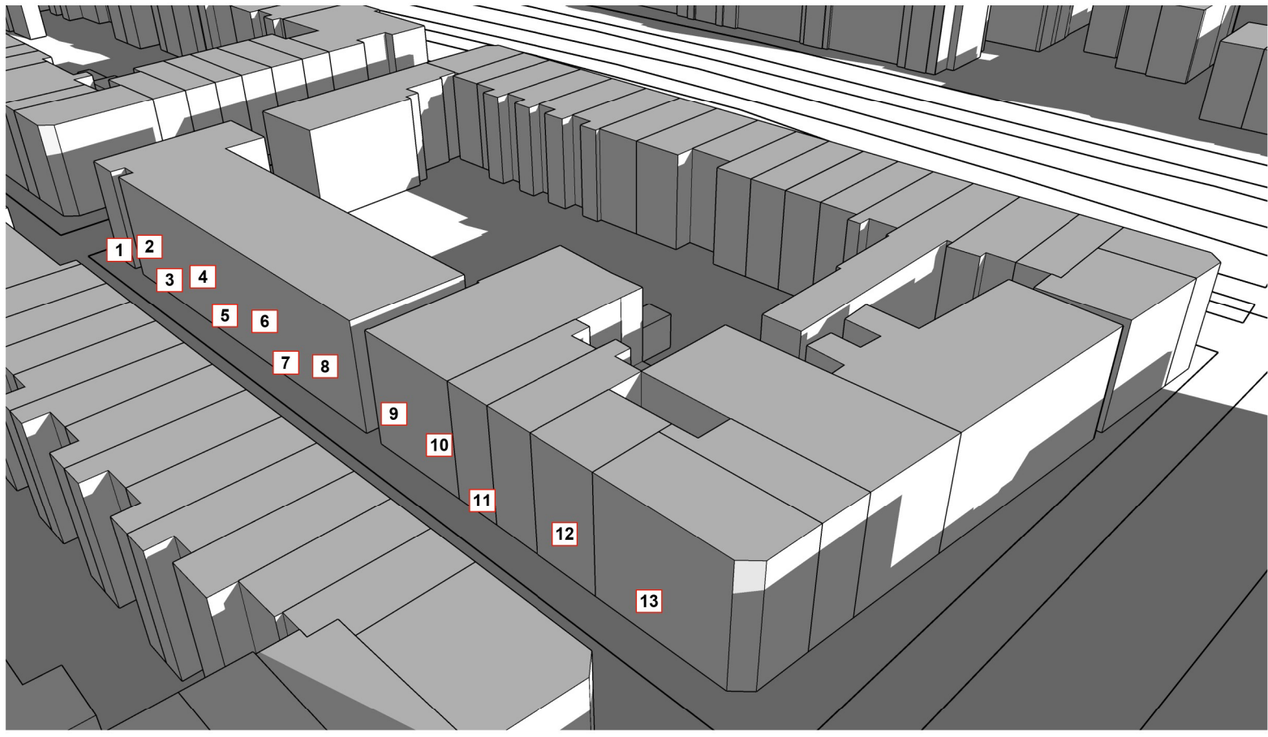
Agniesestraat Noordzijde
21 september
07.30





Agniesestraat Noordzijde
21 september
08.00





Agniesestraat Noordzijde
21 september
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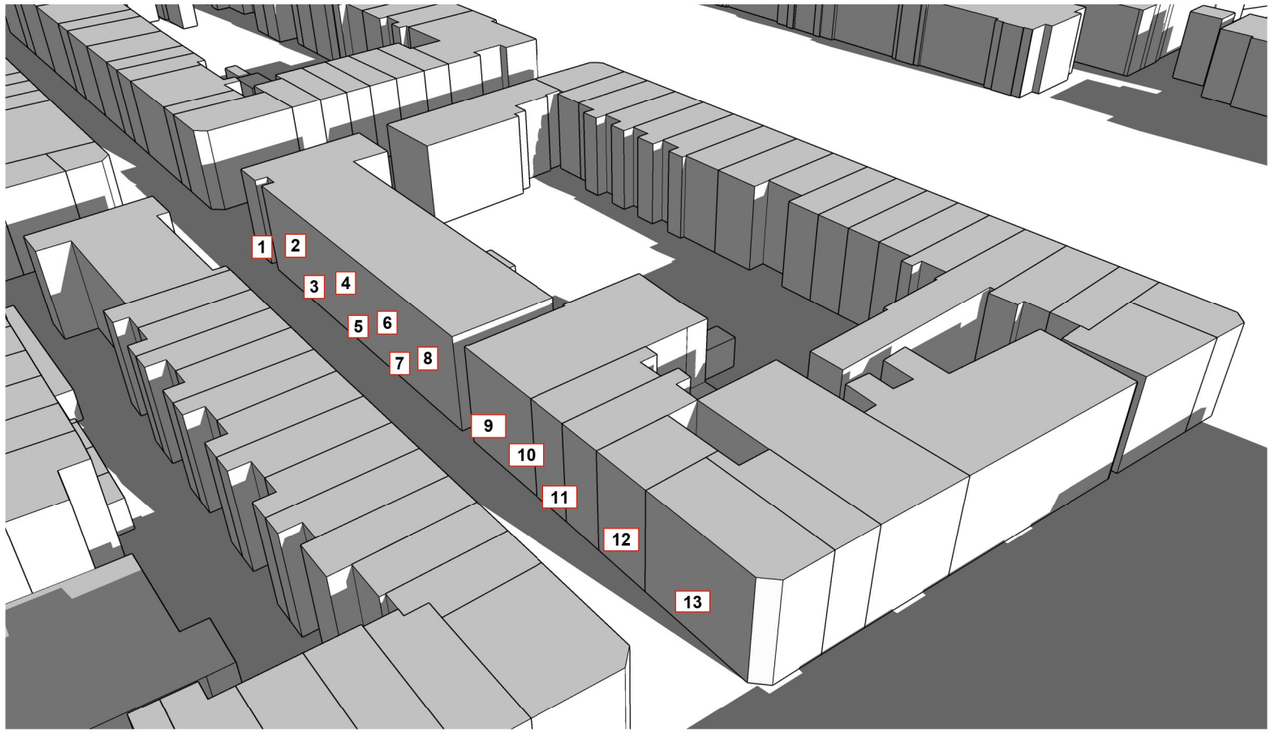
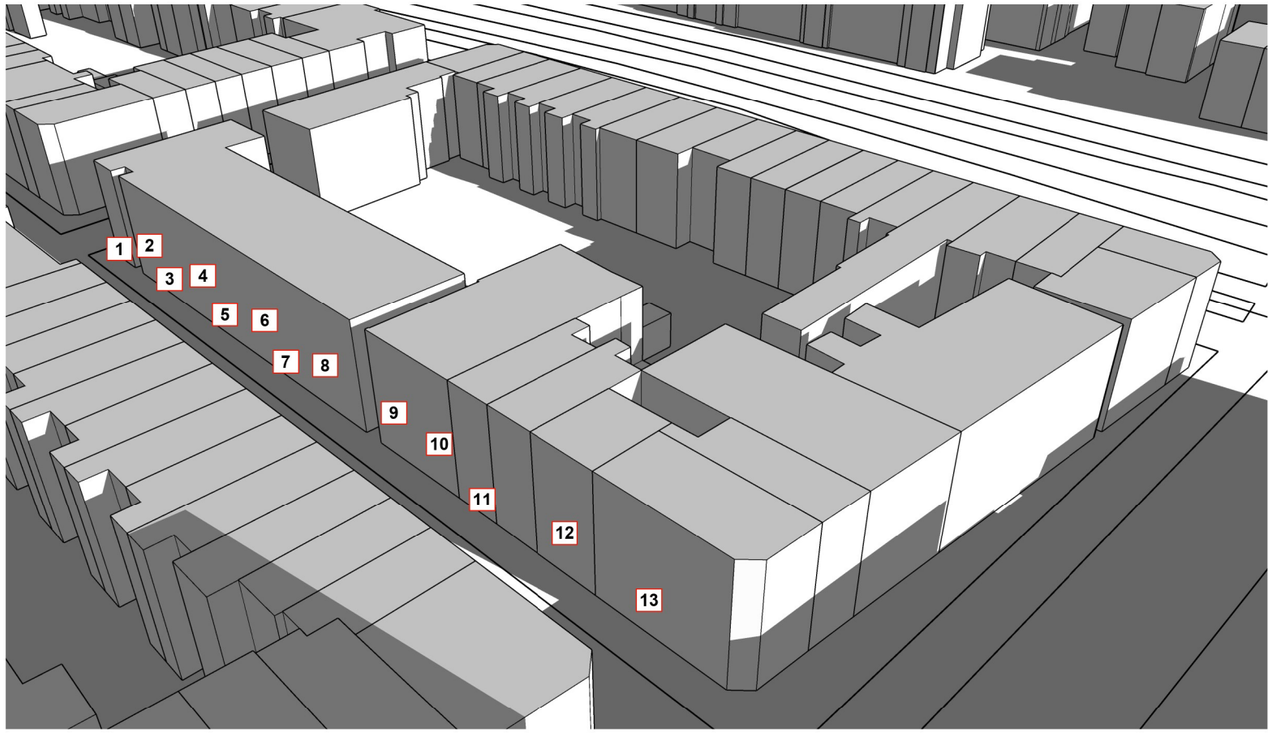
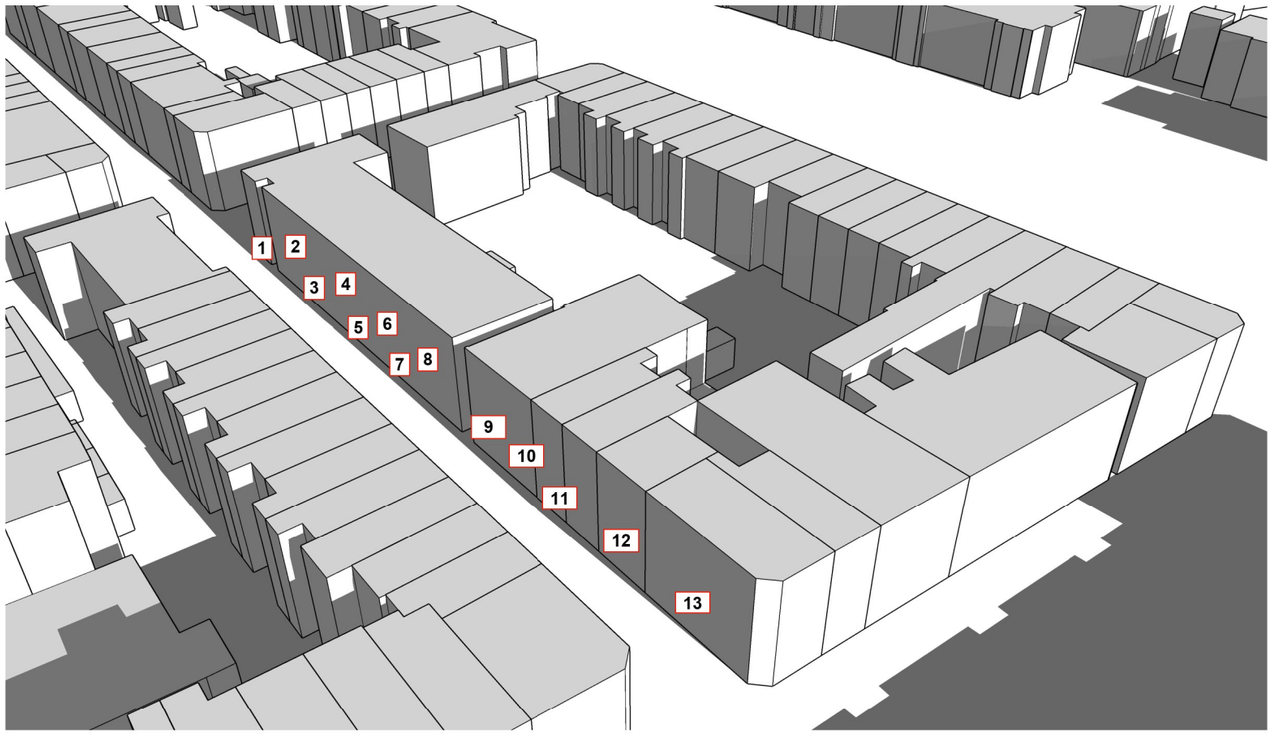
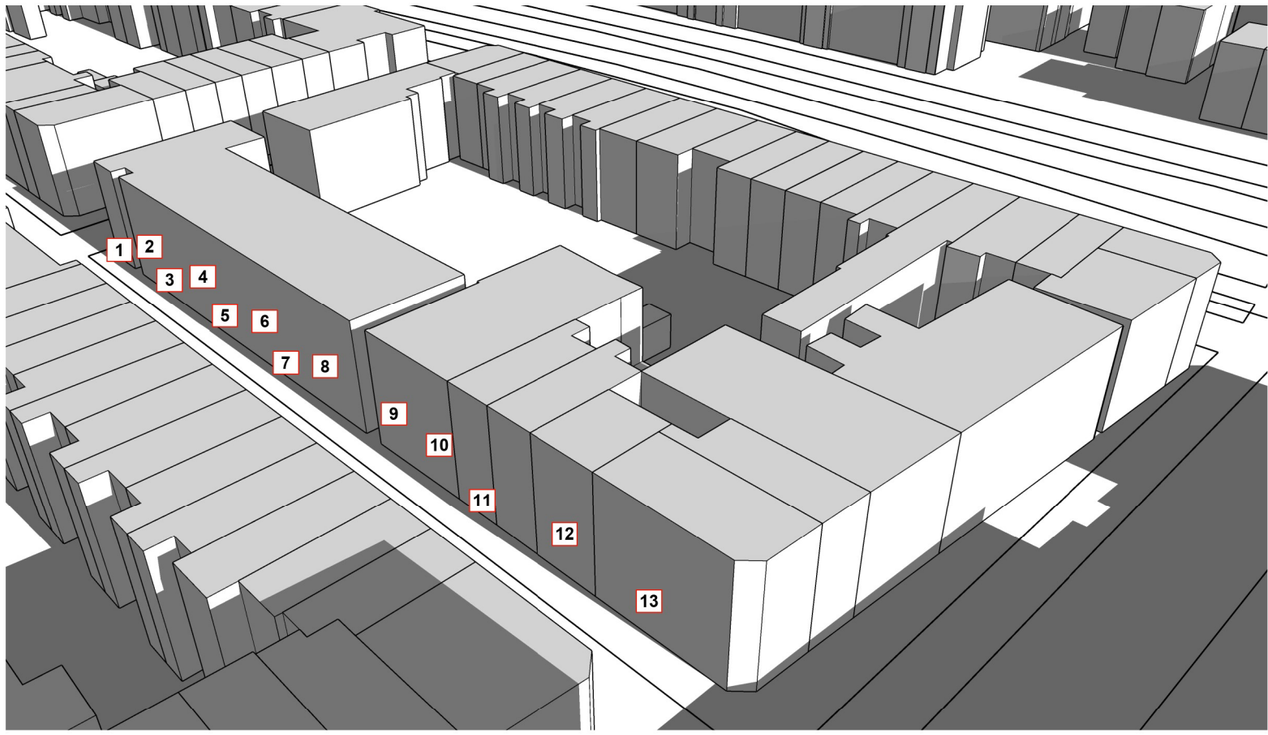


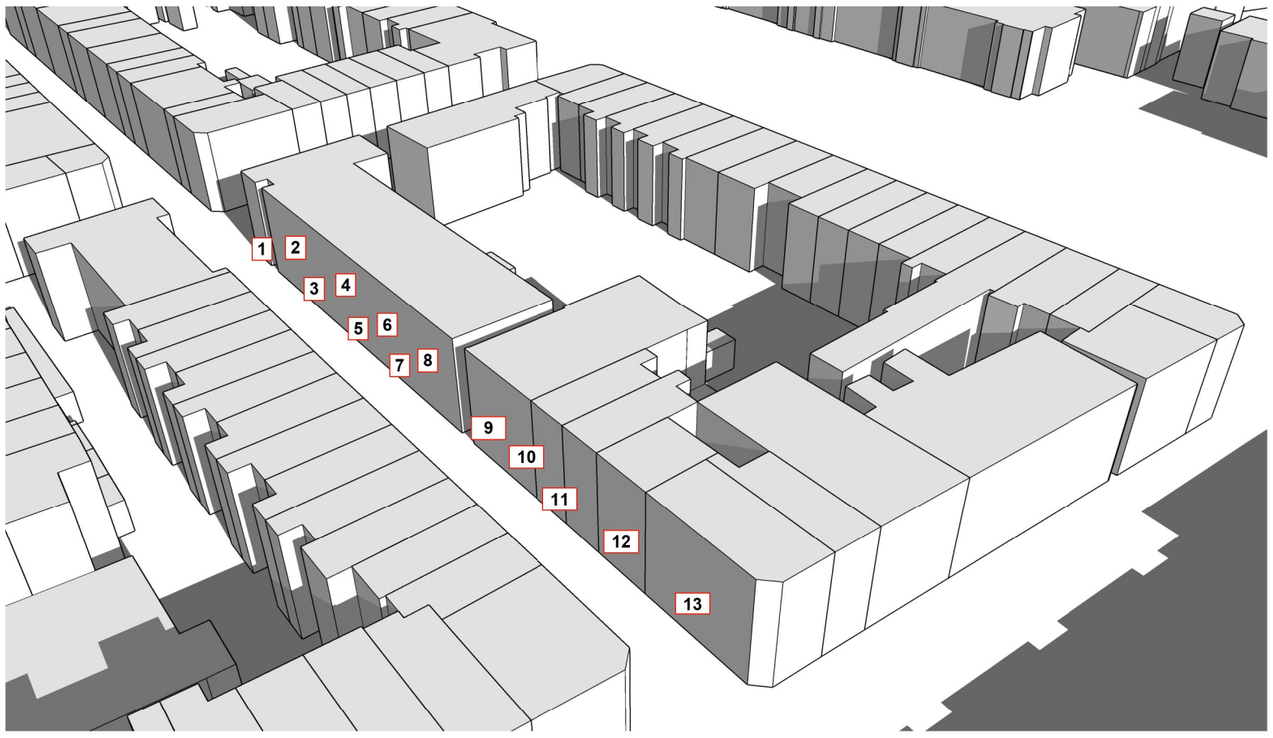


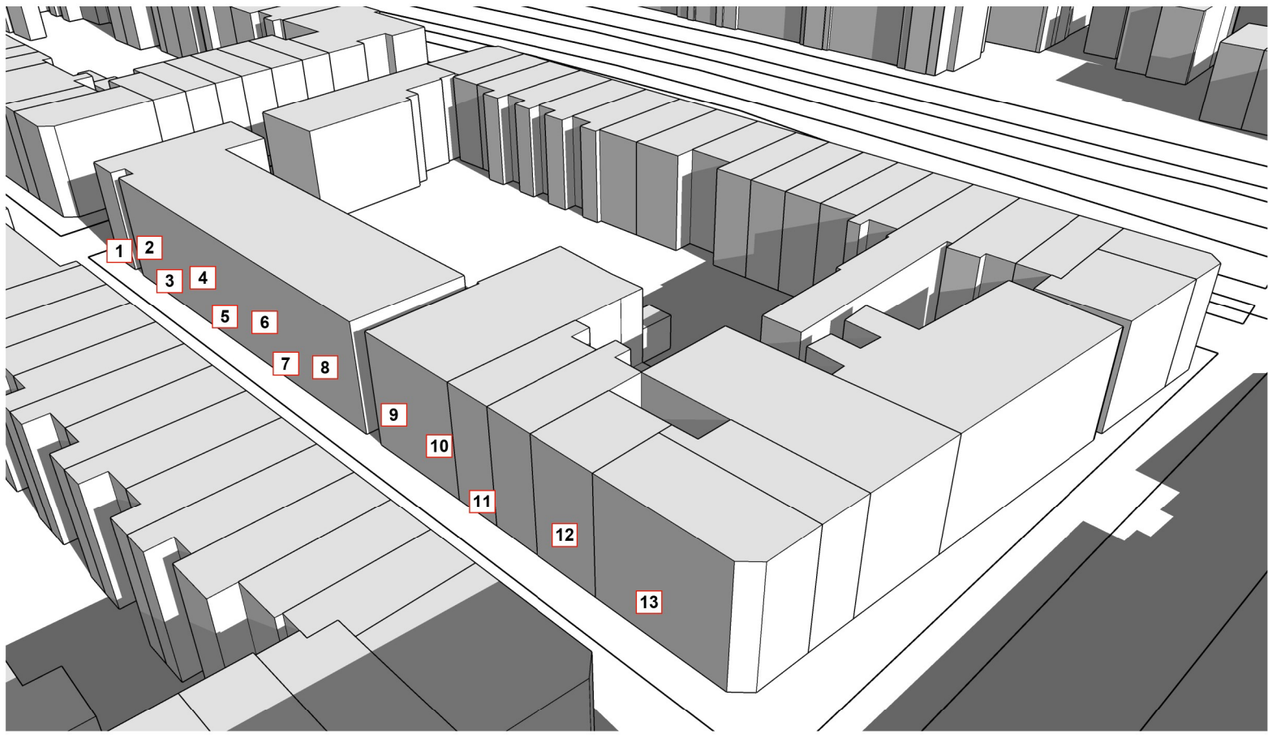
Agniesestraat Noordzijde
21 september
09.00



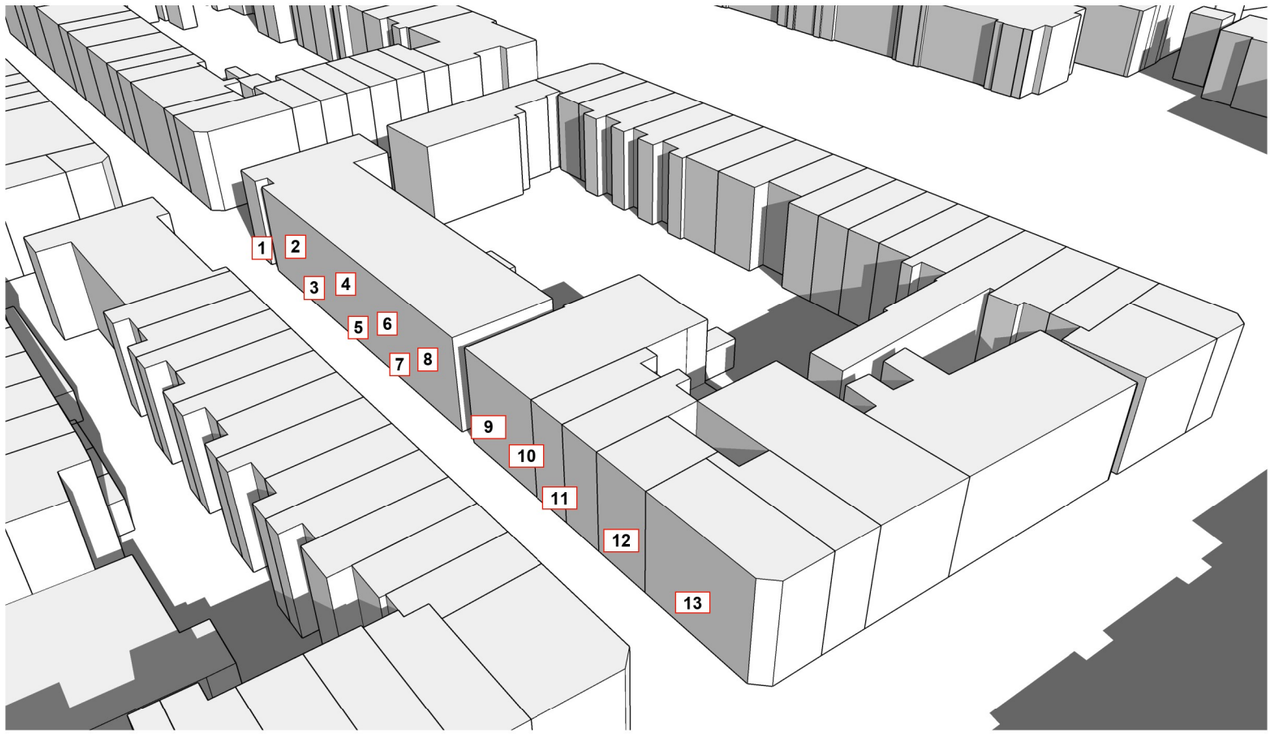


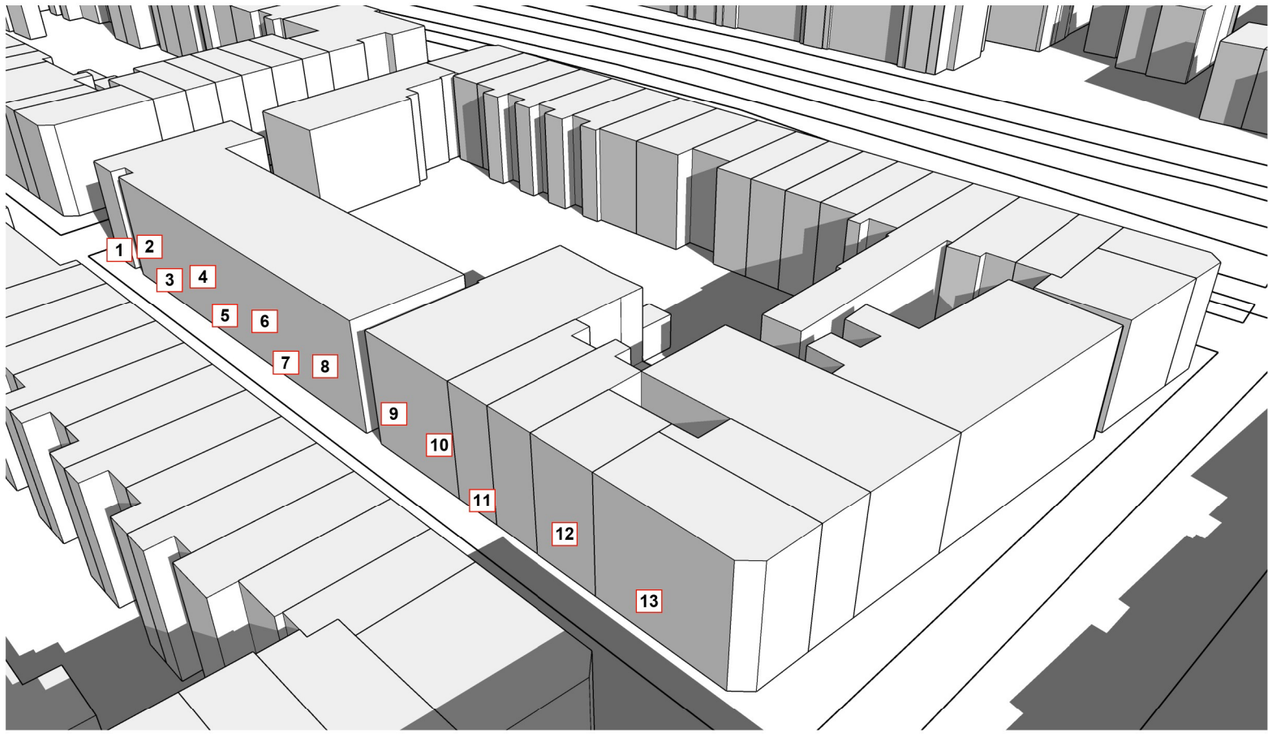
Agniesestraat Noordzijde
21 september
09.30



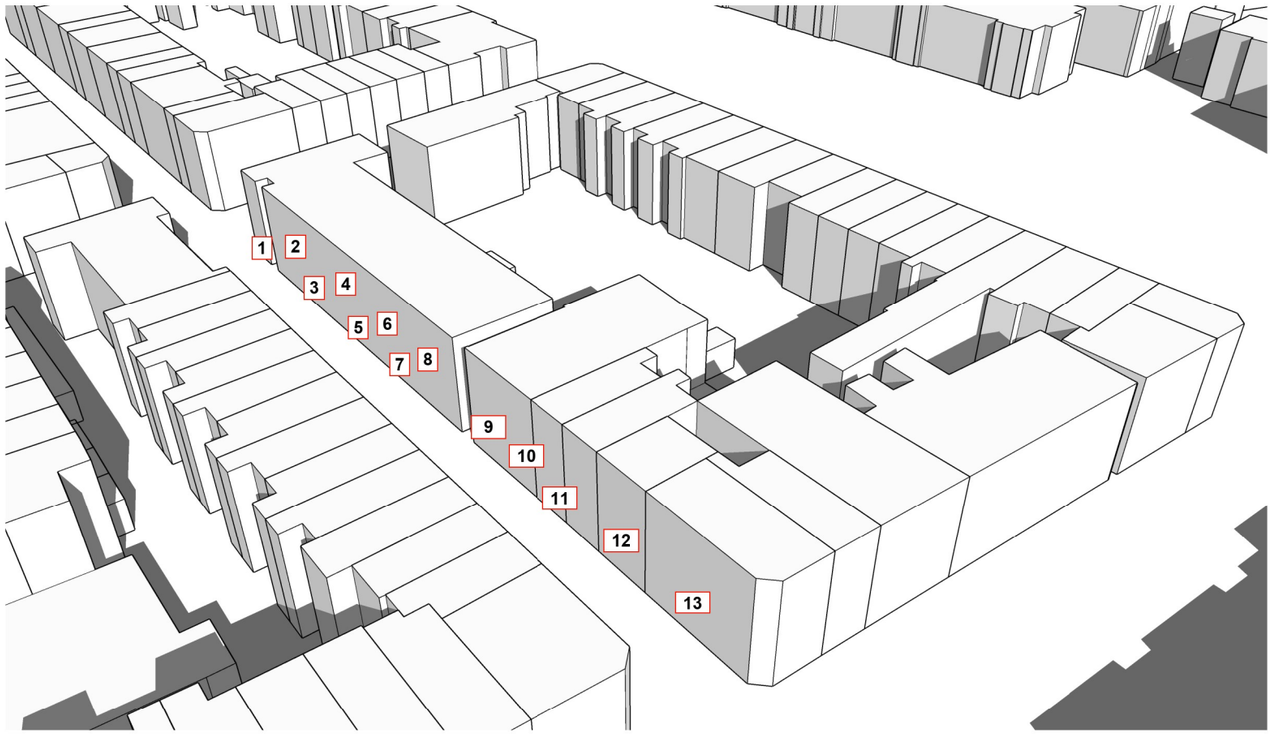


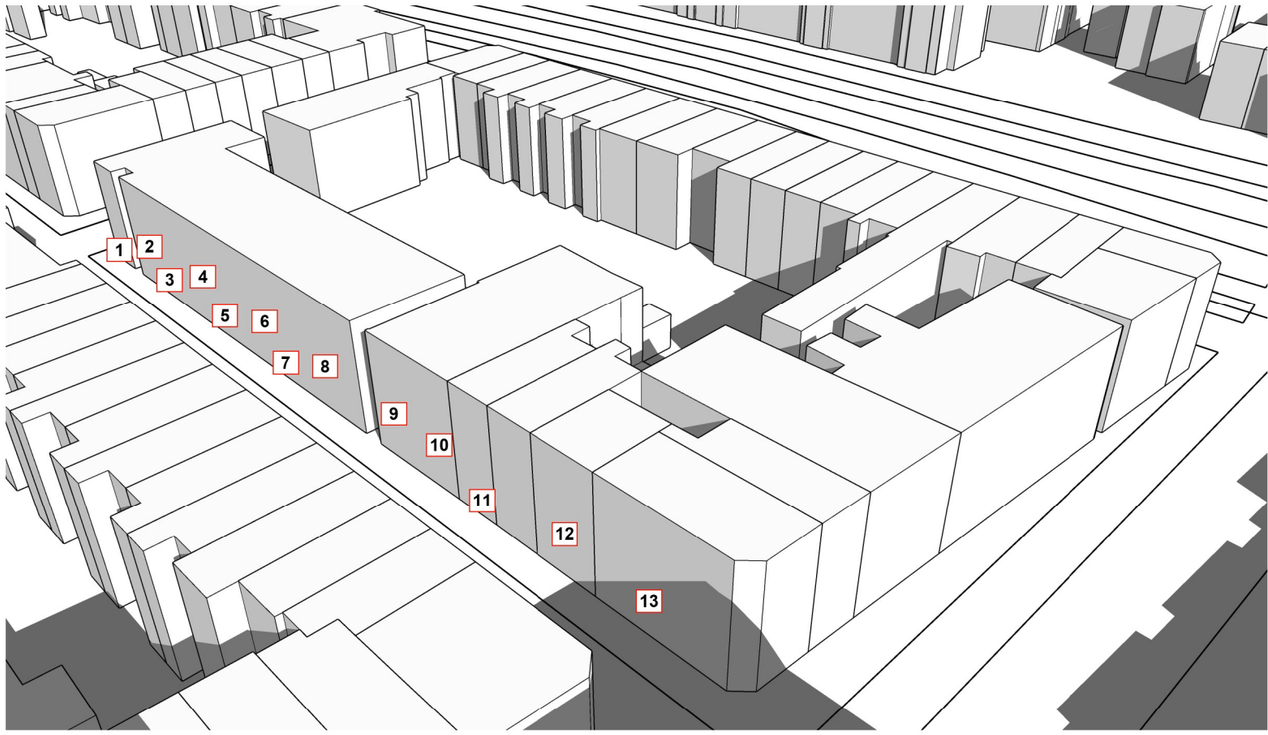
Agniesestraat Noordzijde
21 september
10.00



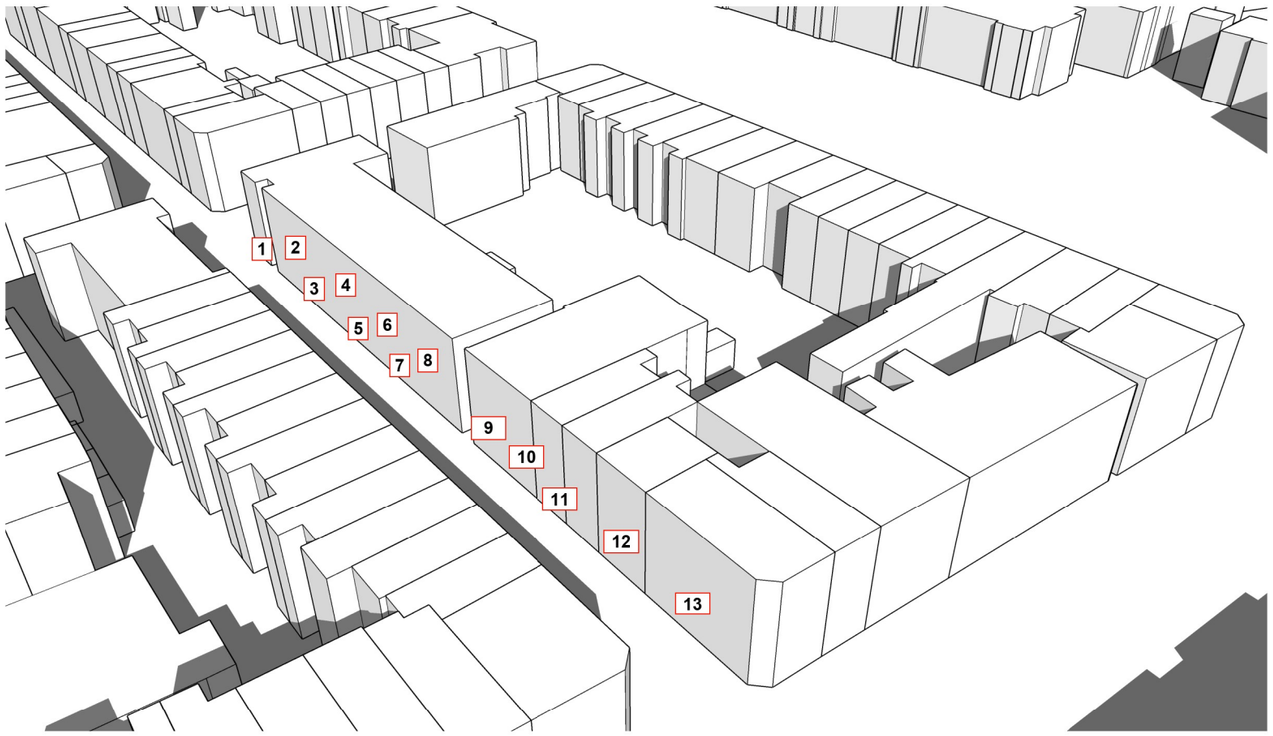


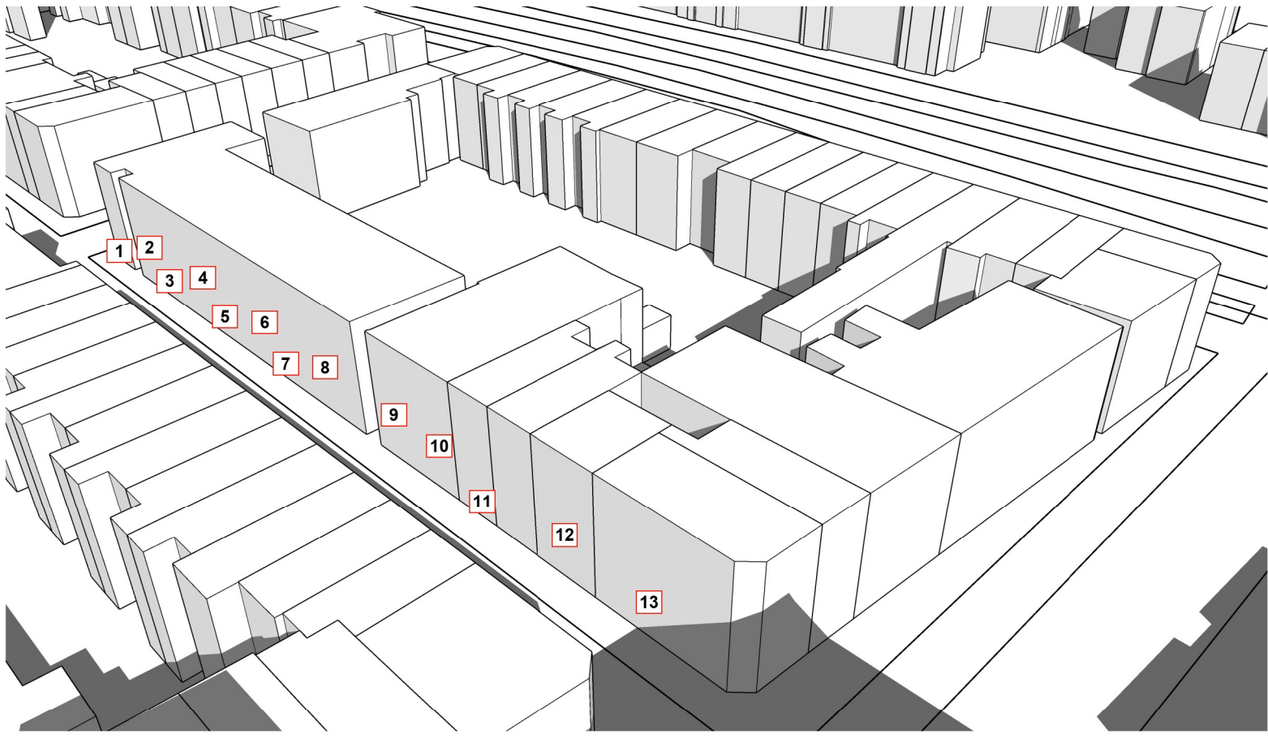
Agniesestraat Noordzijde
21 september
10.30



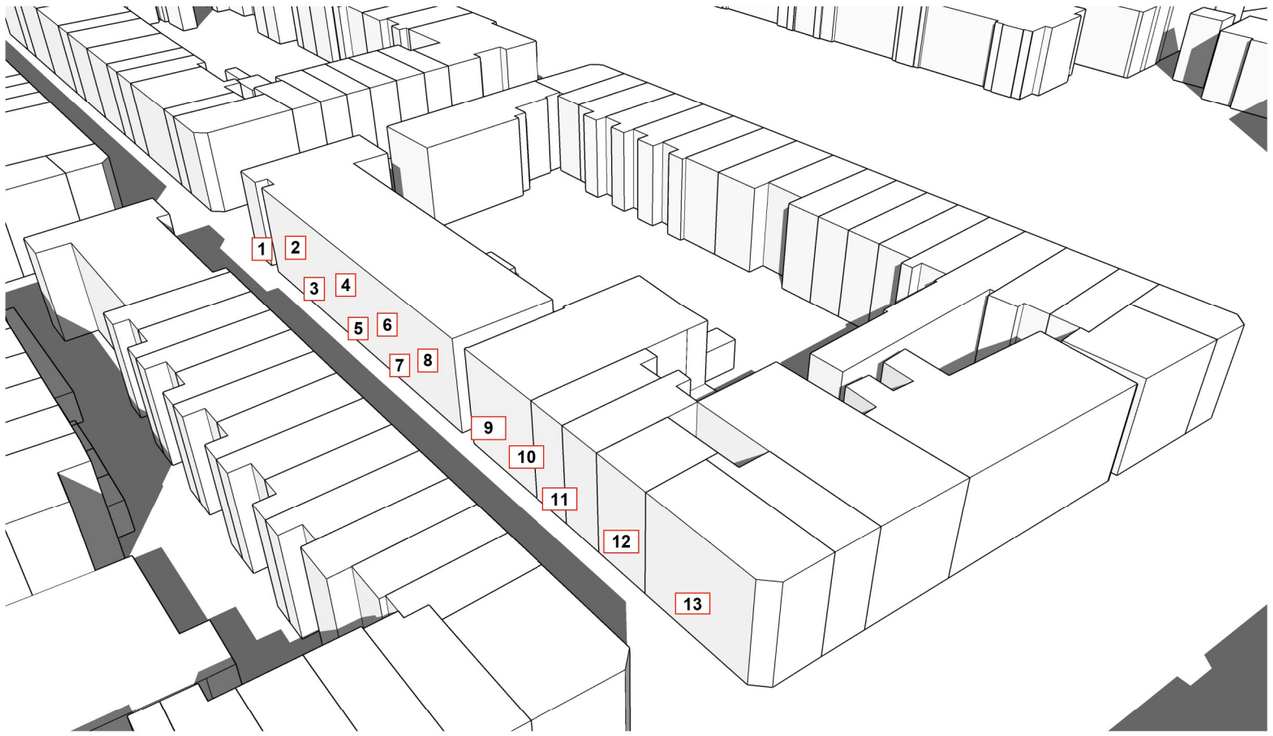


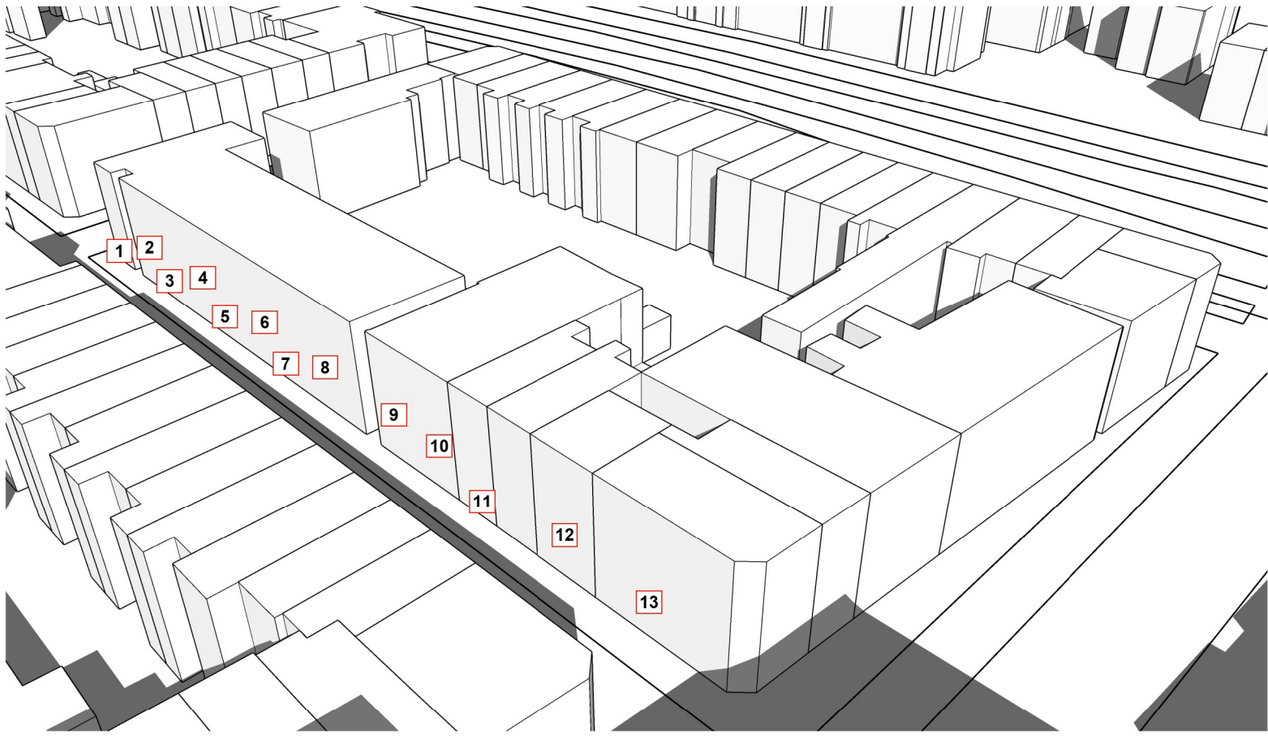
Agniesestraat Noordzijde
21 september
11.00





Agniesestraat Noordzijde
21 september
11.30





Agniesestraat Noordzijde
21 september
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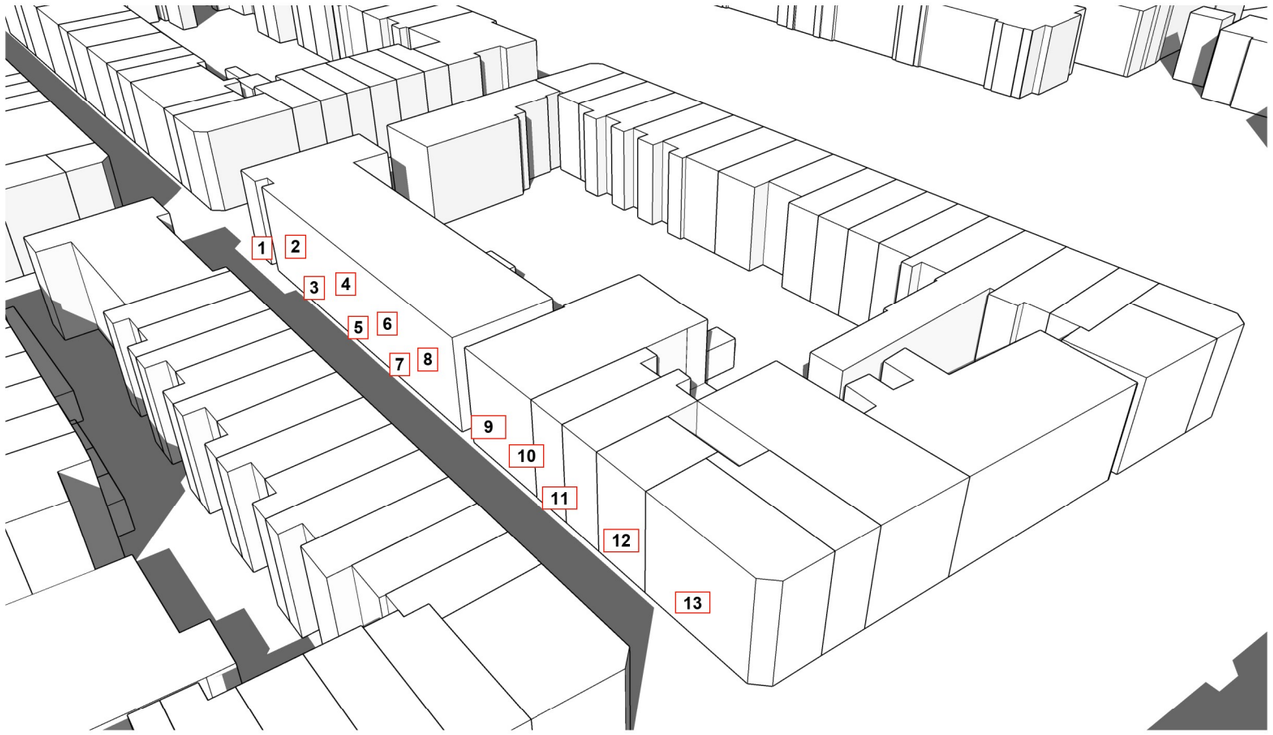

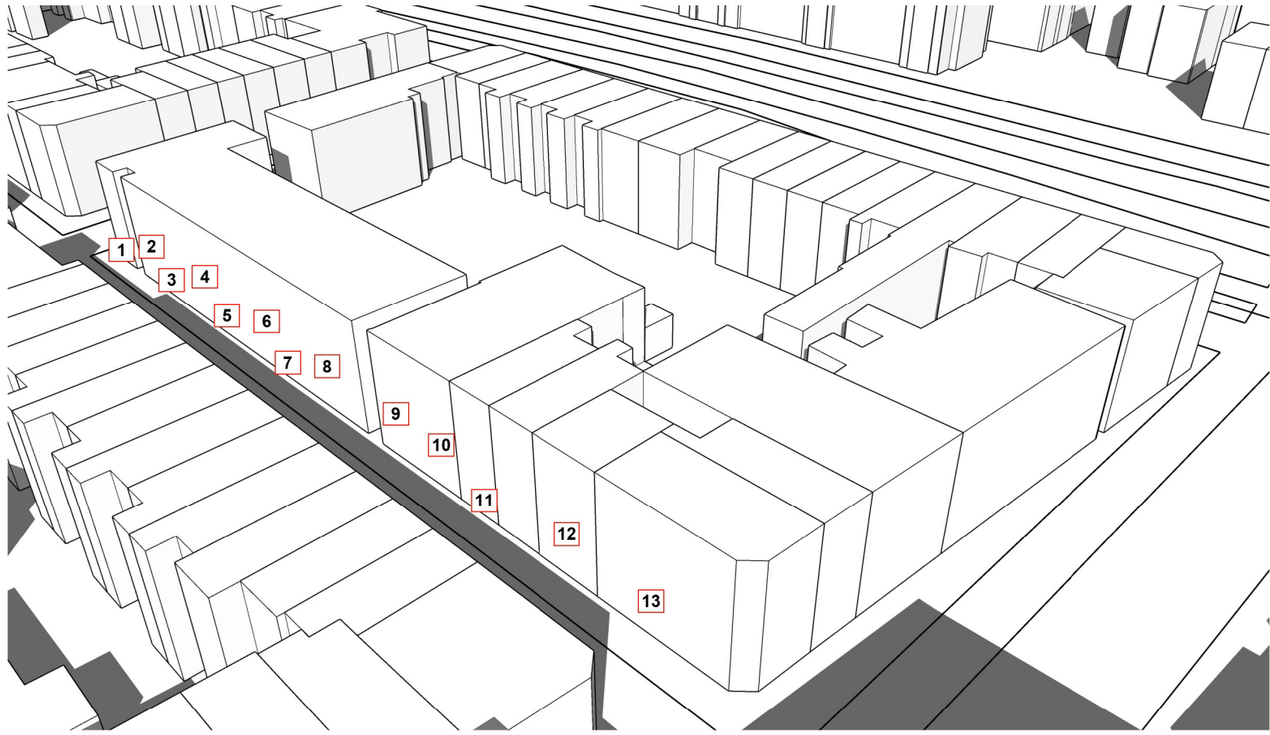

Agniesestraat Noordzijde
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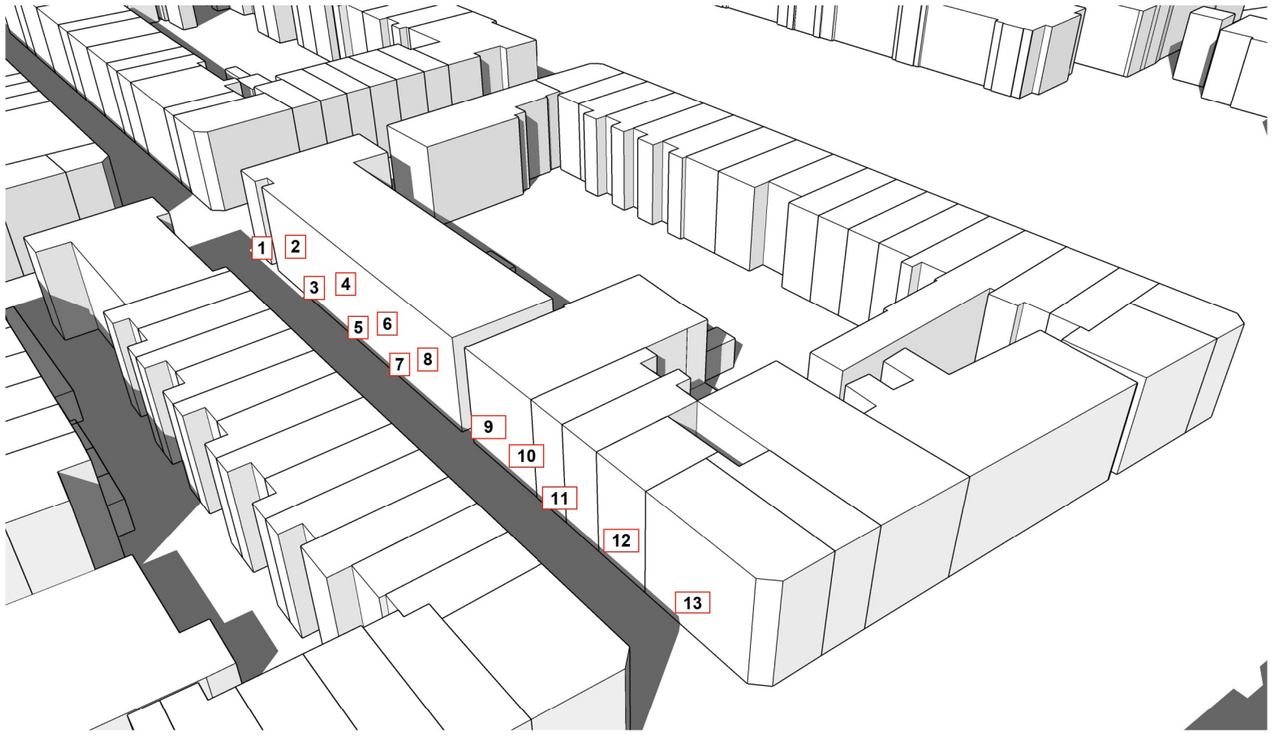

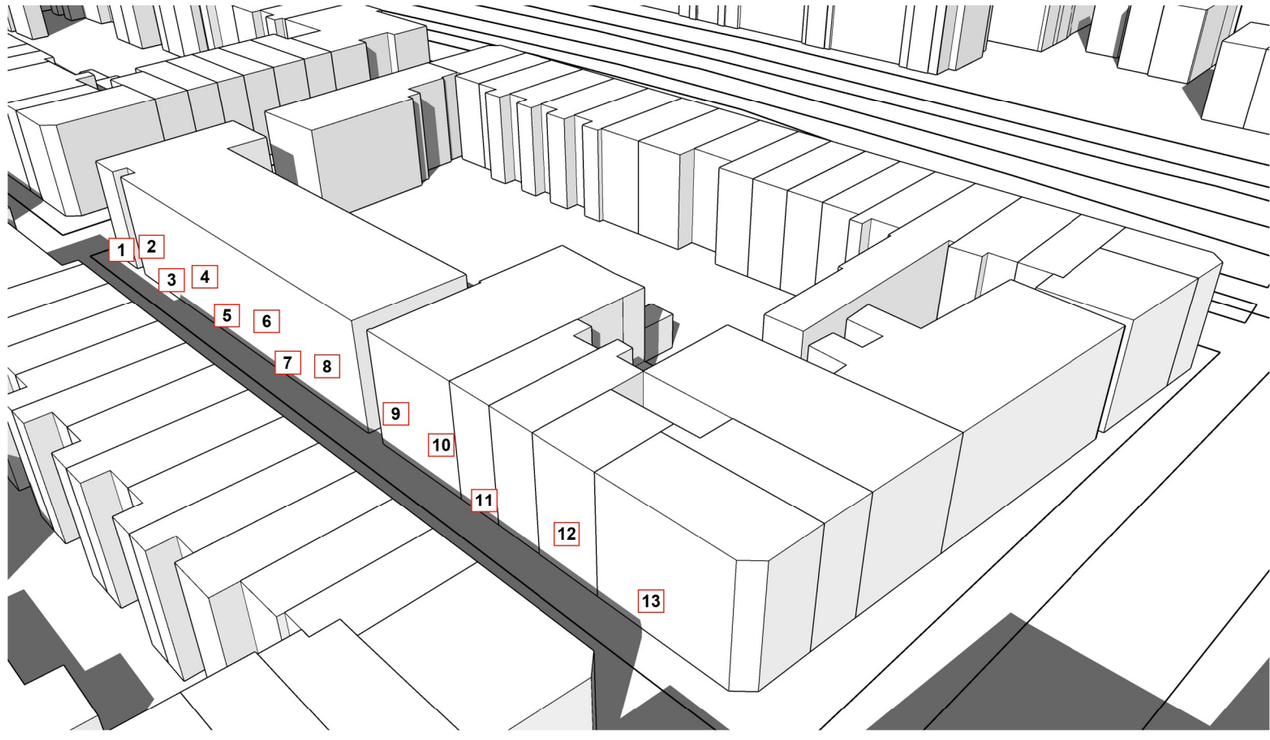

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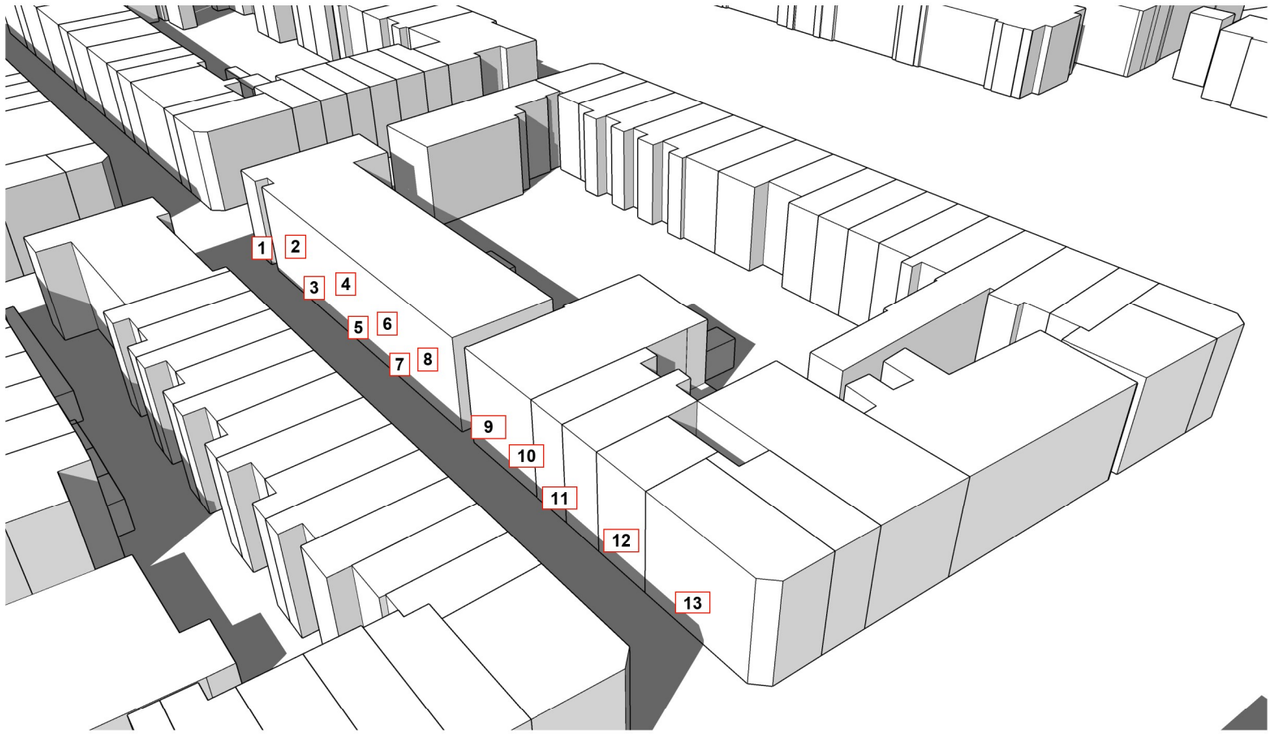

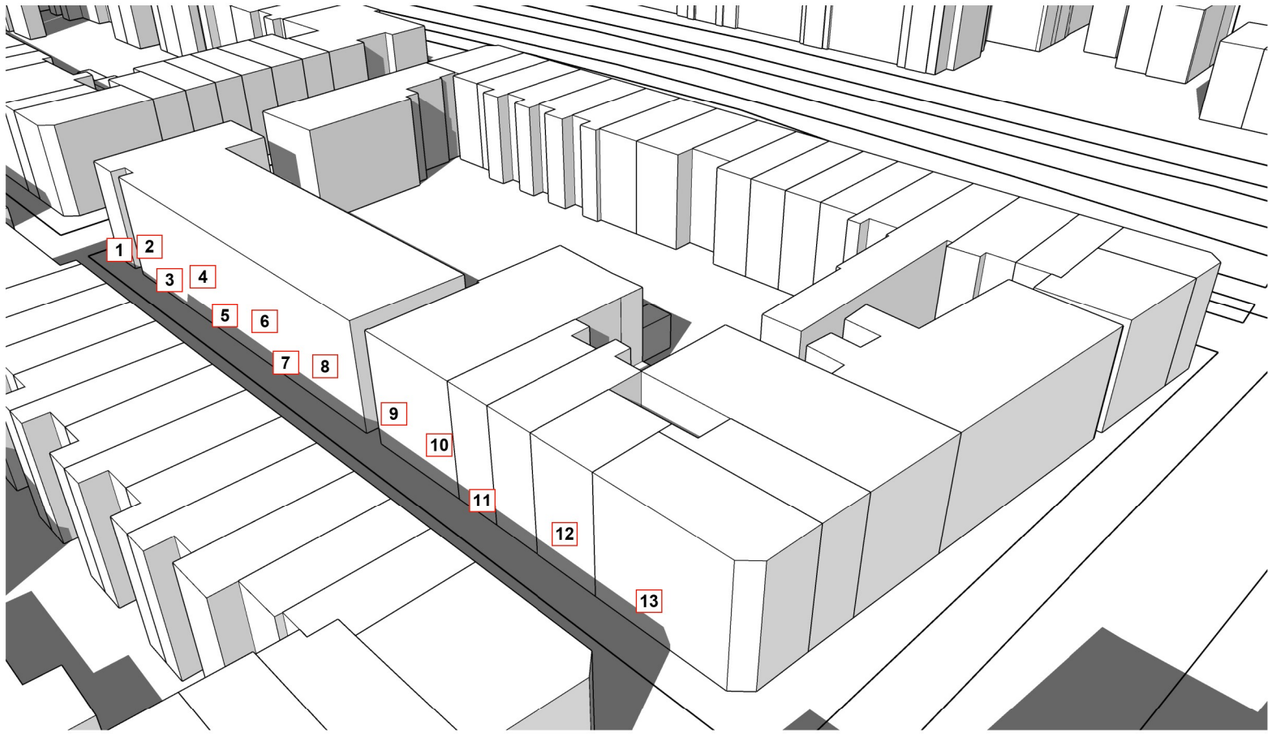

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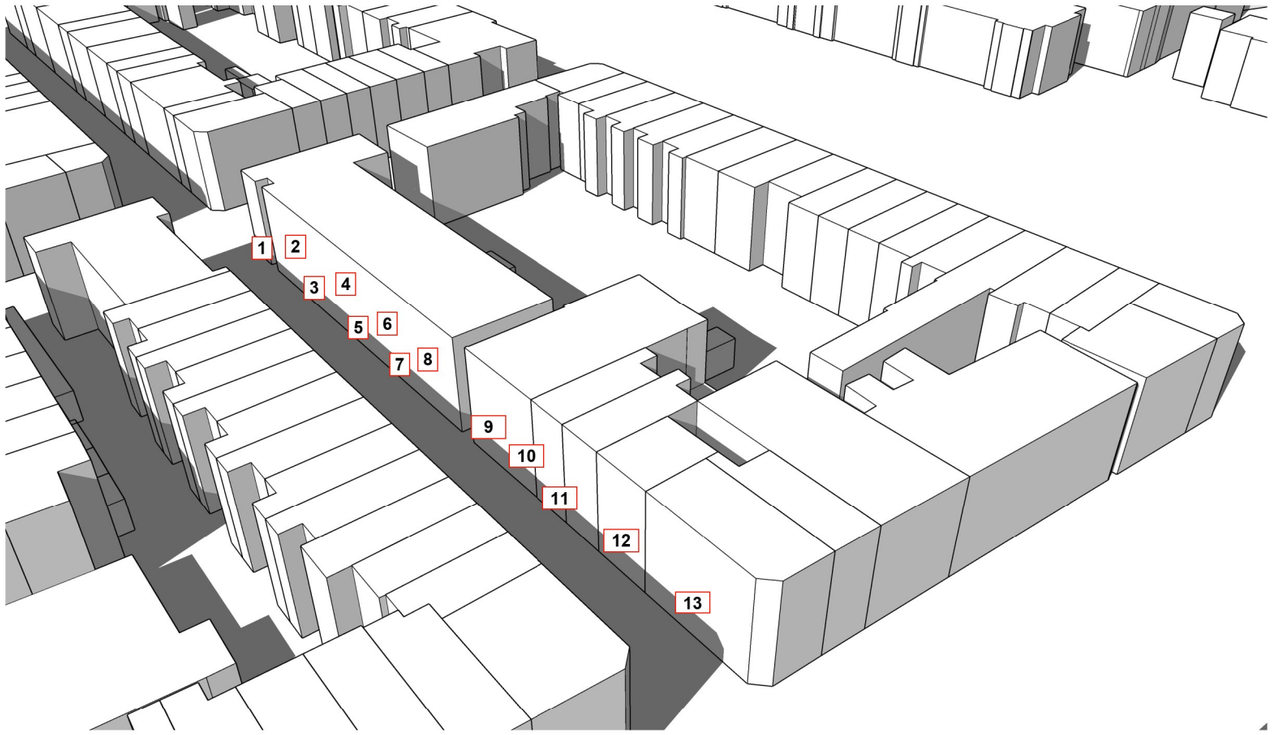
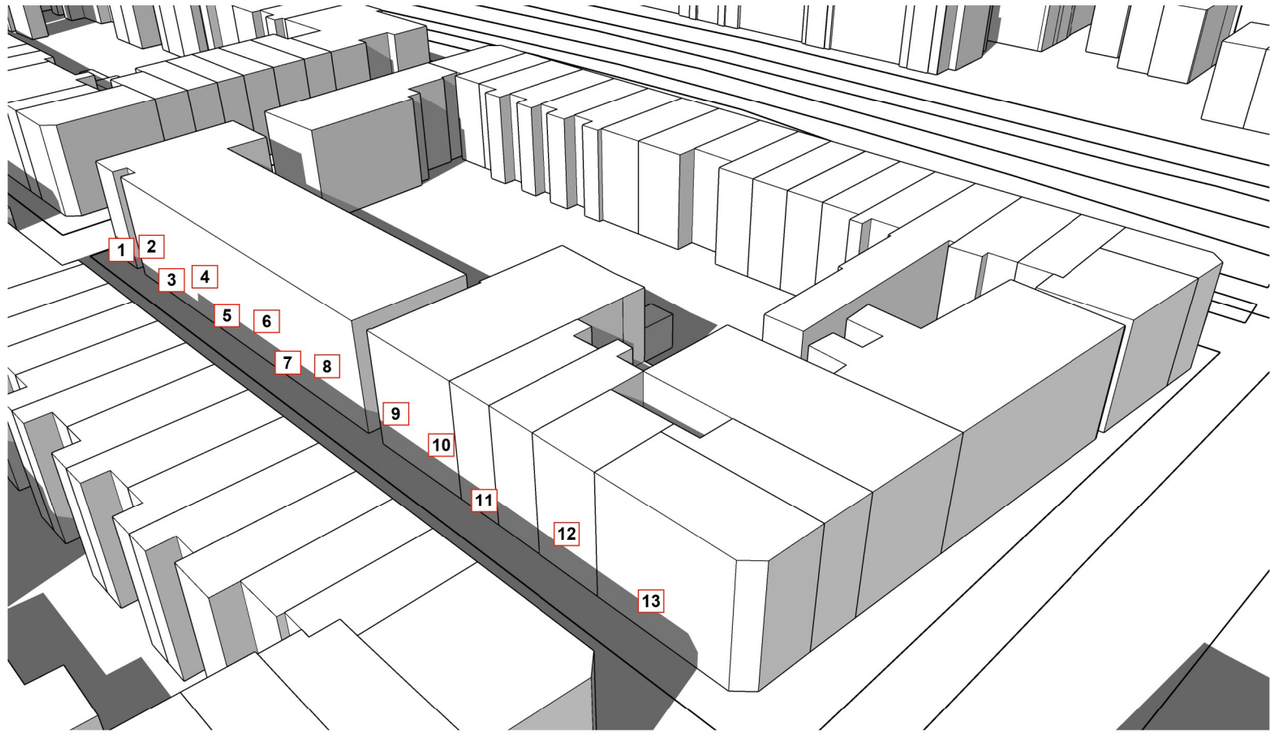
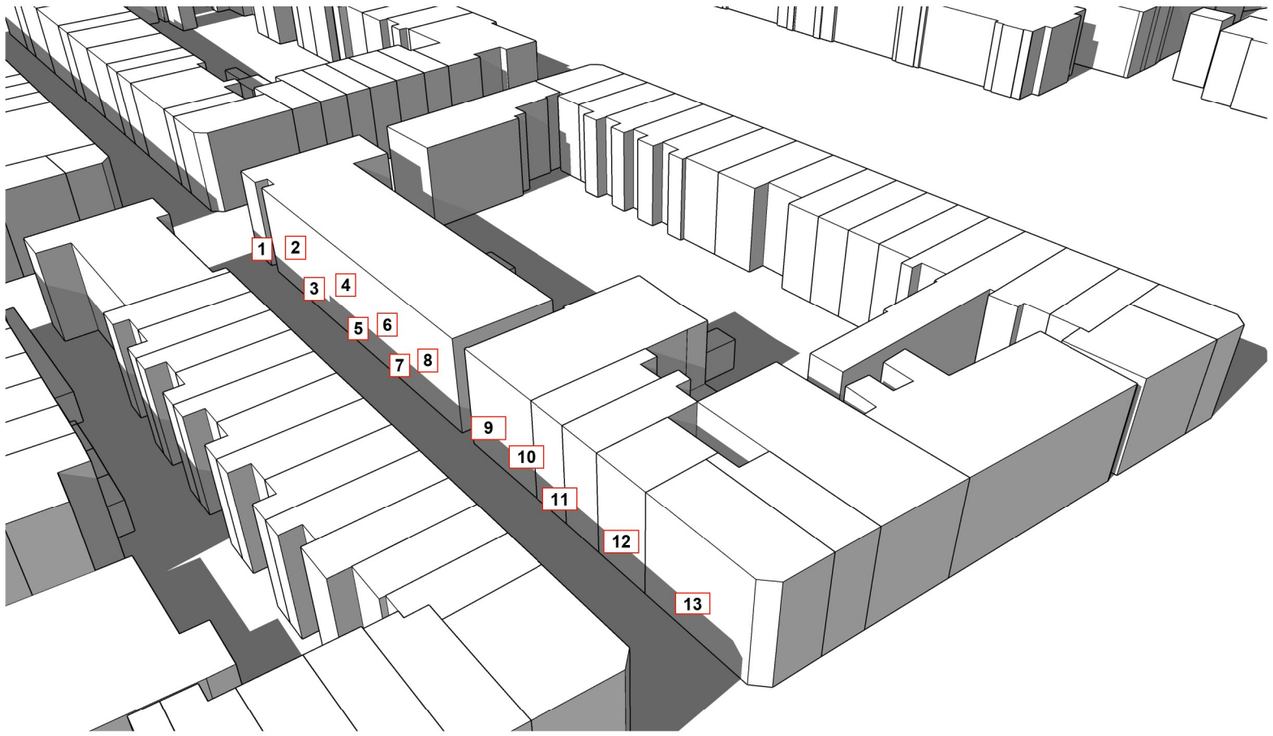
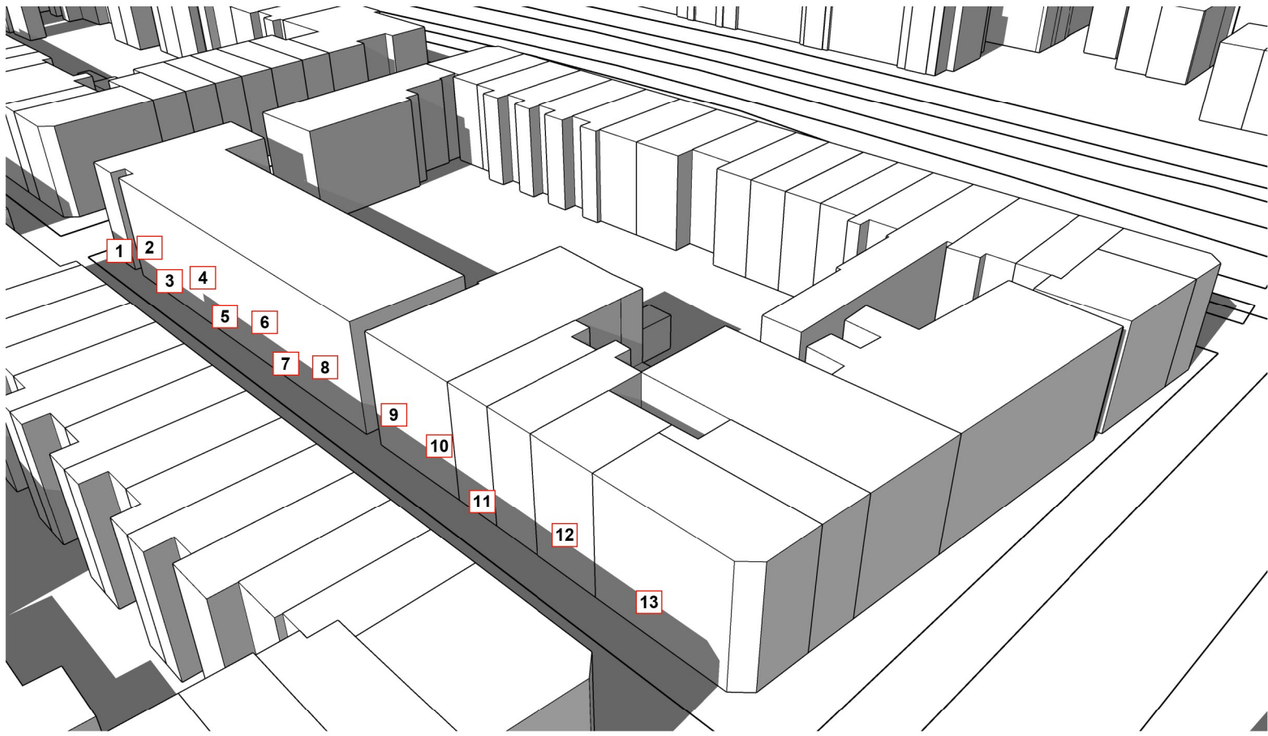




Agniesestraat Noordzijde
21 september
14.00





Agniesestraat Noordzijde
21 september
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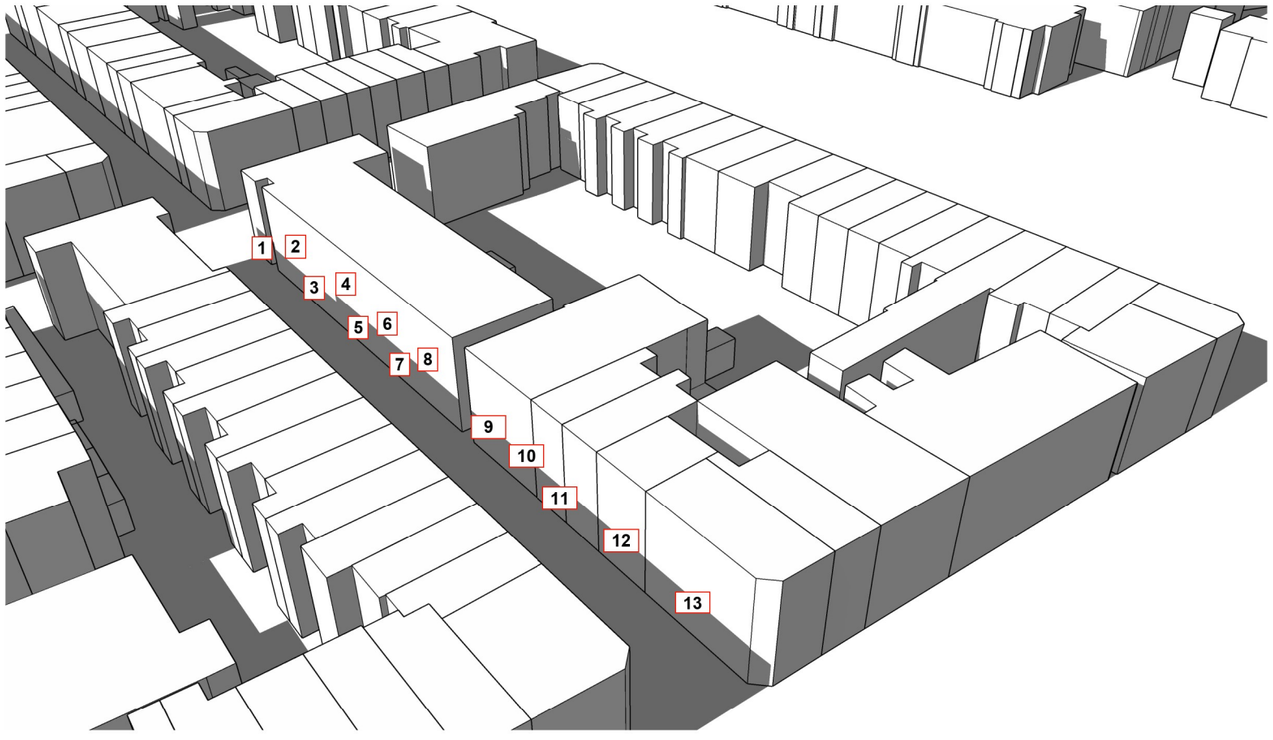
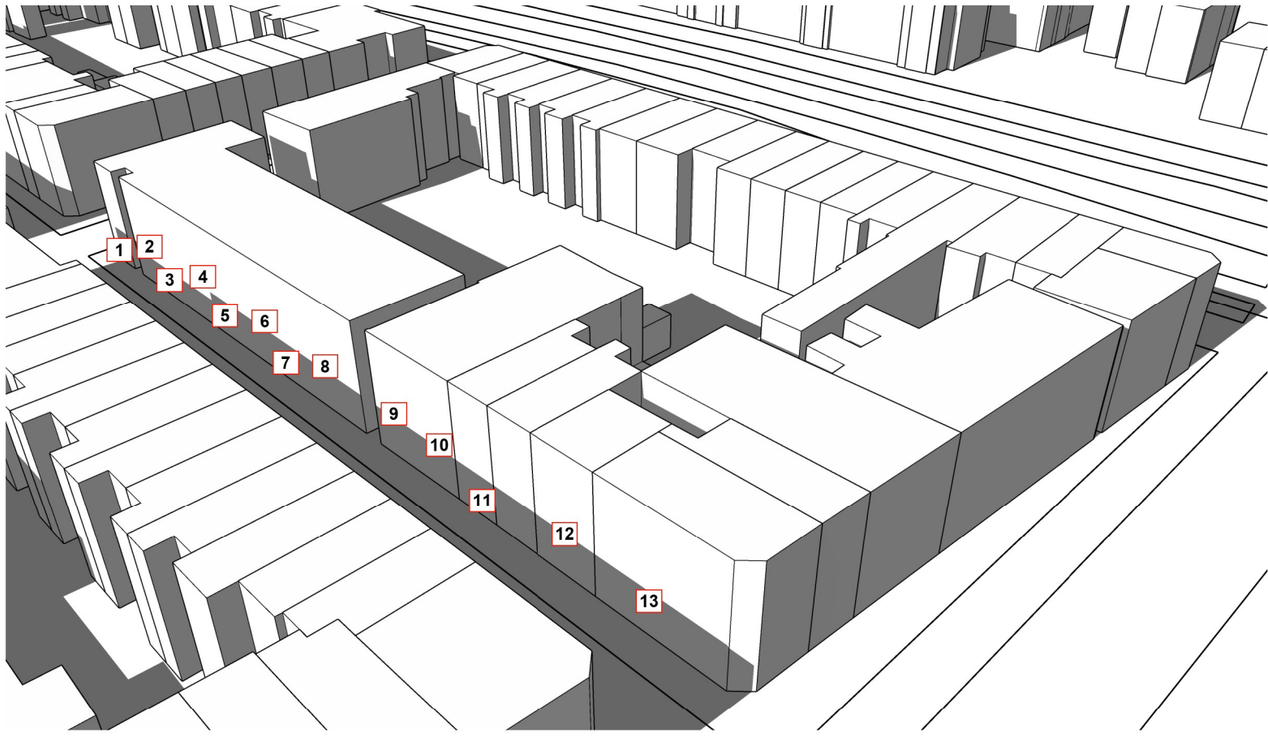
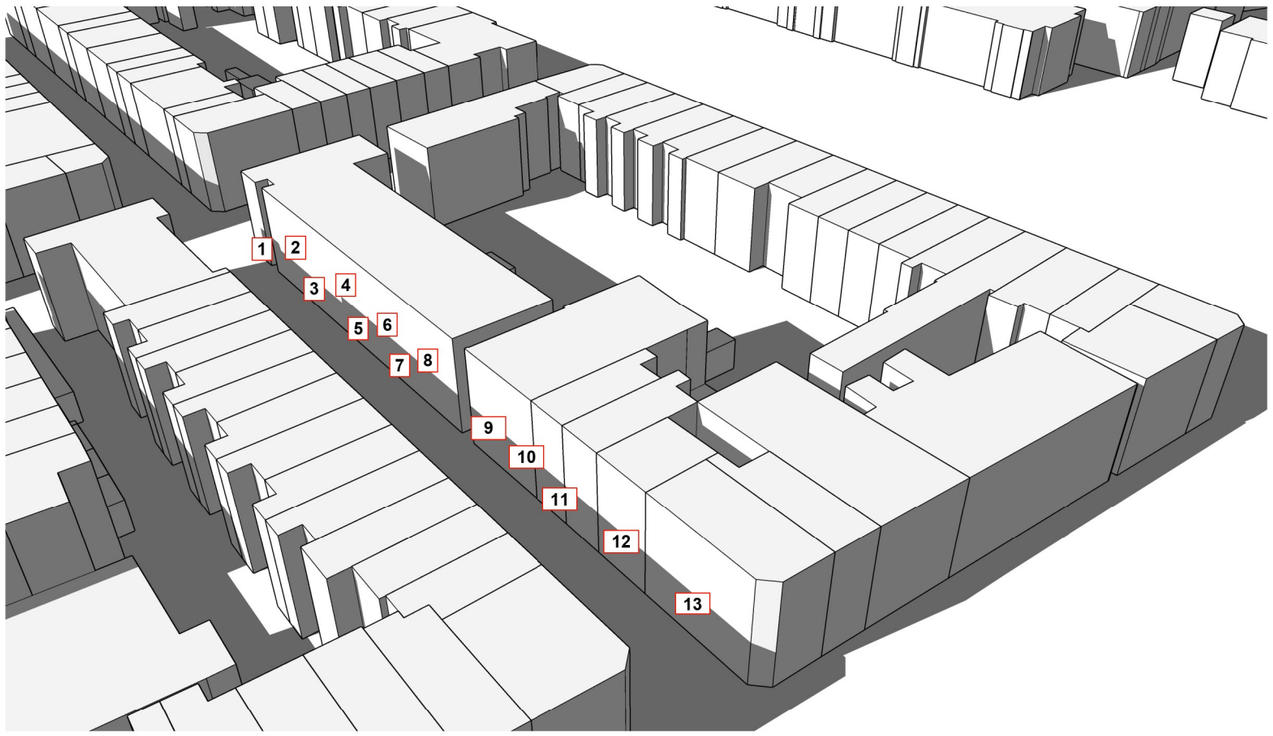
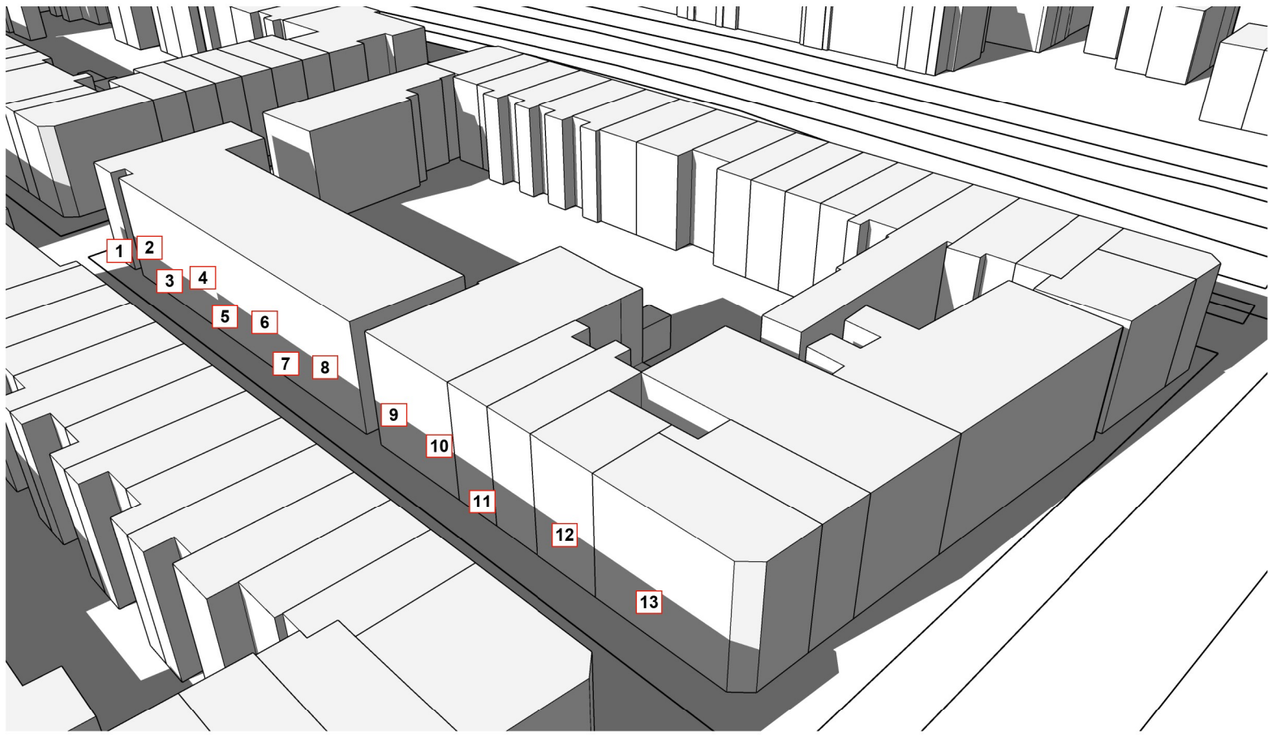


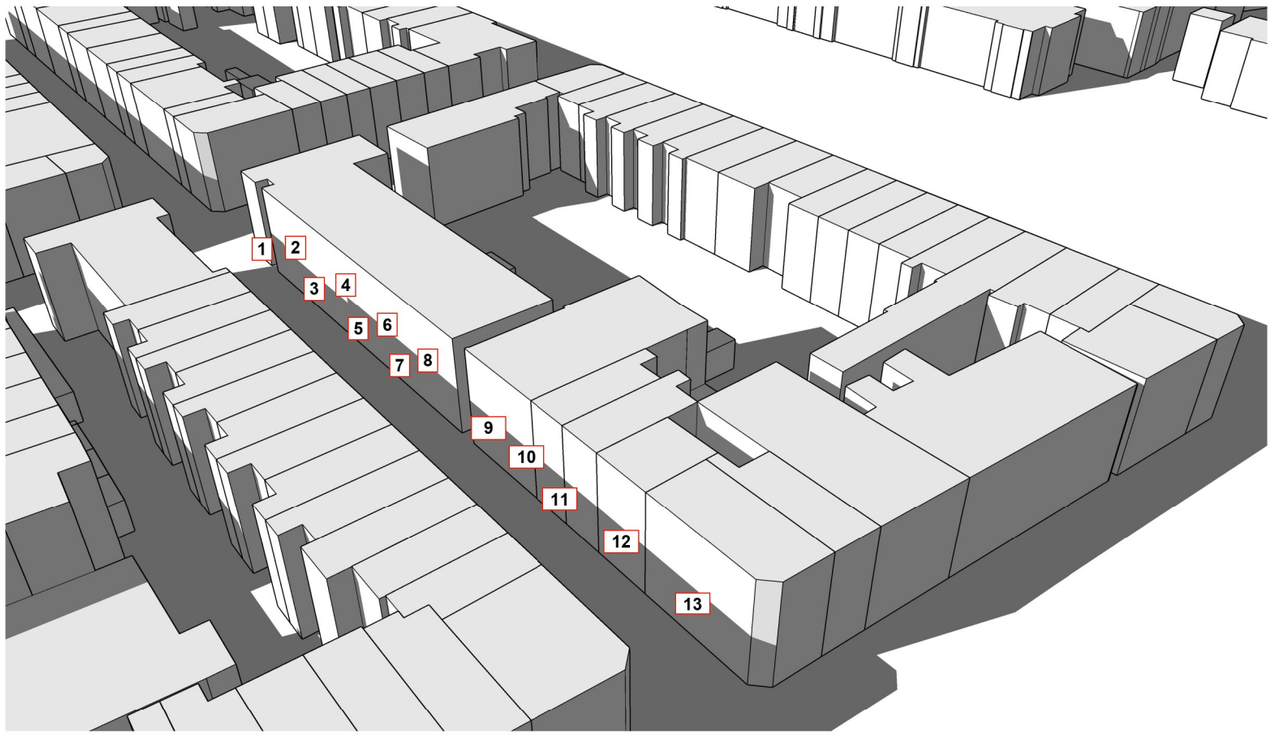


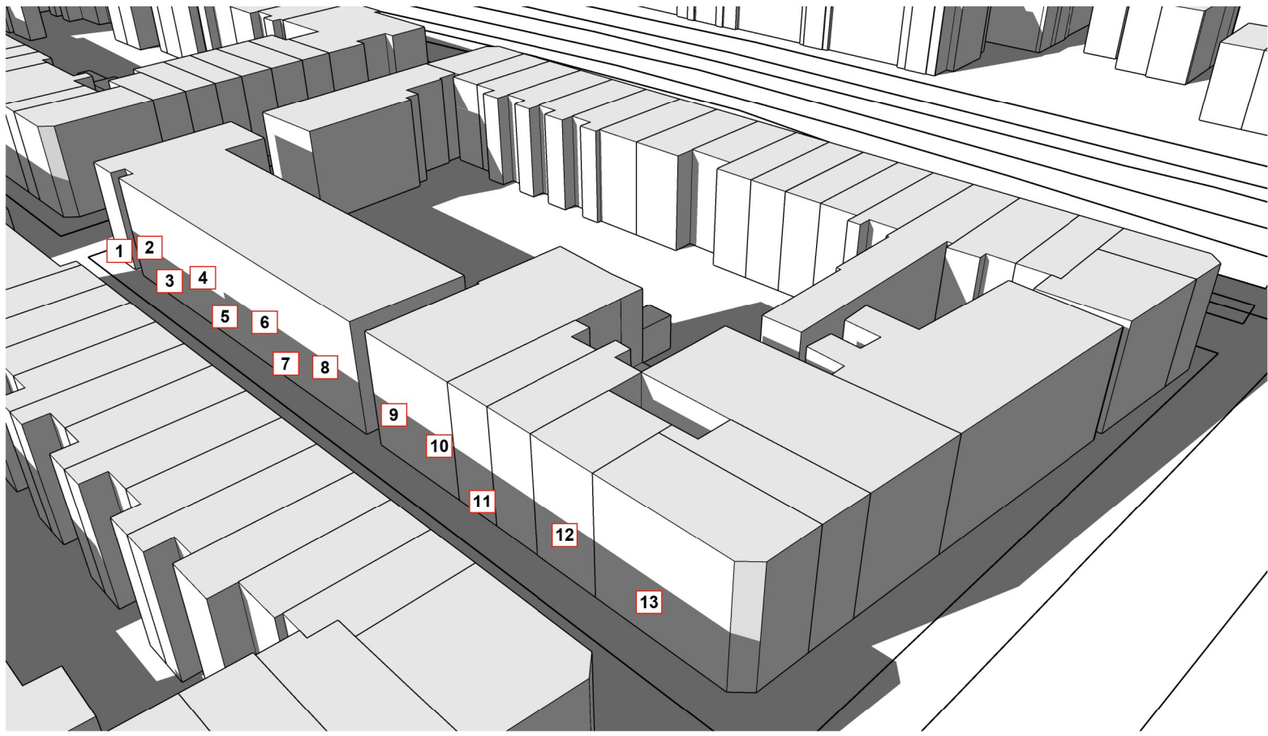
Agniesestraat Noordzijde
21 september
15.00



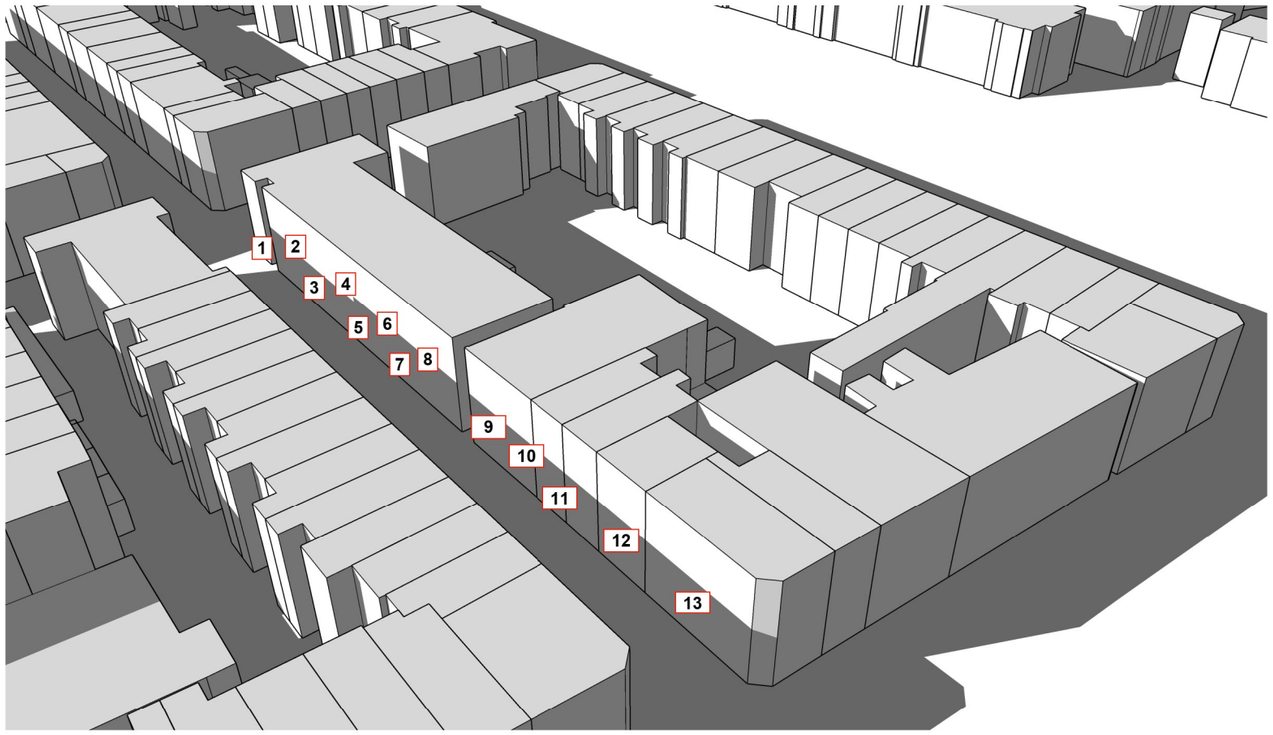


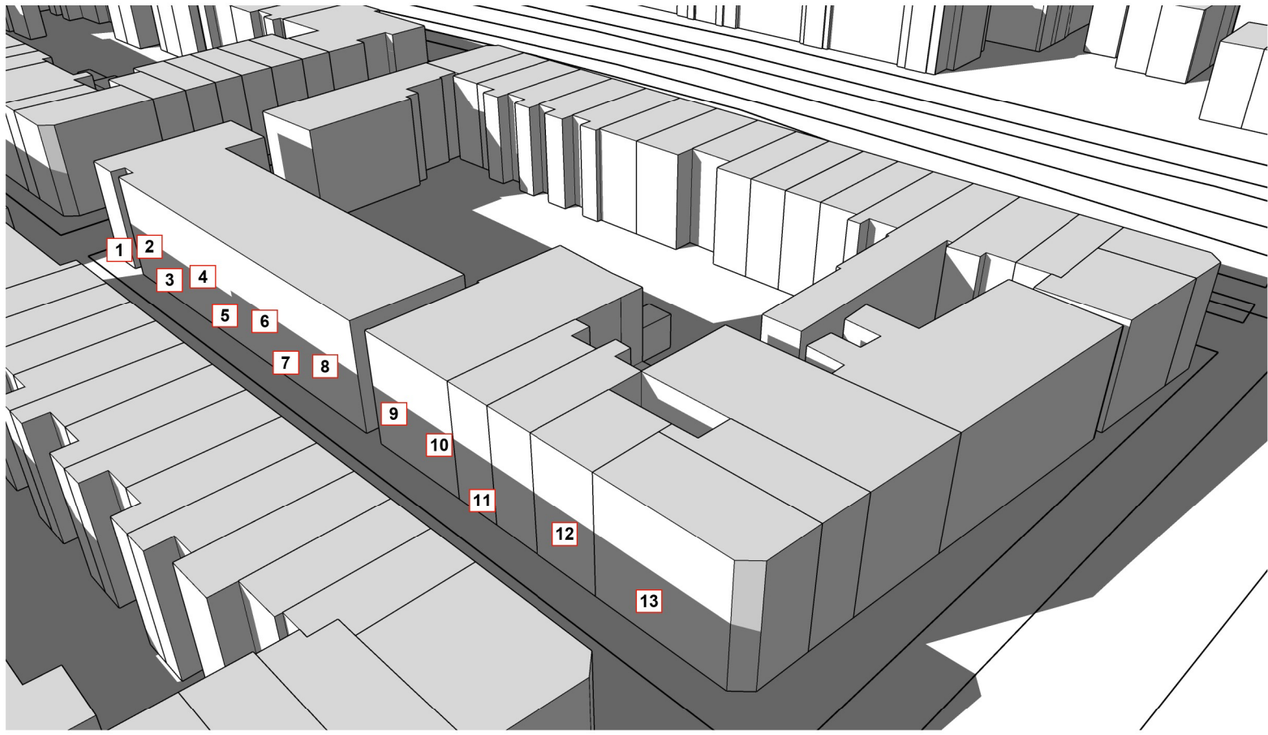
Agniesestraat Noordzijde
21 september
15.30



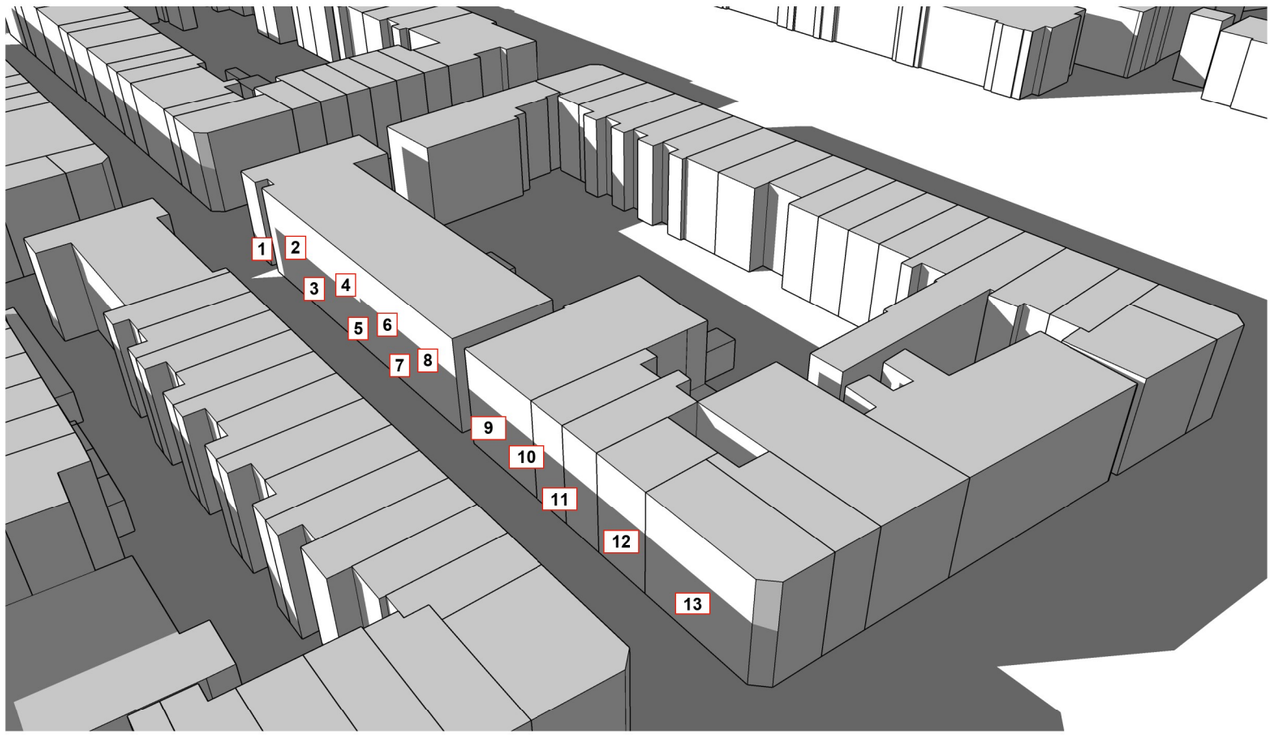


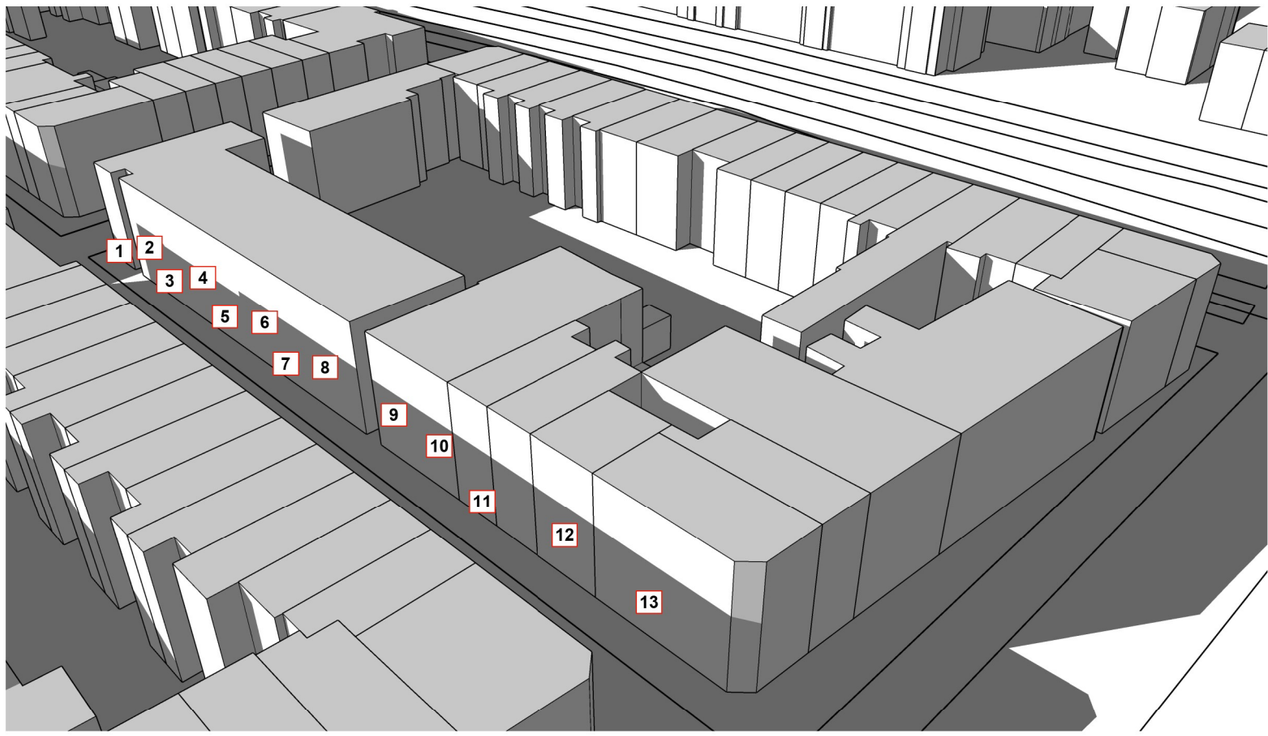
Agniesestraat Noordzijde
21 september
16.00



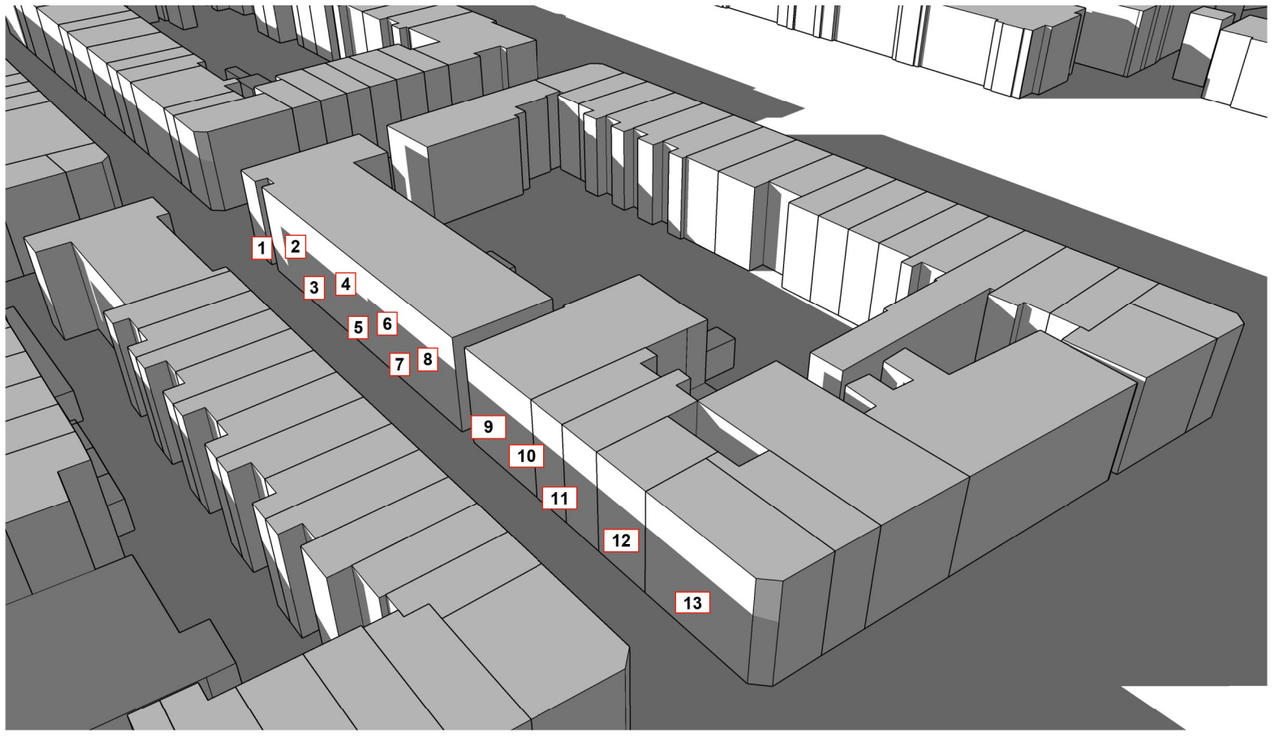


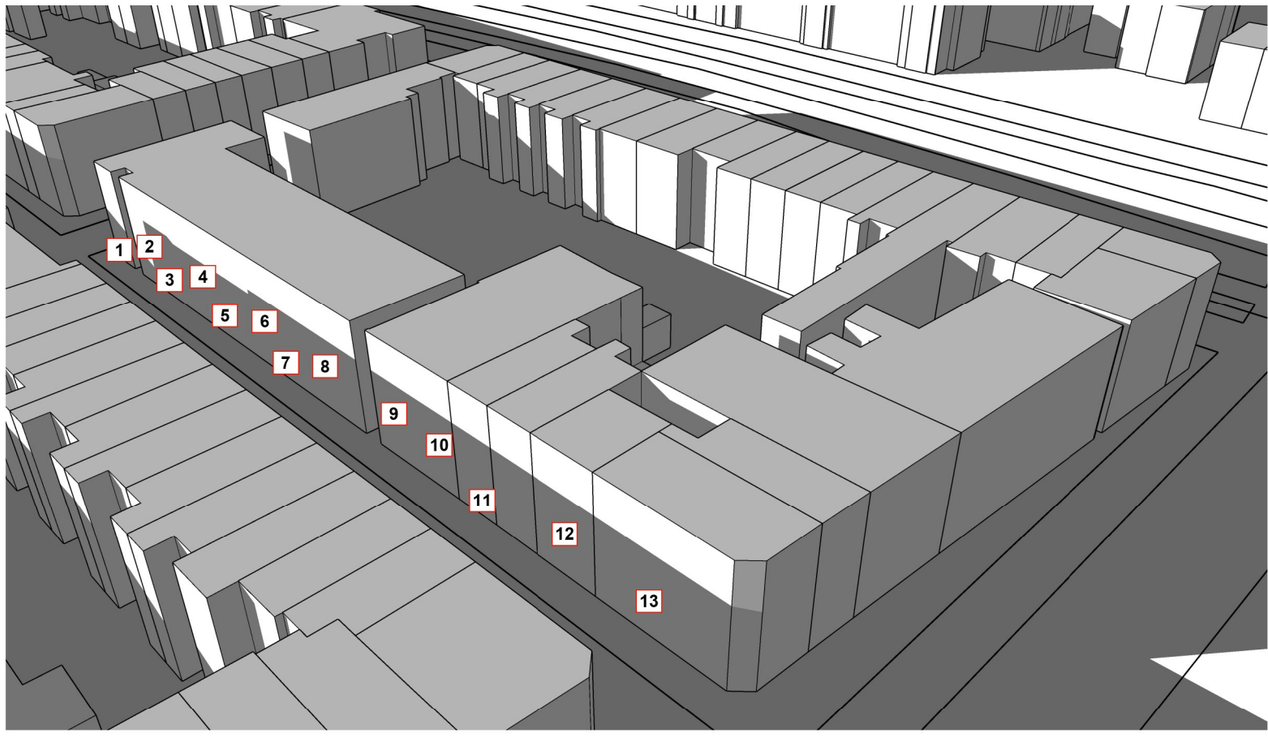
Agniesestraat Noordzijde
21 september
16.30



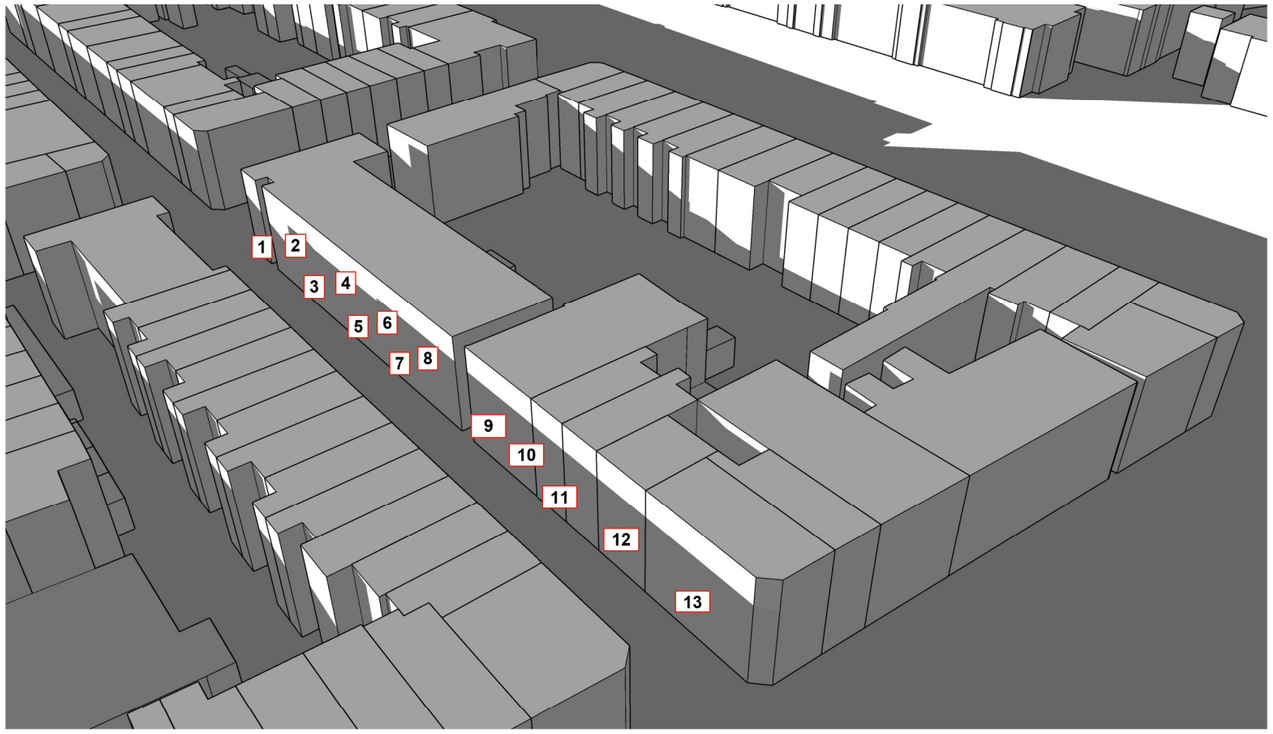


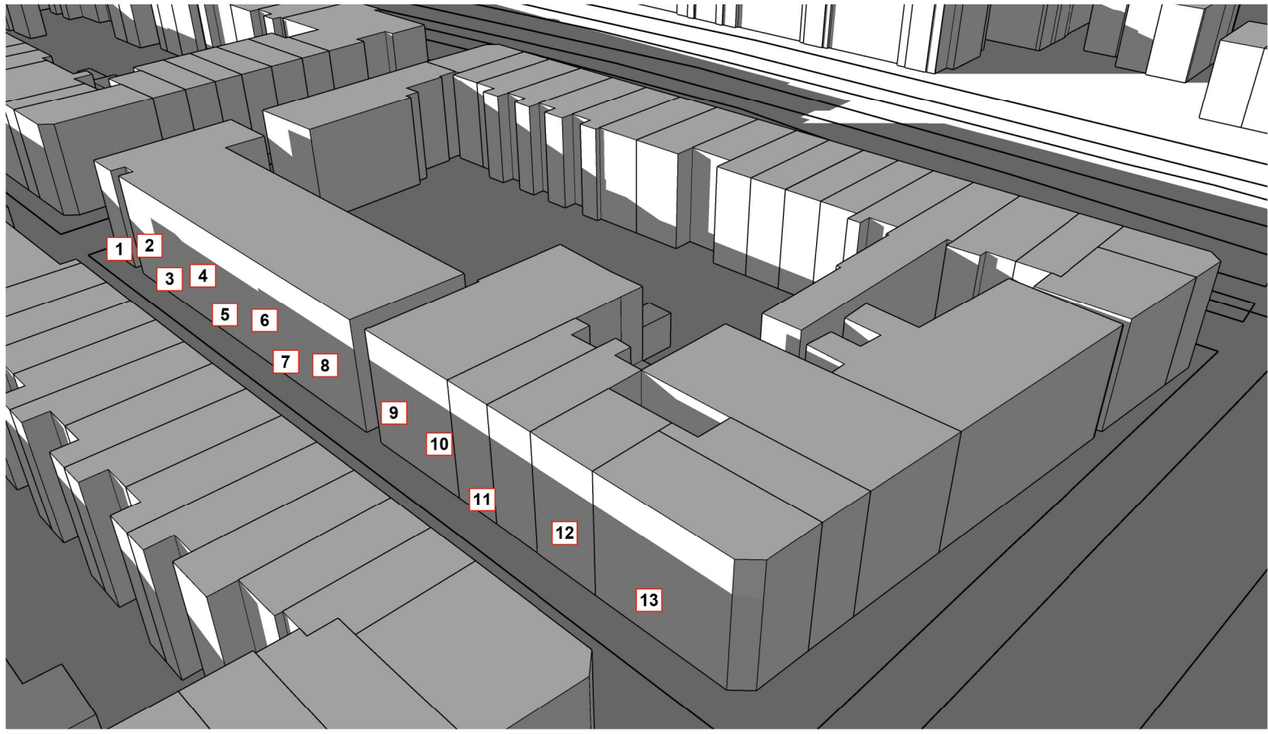
Agniesestraat Noordzijde
21 september
17.00



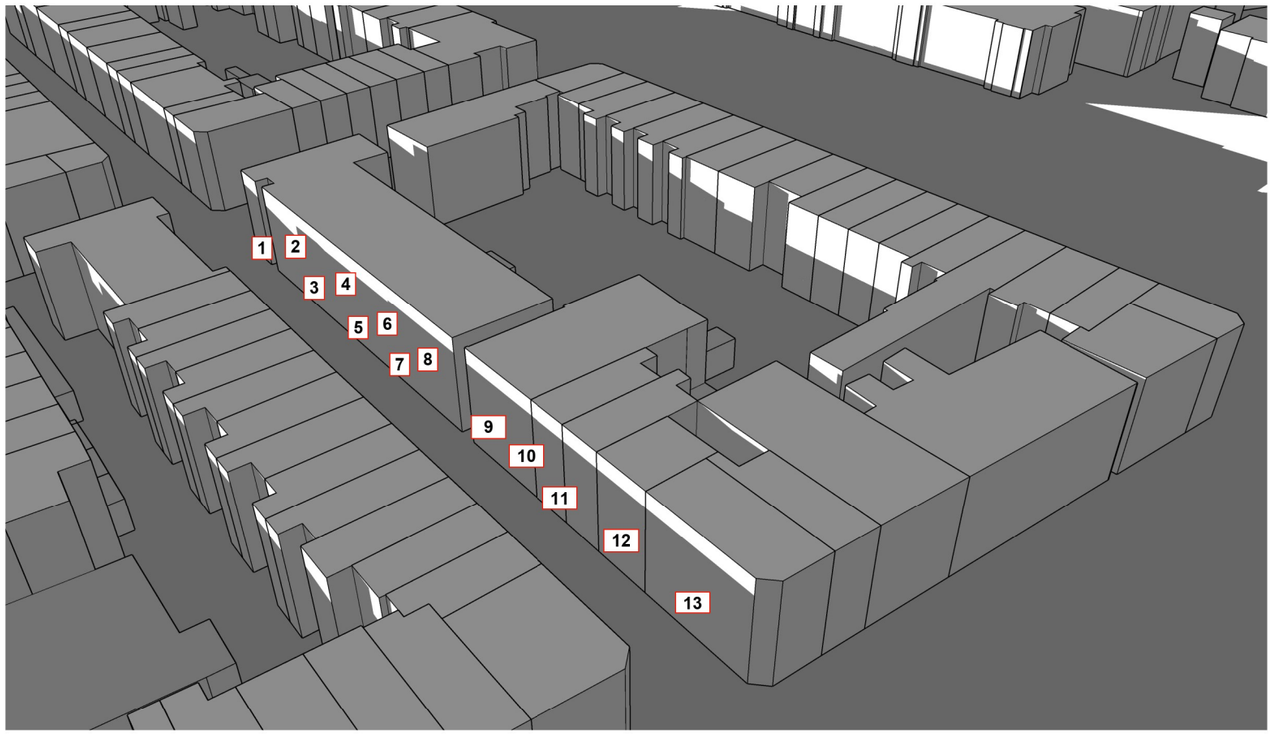


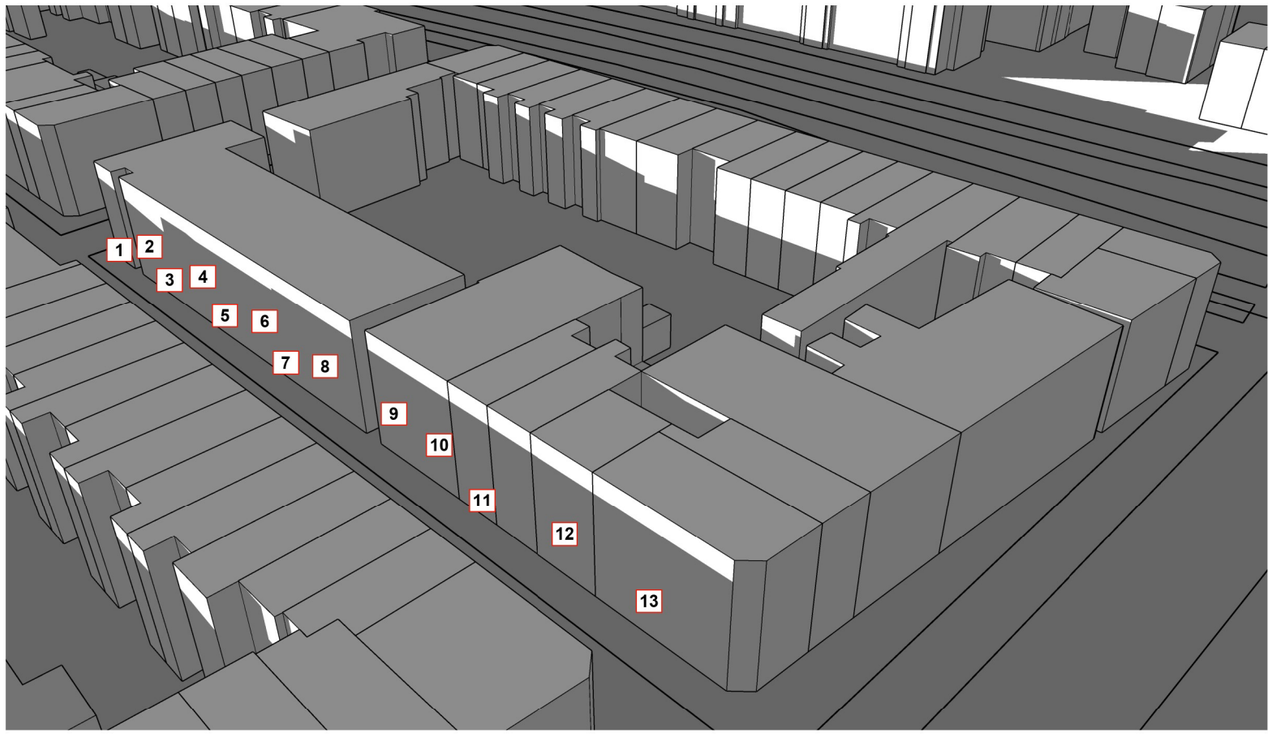
Agniesestraat Noordzijde
21 september
17.30



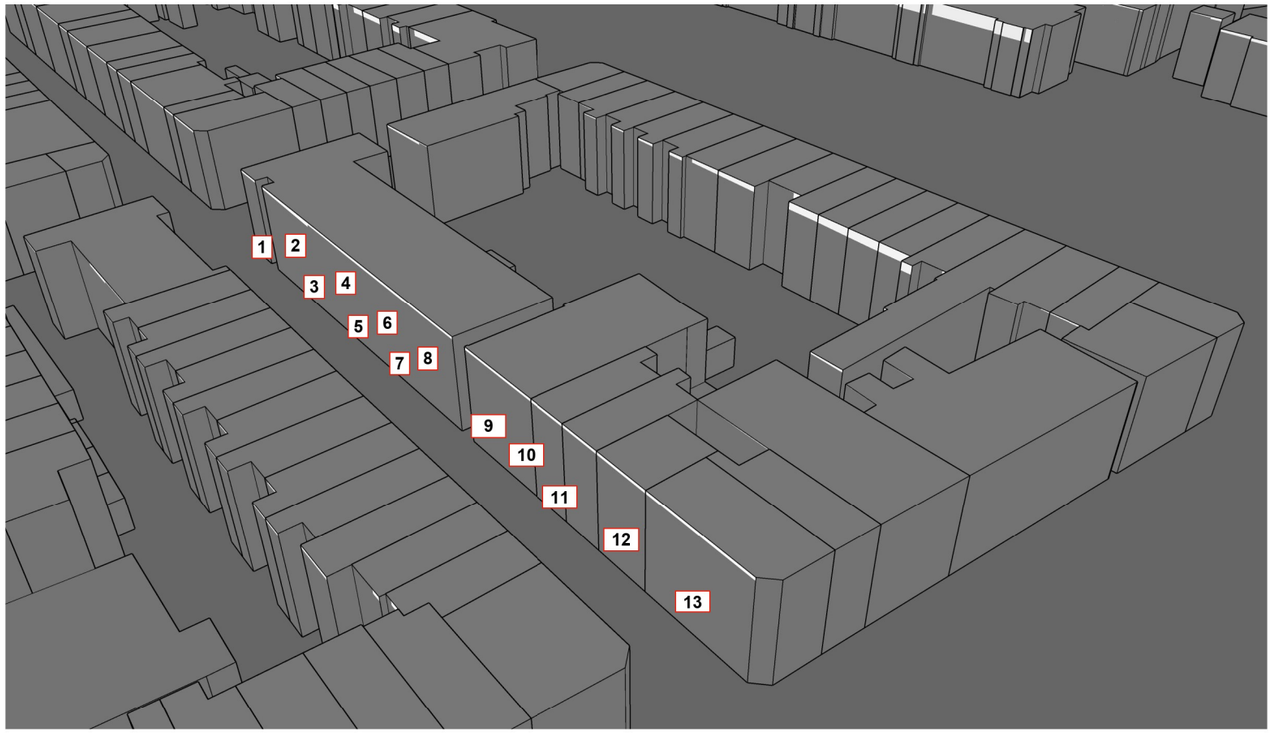


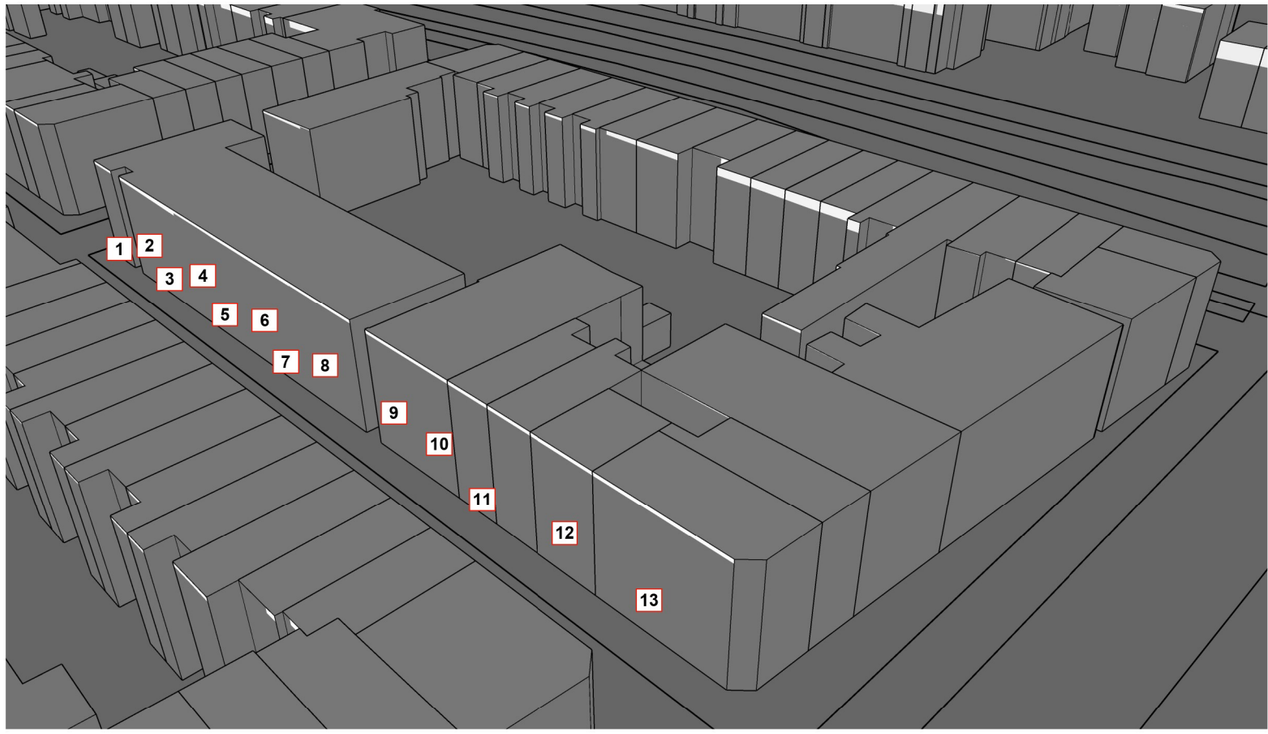
Agniesestraat Noordzijde
21 september
18.00



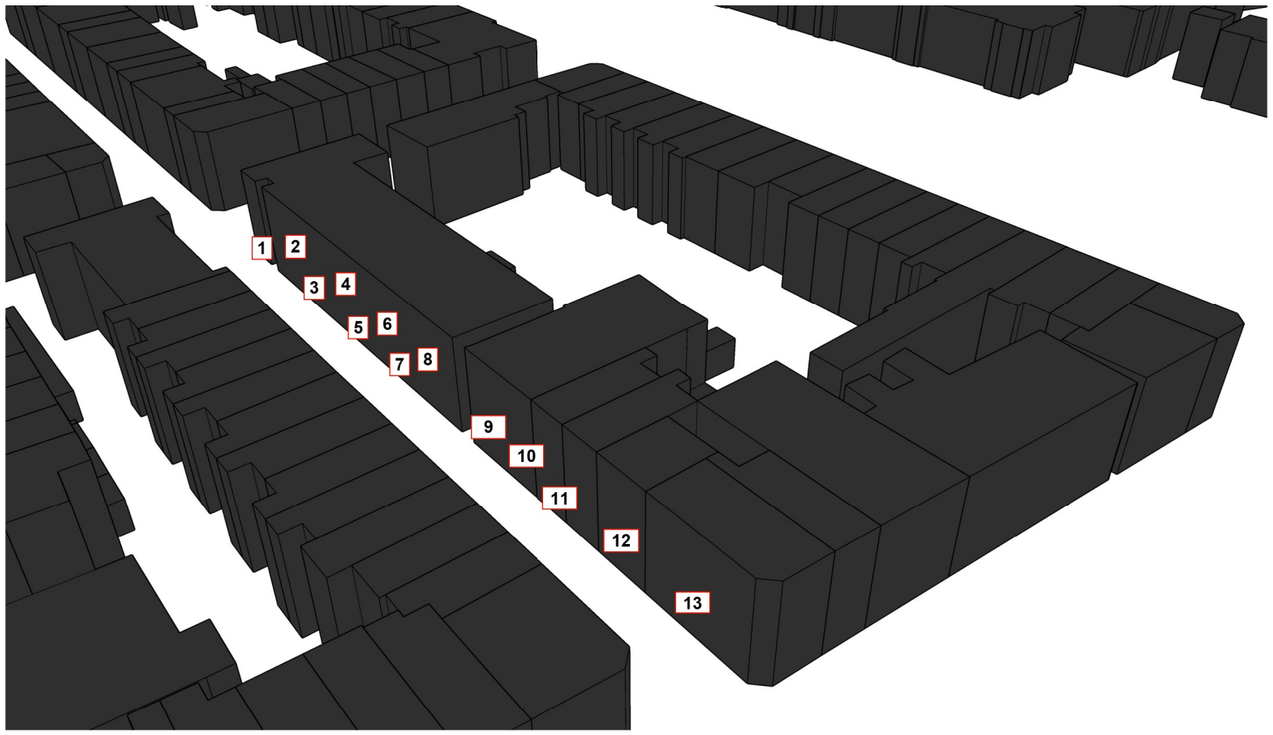


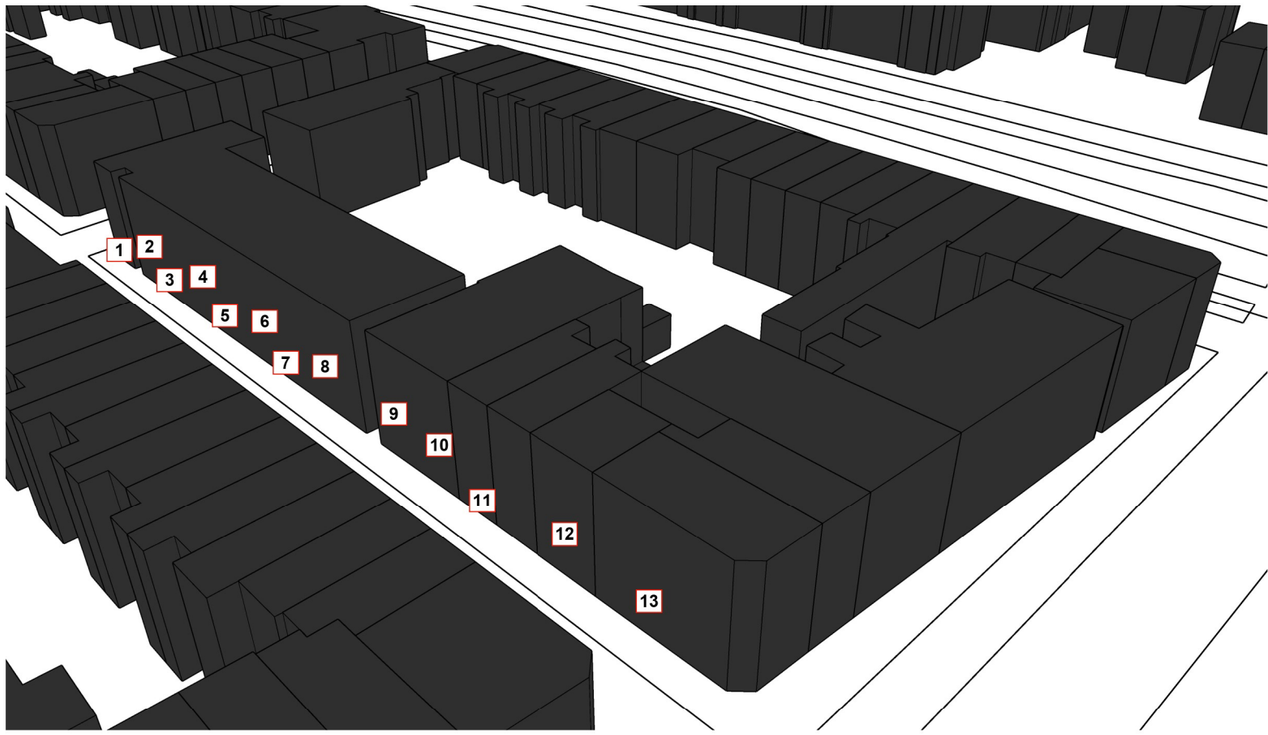
Agniesestraat Noordzijde
21 september
18.30





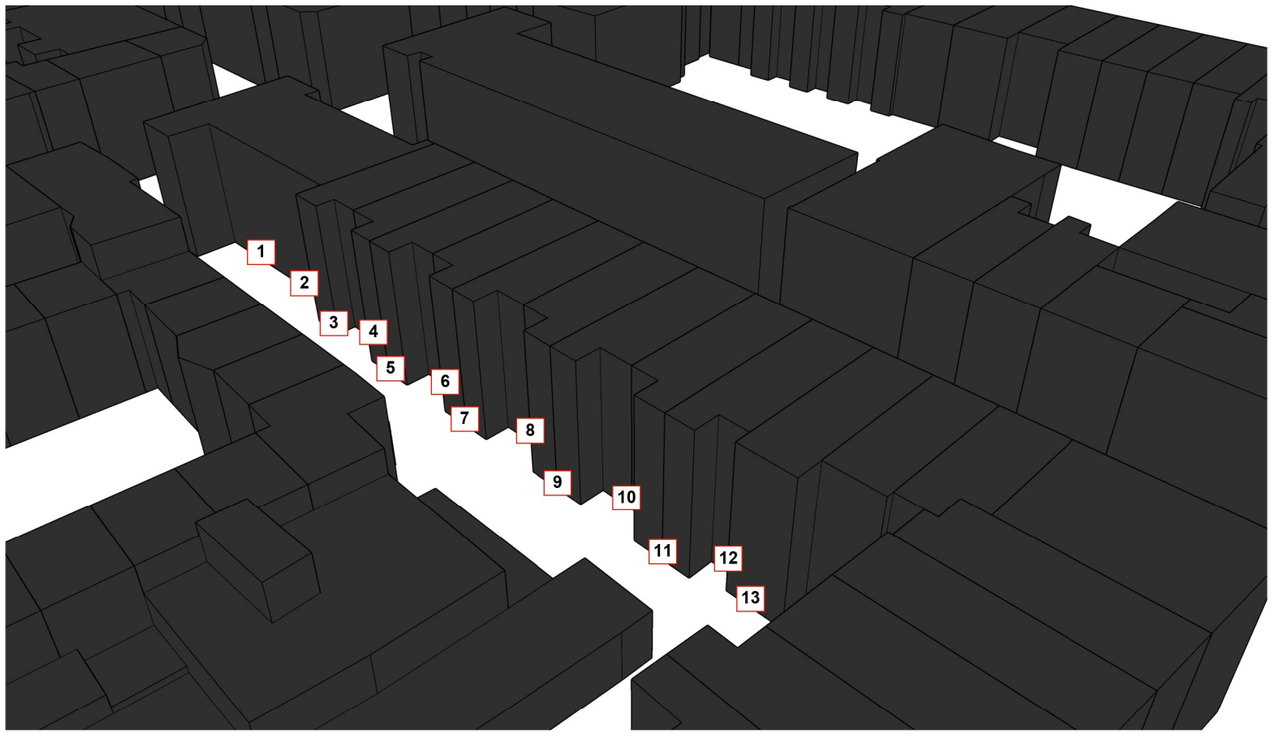
Agniesestraat Noordzijde
21 september
19.00

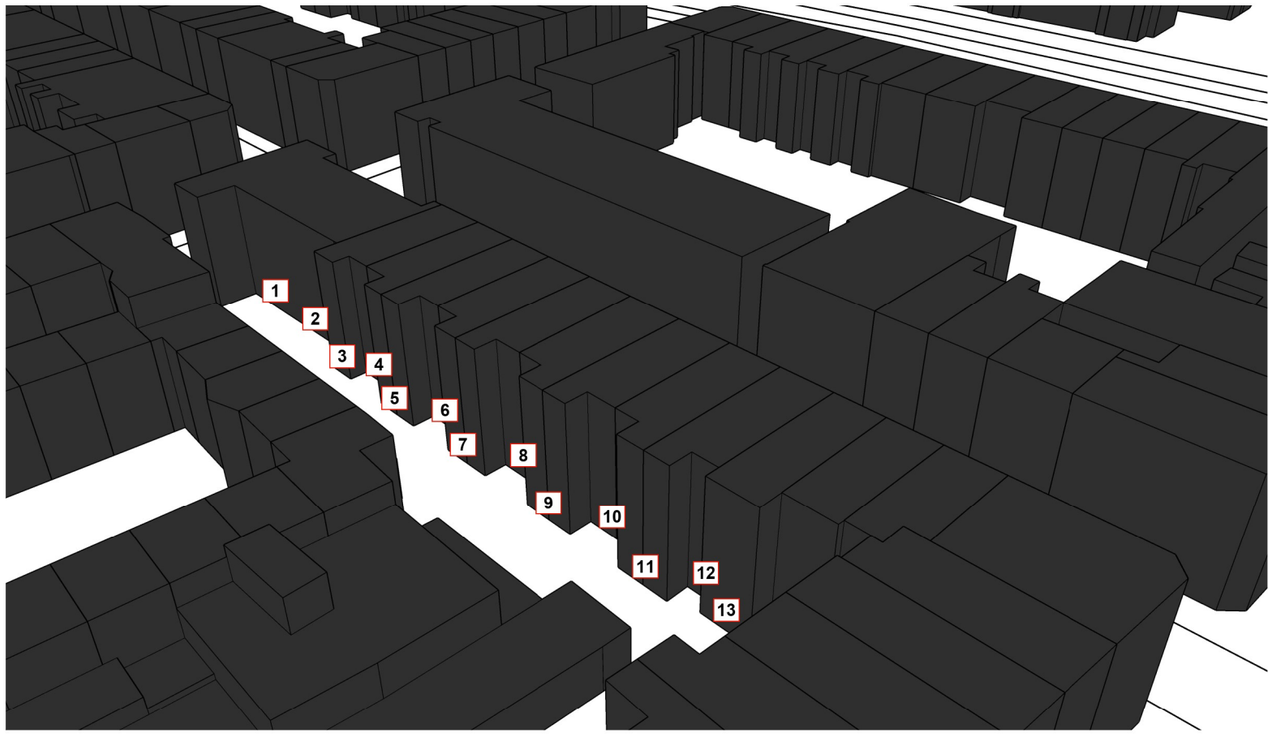




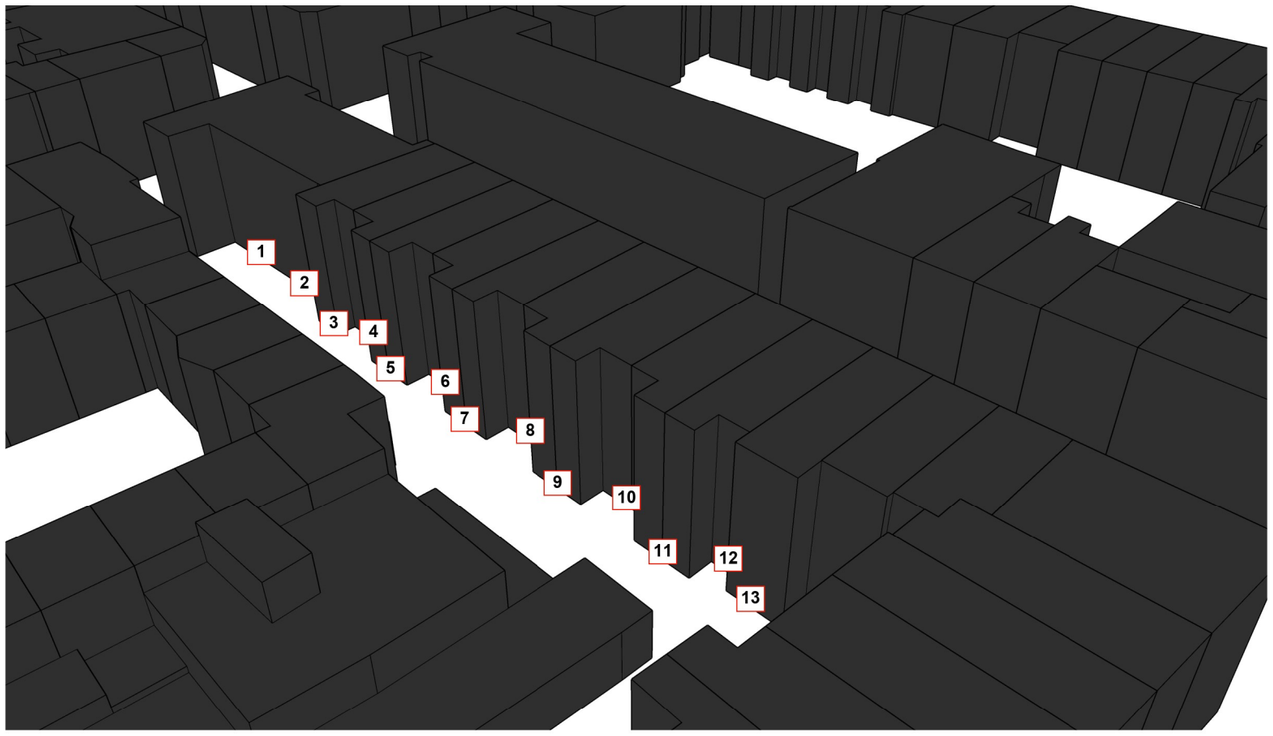
bijlage 3. resultaten 21 september Agniesestraat Zuid huidig vs. nieuw

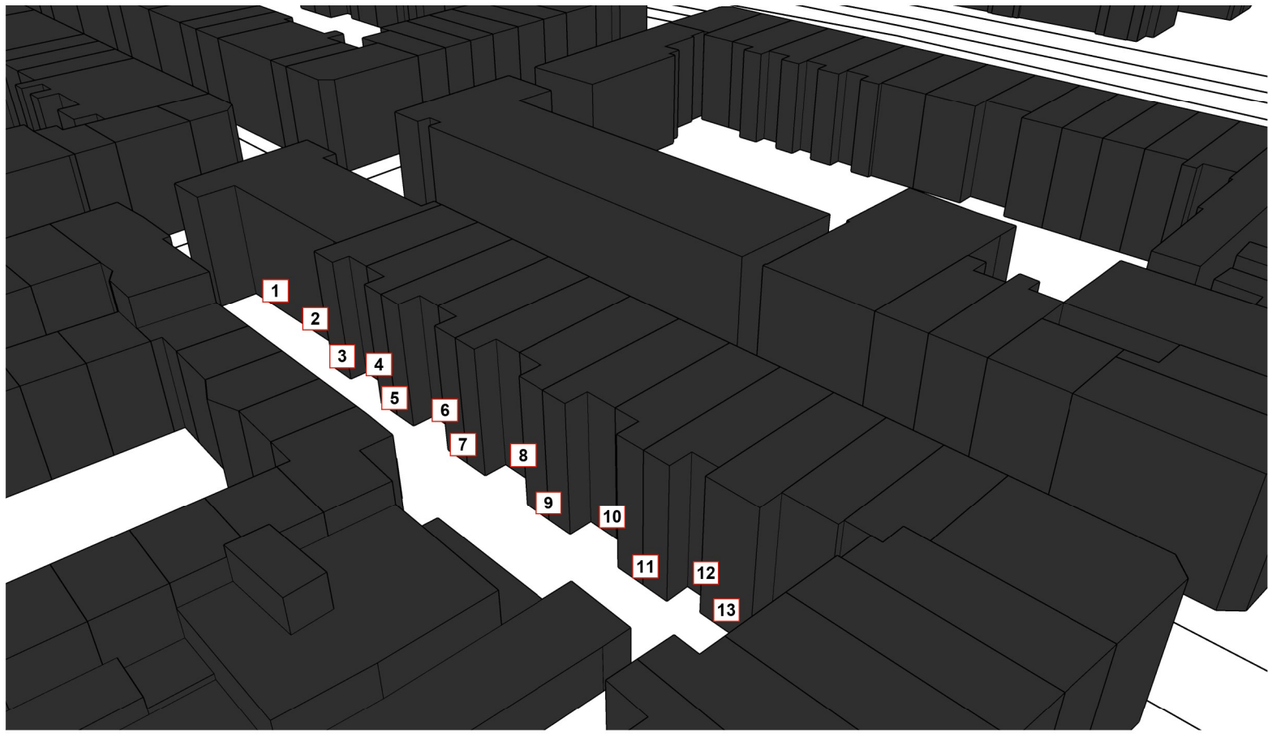
Agniesestraat Zuidzijde
21 september
06.00



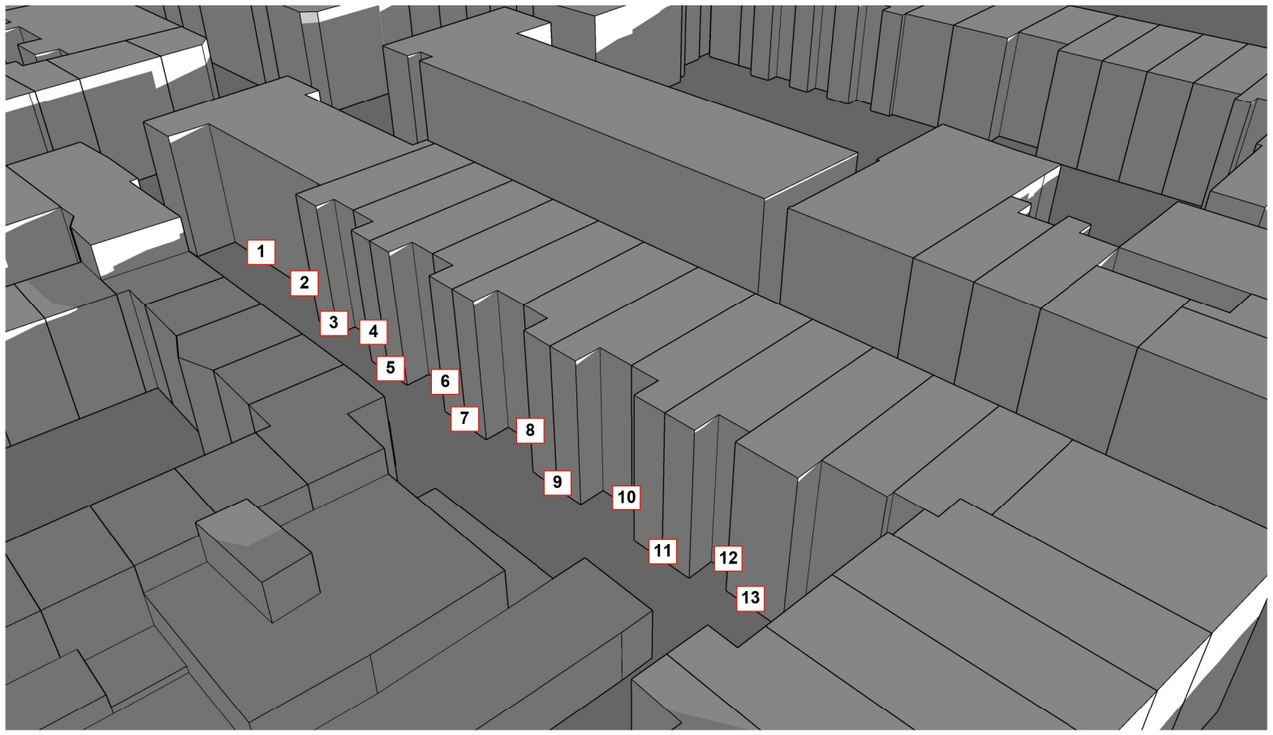


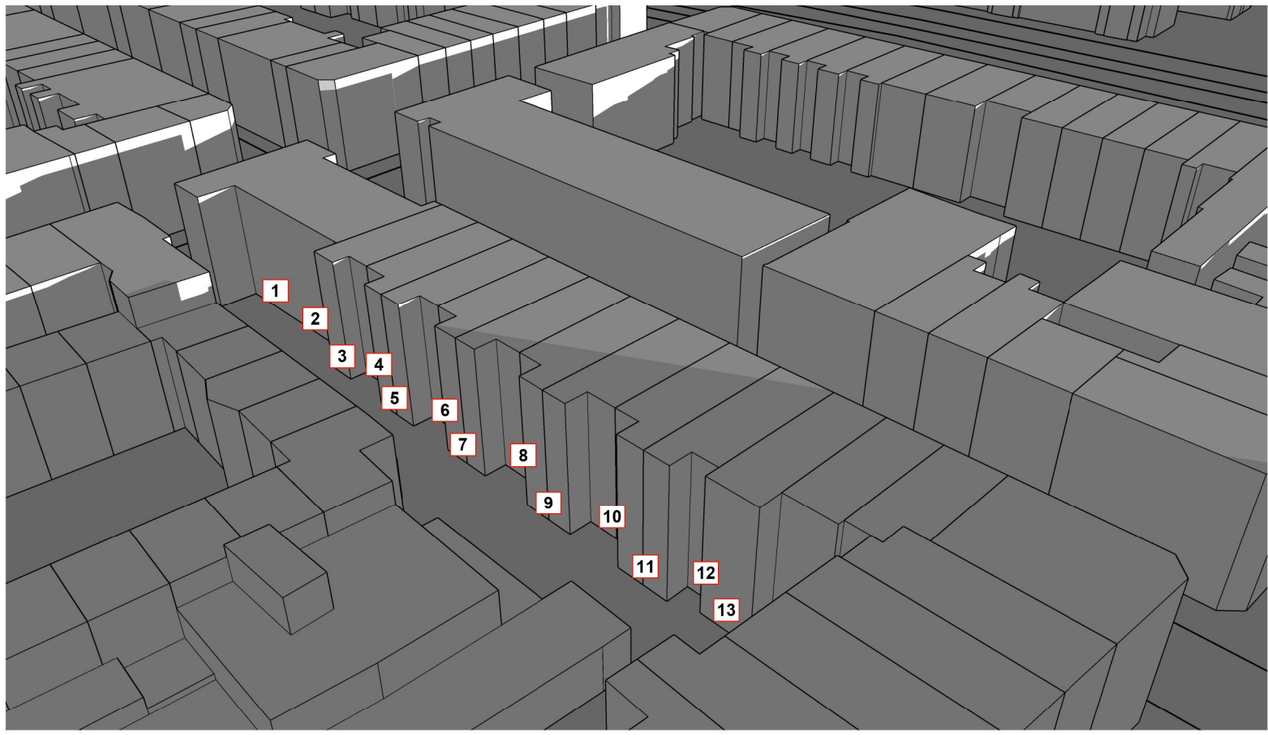
Agniesestraat Zuidzijde
21 september
06.30



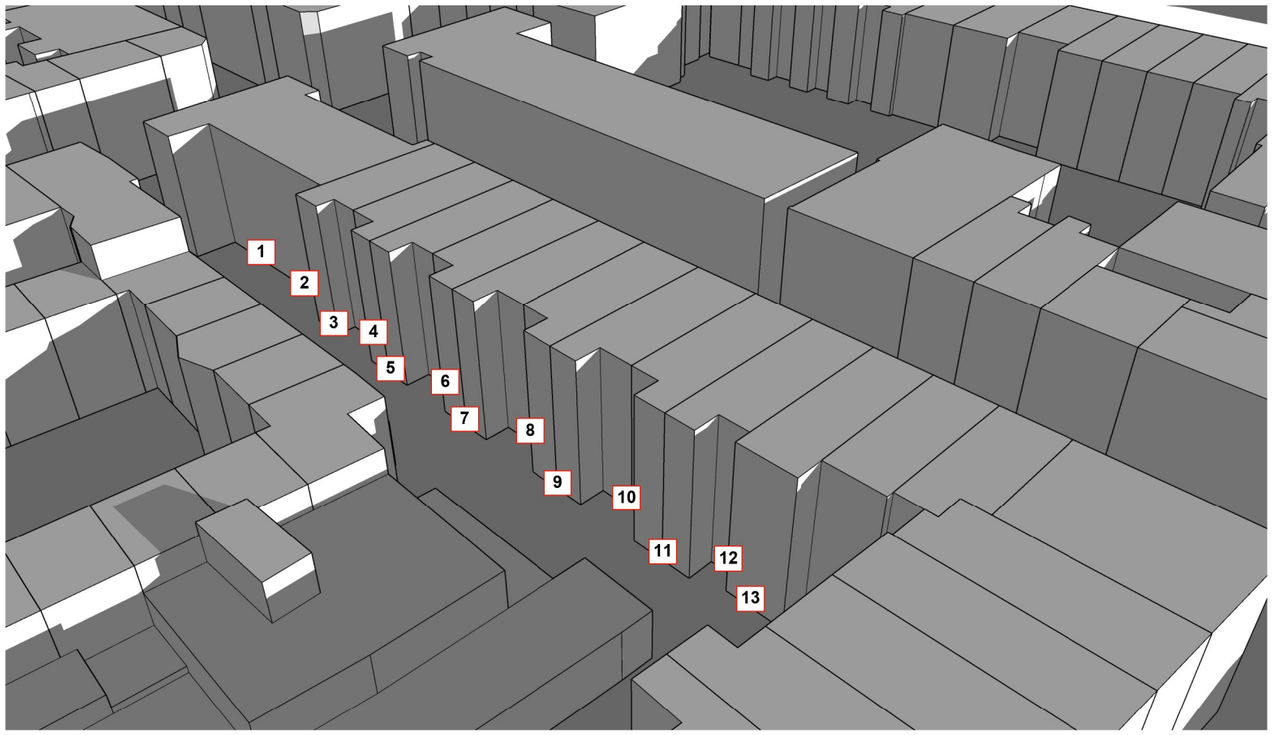


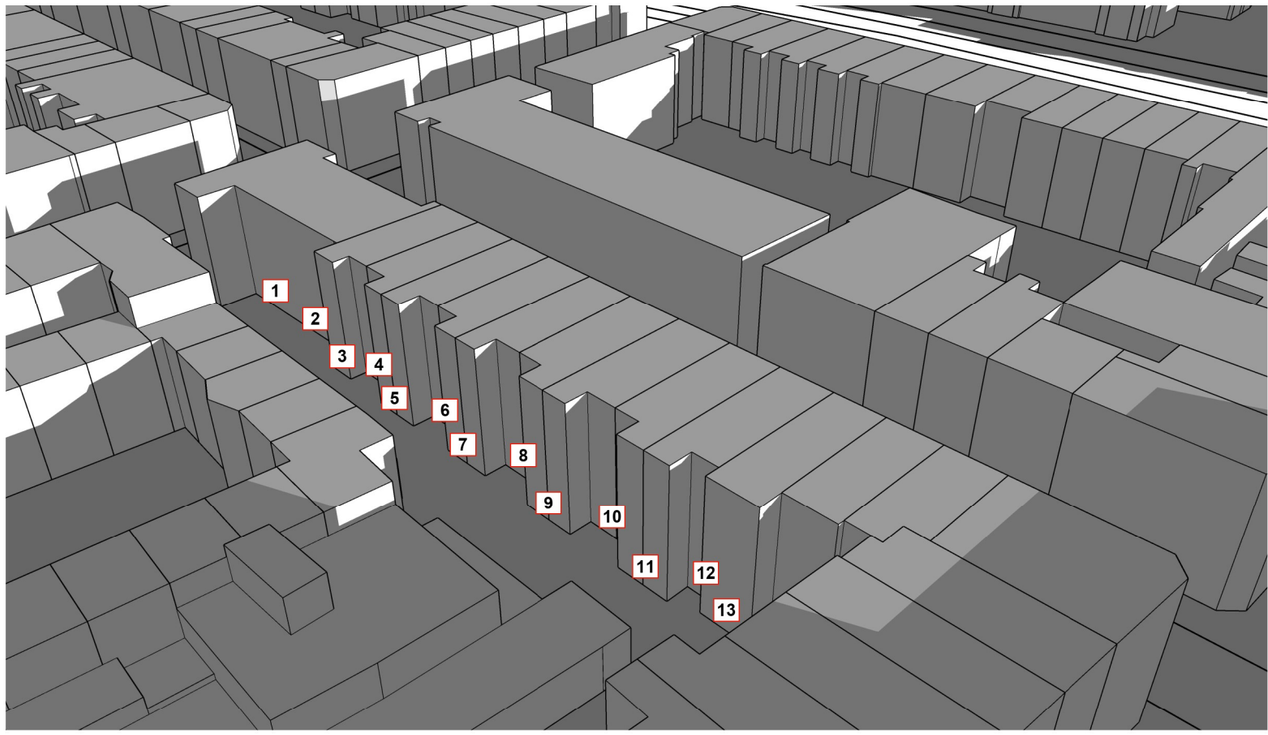
Agniesestraat Zuidzijde
21 september
07.00



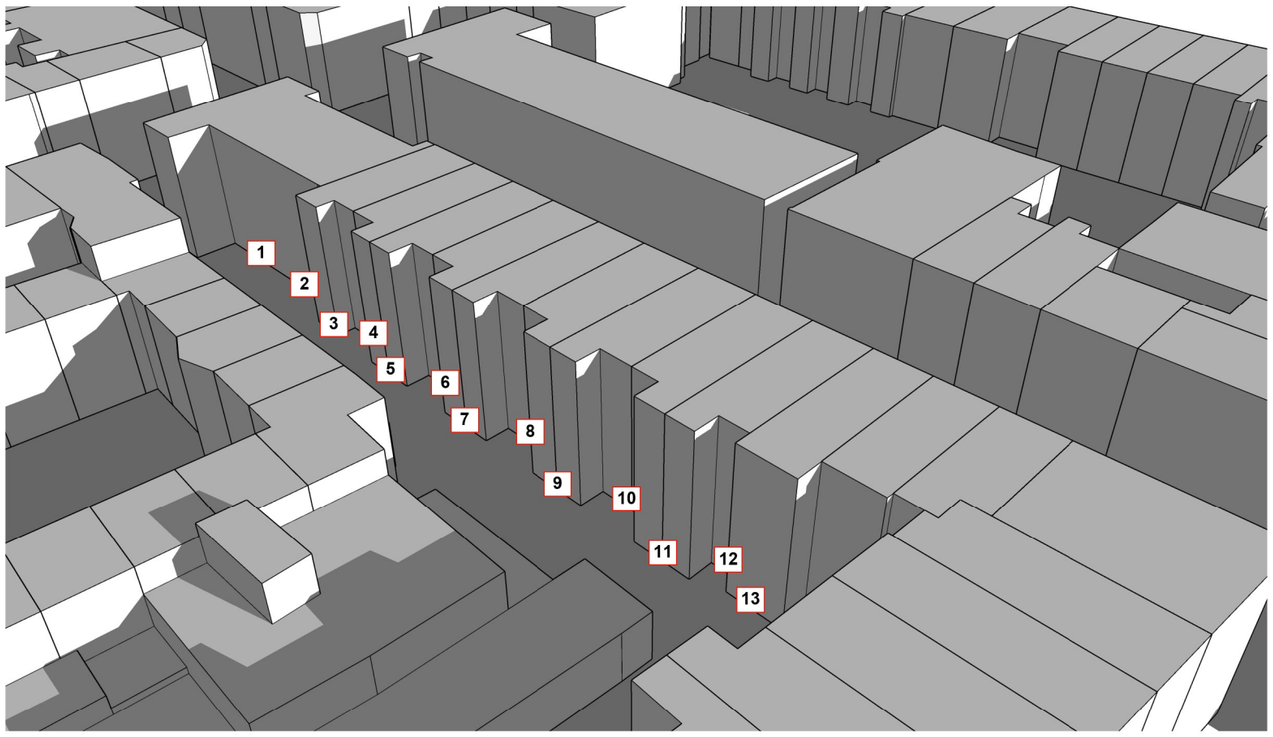


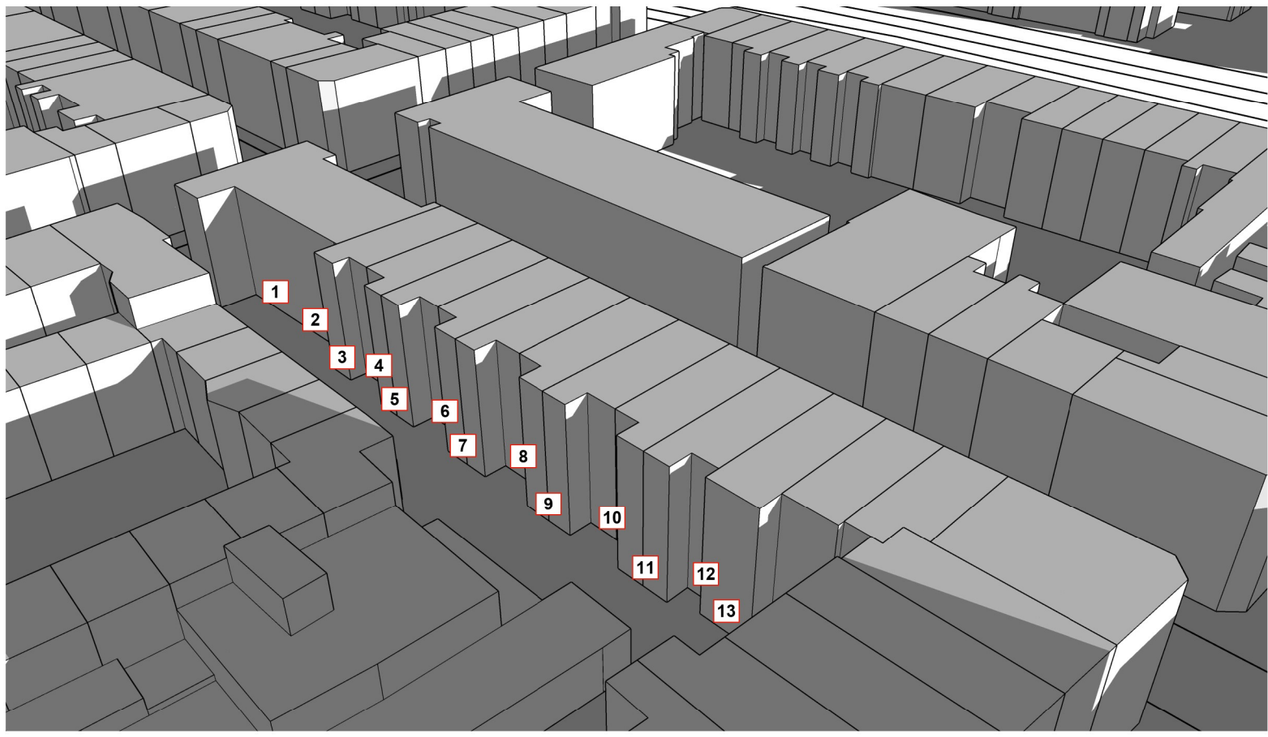
Agniesestraat Zuidzijde
21 september
07.30



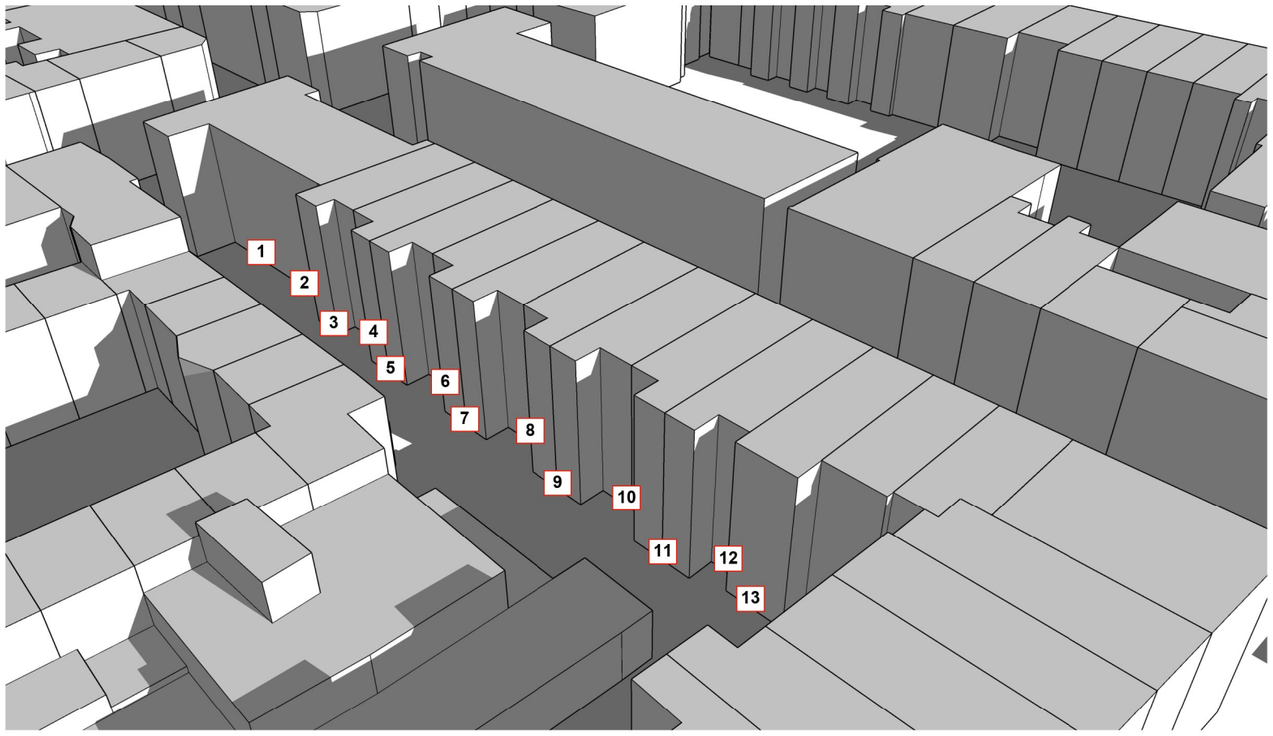


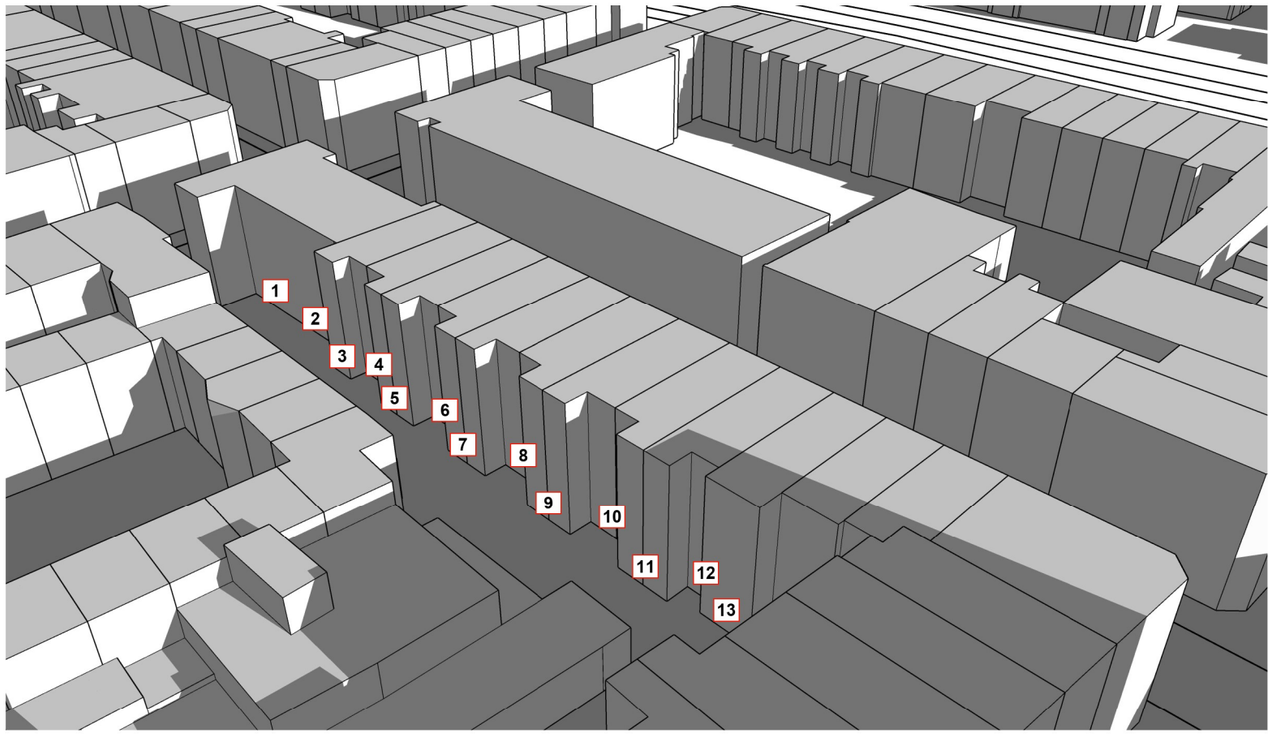
Agniesestraat Zuidzijde
21 september
08.00



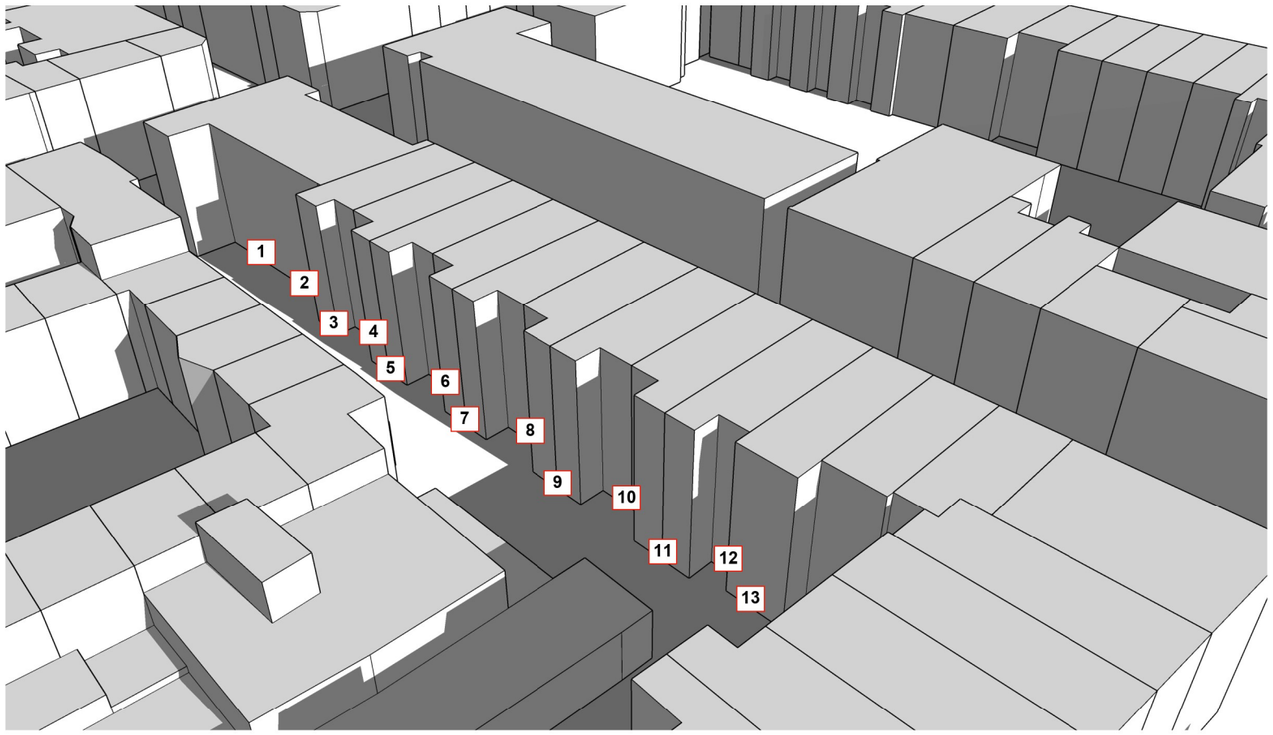


Agniesestraat Zuidzijde
21 september
08.30



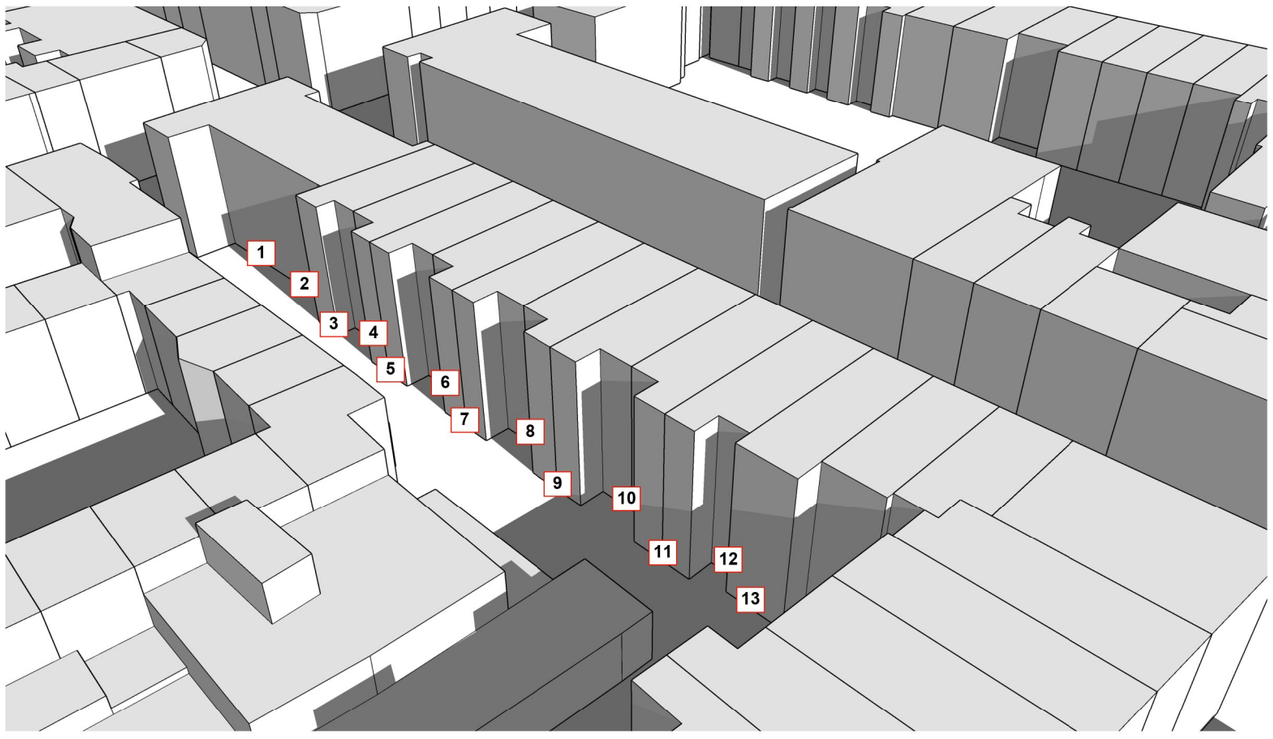


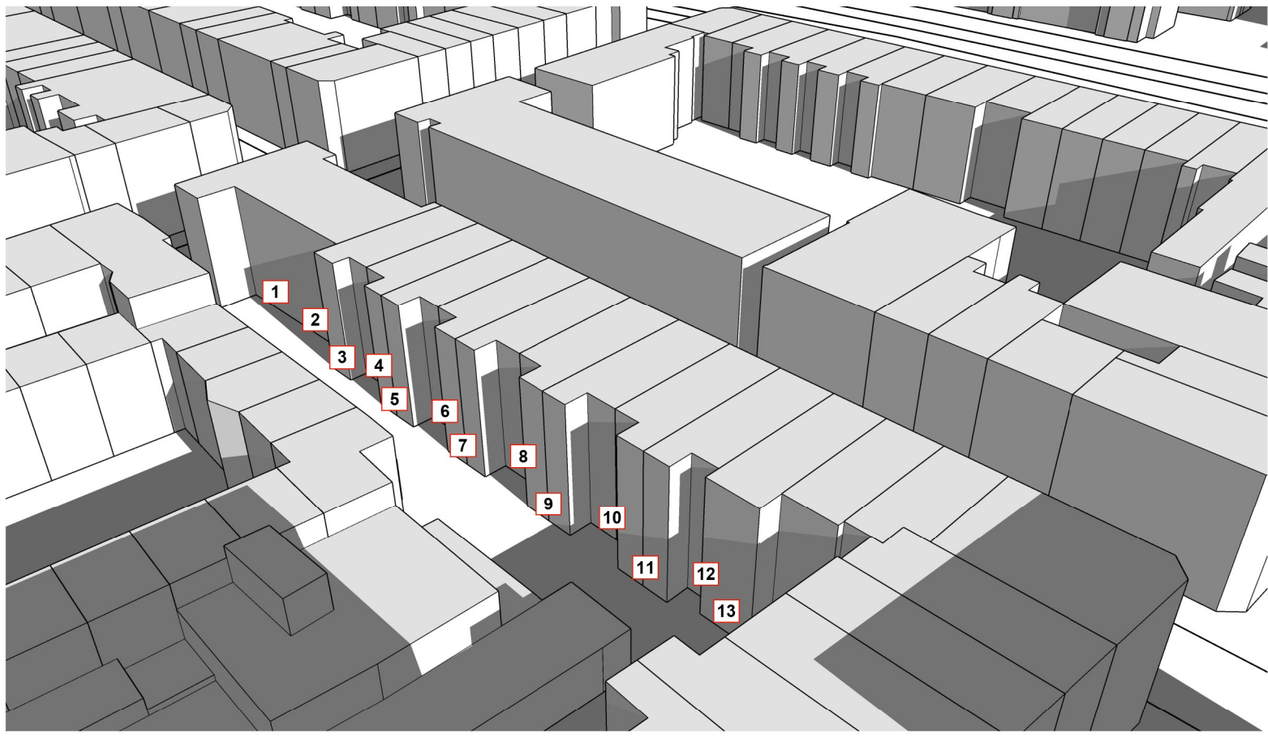
Agniesestraat Zuidzijde
21 september
09.00



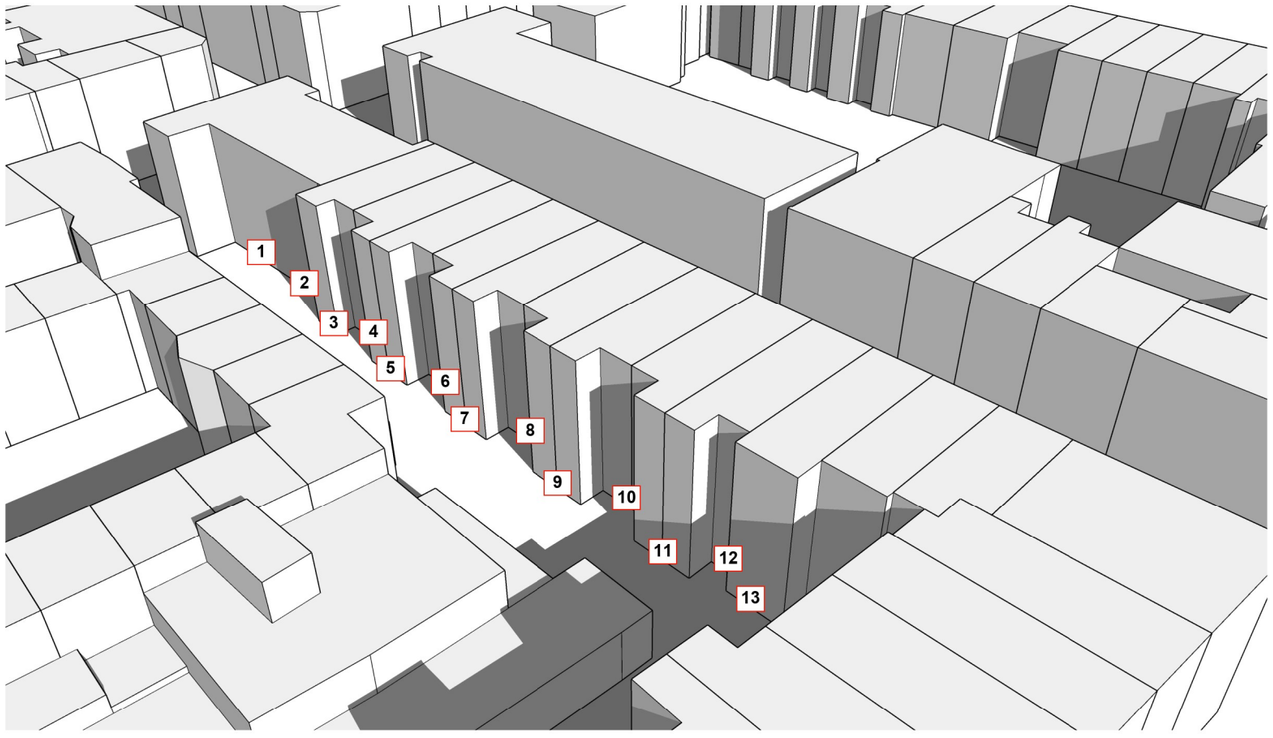


Agniesestraat Zuidzijde
21 september
09.30



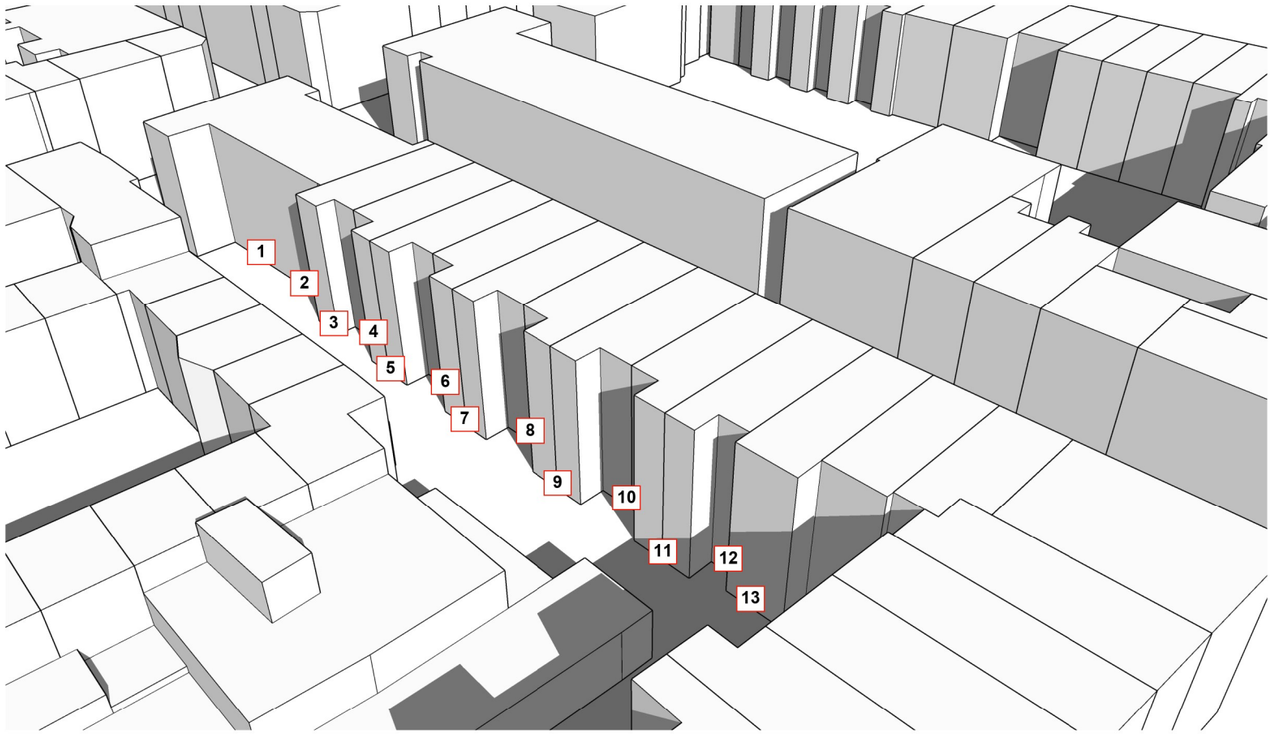


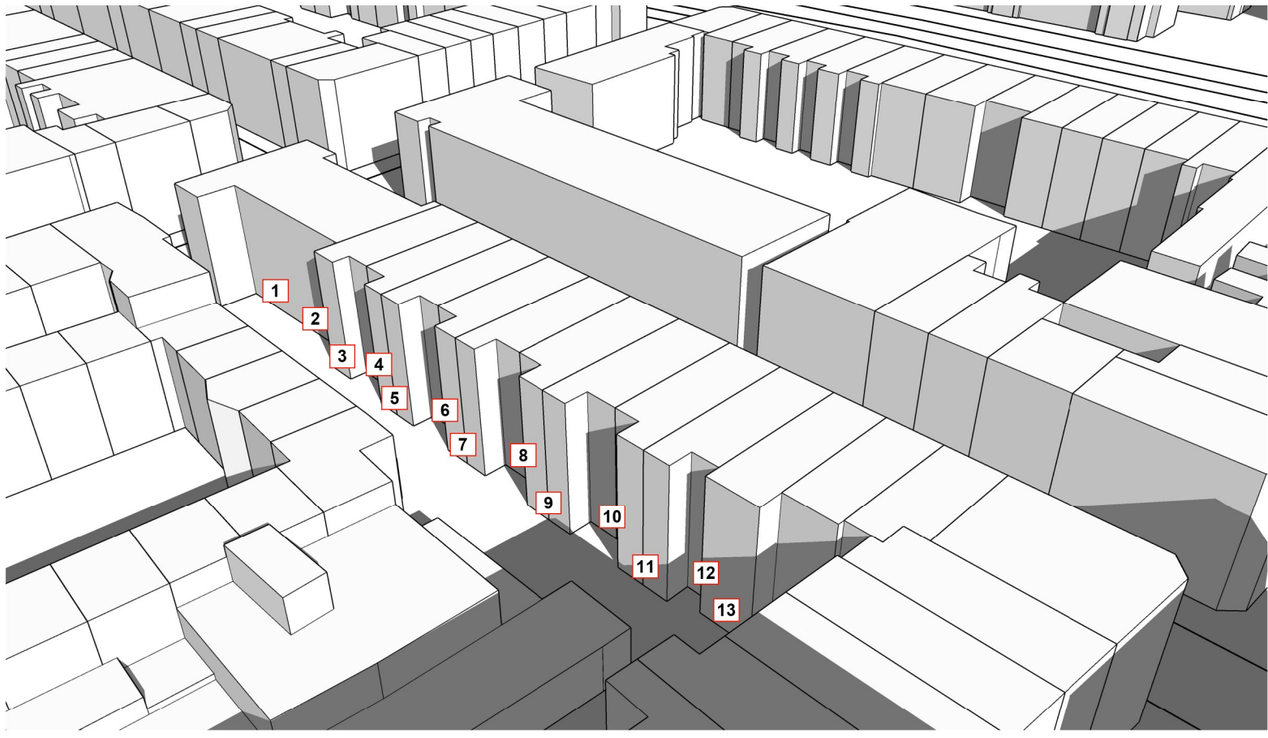
Agniesestraat Zuidzijde
21 september
10.00



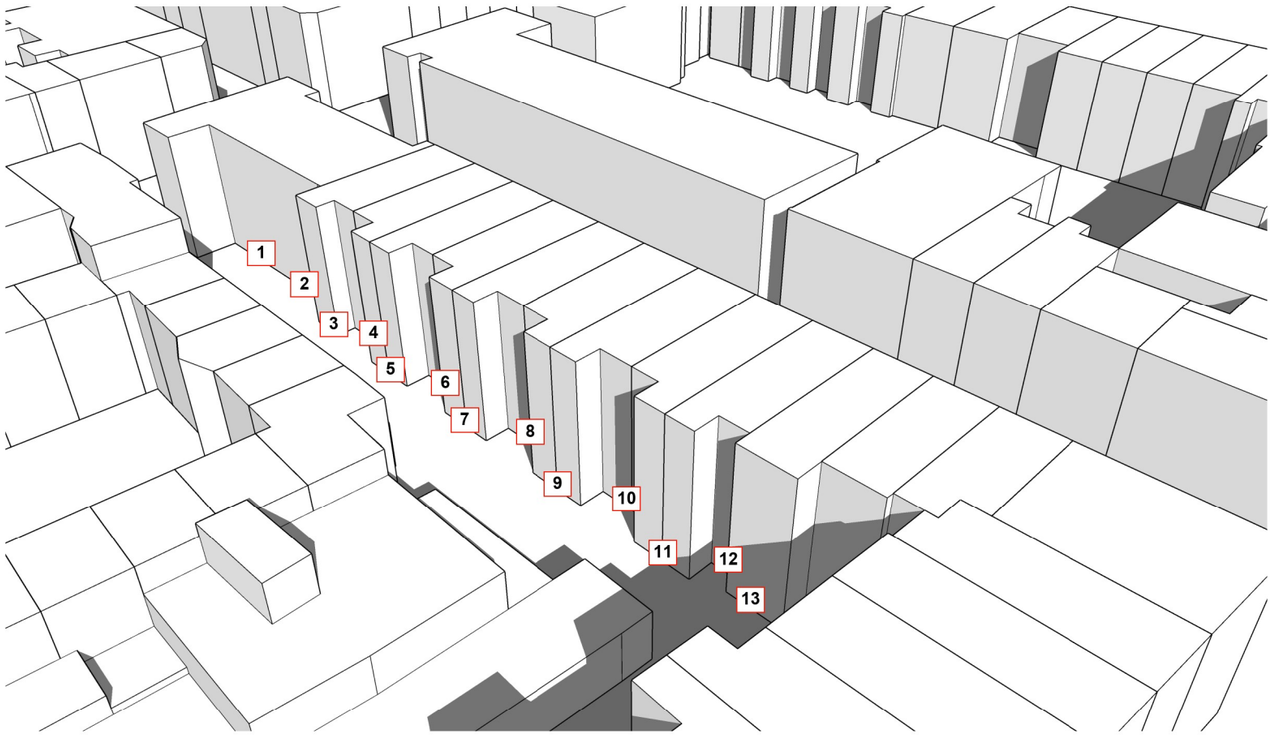


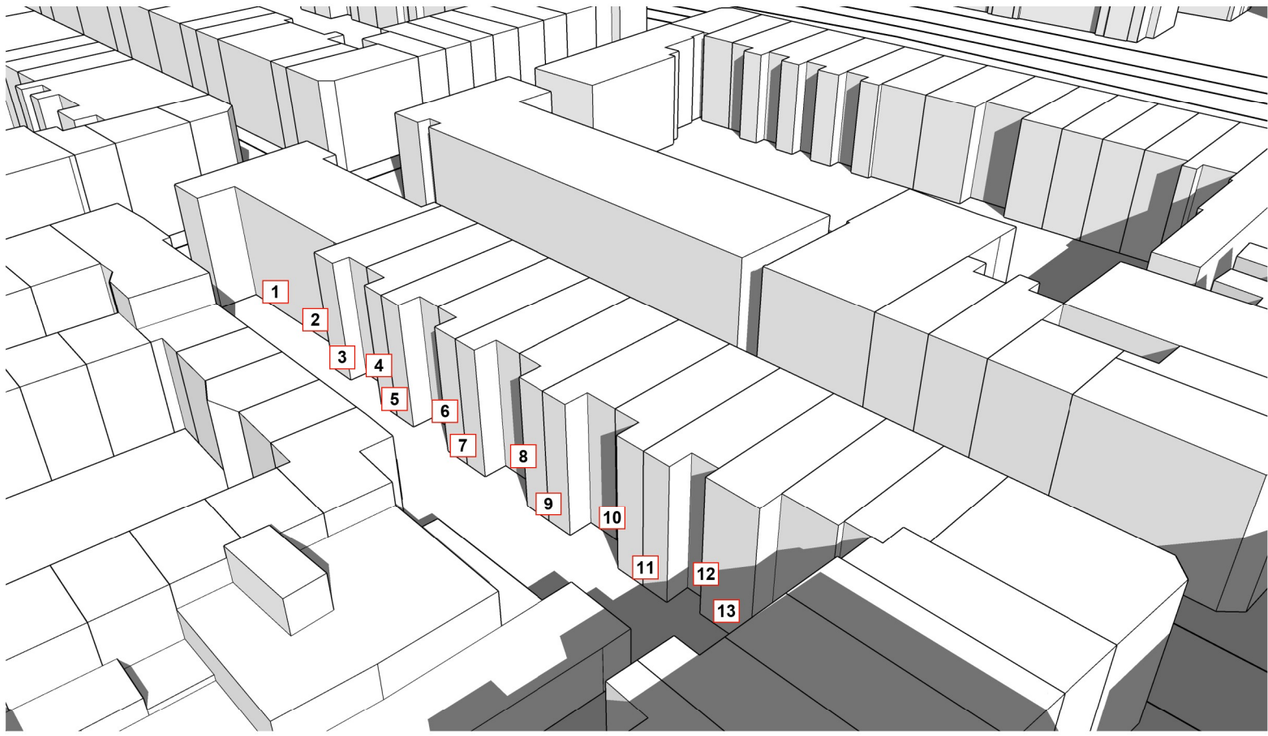
Agniesestraat Zuidzijde
21 september
10.30



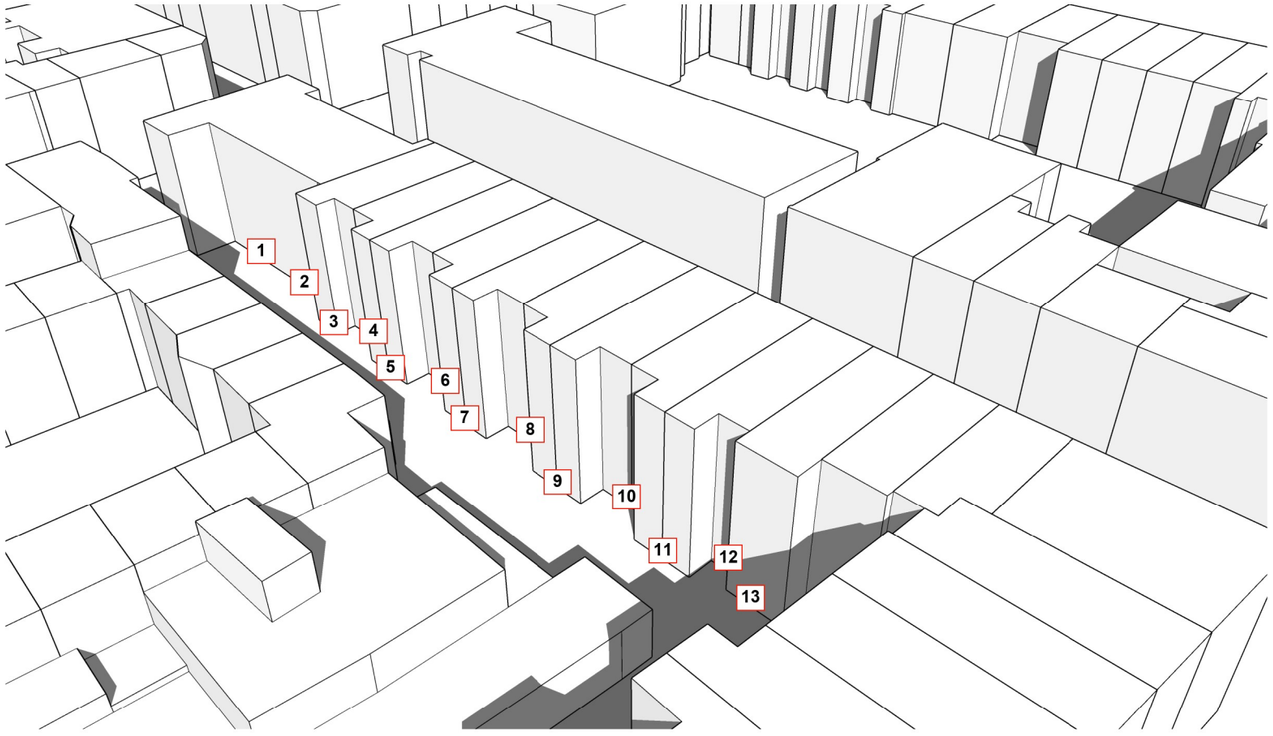


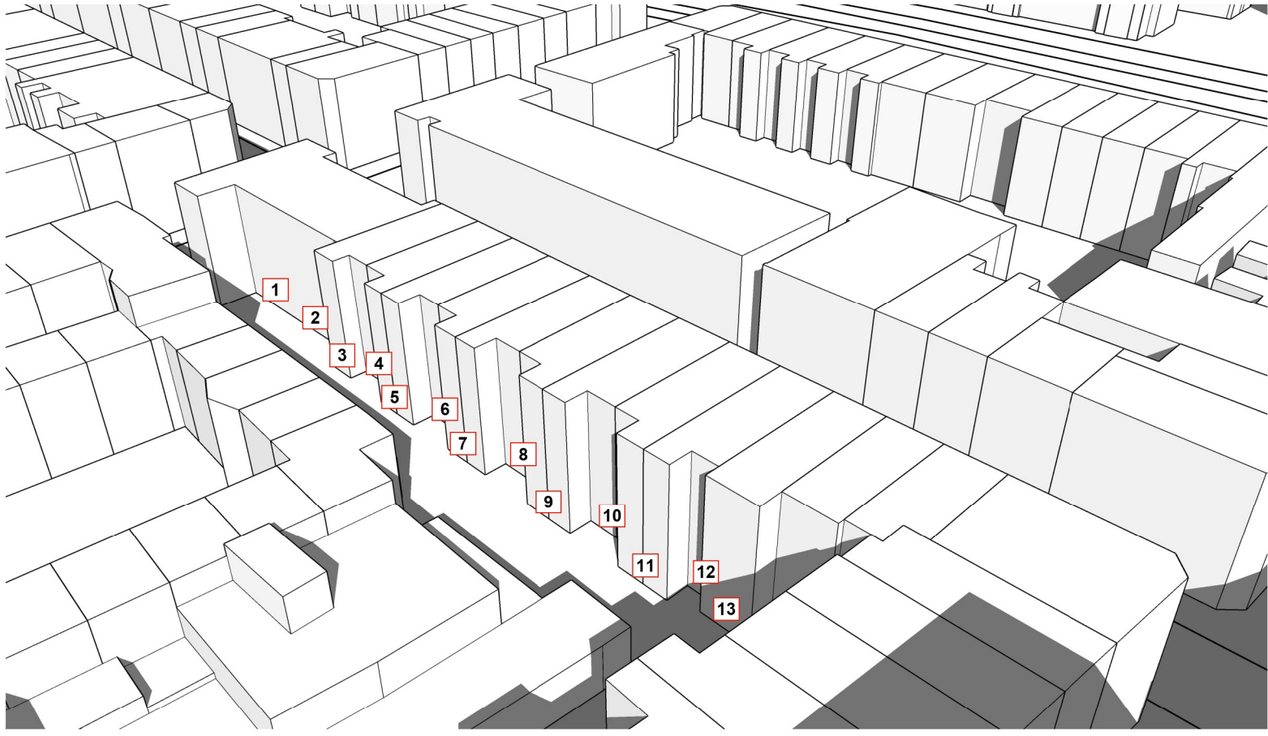
Agniesestraat Zuidzijde
21 september
11.00



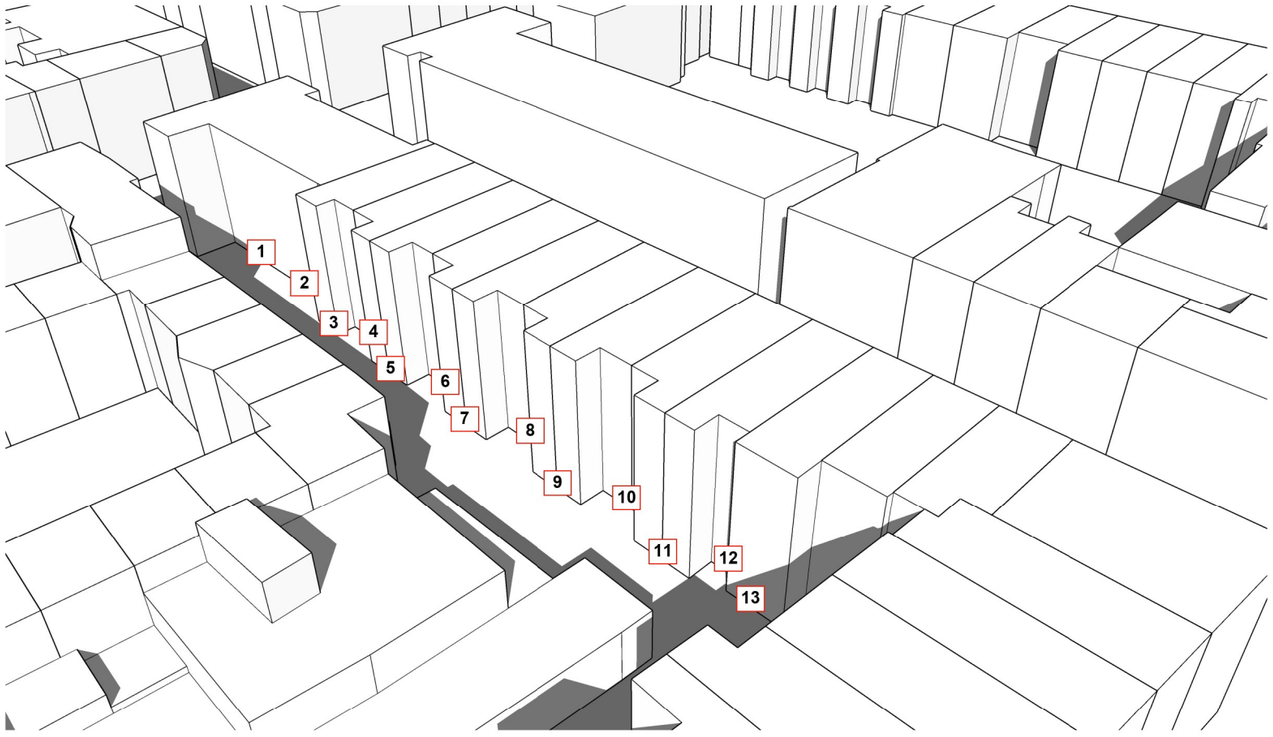


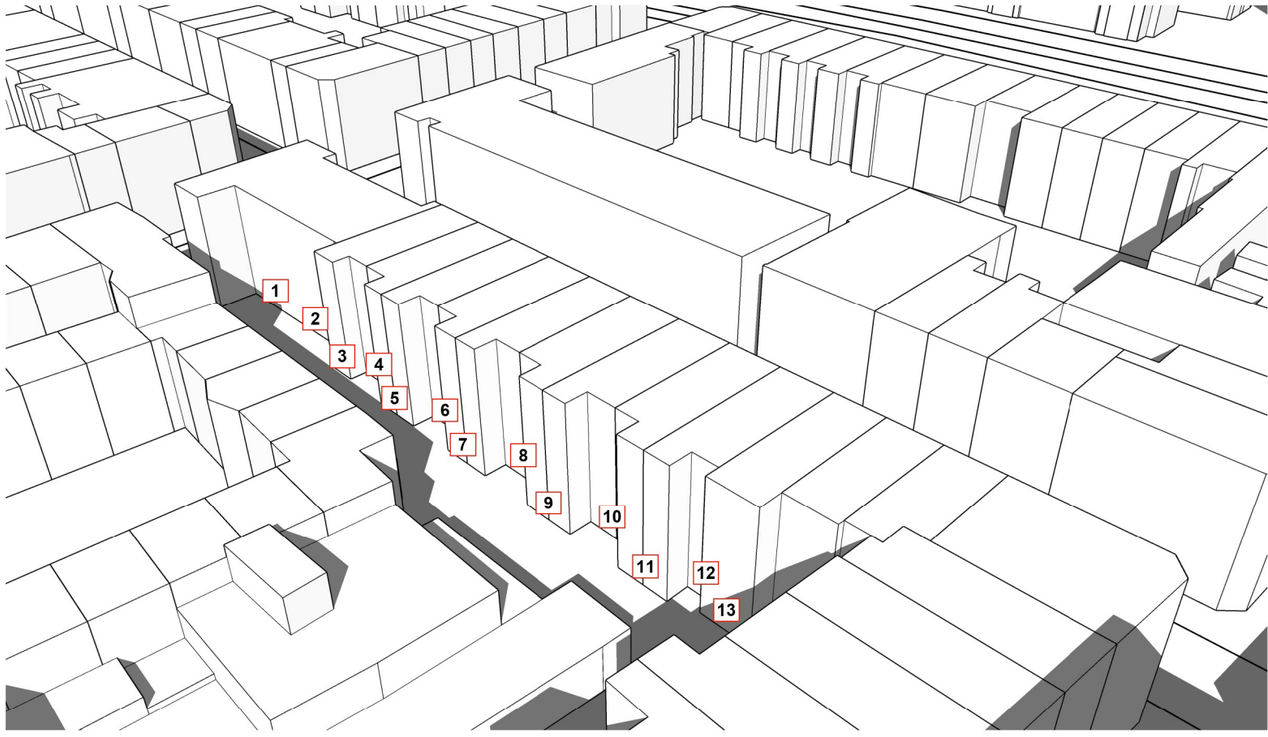
Agniesestraat Zuidzijde
21 september
11.30



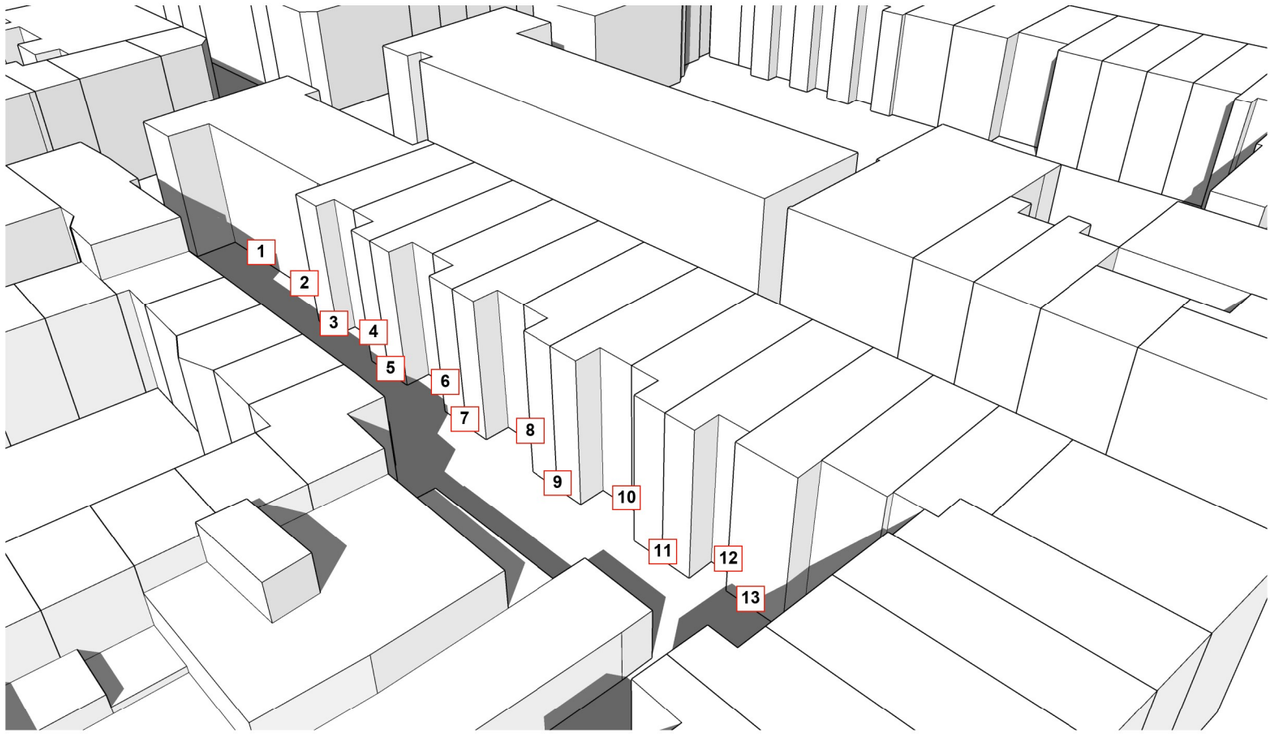


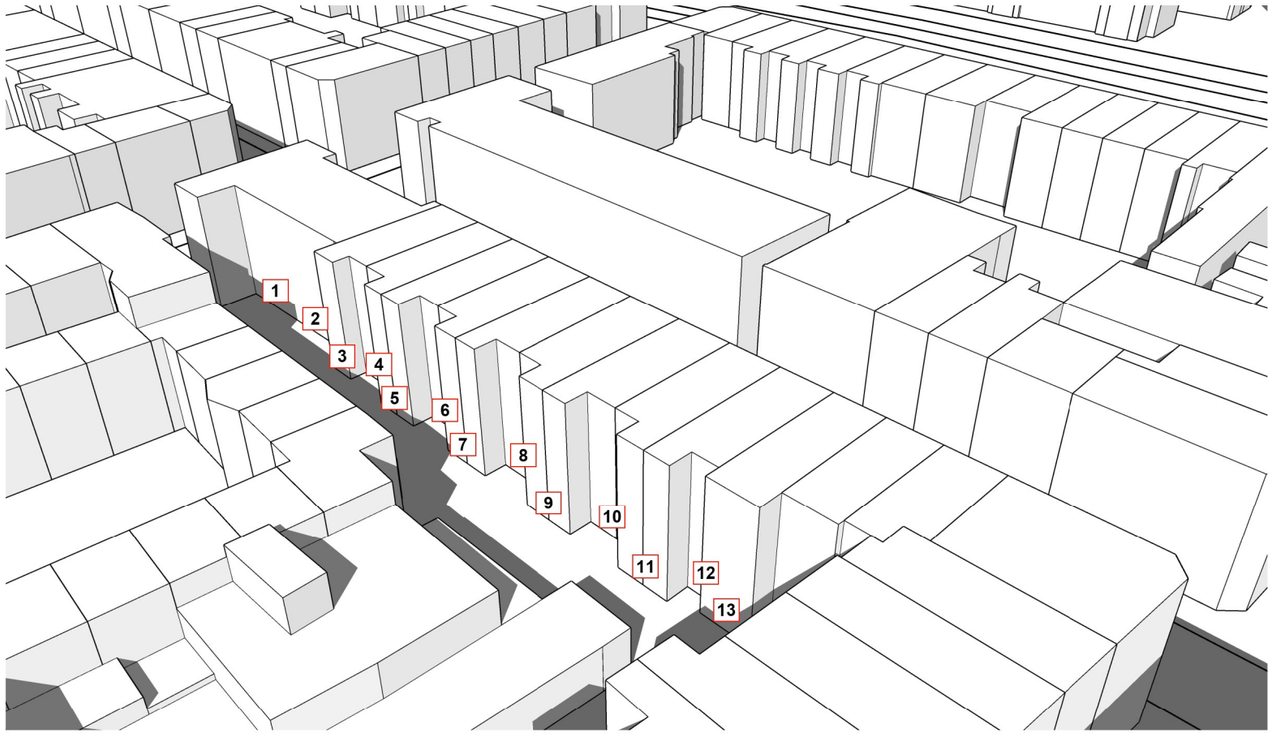
Agniesestraat Zuidzijde
21 september
12.00



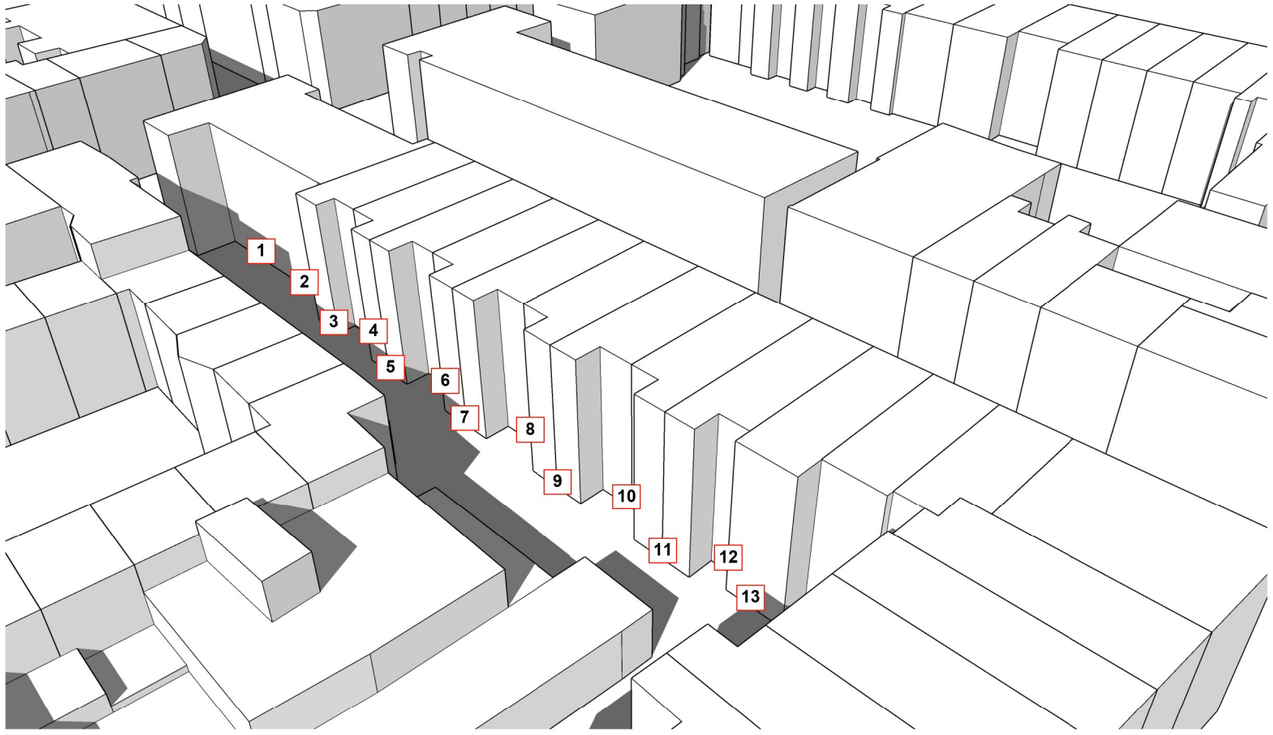


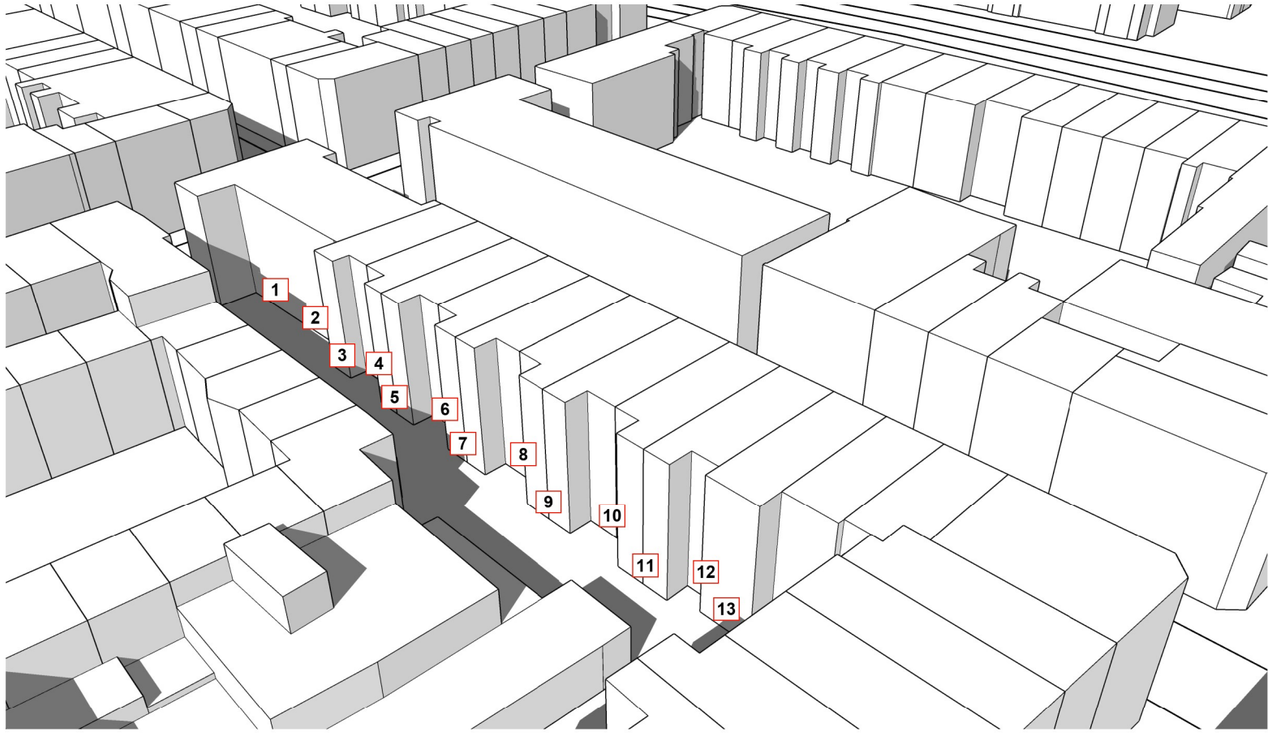
Agniesestraat Zuidzijde
21 september
12.30



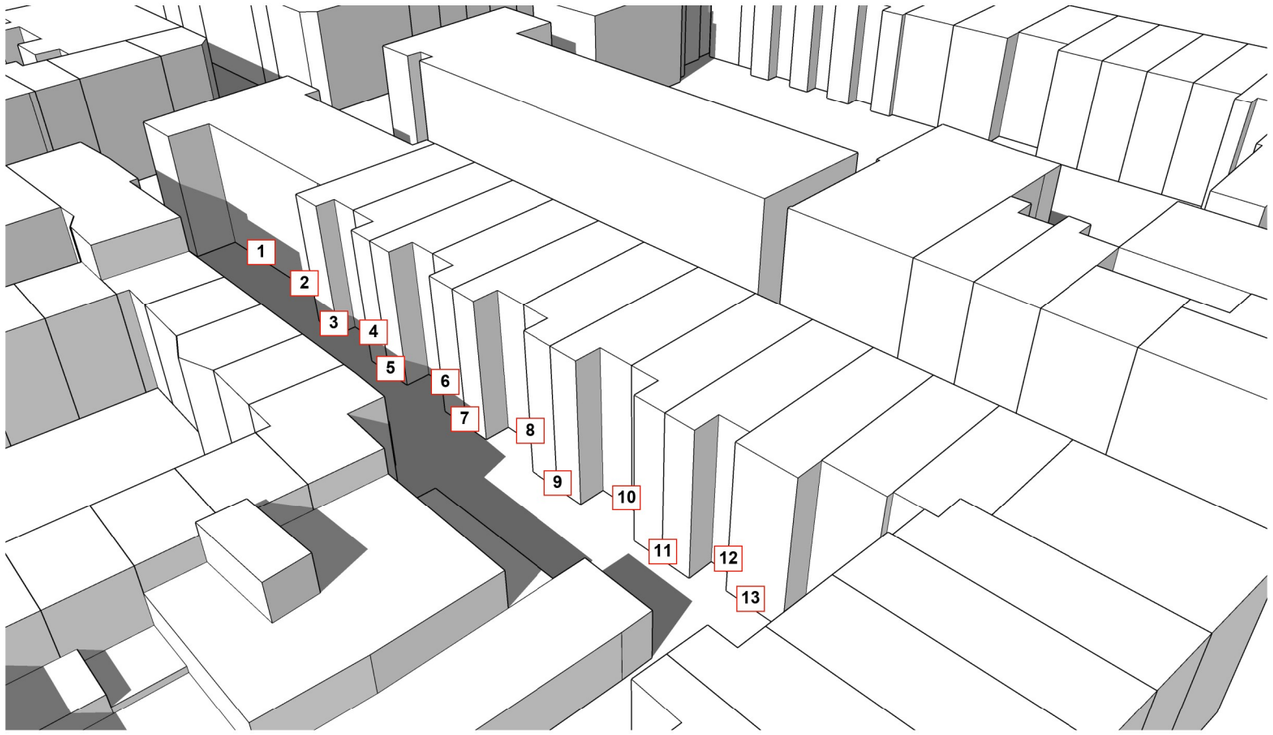


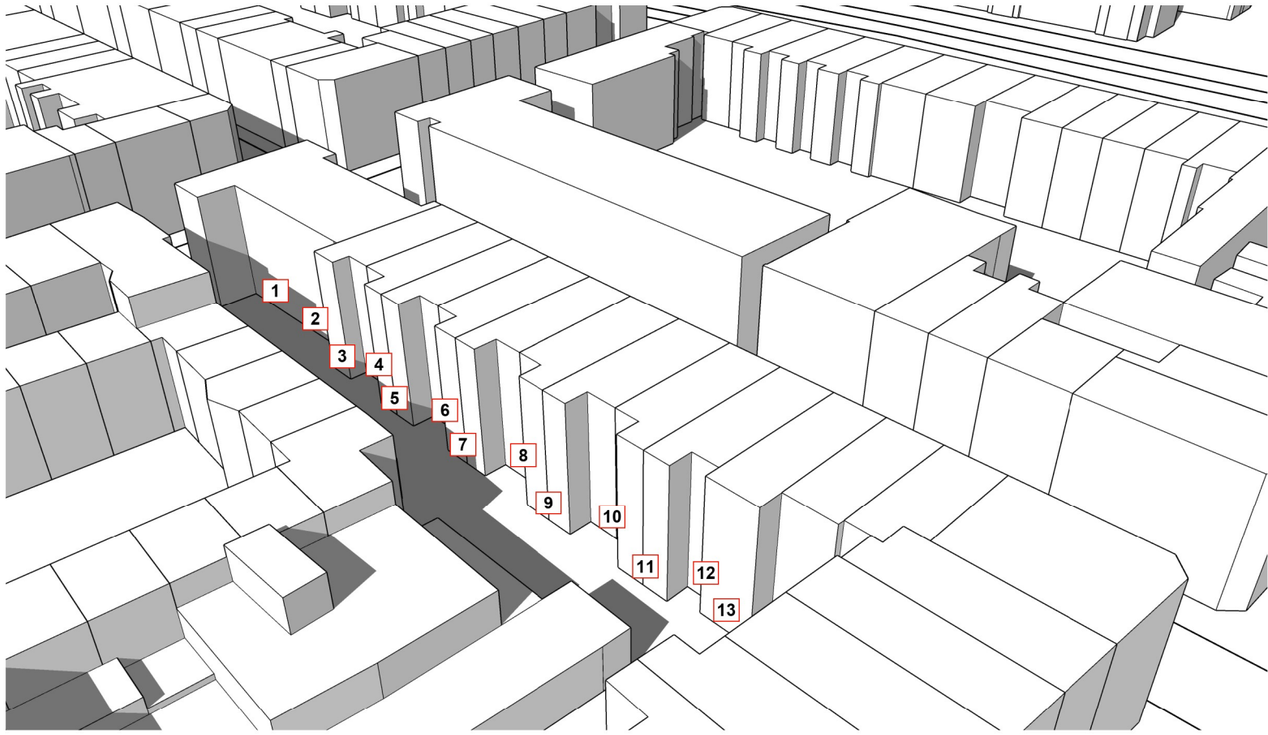
Agniesestraat Zuidzijde
21 september
13.00



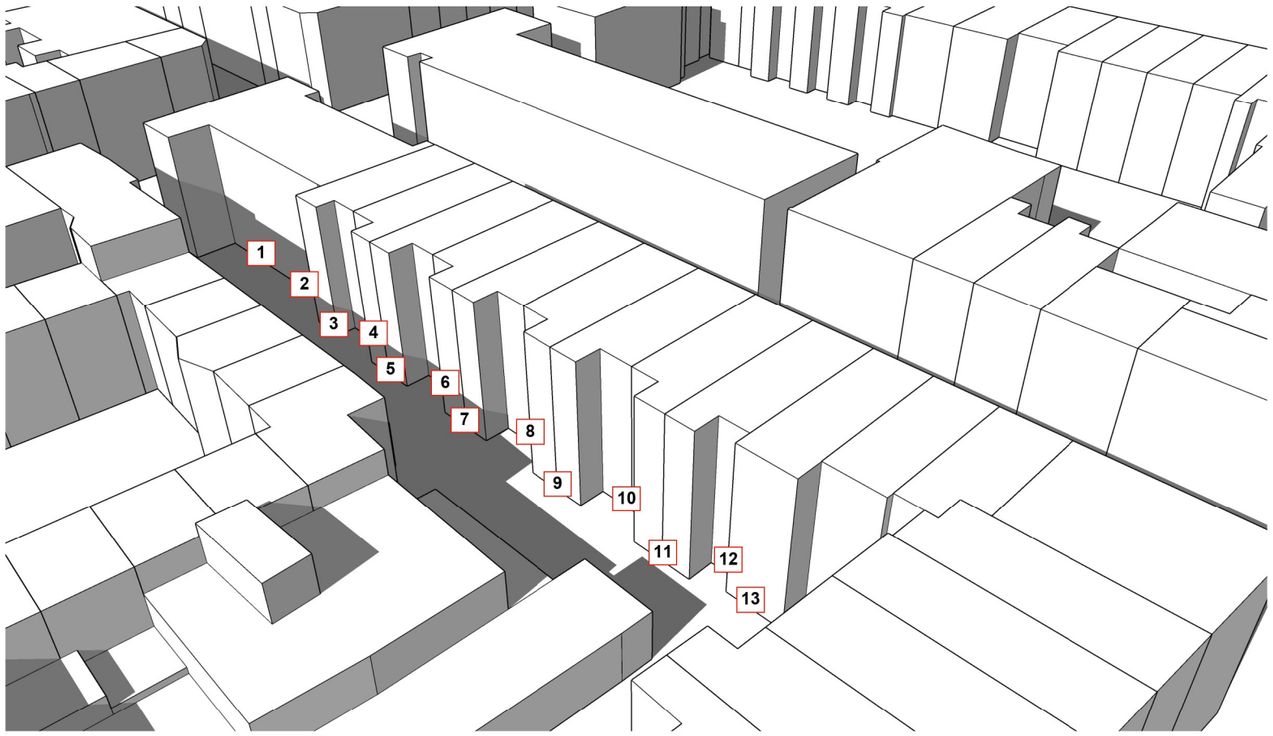


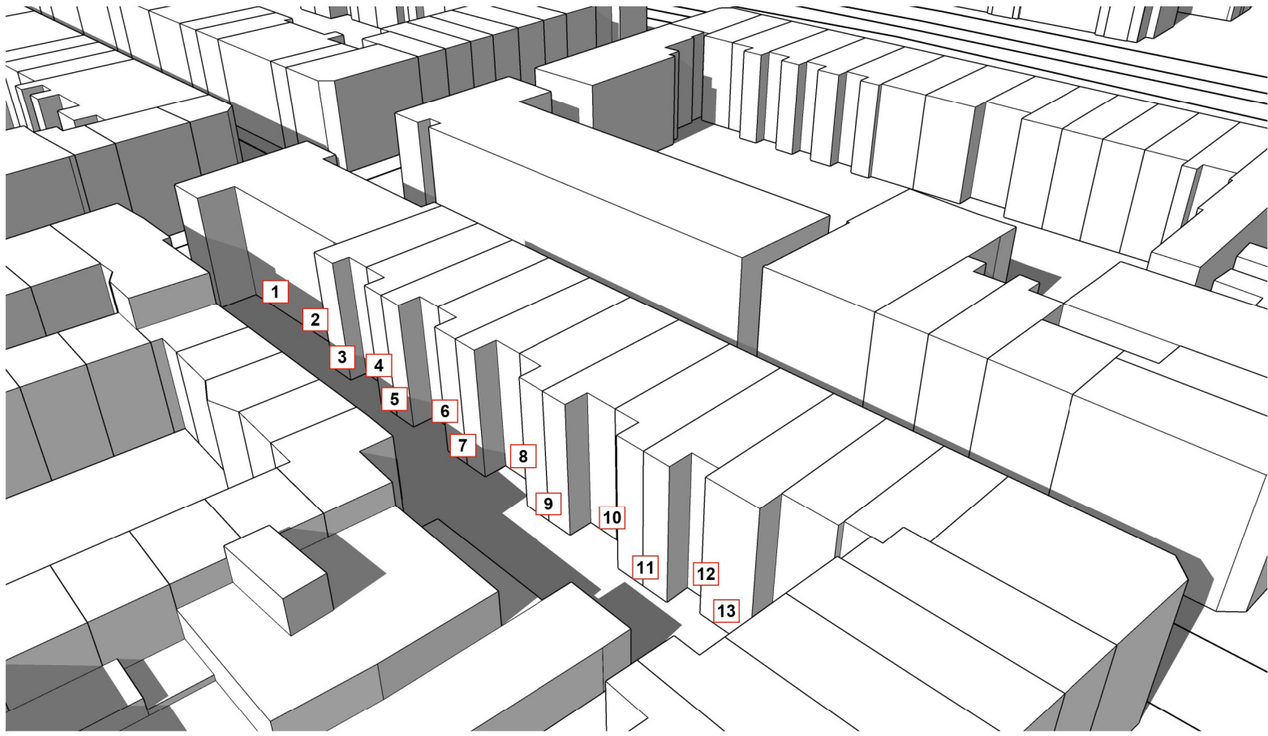
Agniesestraat Zuidzijde
21 september
13.30



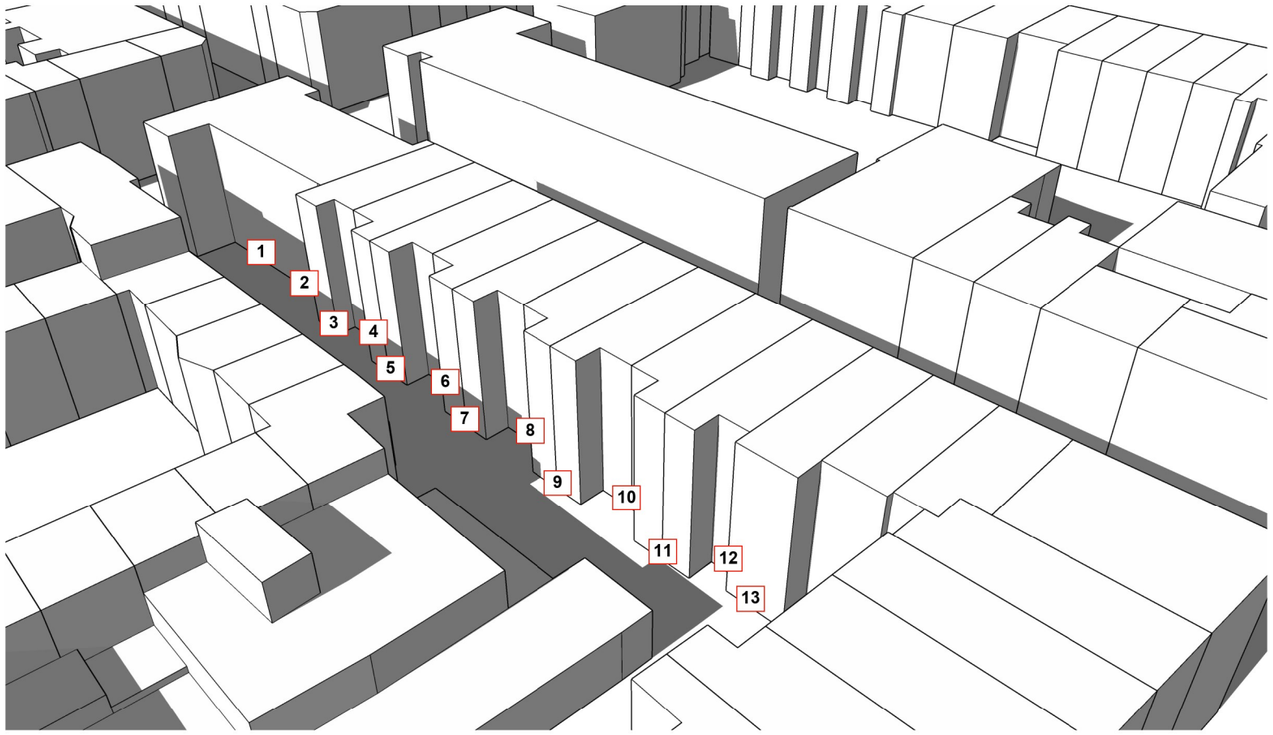


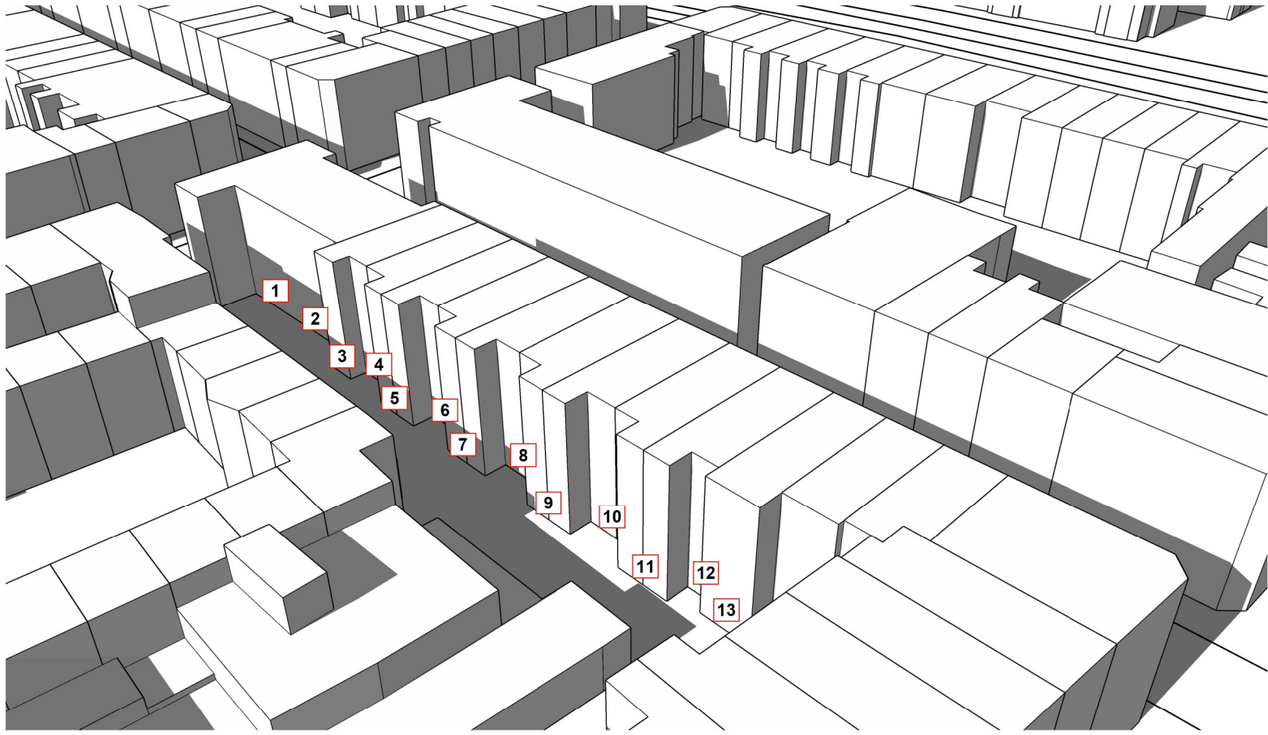
Agniesestraat Zuidzijde
21 september
14.00



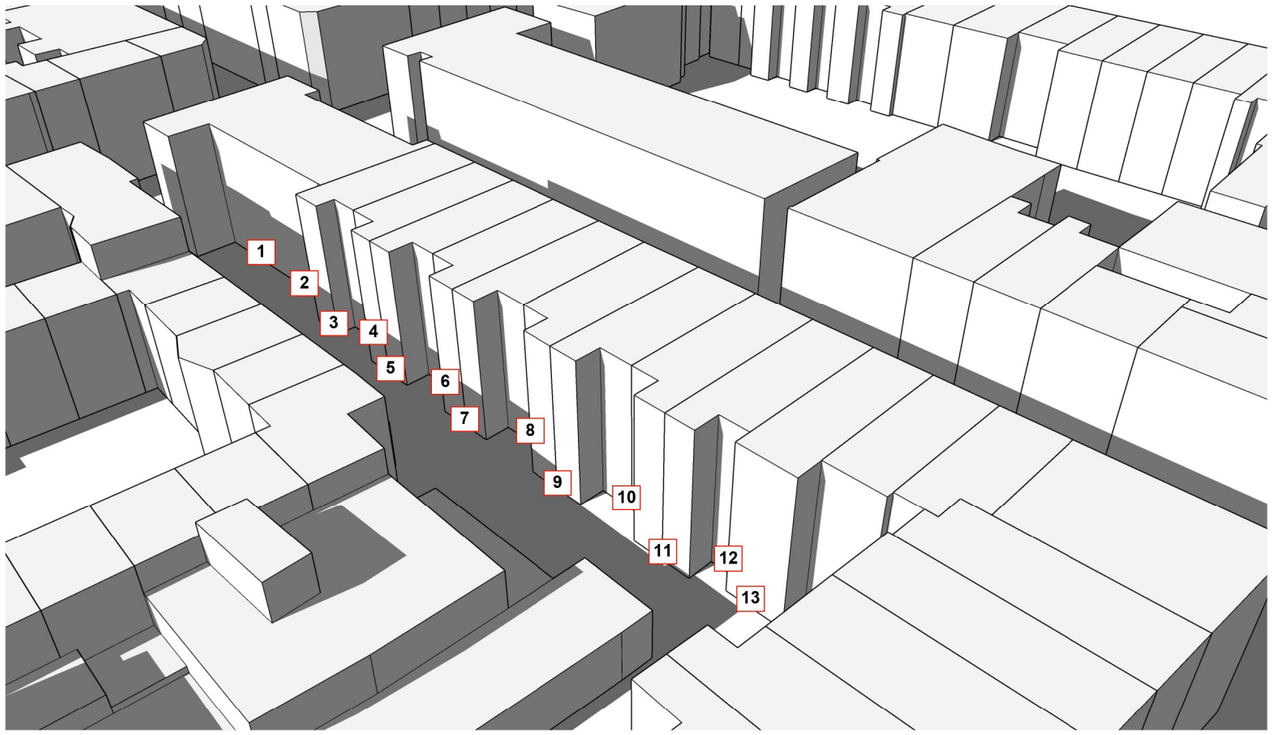


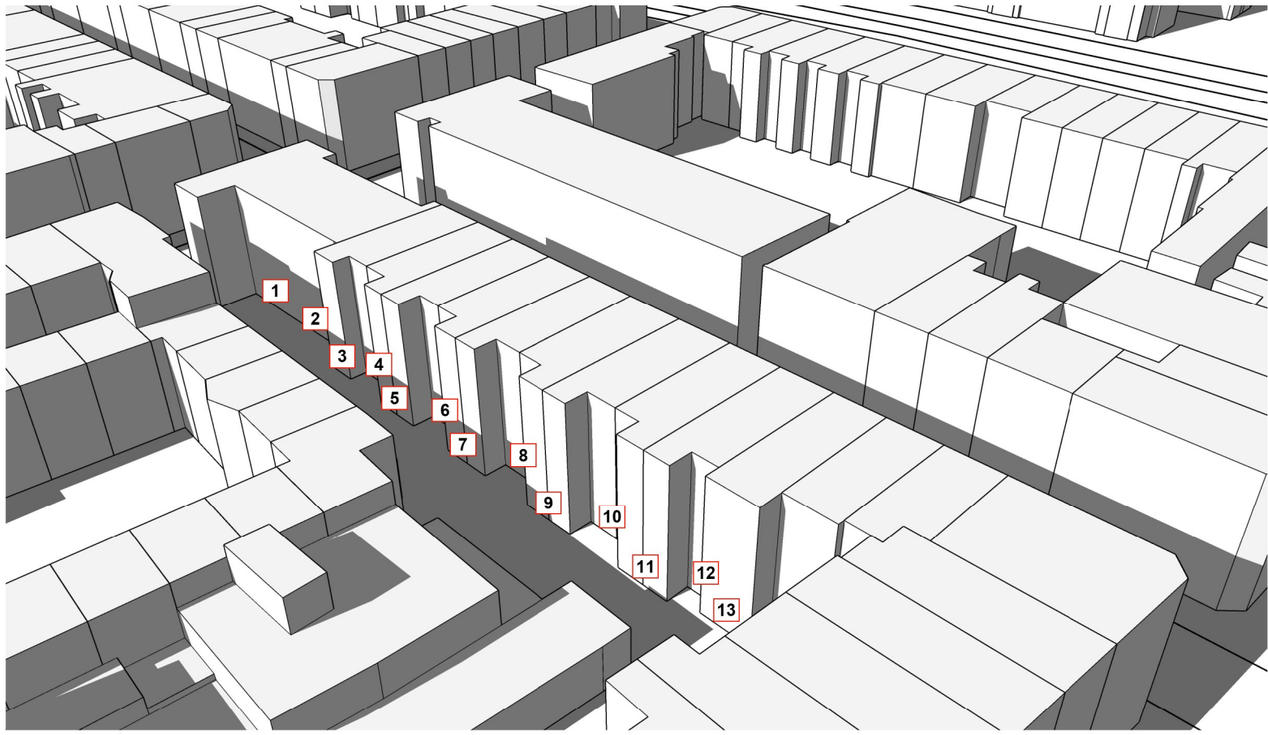
Agniesestraat Zuidzijde
21 september
14.30



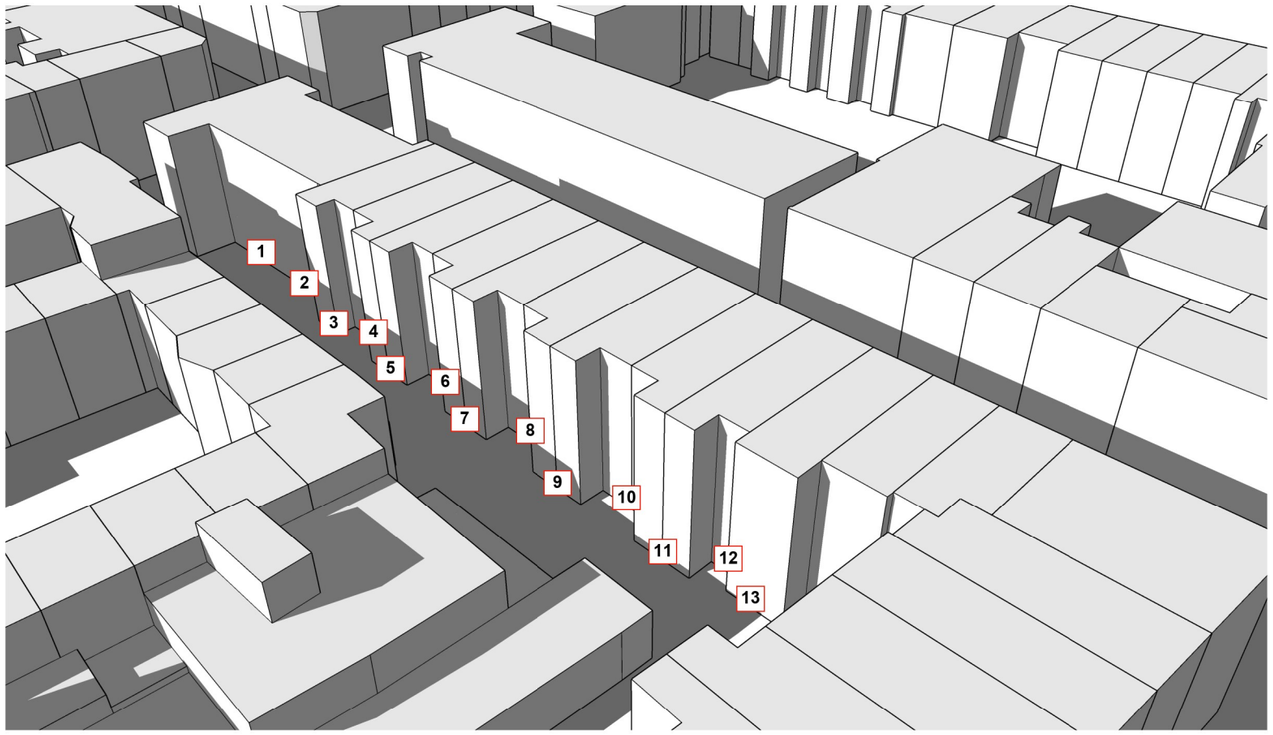


Agniesestraat Zuidzijde
21 september
15.00



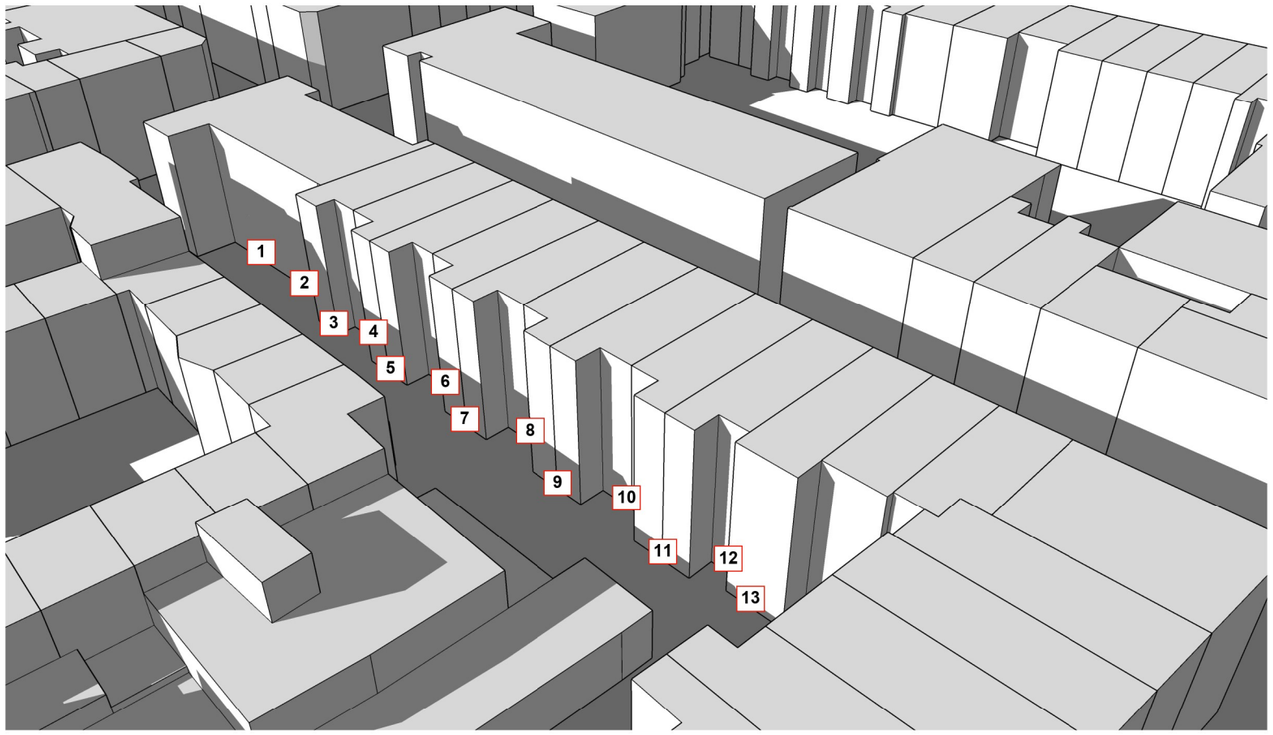


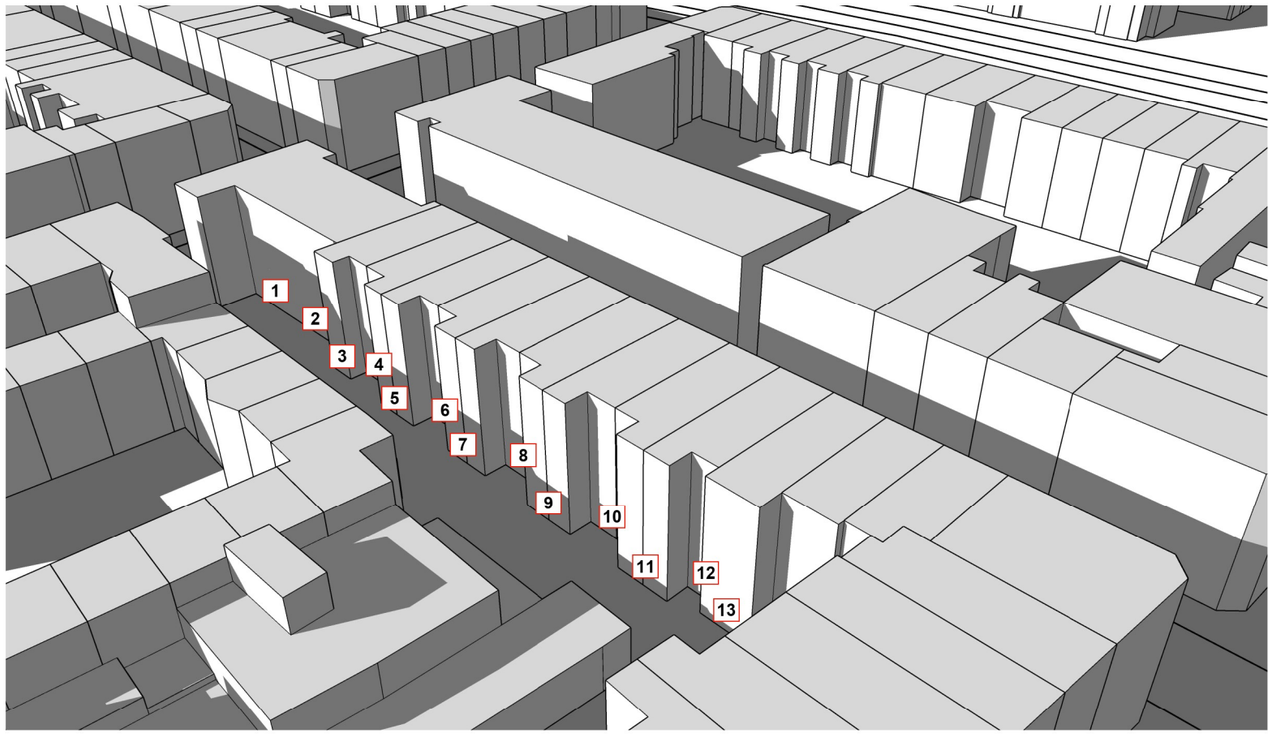
Agniesestraat Zuidzijde
21 september
15.30



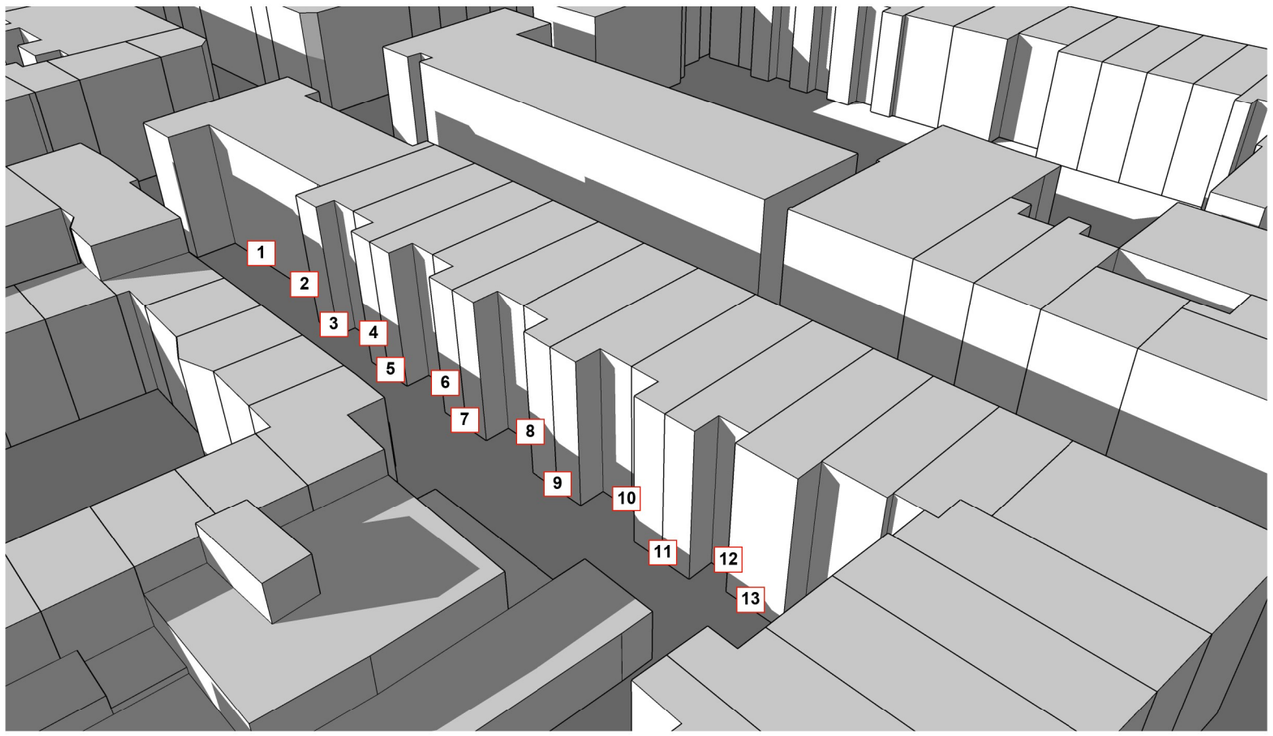


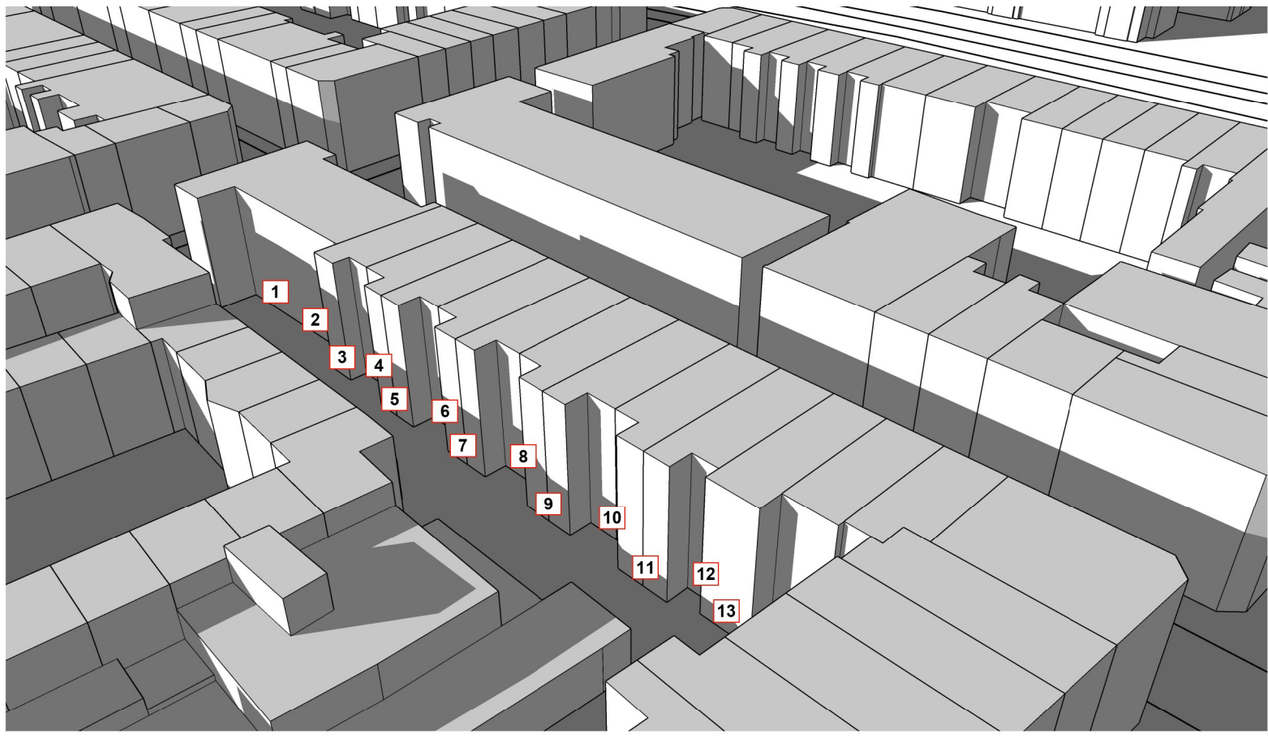
Agniesestraat Zuidzijde
21 september
16.00



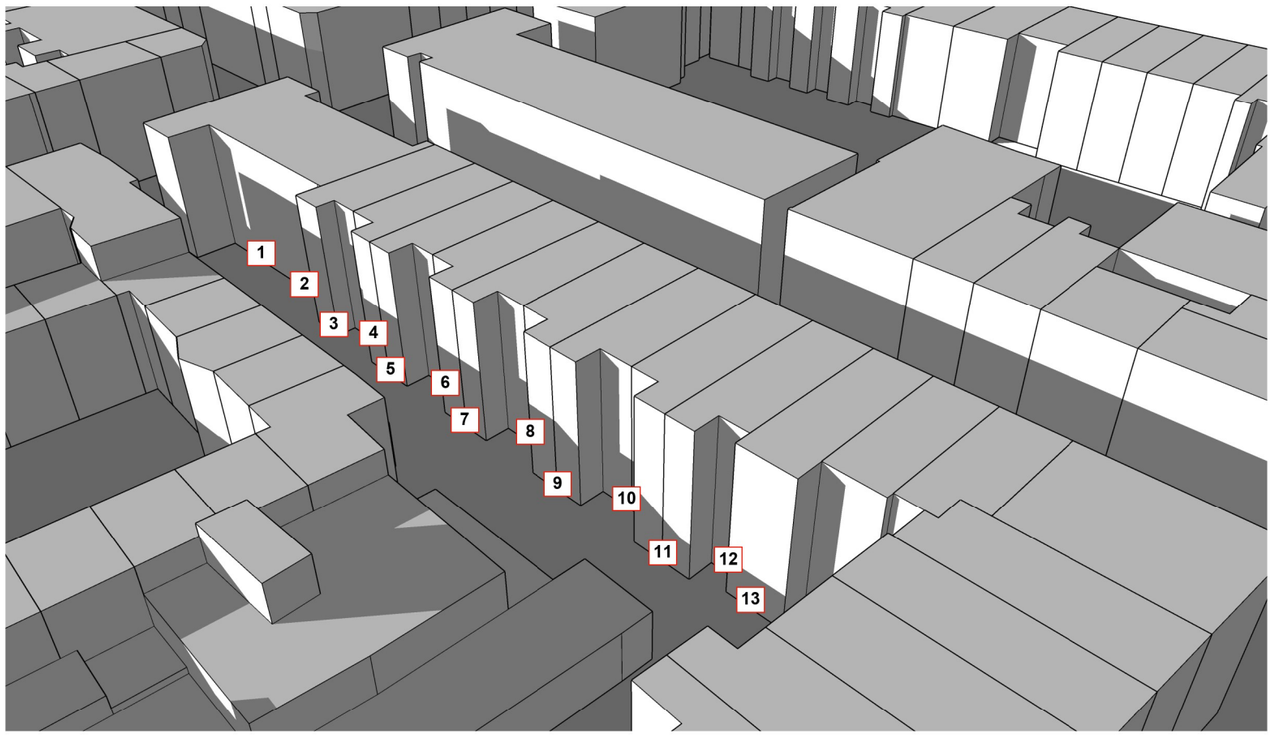


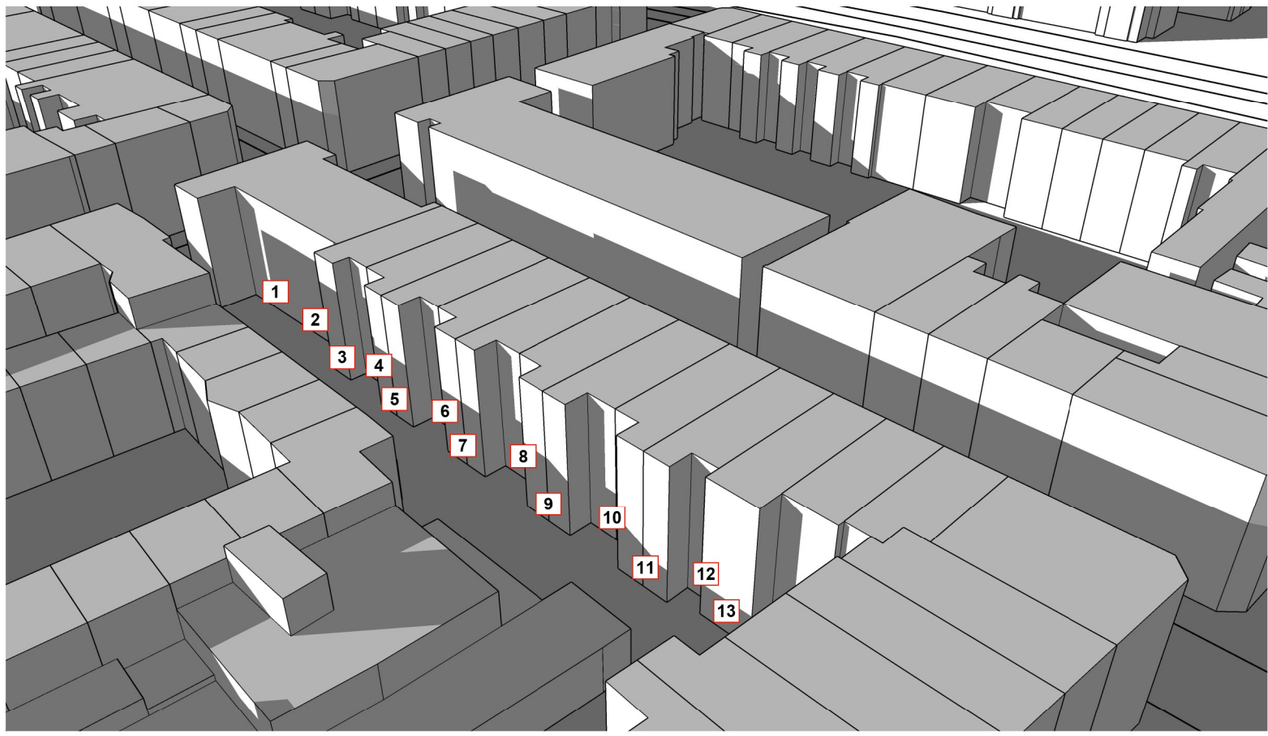
Agniesestraat Zuidzijde
21 september
16.30



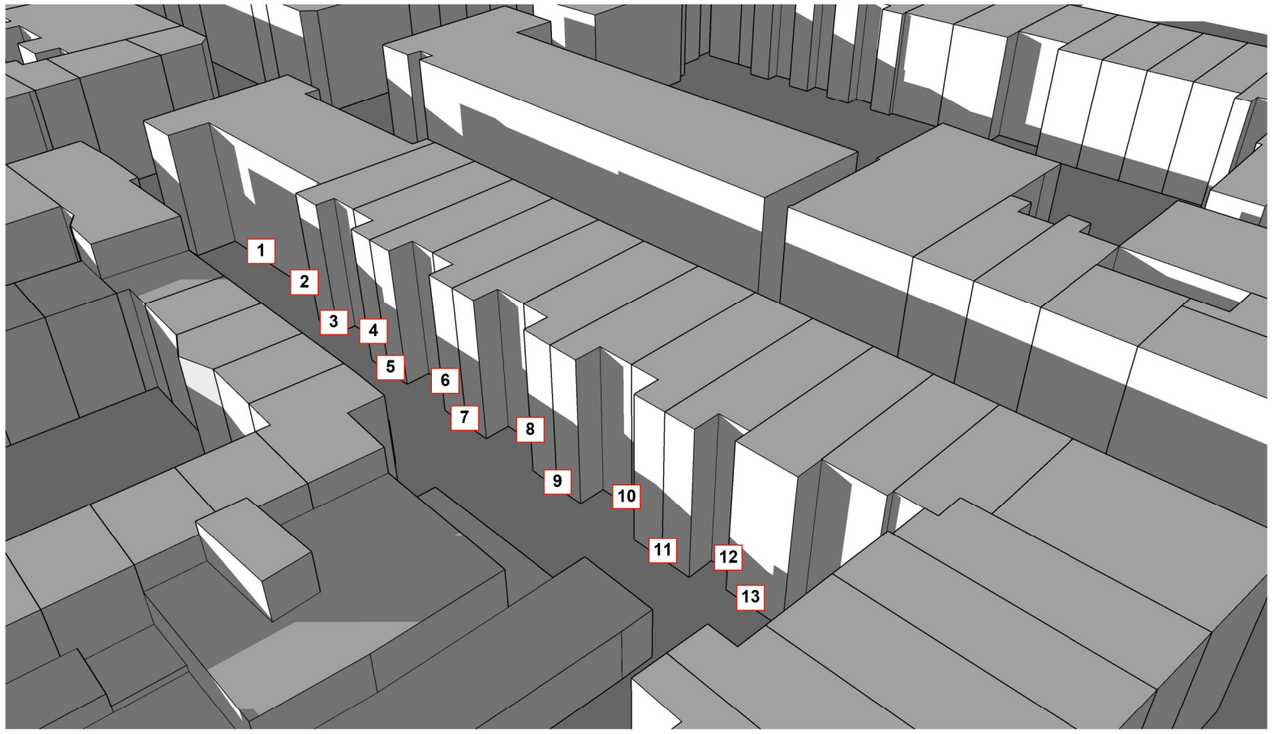


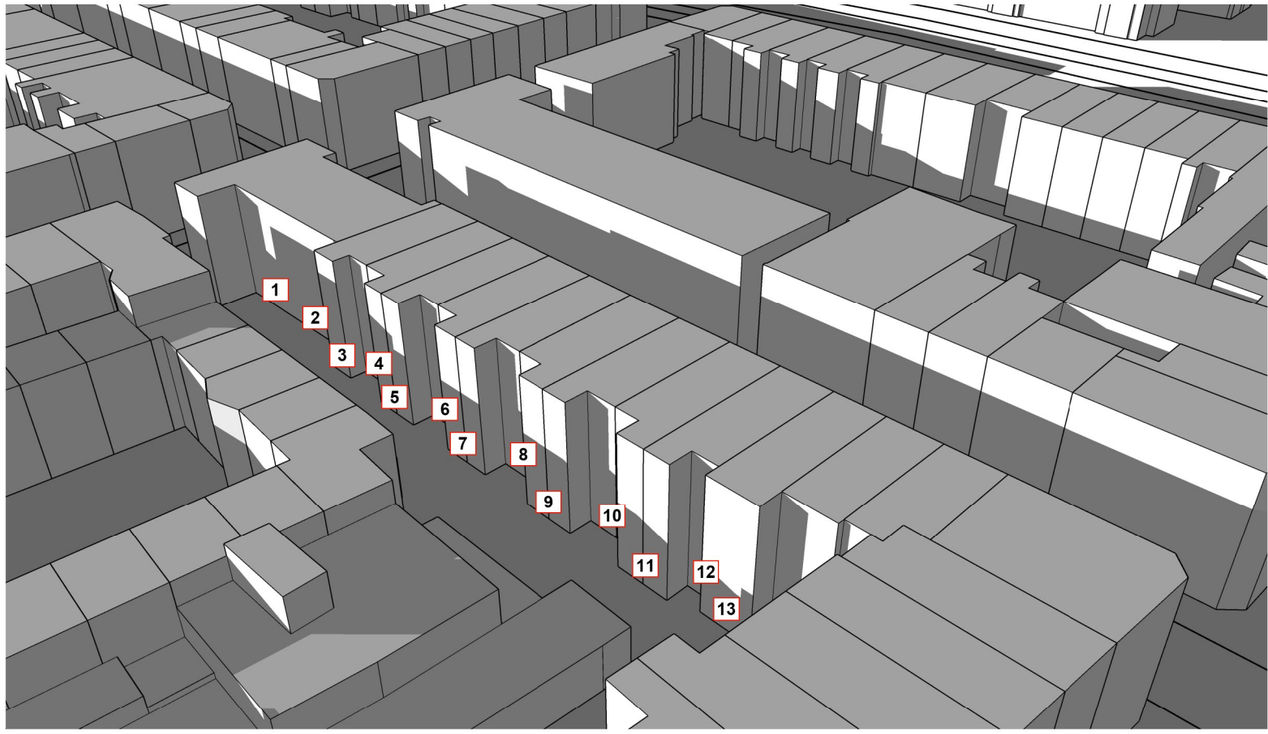
Agniesestraat Zuidzijde
21 september
17.00



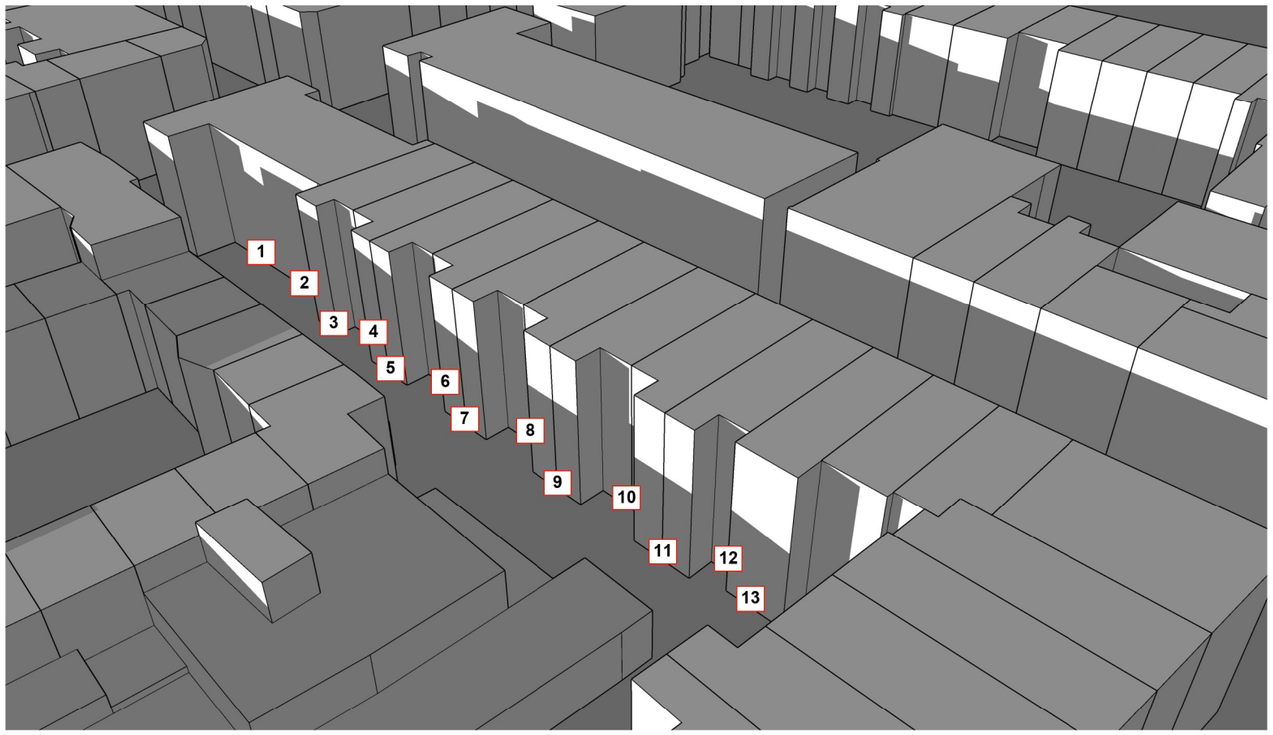


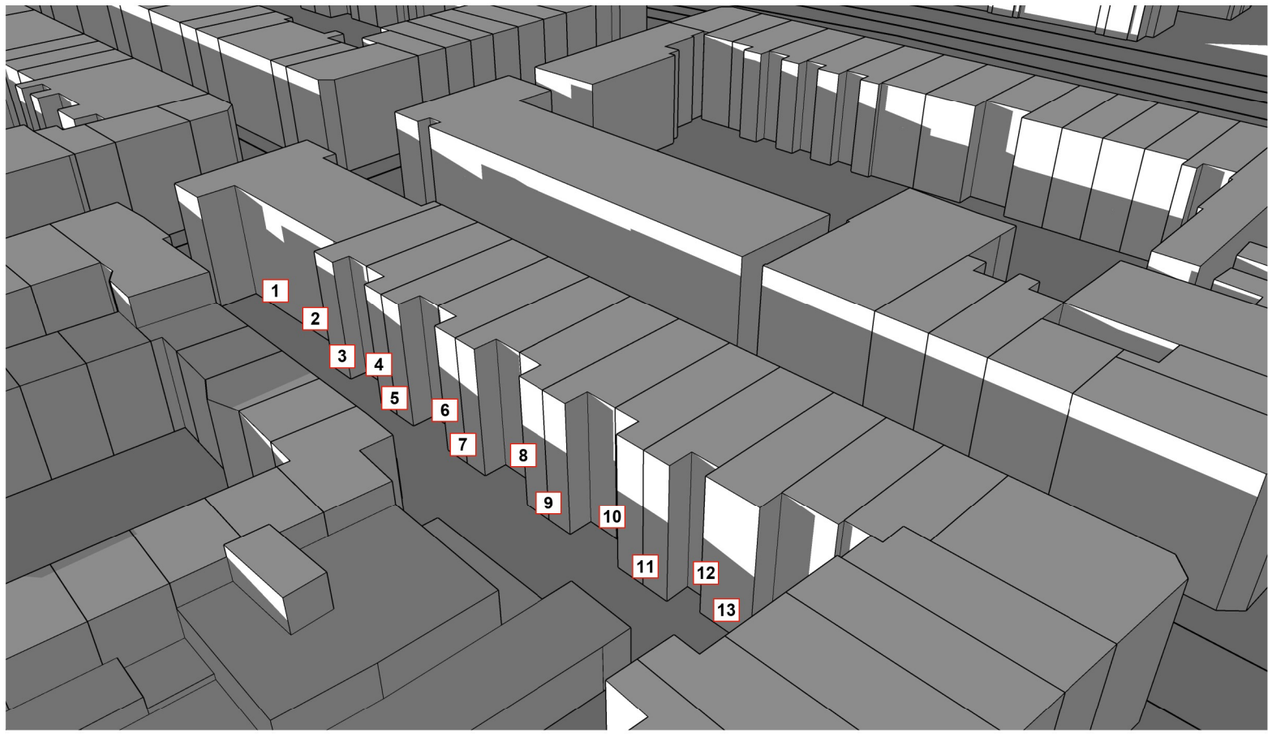
Agniesestraat Zuidzijde
21 september
17.30



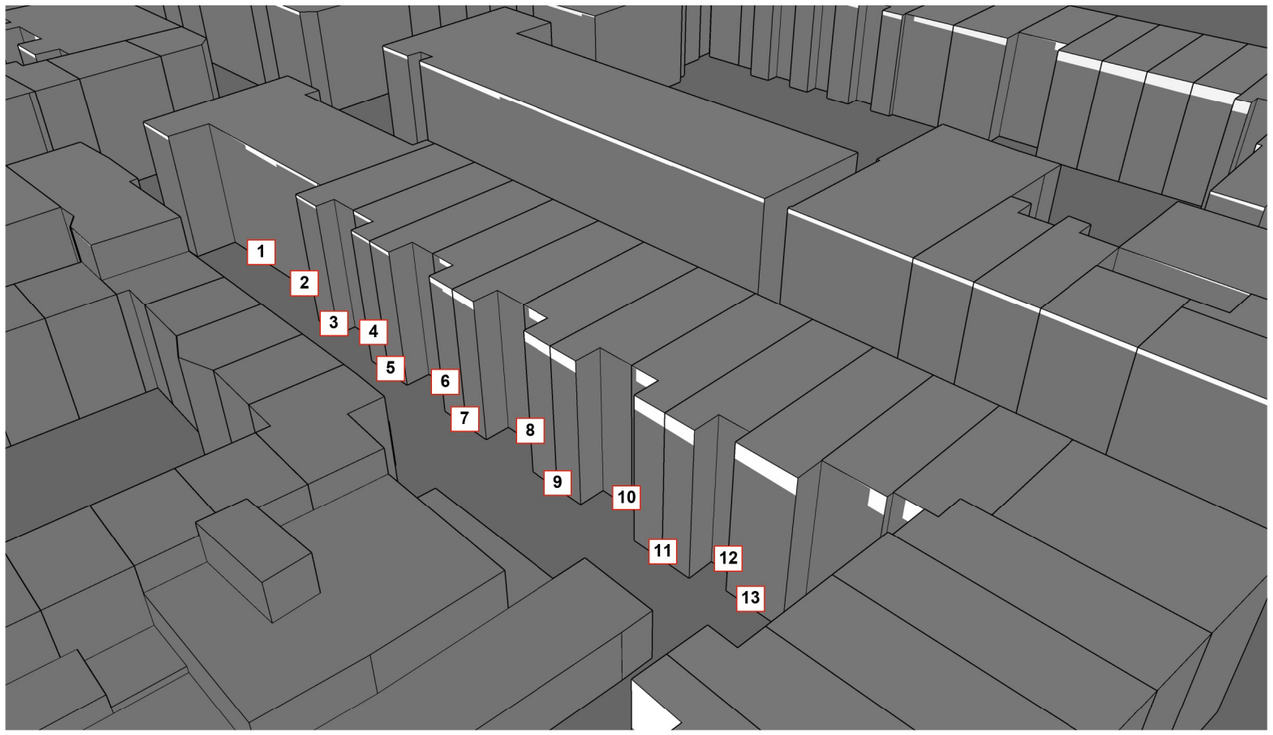


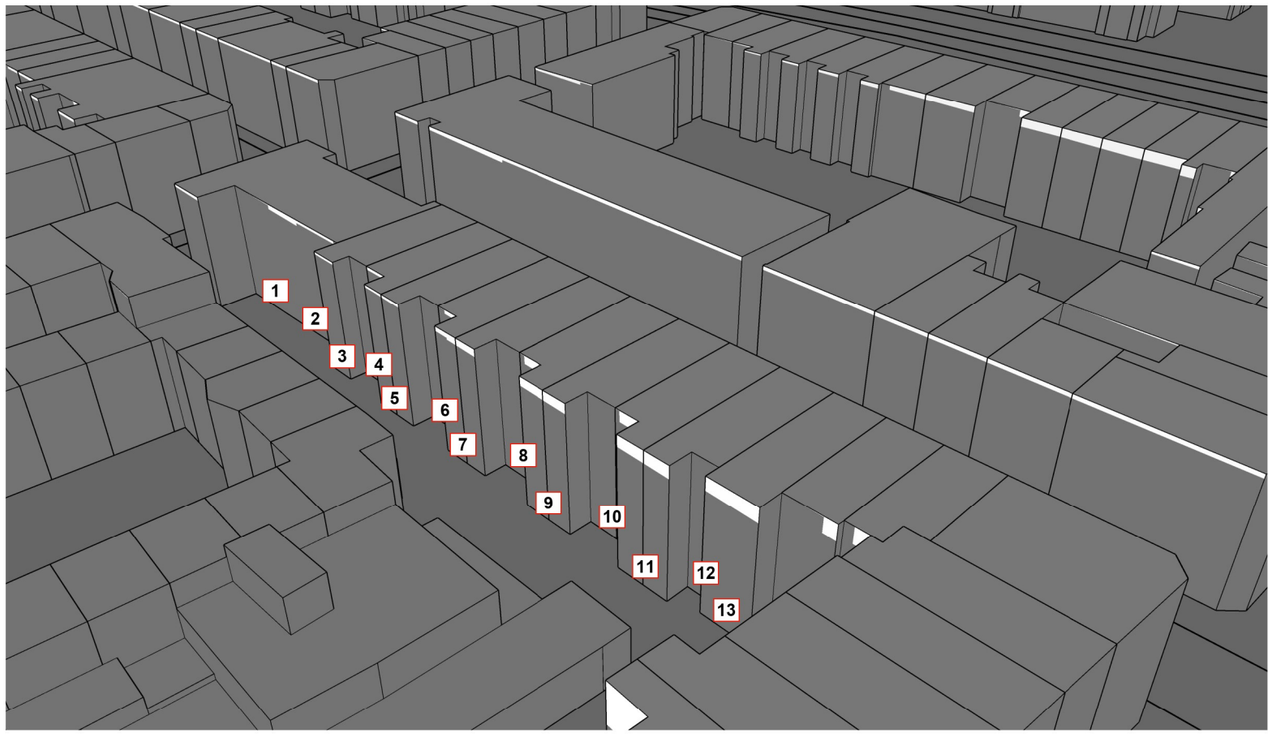
Agniesestraat Zuidzijde
21 september
18.00



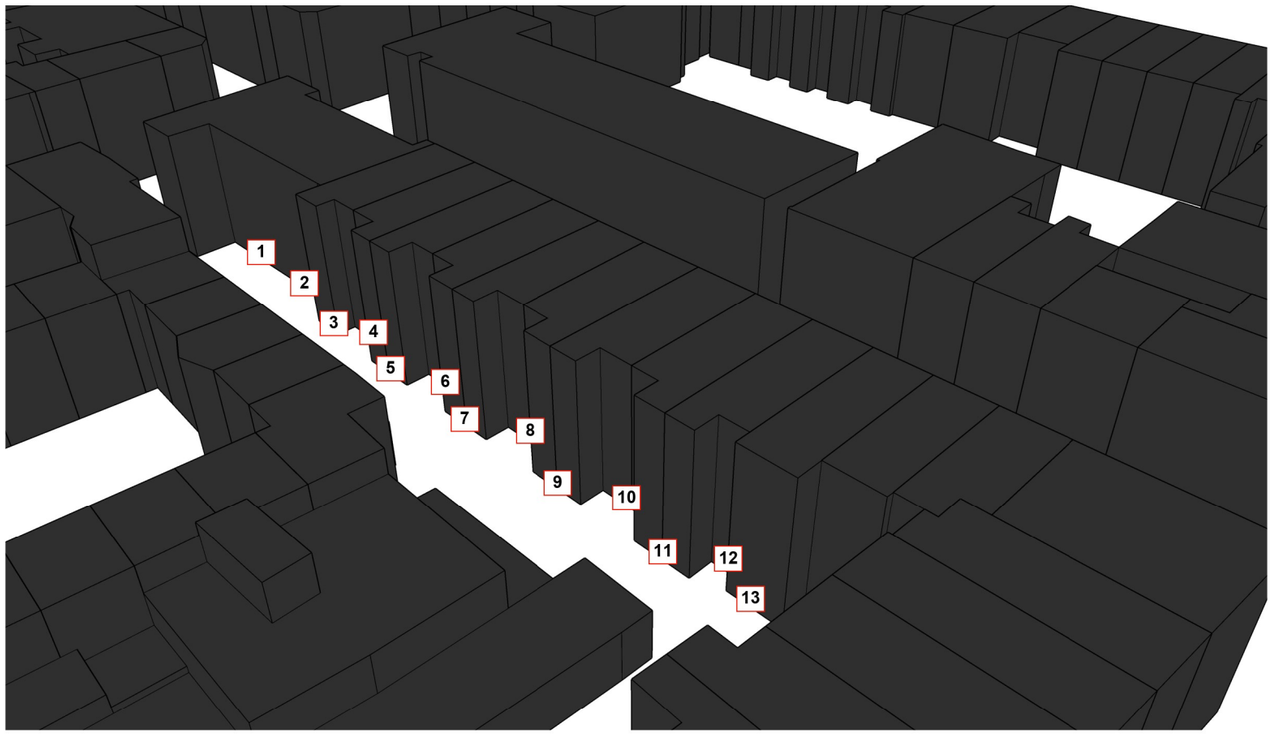


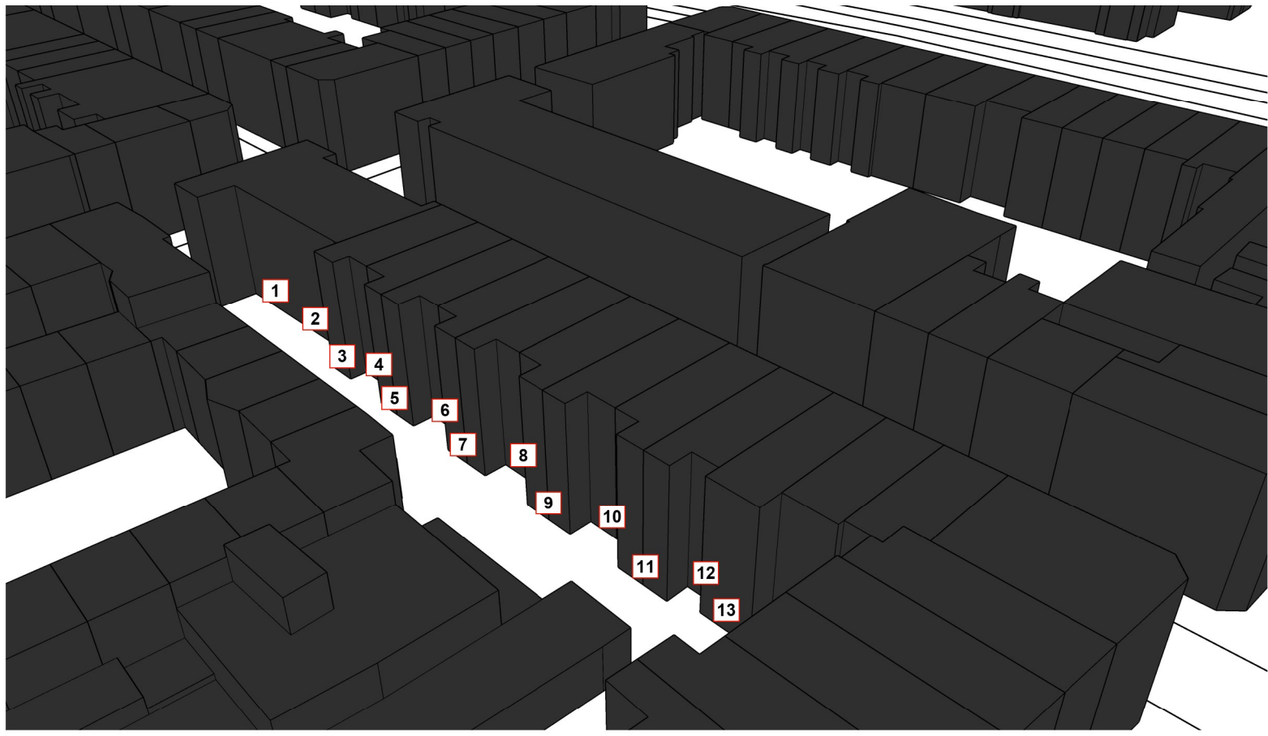
Agniesestraat Zuidzijde
21 september
18.30





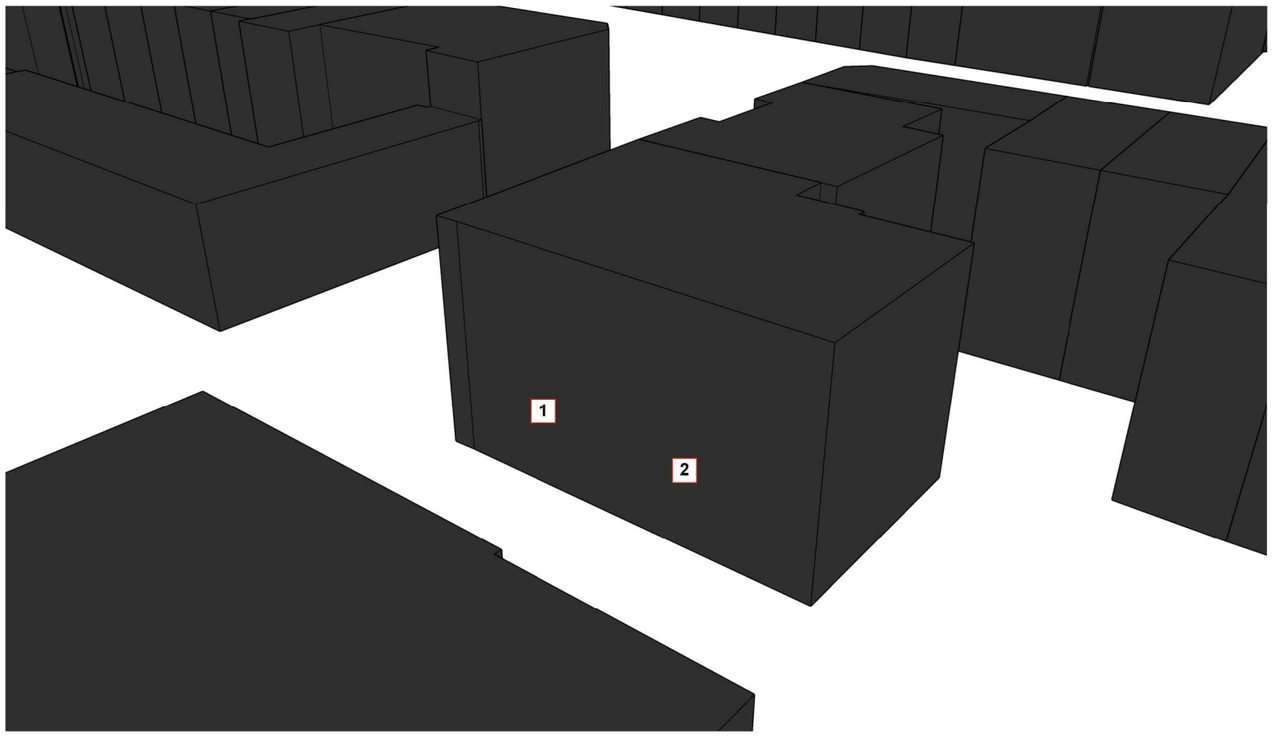
Agniesestraat Zuidzijde
21 september
19.00

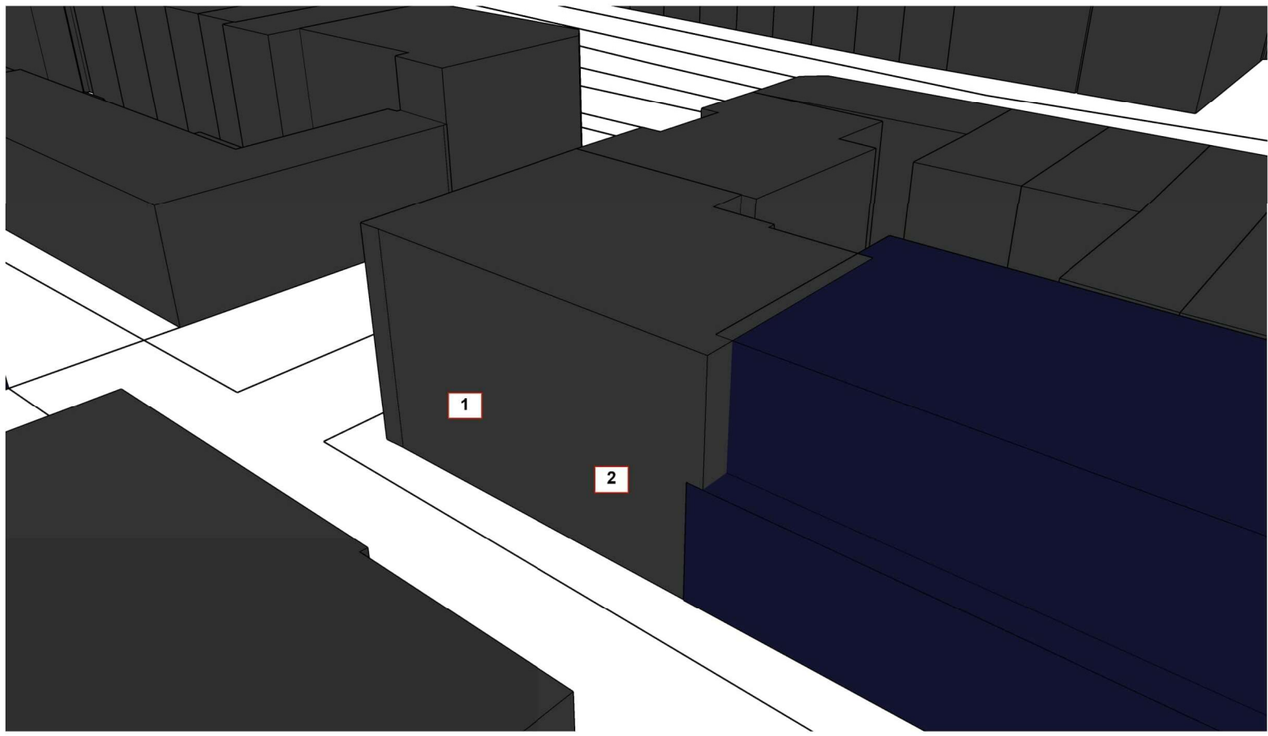




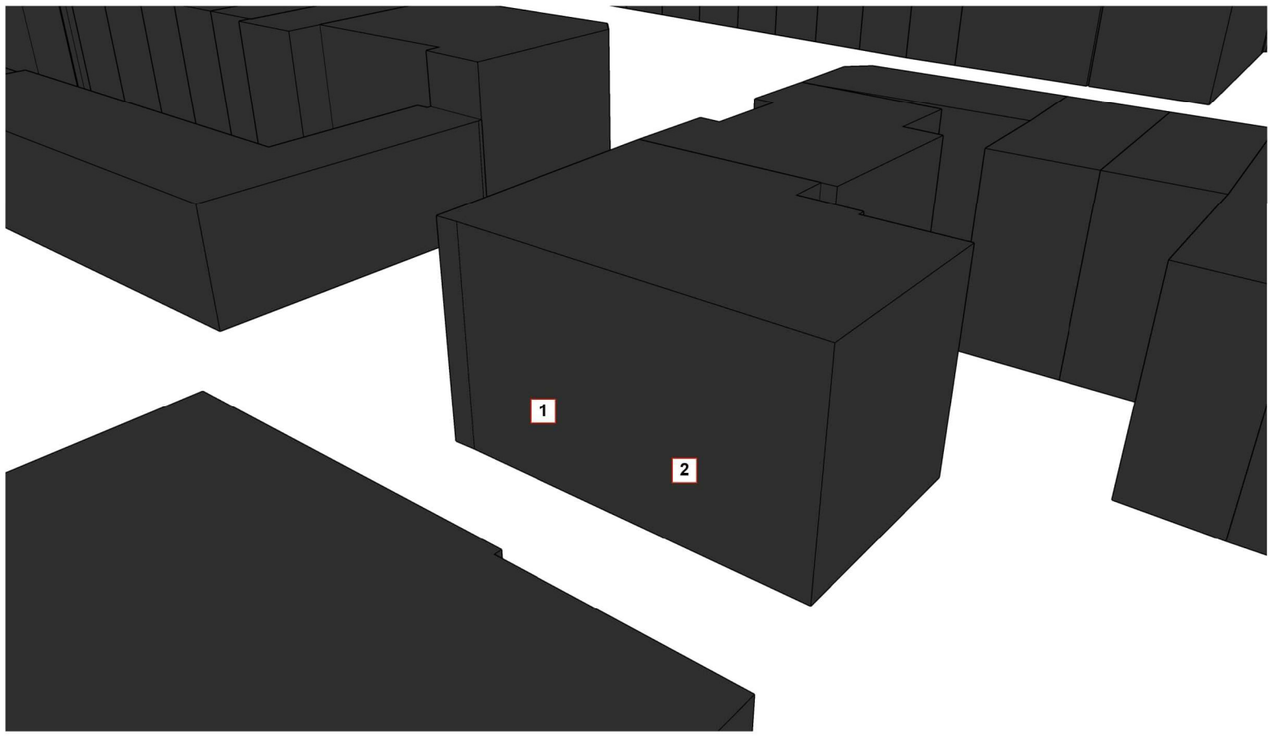
bijlage 4. resultaten 21 september Almondestraat Oost huidig vs. nieuw

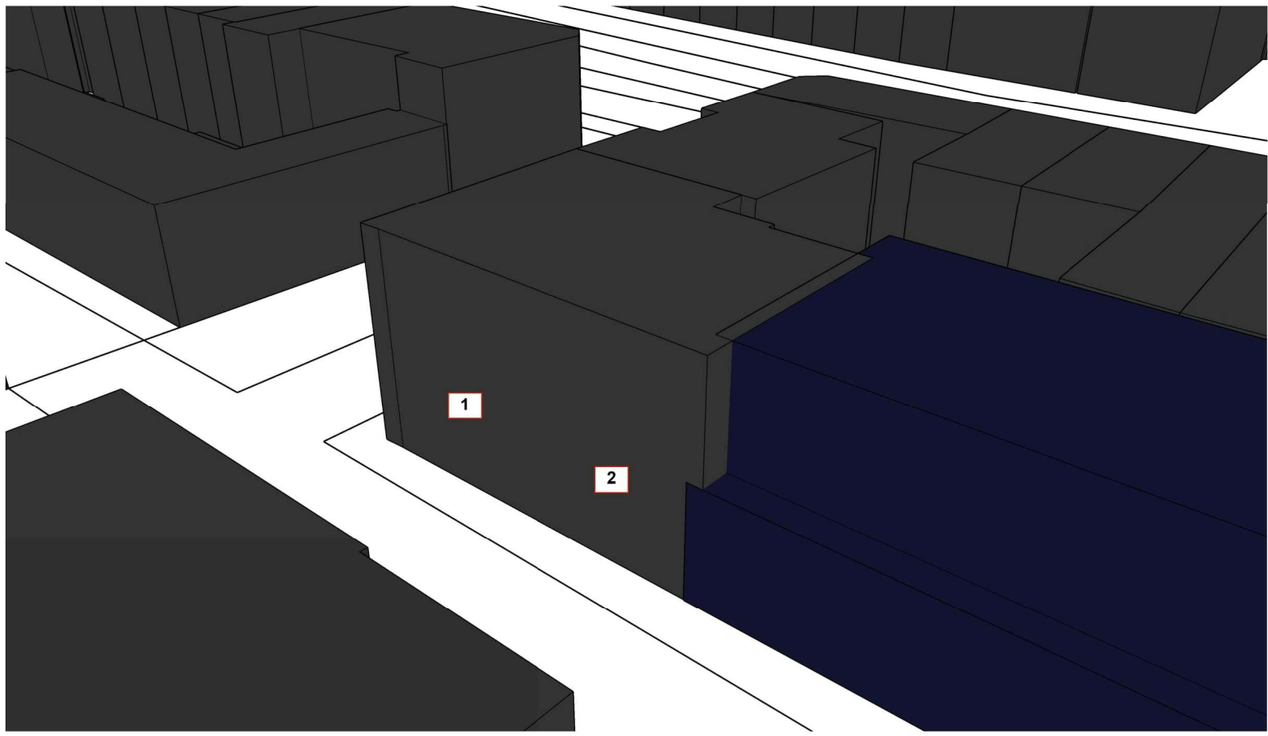
Almondestraat Oostzijde
21 september
06.00



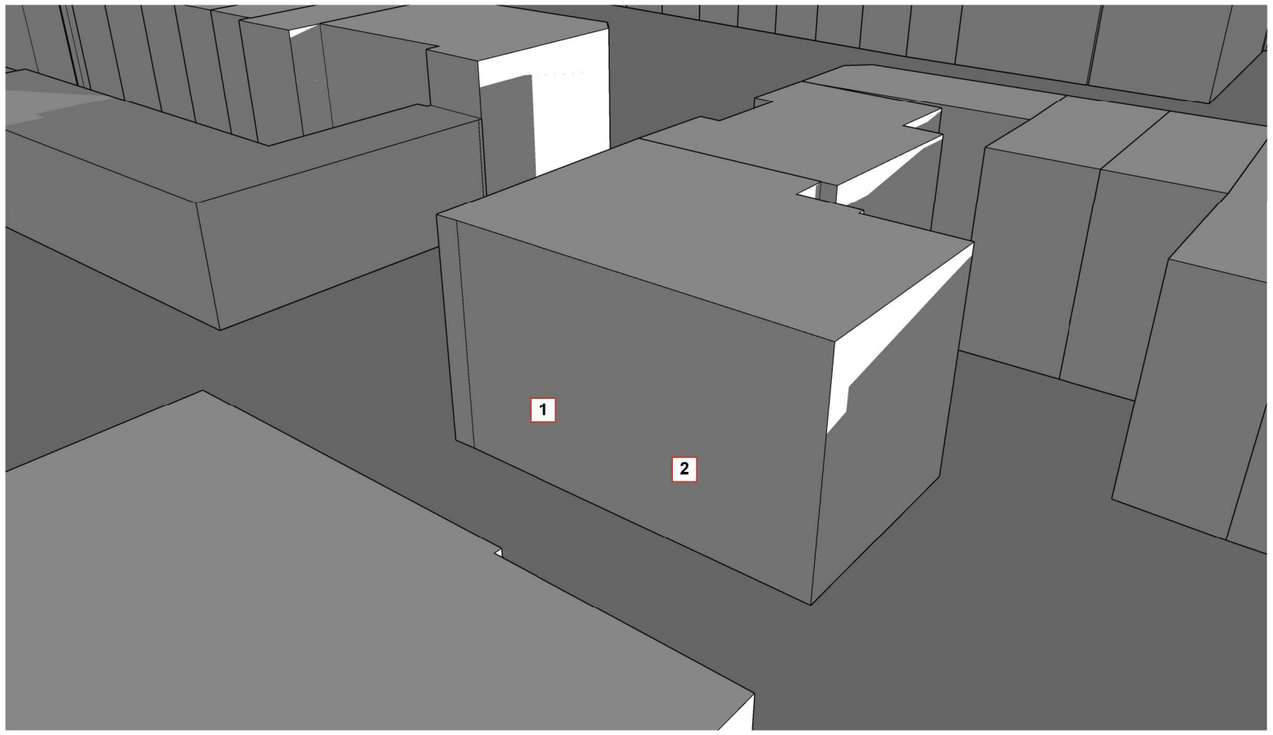


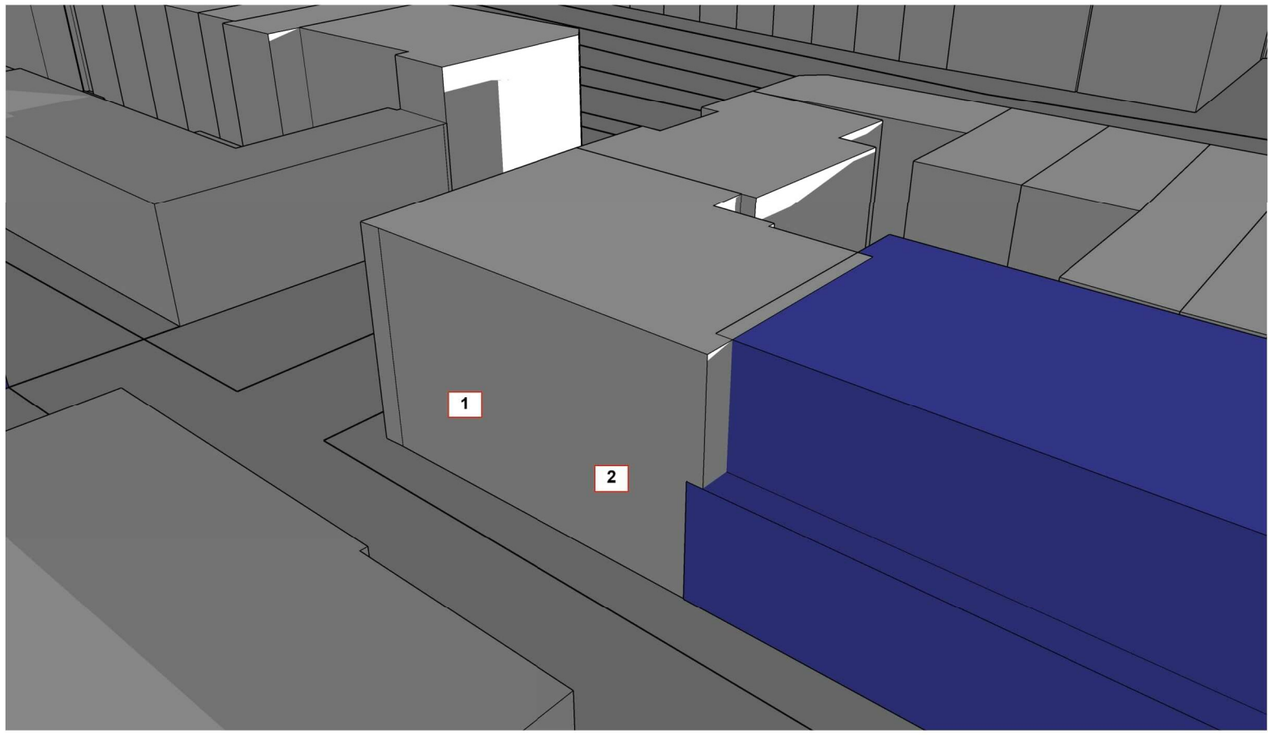
Almondestraat Oostzijde
21 september
06.30



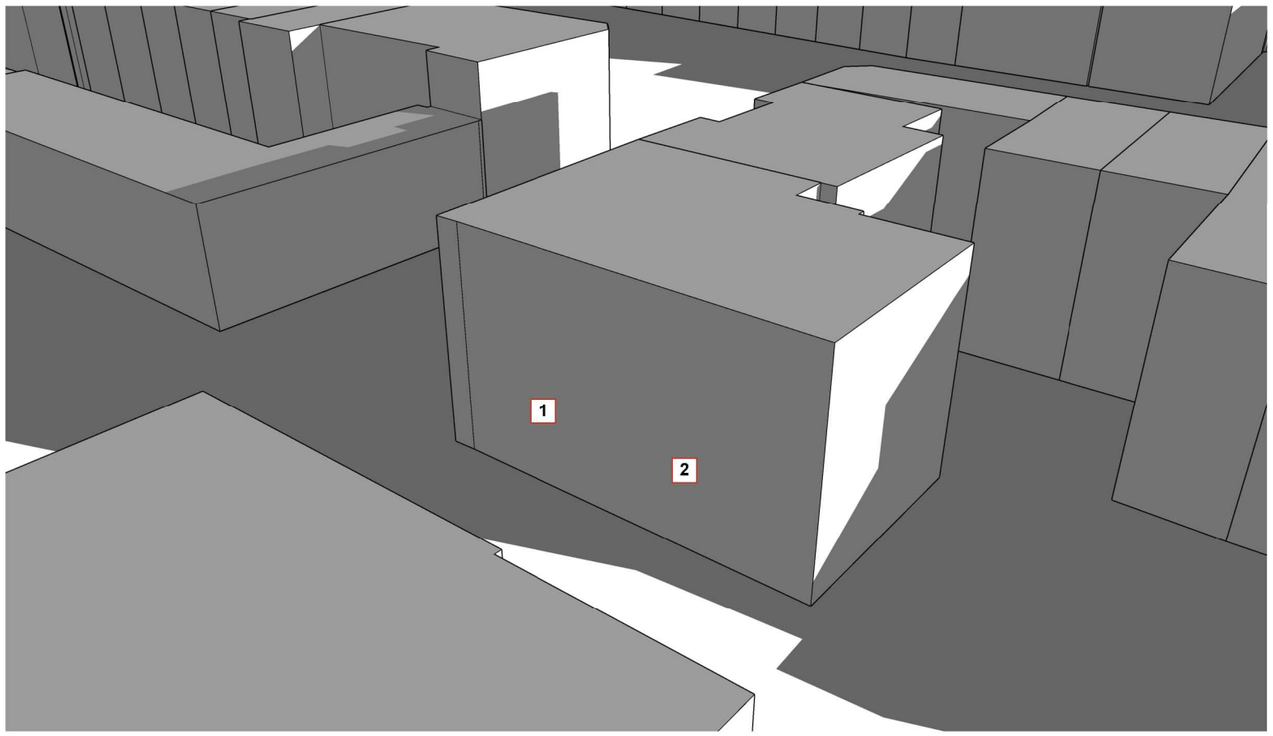


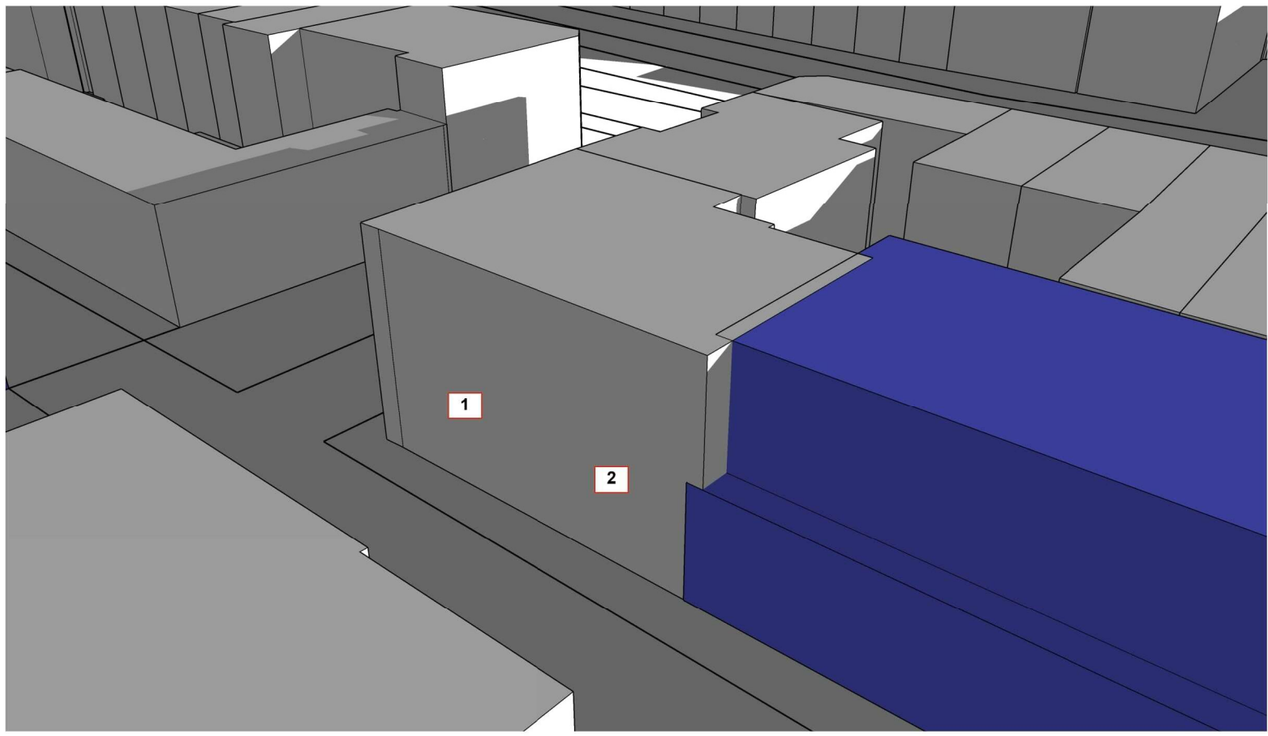
Almondestraat Oostzijde
21 september
07.00



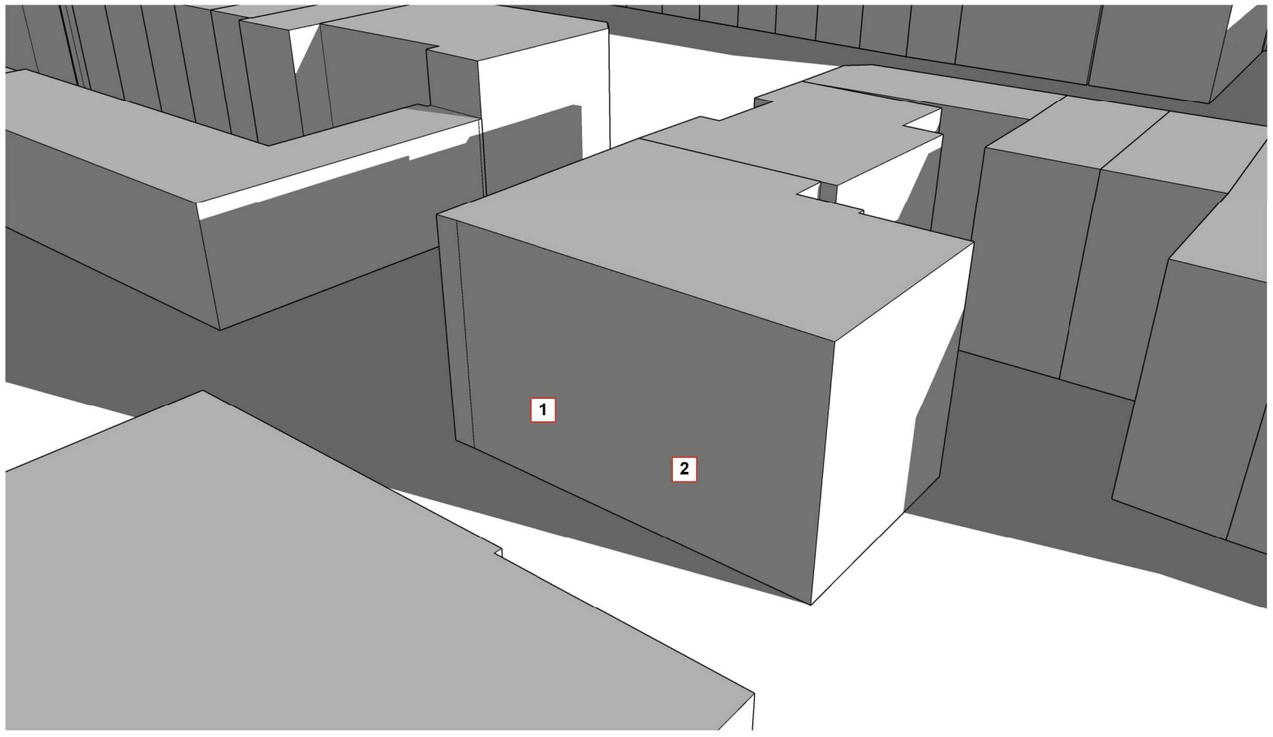


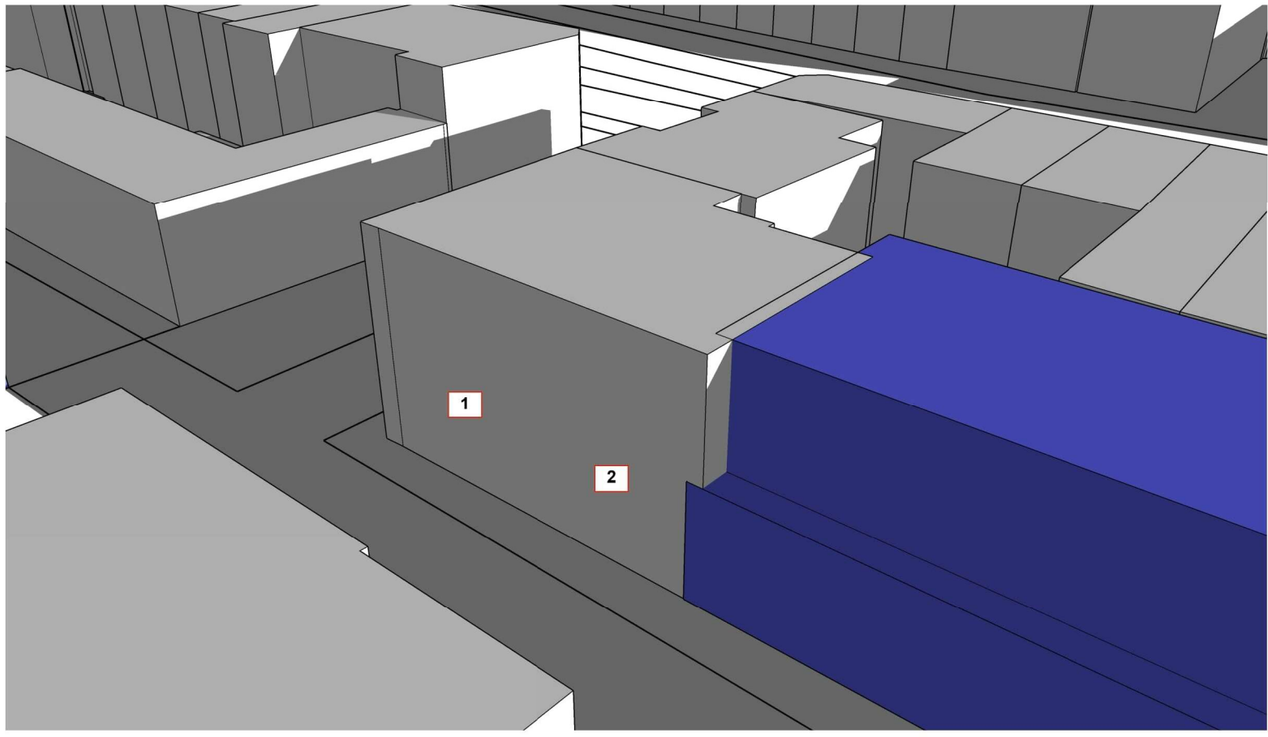
Almondestraat Oostzijde
21 september
07.30





Almondestraat Oostzijde
21 september
08.00





Almondestraat Oostzijde
21 september
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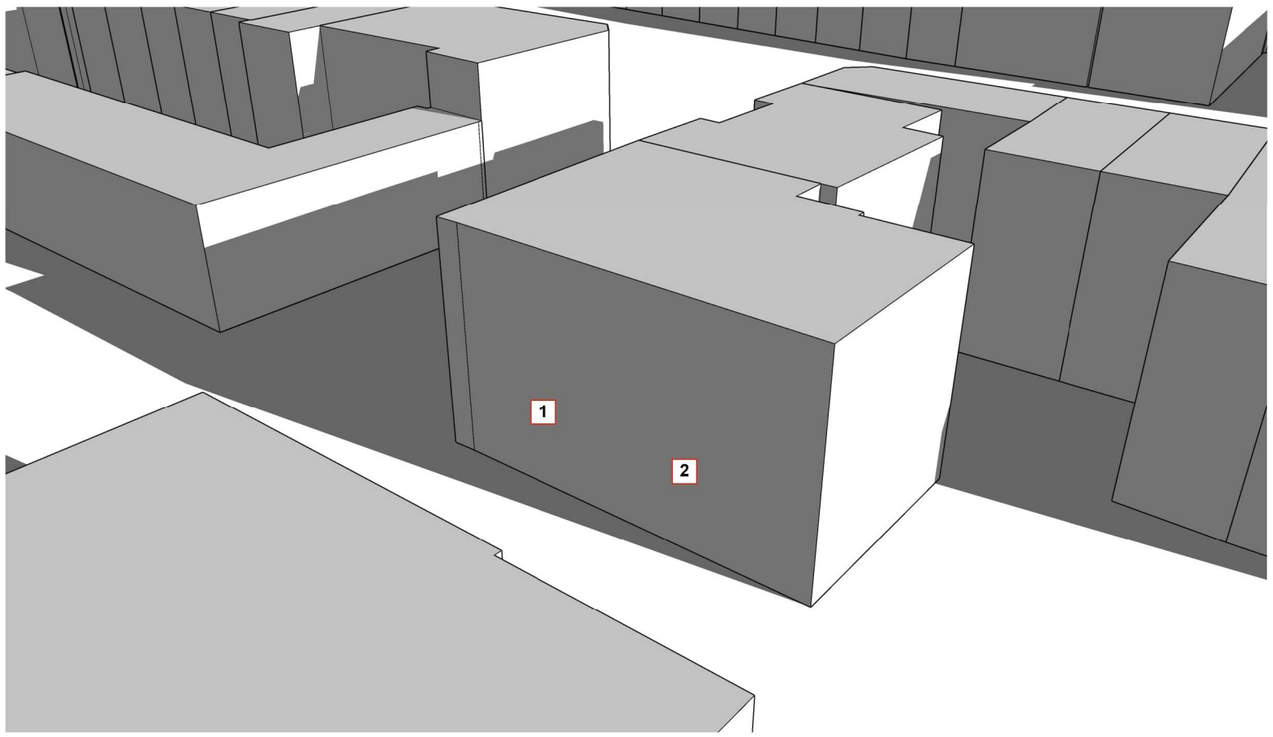
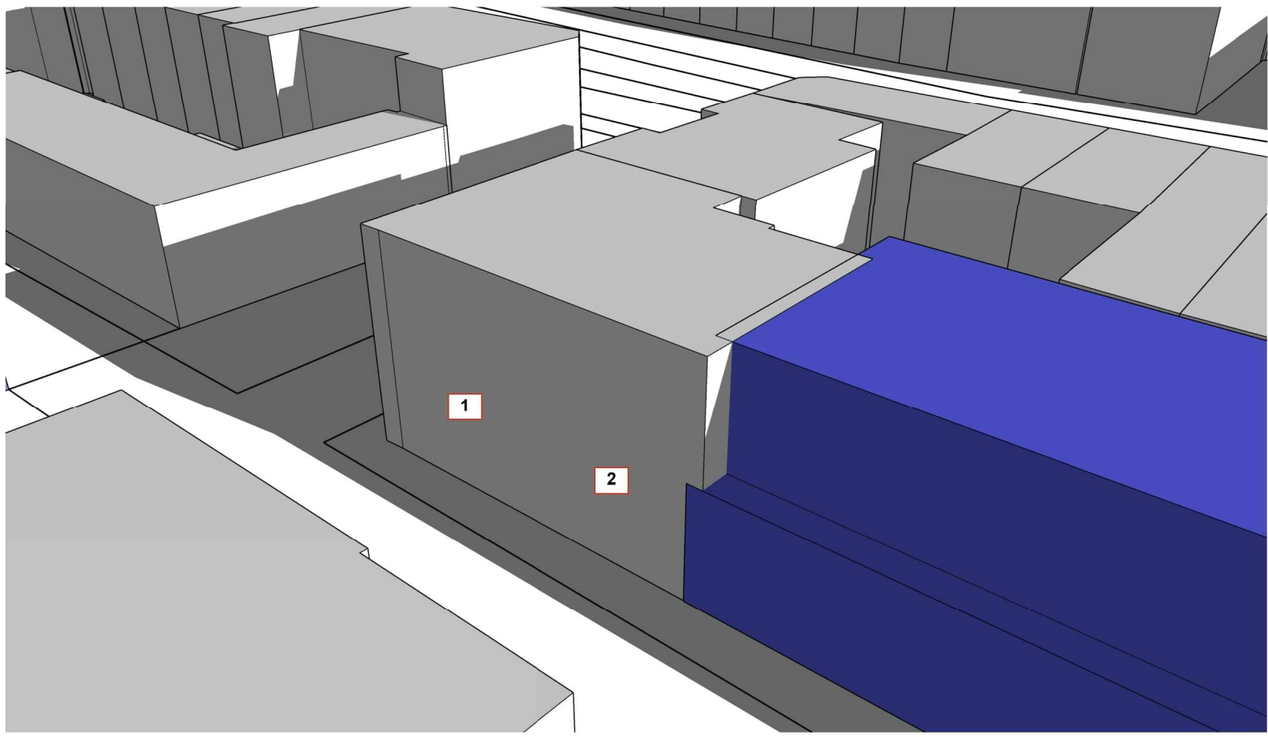
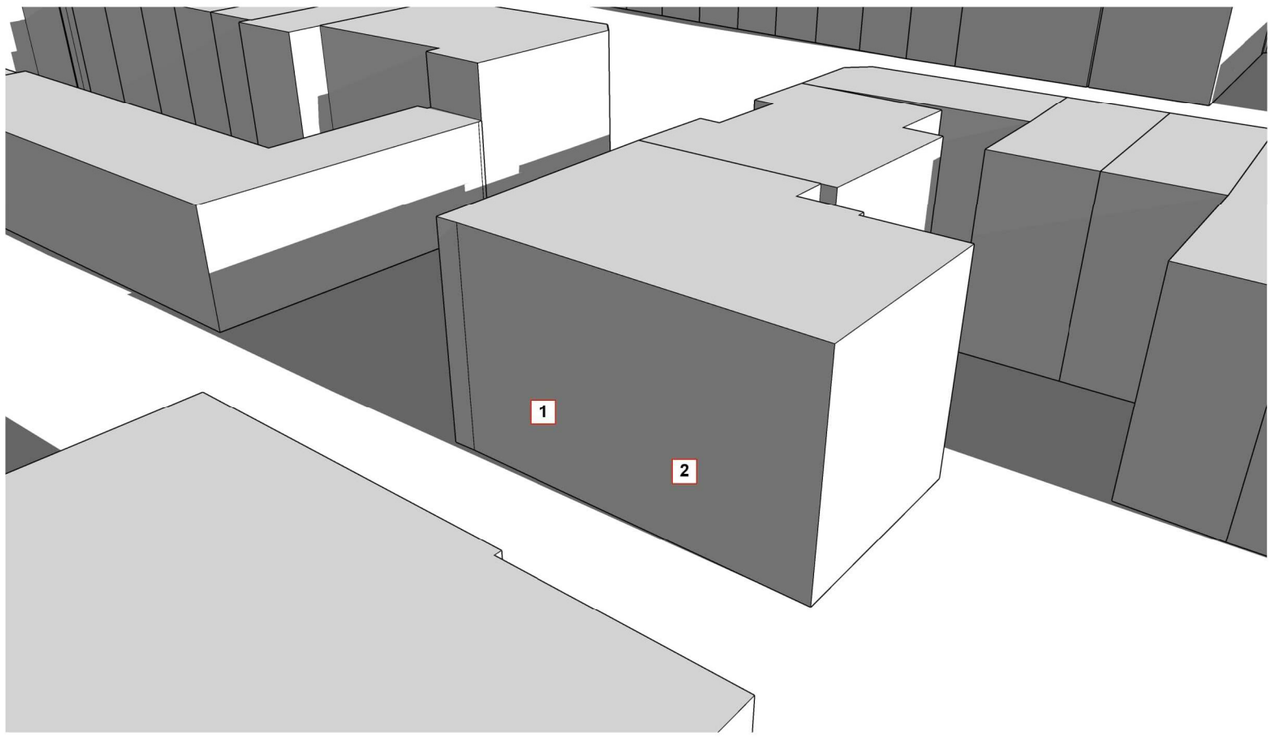
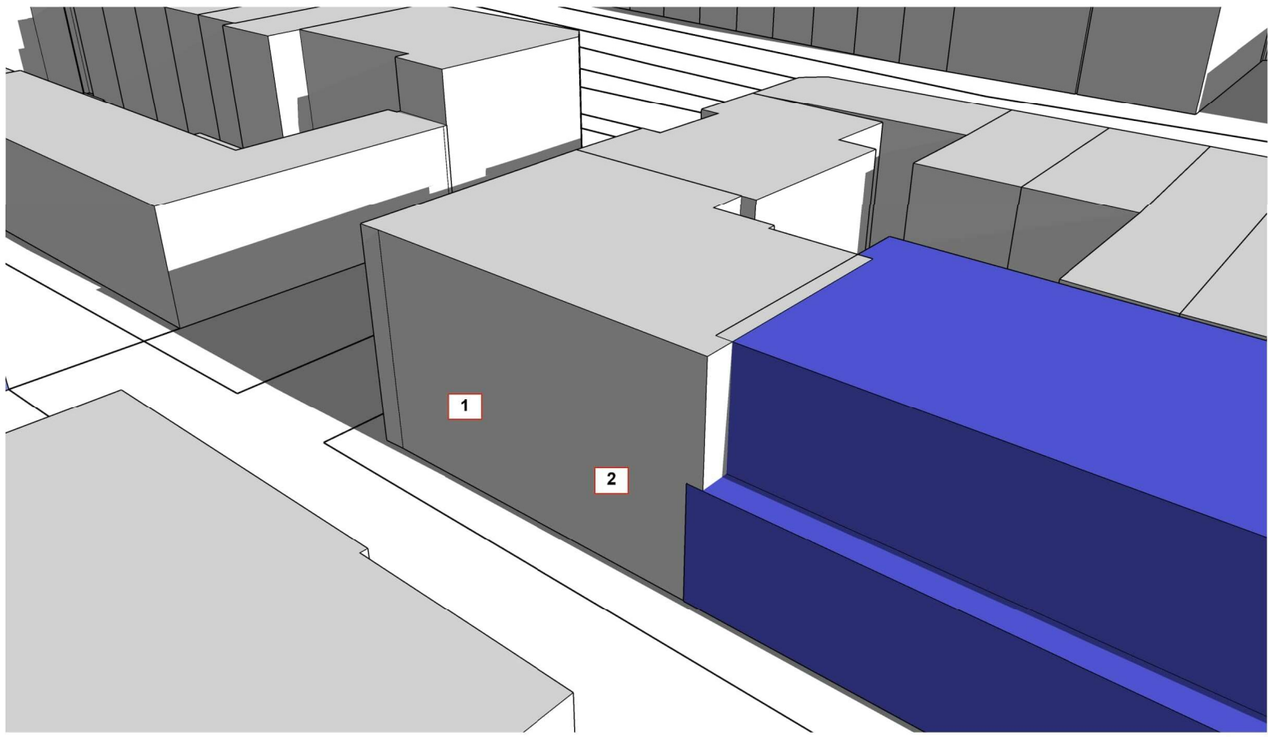




Almondestraat Oostzijde
21 september
09.00





Almondestraat Oostzijde
21 september
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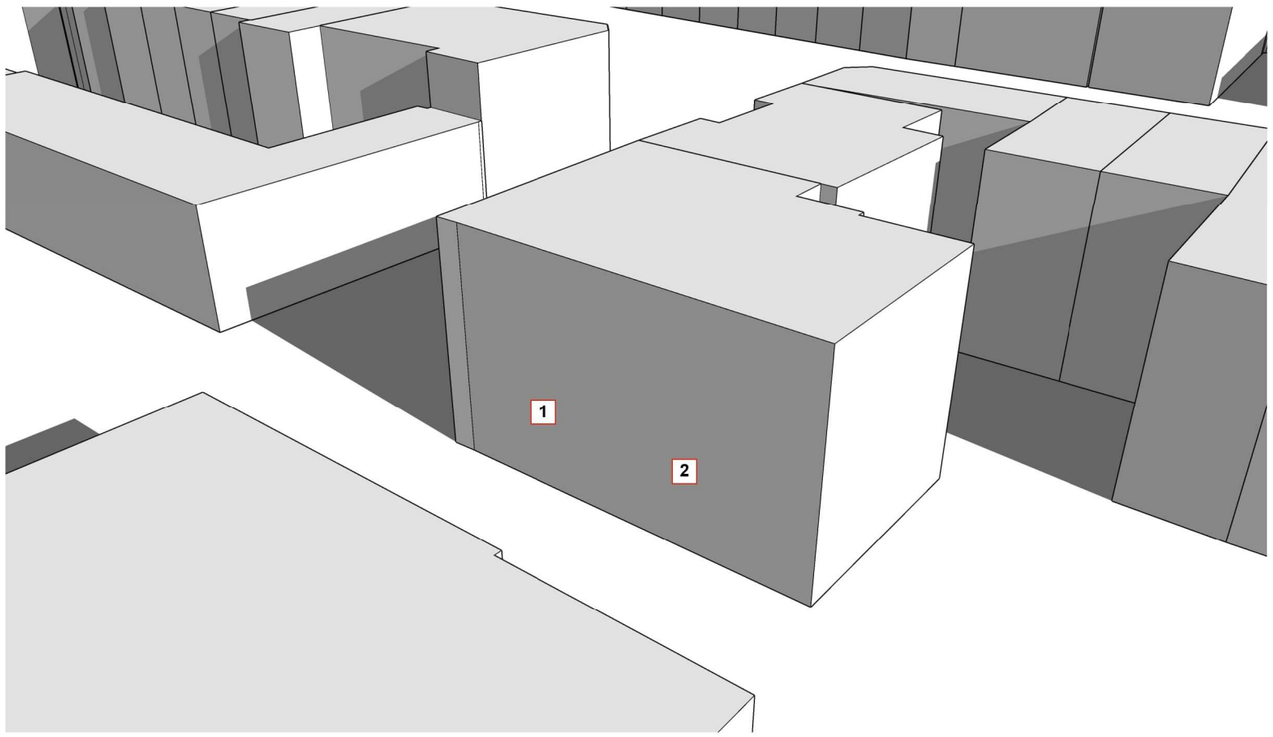
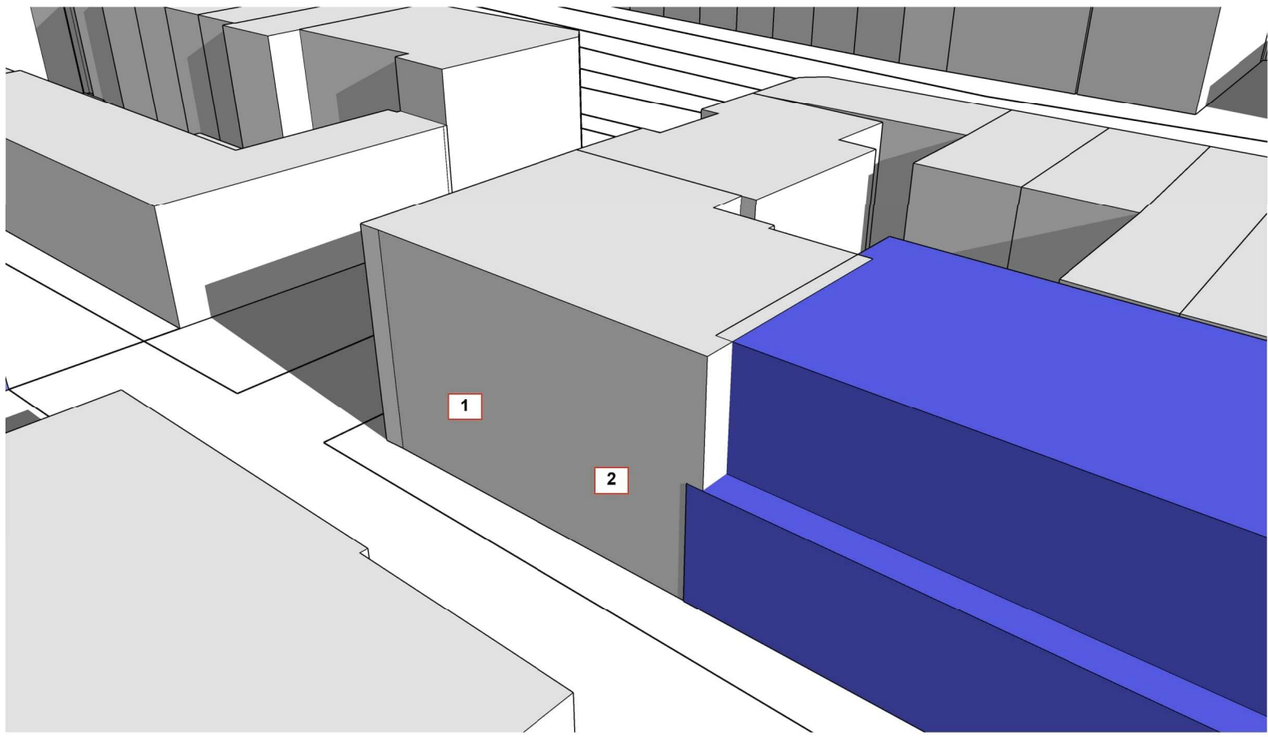
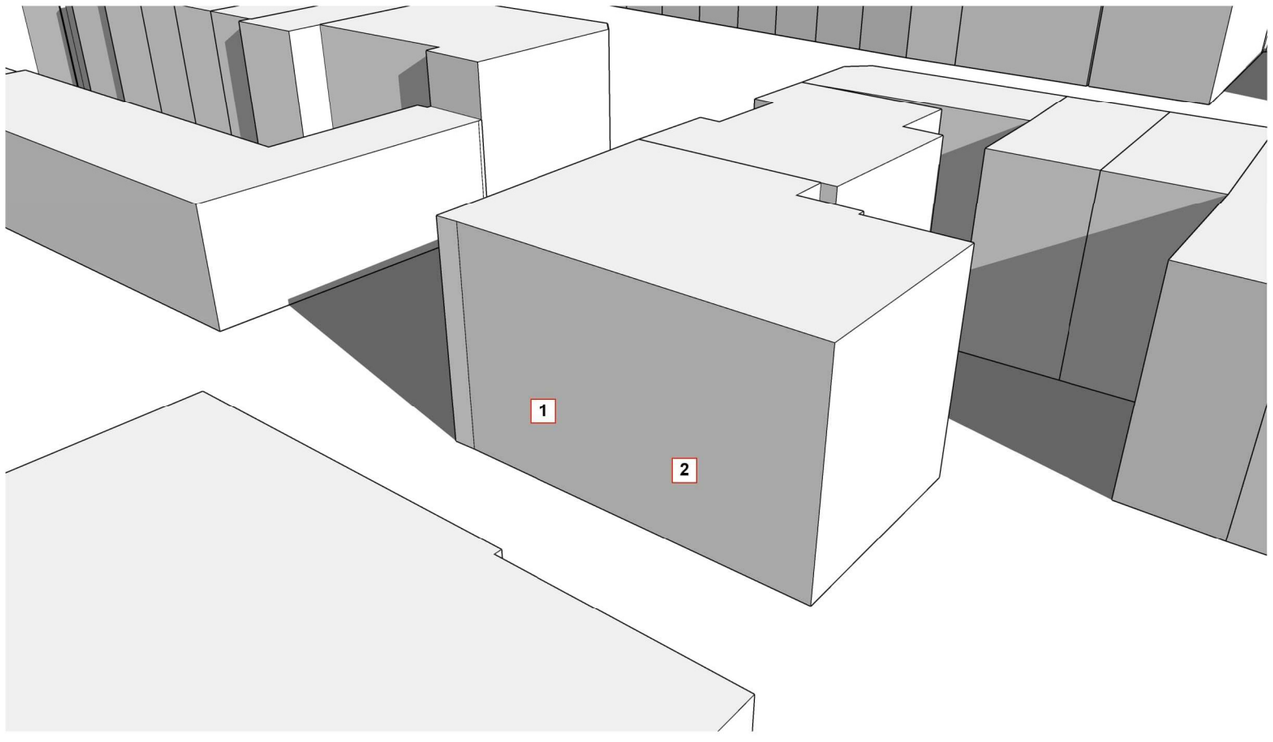
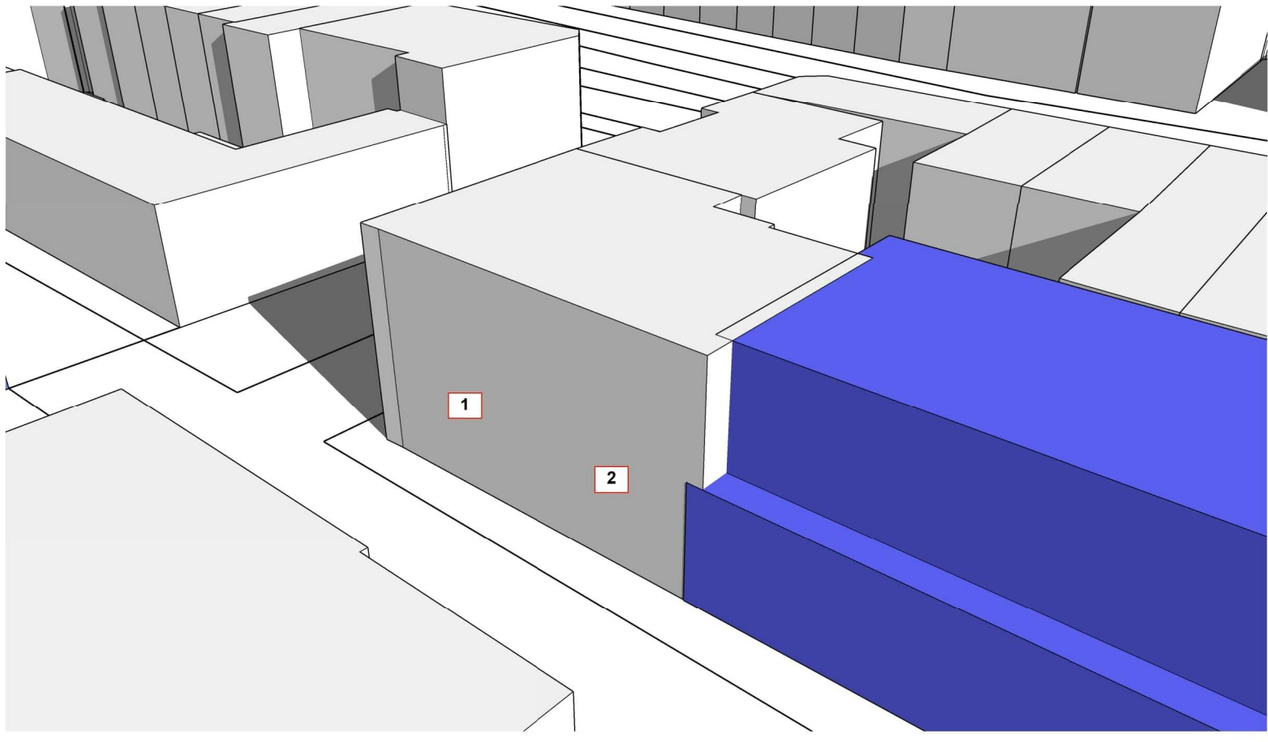


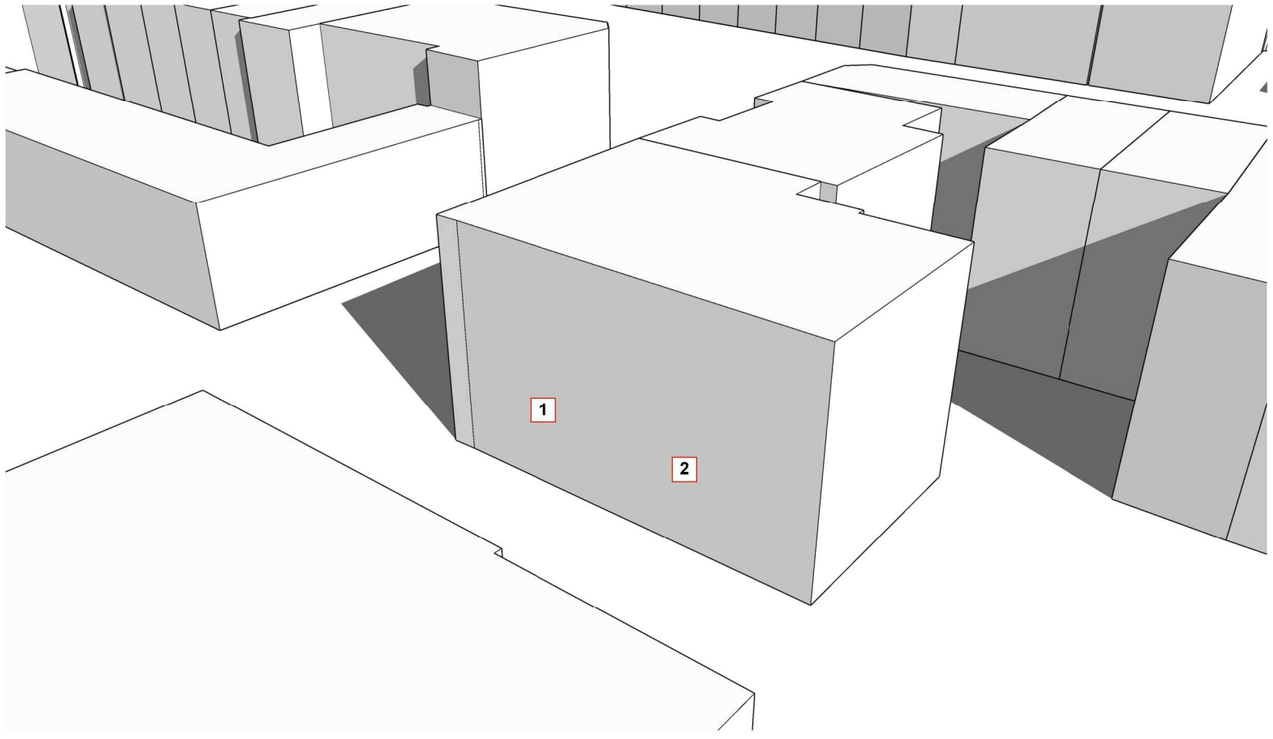


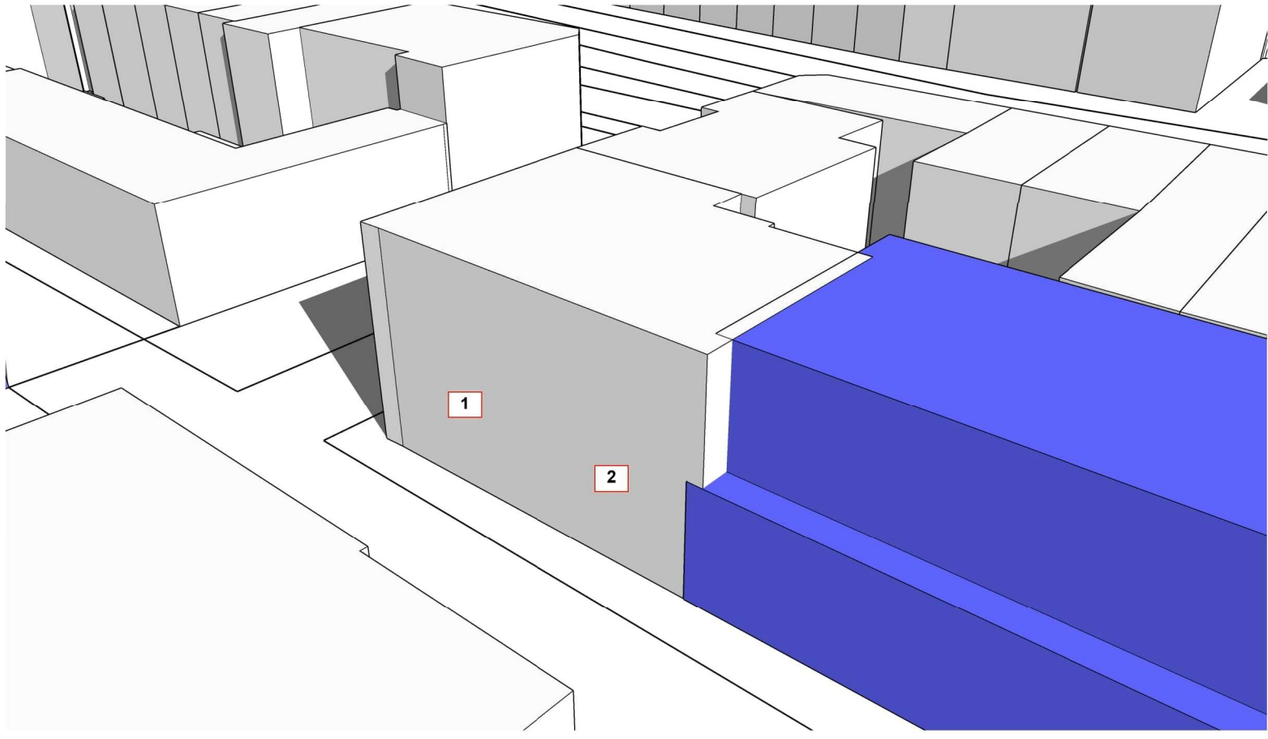
Almondestraat Oostzijde
21 september
10.00



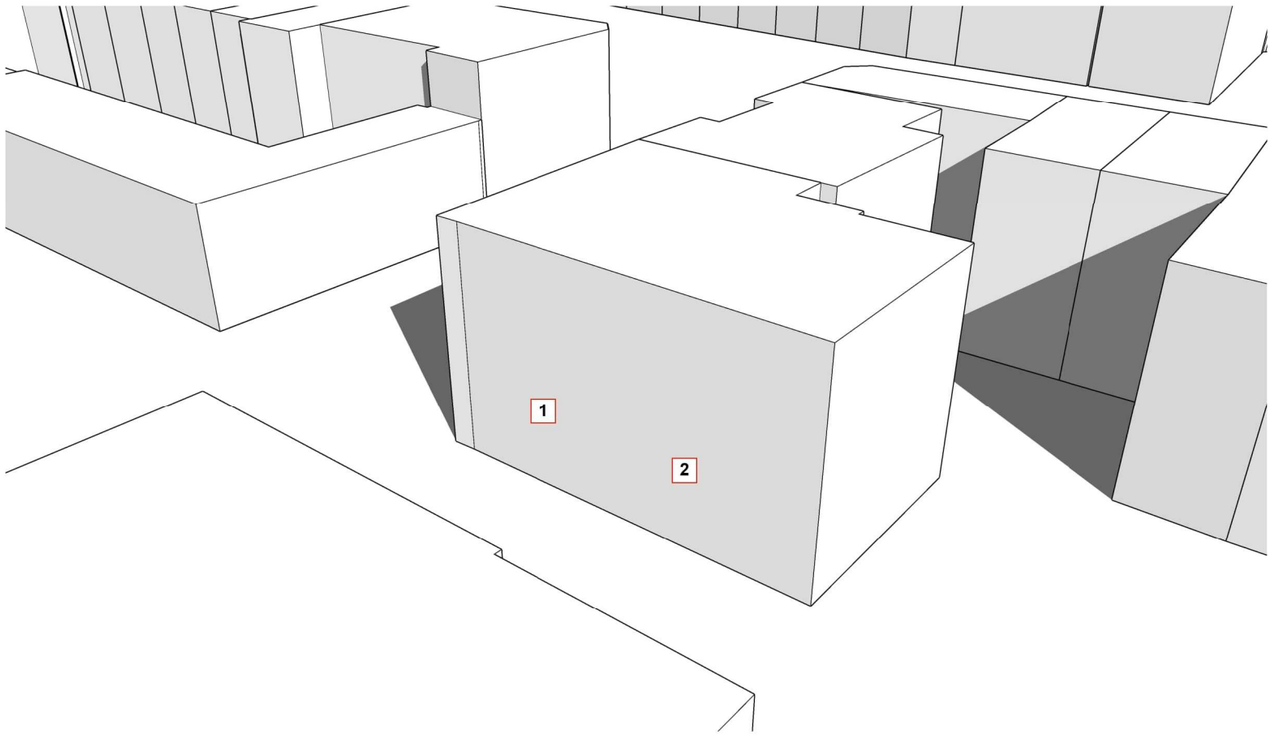


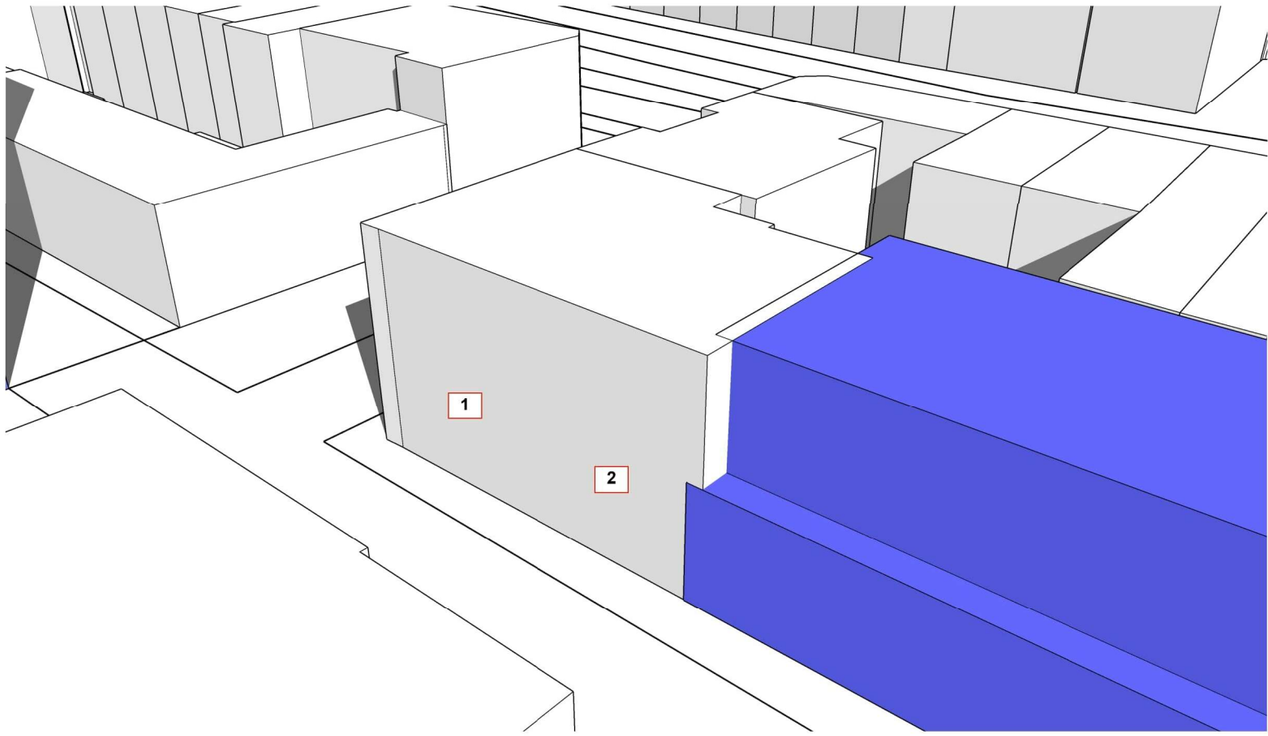
Almondestraat Oostzijde
21 september
10.30



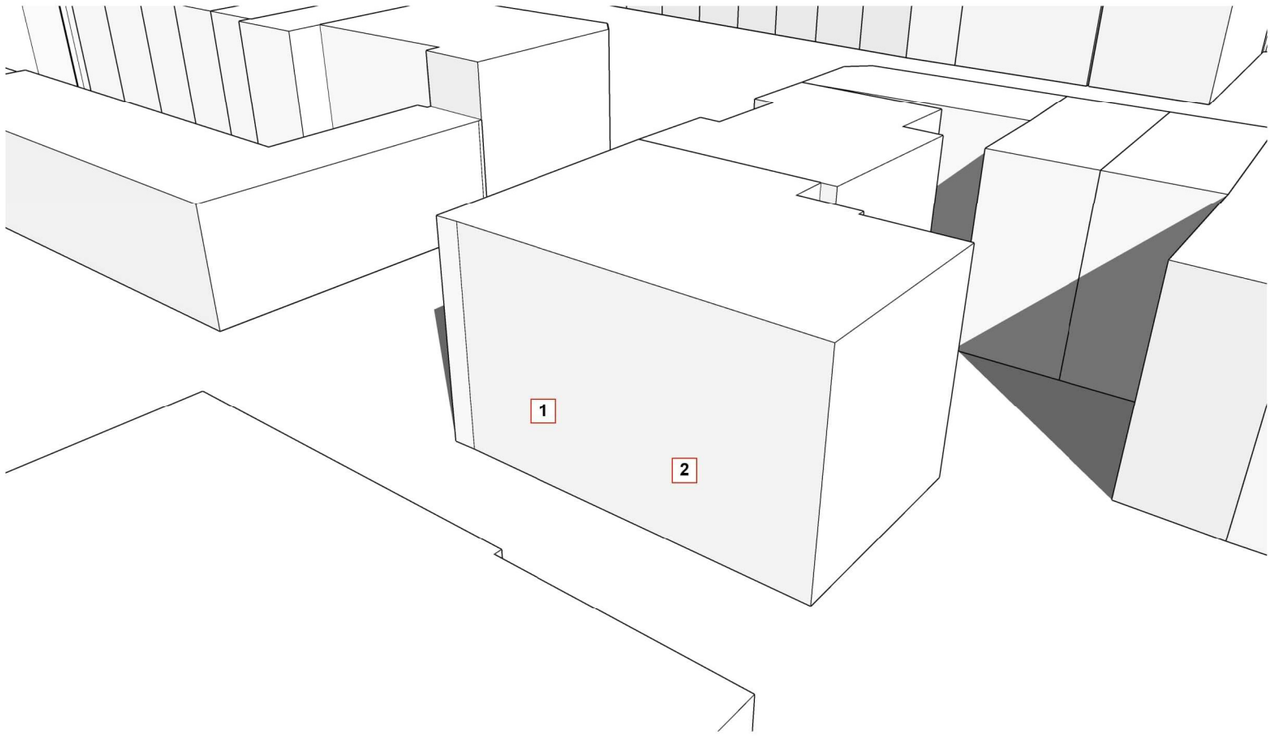


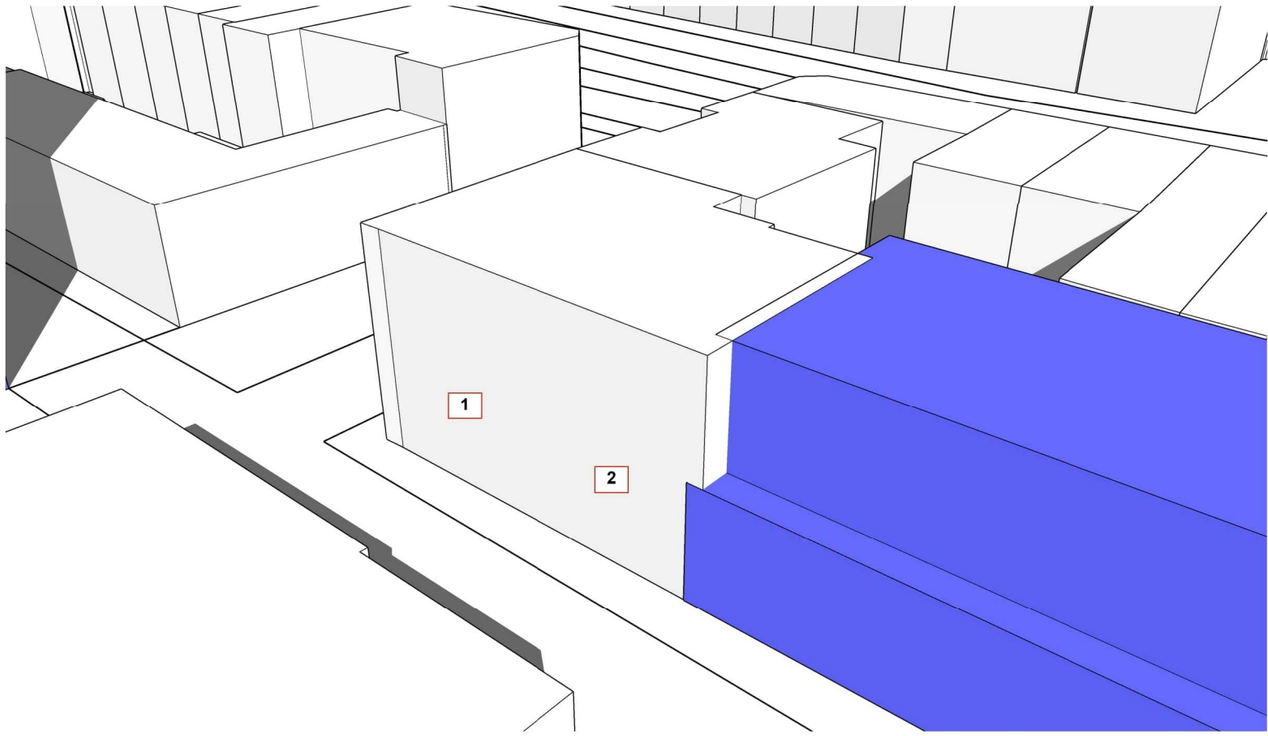
Almondestraat Oostzijde
21 september
11.00



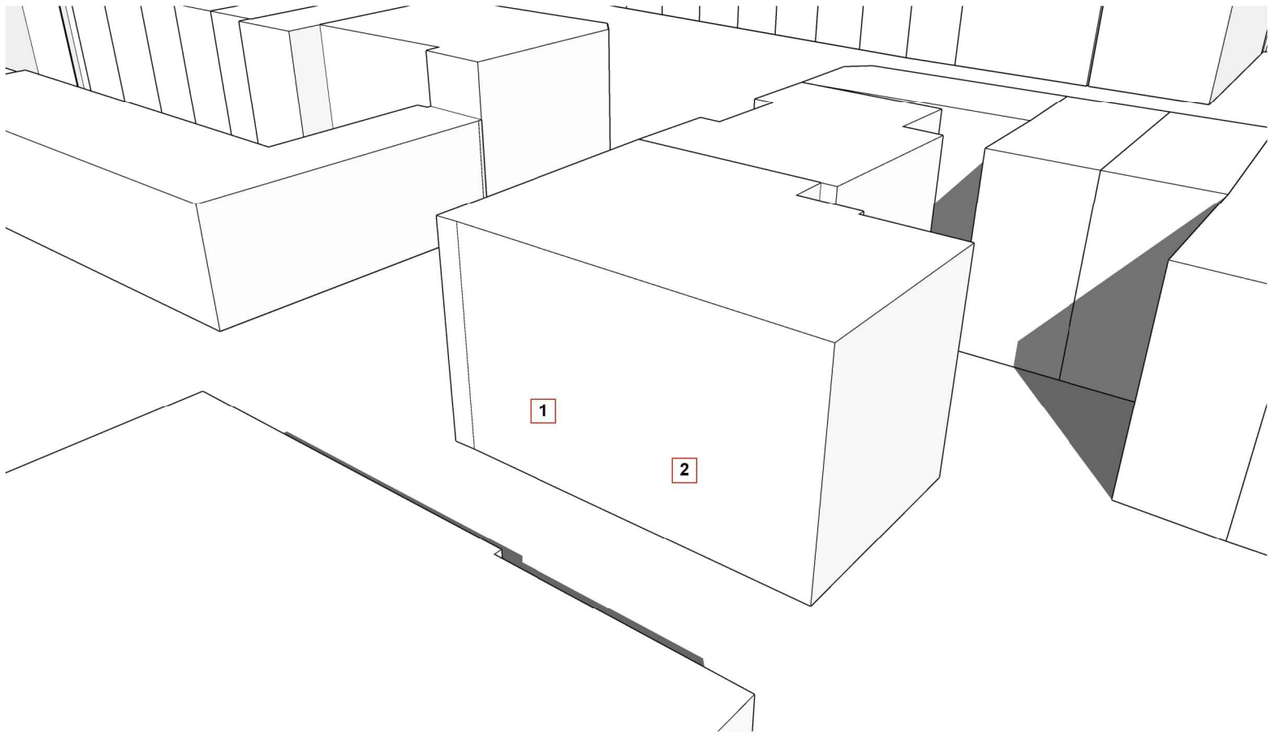


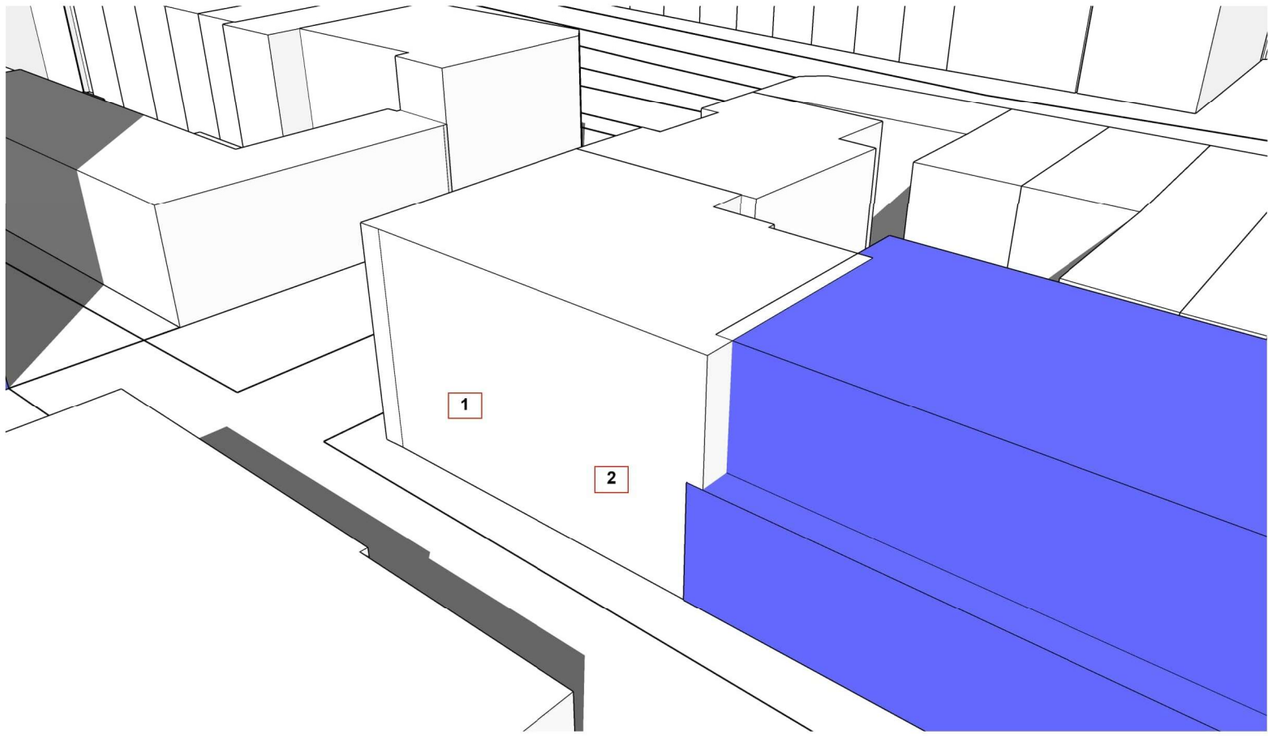
Almondestraat Oostzijde
21 september
11.30





Almondestraat Oostzijde
21 september
12.00





Almondestraat Oostzijde
21 september
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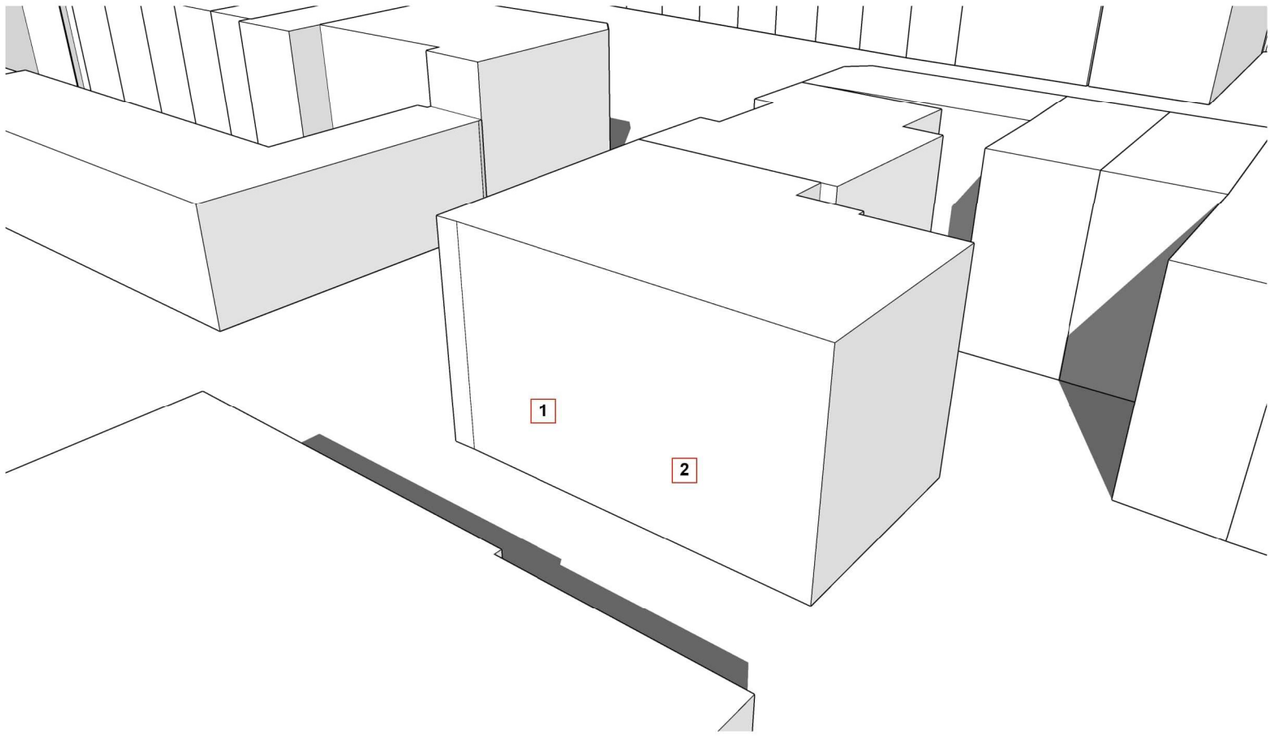
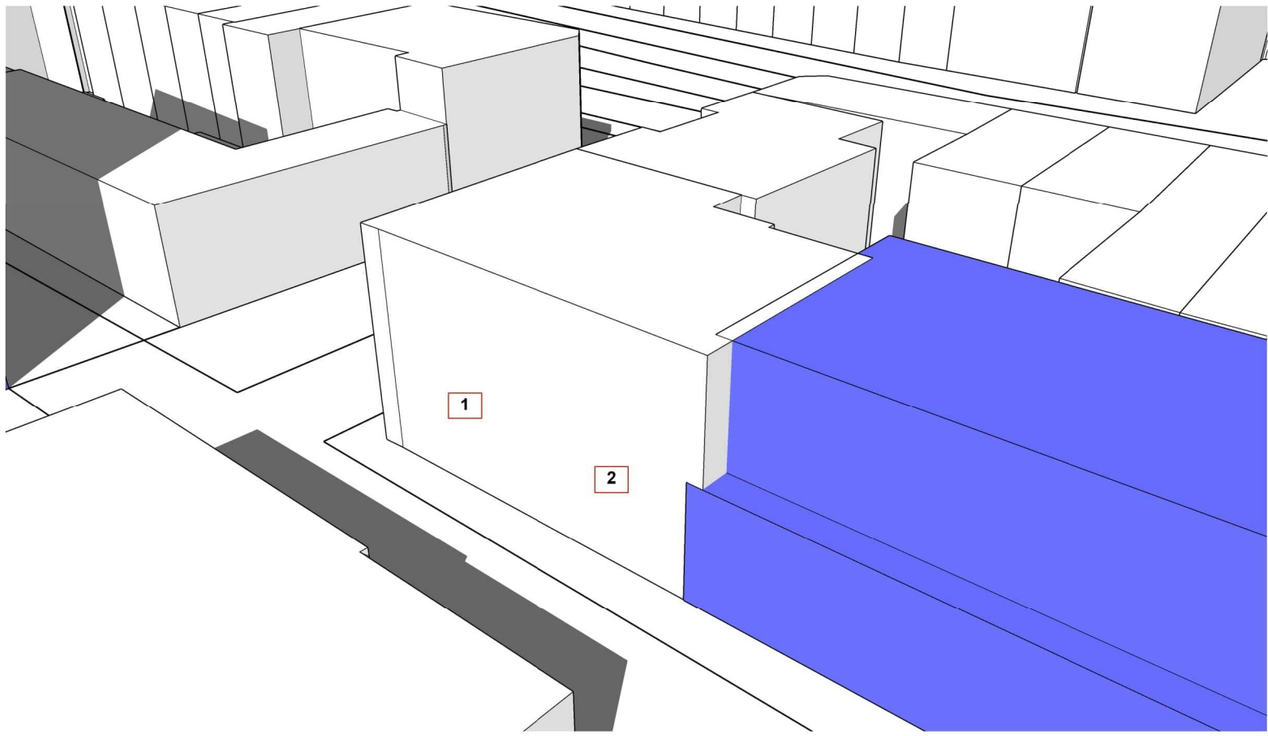
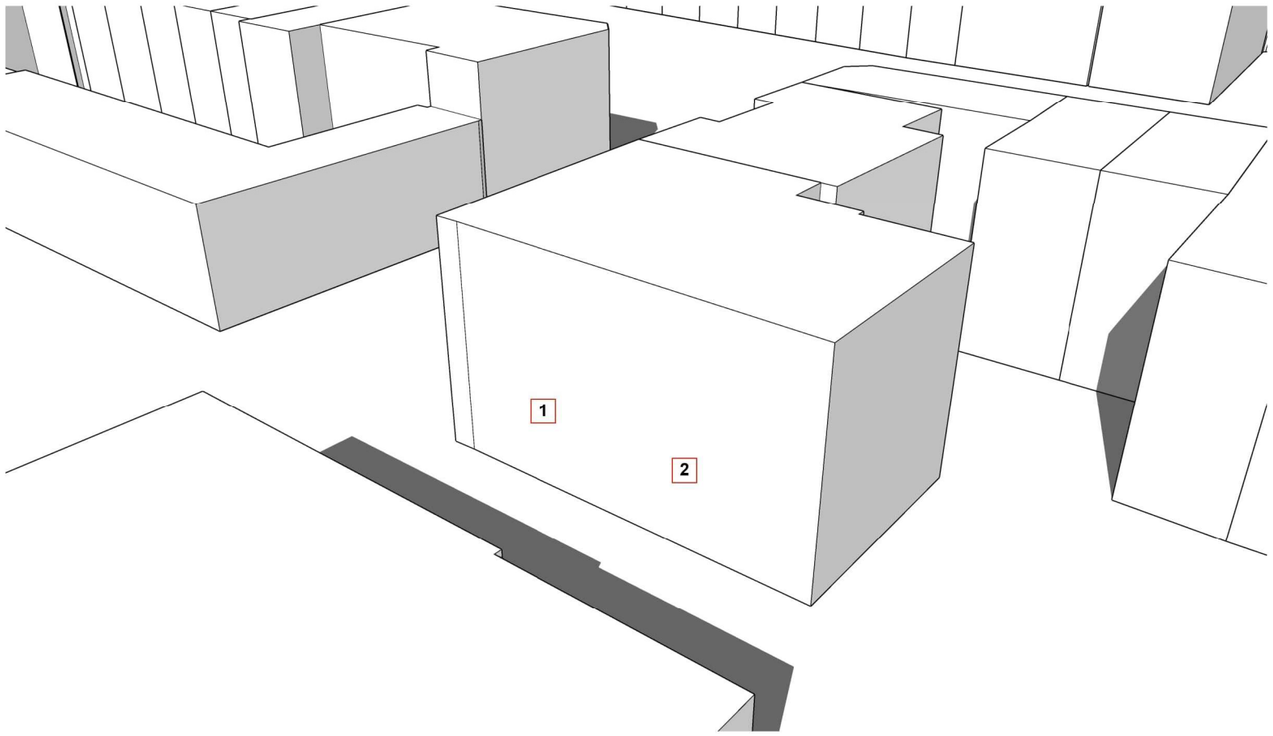
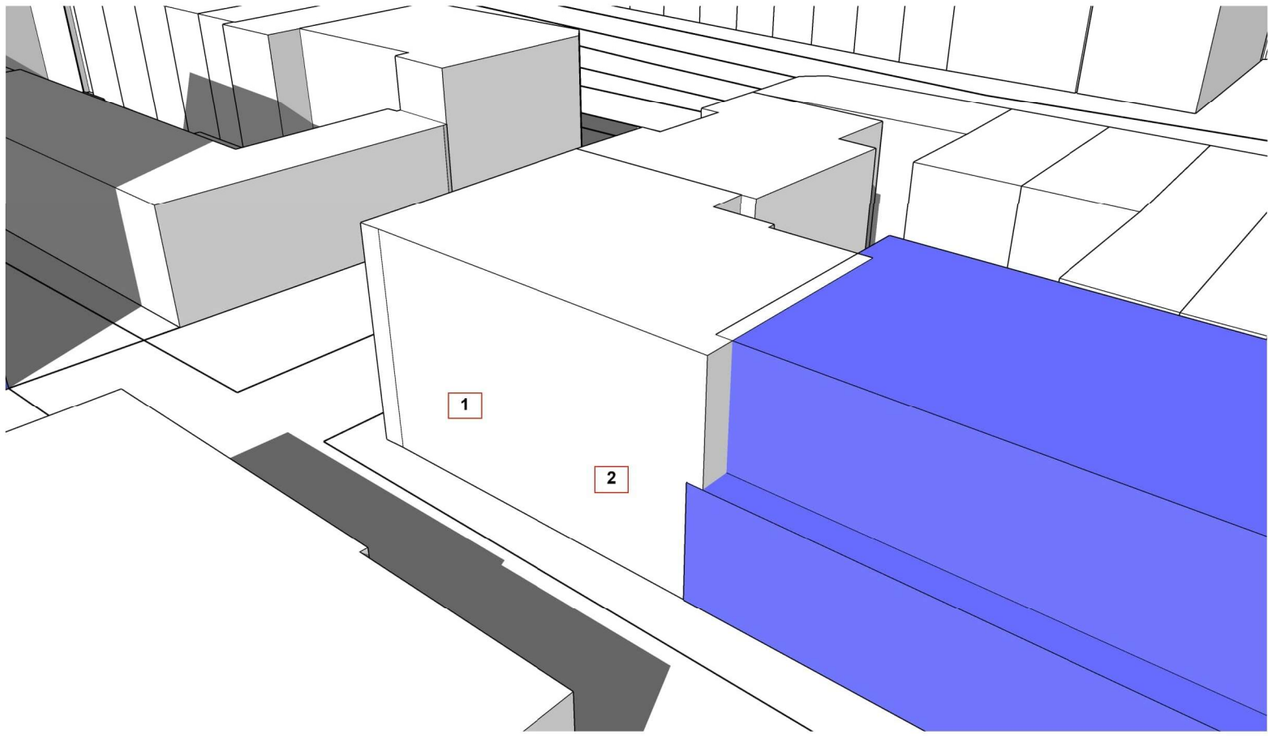




Almondestraat Oostzijde
21 september
13.00





Almondestraat Oostzijde
21 september
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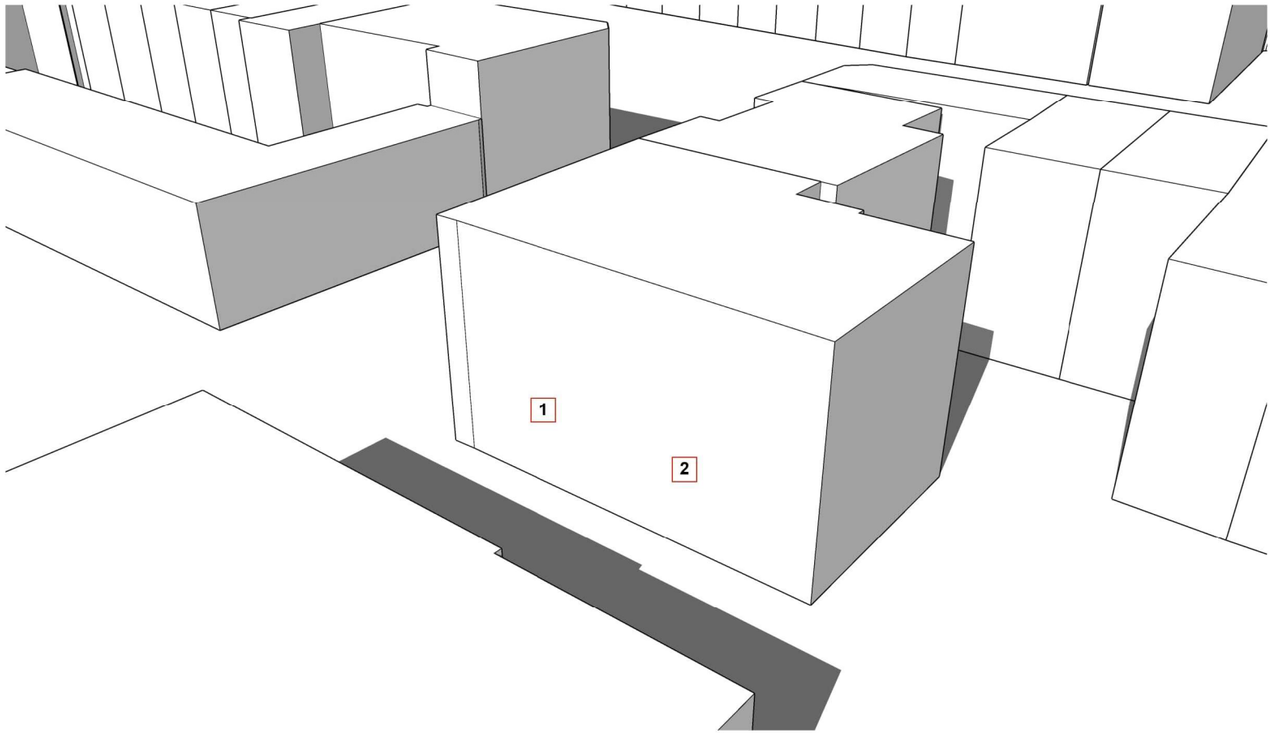

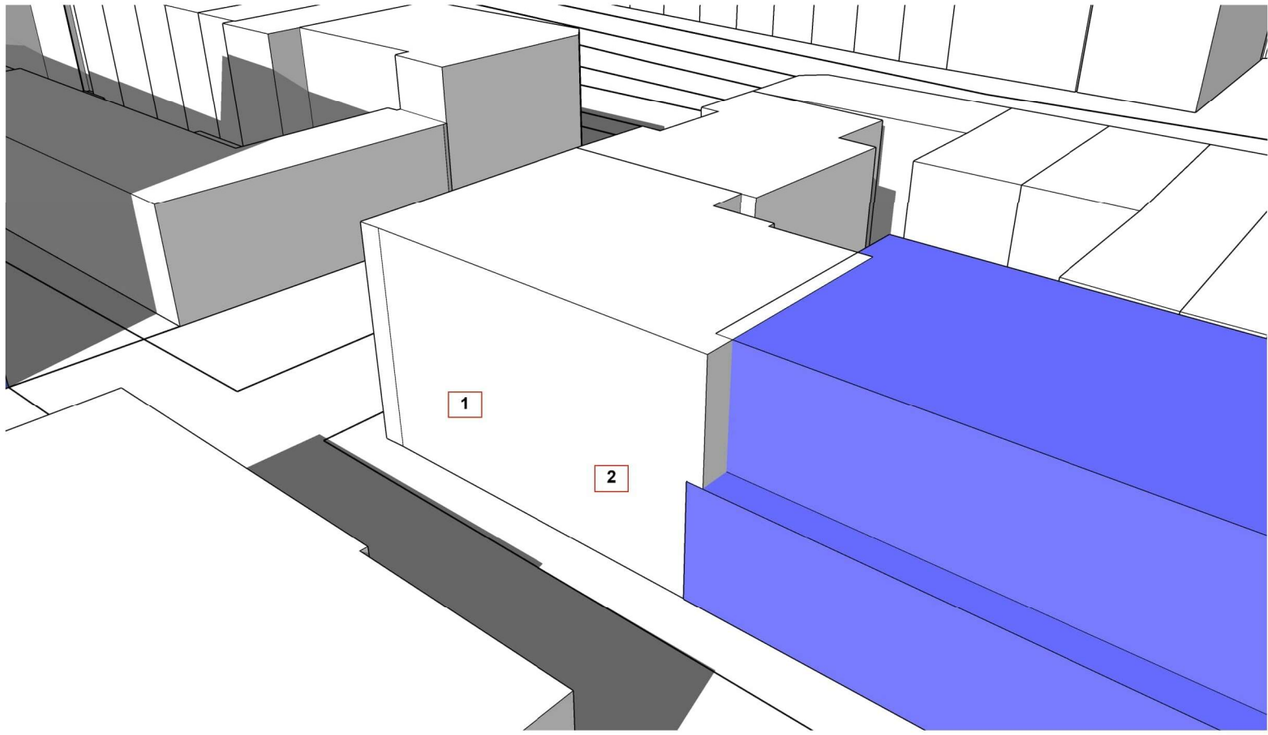

Almondestraat Oostzijde
21 september
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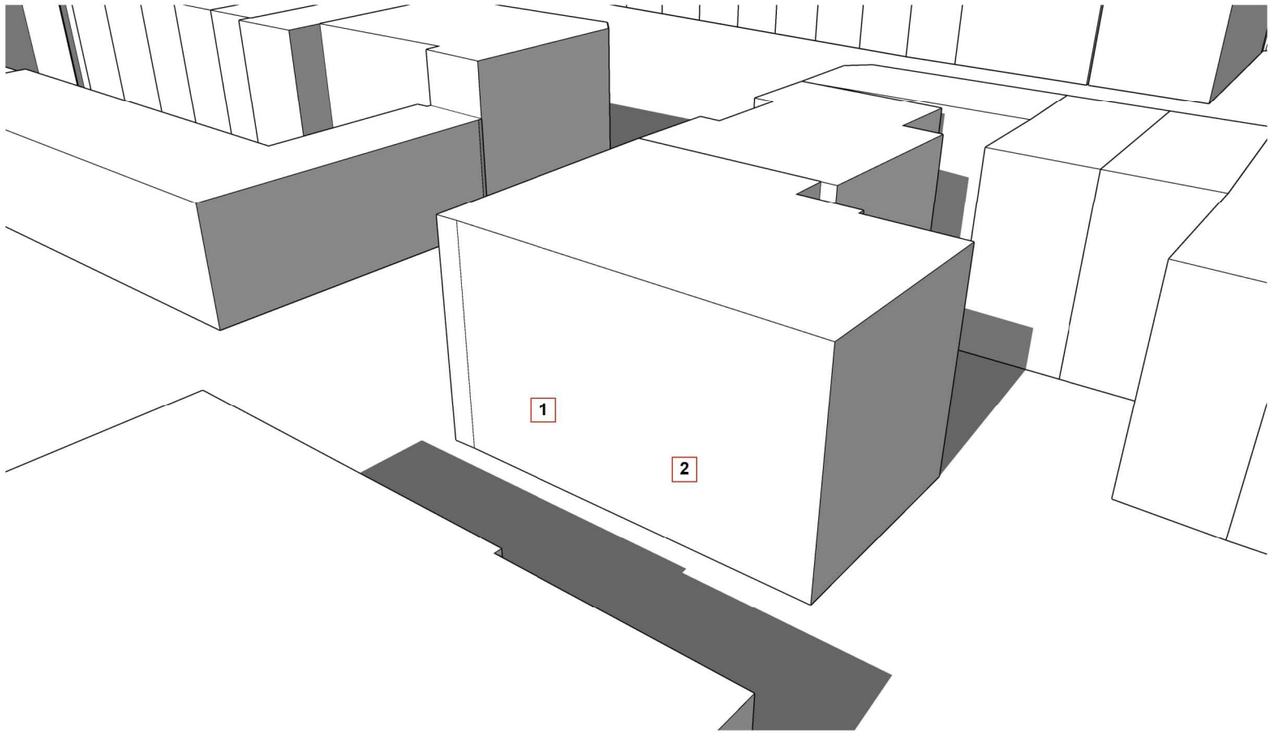
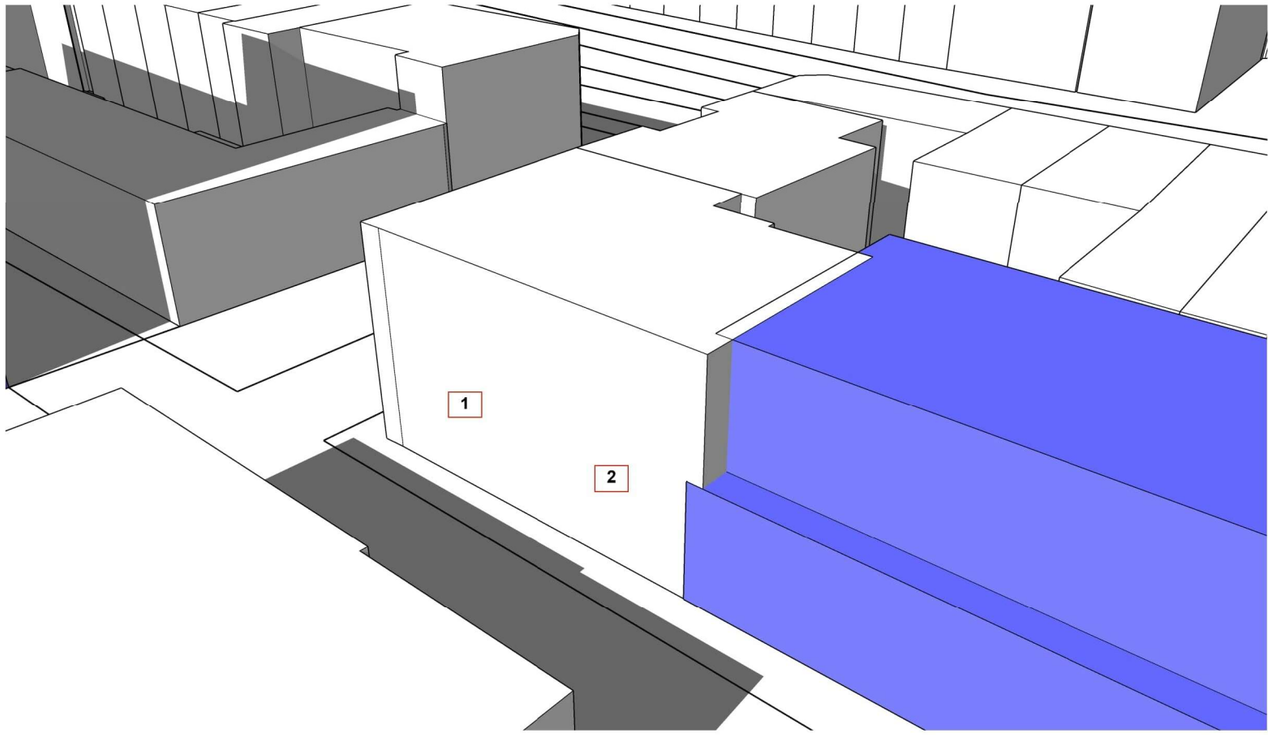
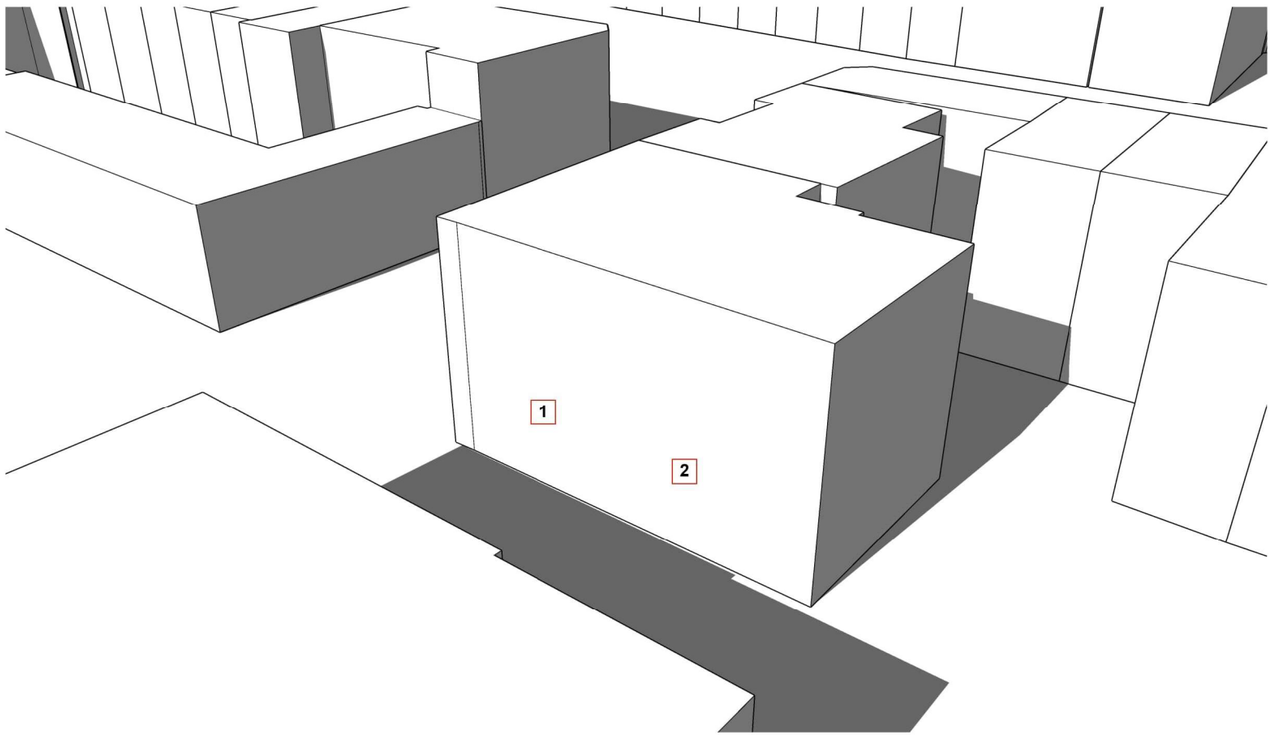
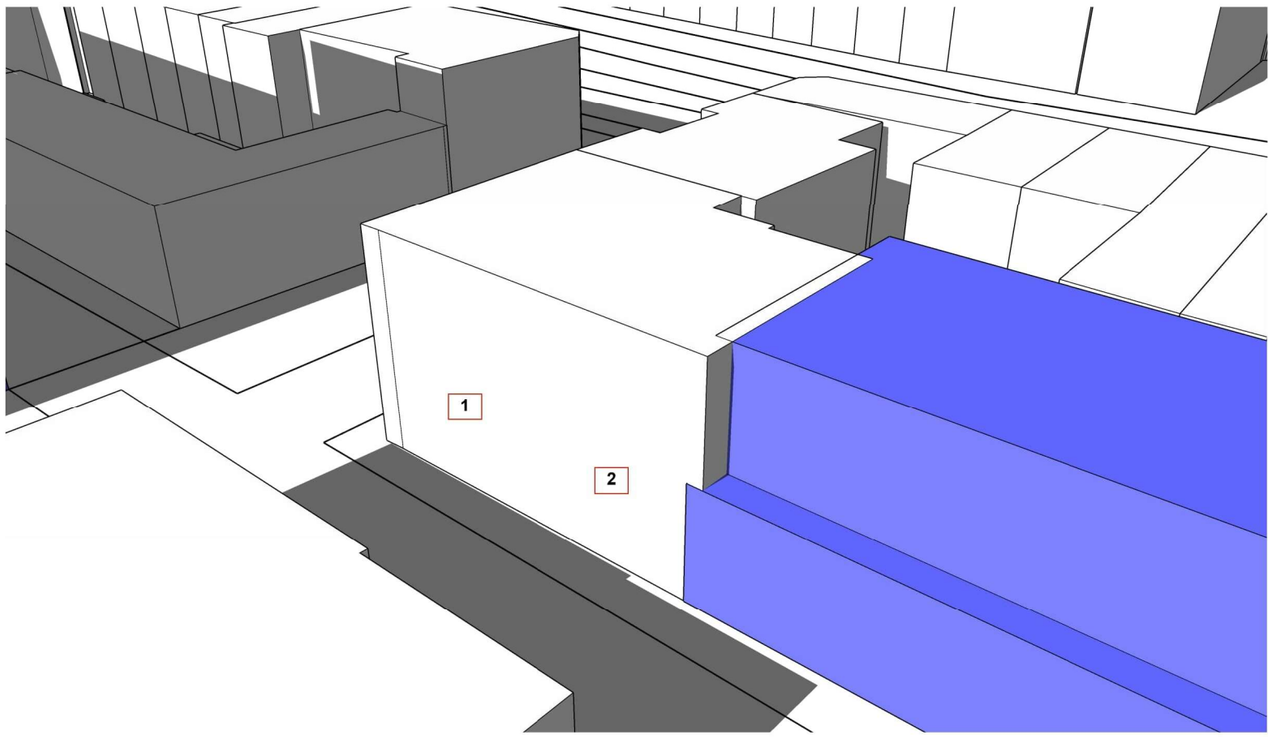




Almondestraat Oostzijde
21 september
14.30





Almondestraat Oostzijde
21 september
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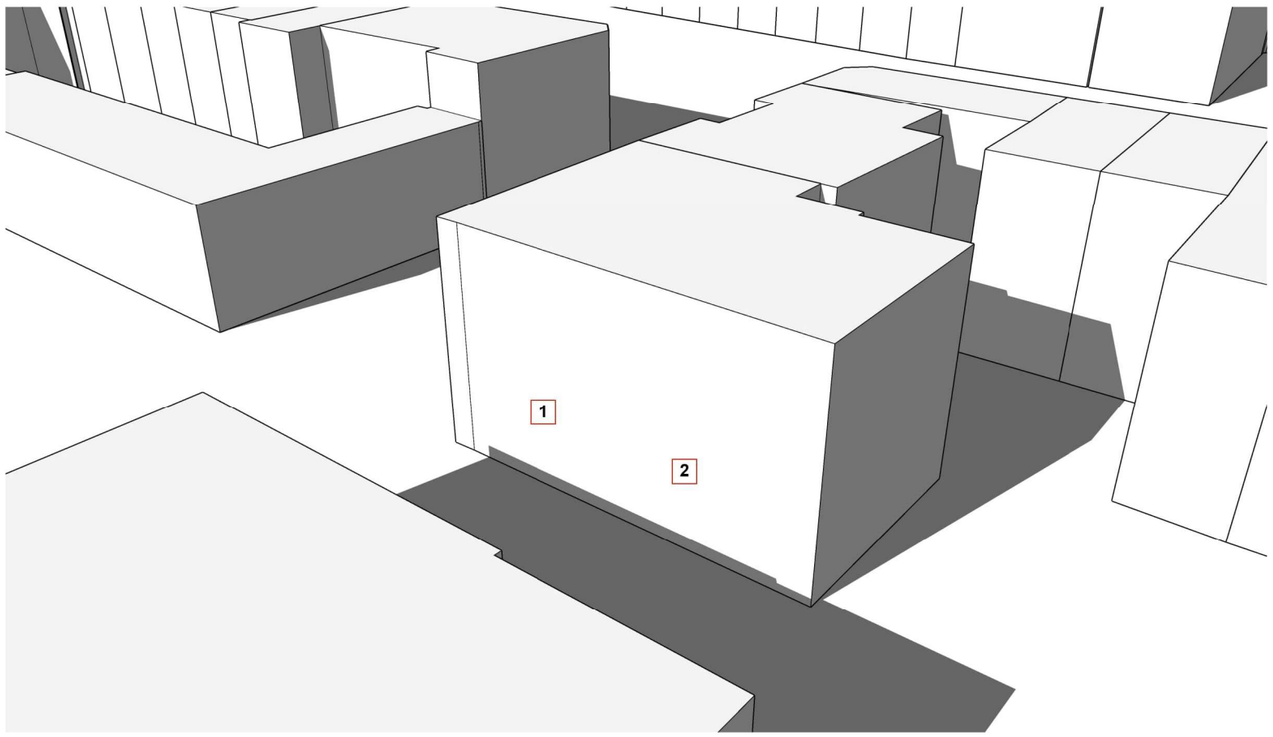

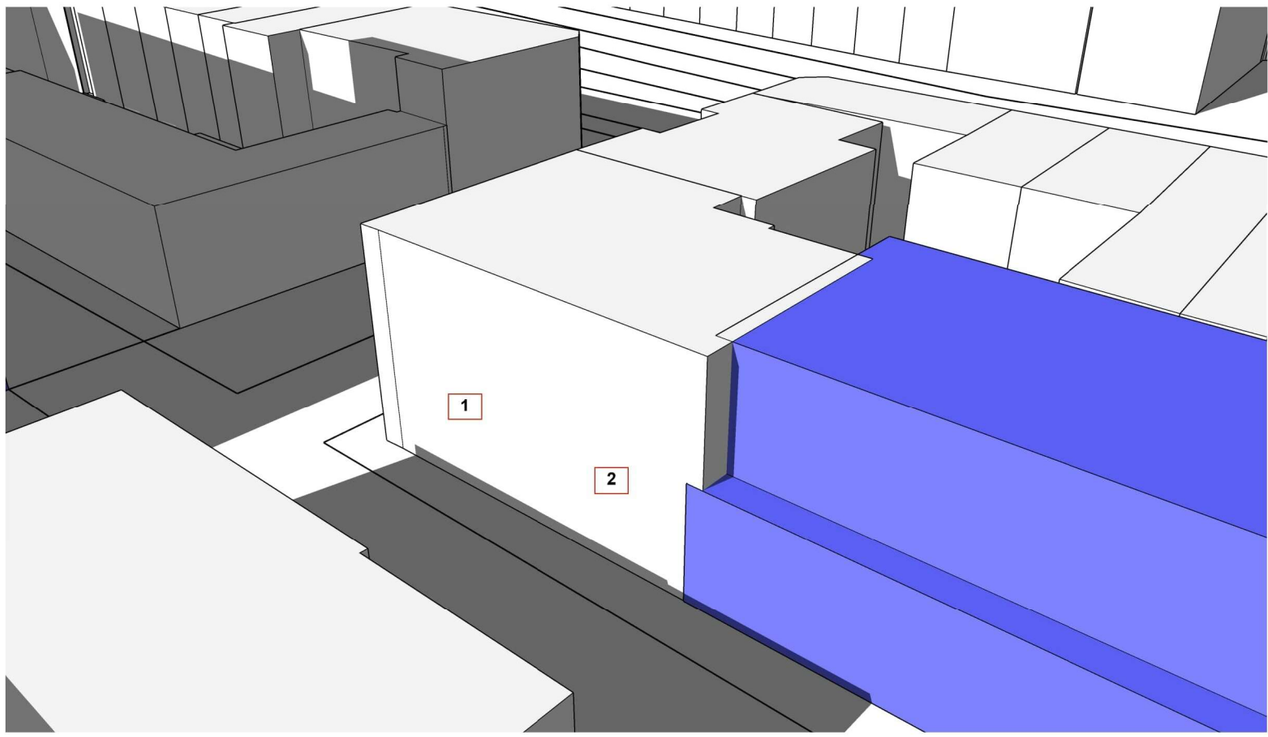

Almondestraat Oostzijde
21 september
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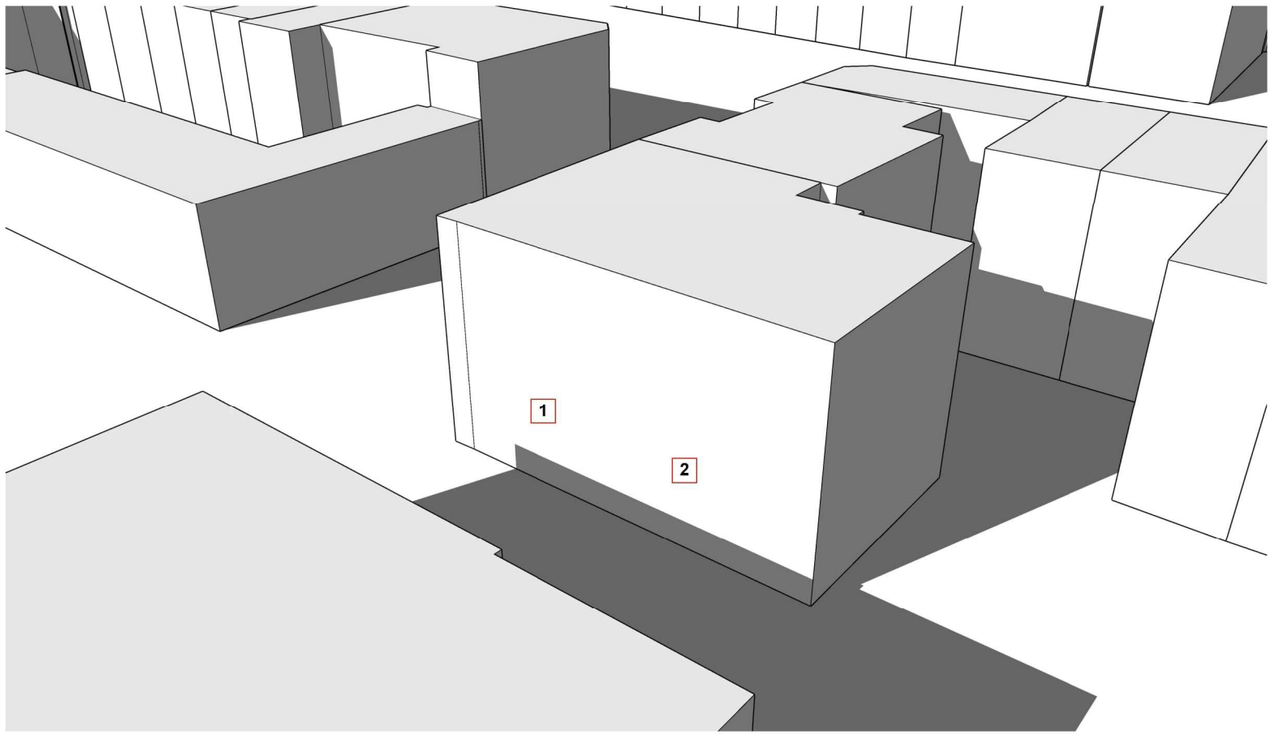
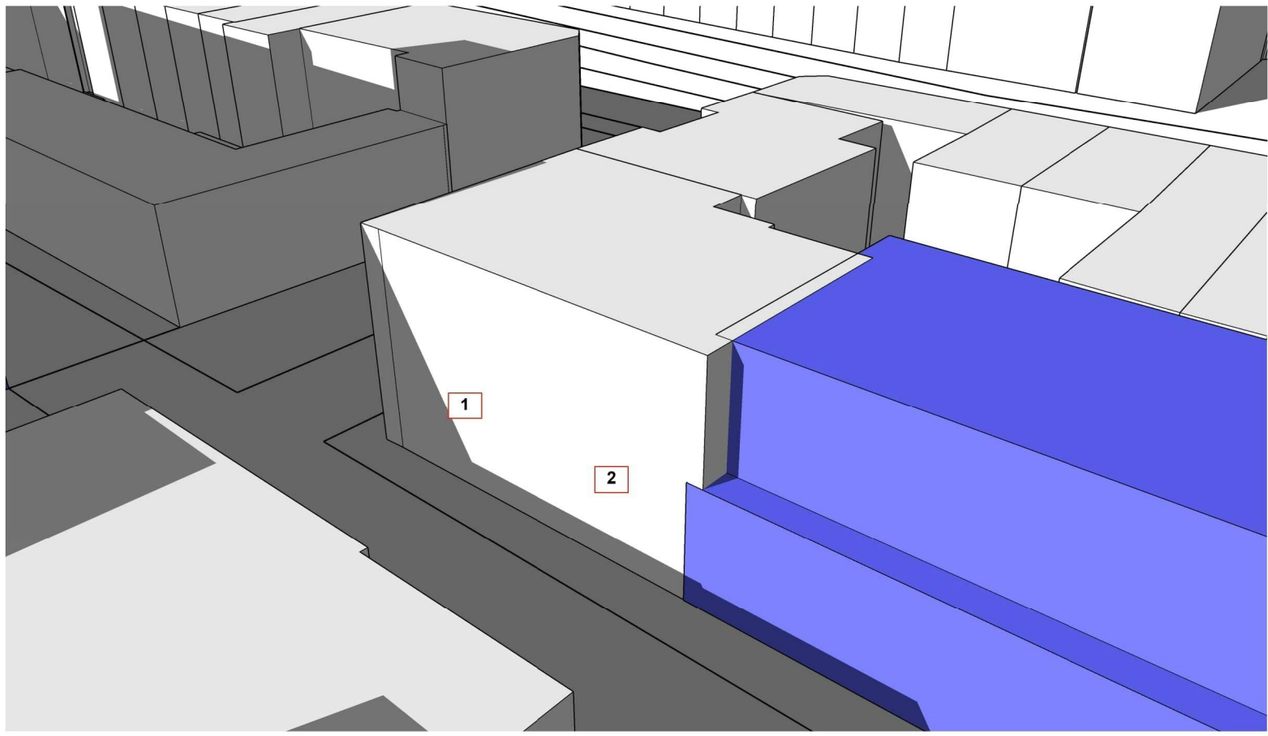
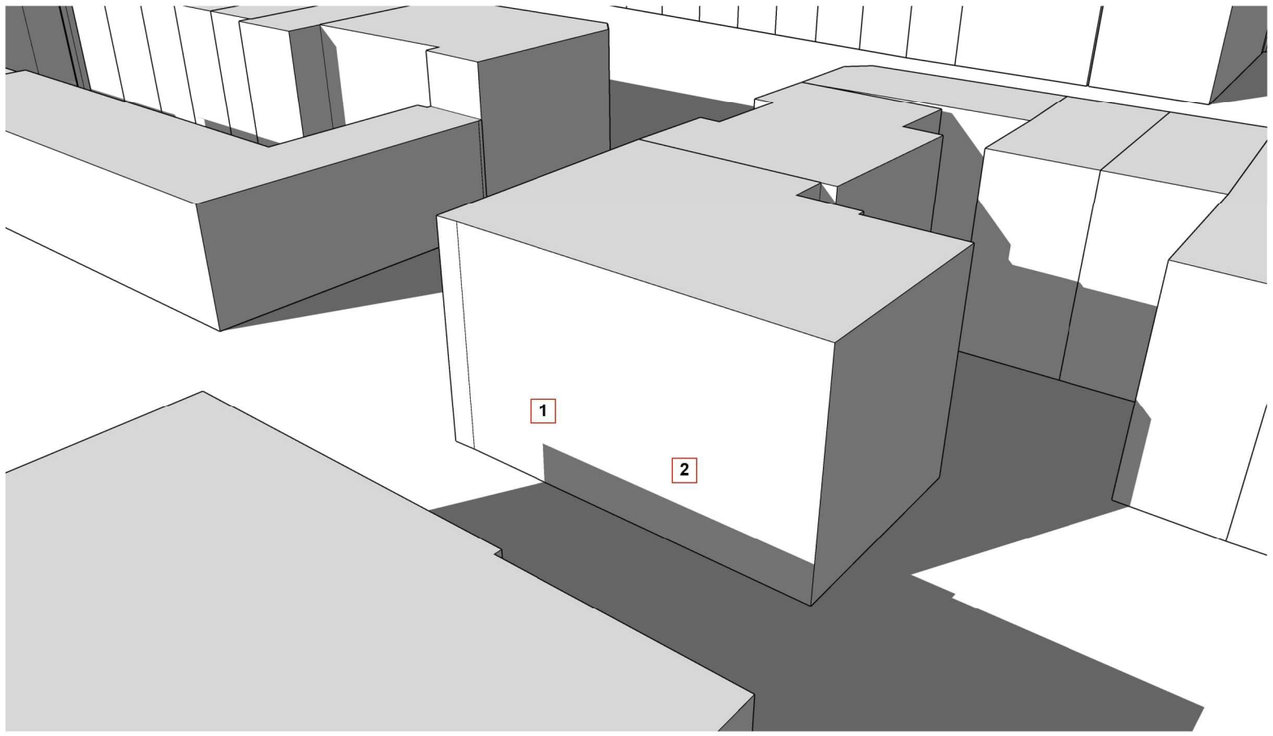
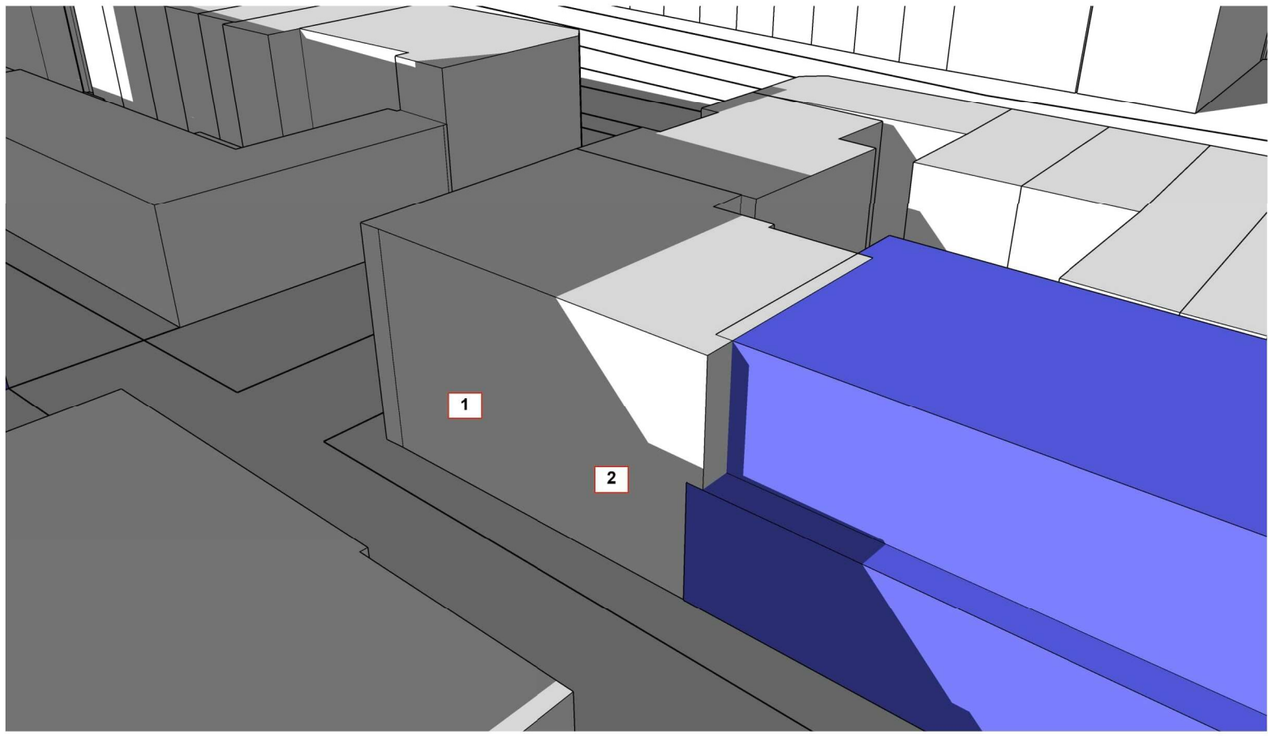




Almondestraat Oostzijde
21 september
16.00





Almondestraat Oostzijde
21 september
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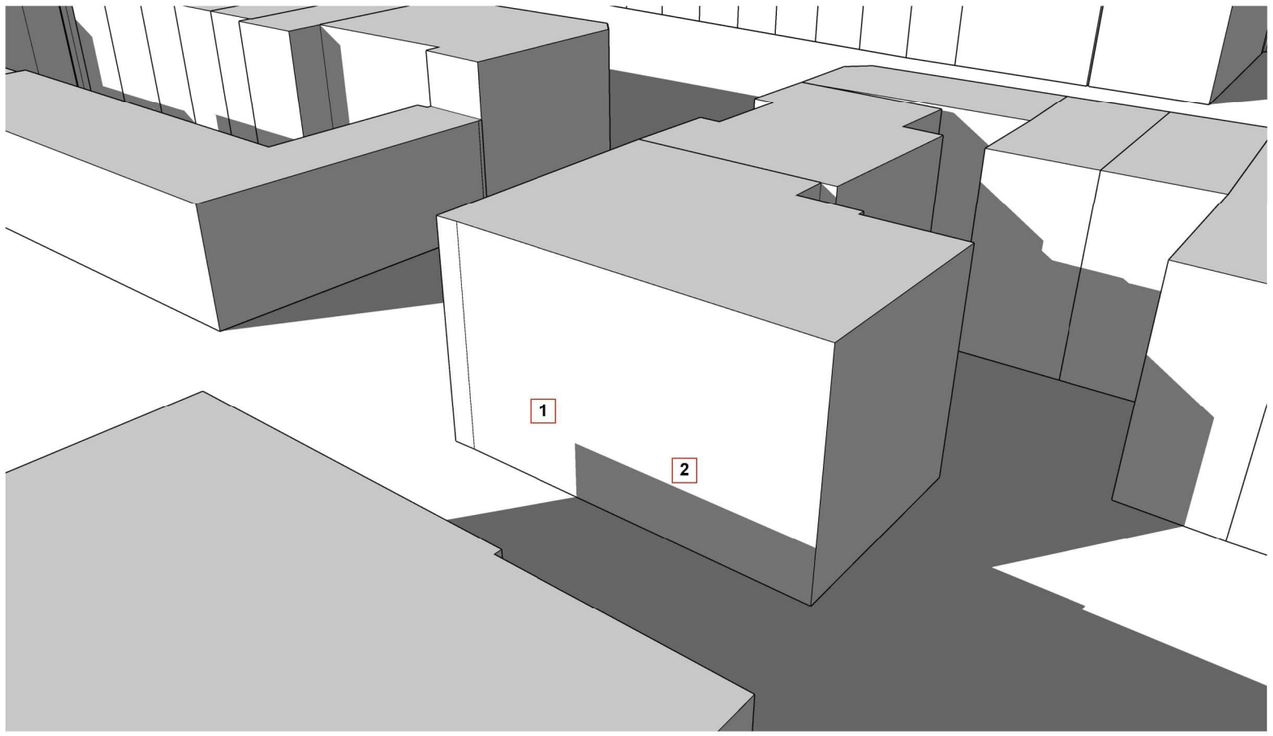

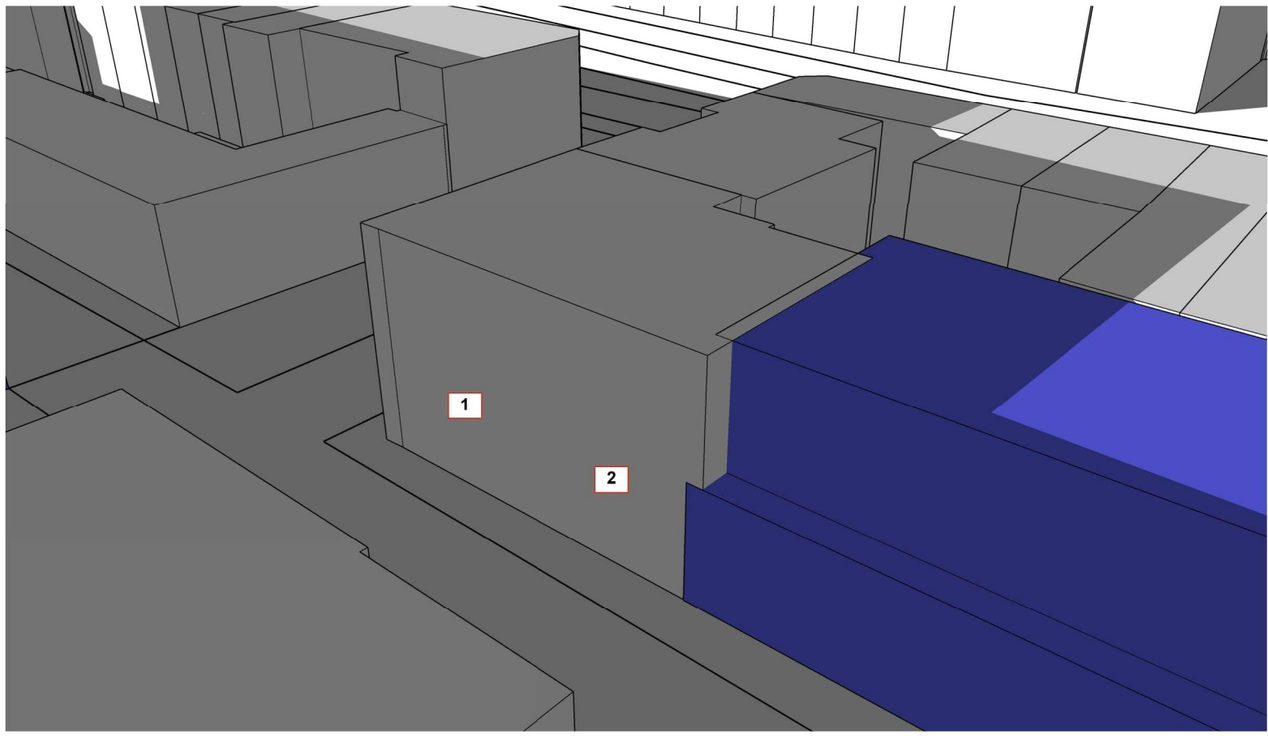

Almondestraat Oostzijde
21 september
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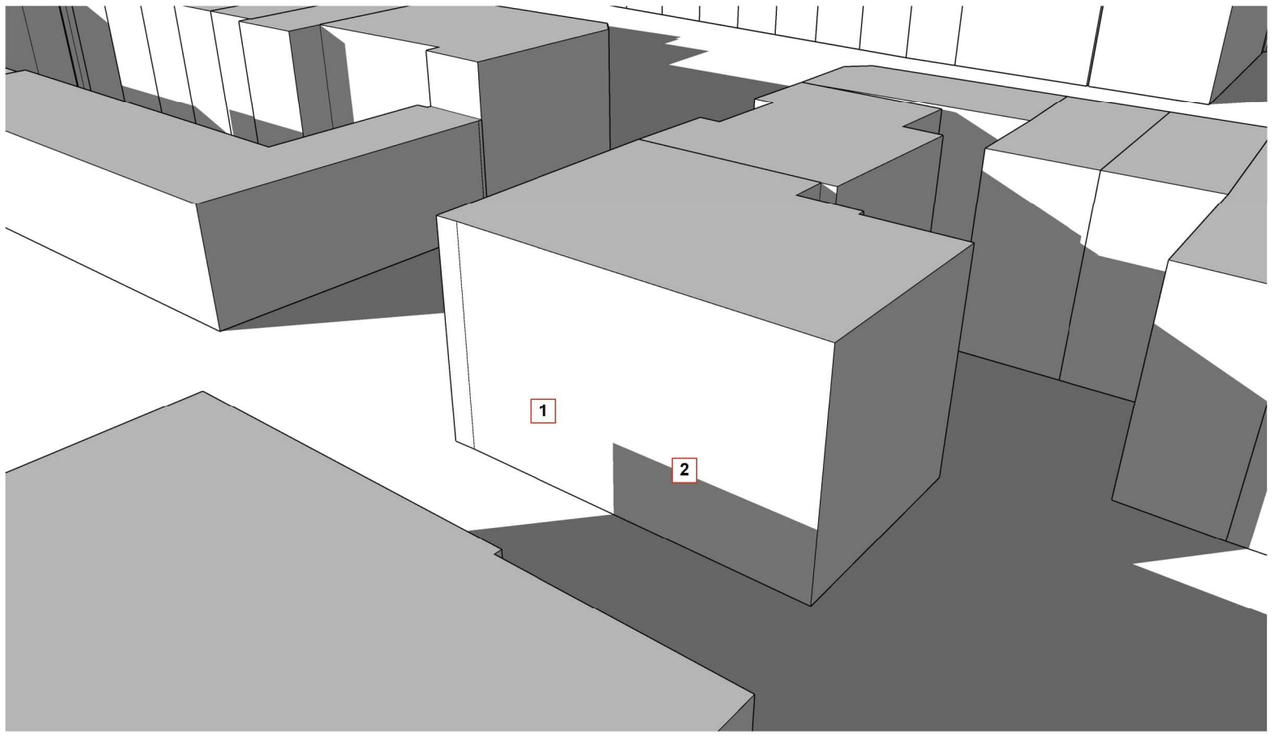

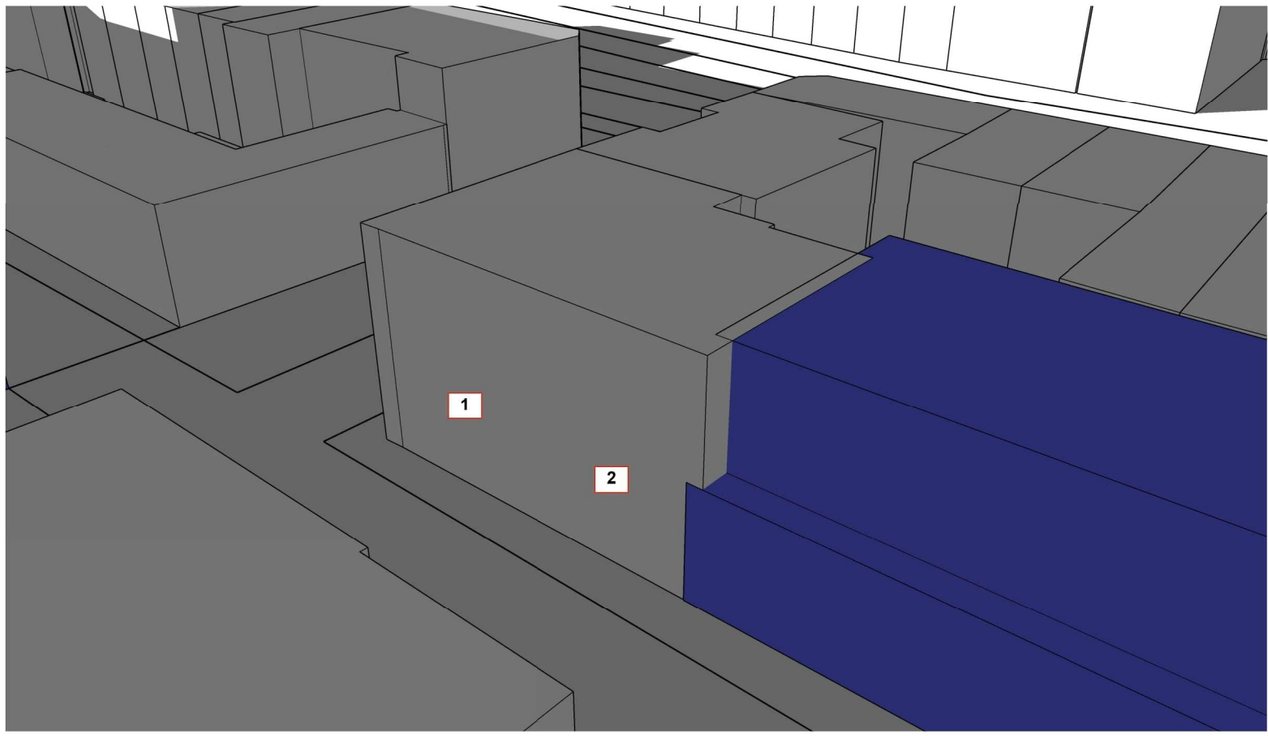

Almondestraat Oostzijde
21 september
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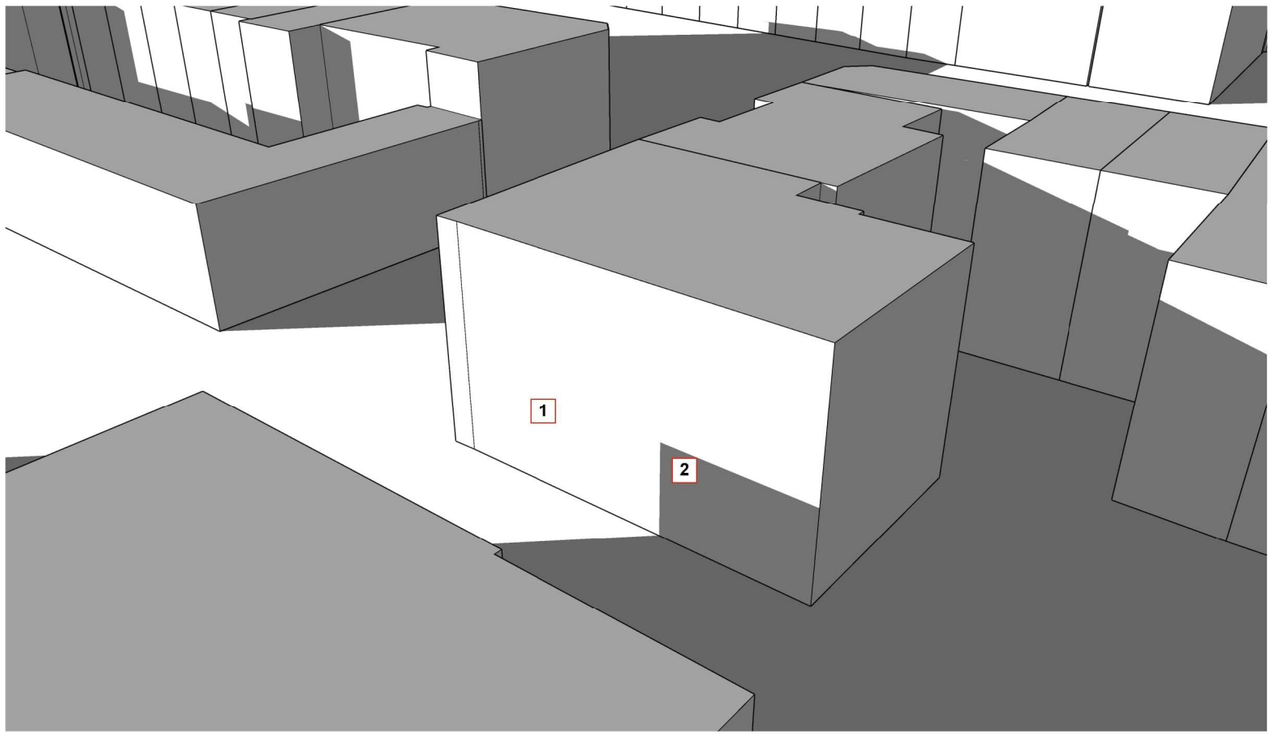
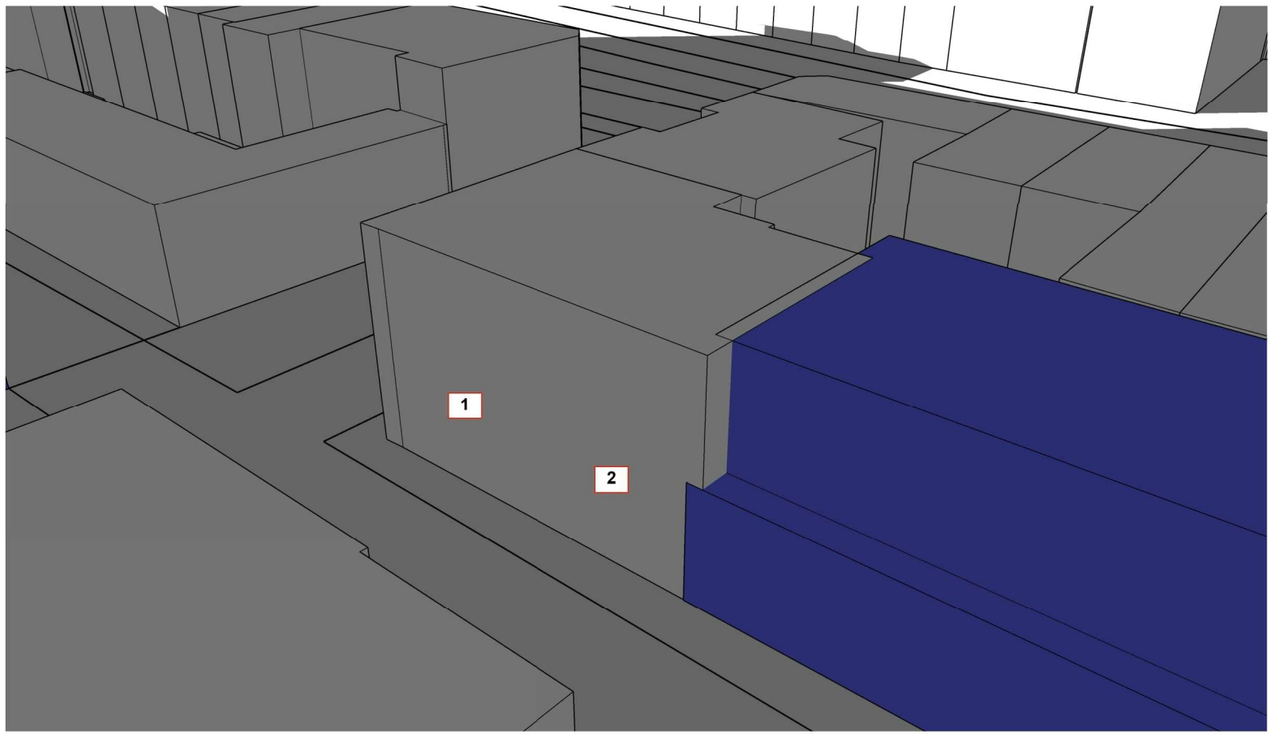
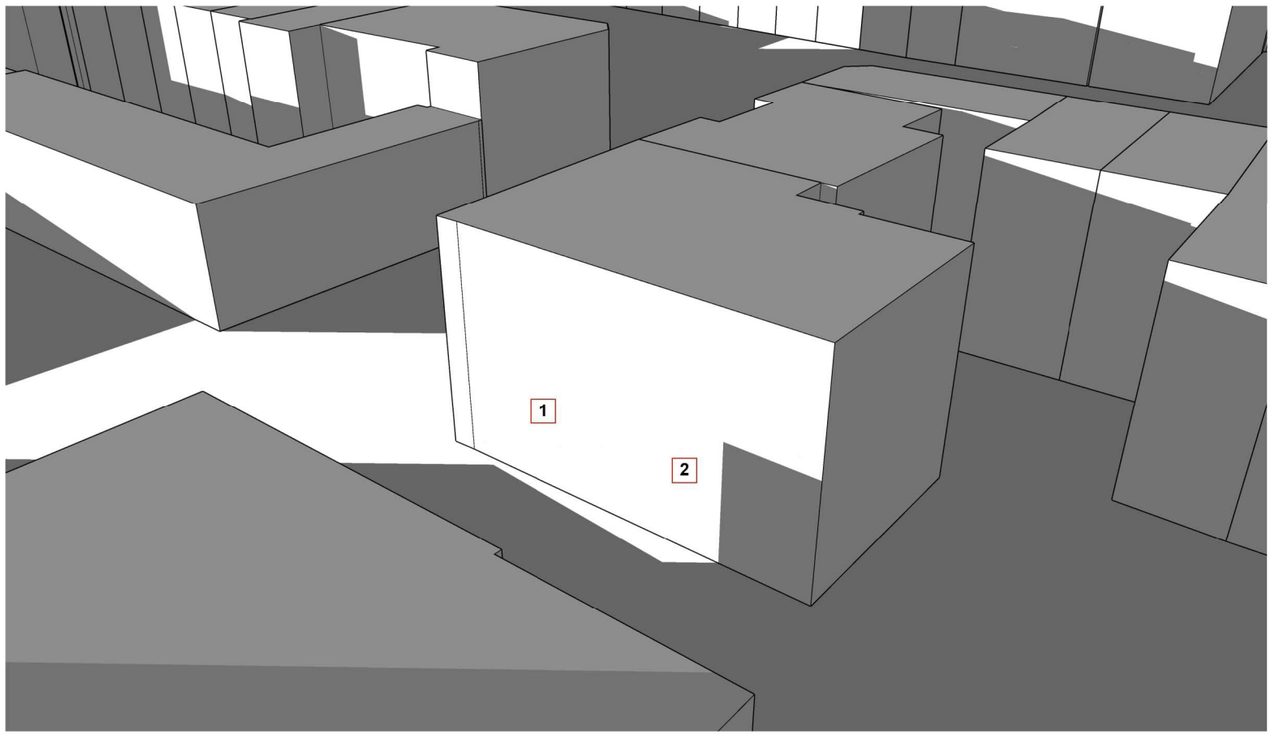
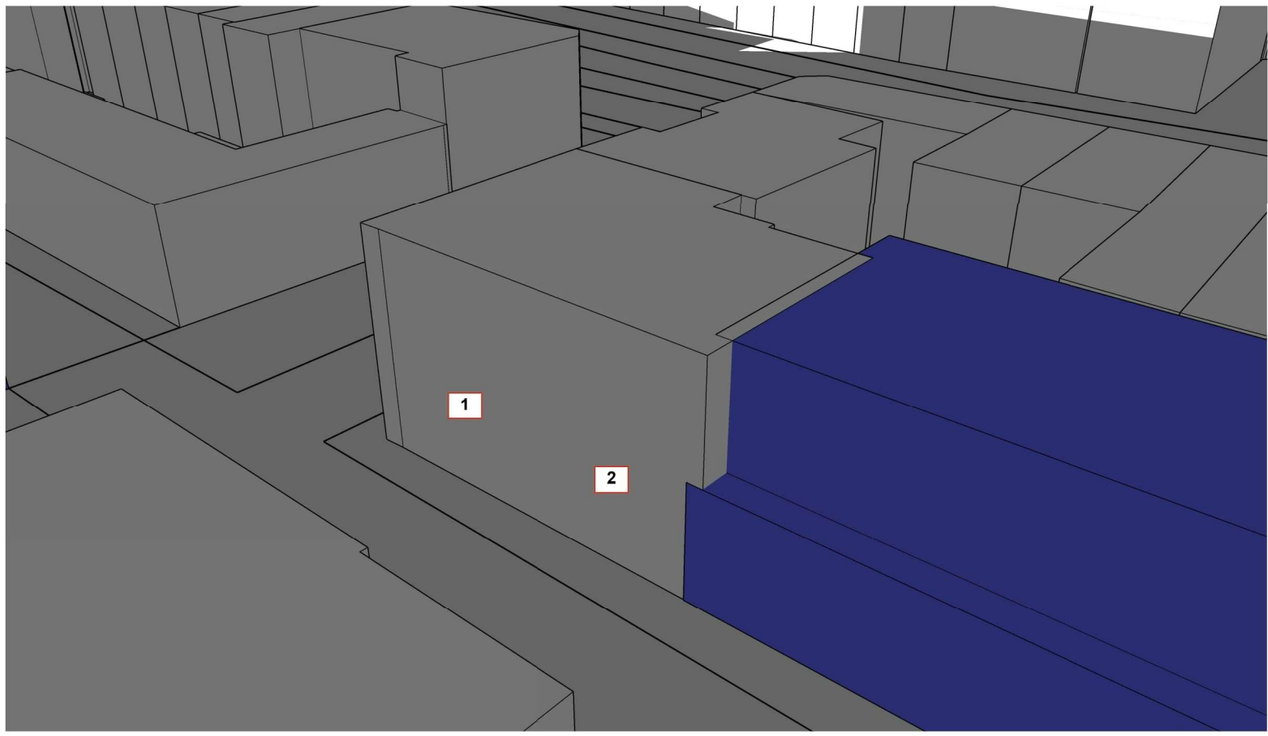


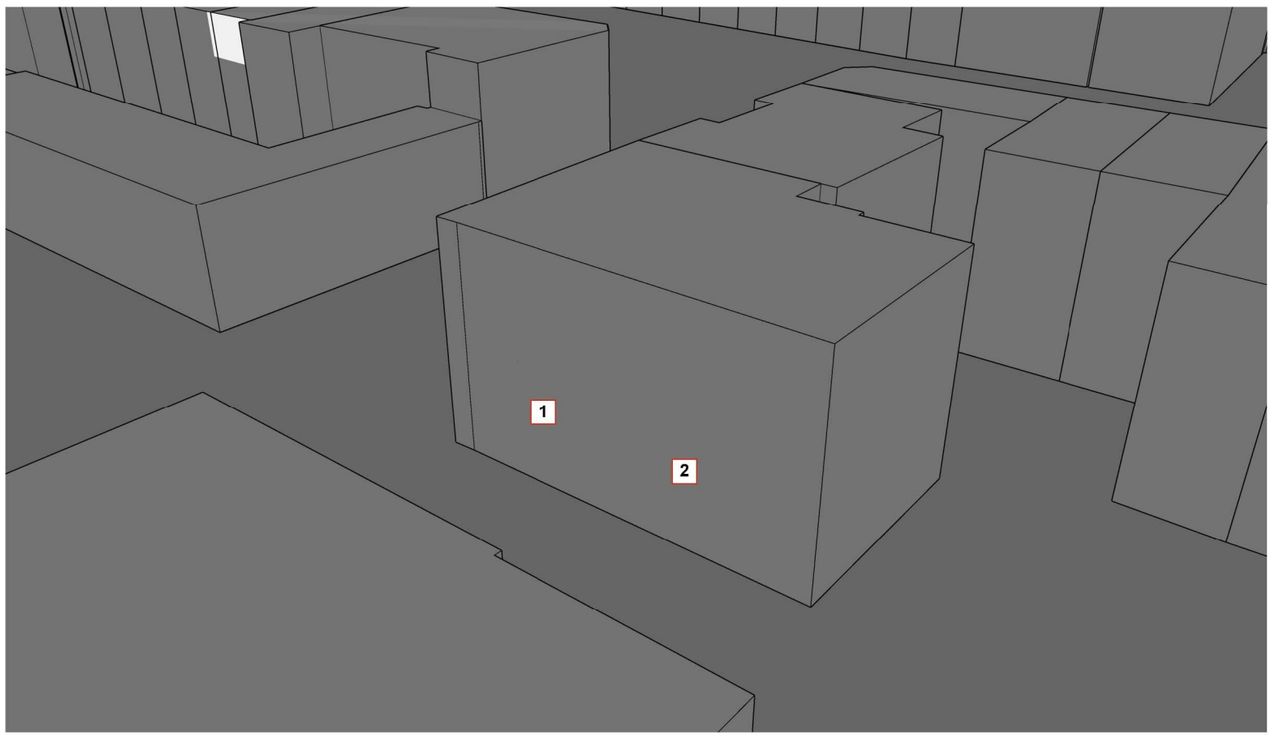


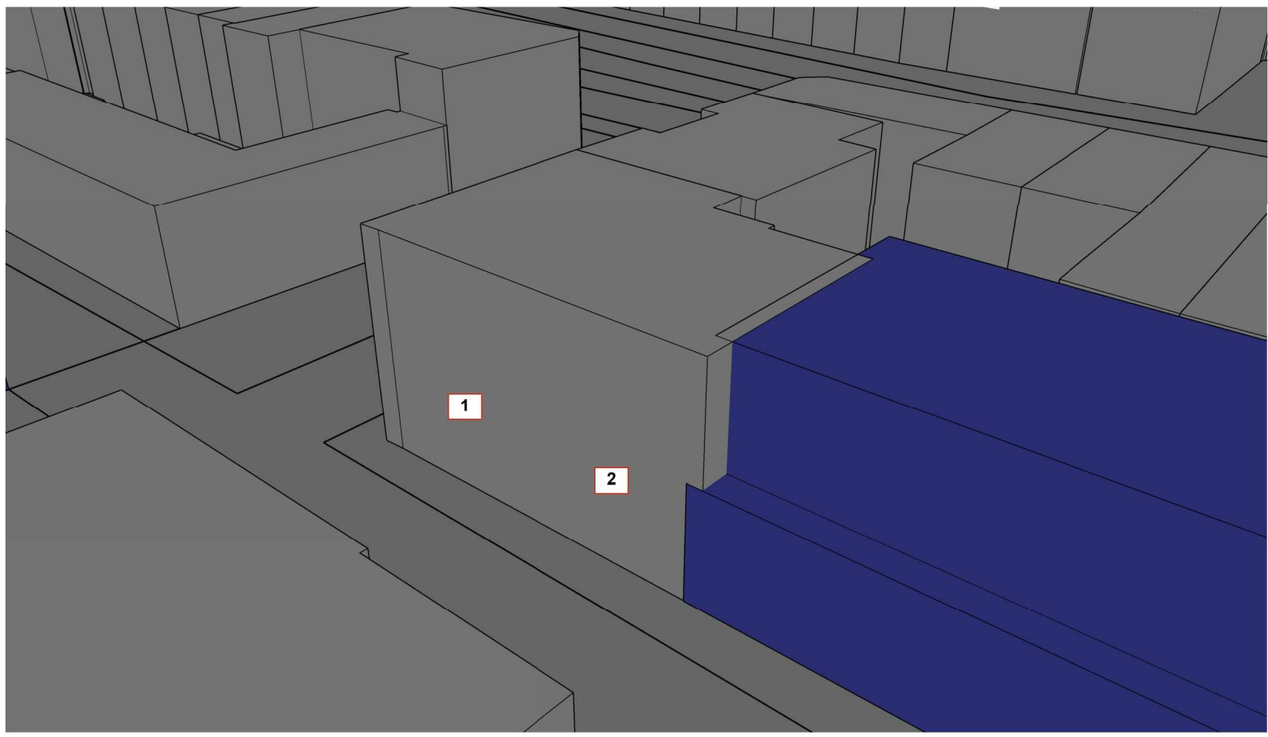
Almondestraat Oostzijde
21 september
18.00



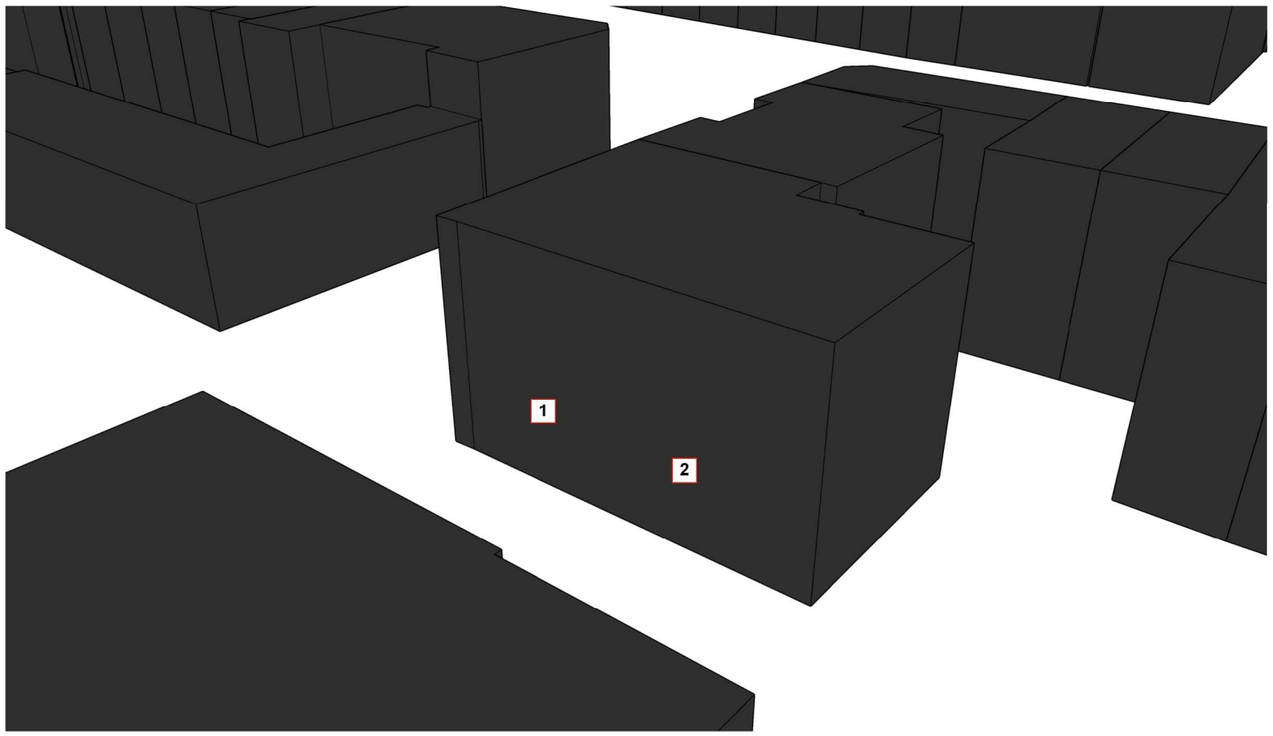


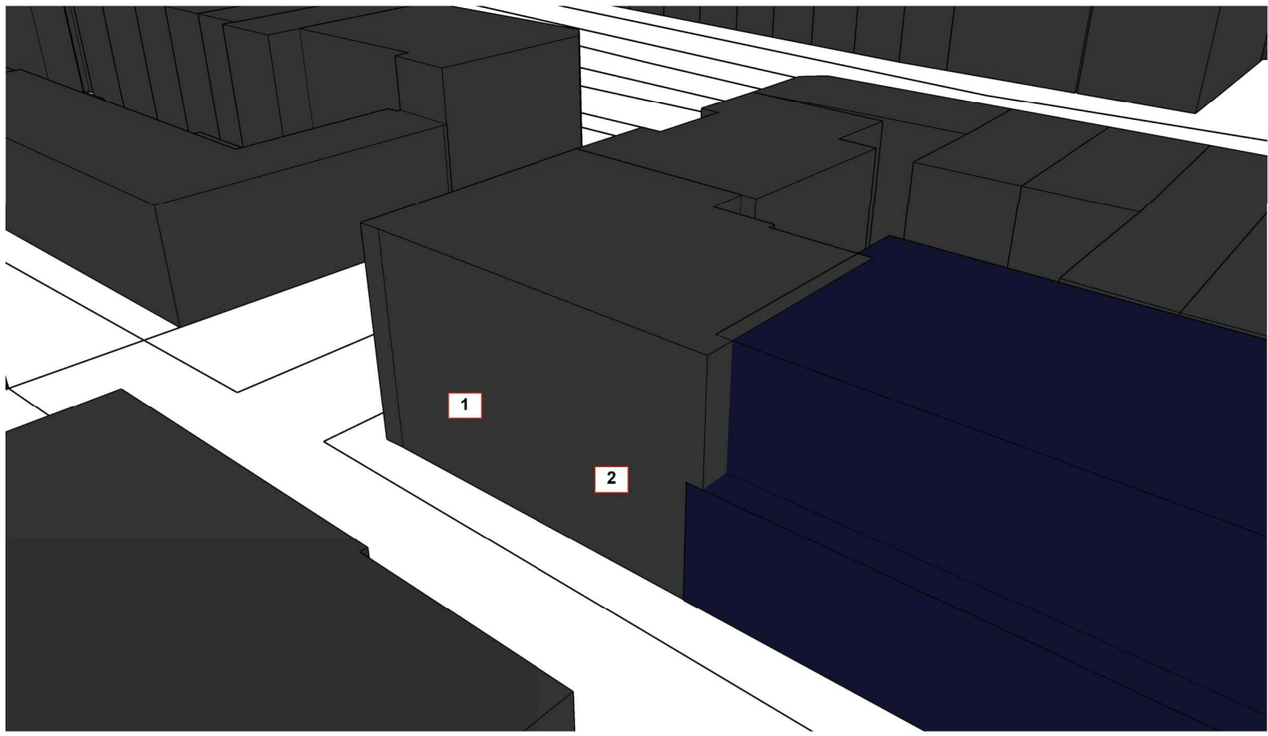
Almondestraat Oostzijde
21 september
18.30





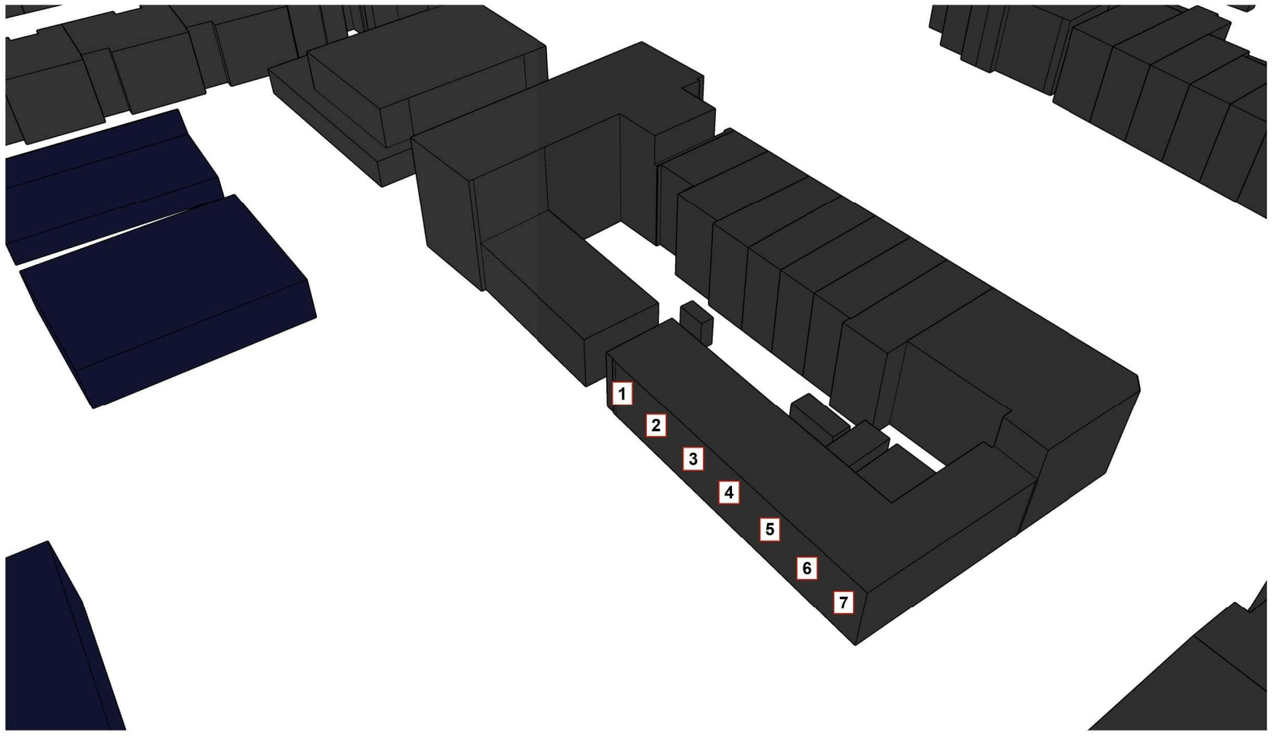
Almondestraat Oostzijde
21 september
19.00

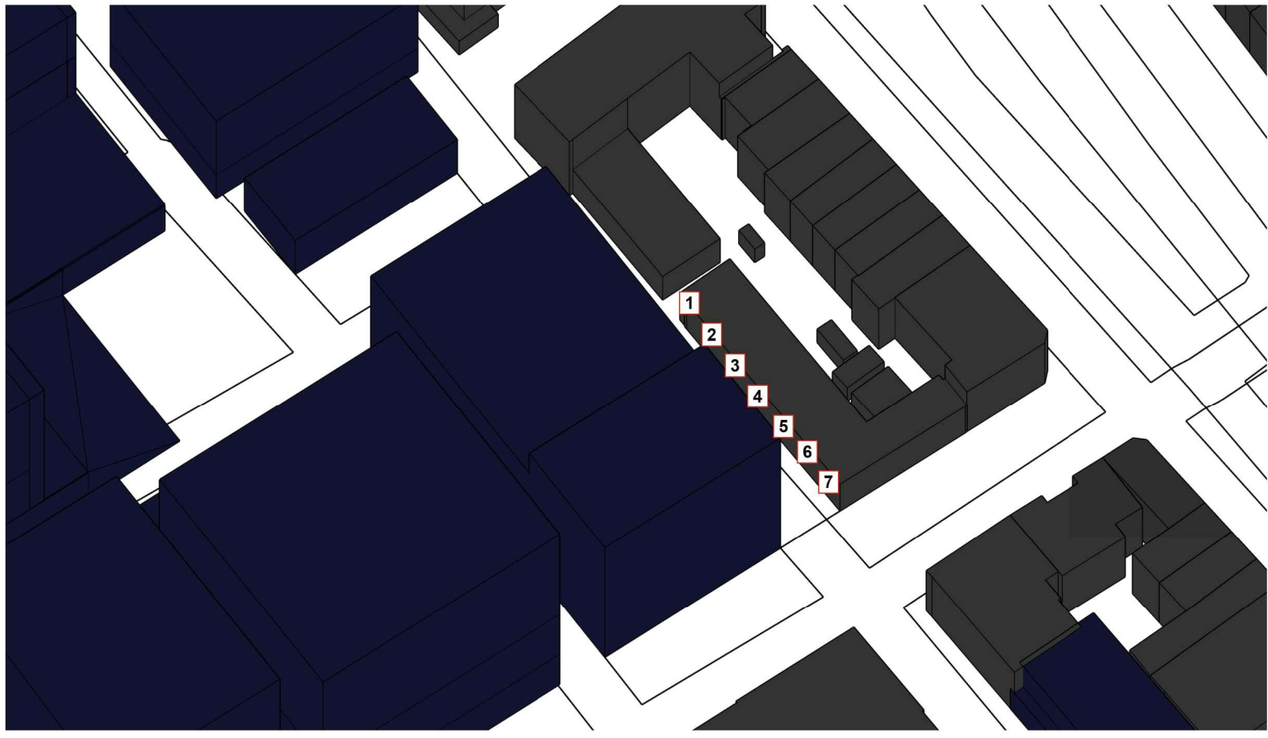




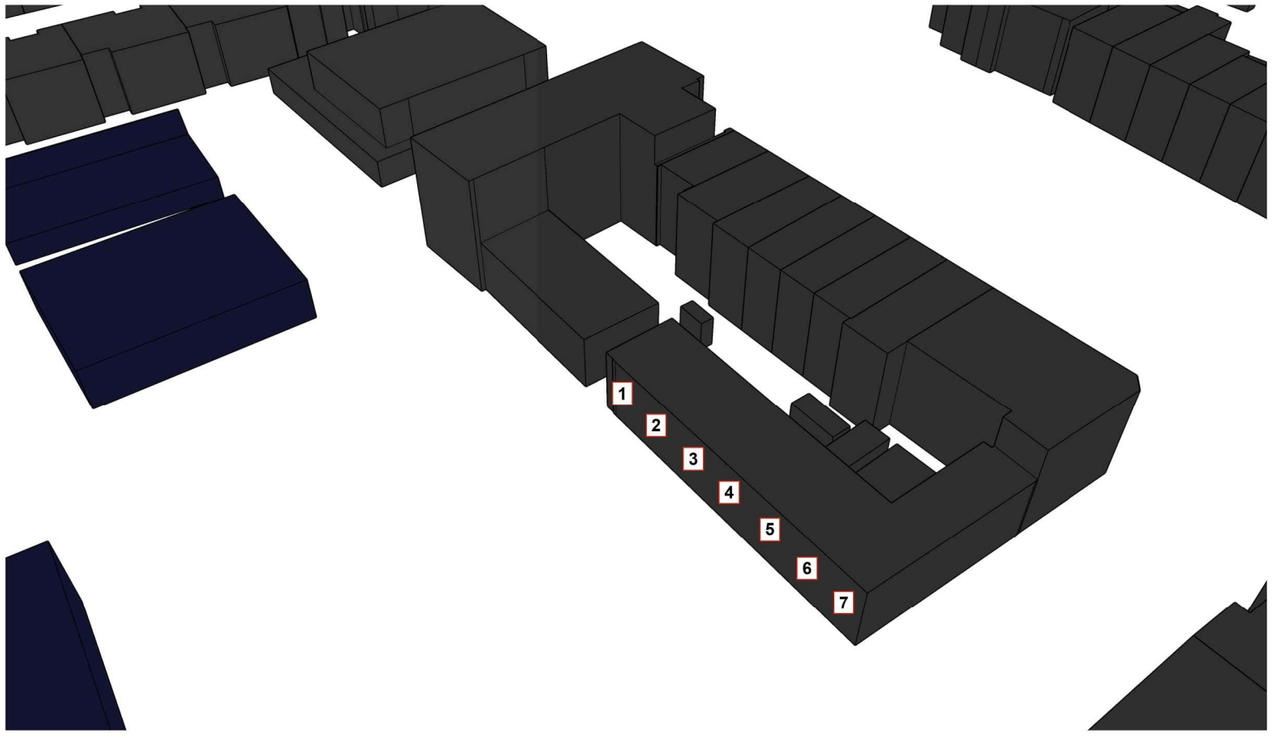
bijlage 5. resultaten 21 september Almondestraat West huidig vs. nieuw

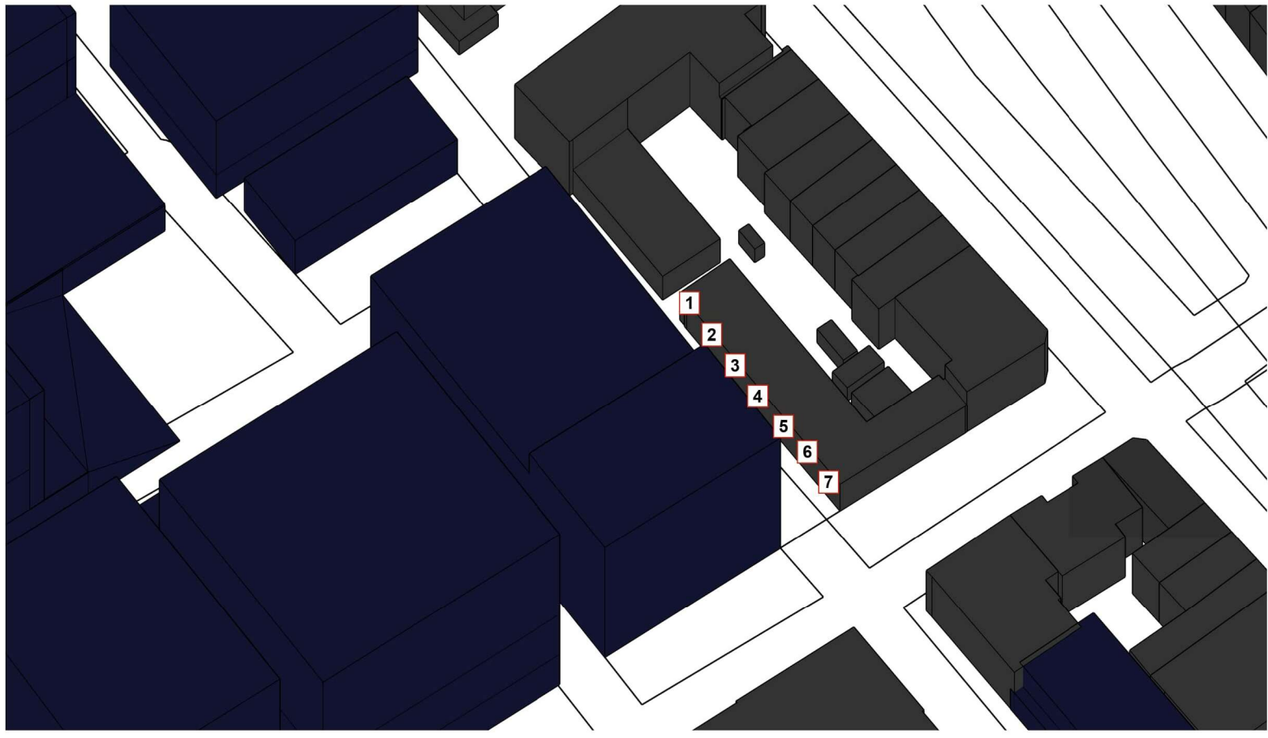
Almondestraat Westzijde
21 september
06.00



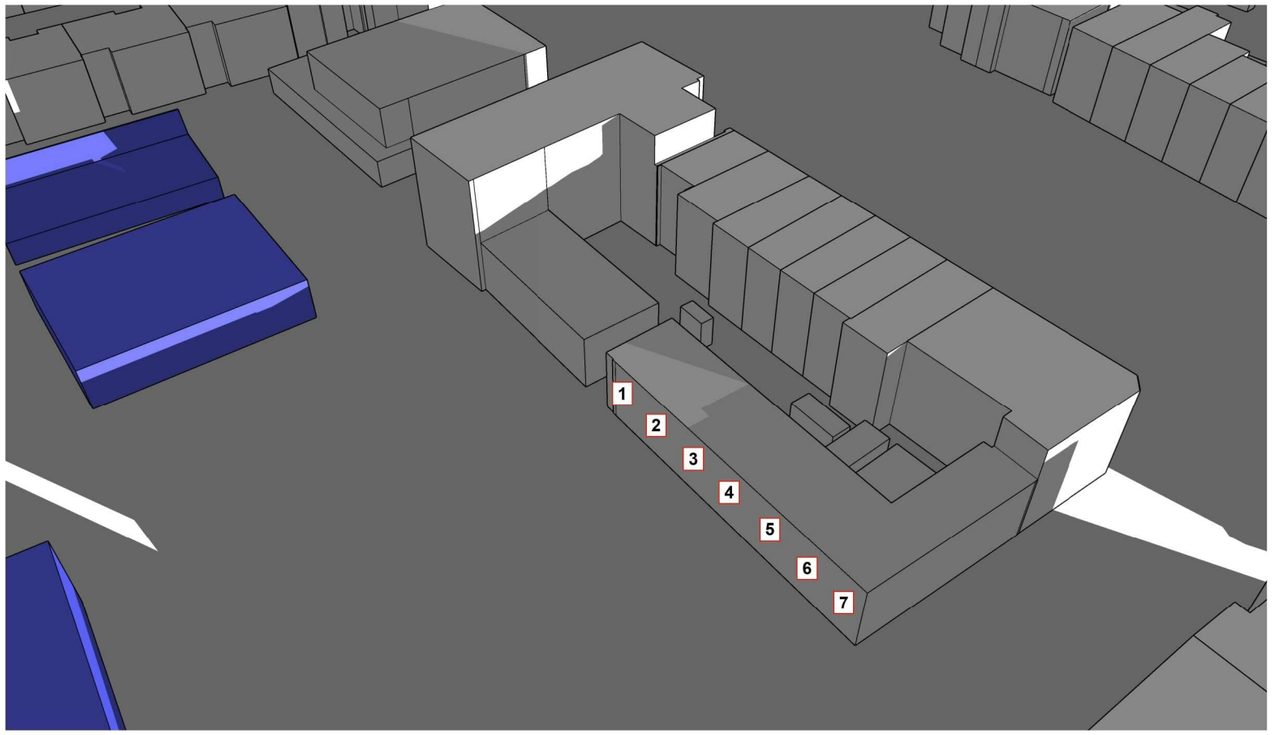


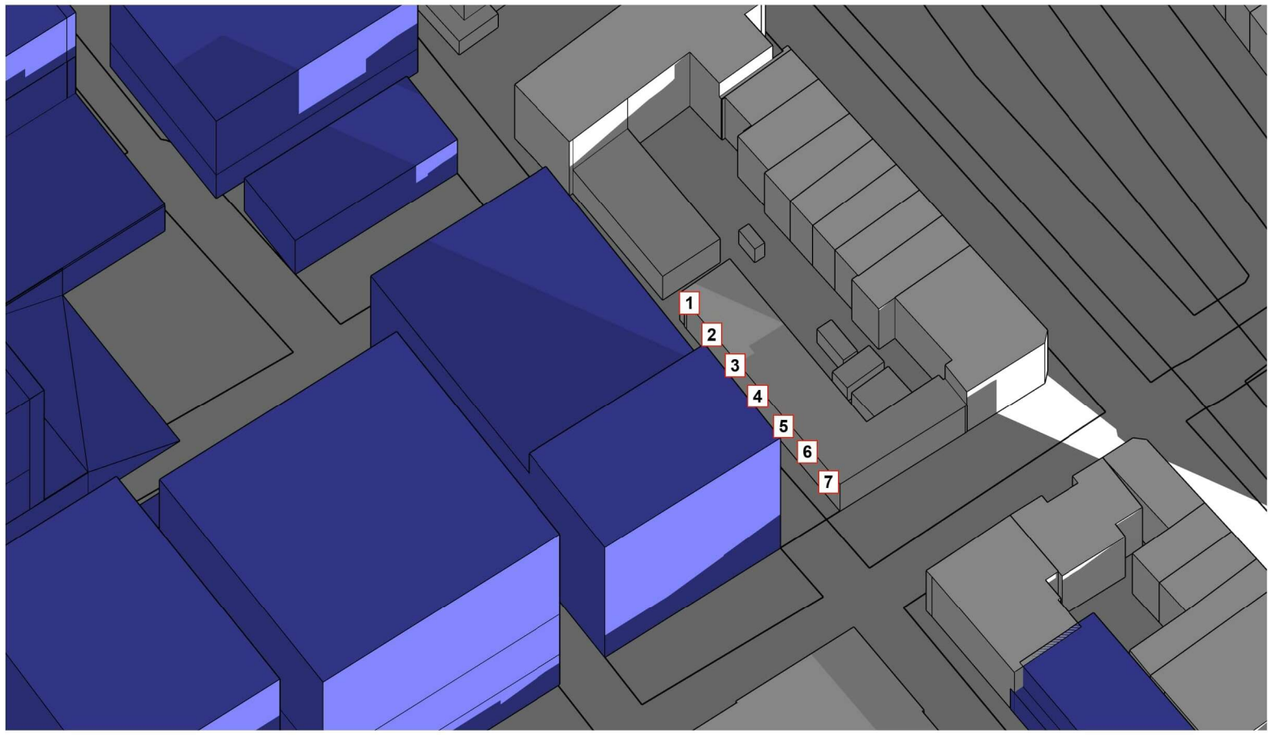
Almondestraat Westzijde
21 september
06.30





Almondestraat Westzijde
21 september
07.00





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21 september
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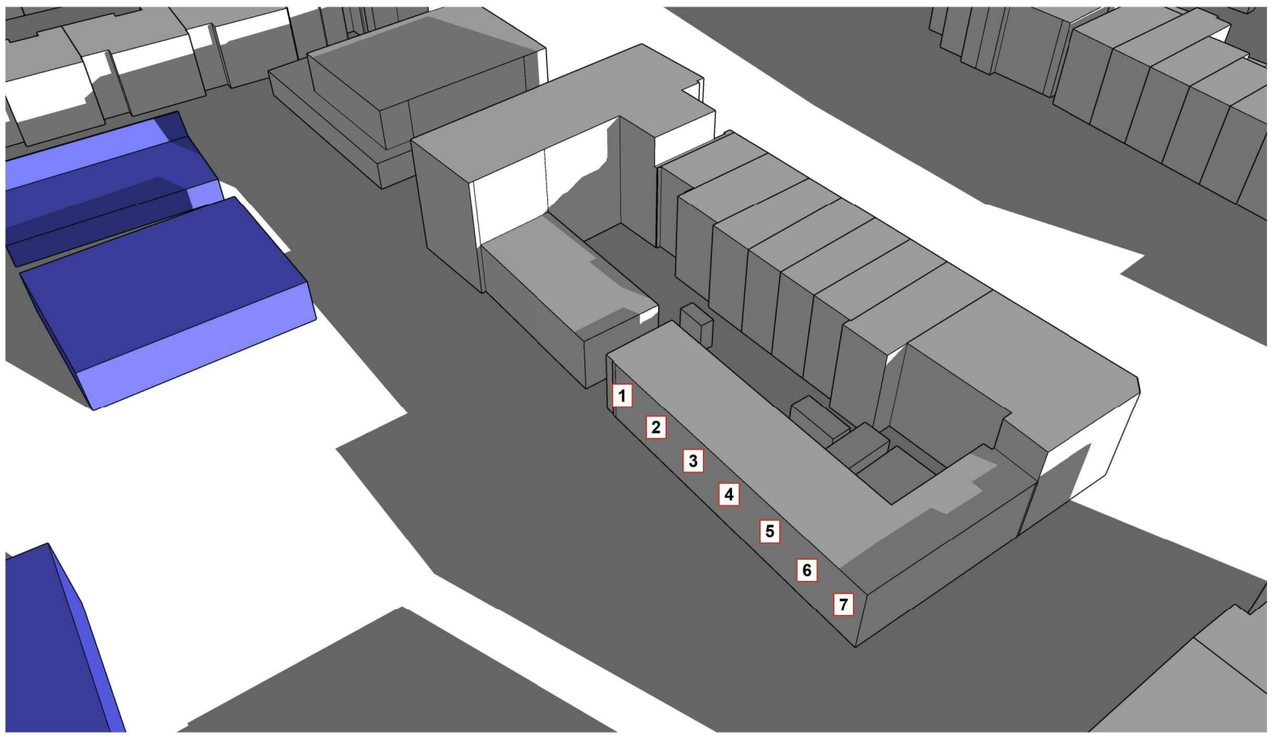

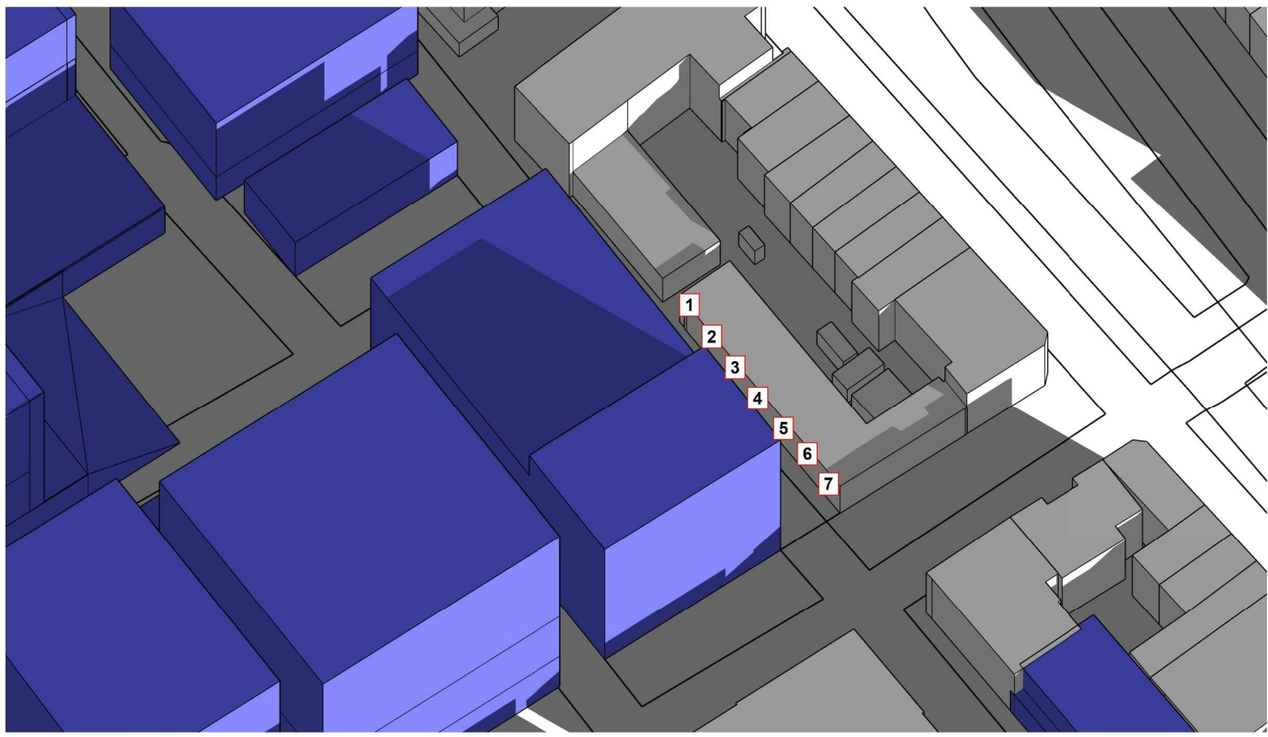

Almondestraat Westzijde
21 september
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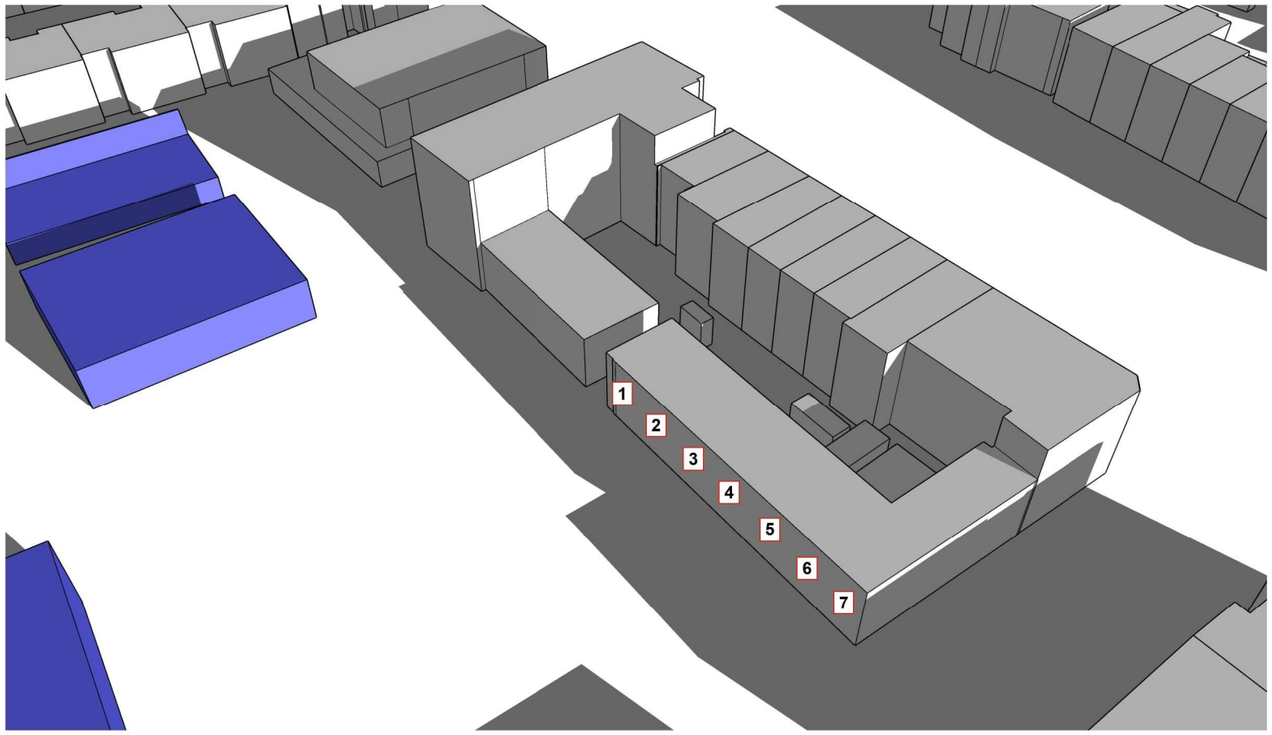

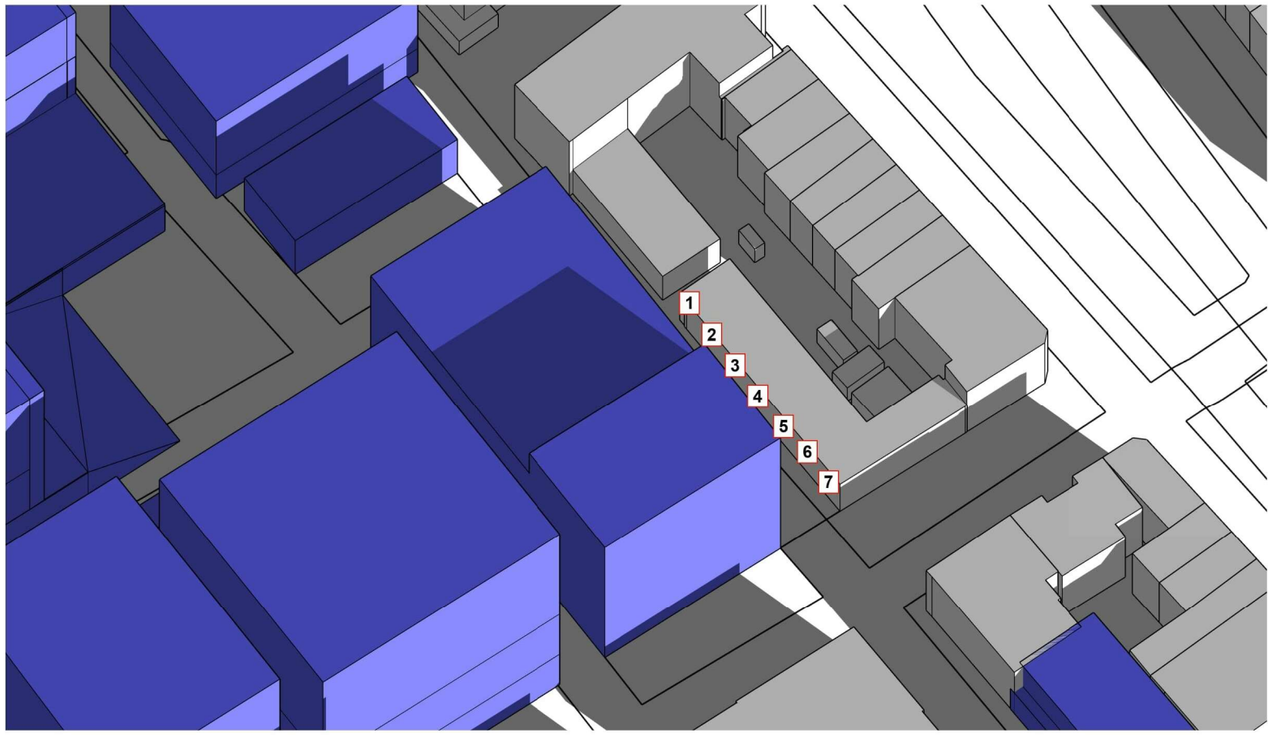

Almondestraat Westzijde
21 september
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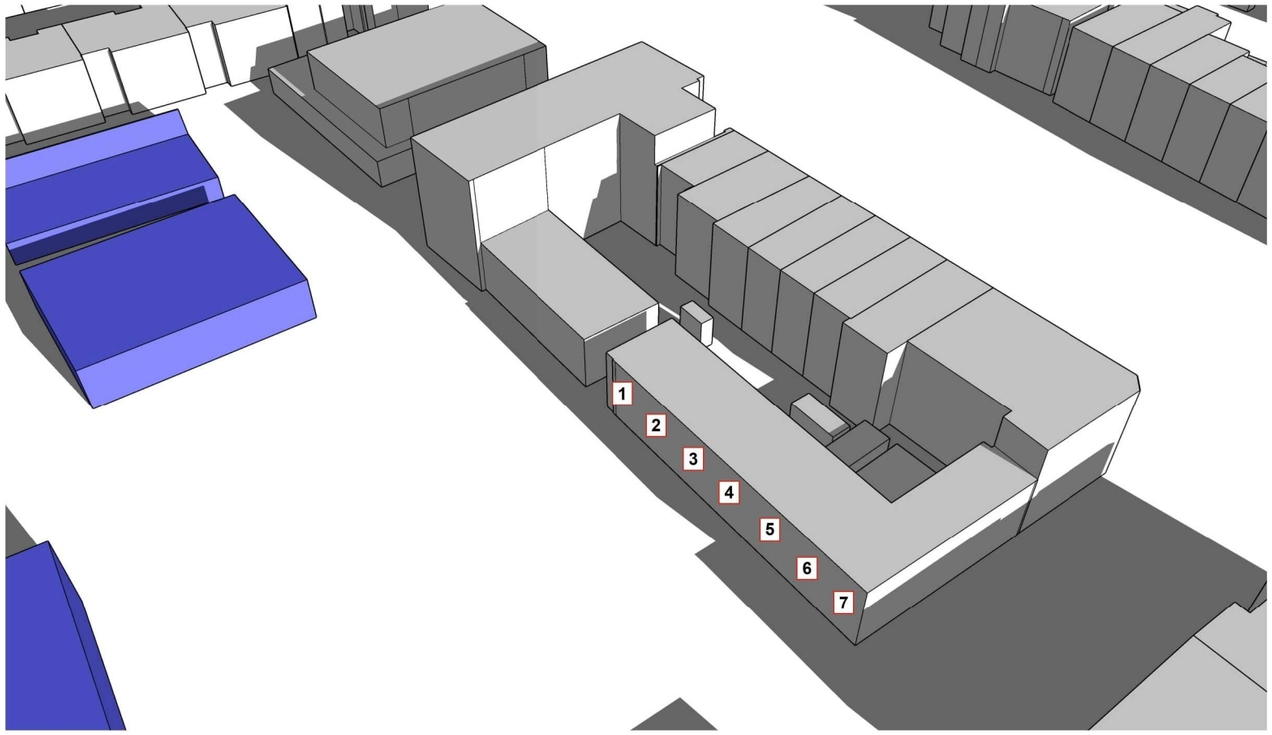

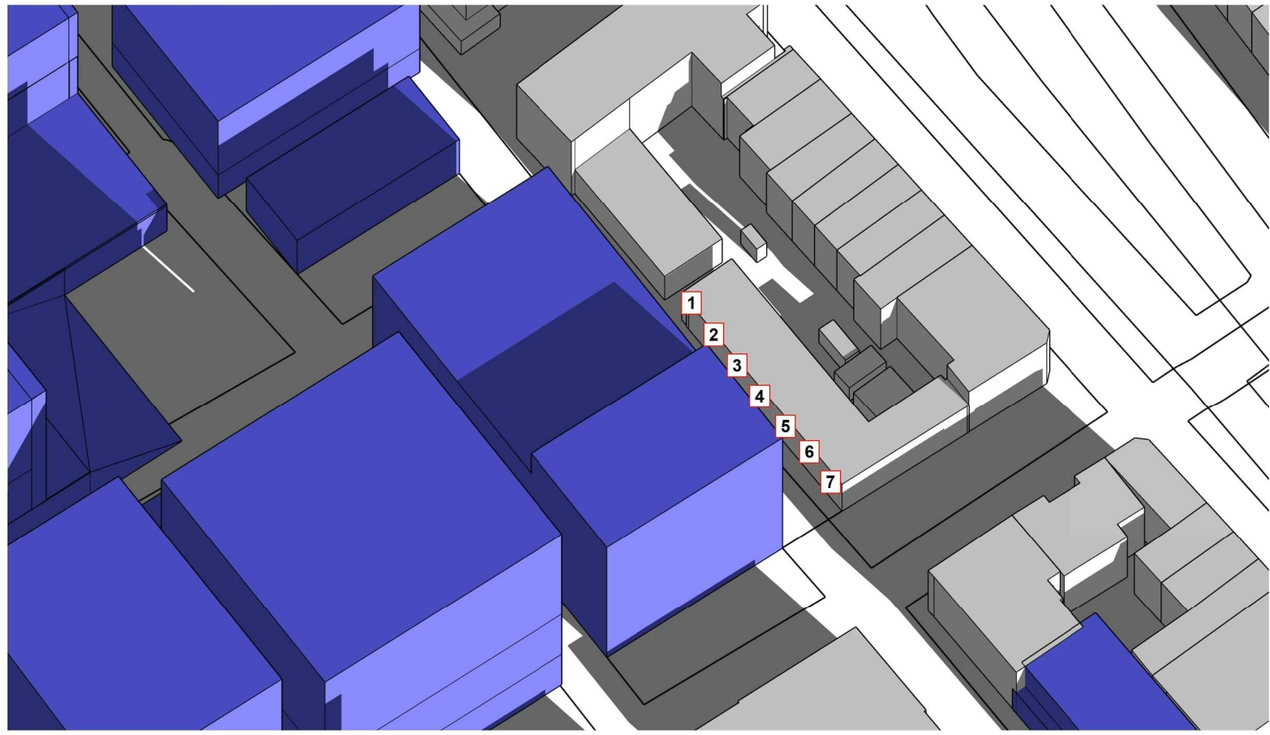

Almondestraat Westzijde
21 september
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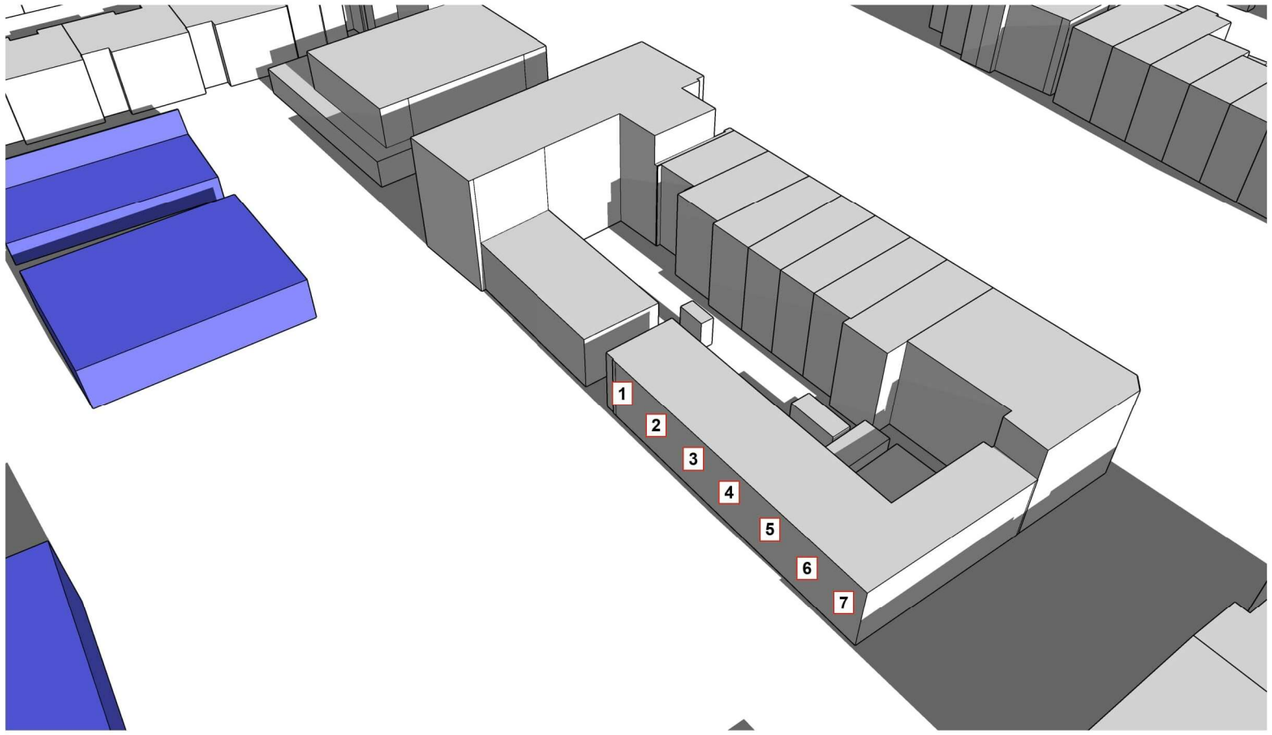

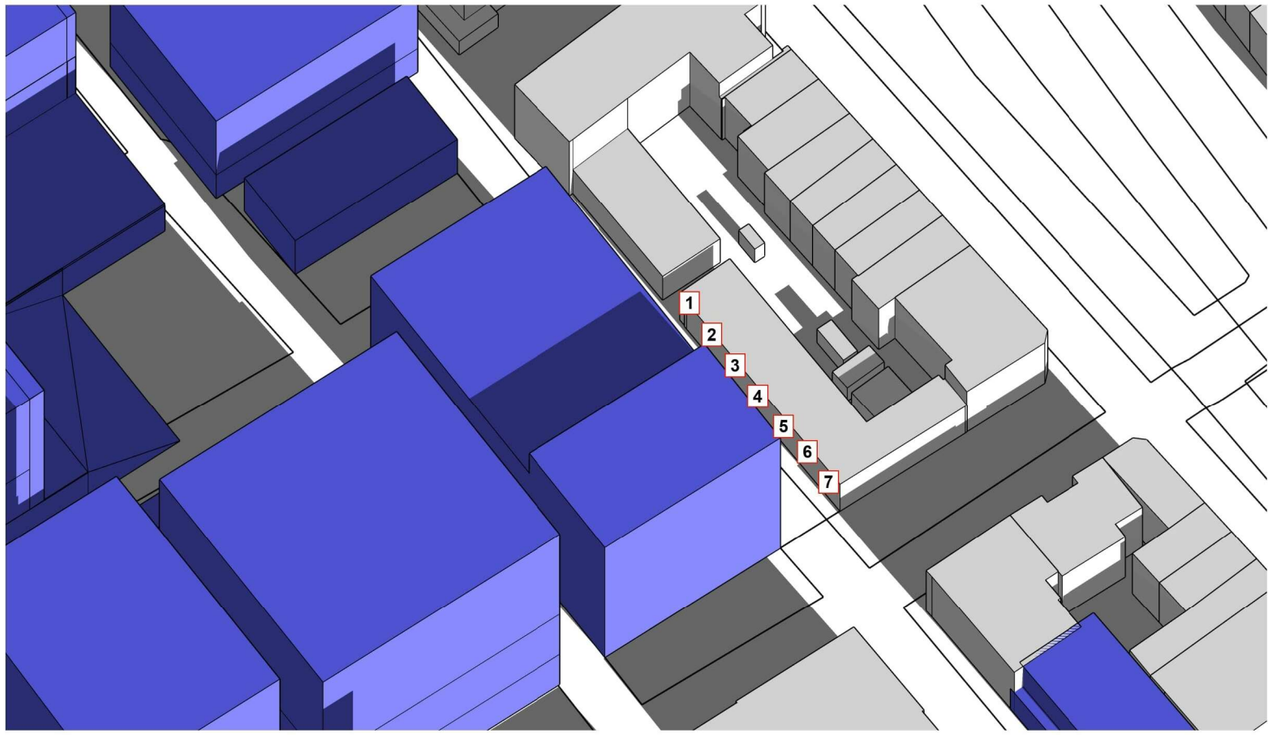

Almondestraat Westzijde
21 september
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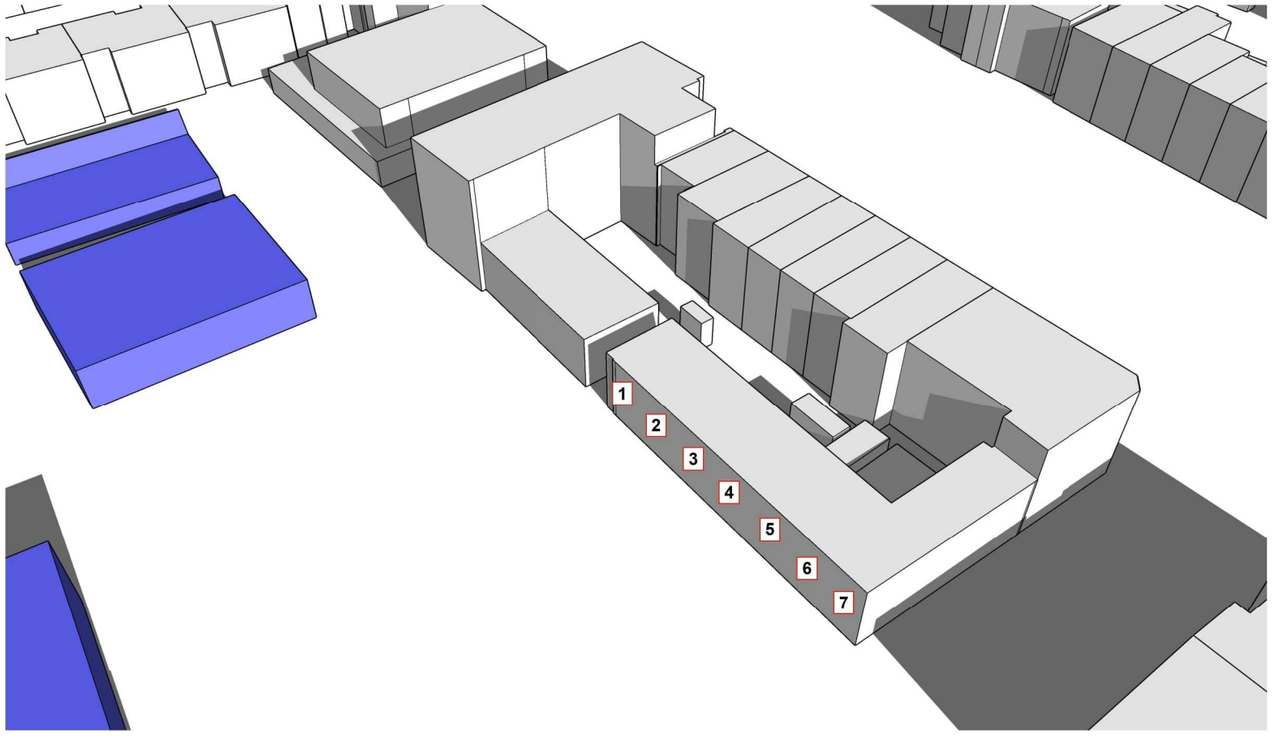

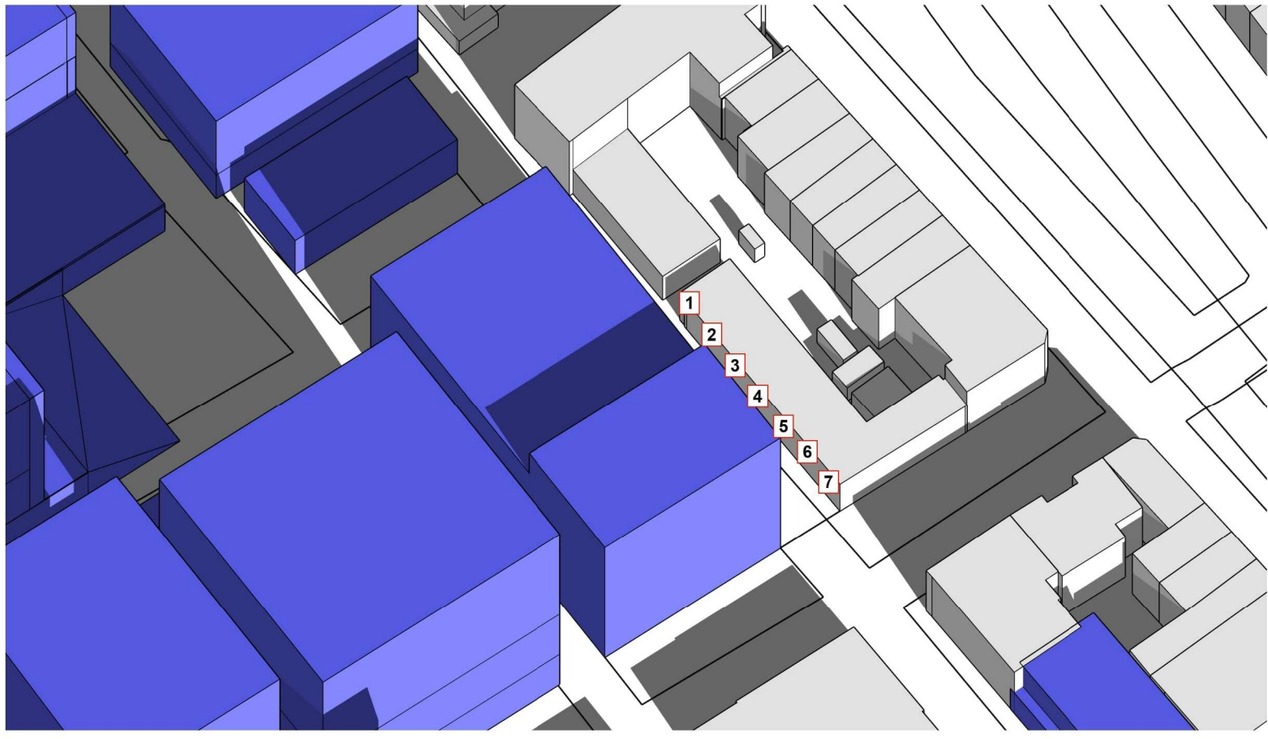

Almondestraat Westzijde
21 september
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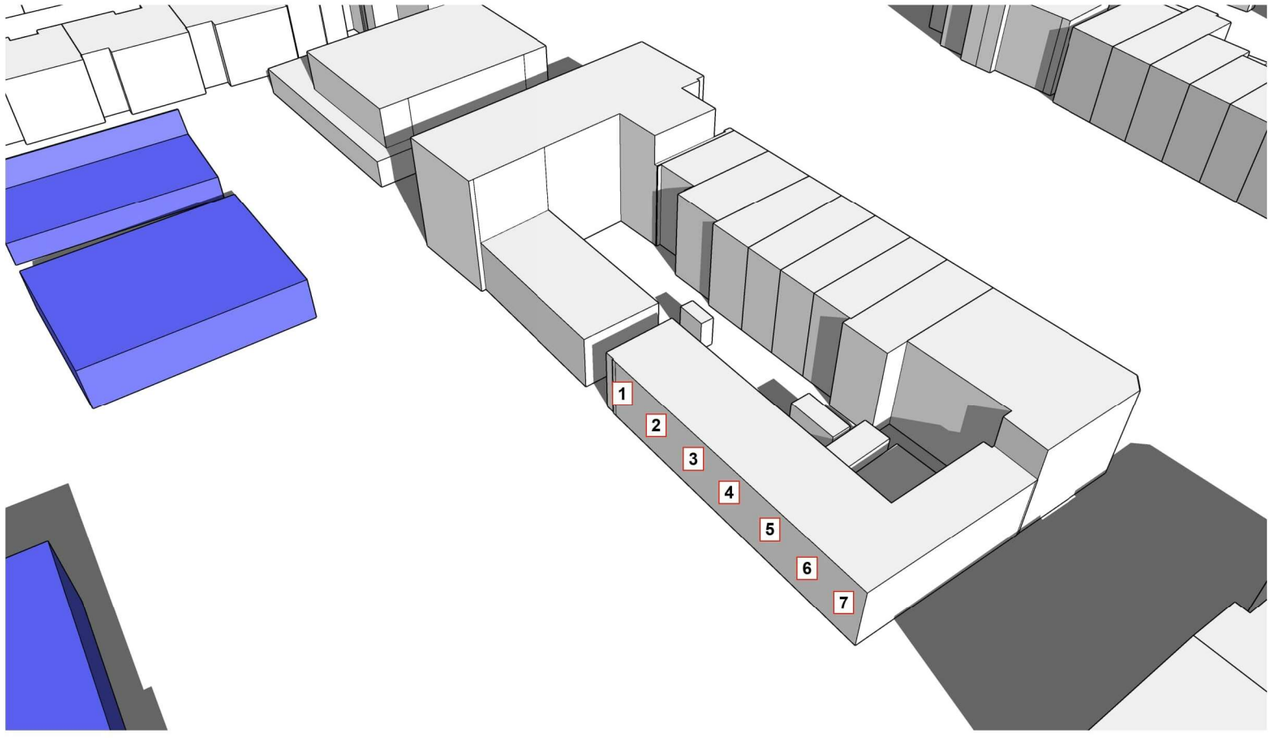

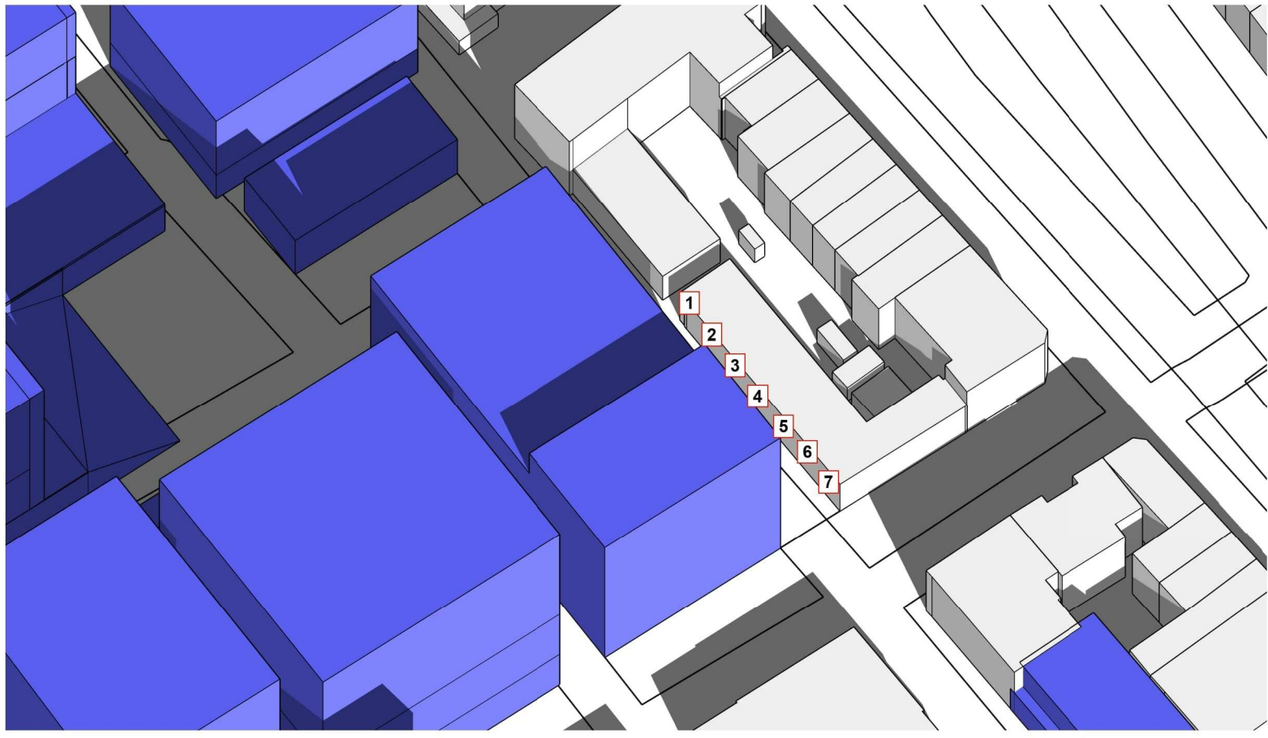

Almondestraat Westzijde
21 september
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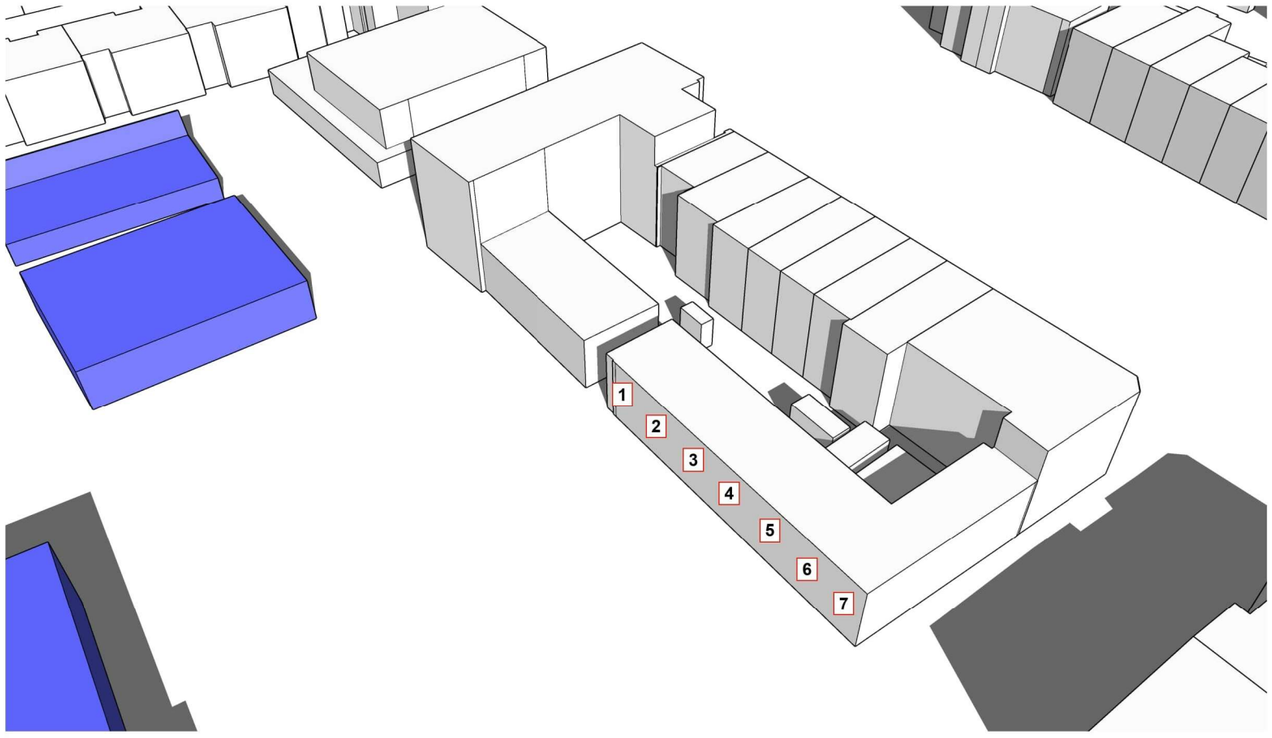

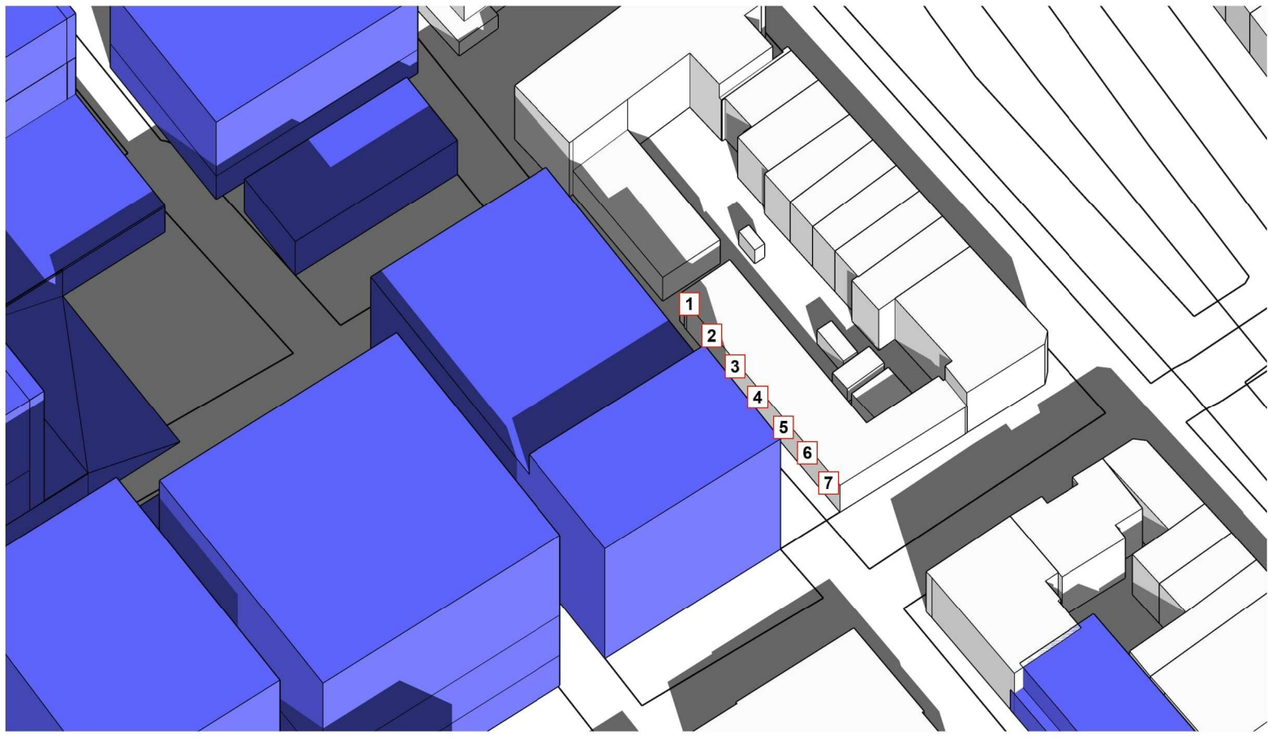

Almondestraat Westzijde
21 september
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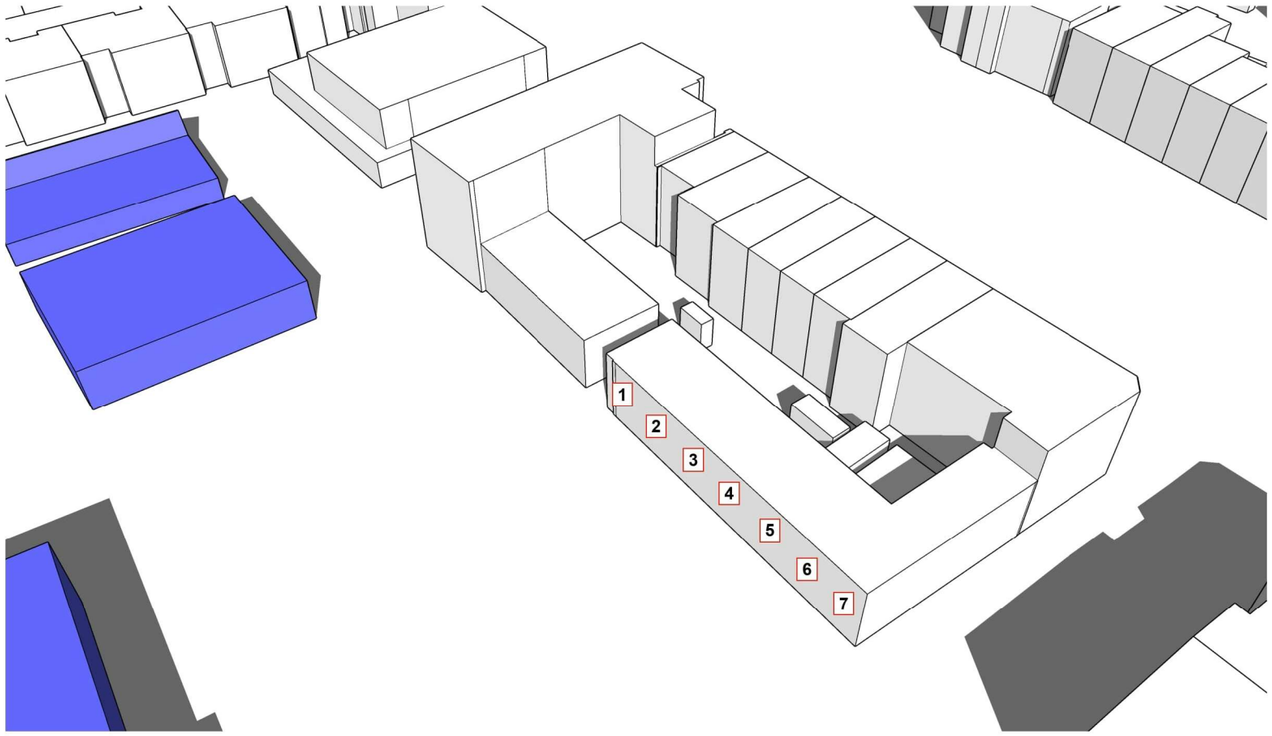

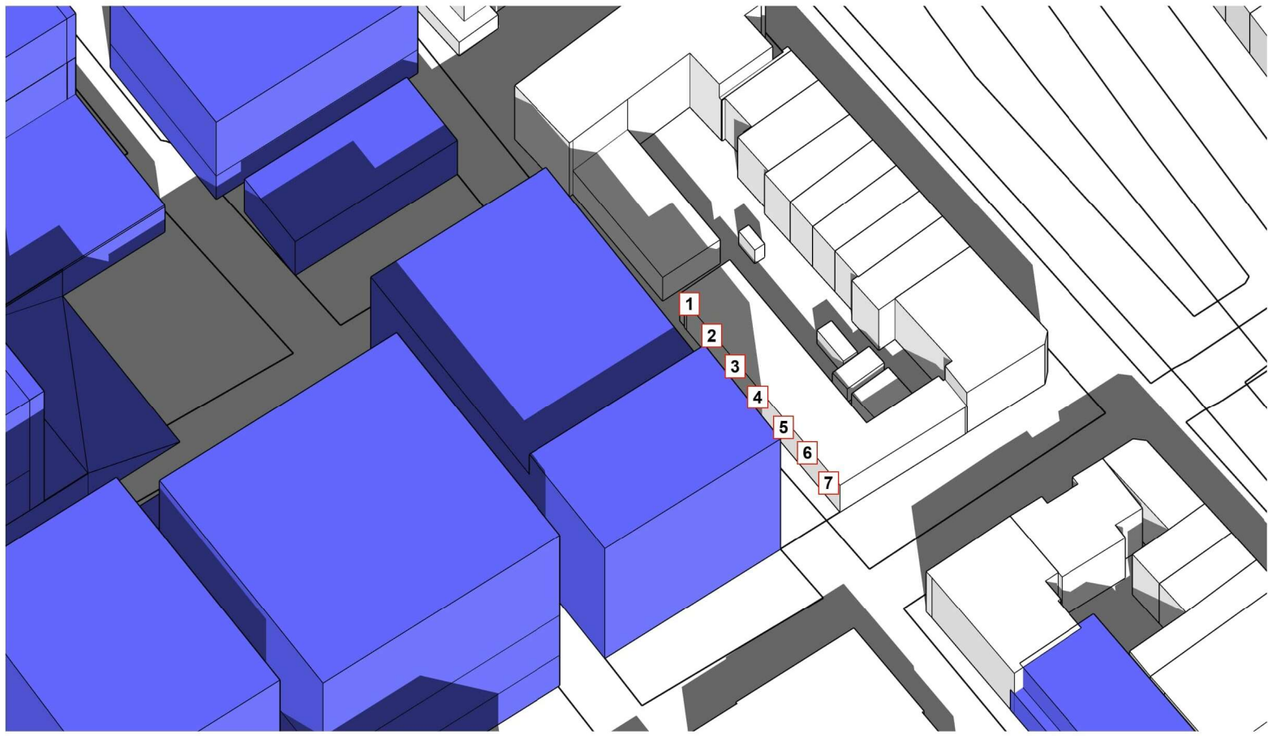

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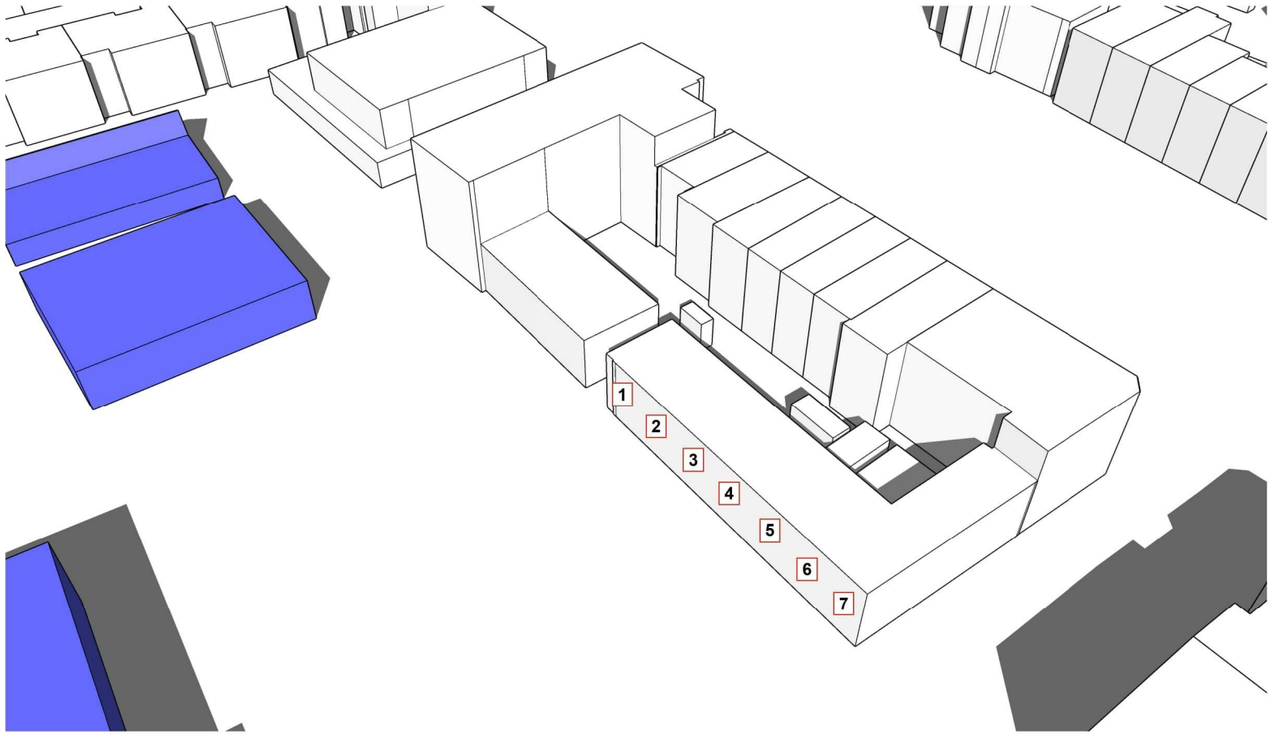

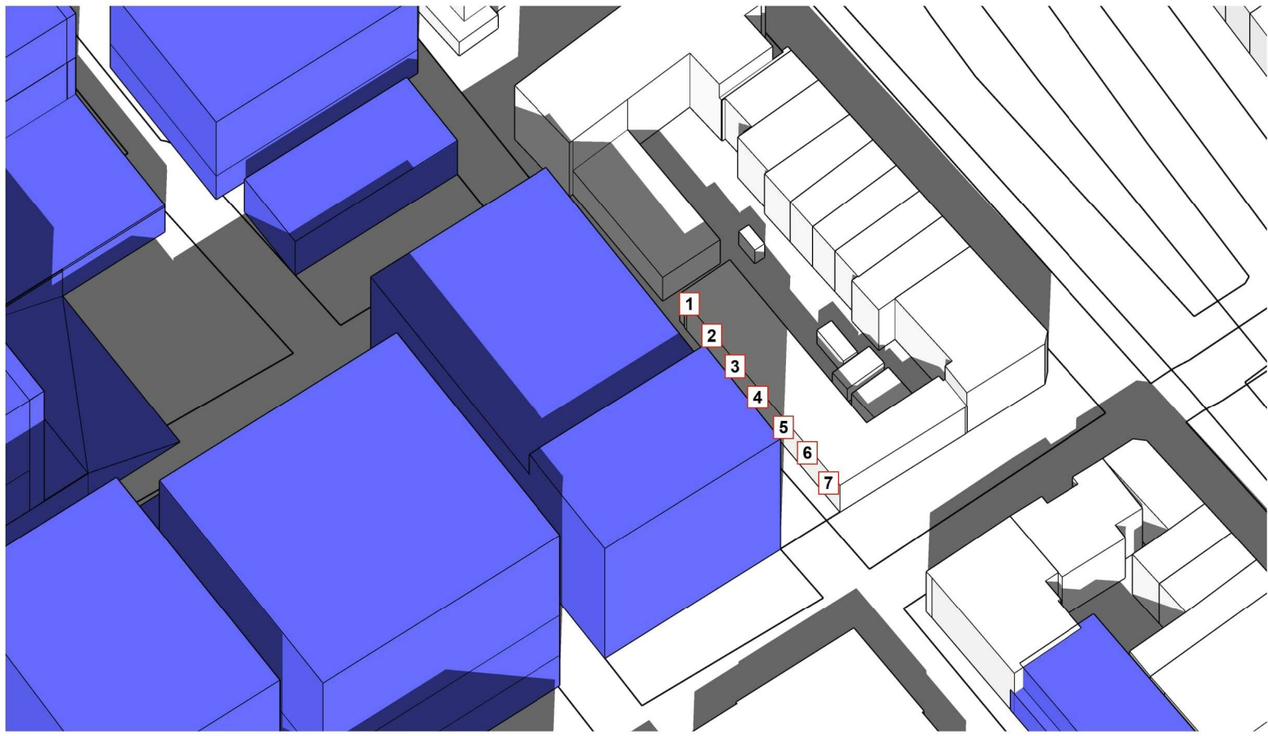

Almondestraat Westzijde
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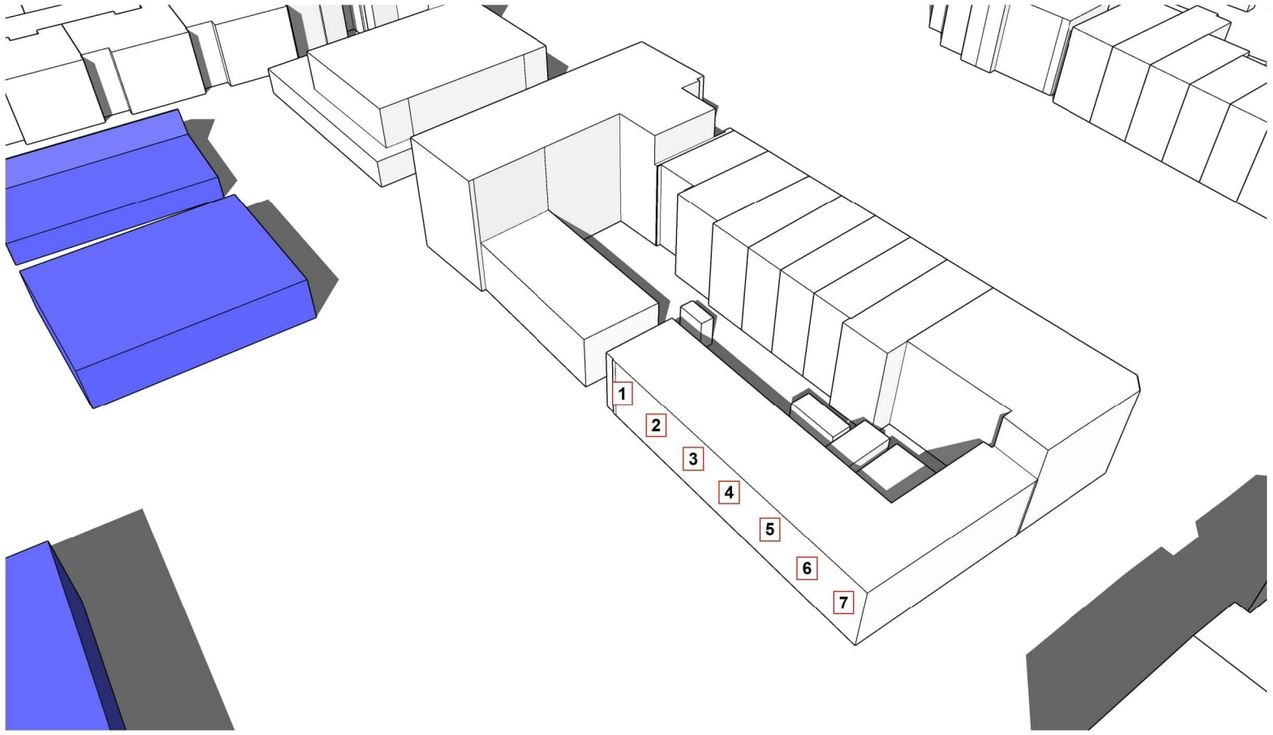

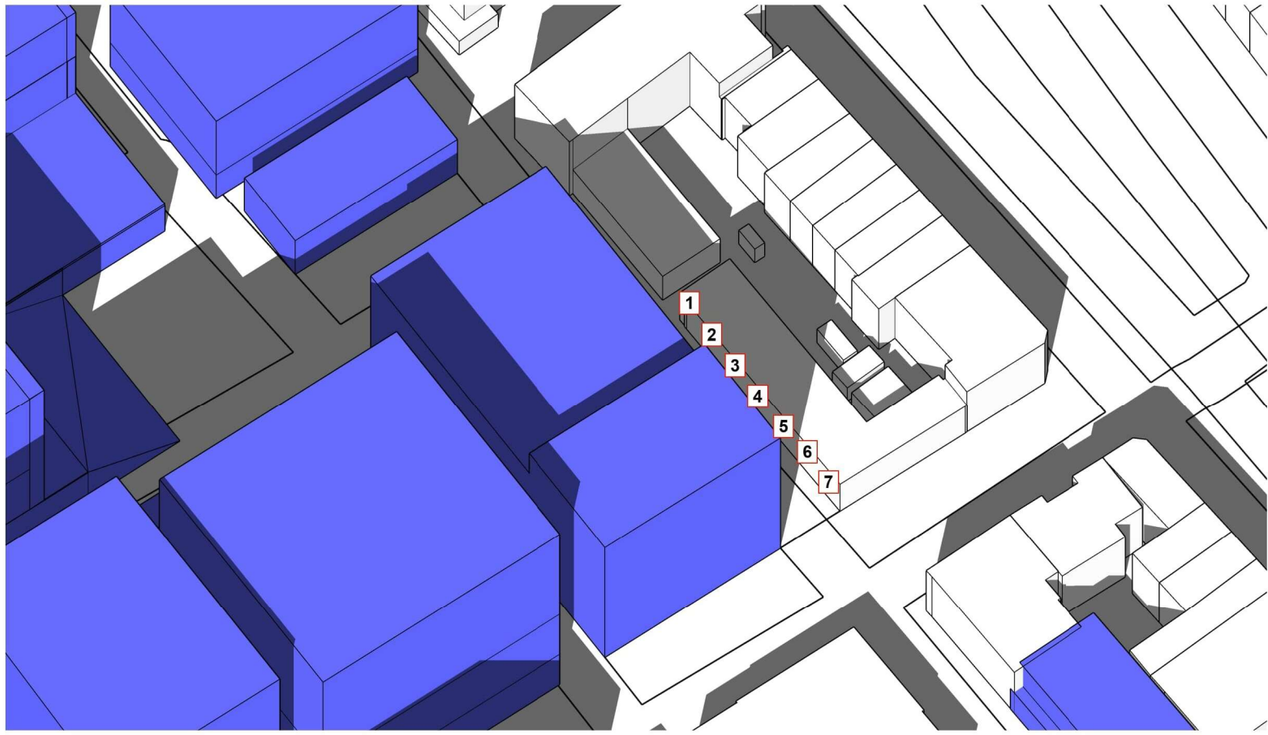

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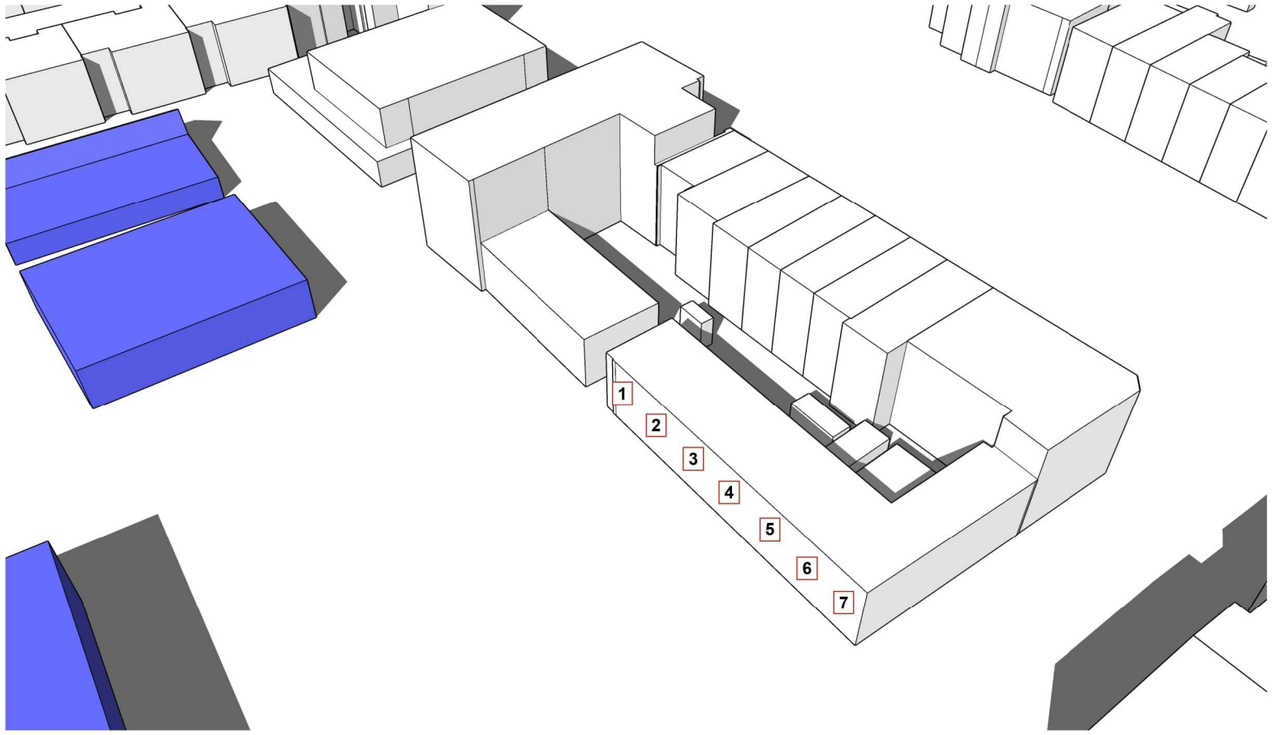

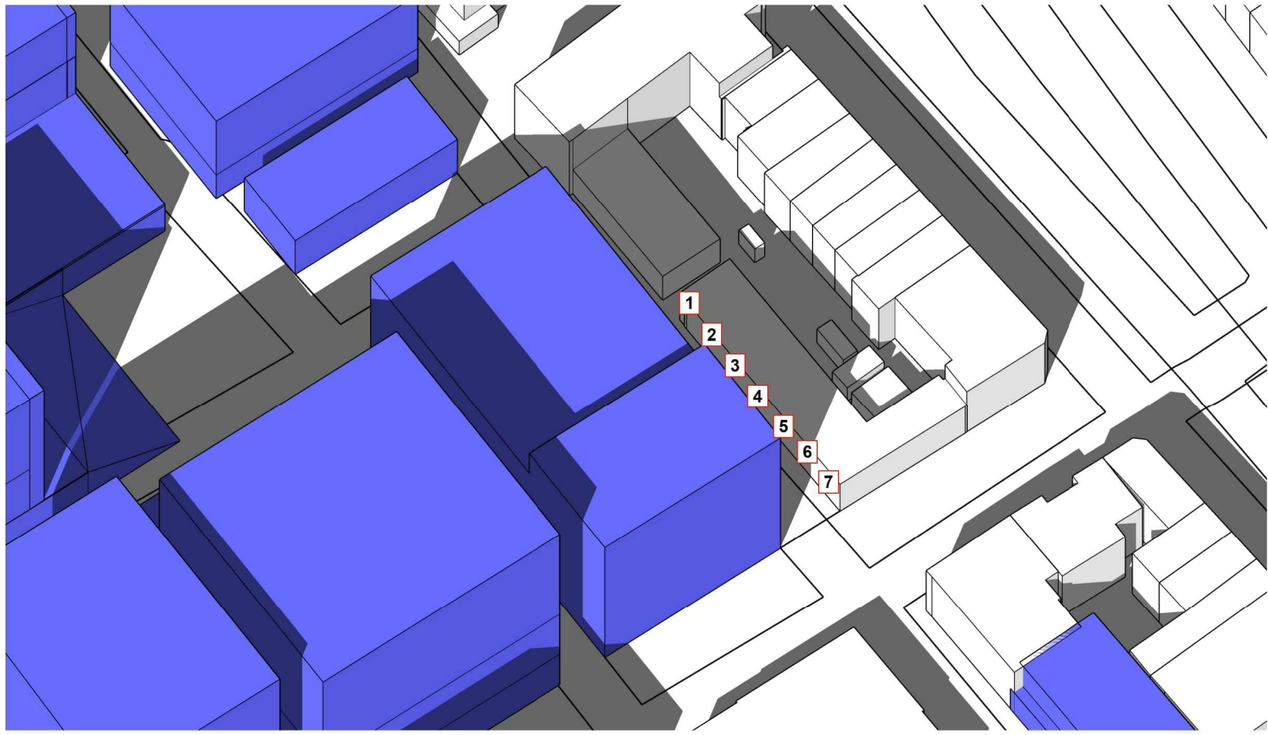

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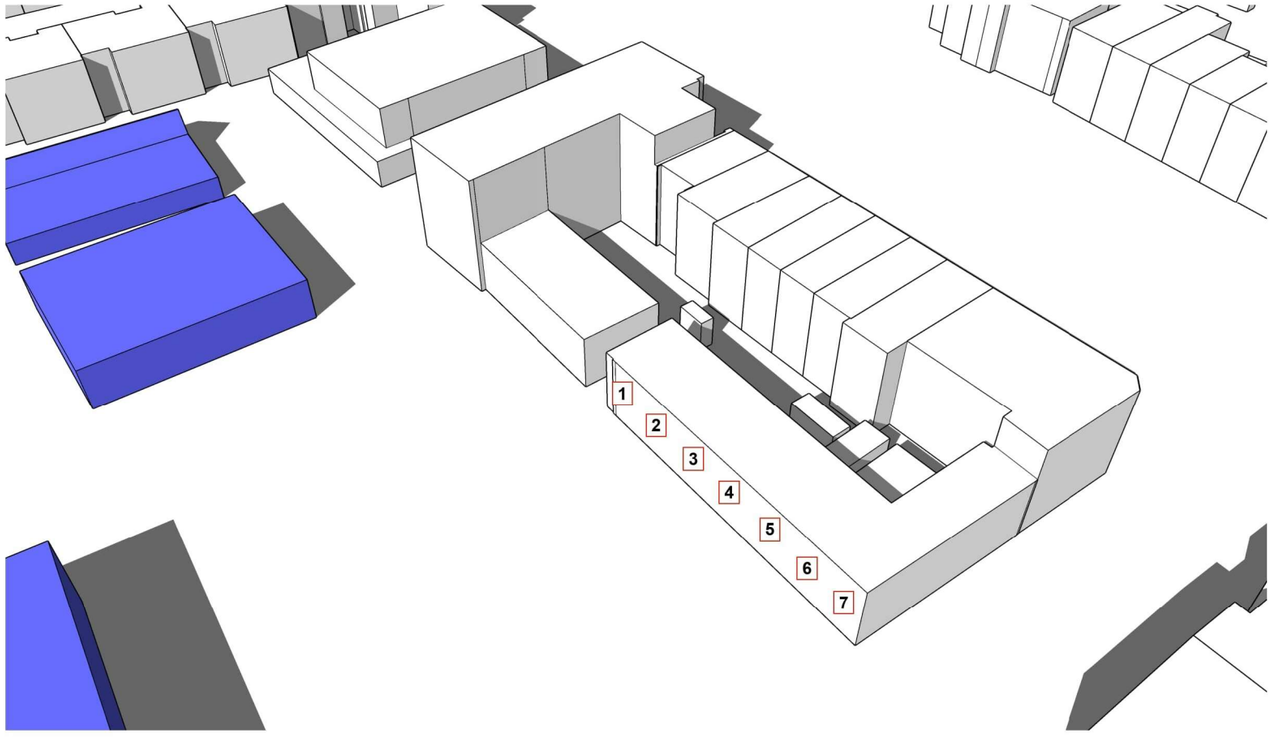

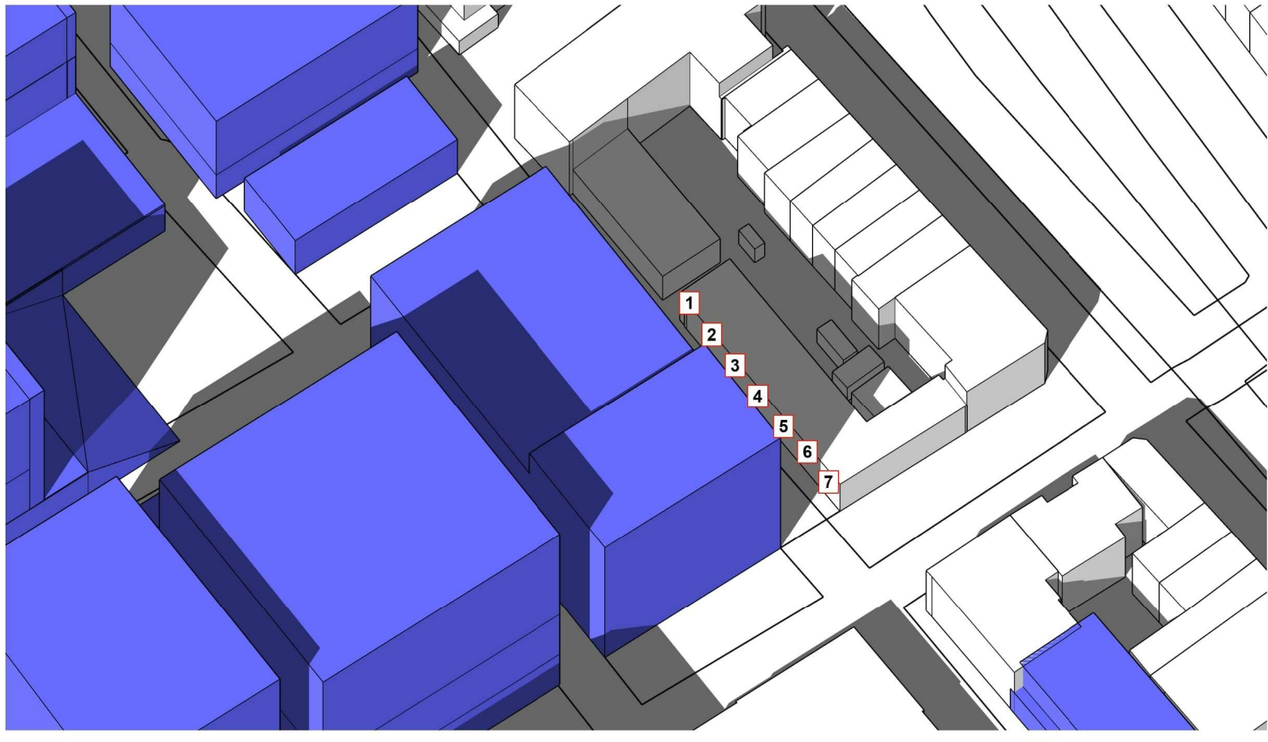

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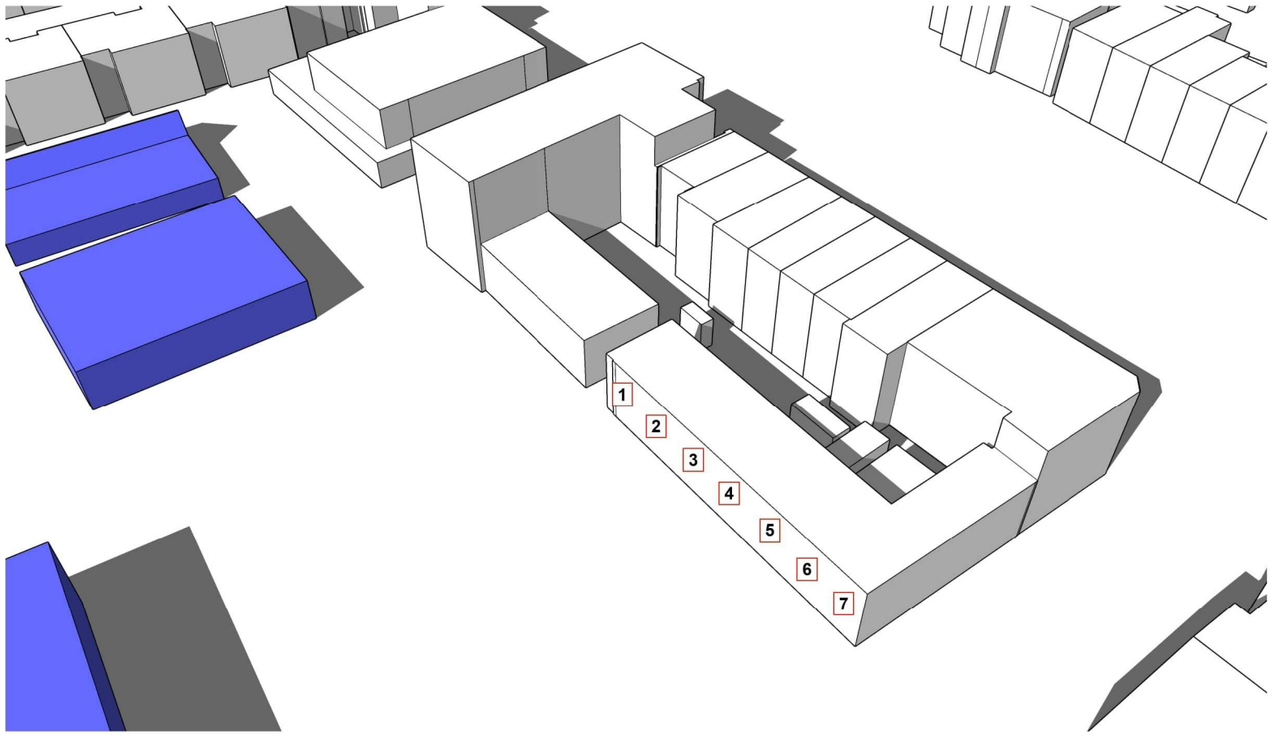

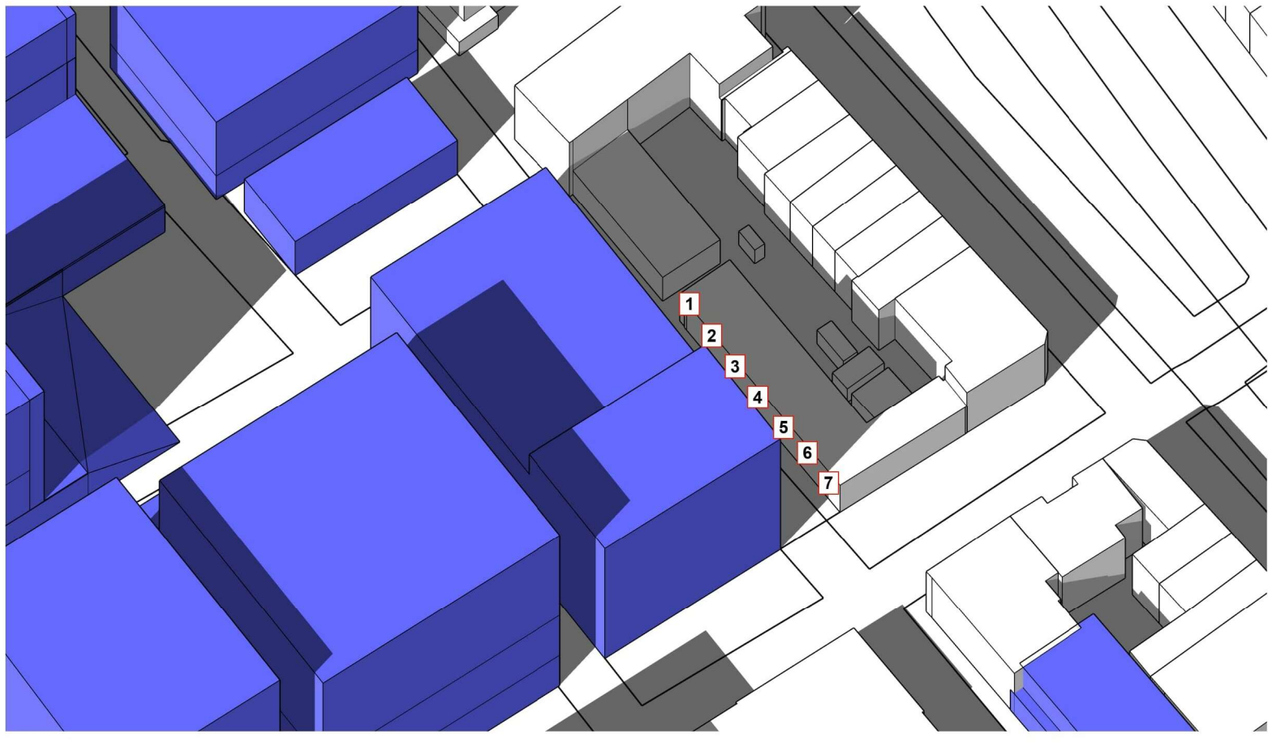

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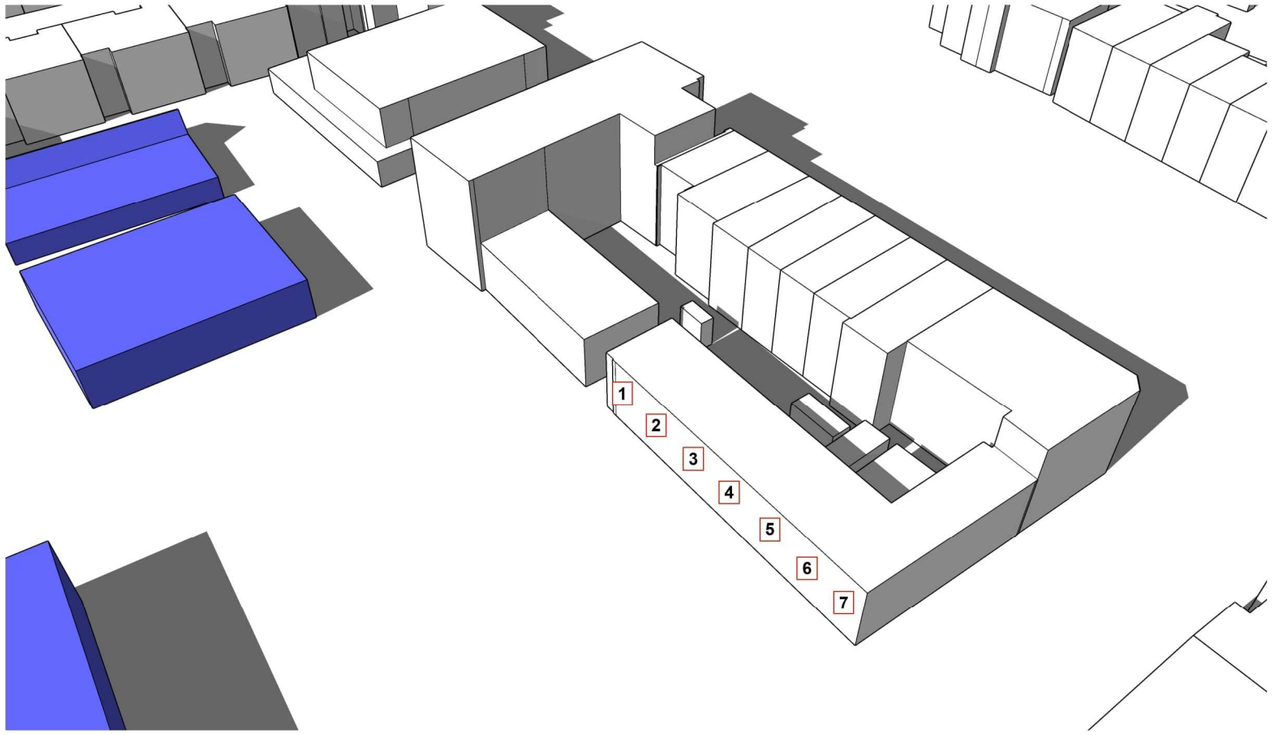

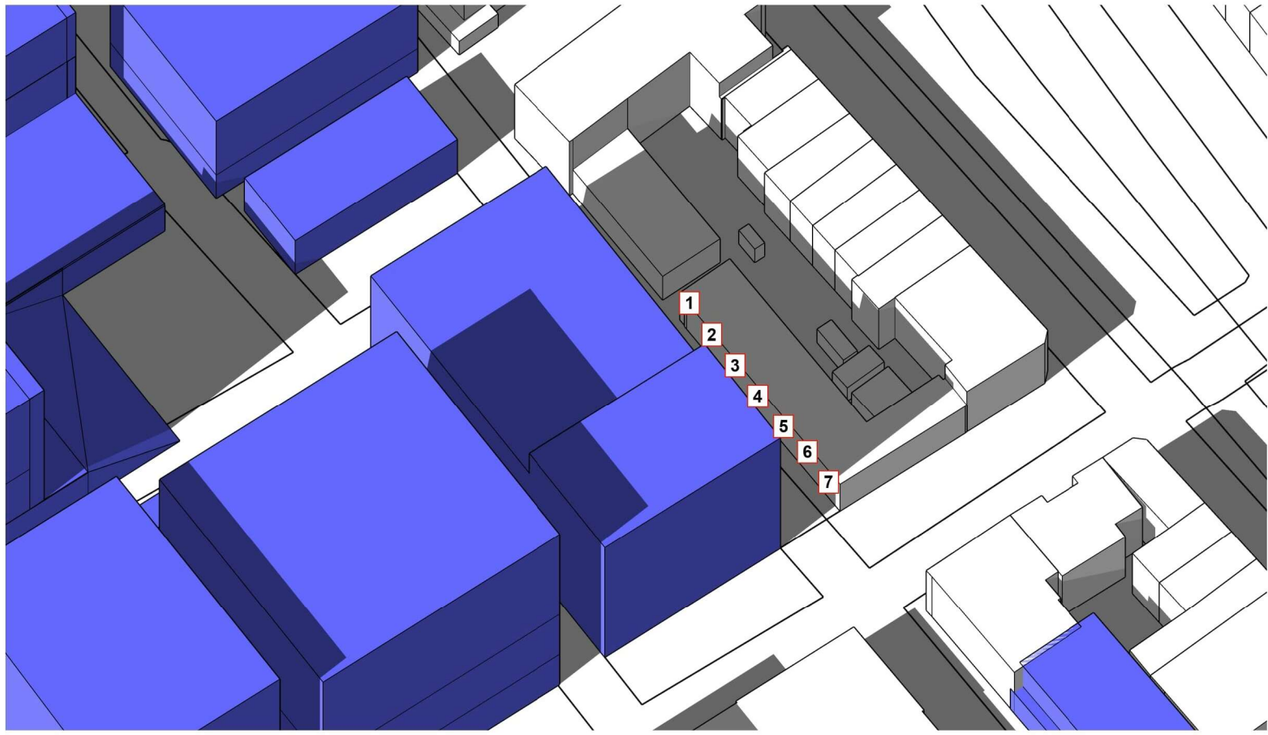

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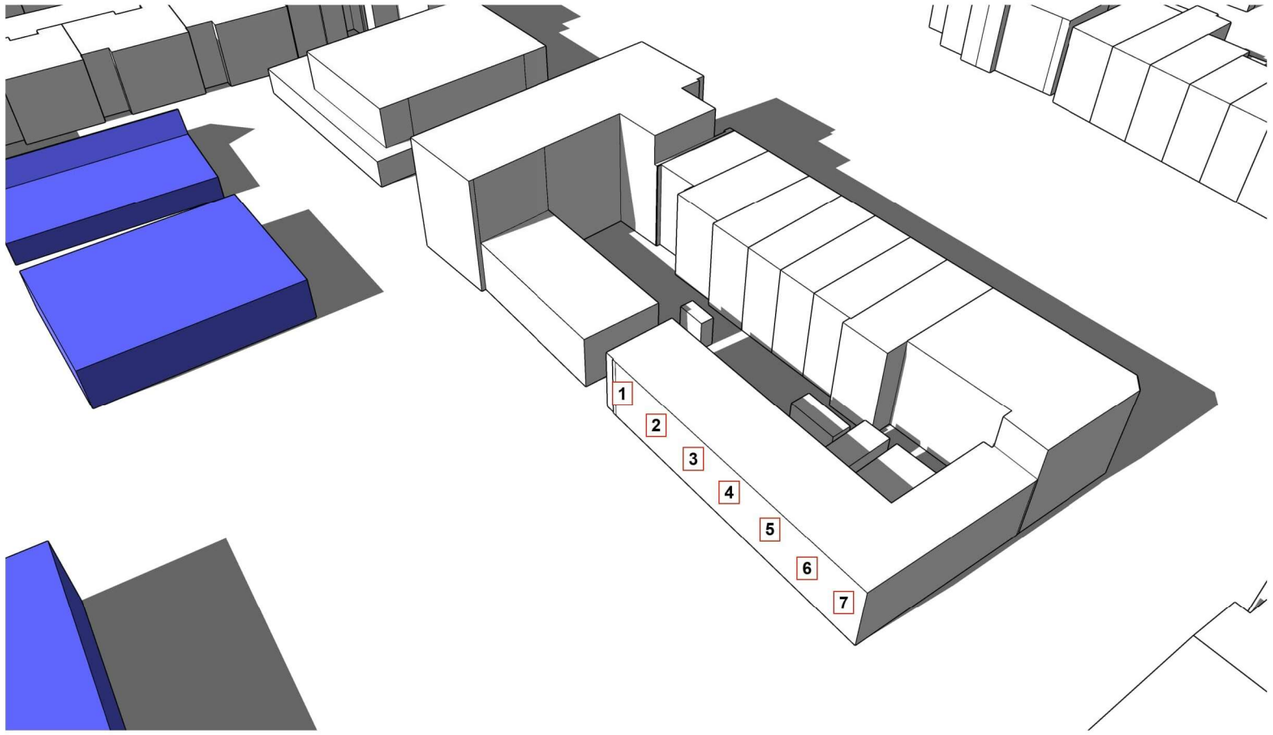

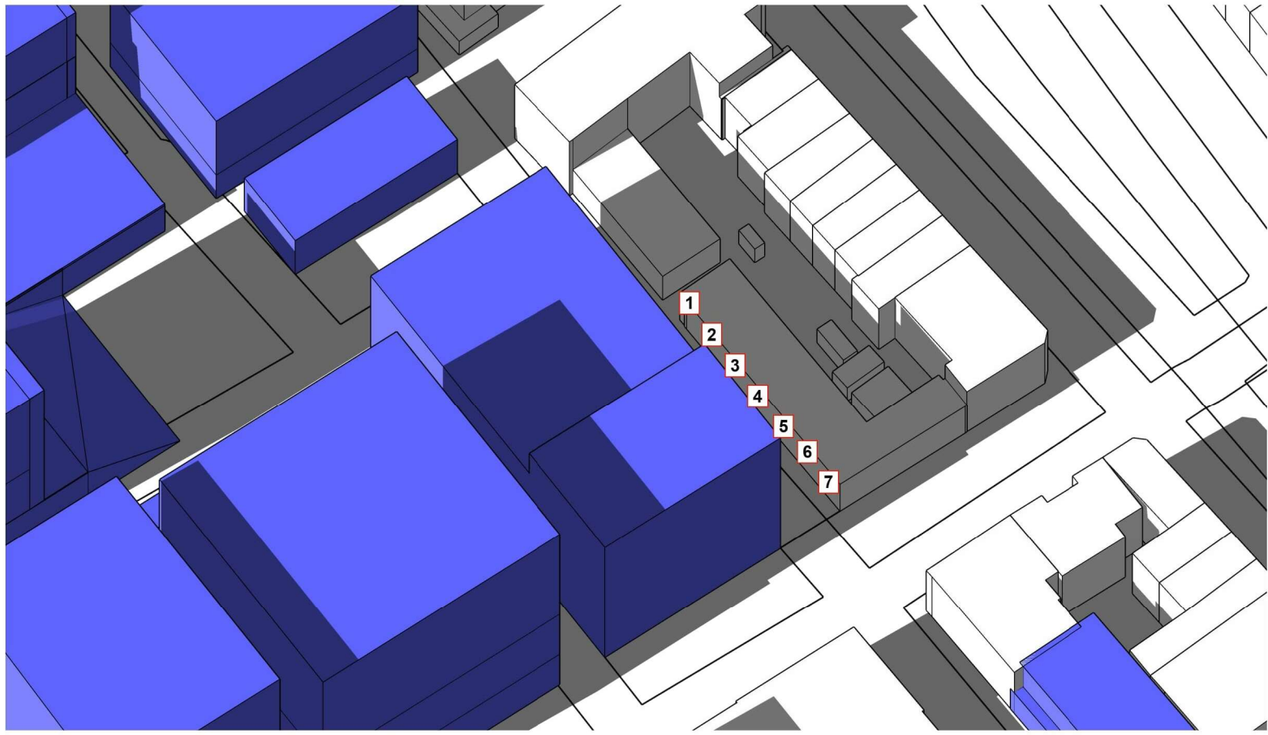

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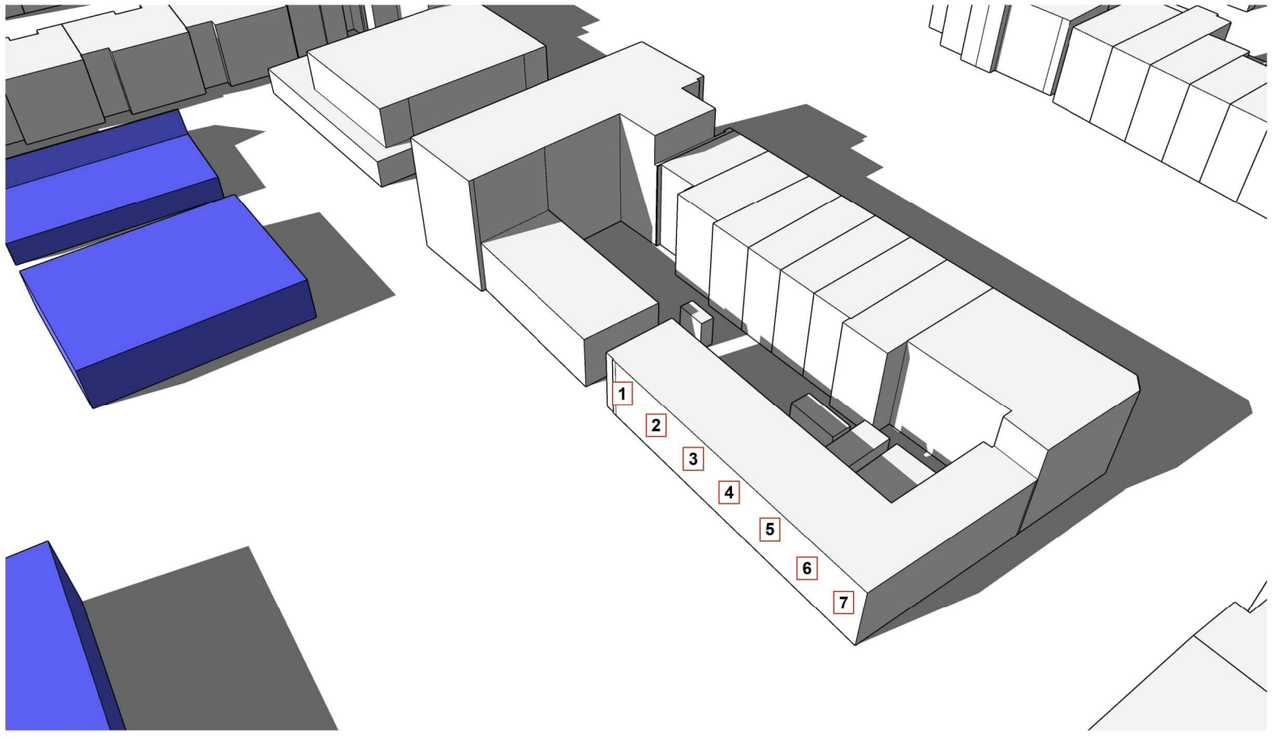

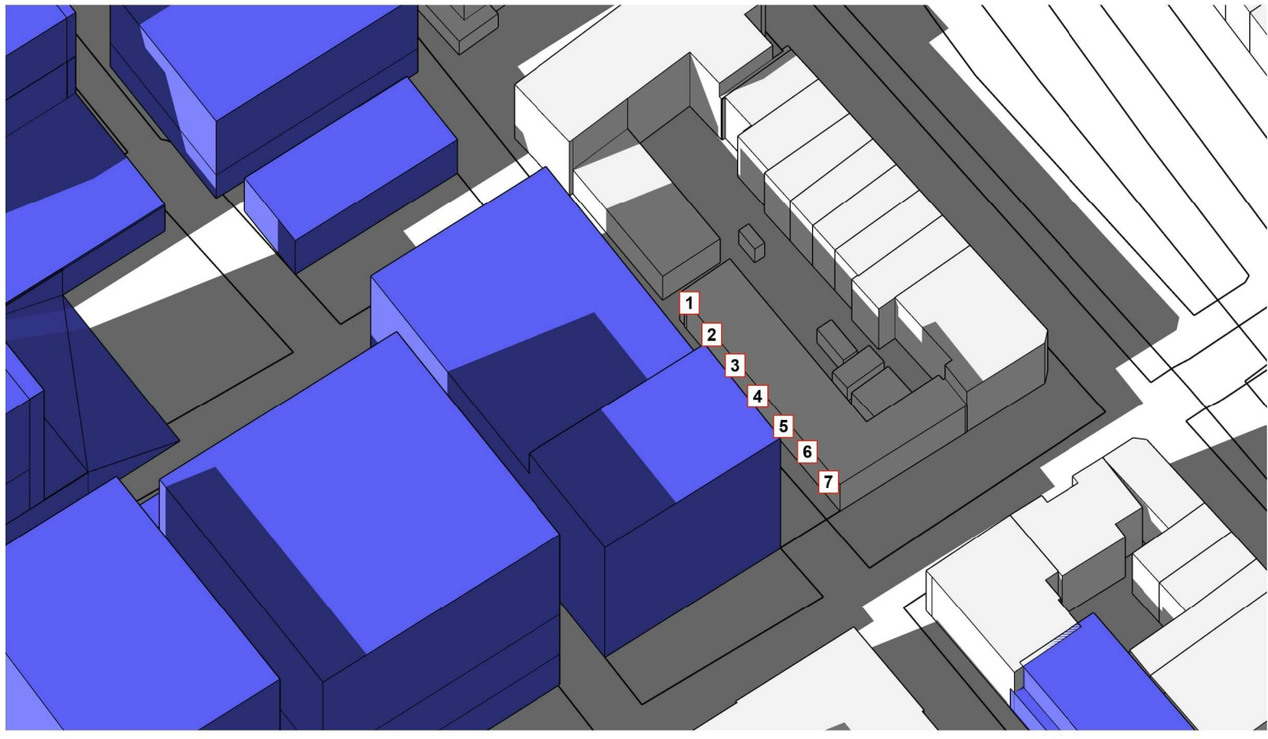

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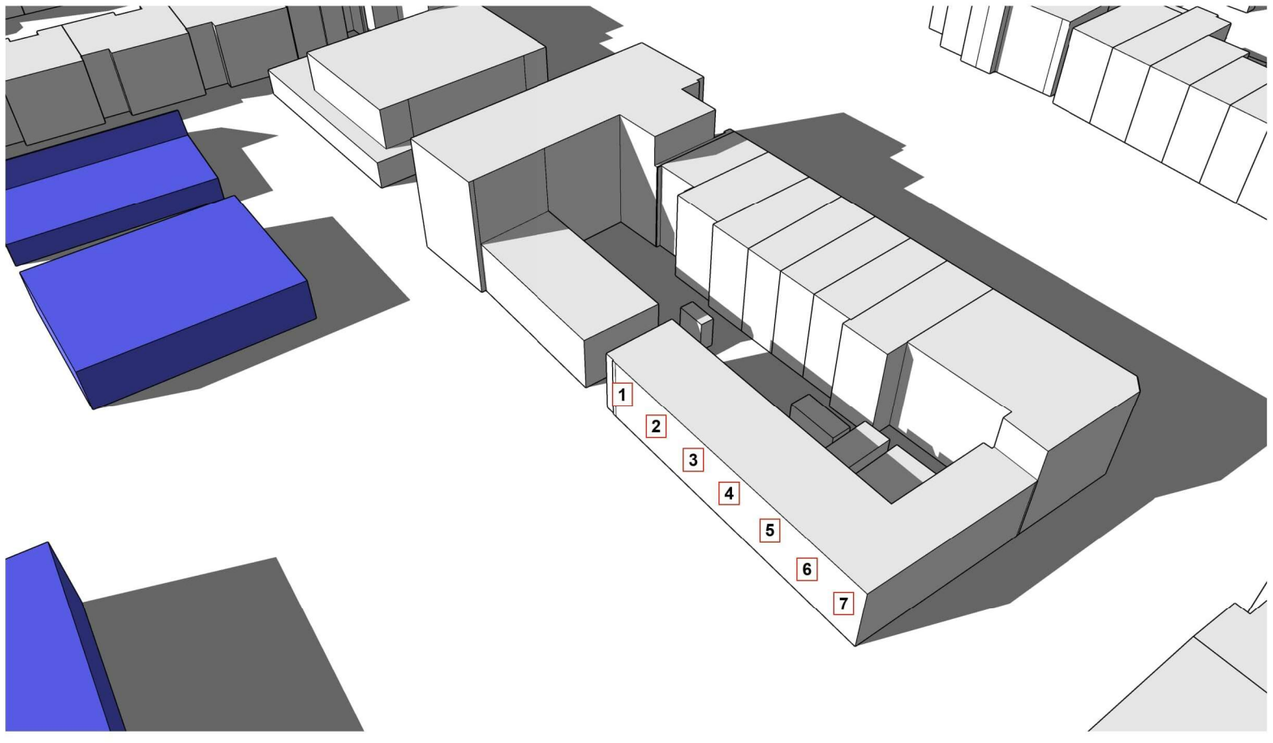

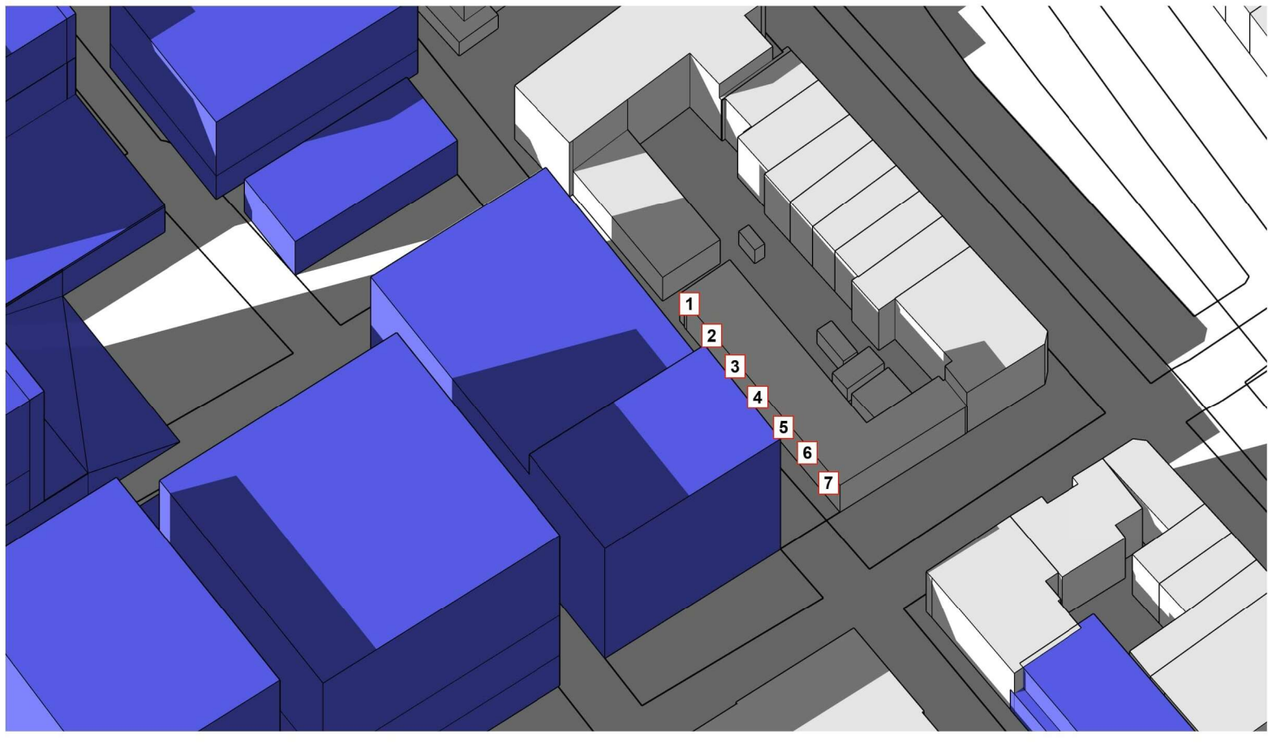

Almondestraat Westzijde
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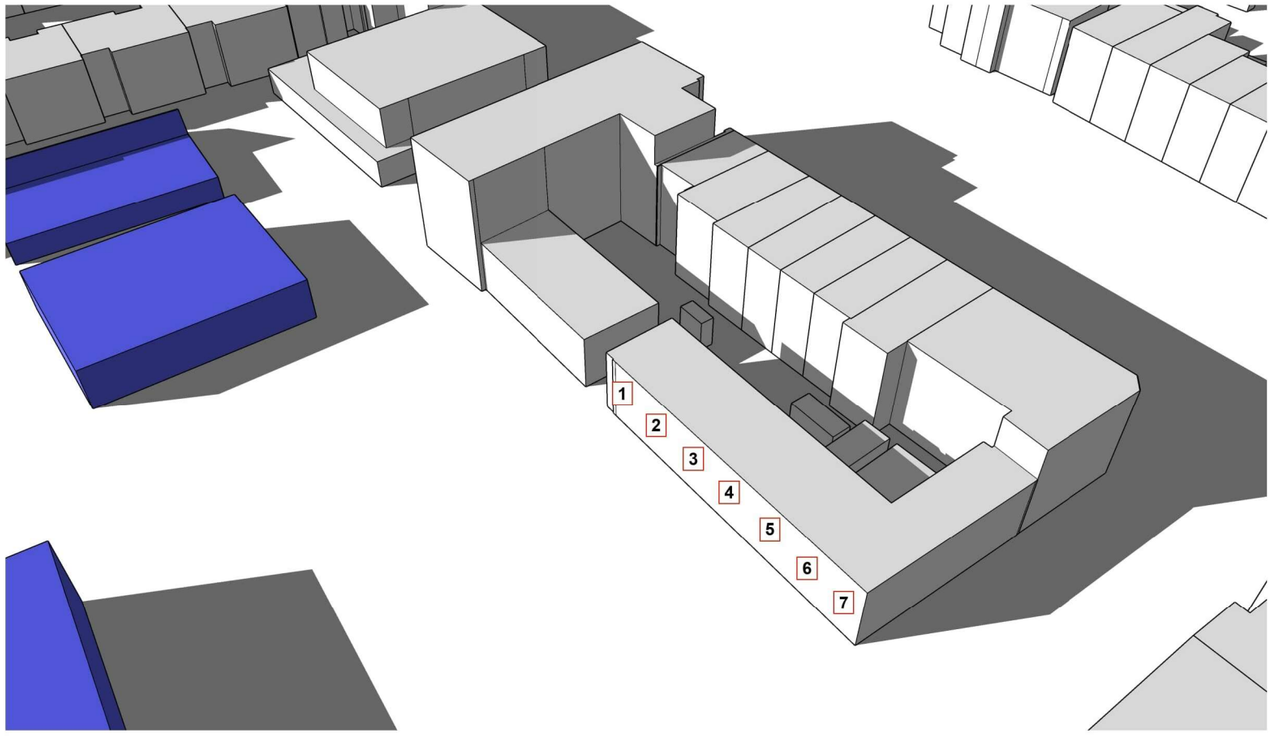

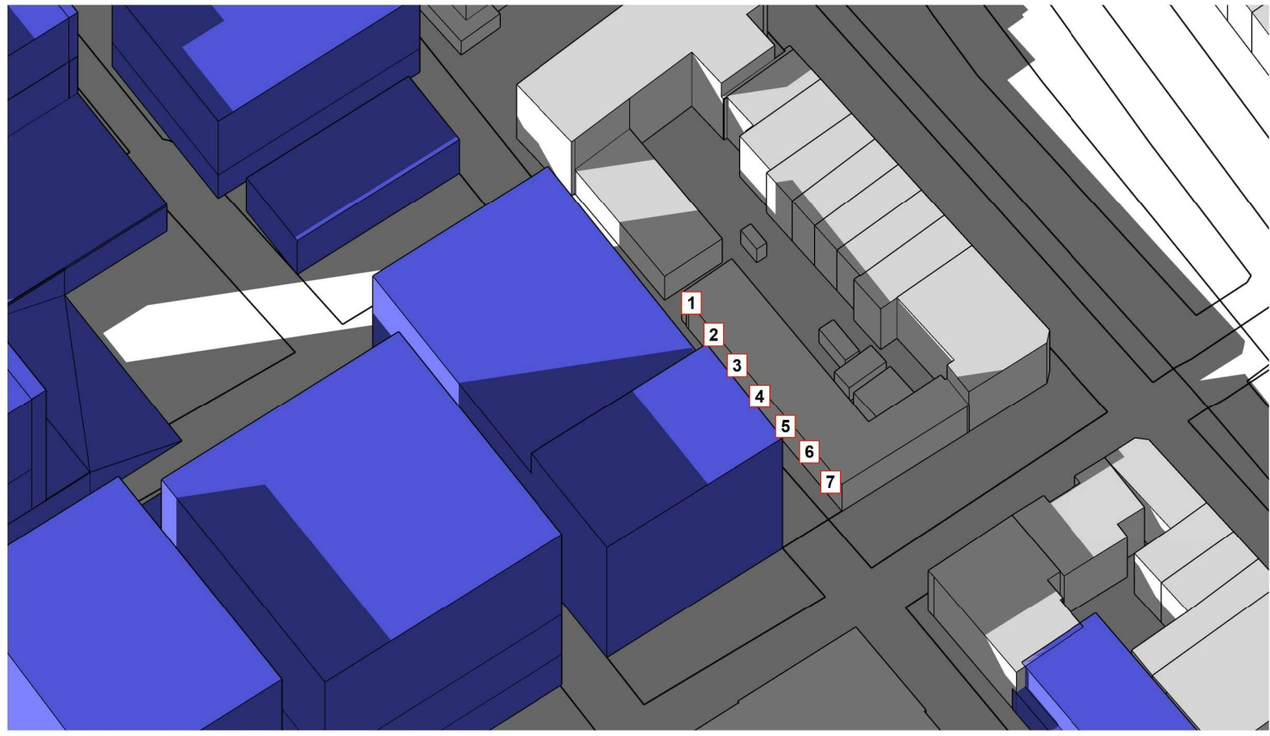

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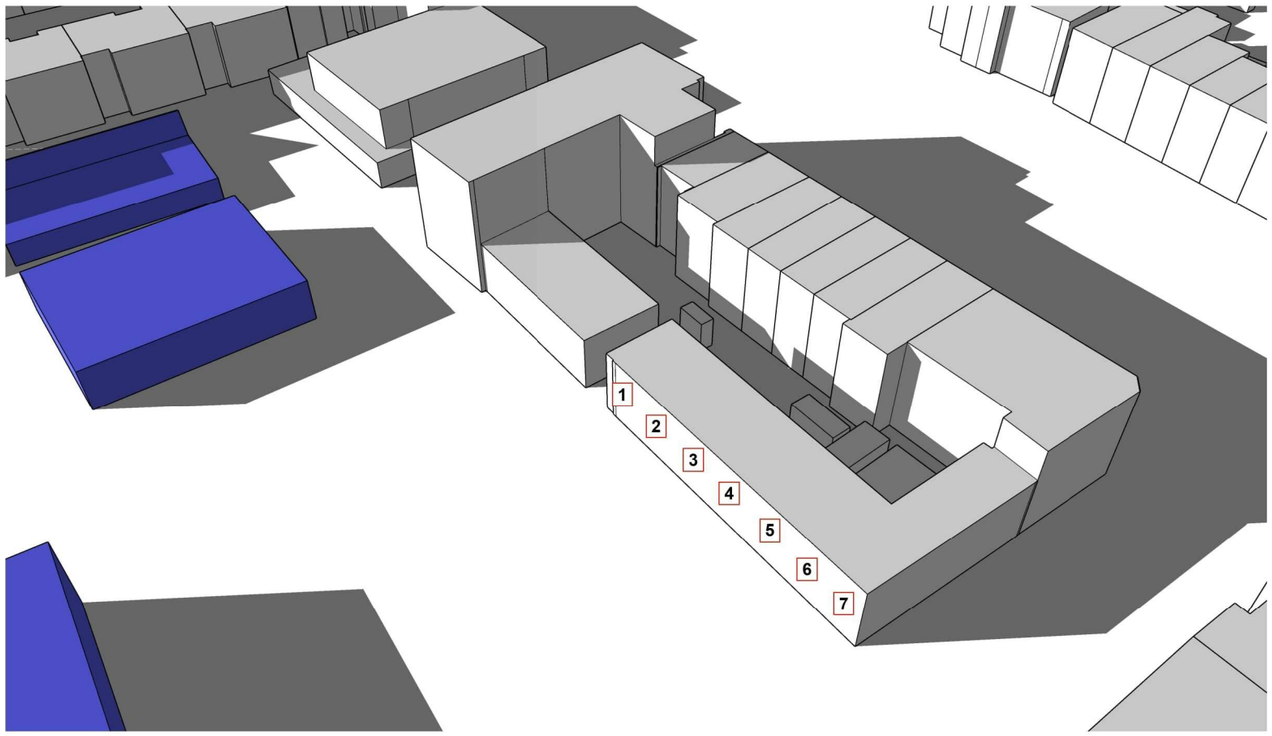

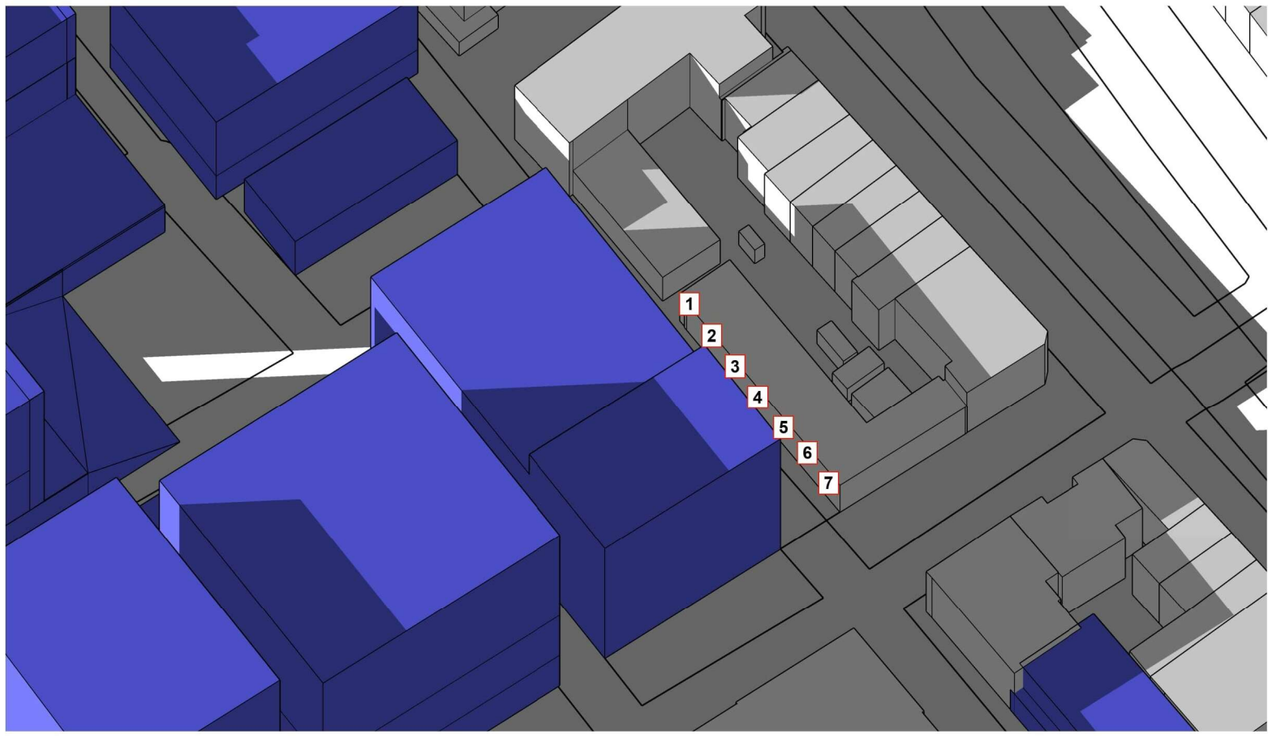

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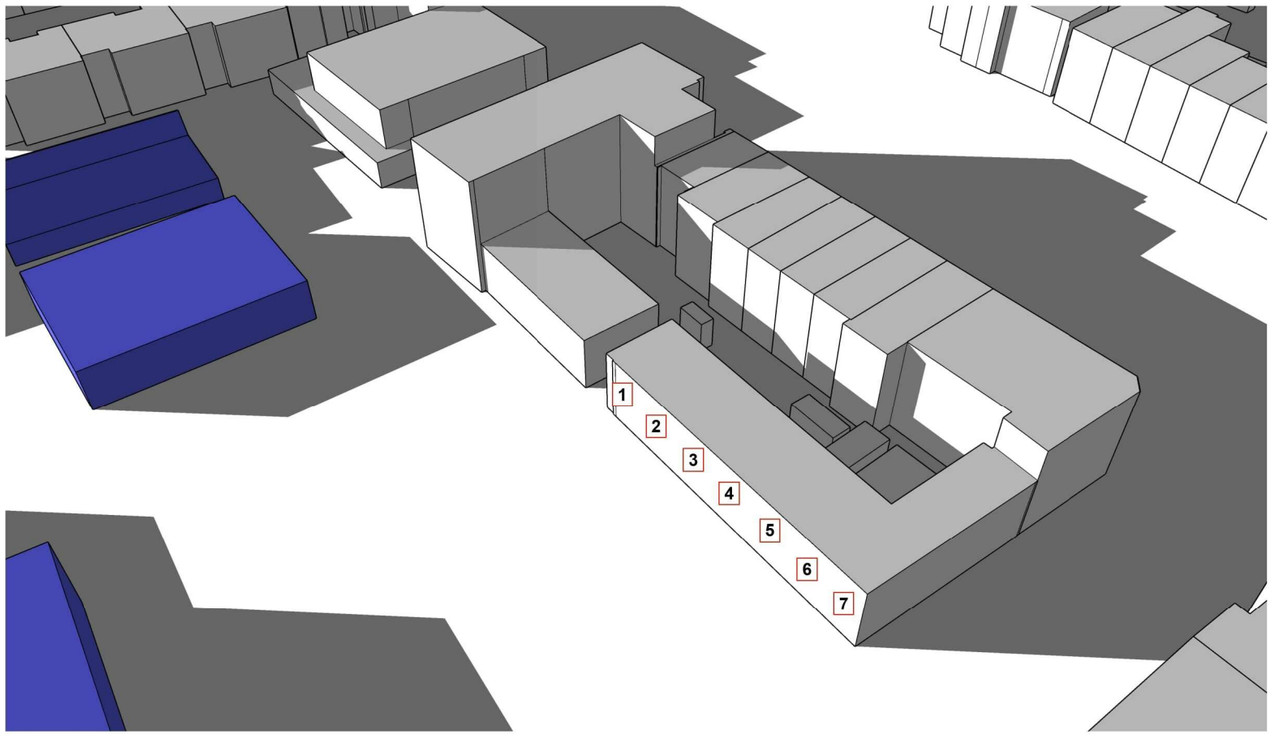

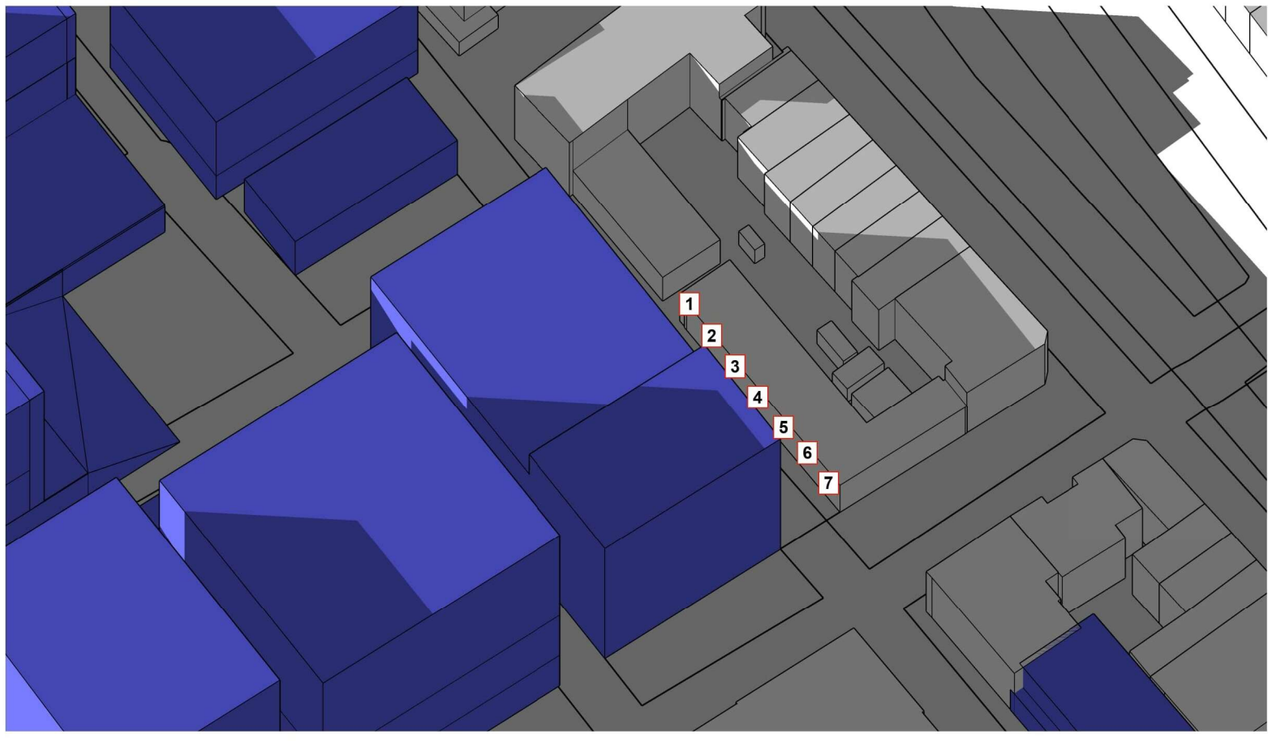

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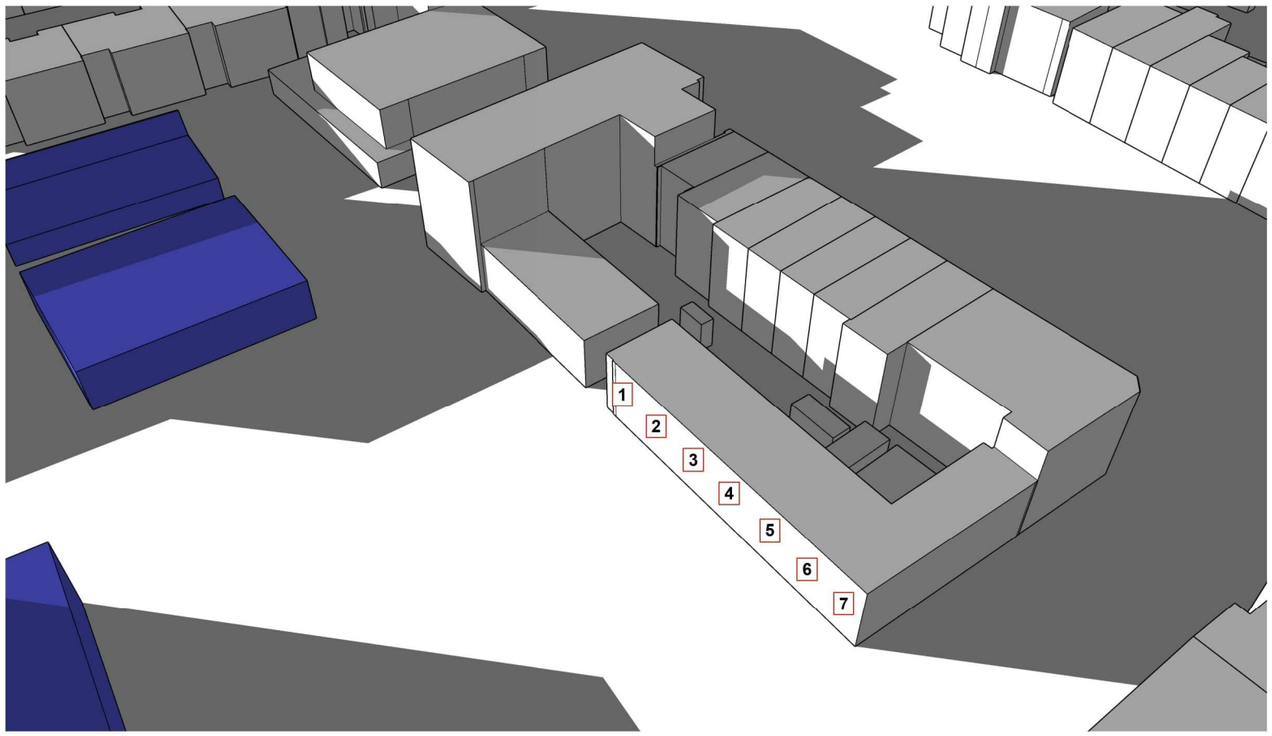

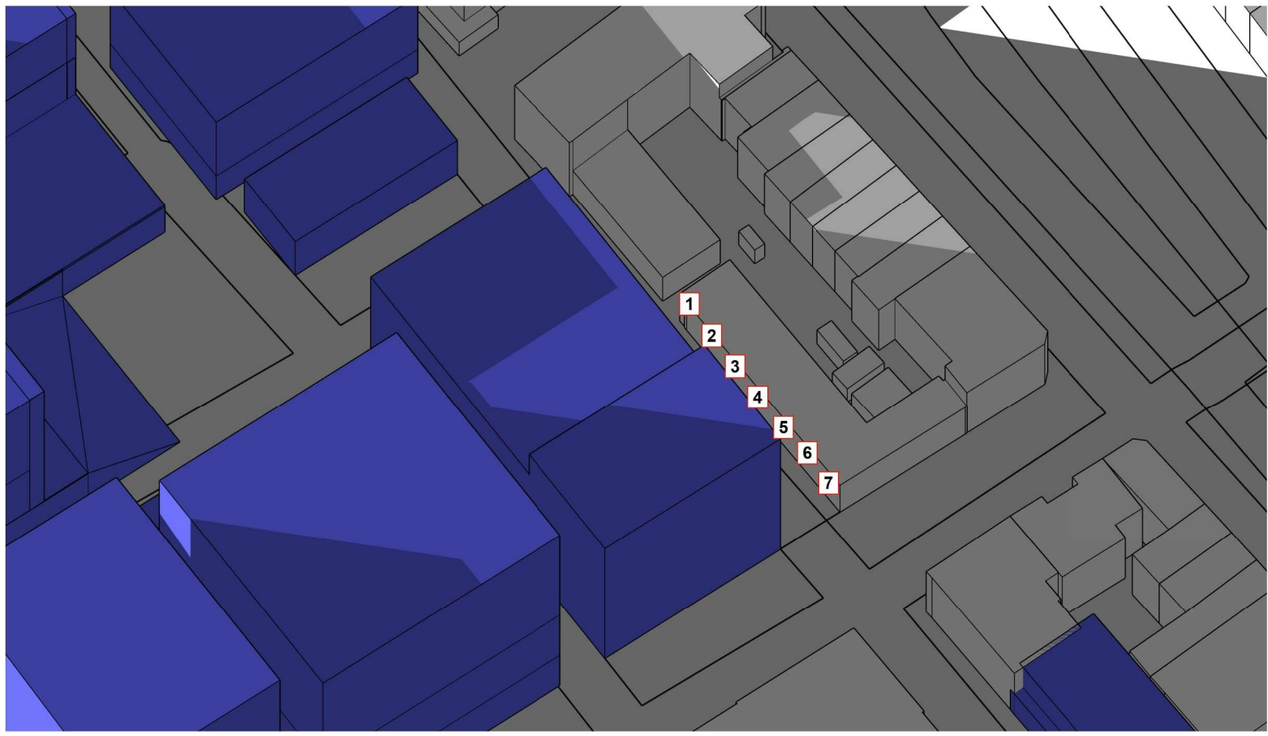

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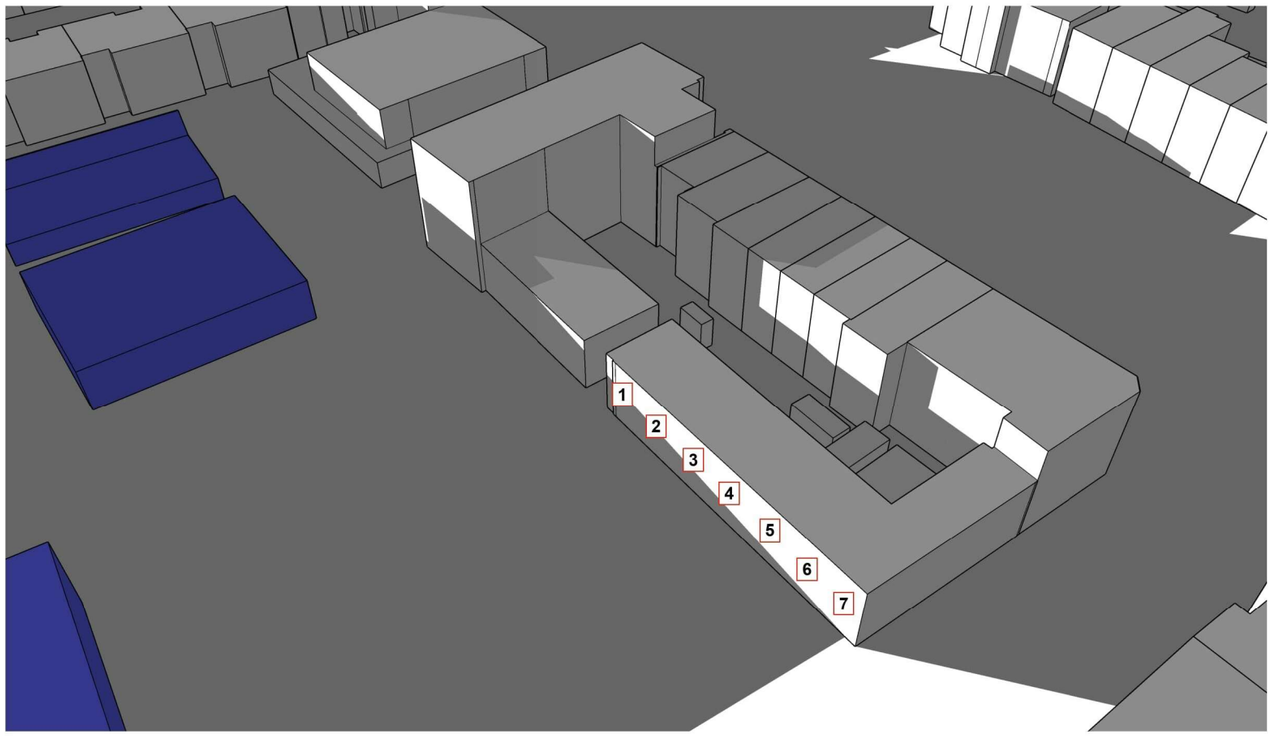

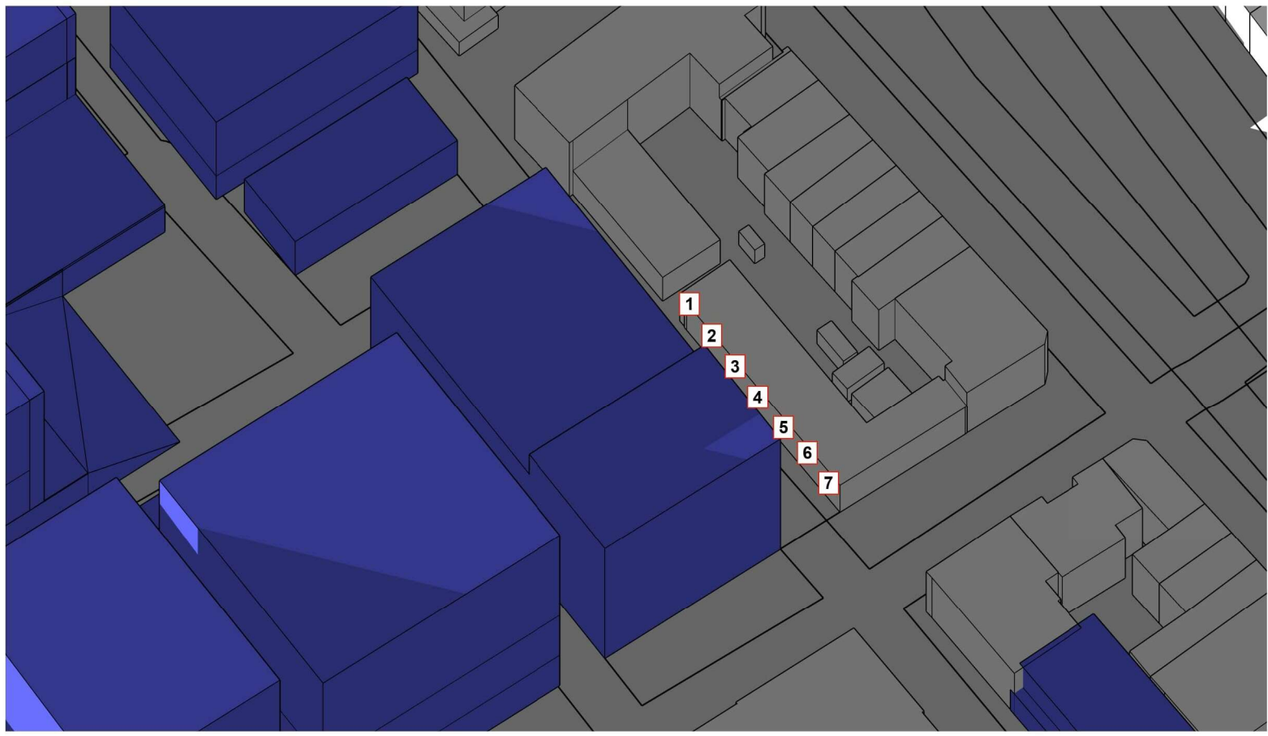

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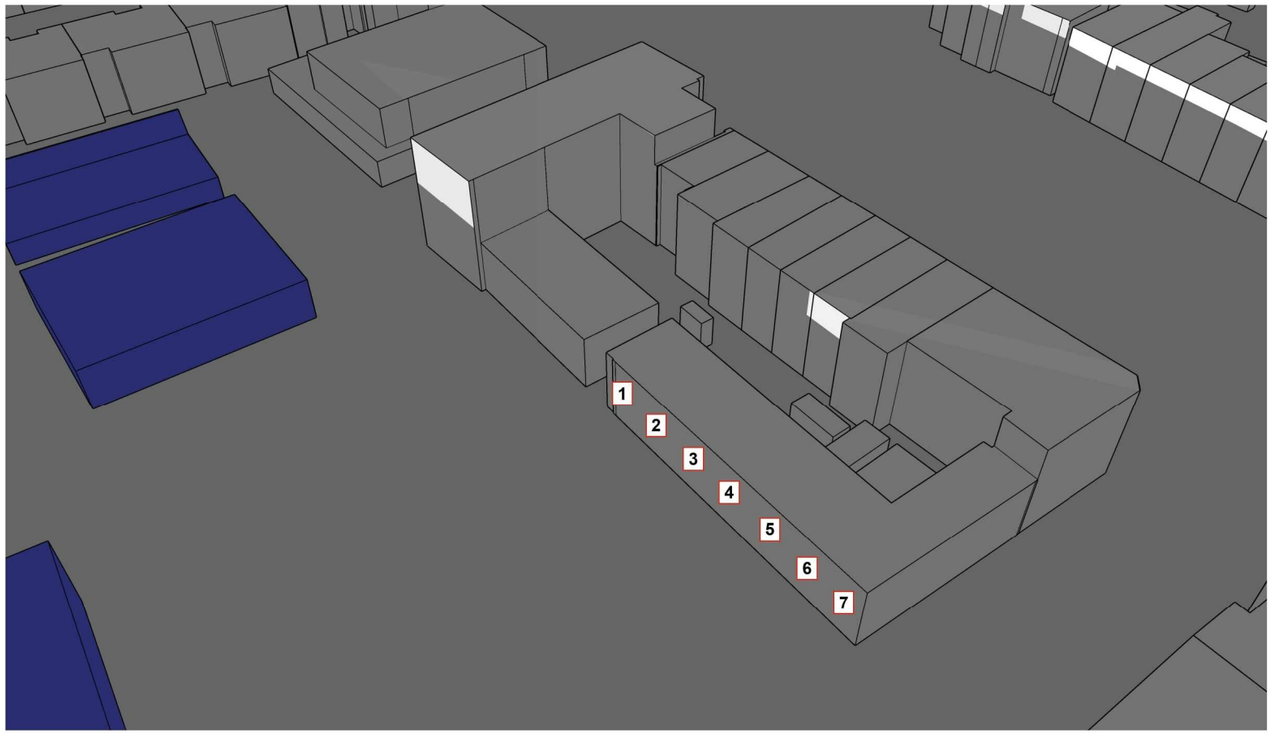
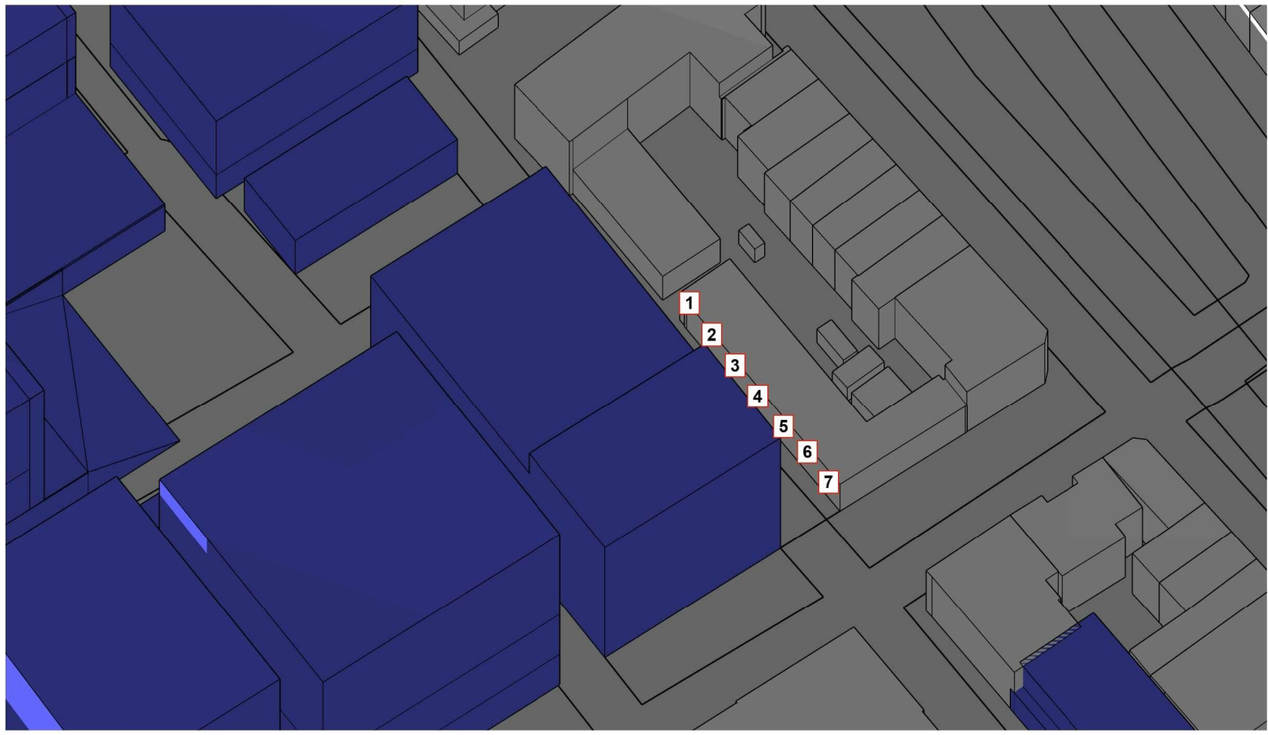
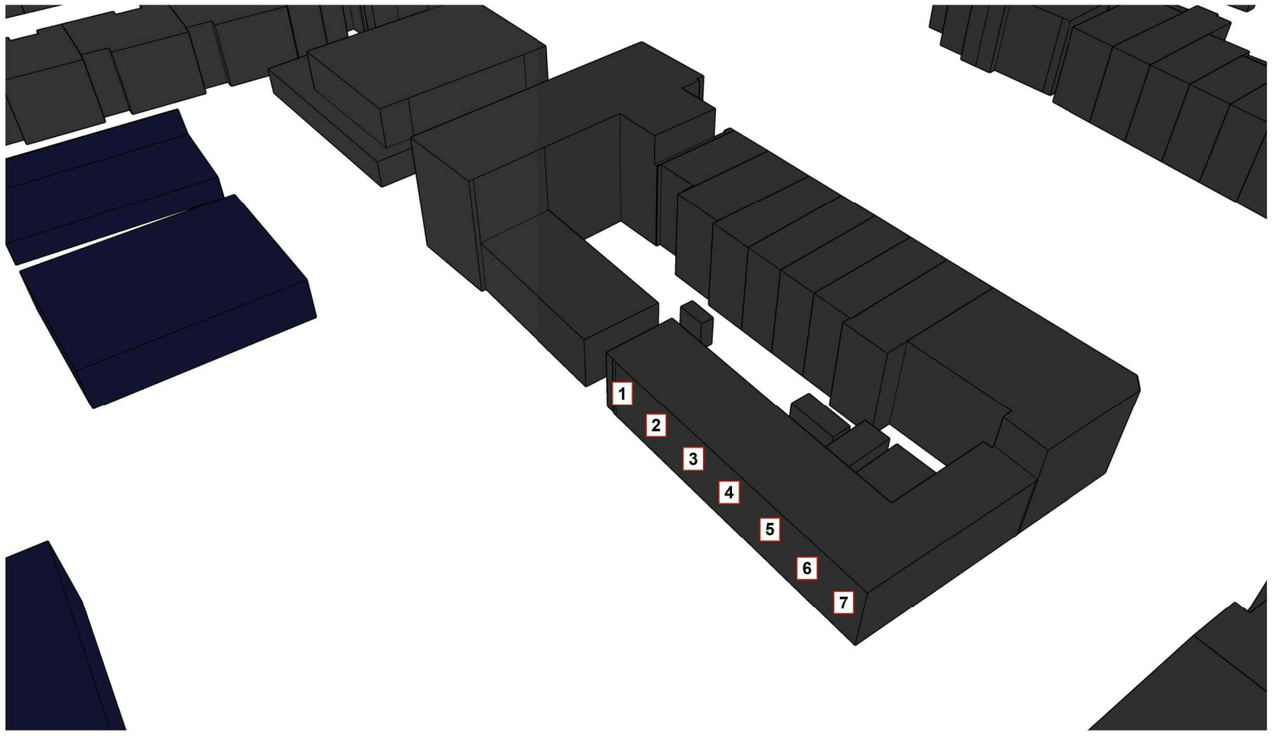
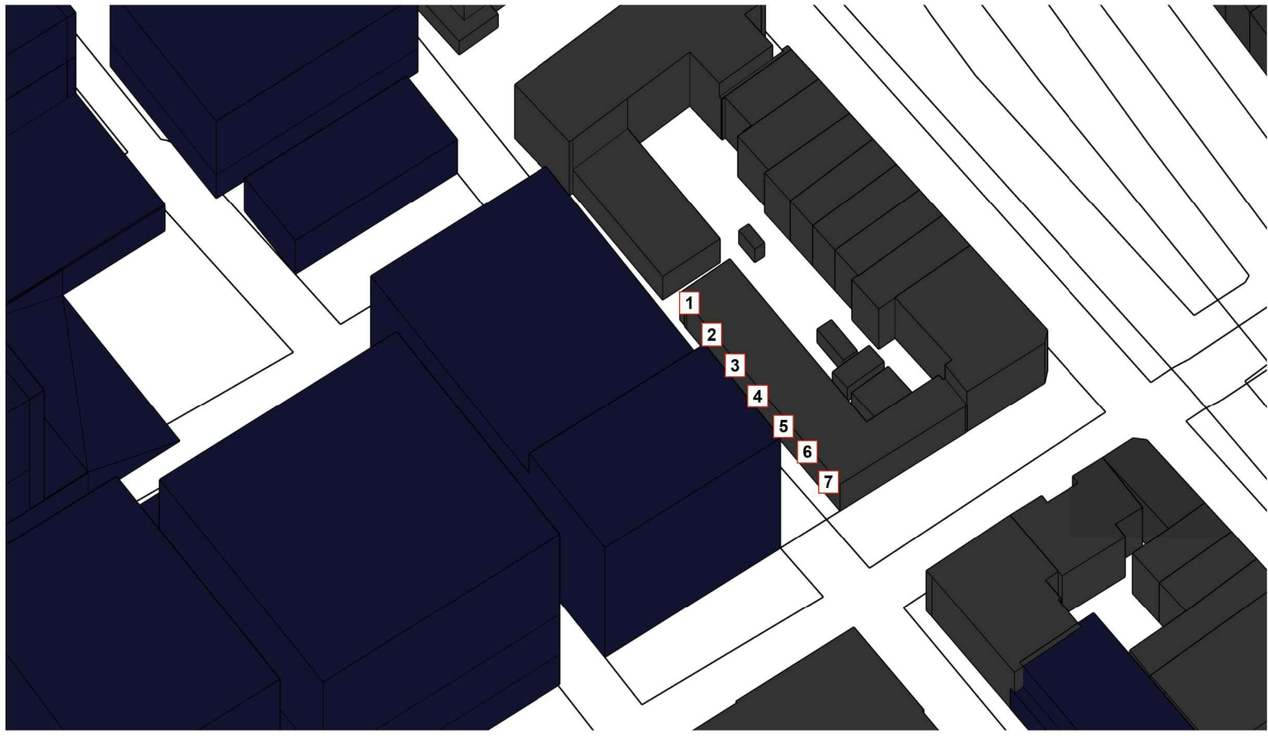




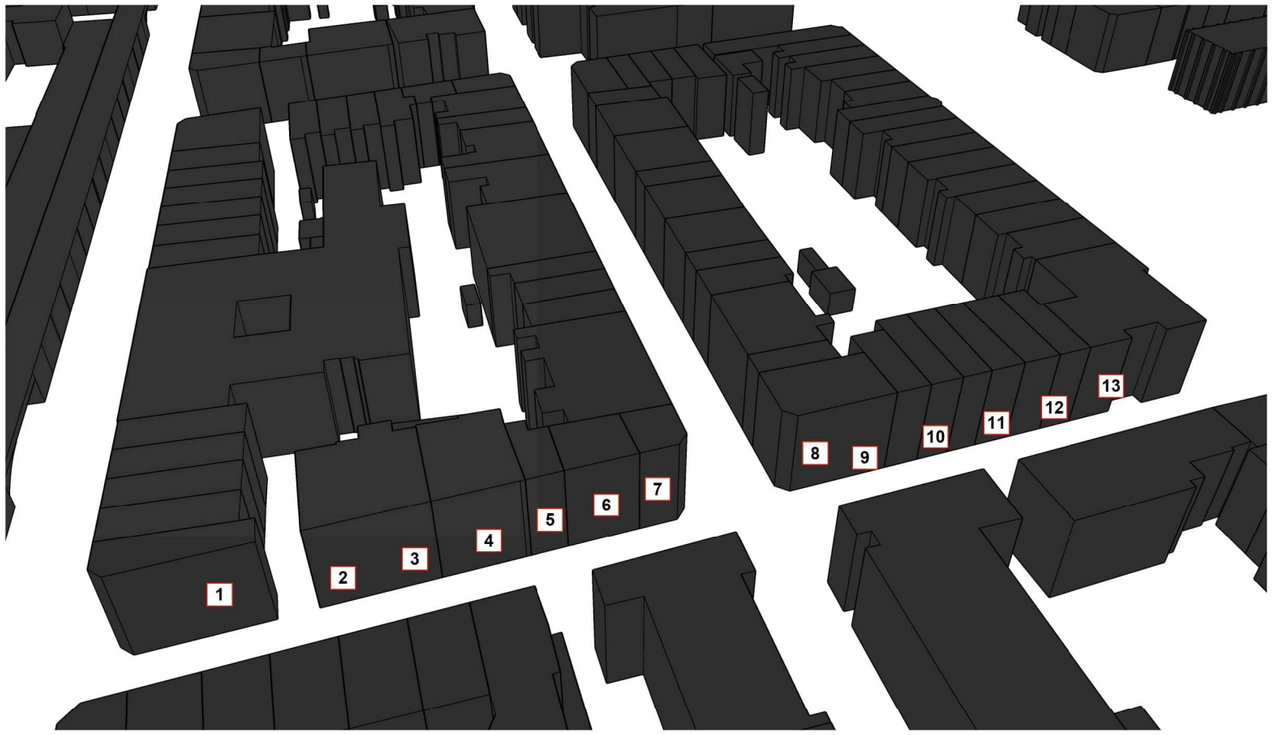
Almondestraat Westzijde
21 september
19.00

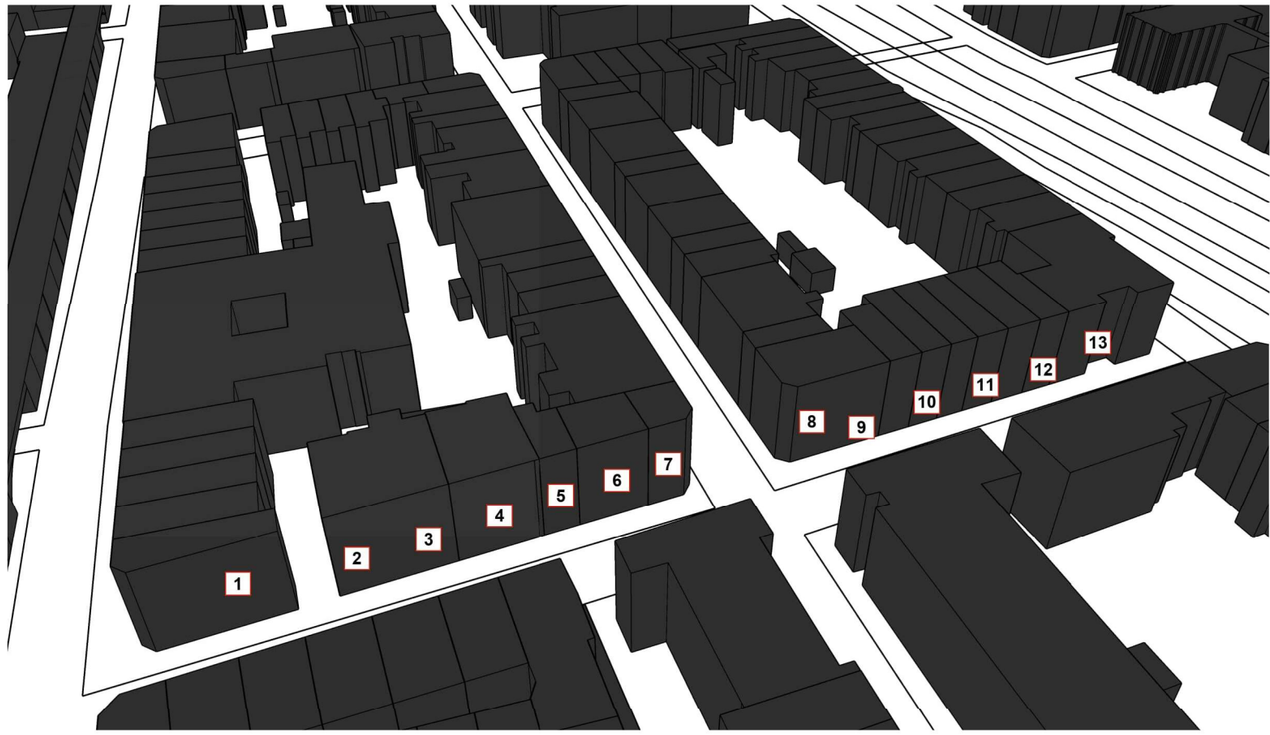




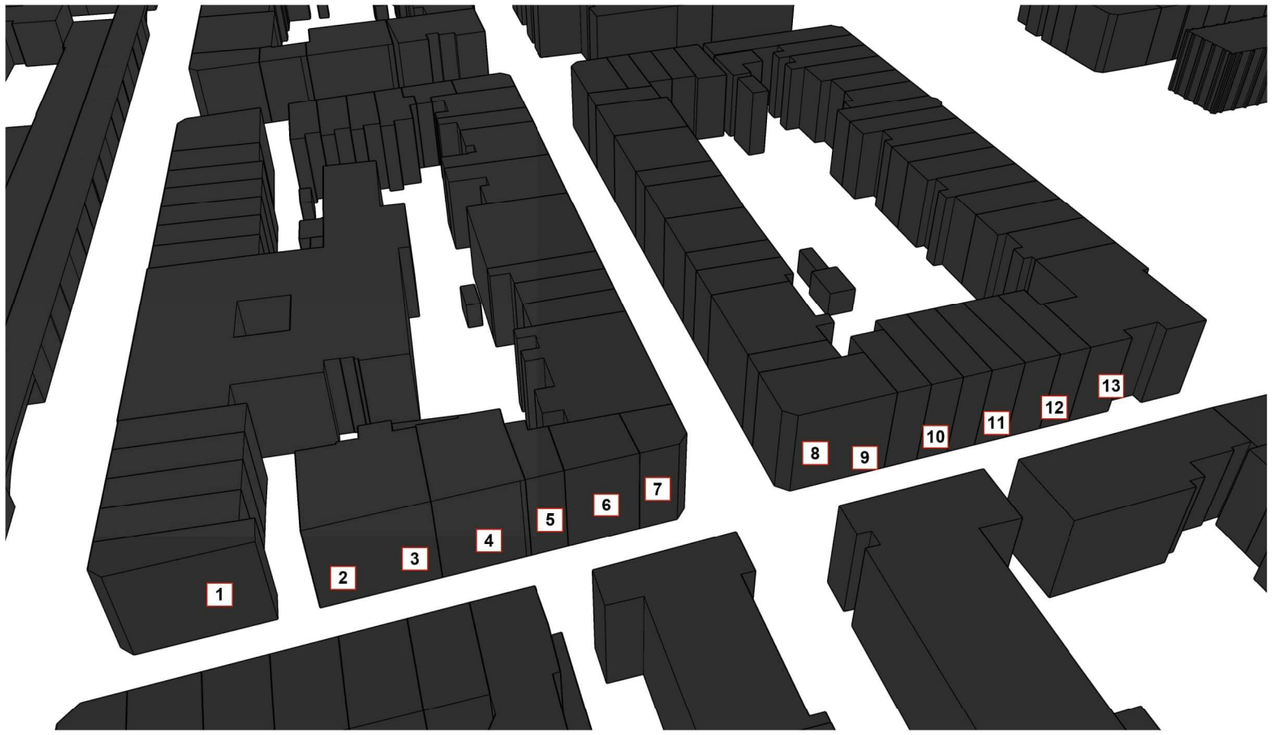
bijlage 6. resultaten 21 september Herlaerstraat huidig vs. nieuw

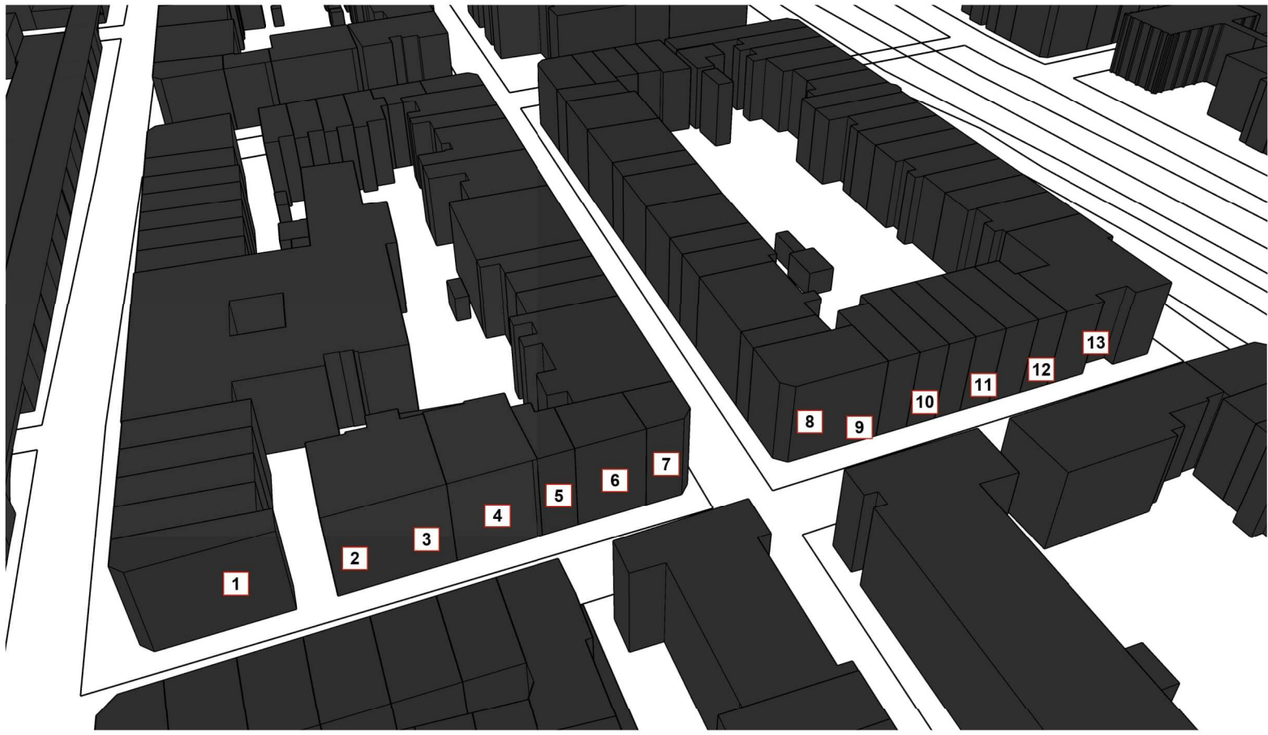
Herlaerstraat
21 september
06.00





Herlaerstraat
21 september
06.30





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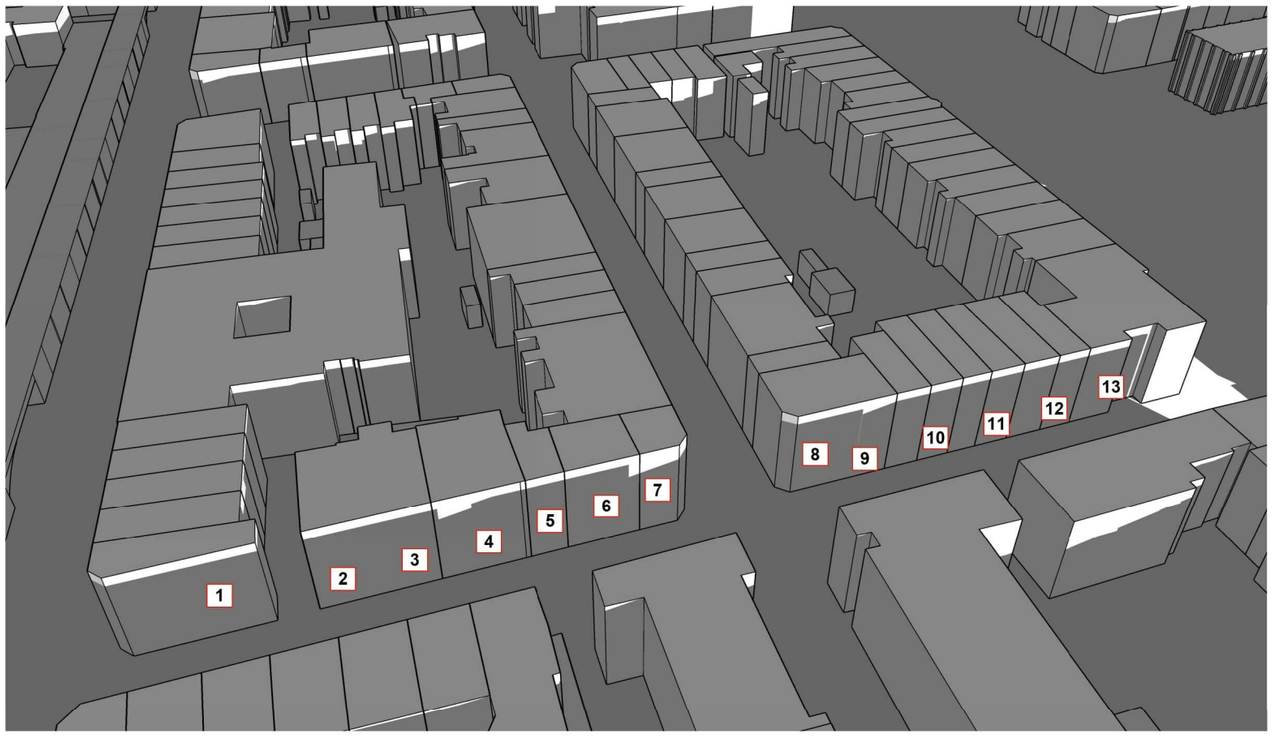
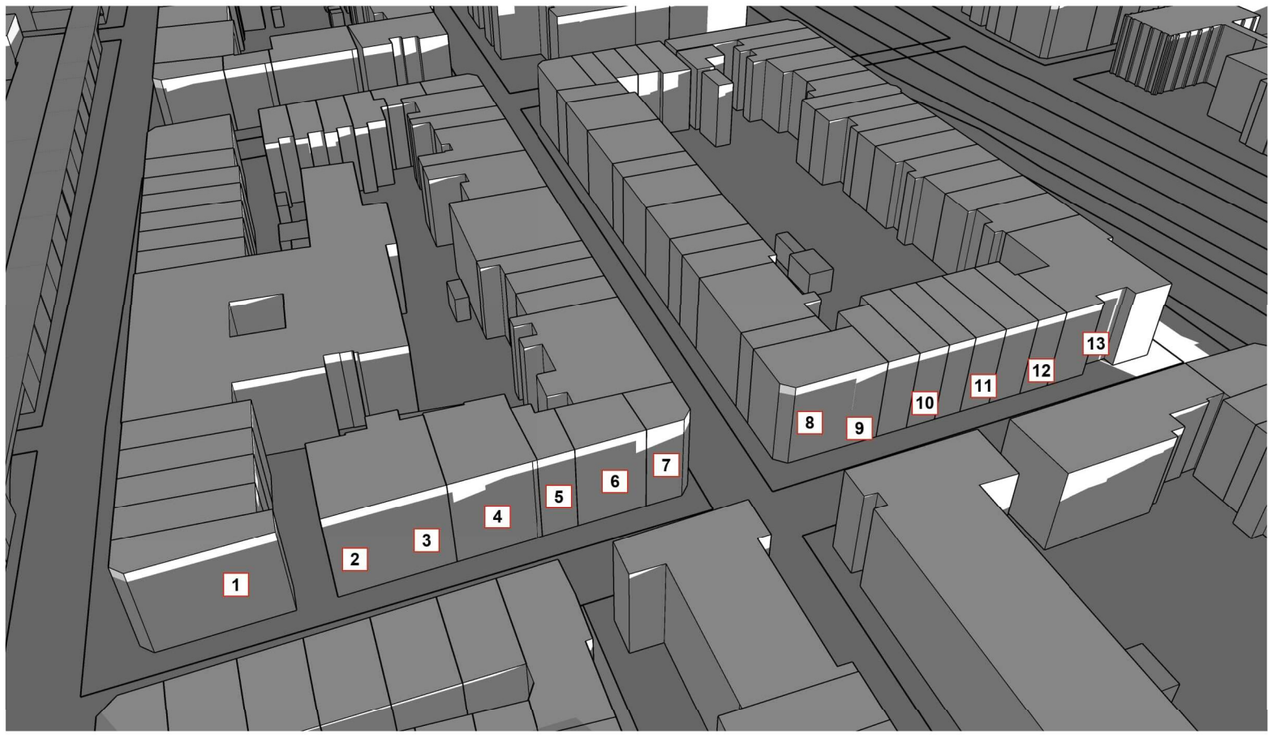
07.00





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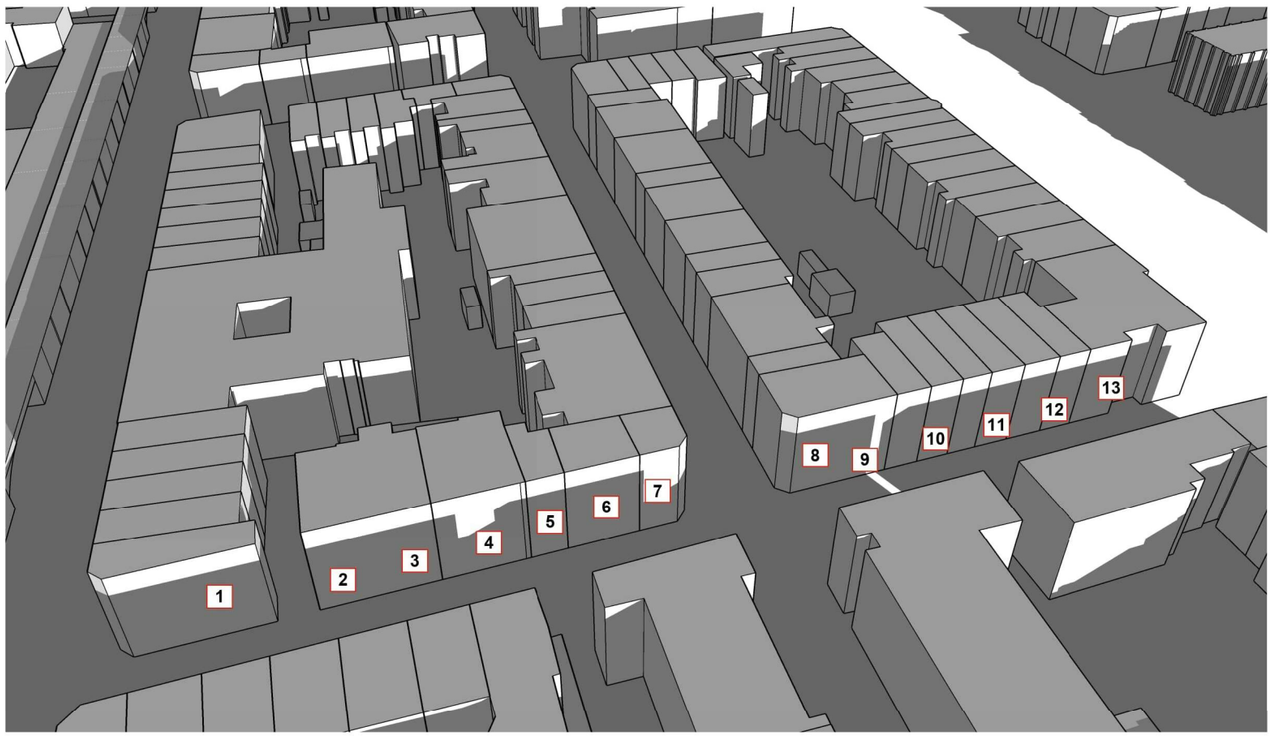

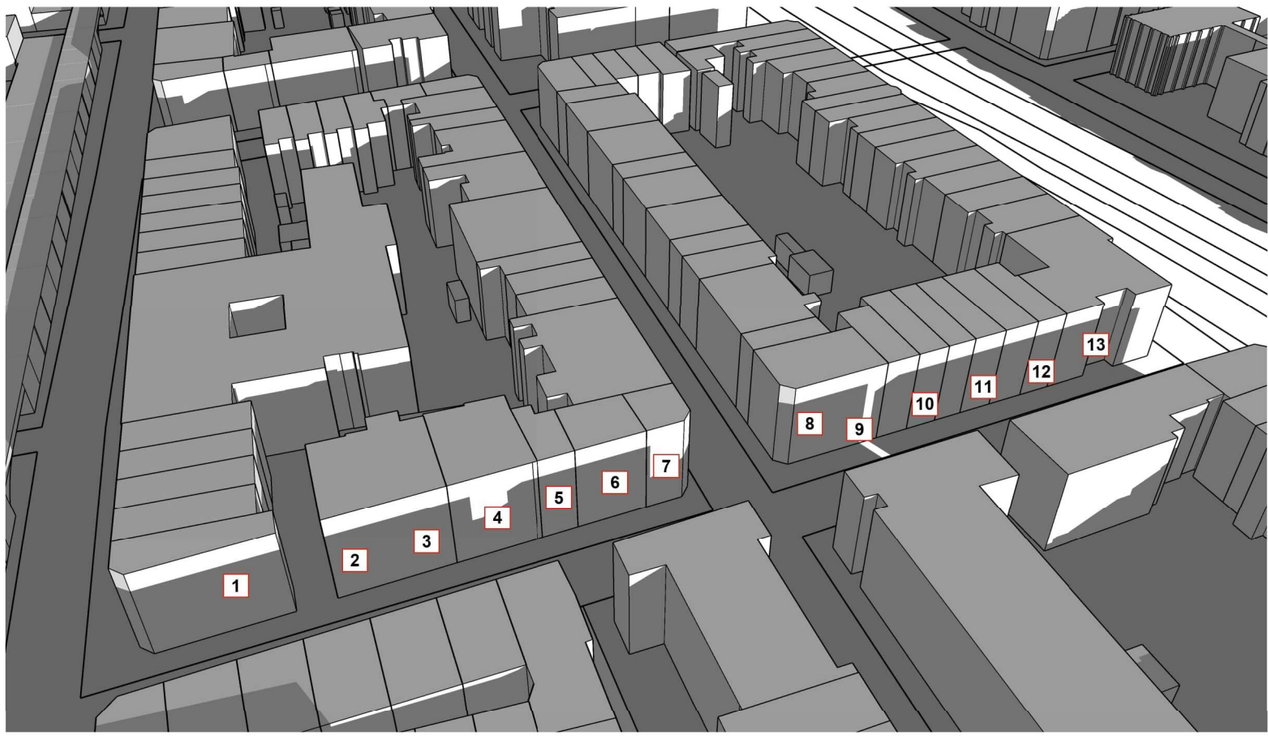

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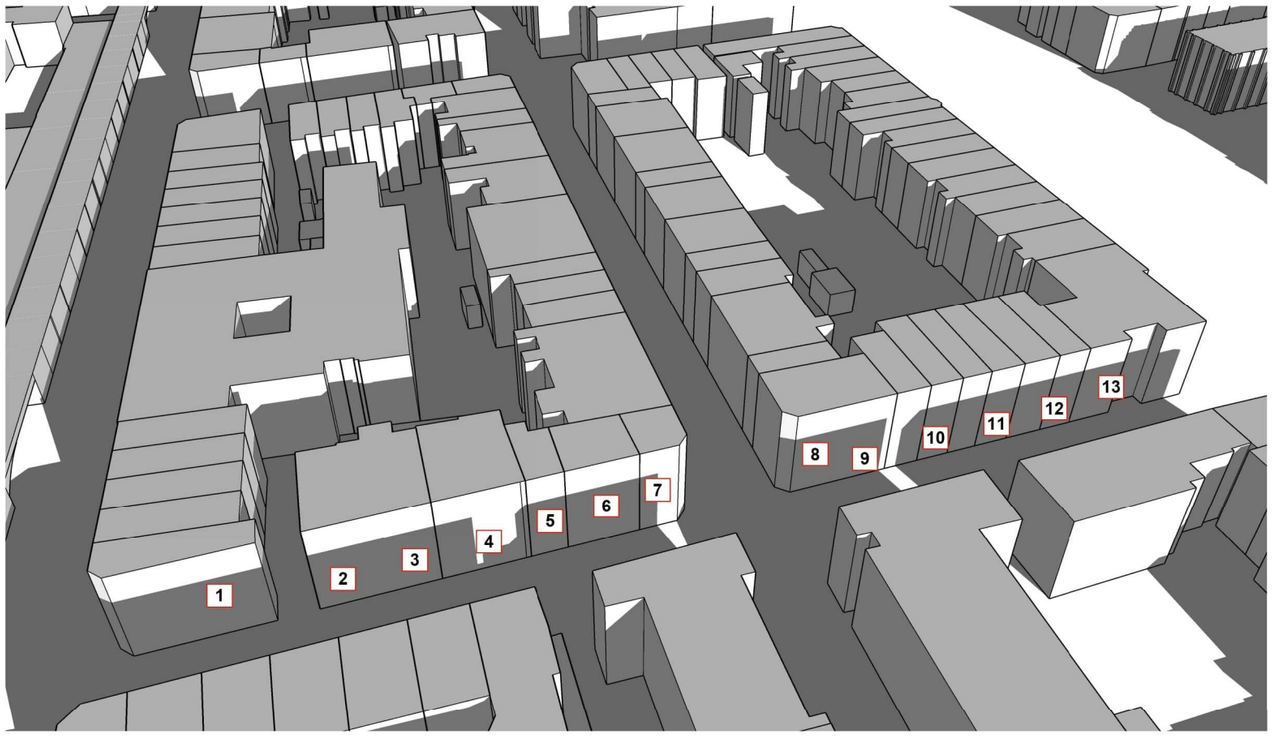
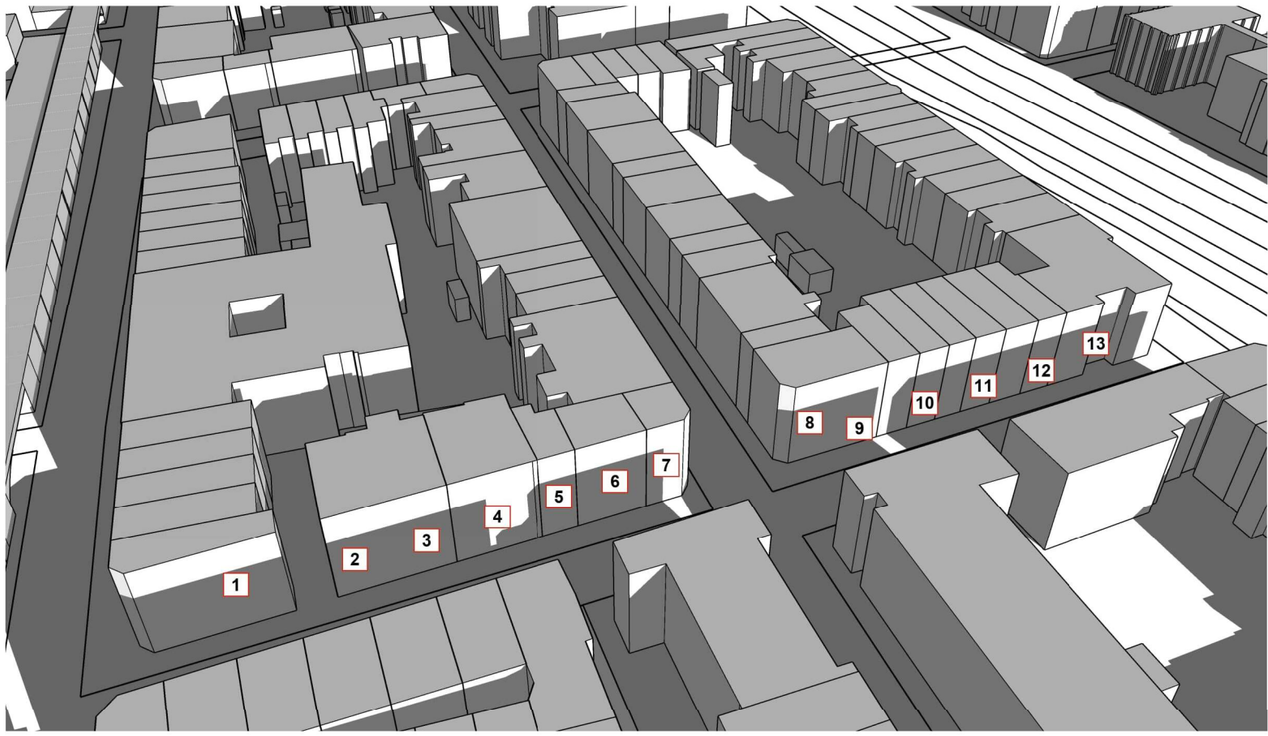
08.00





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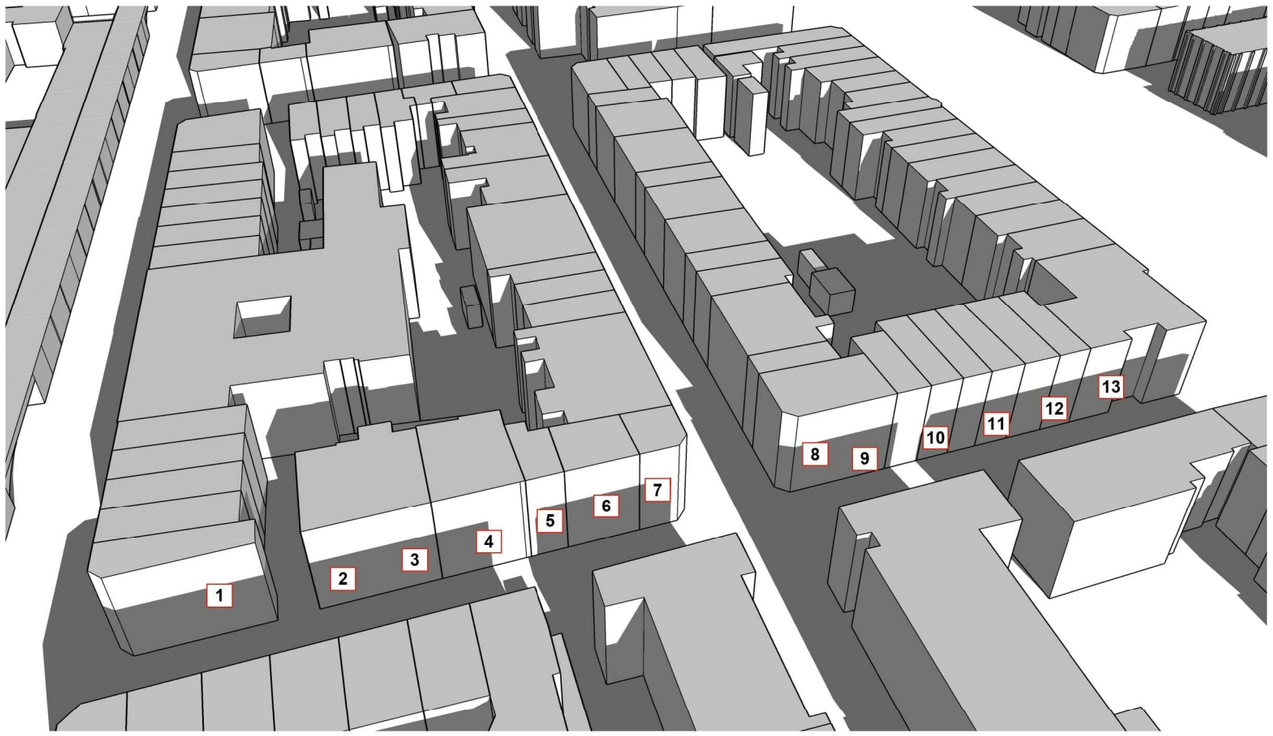

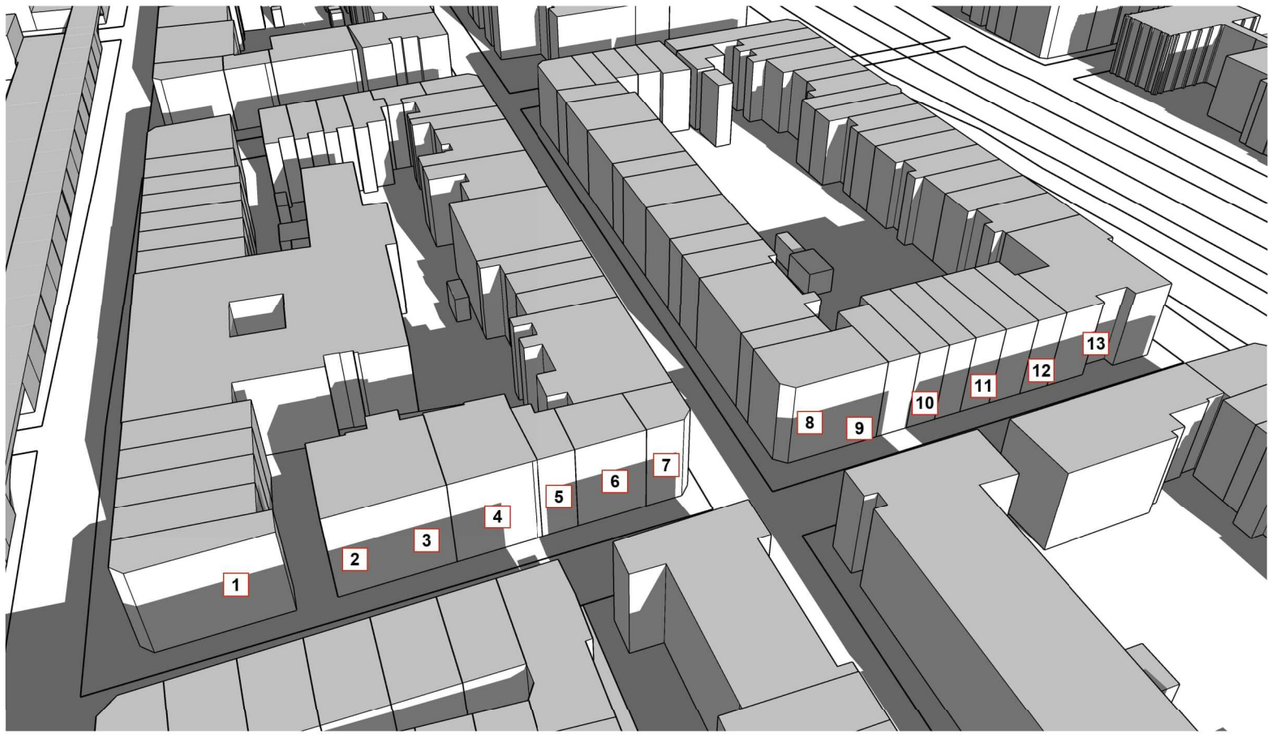

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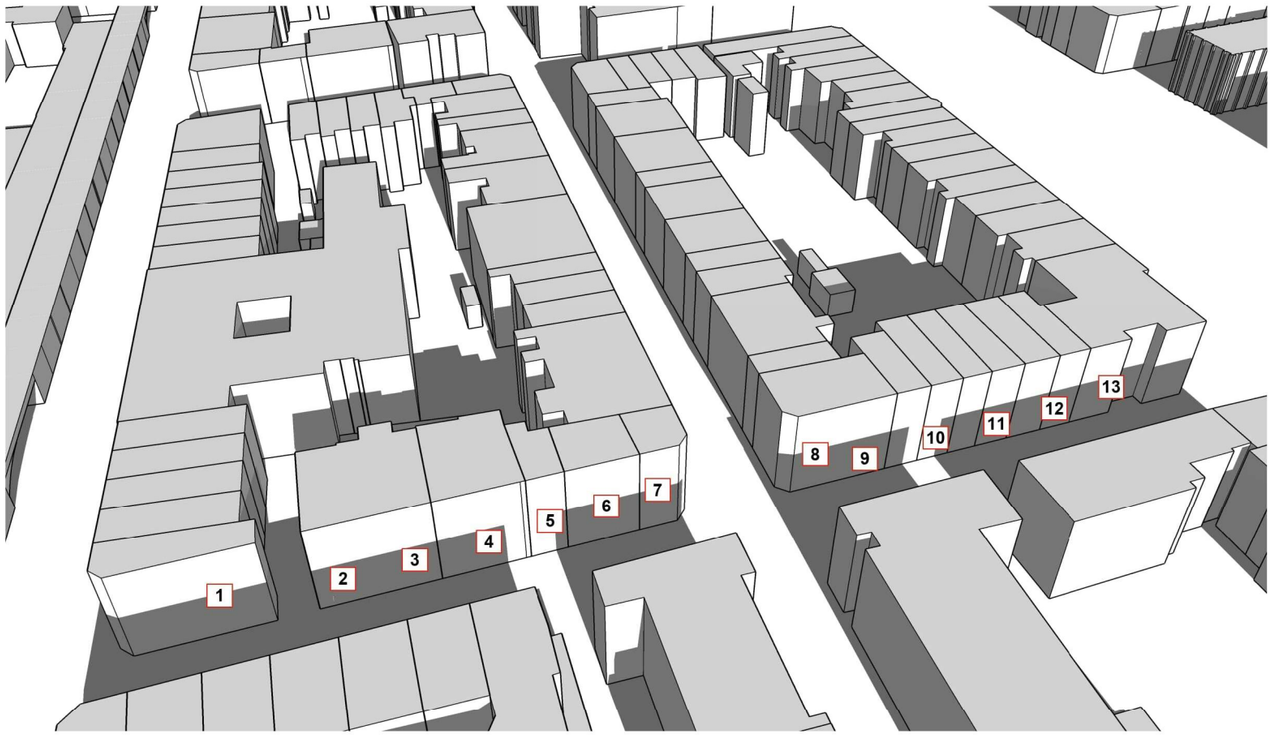
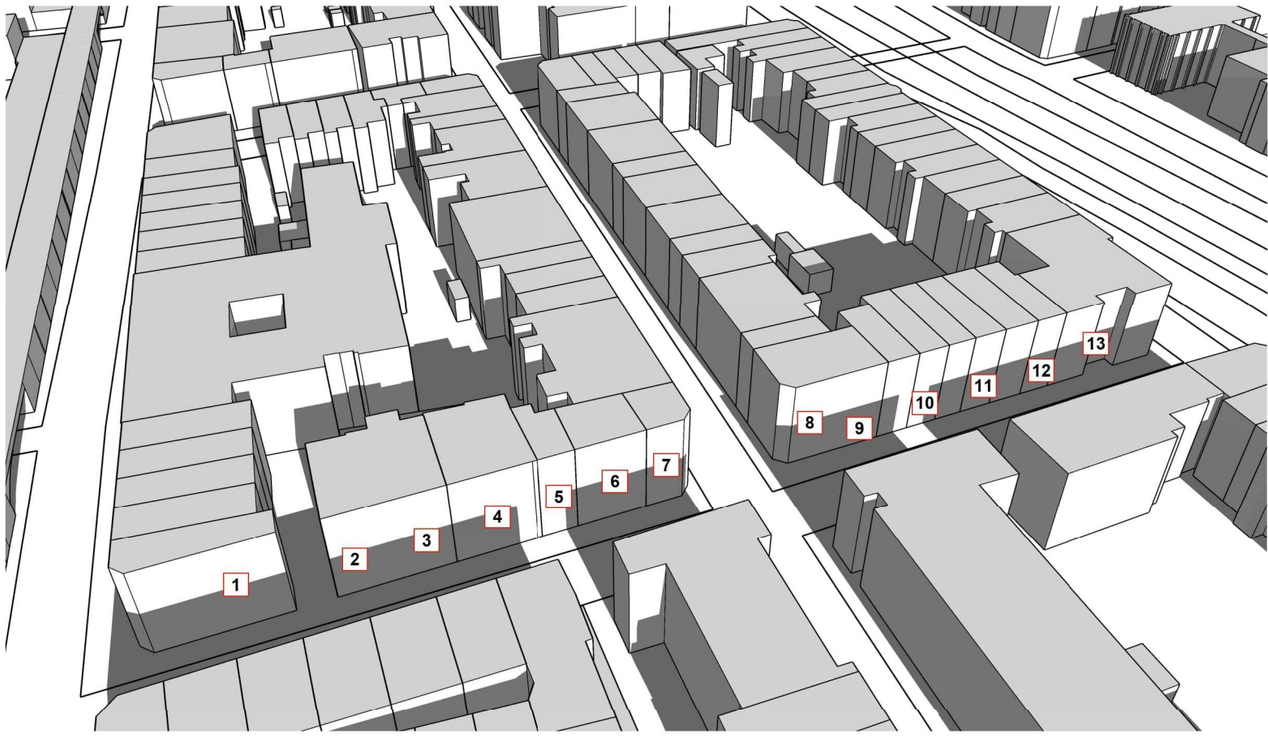
09.00





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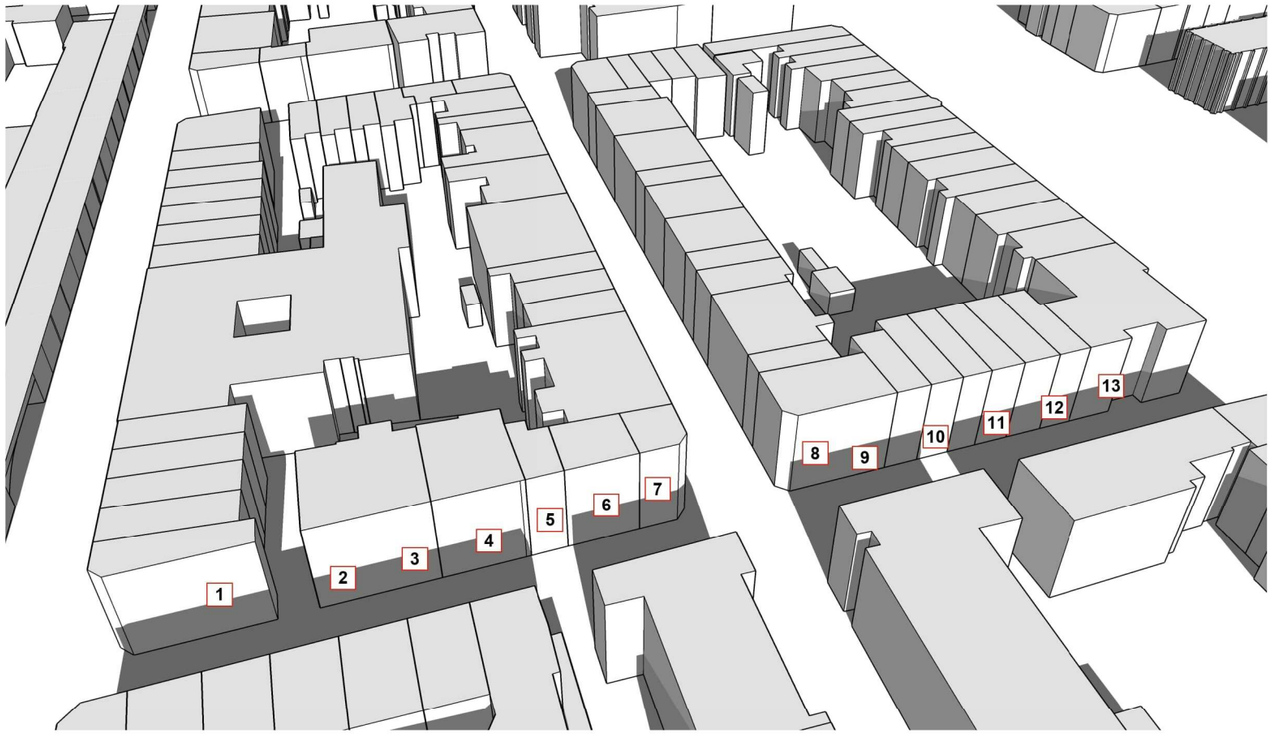

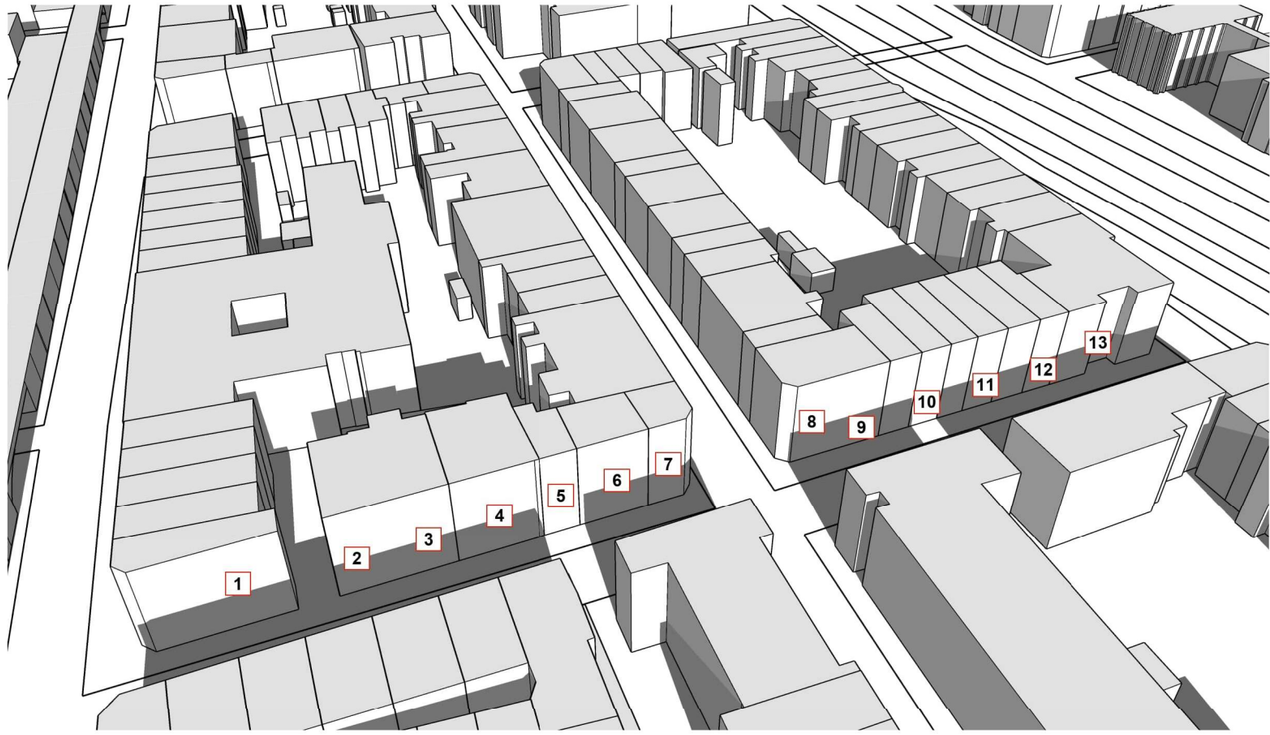

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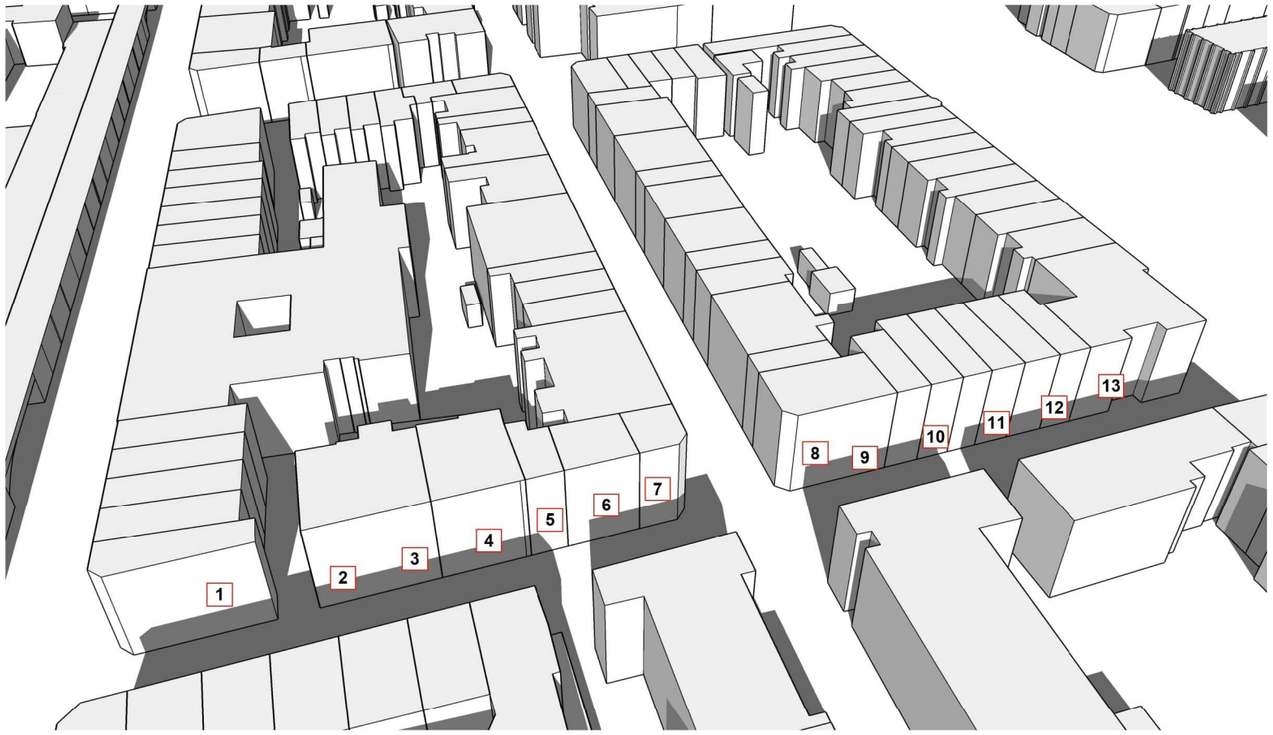
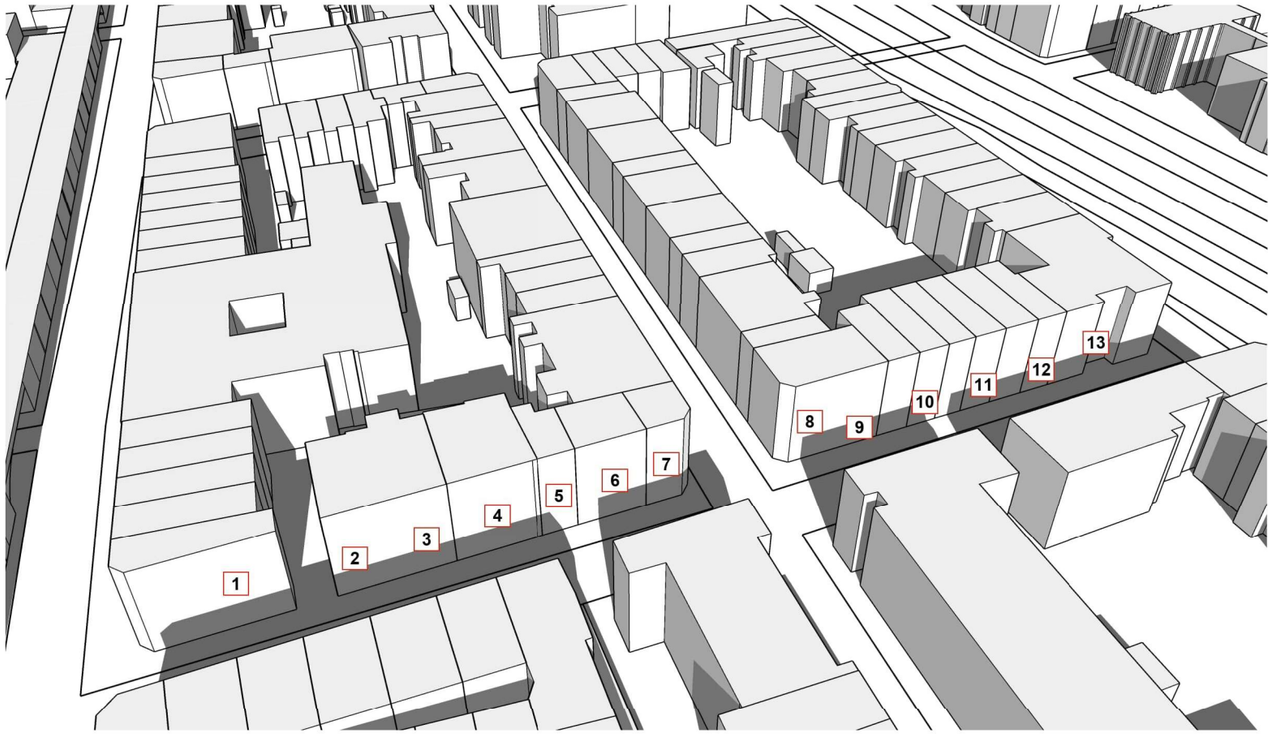
21 september
10.00





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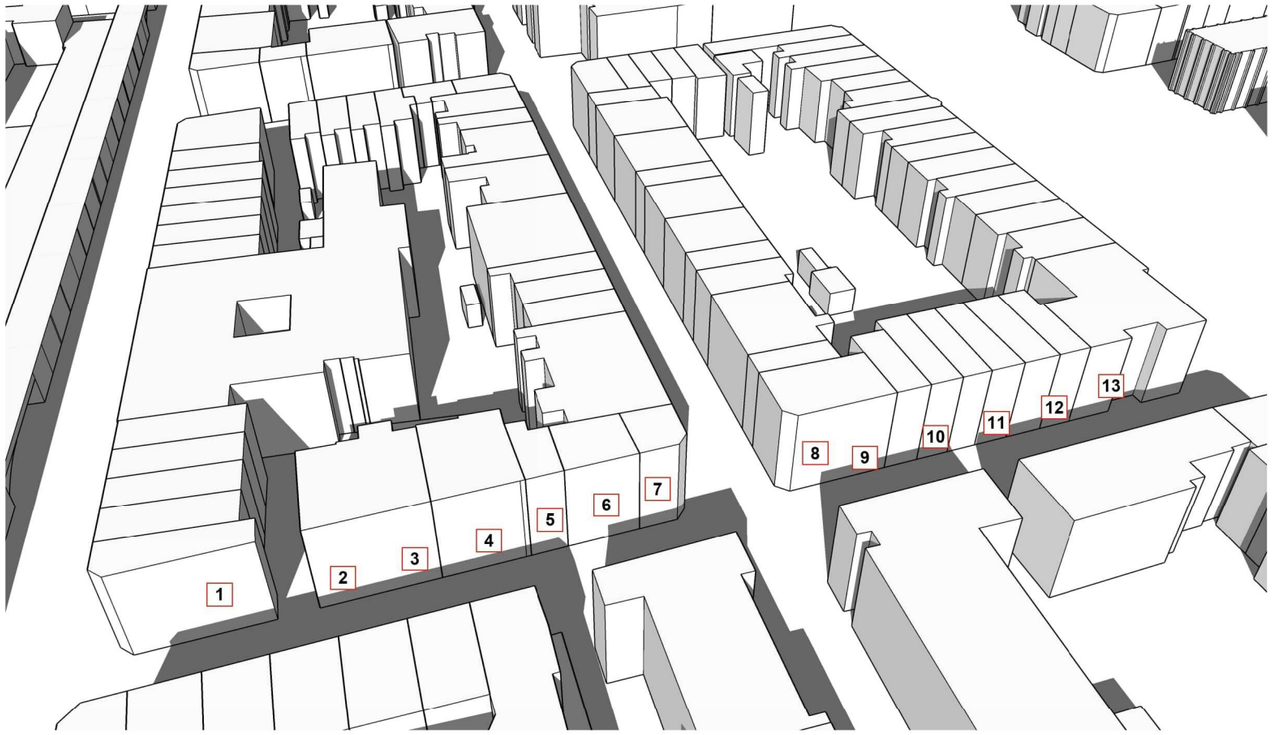

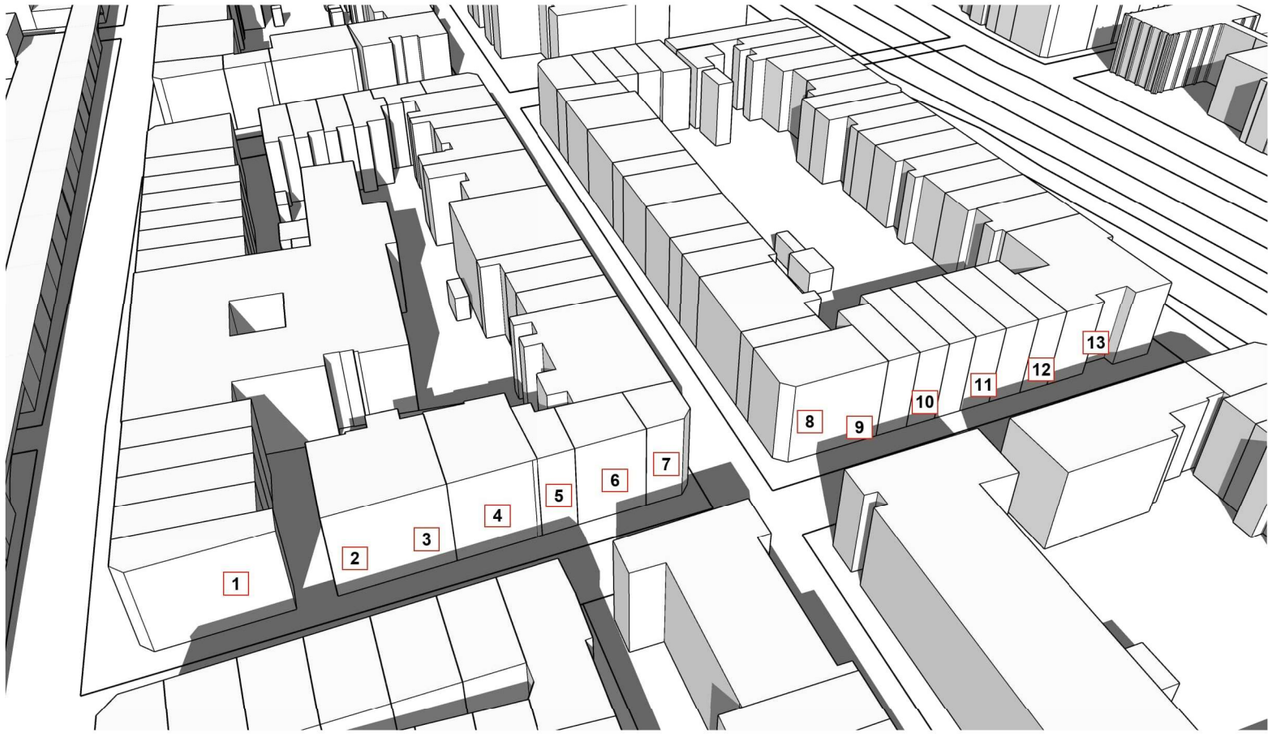

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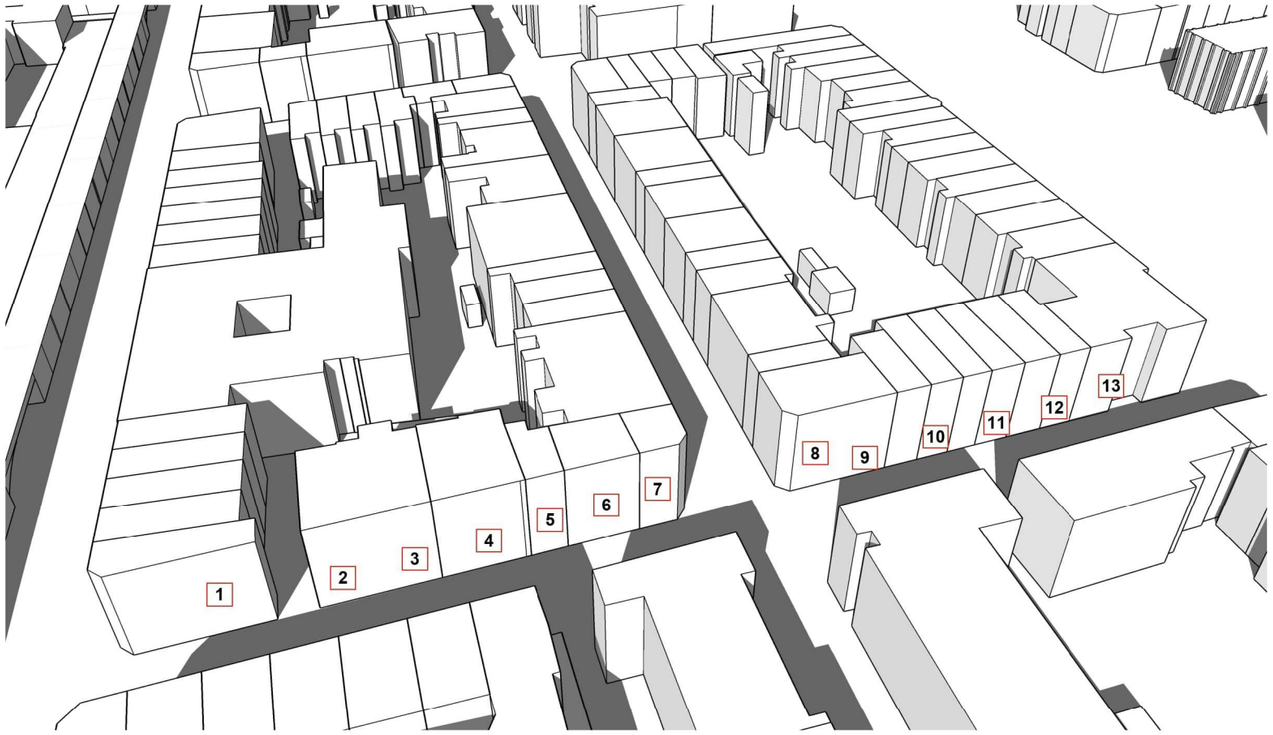
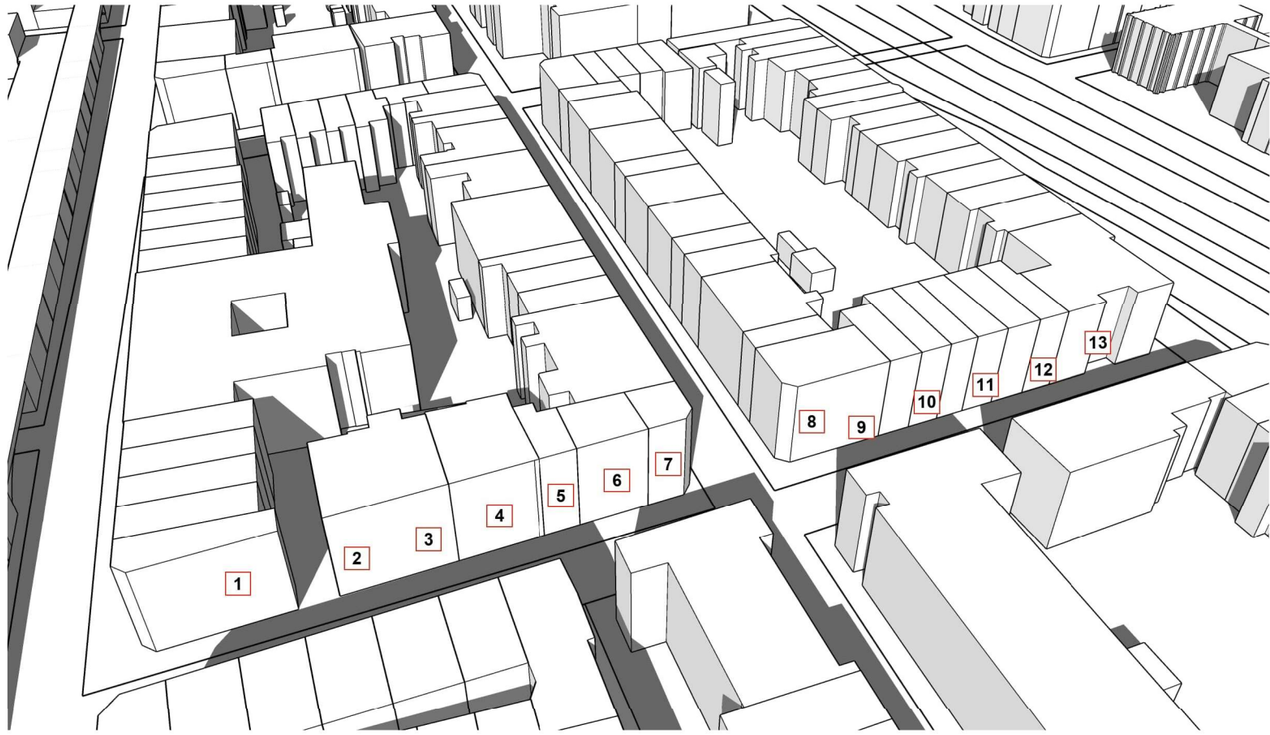
11.00





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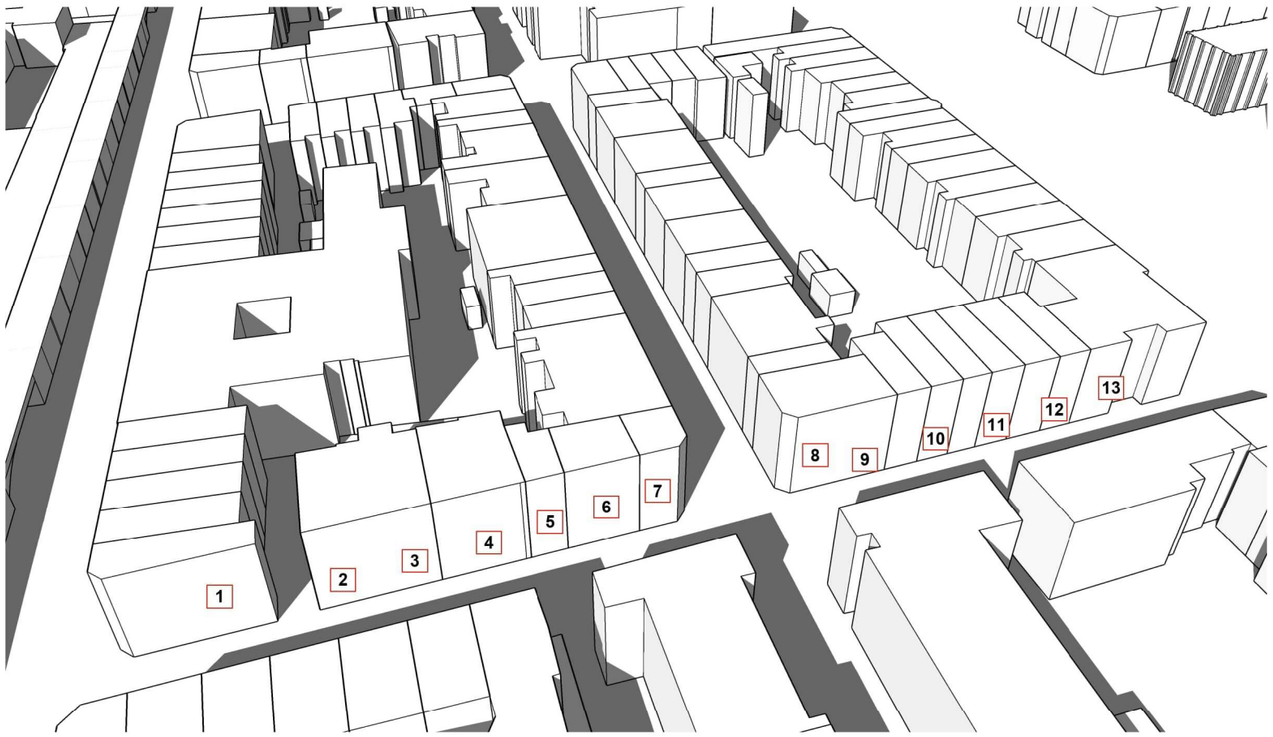

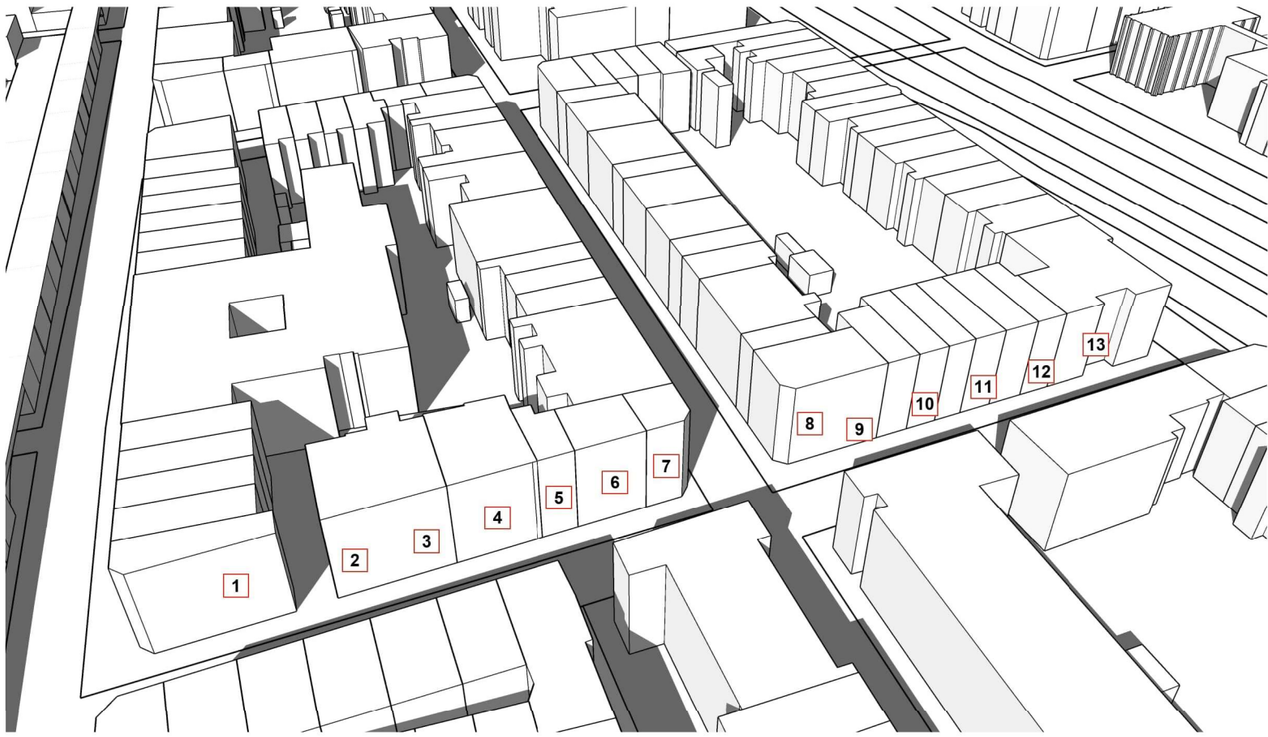

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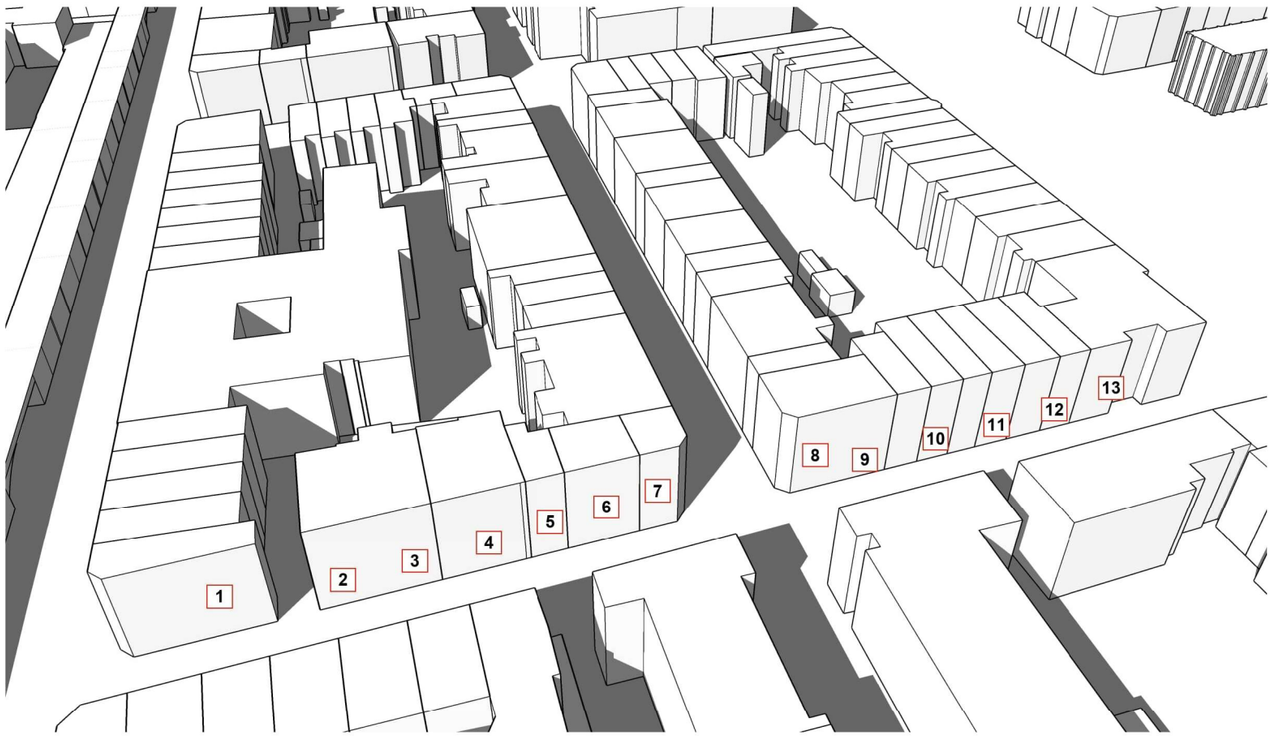

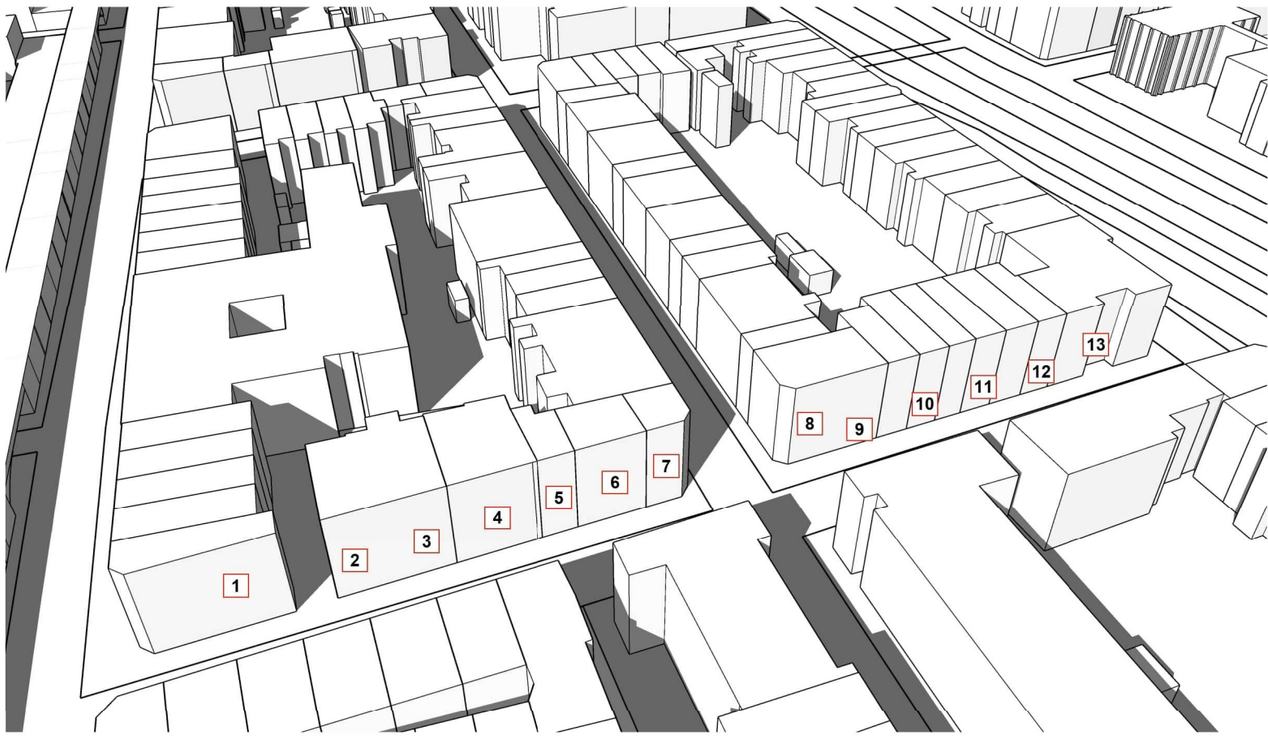

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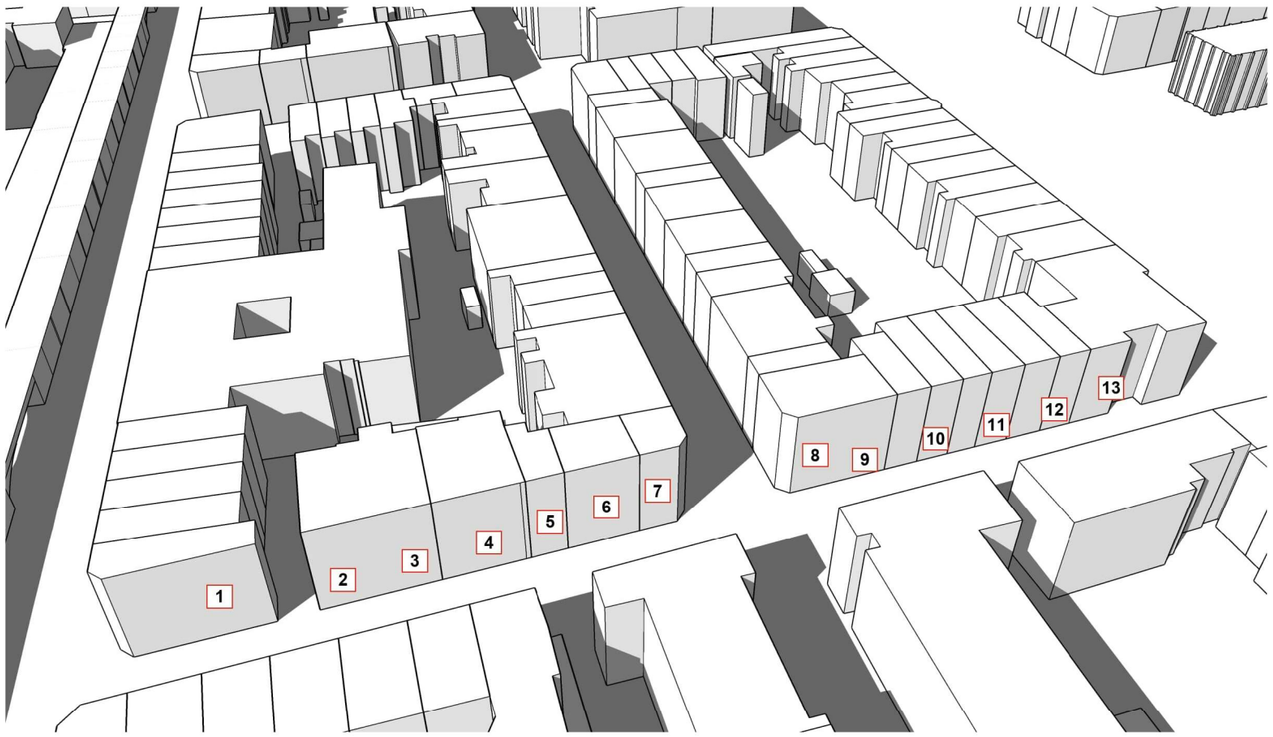

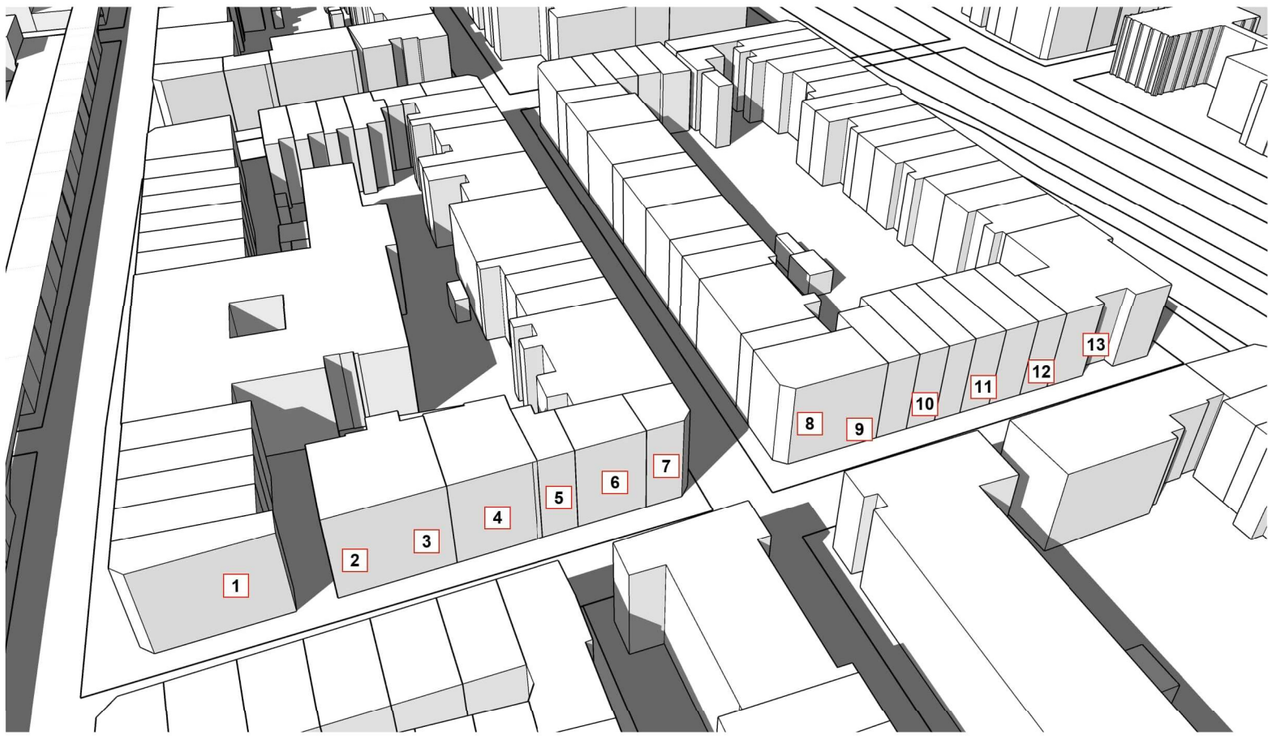

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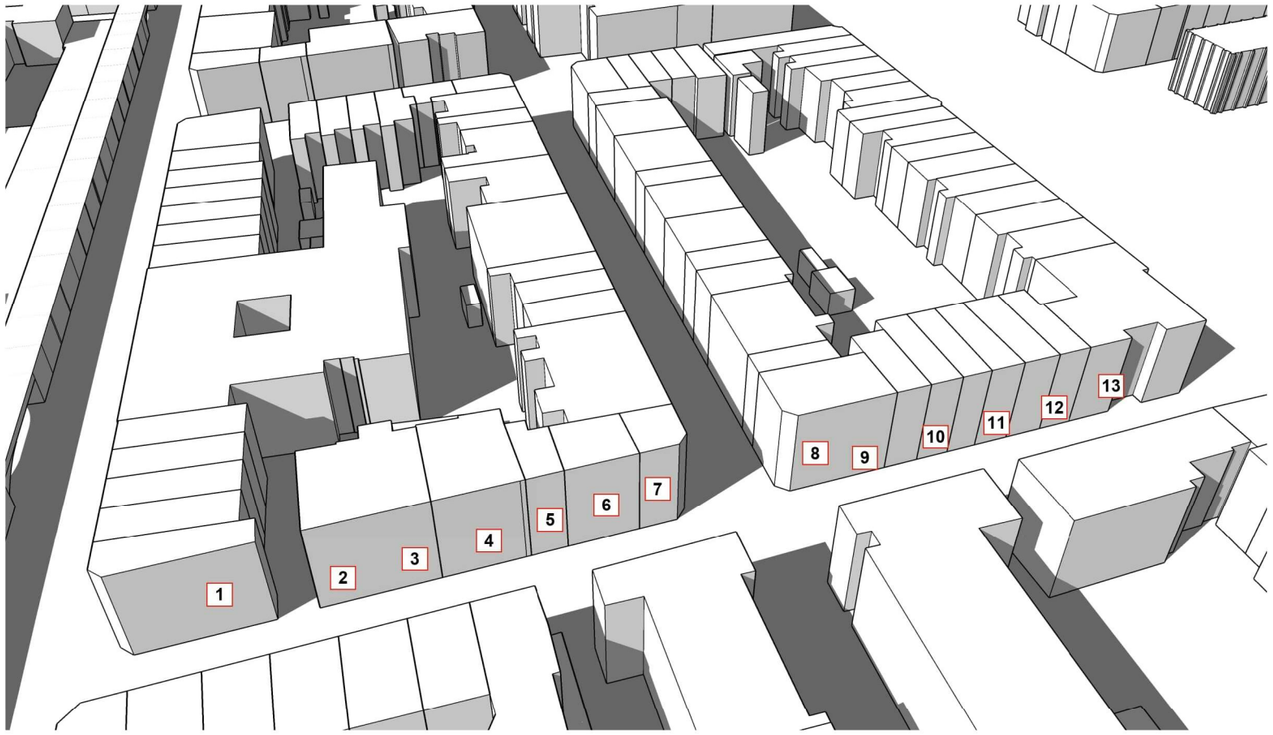



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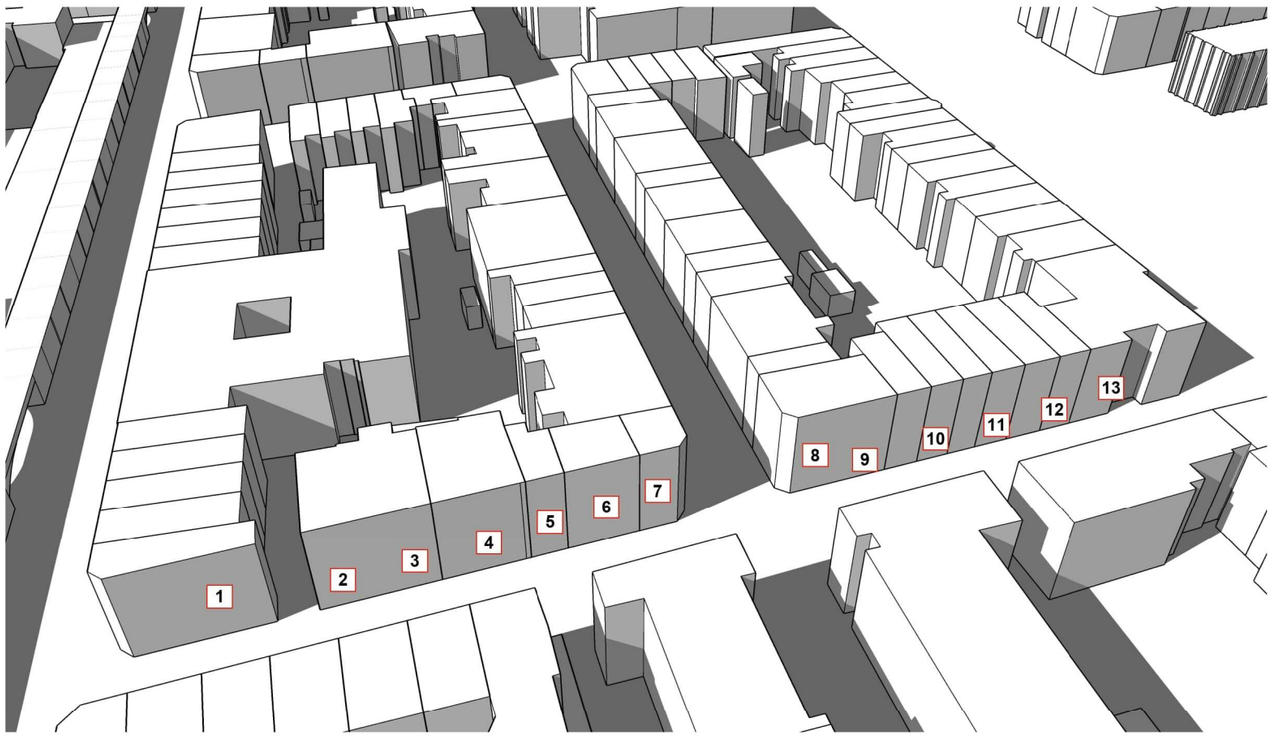

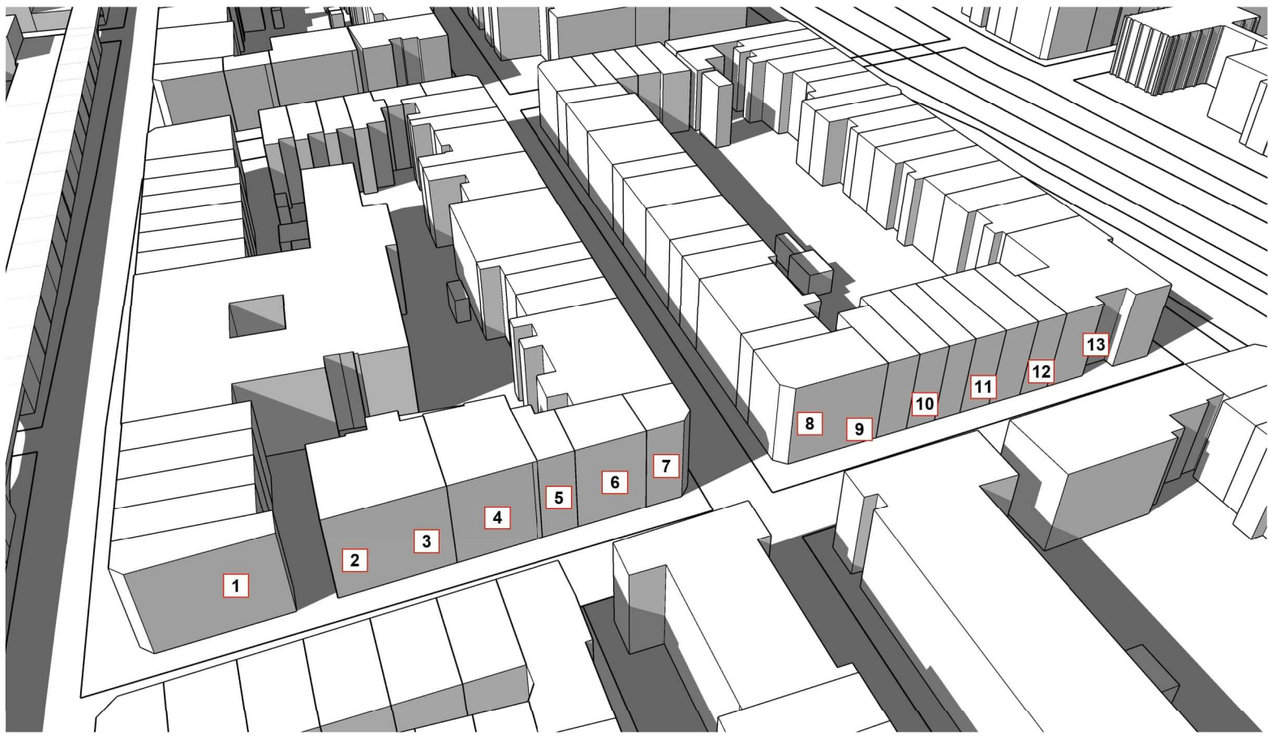

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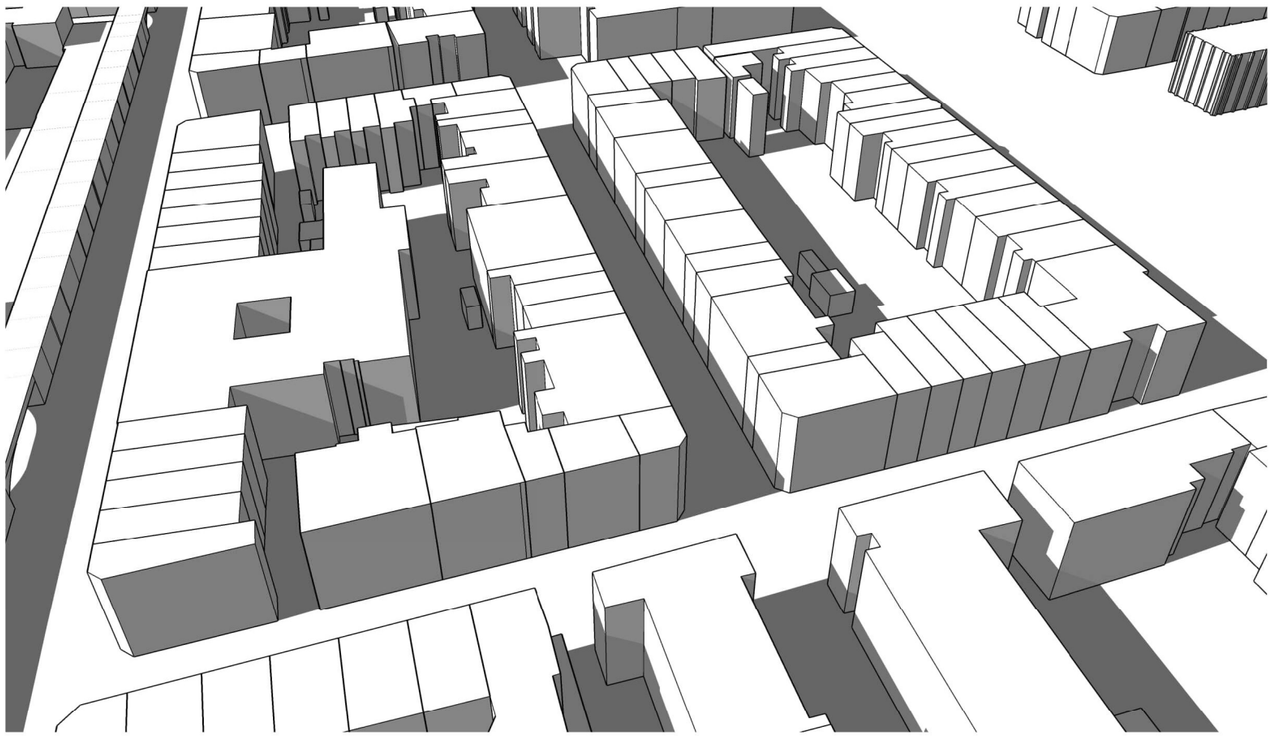
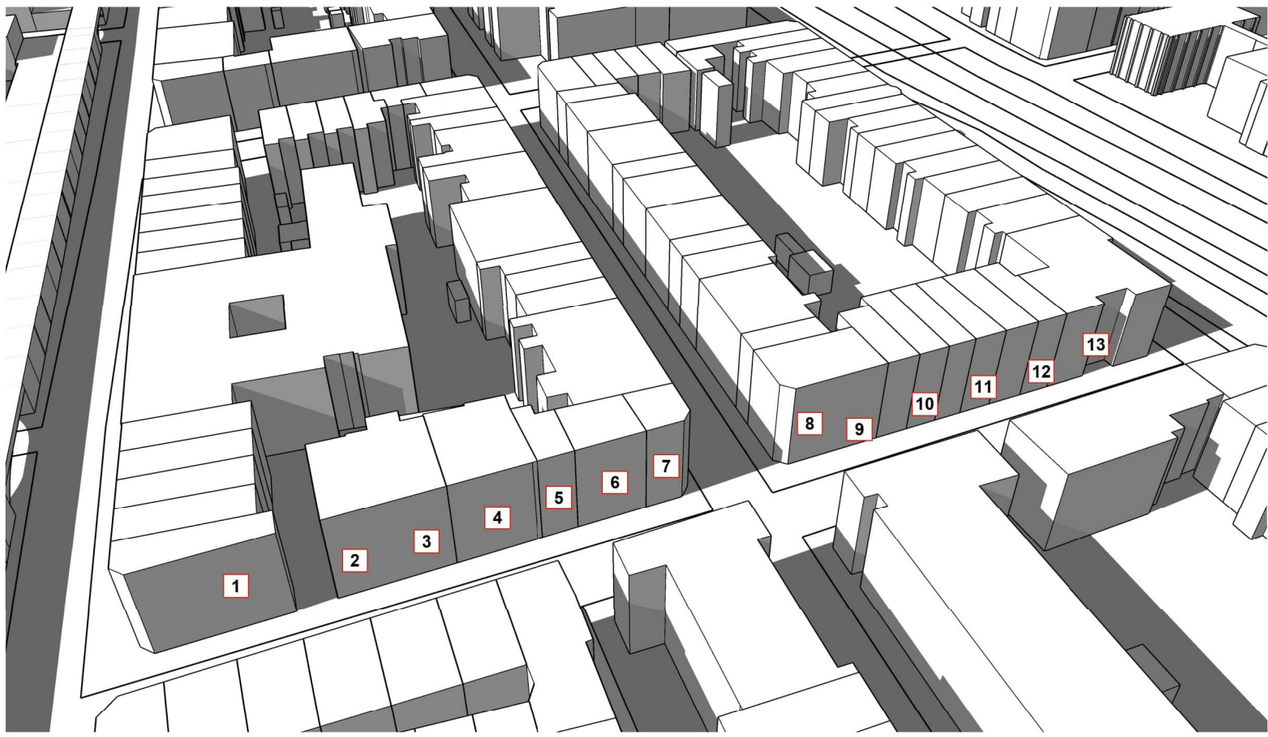
14.00





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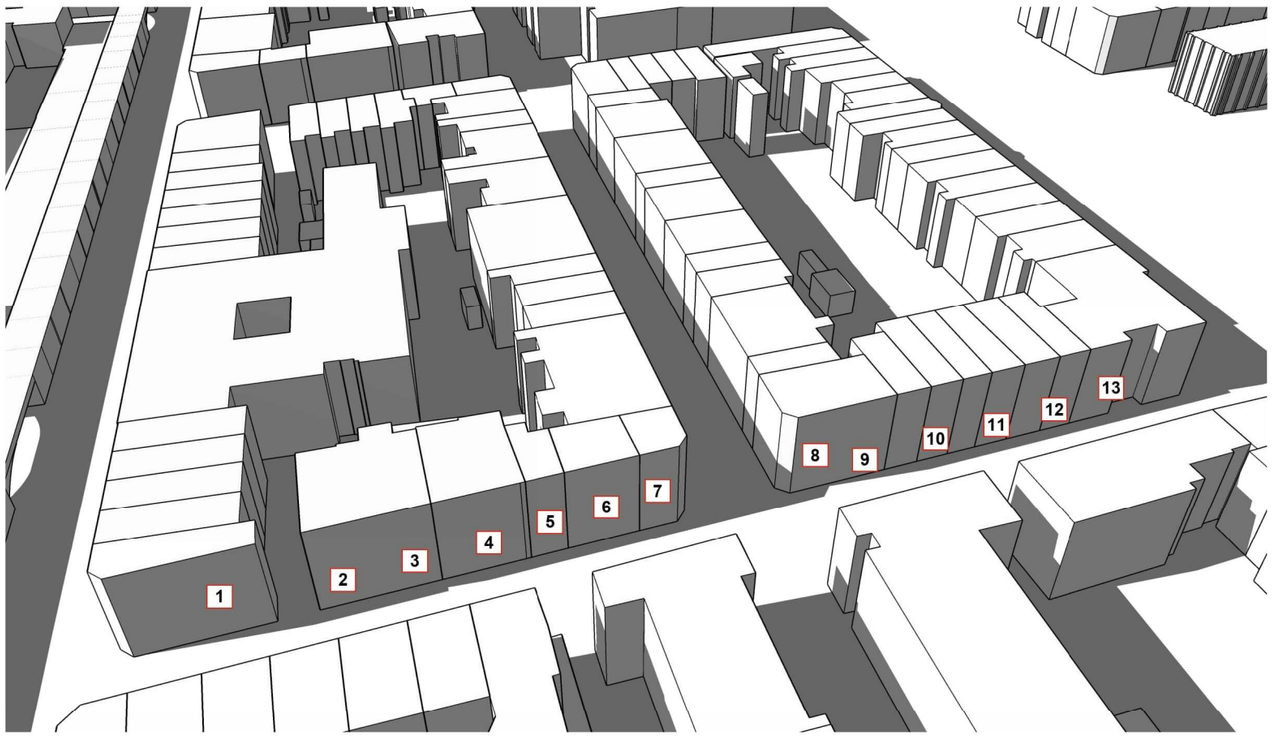

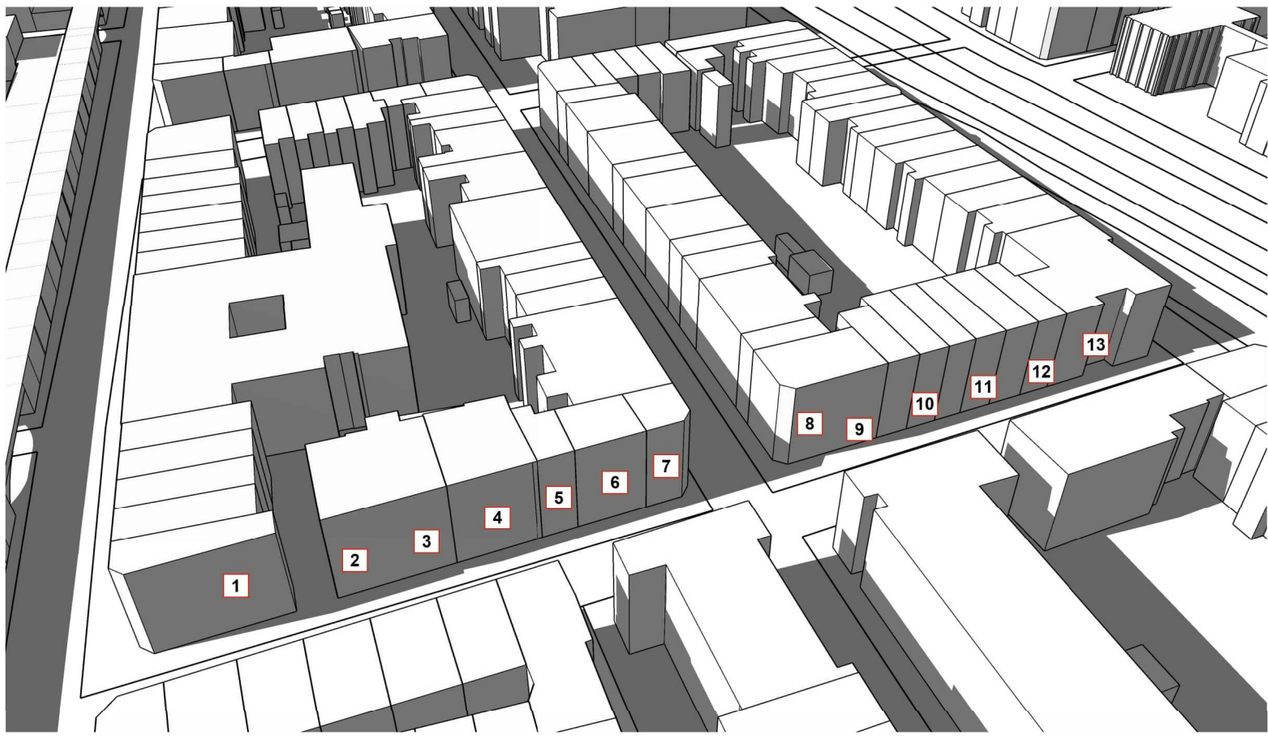

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21 september
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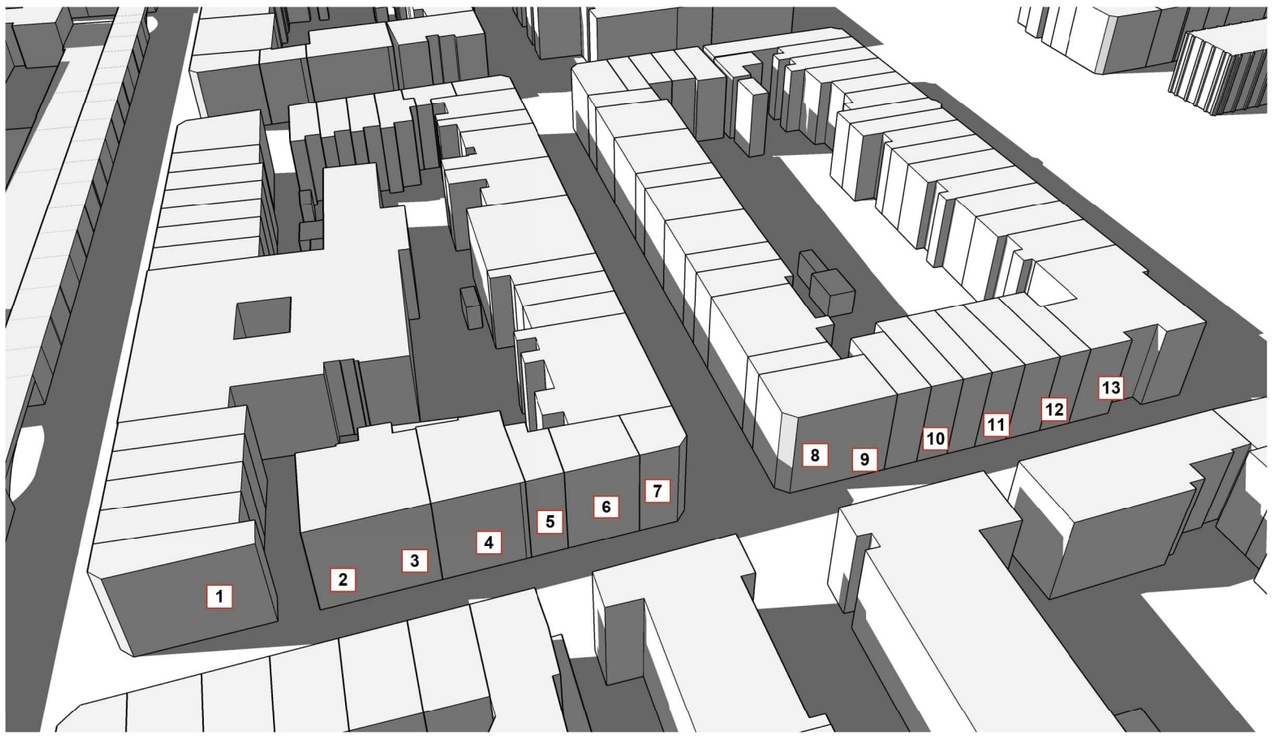

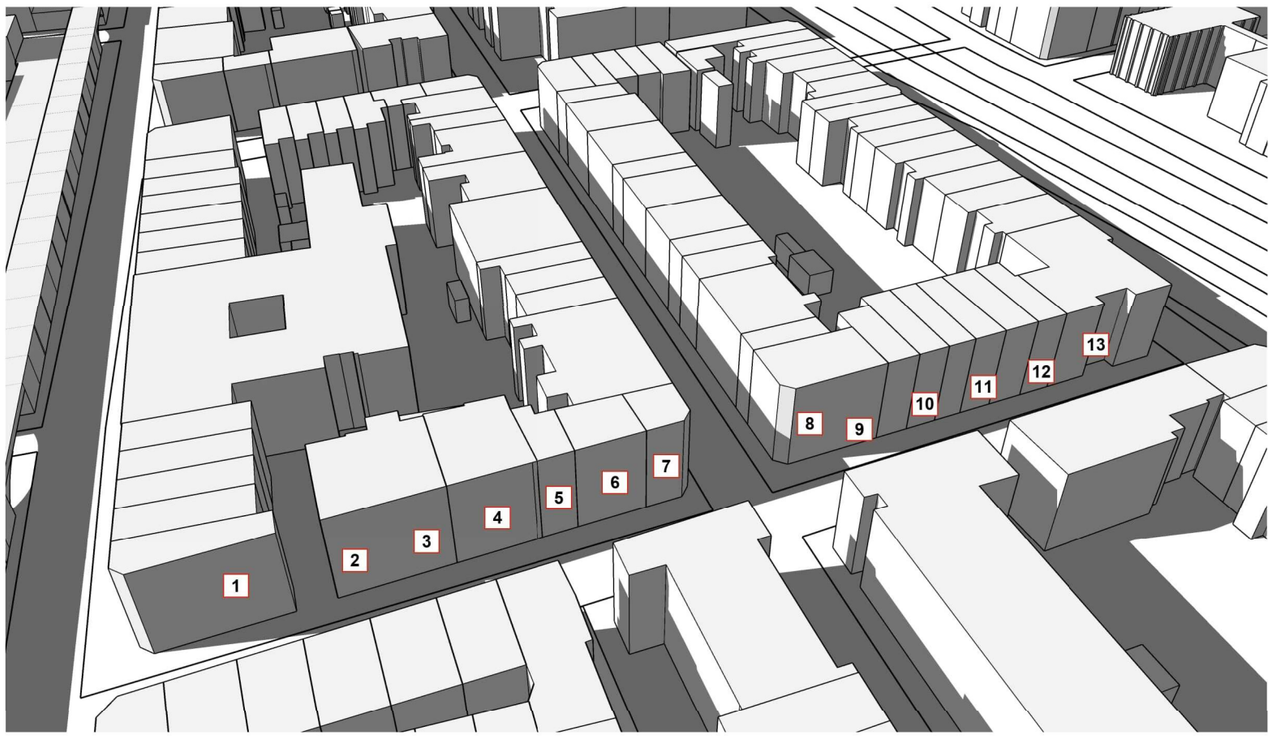

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21 september
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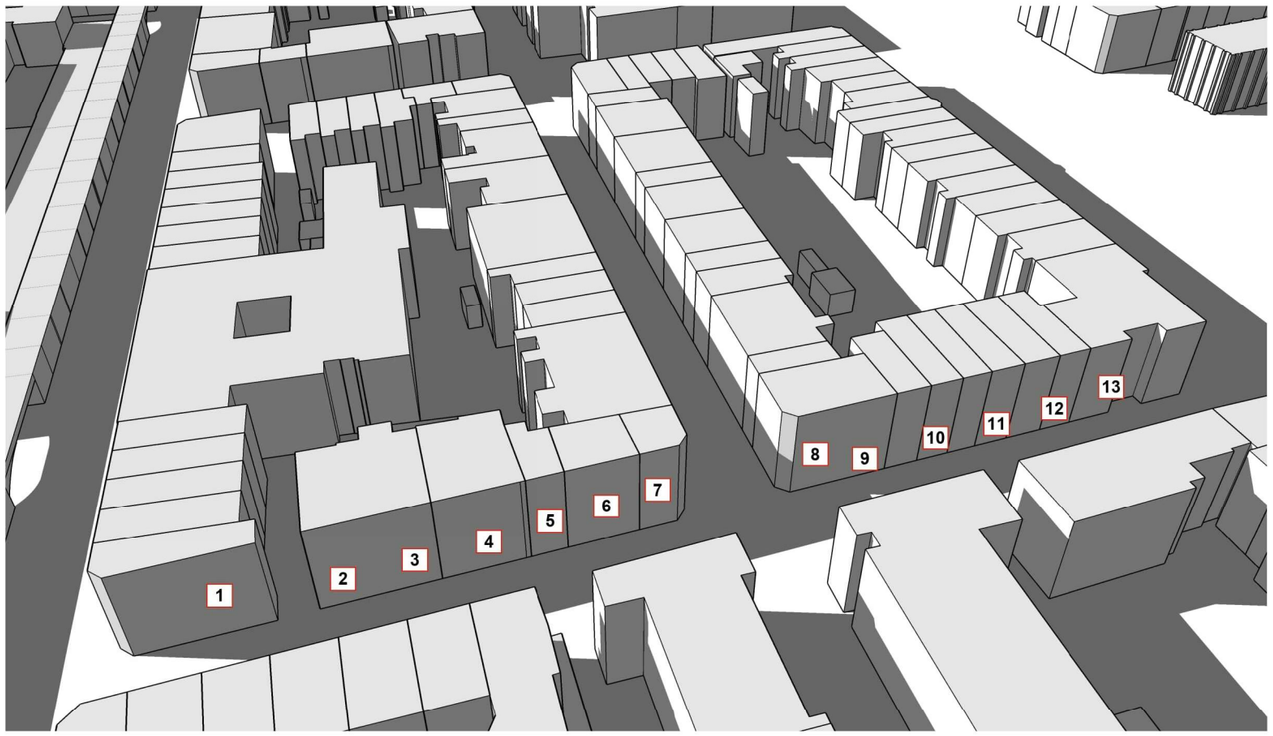

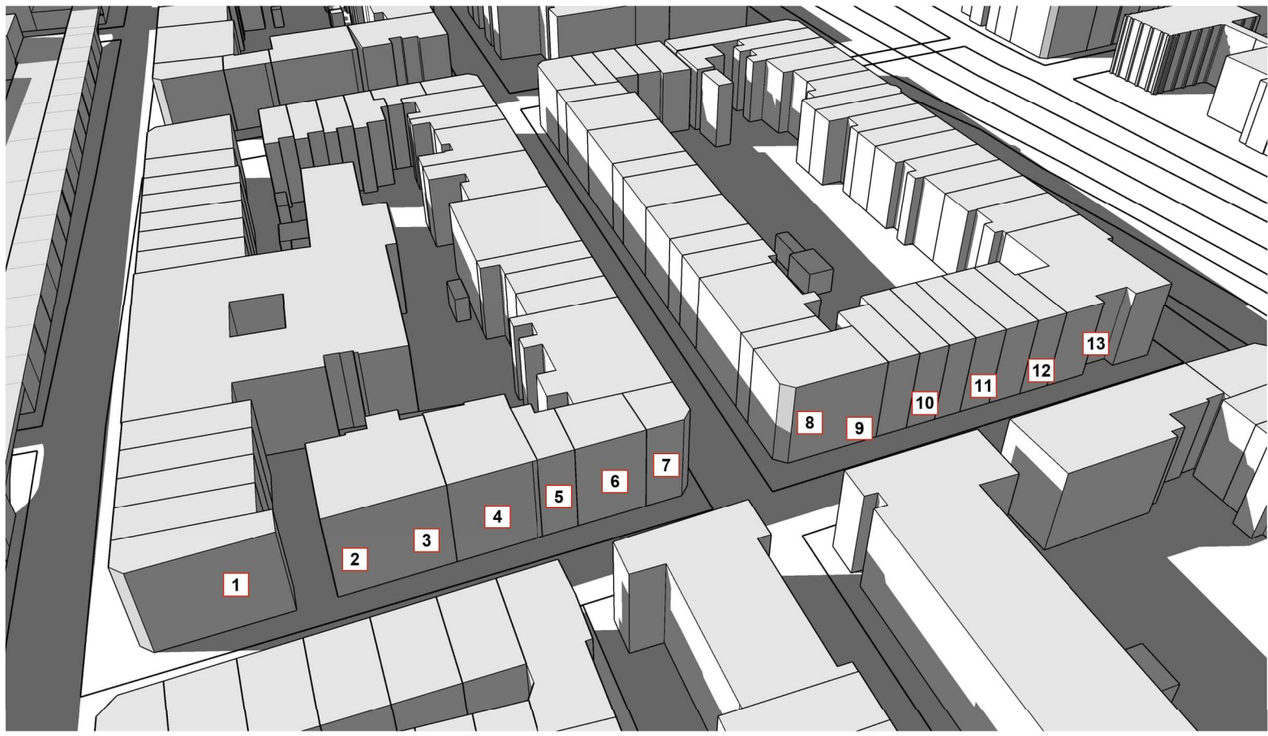

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21 september
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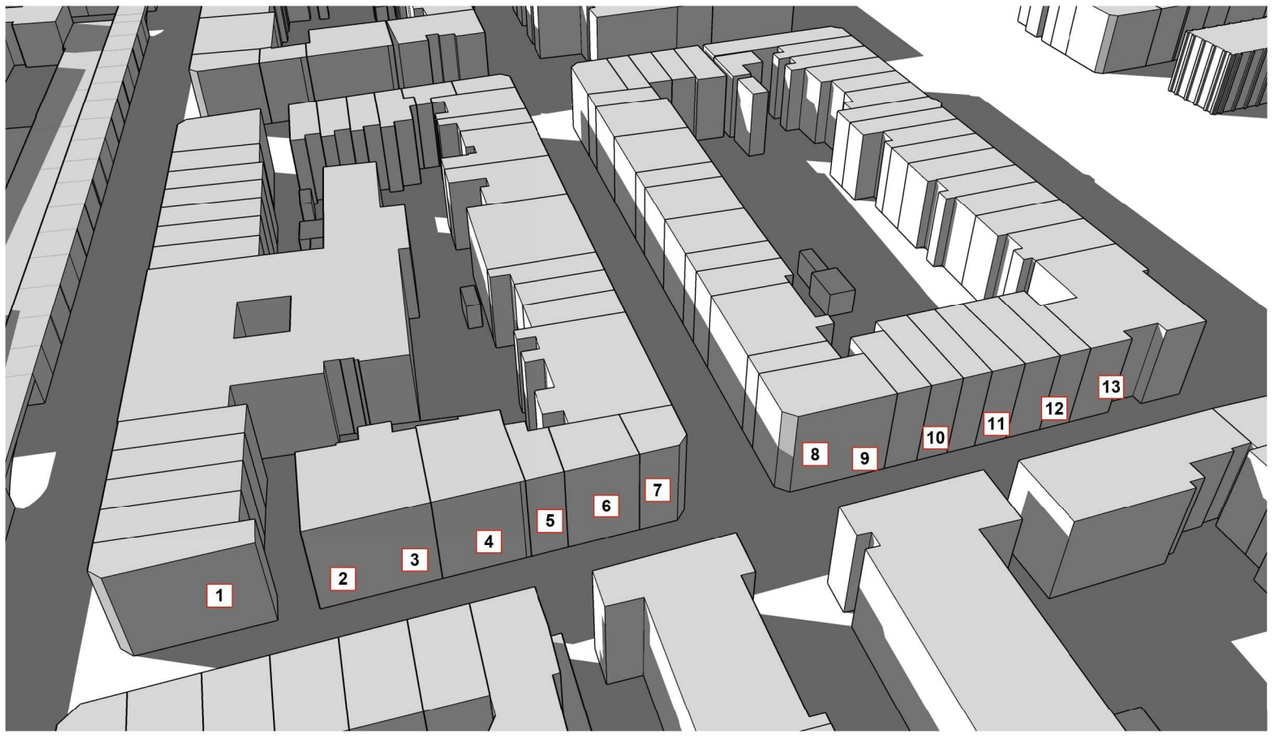

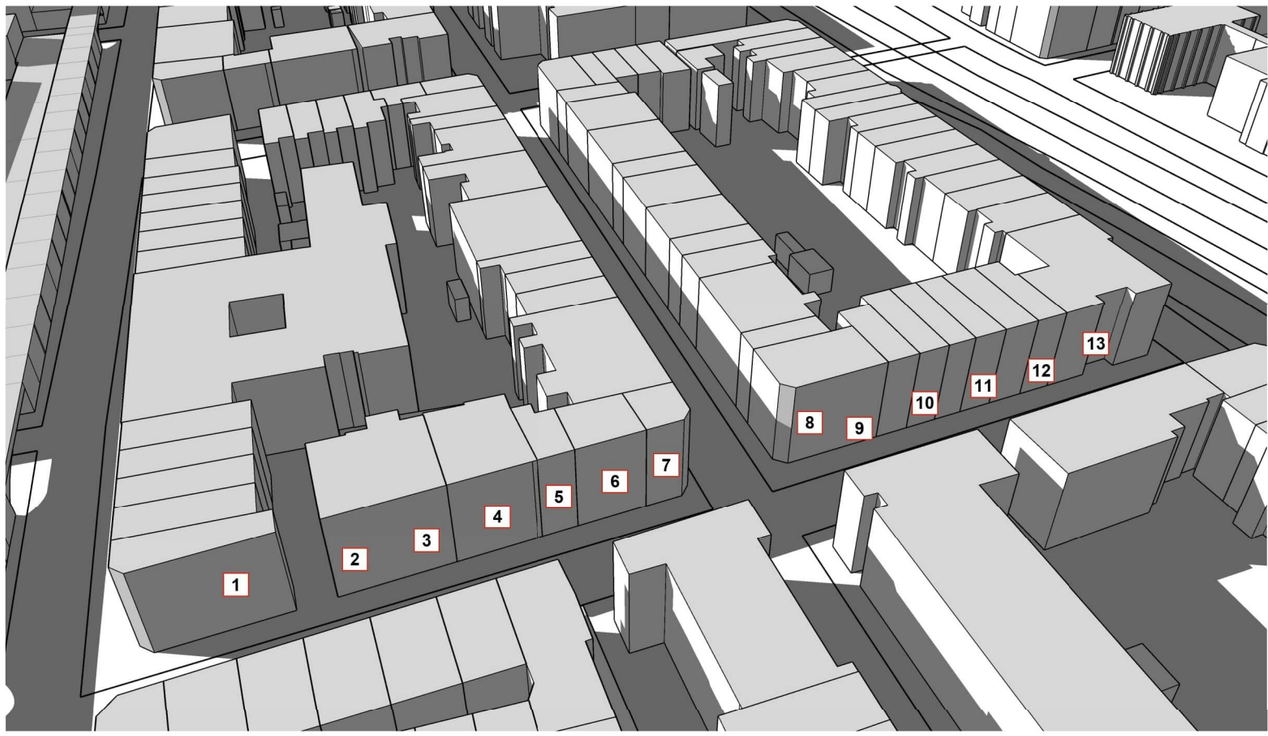

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21 september
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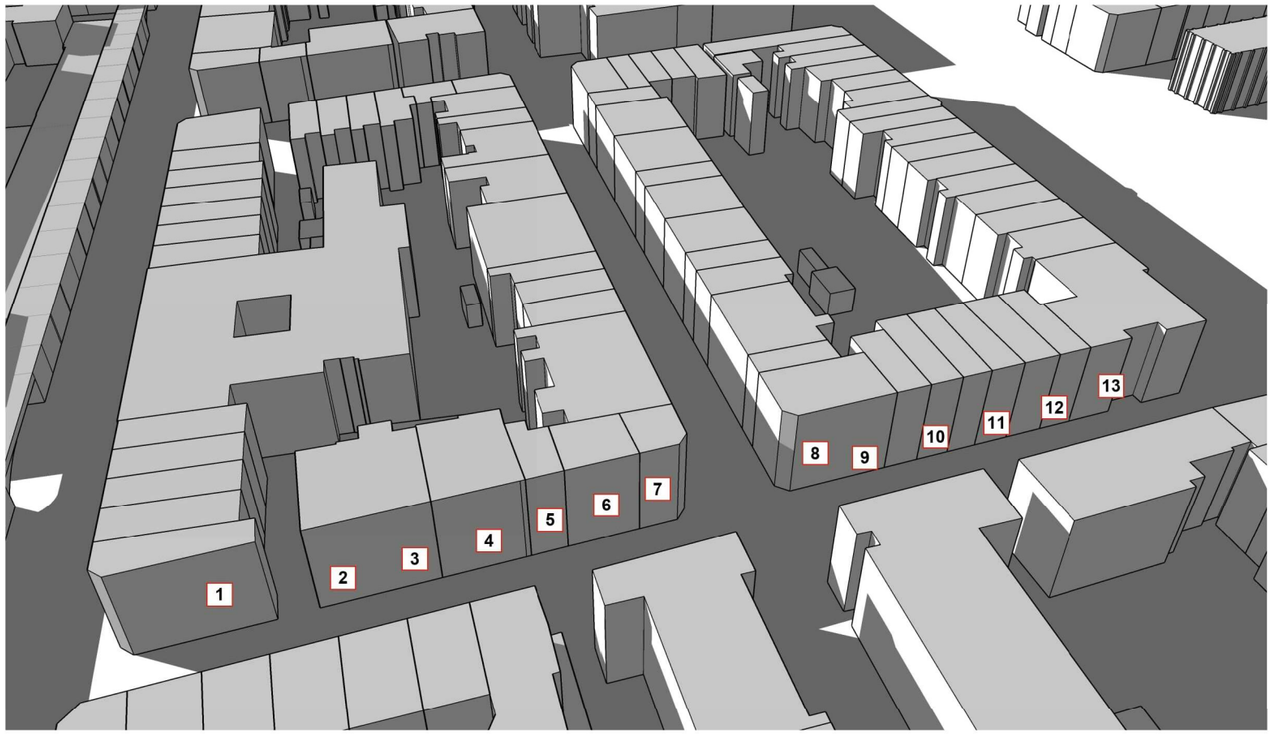



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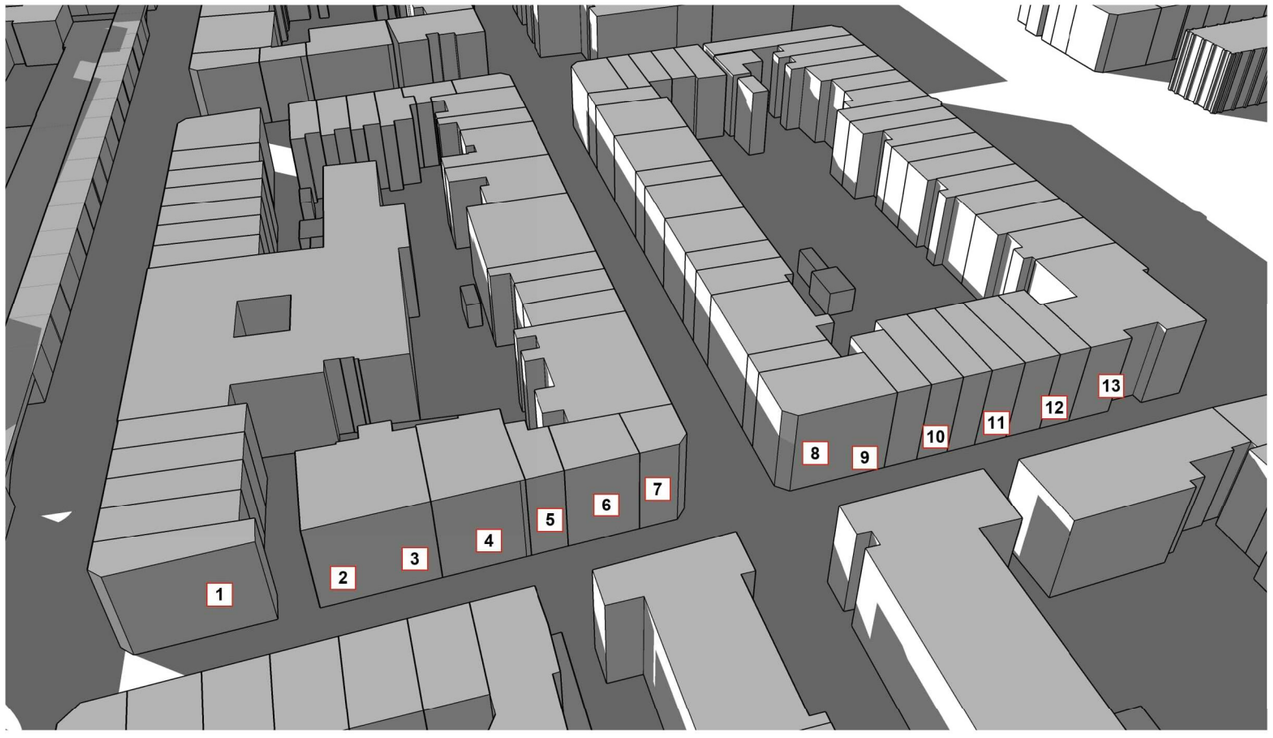
21 september
17.00





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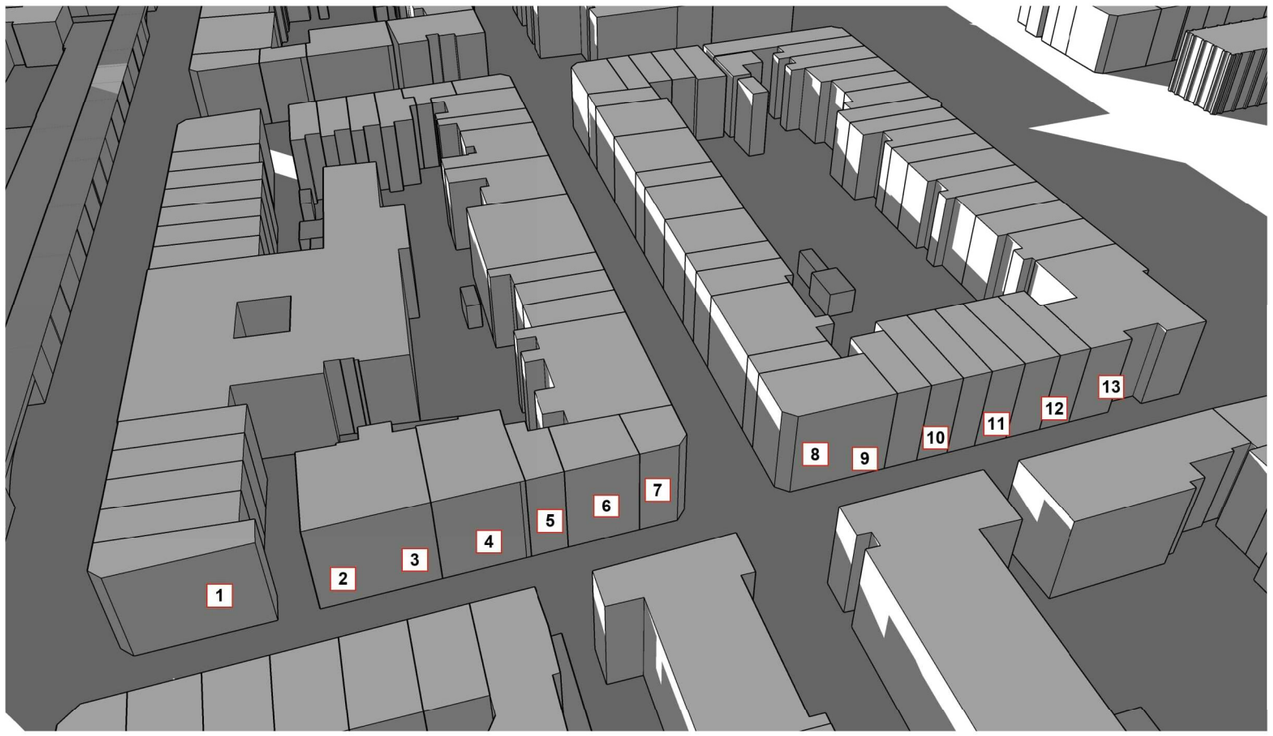

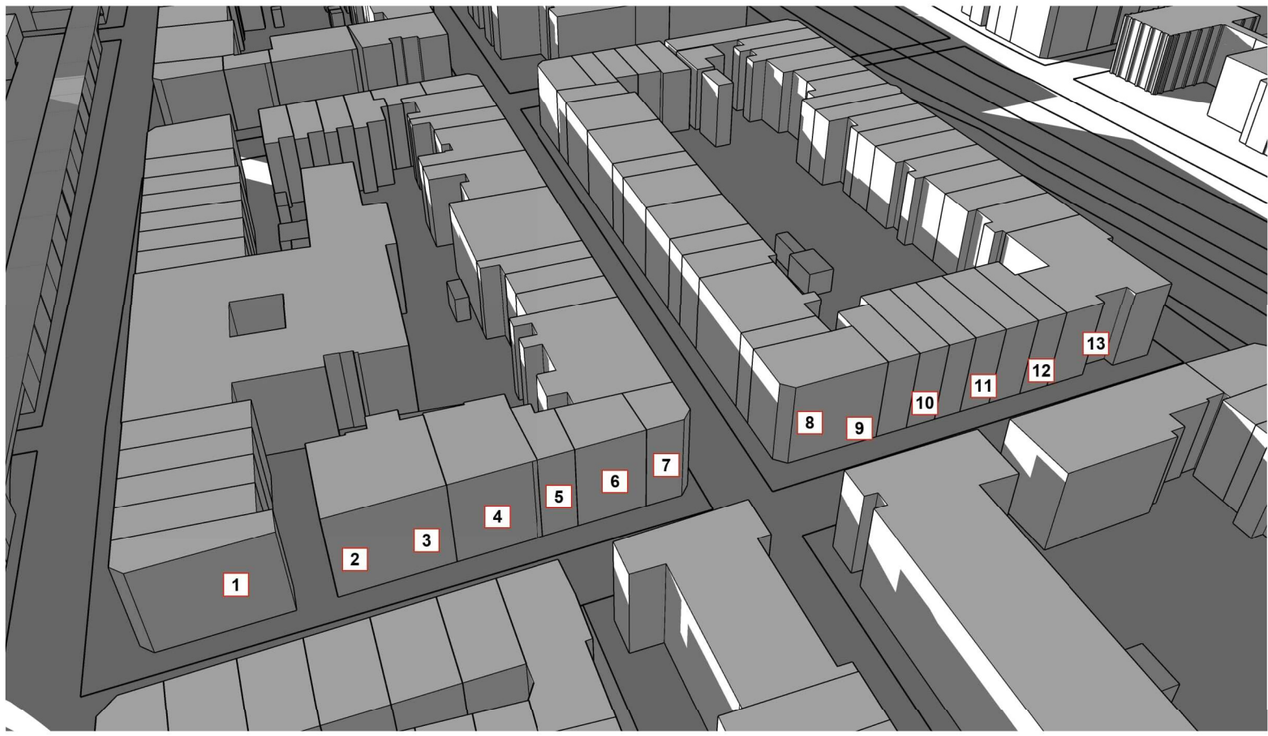

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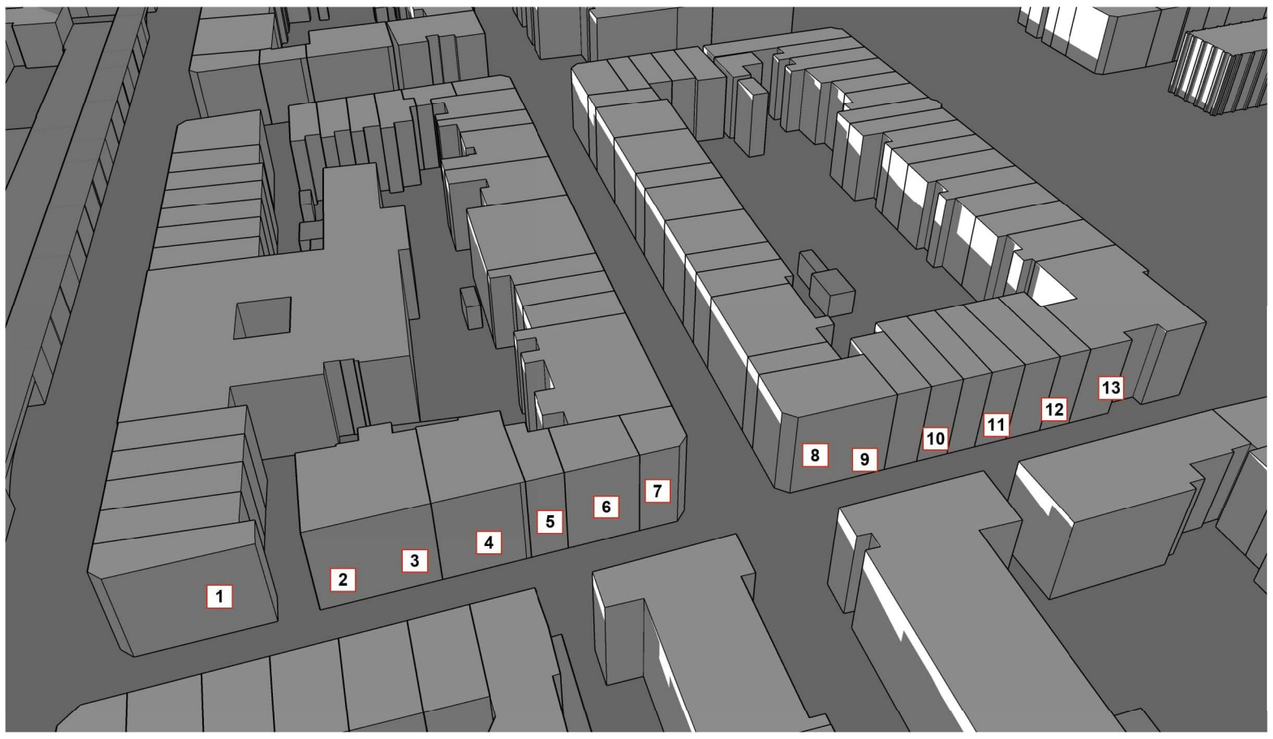
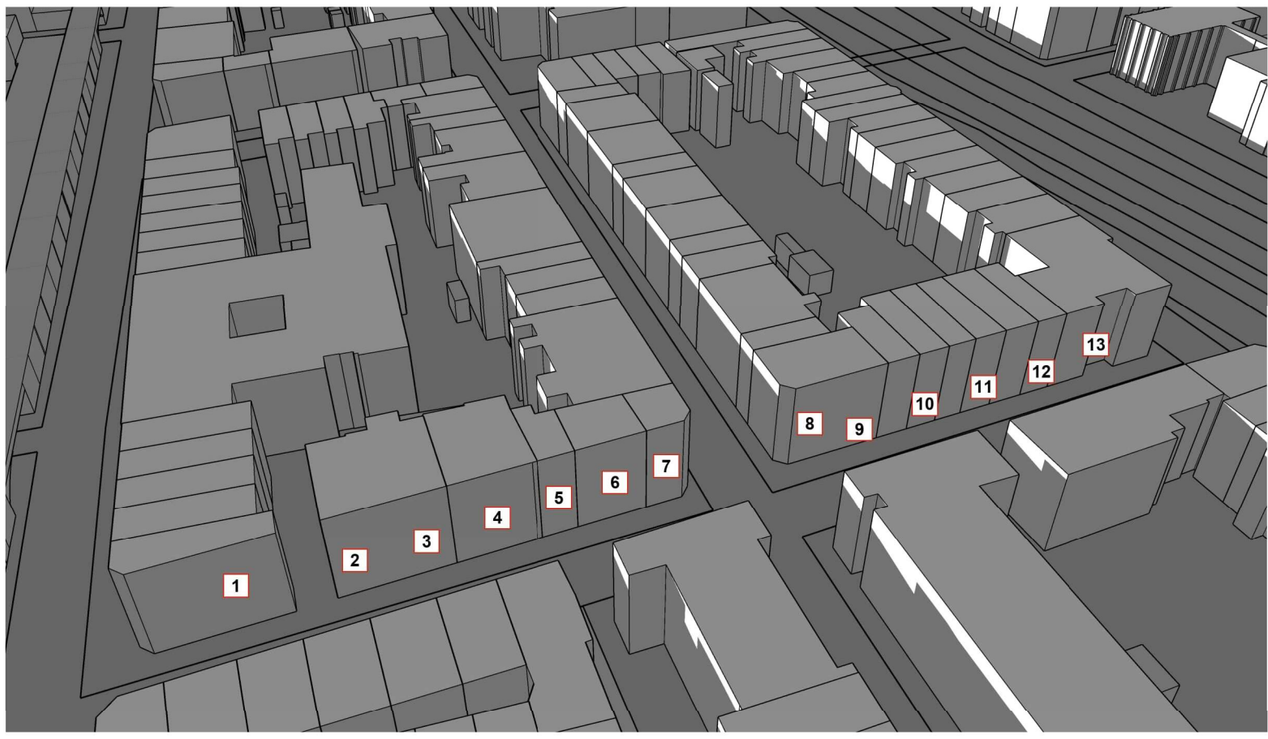
21 september
18.00





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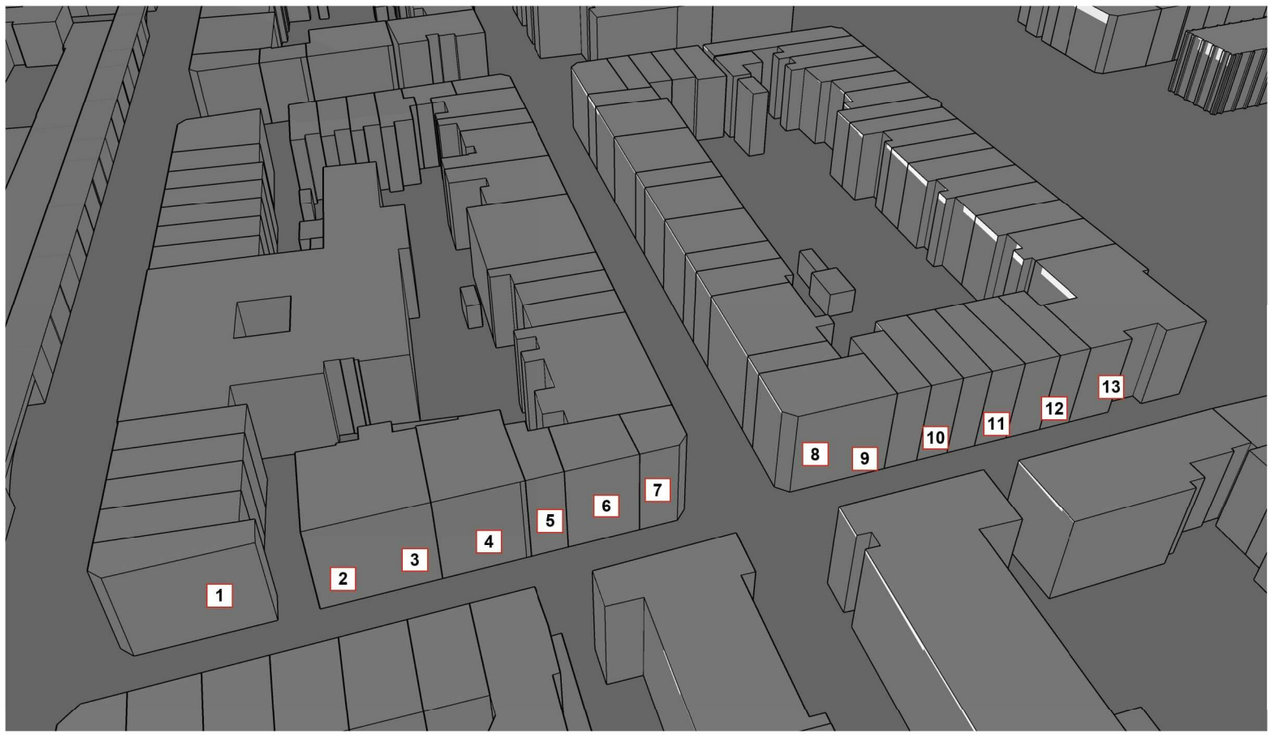
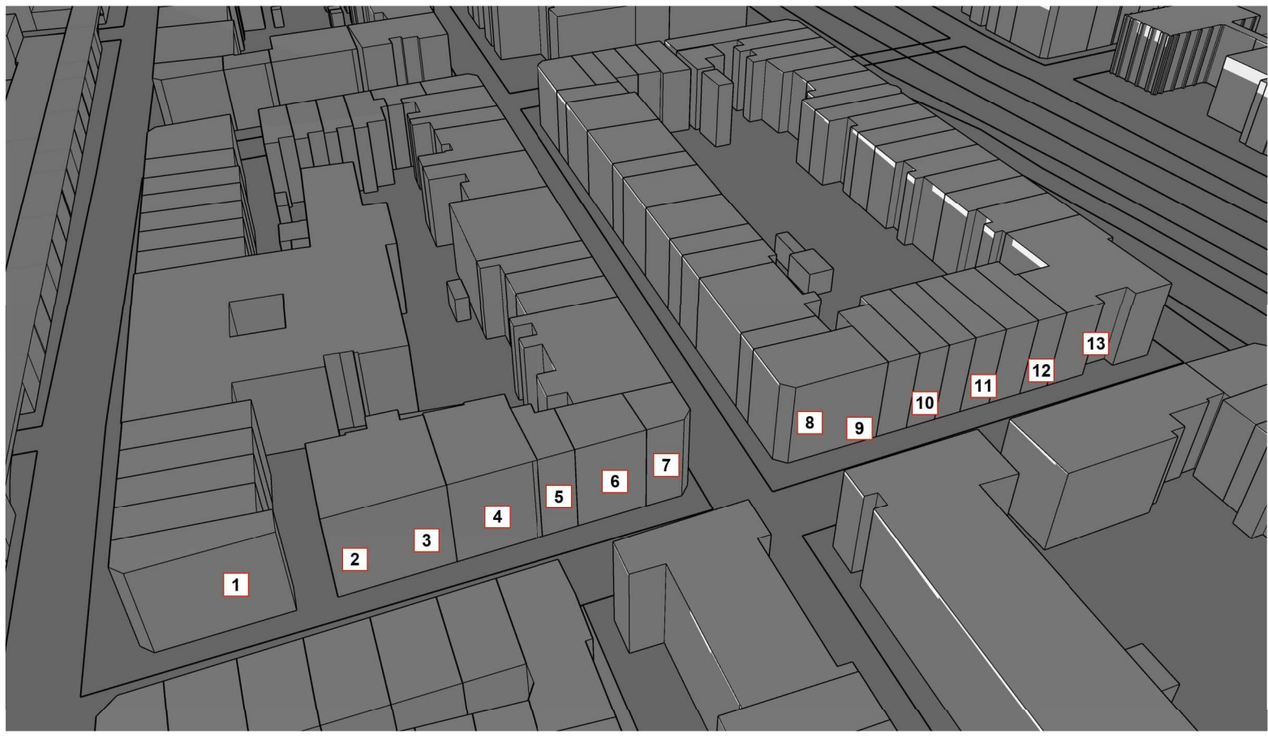
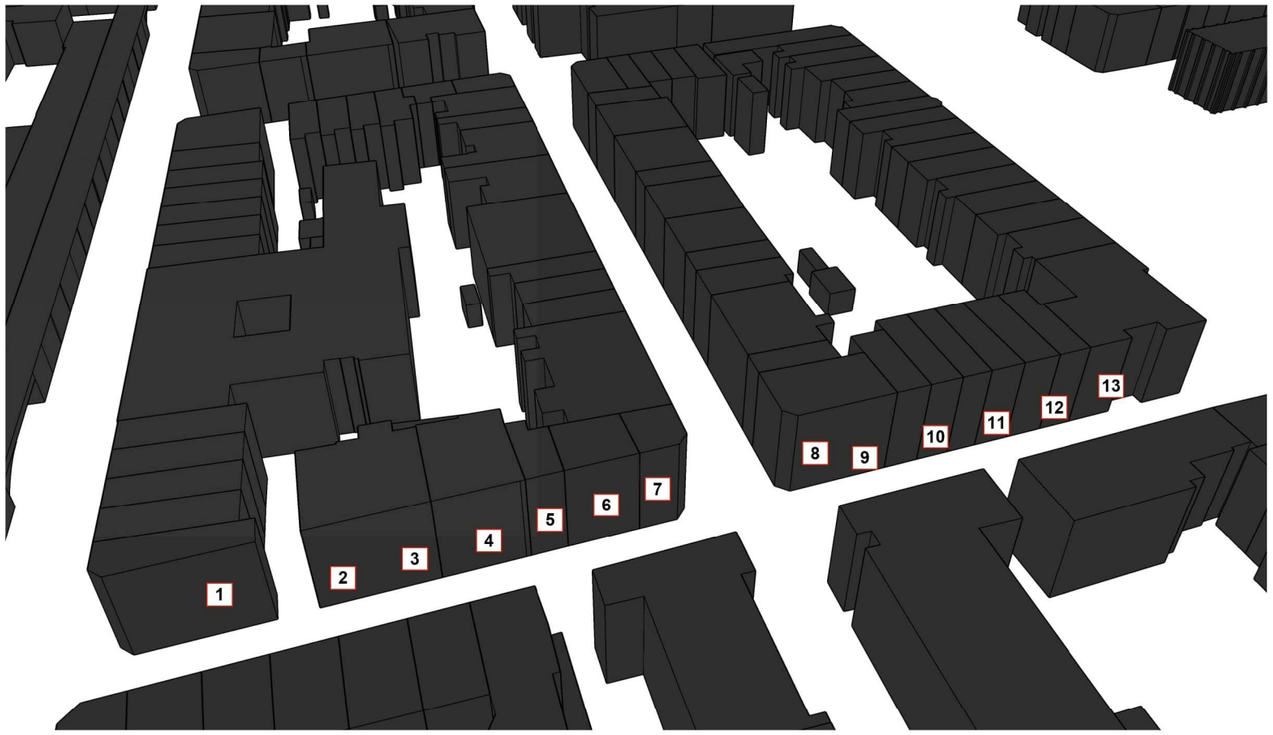
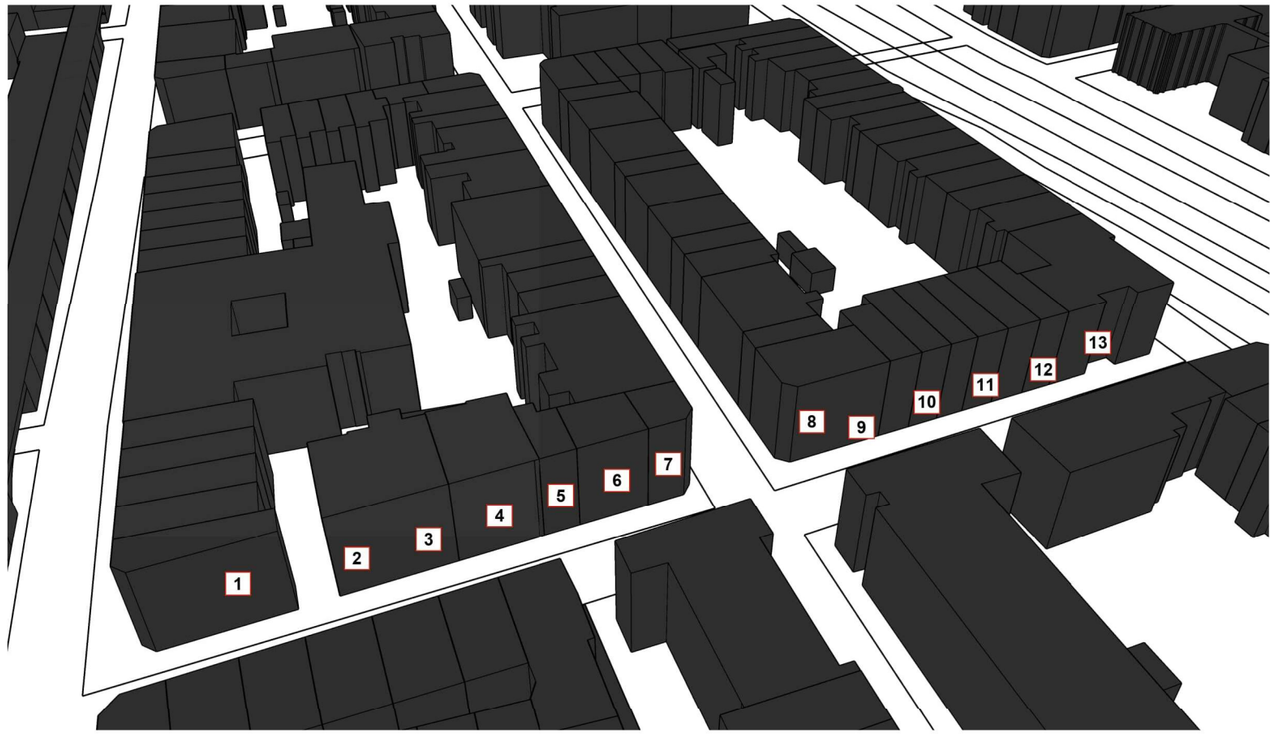




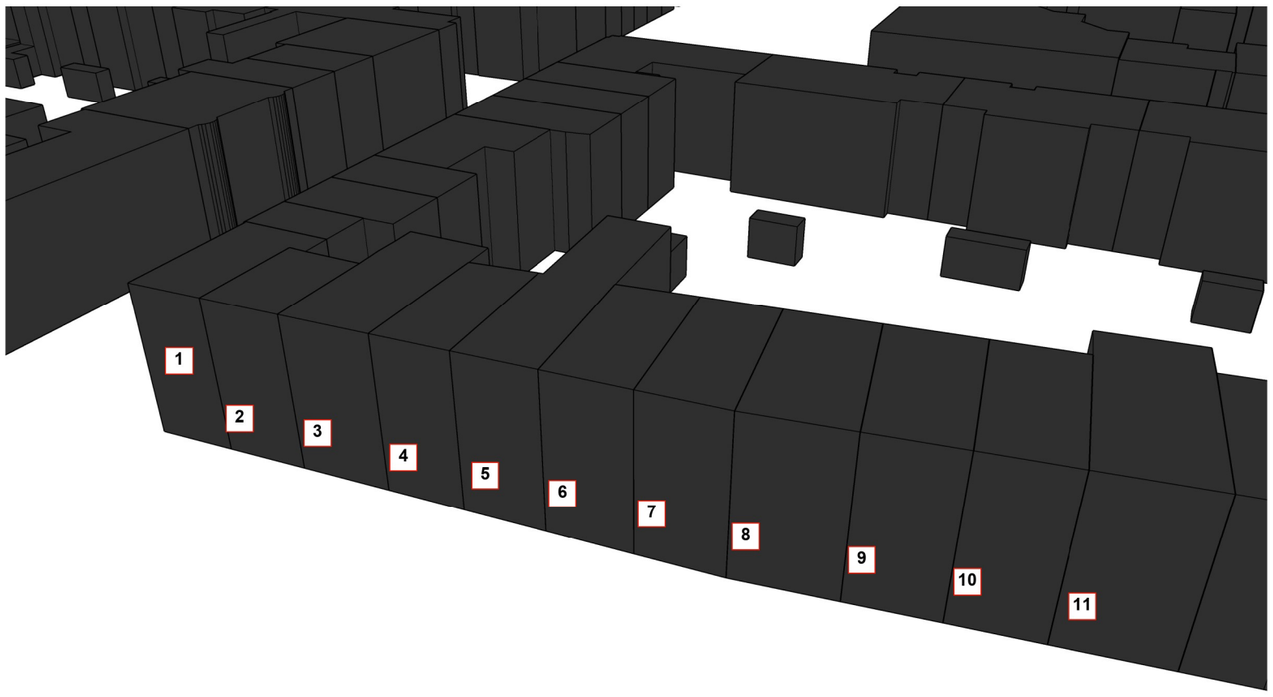
Herlaerstraat
21 september
19.00

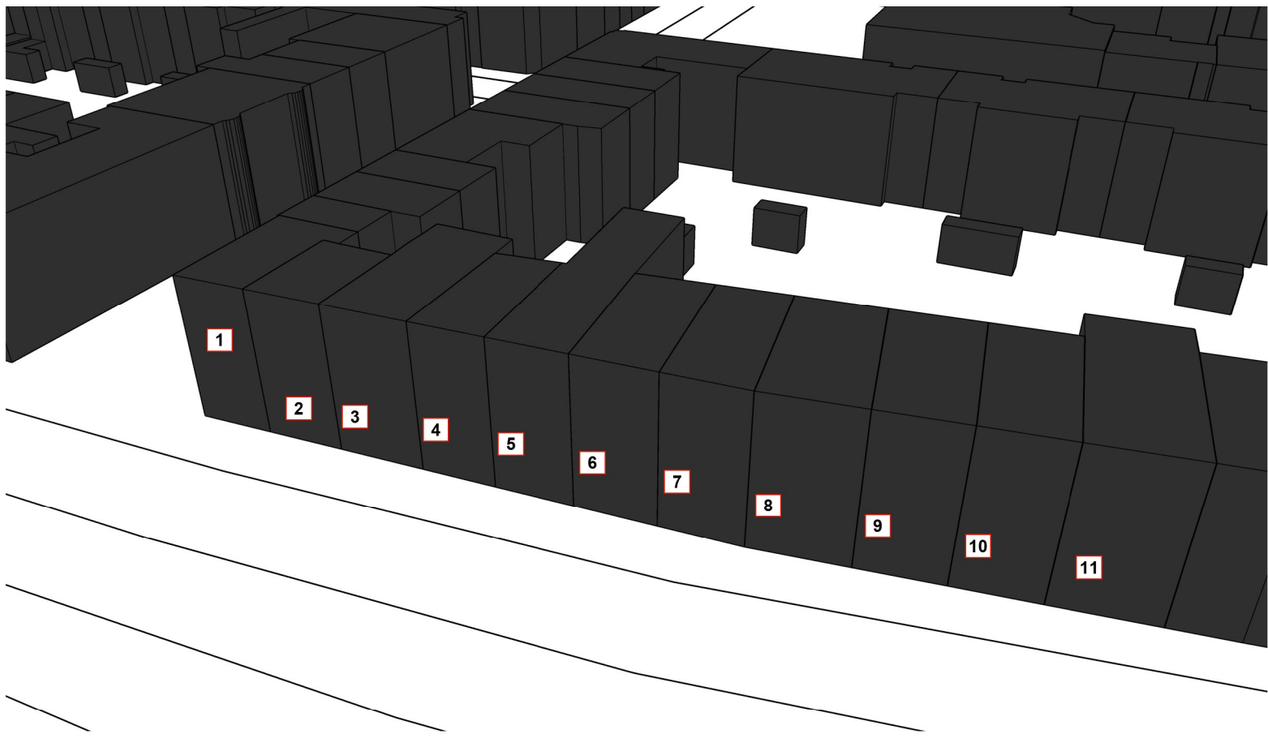




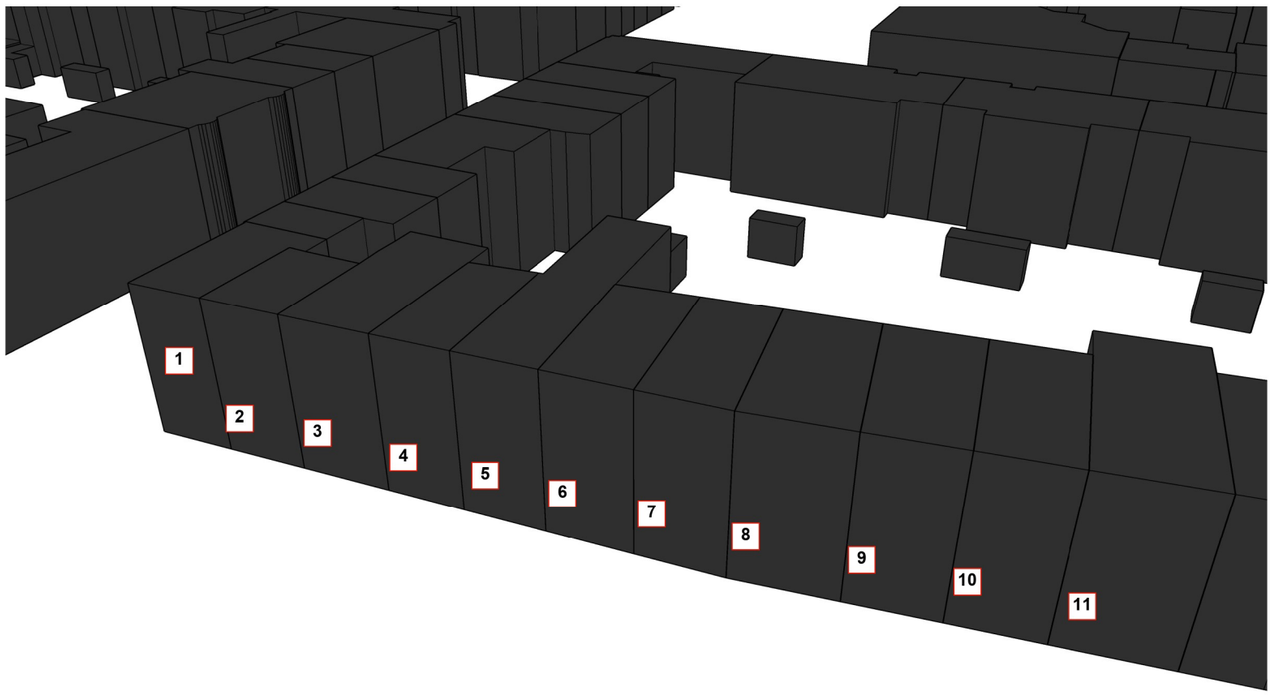
bijlage 7. resultaten 21 september Noordsingel 17 – 37 huidig vs. nieuw

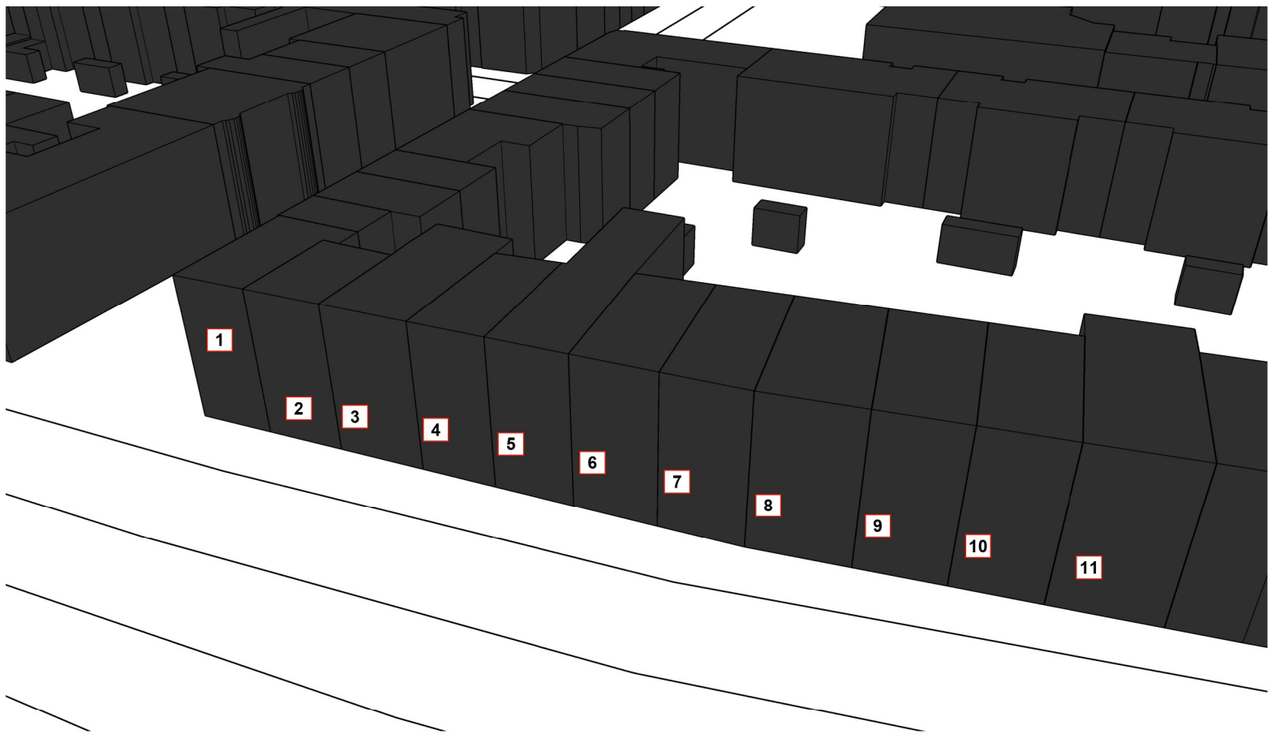
Noordsingel 17 - 37
21 september
06.00



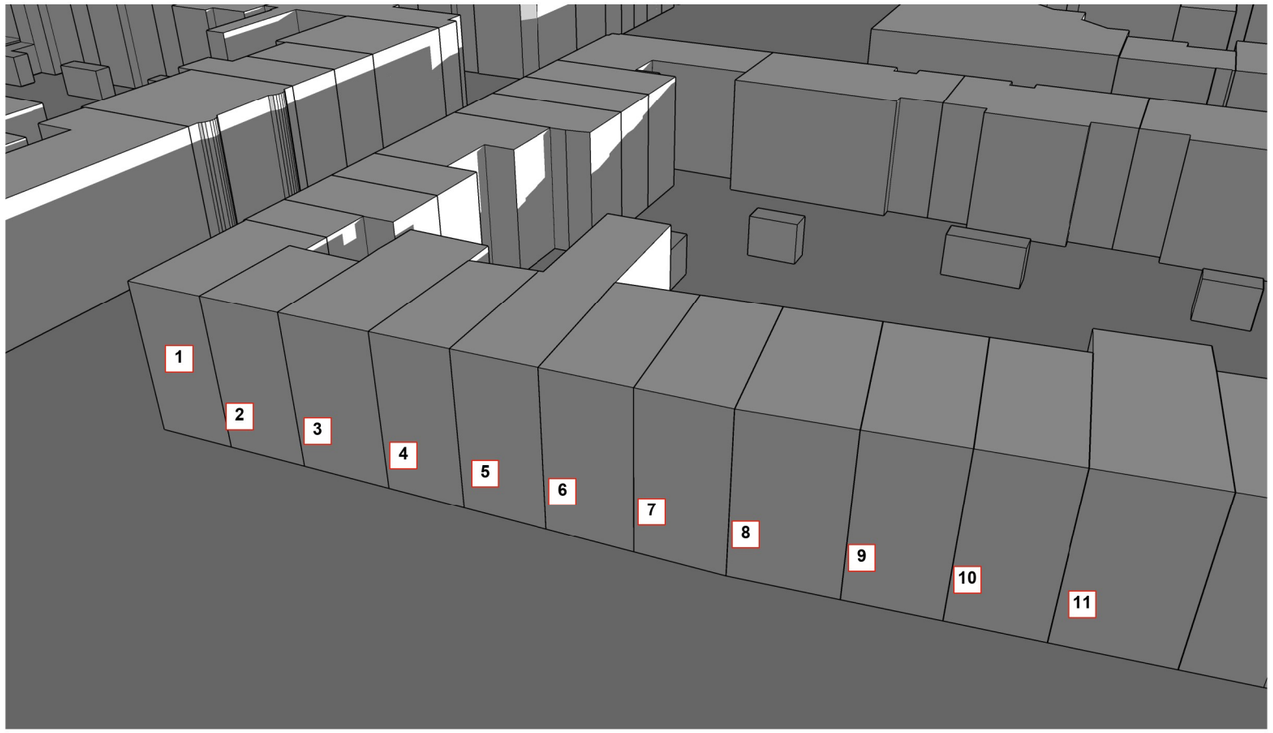


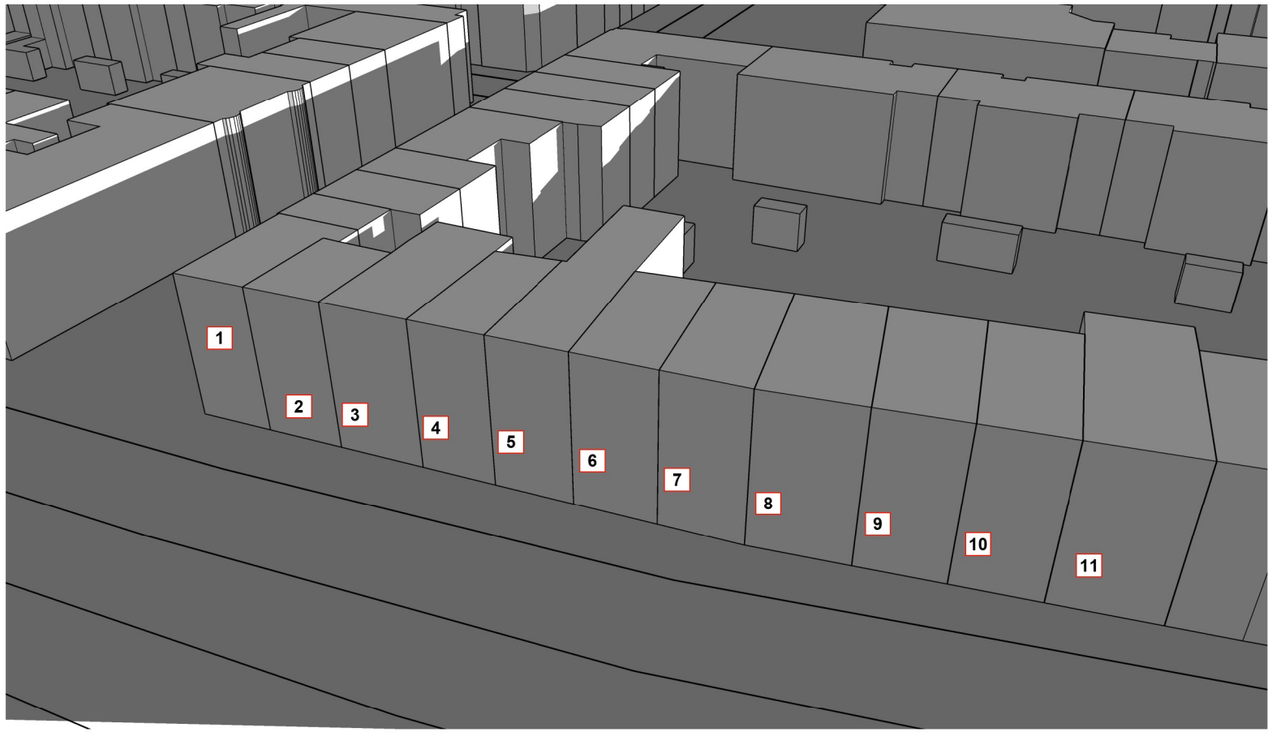
Noordsingel 17 - 37
21 september
06.30





Noordsingel 17 - 37
21 september
07.00





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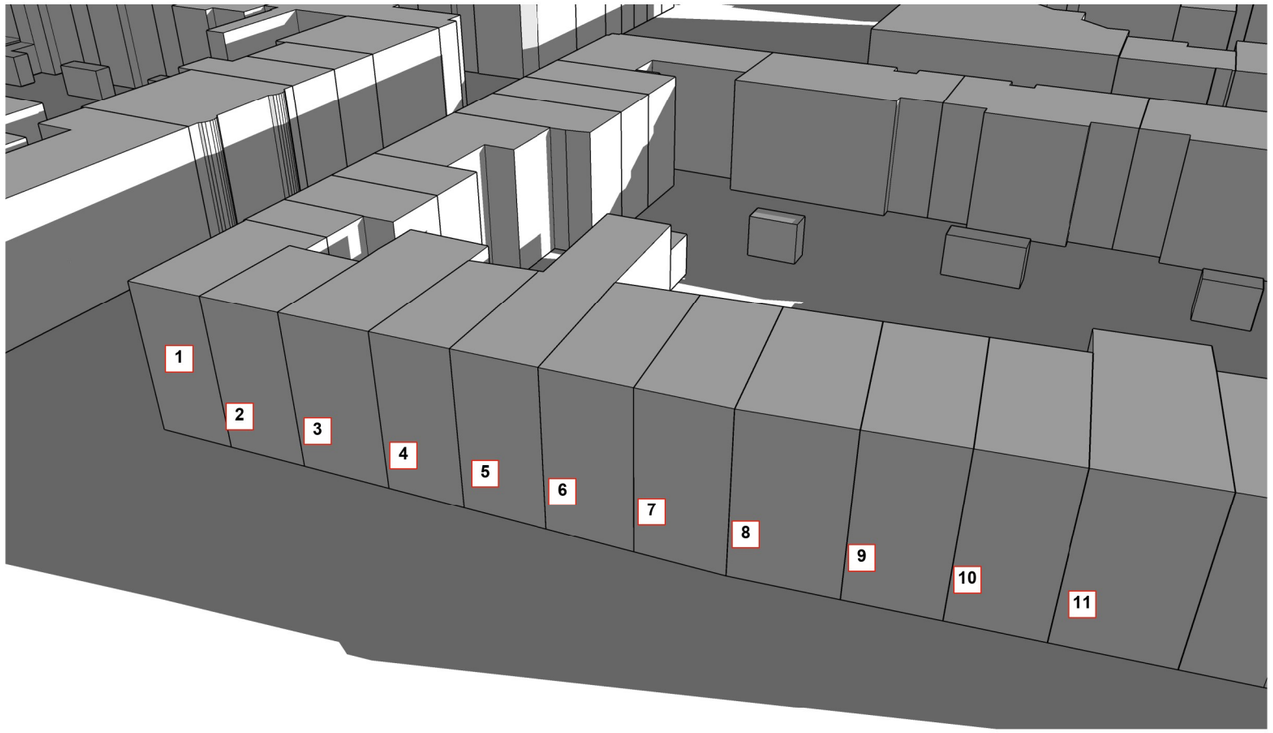

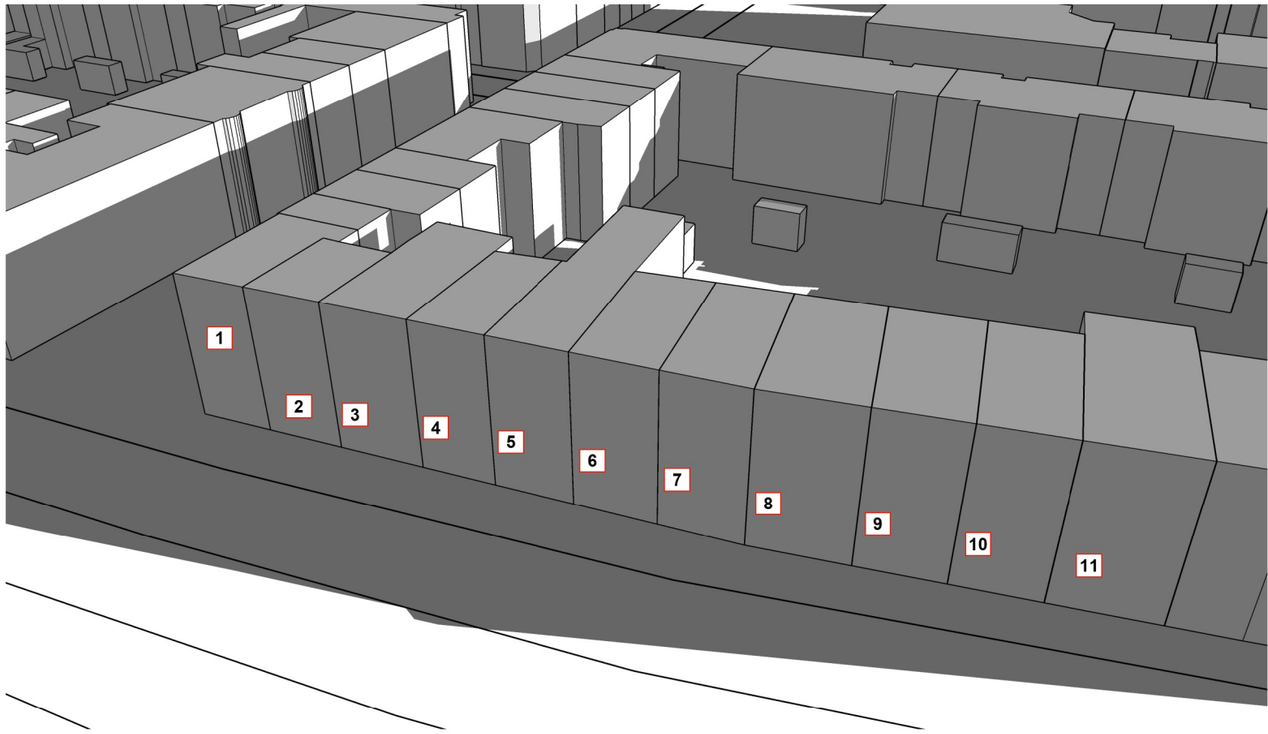

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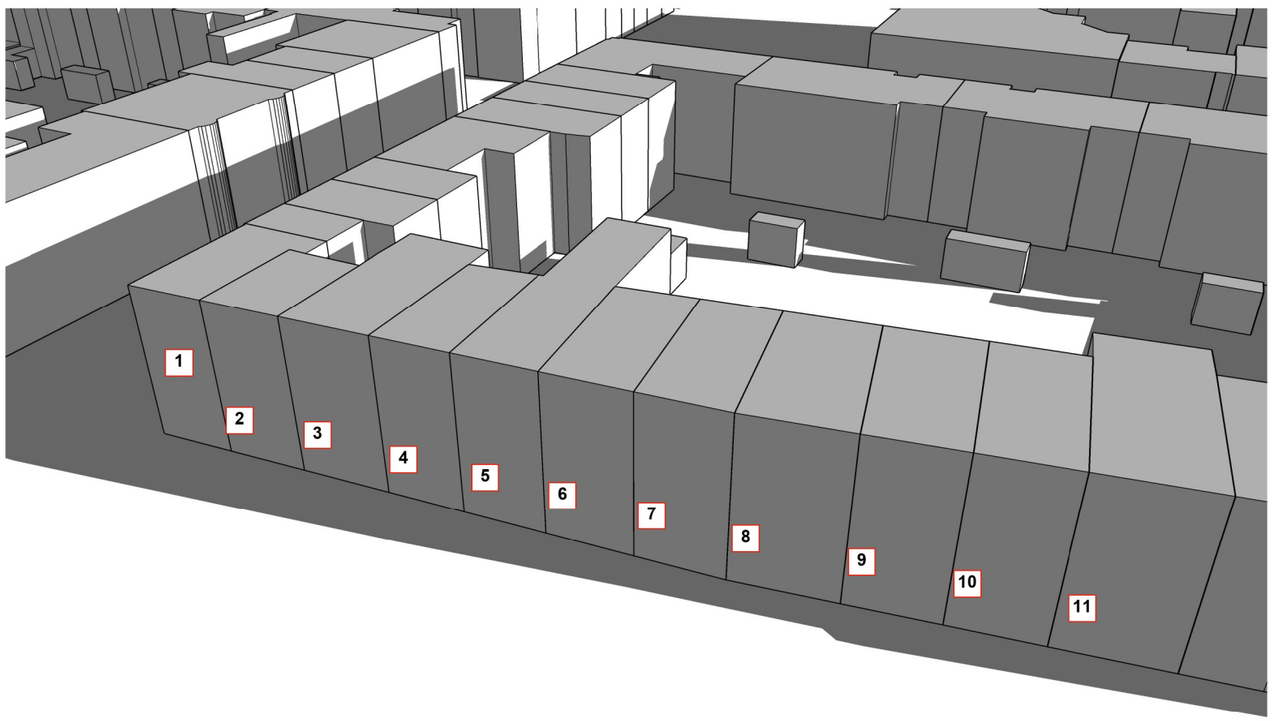

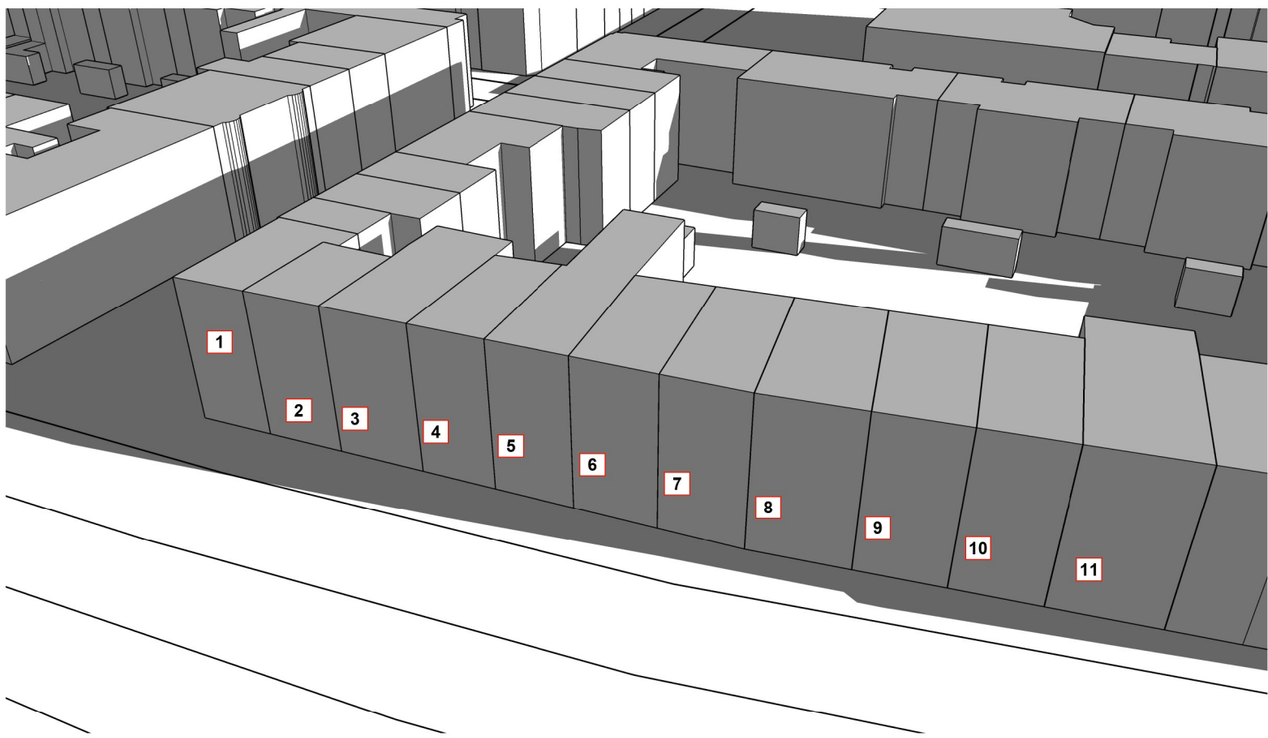

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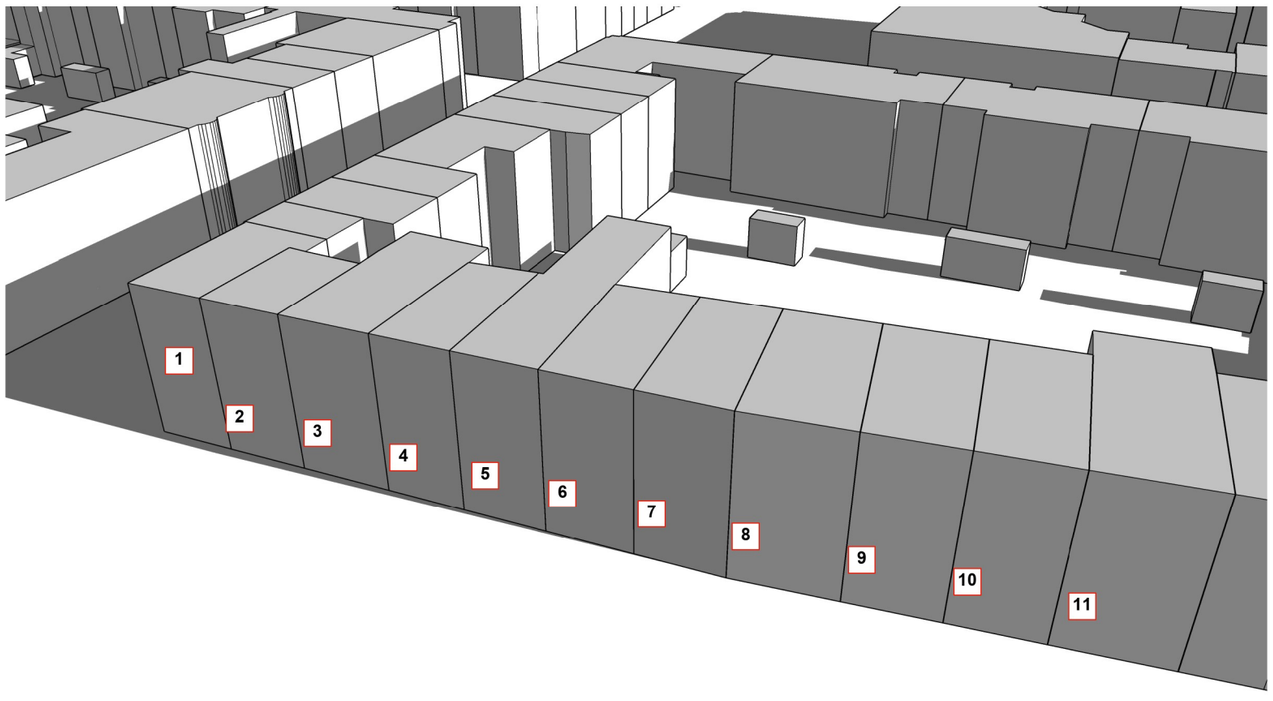

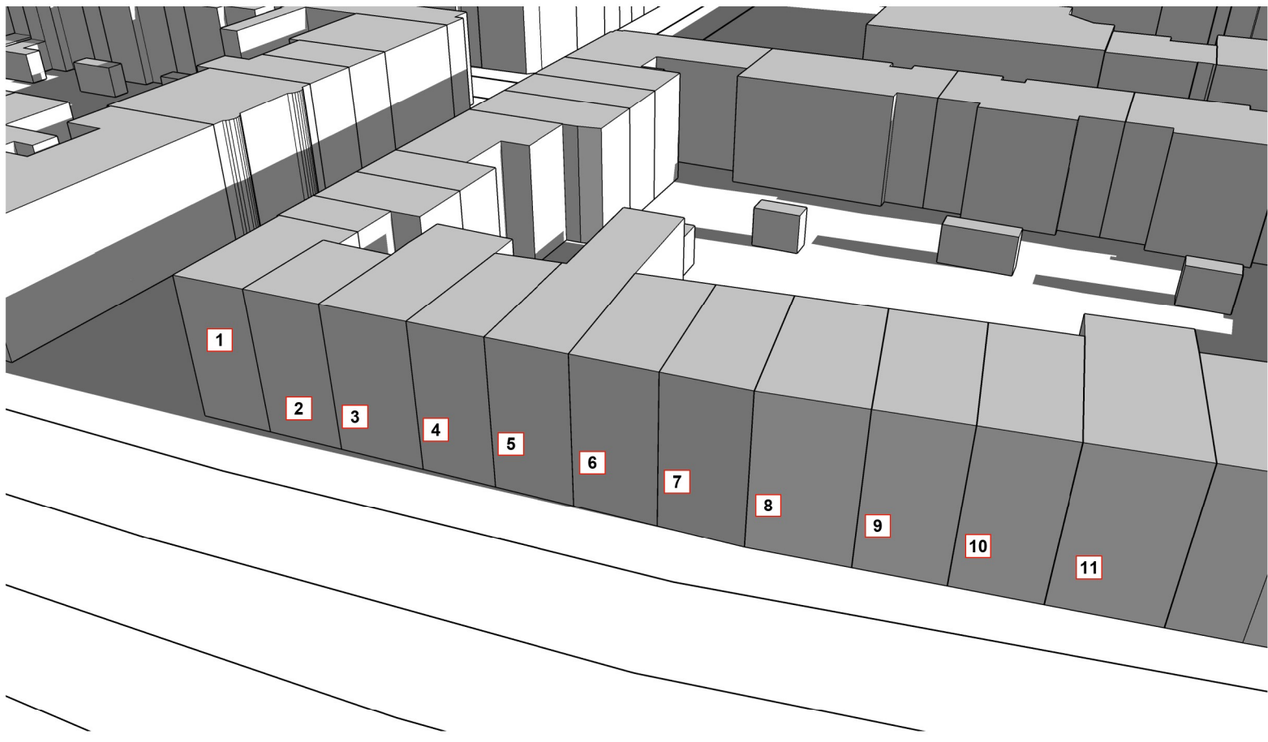

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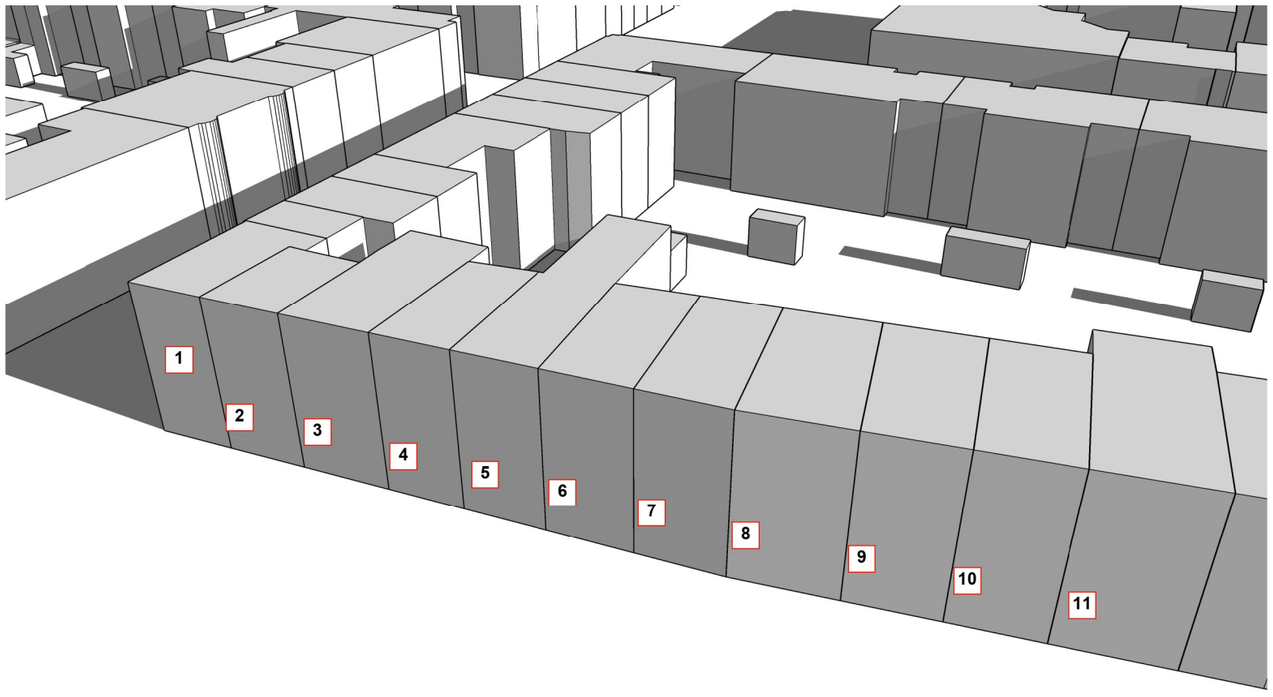

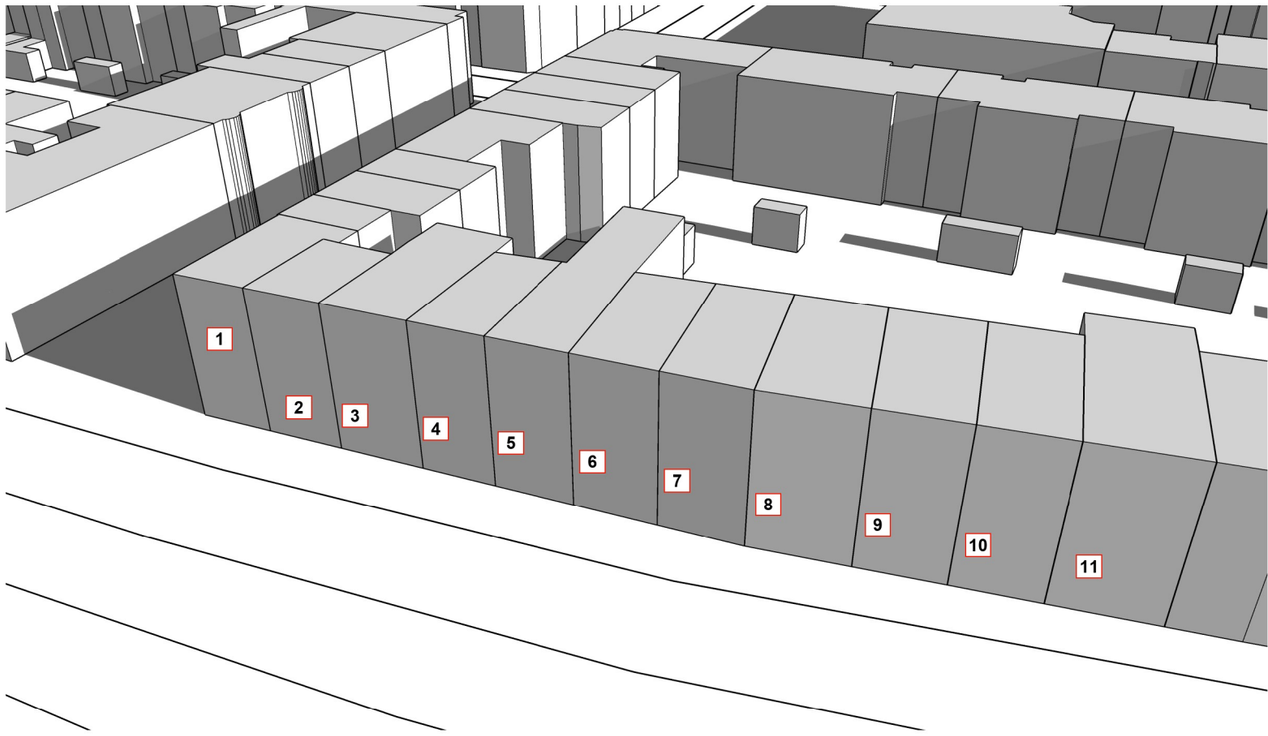

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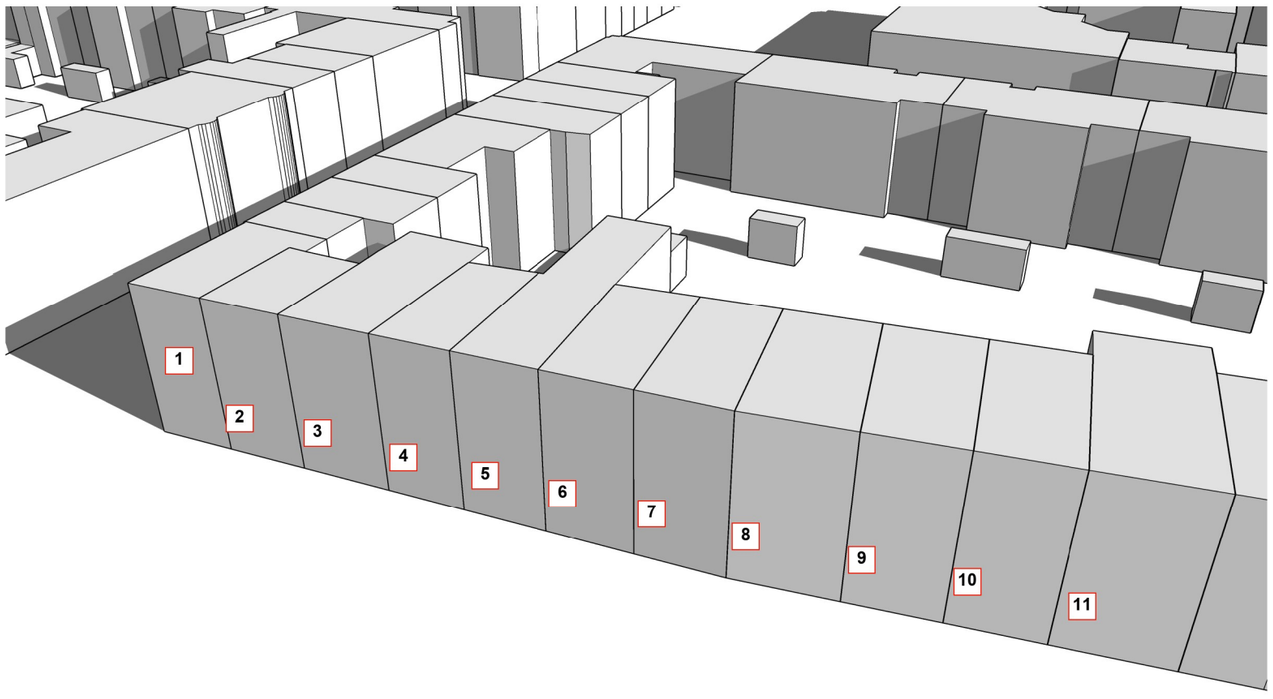



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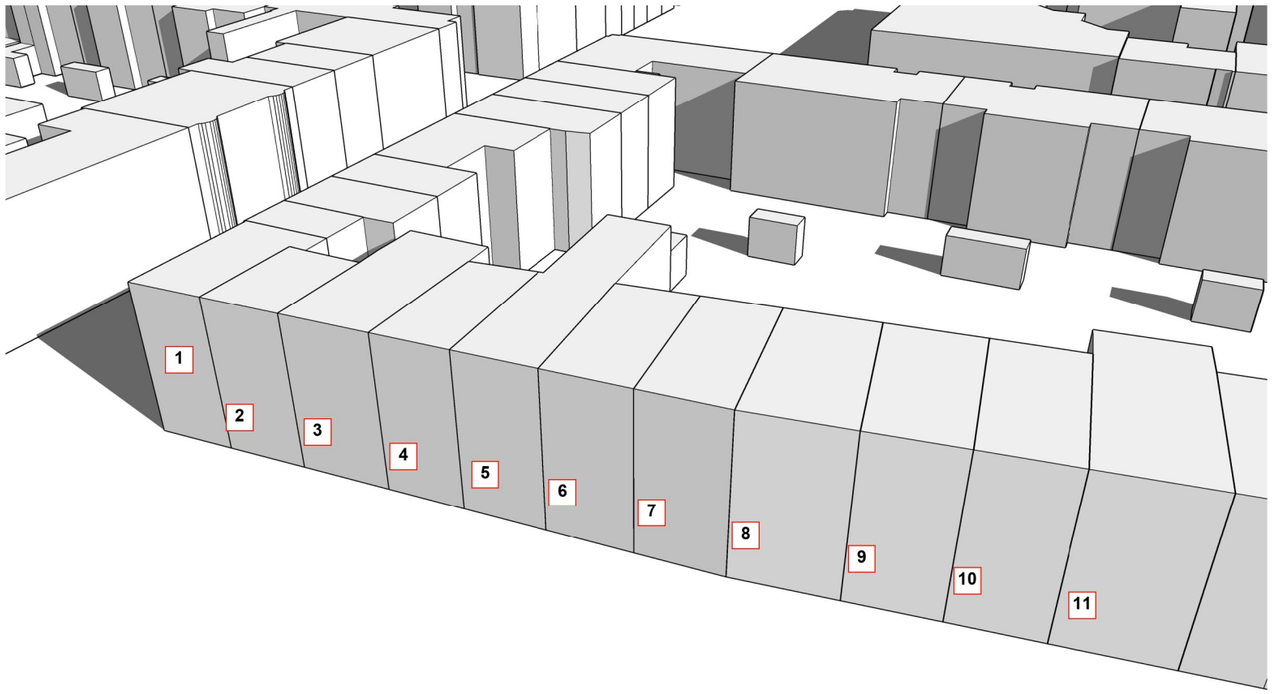

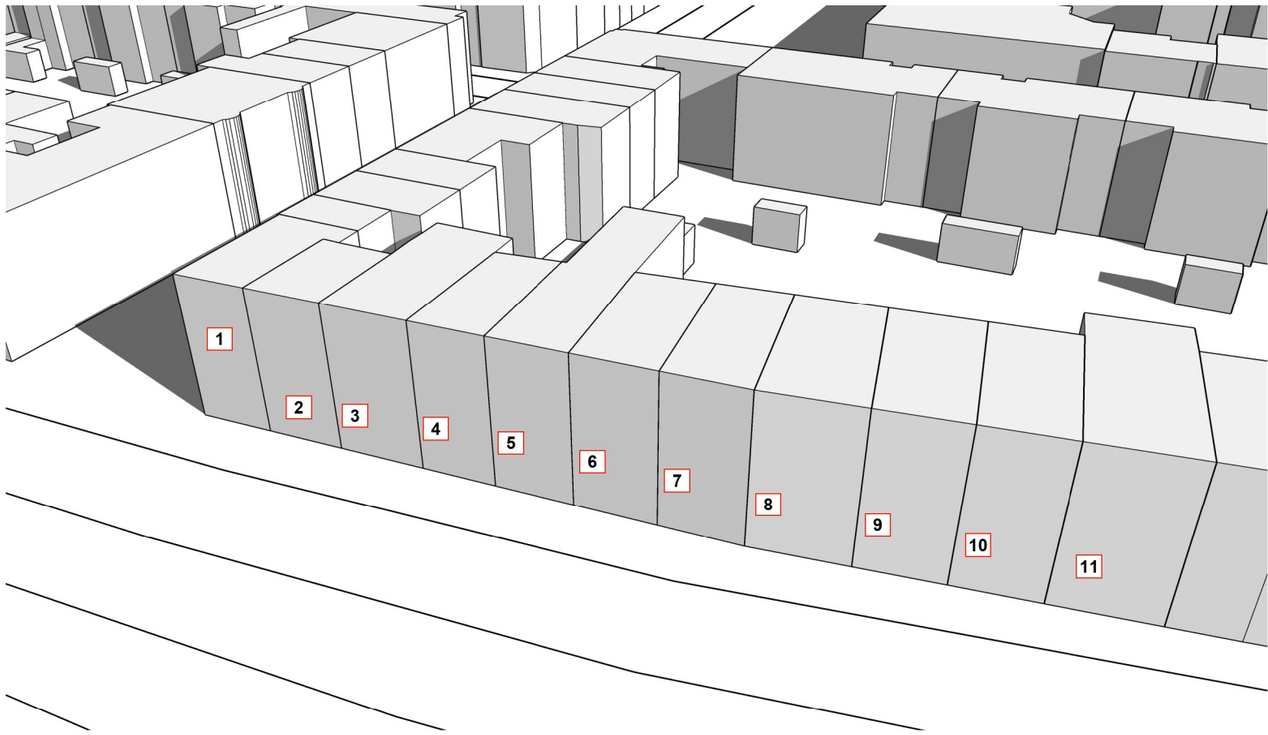

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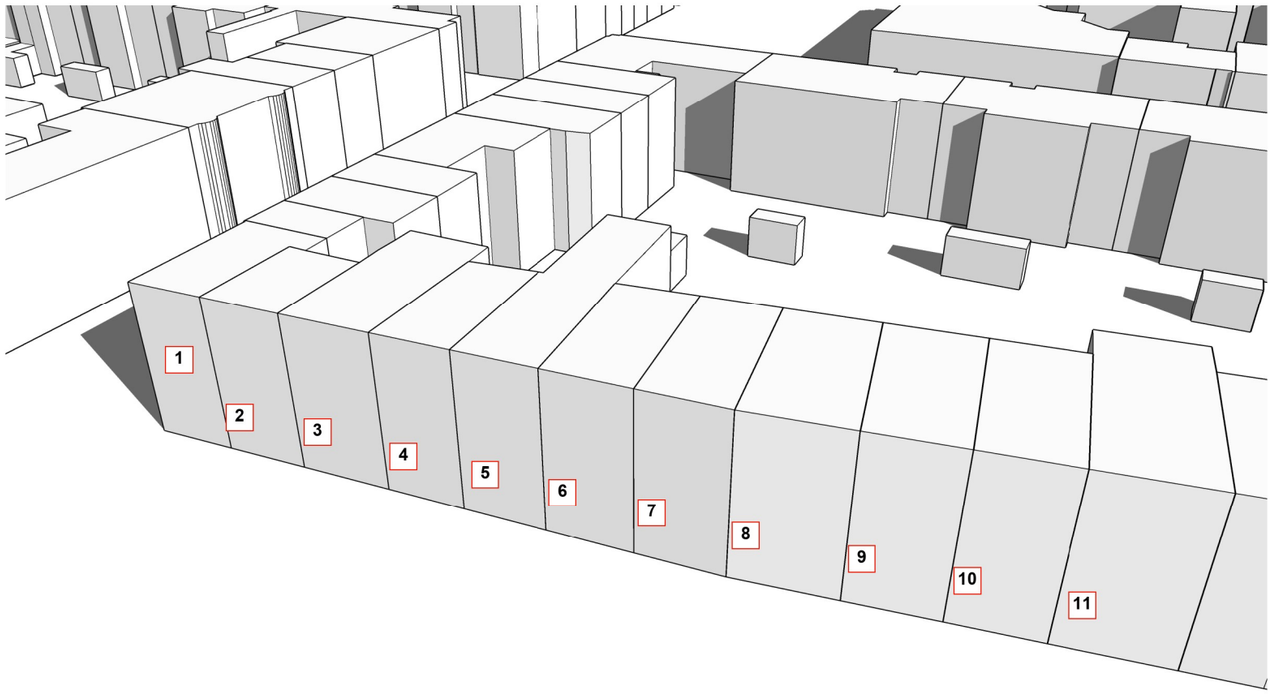

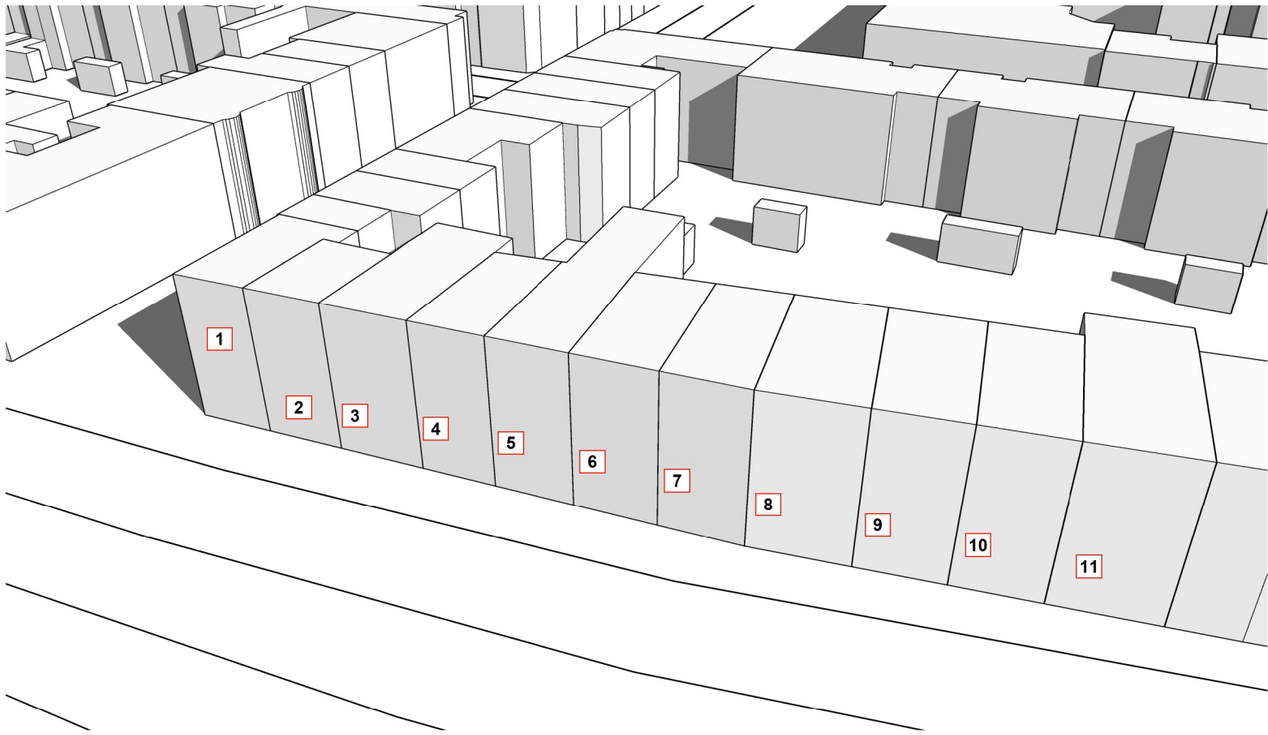

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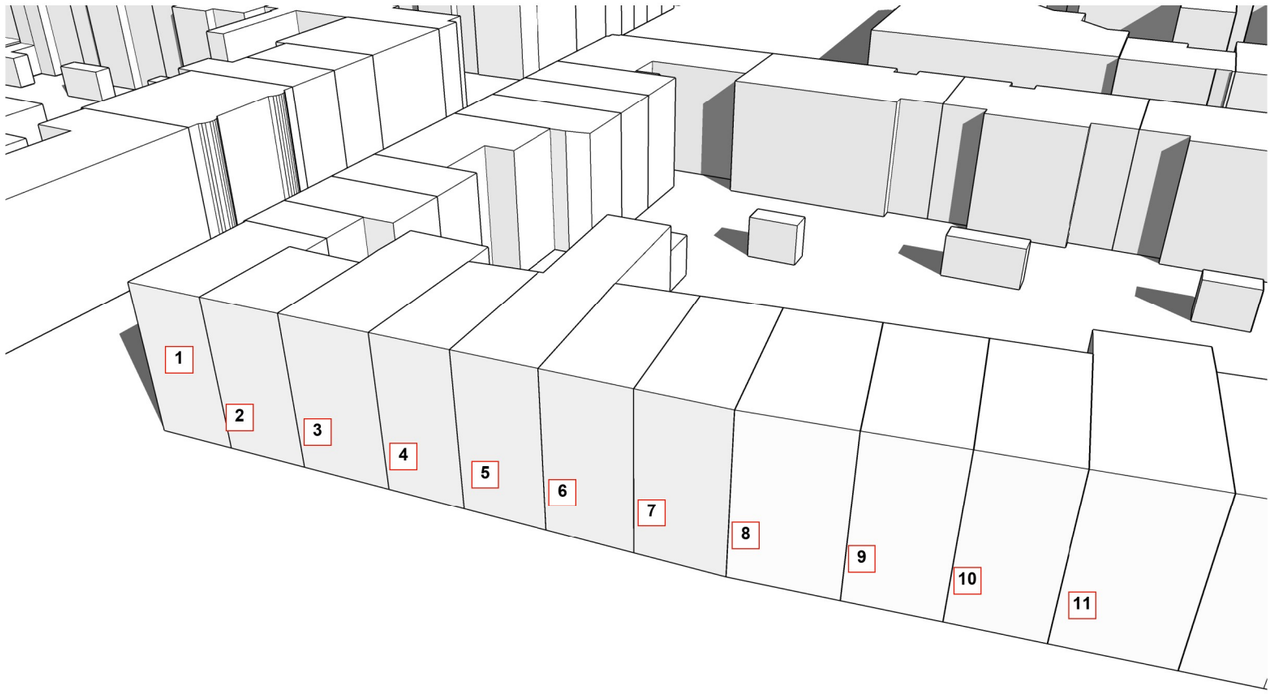

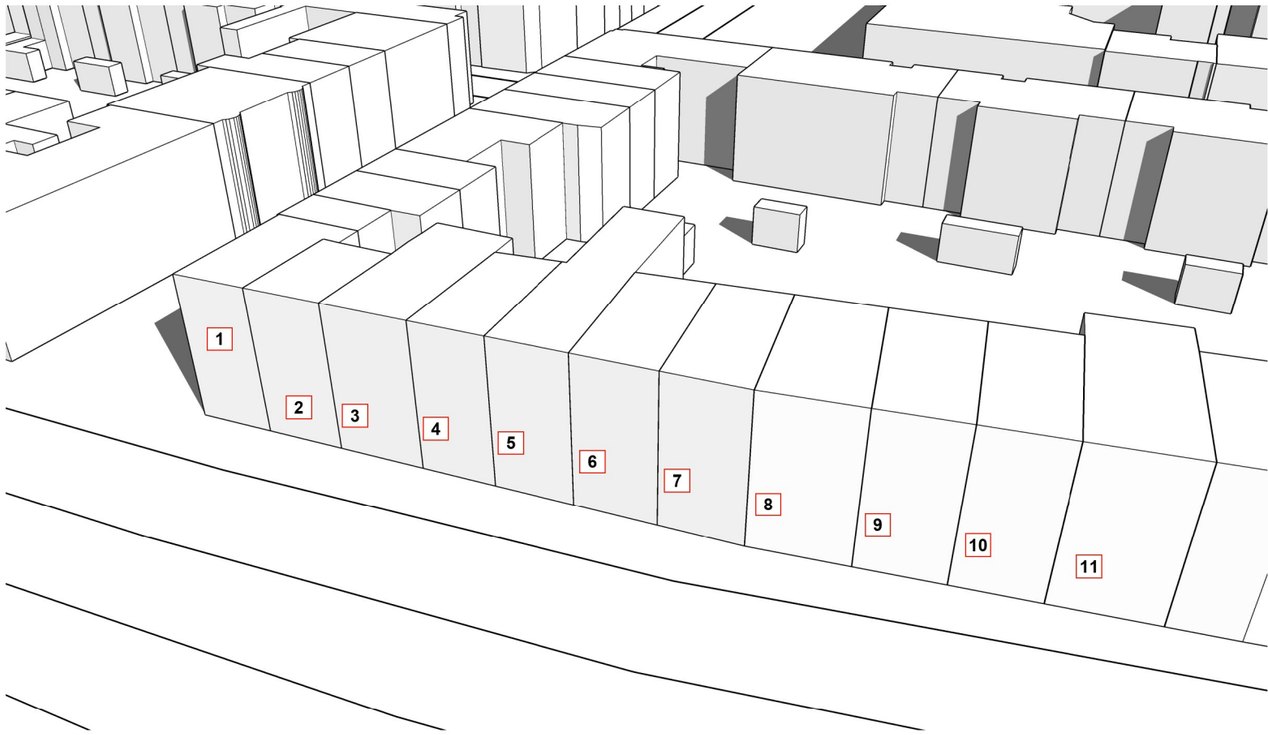

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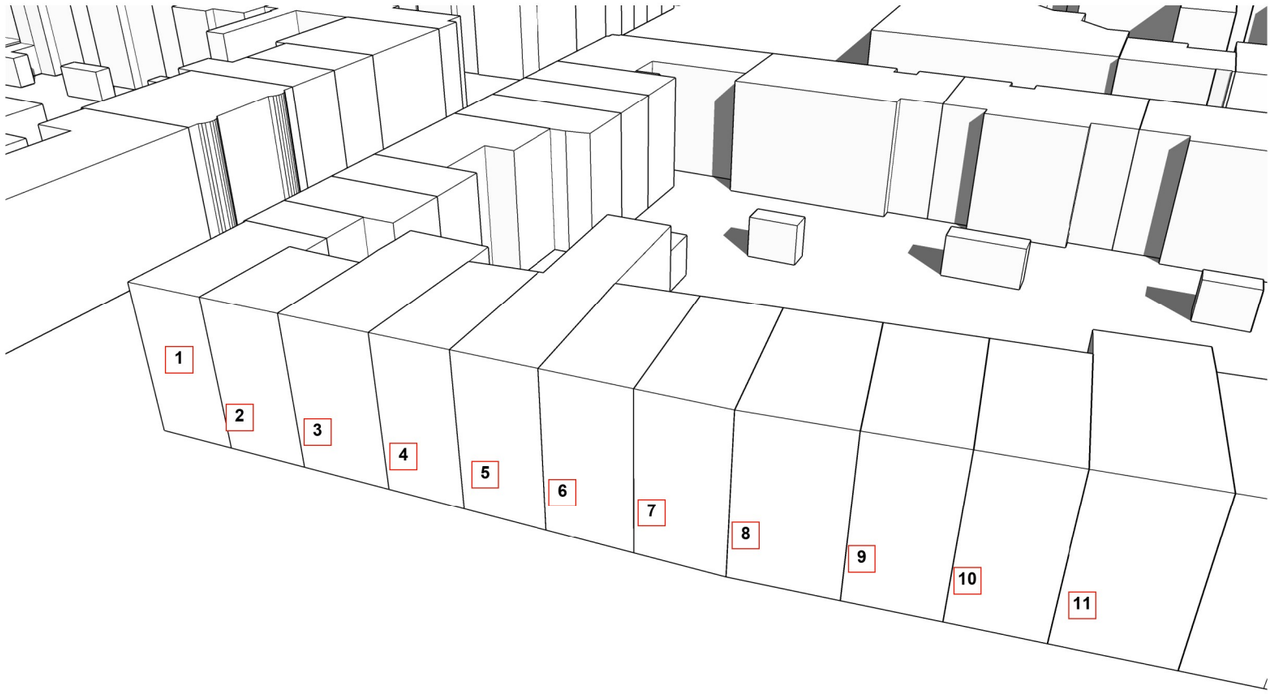

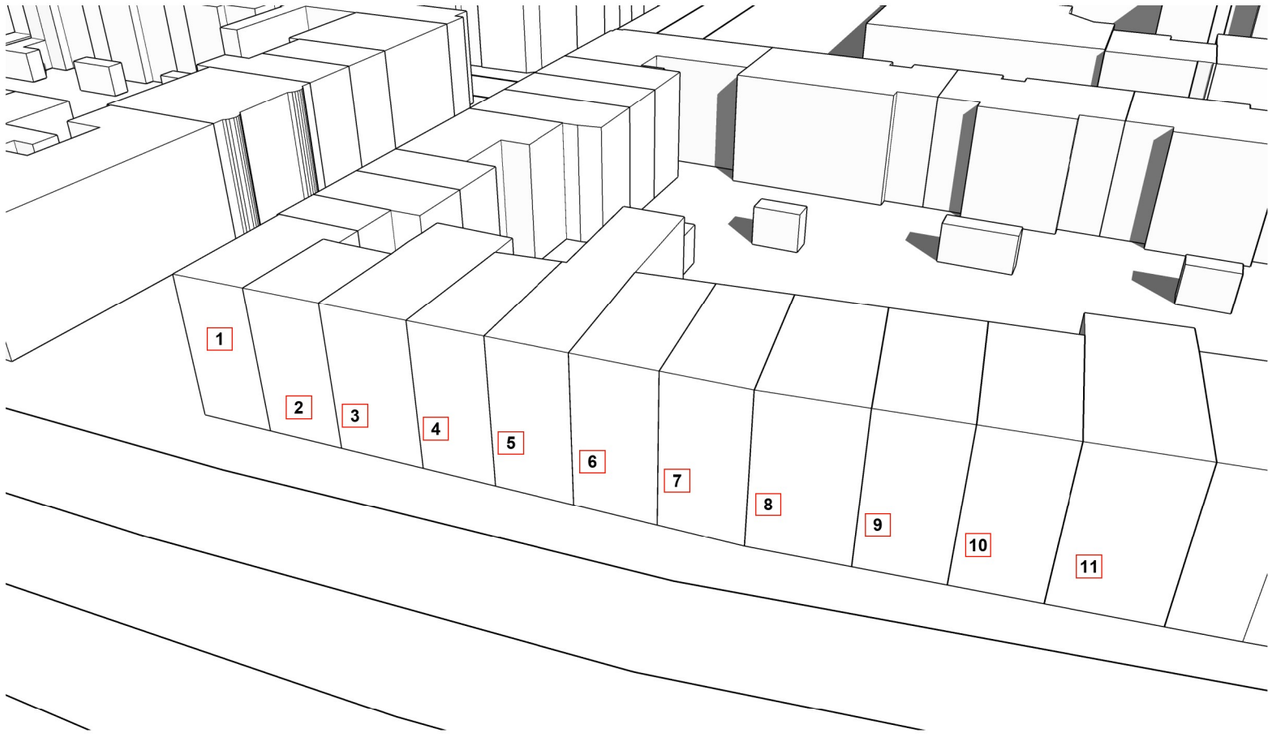

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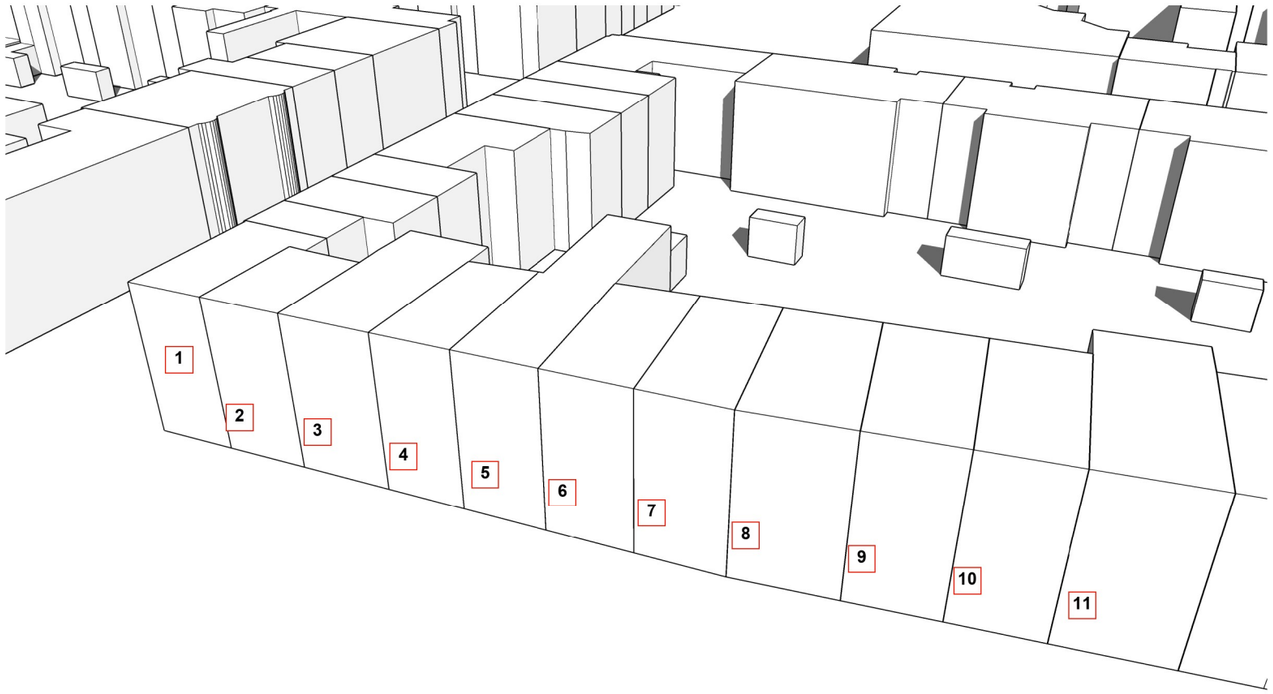

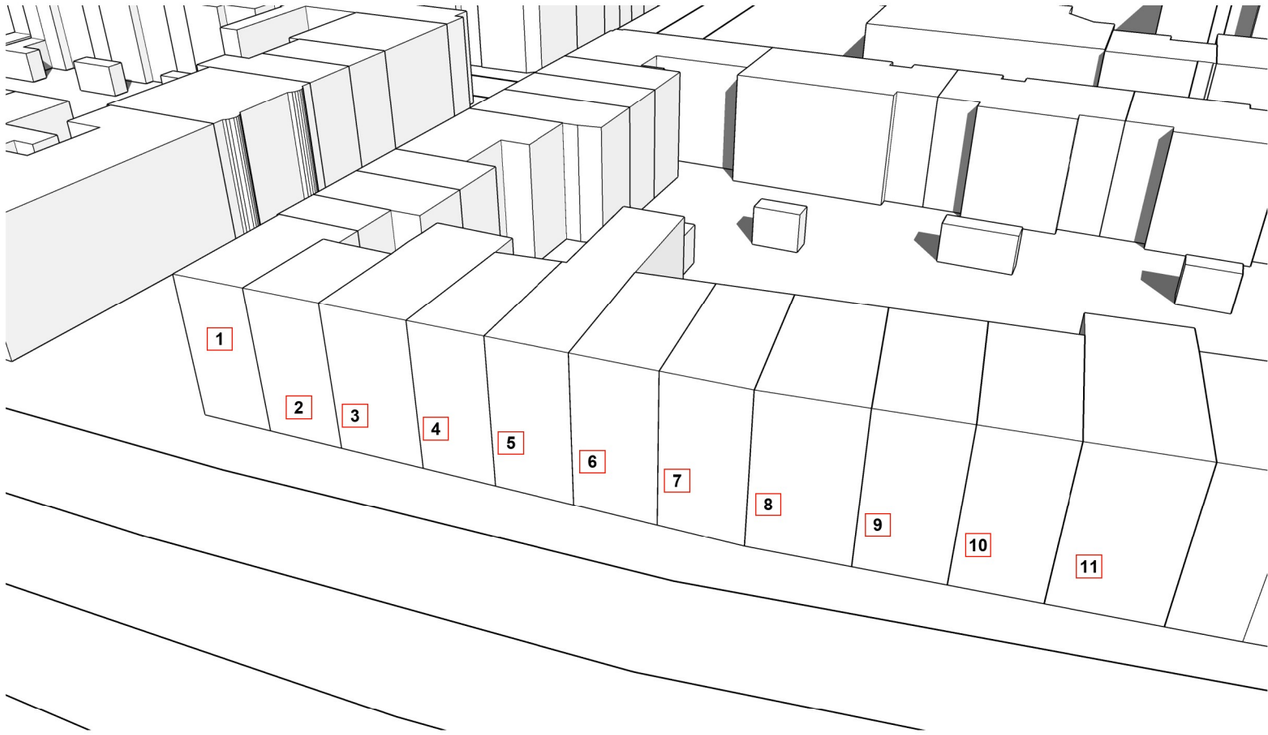

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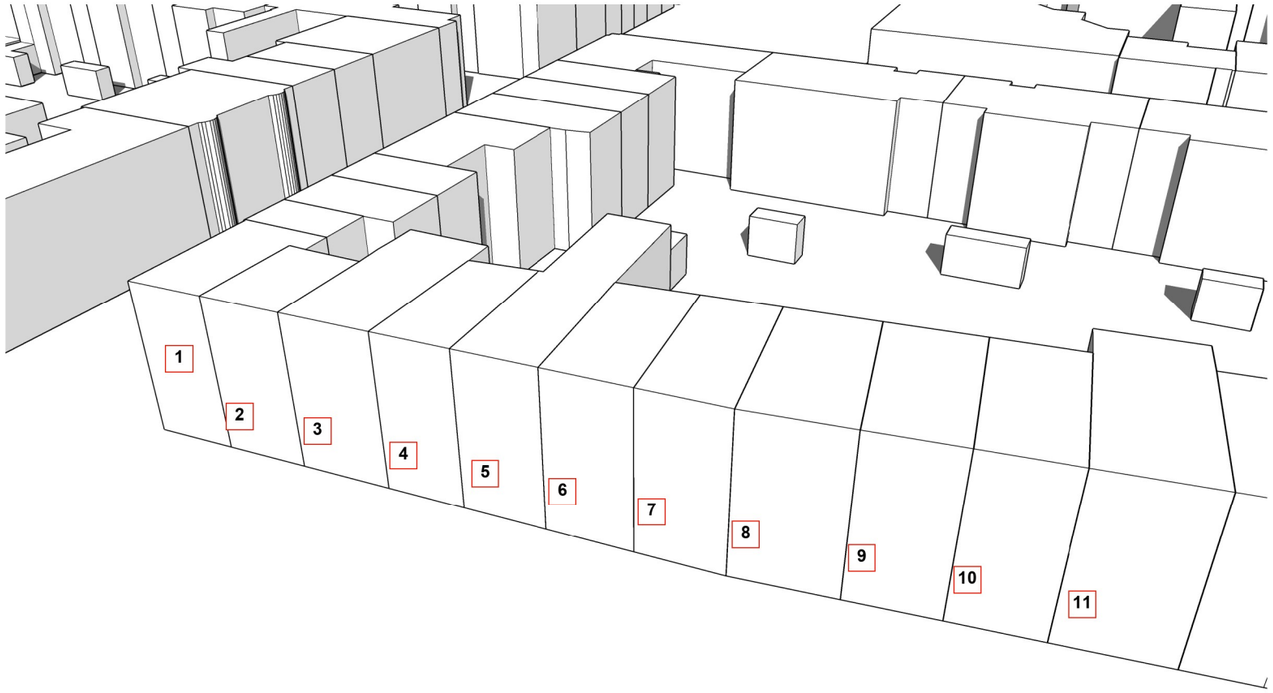

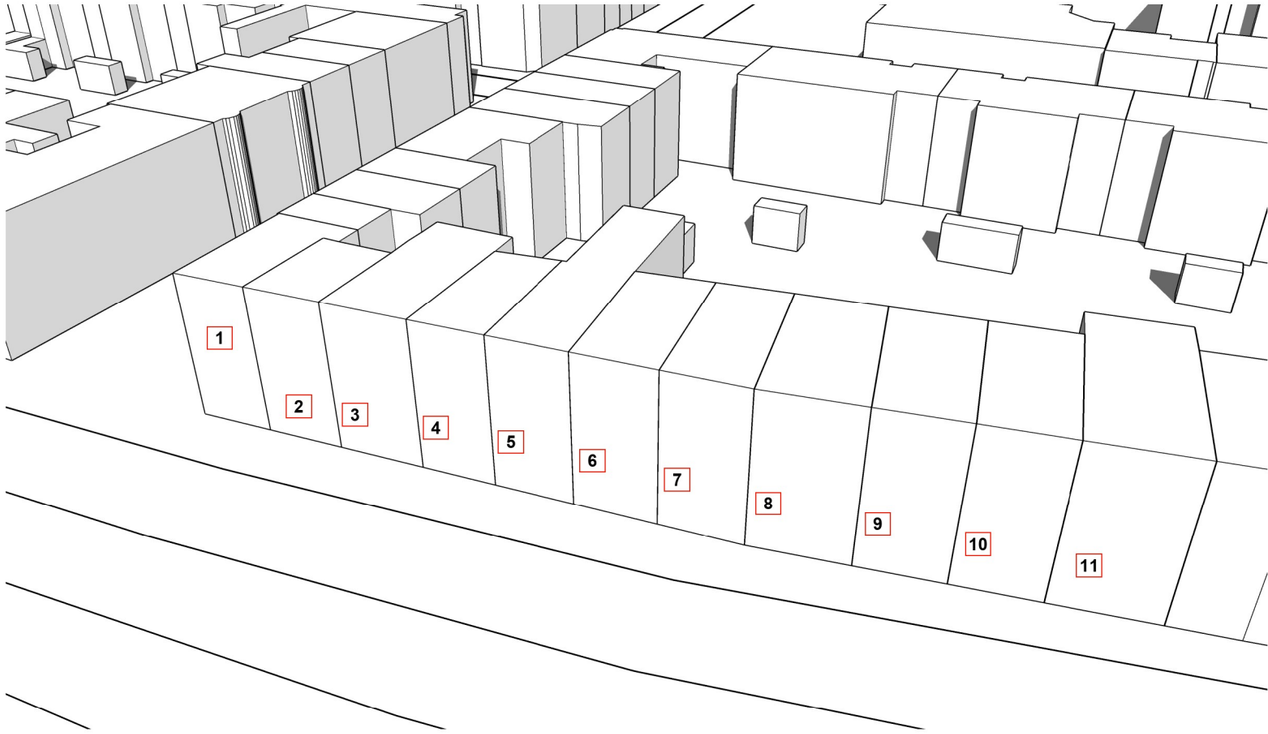

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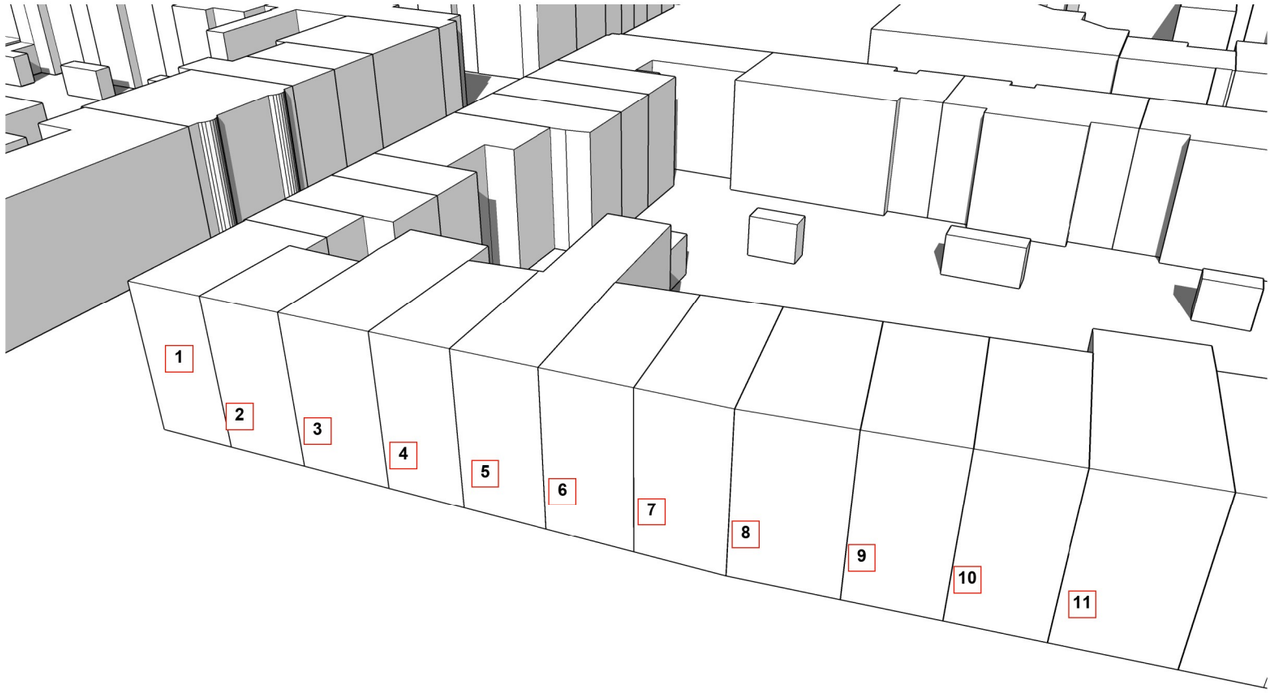



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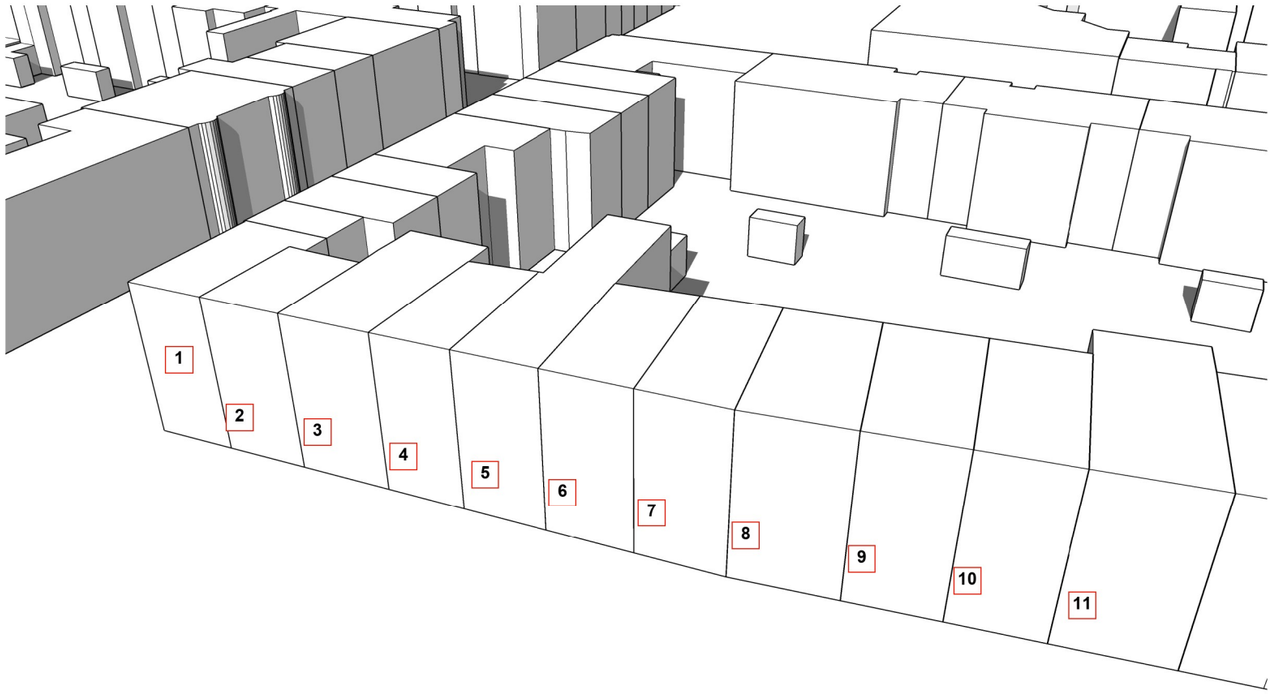

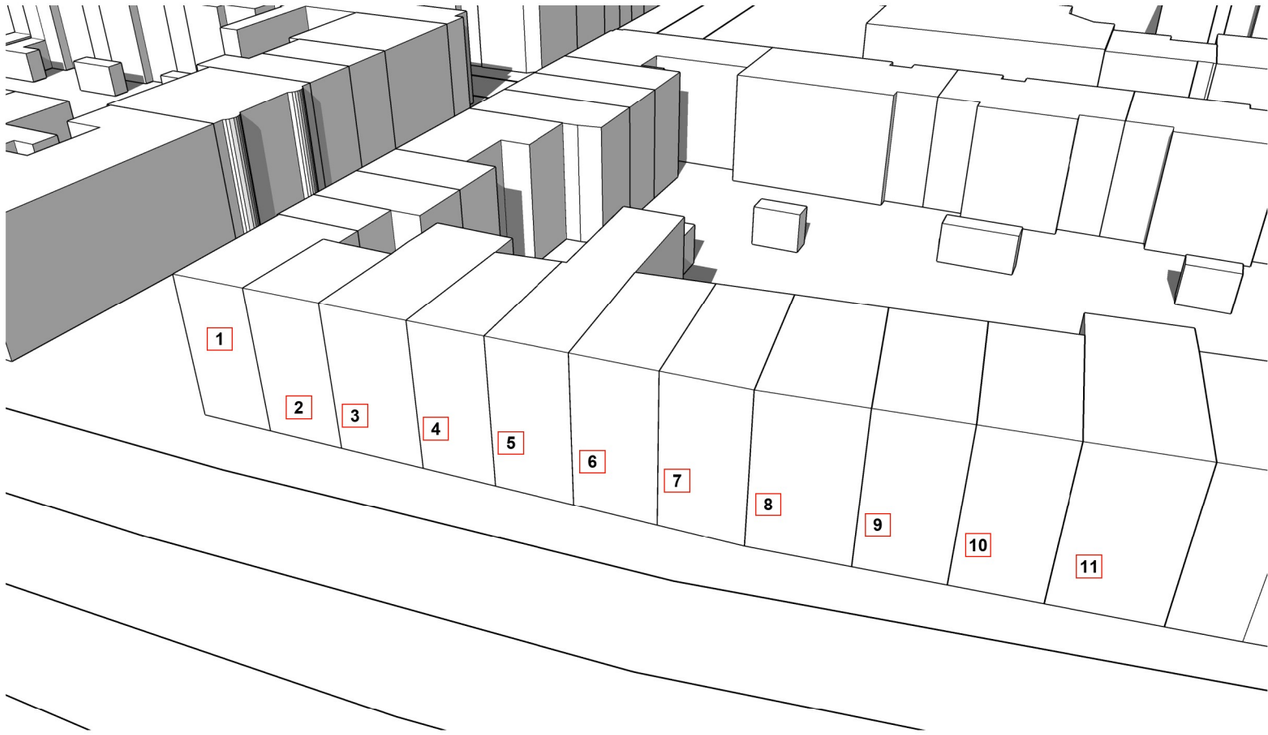

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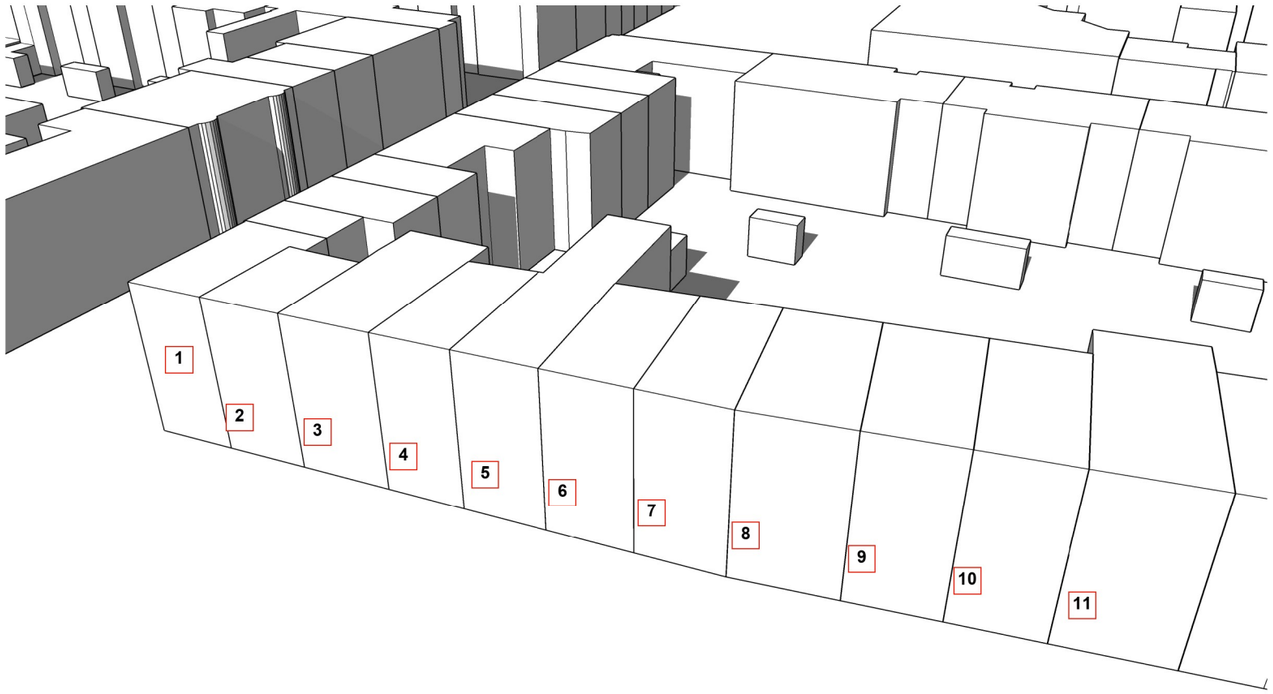

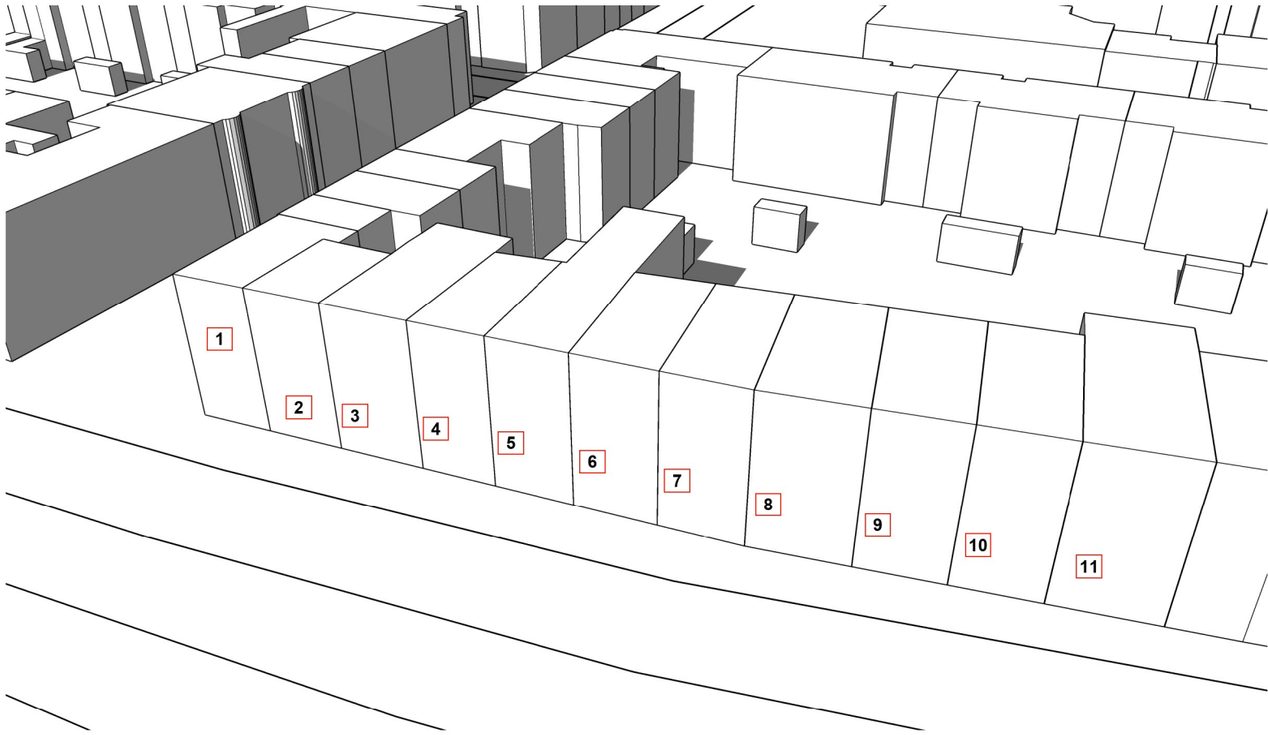

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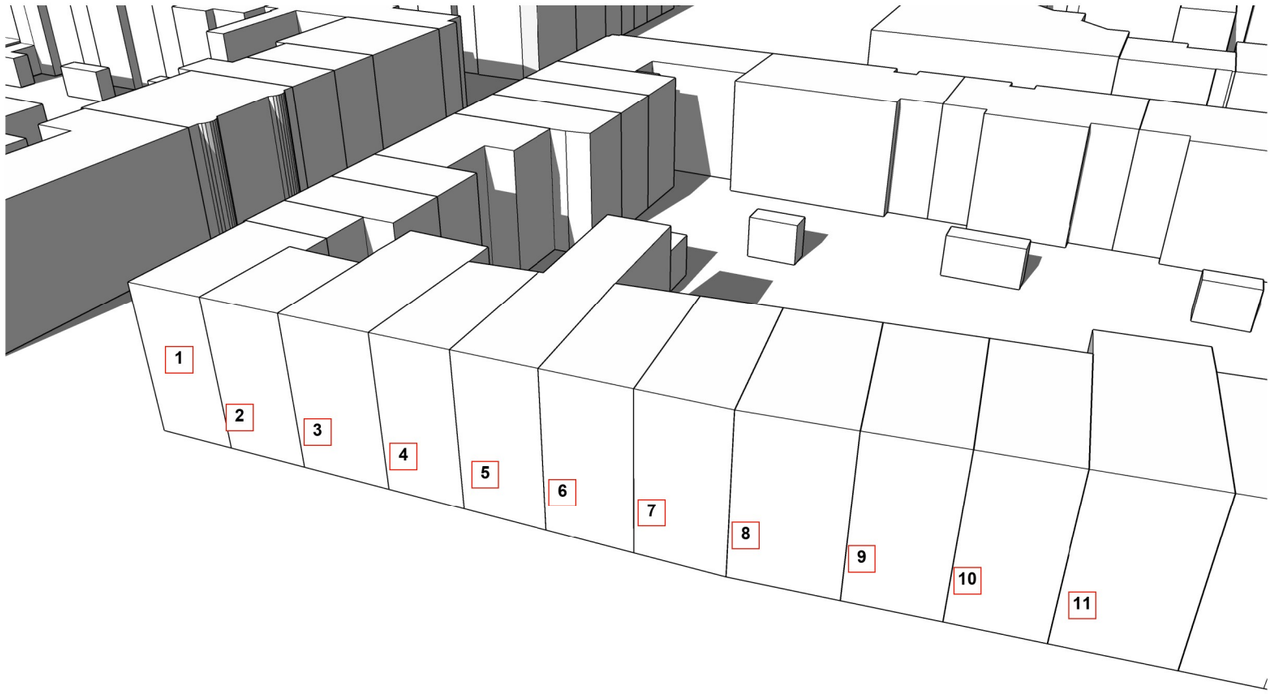

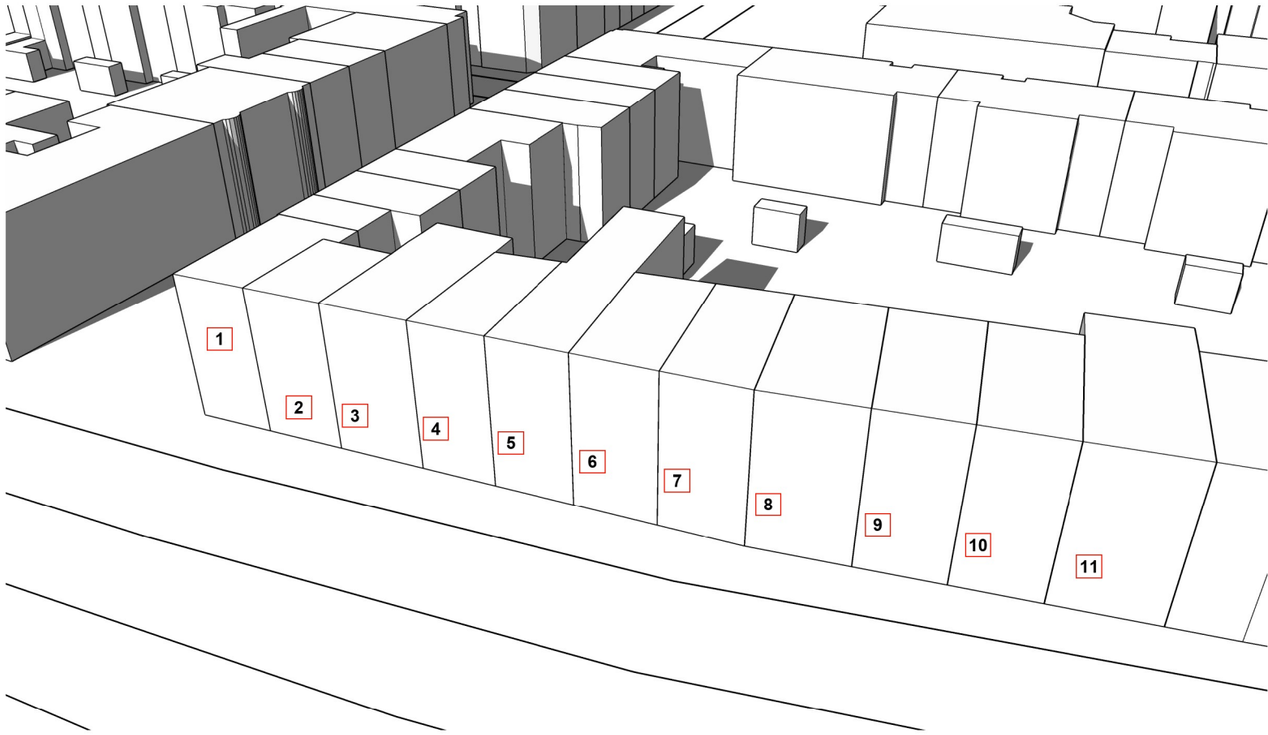

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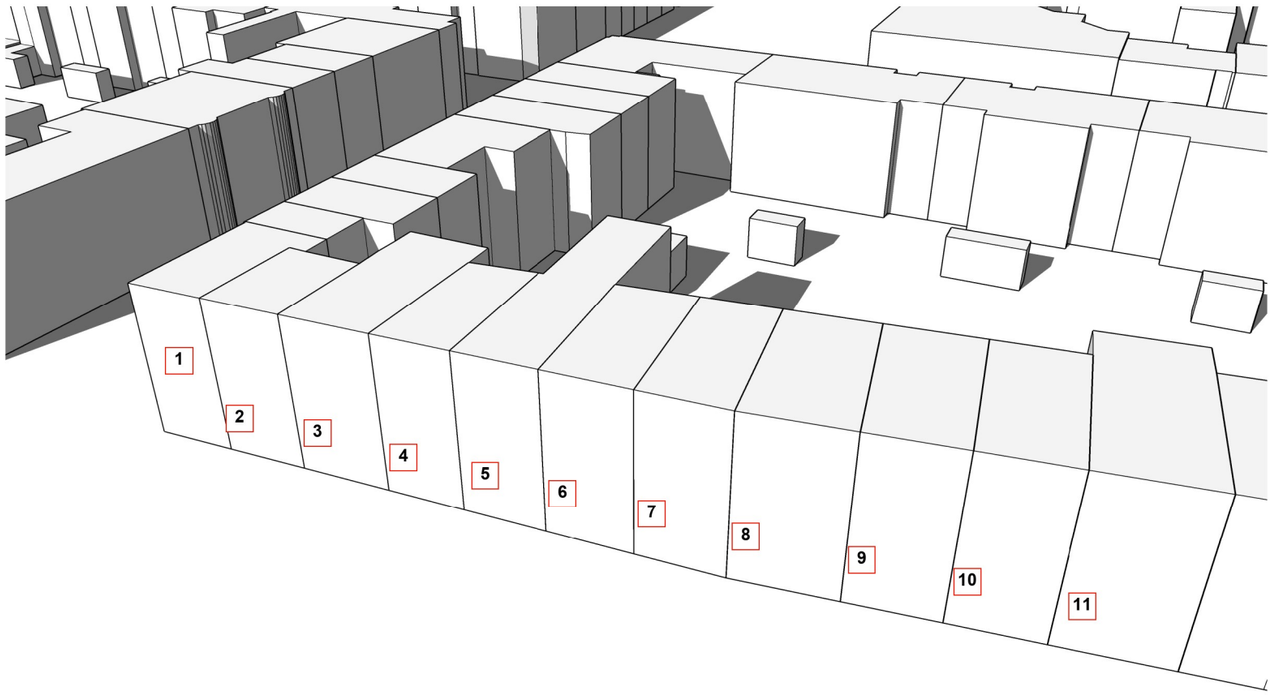

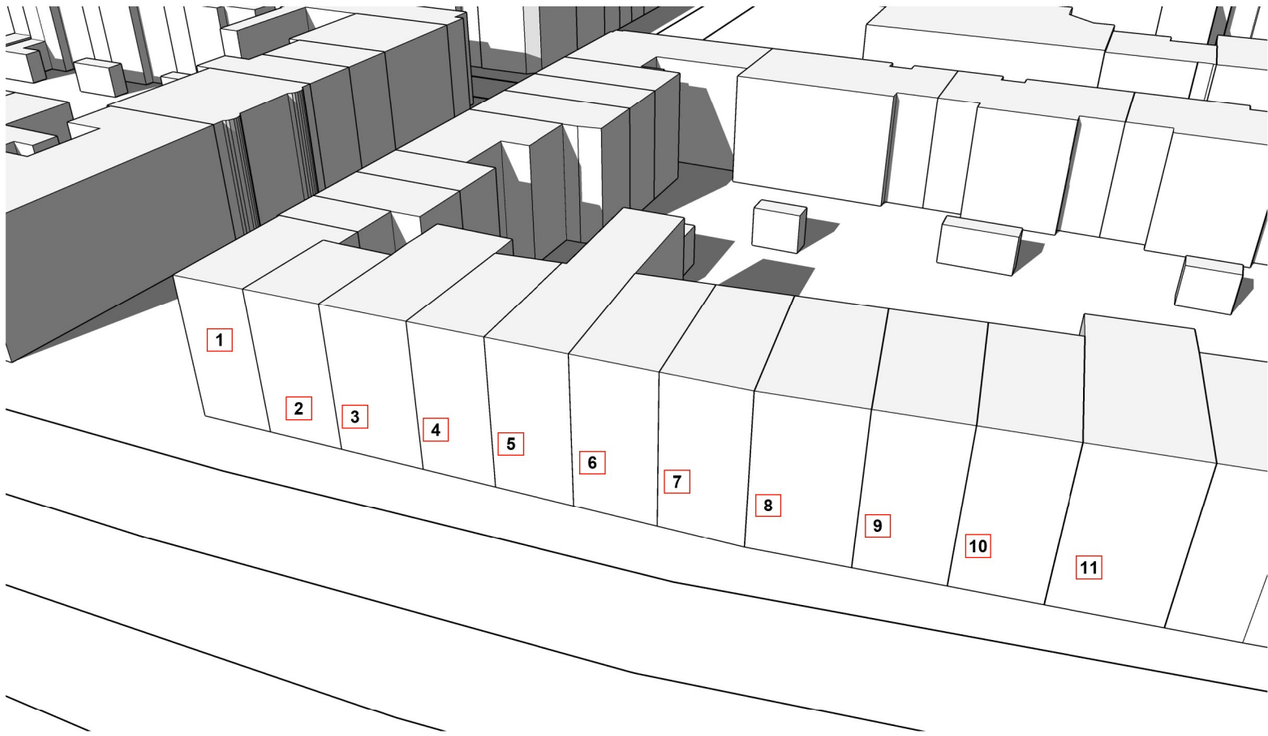

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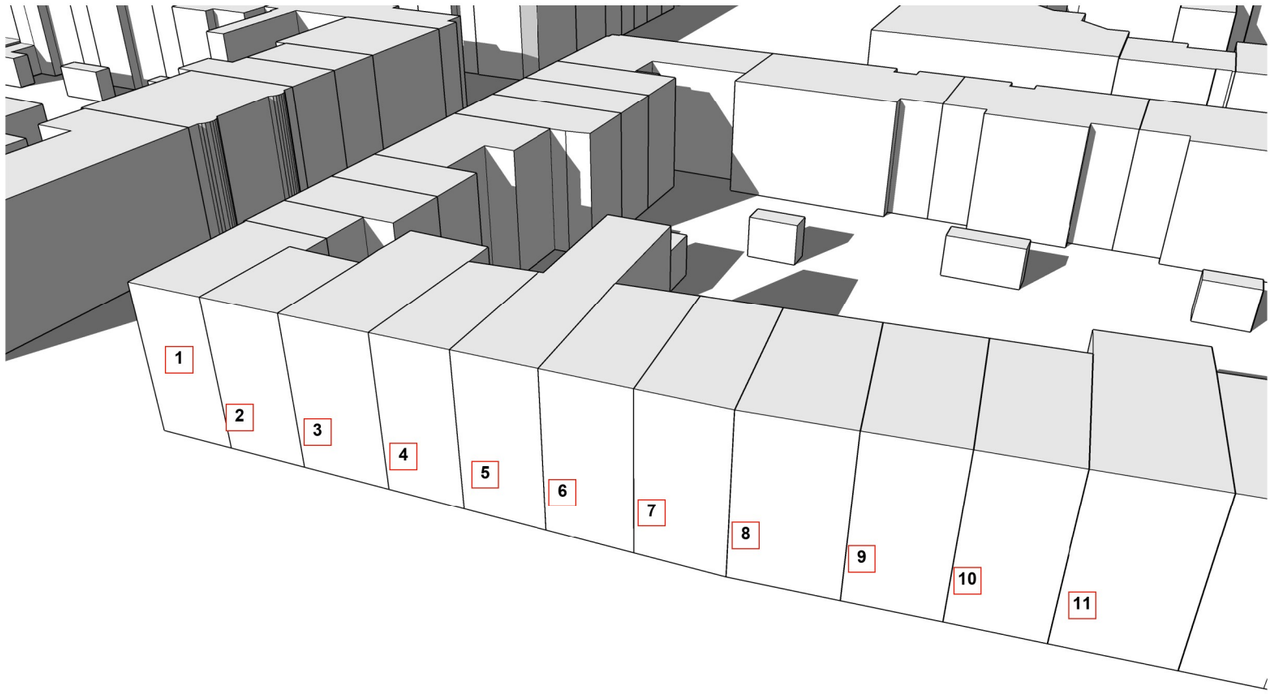

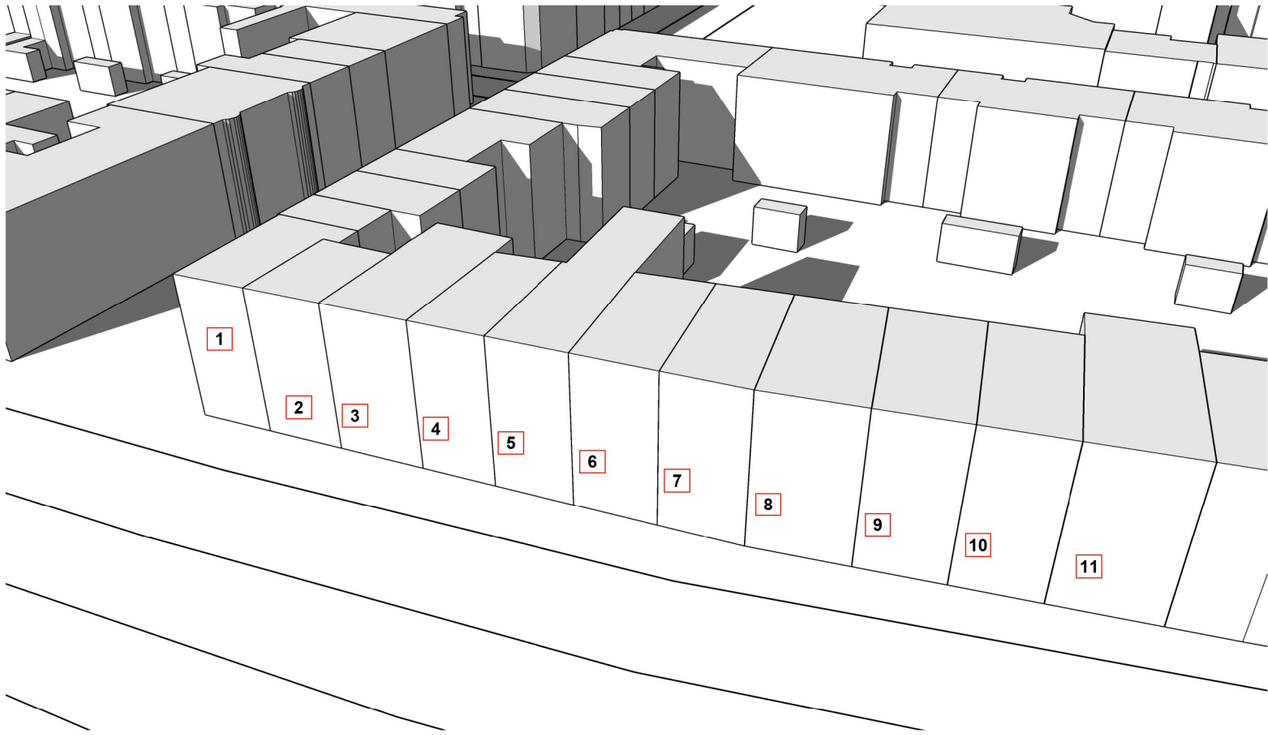

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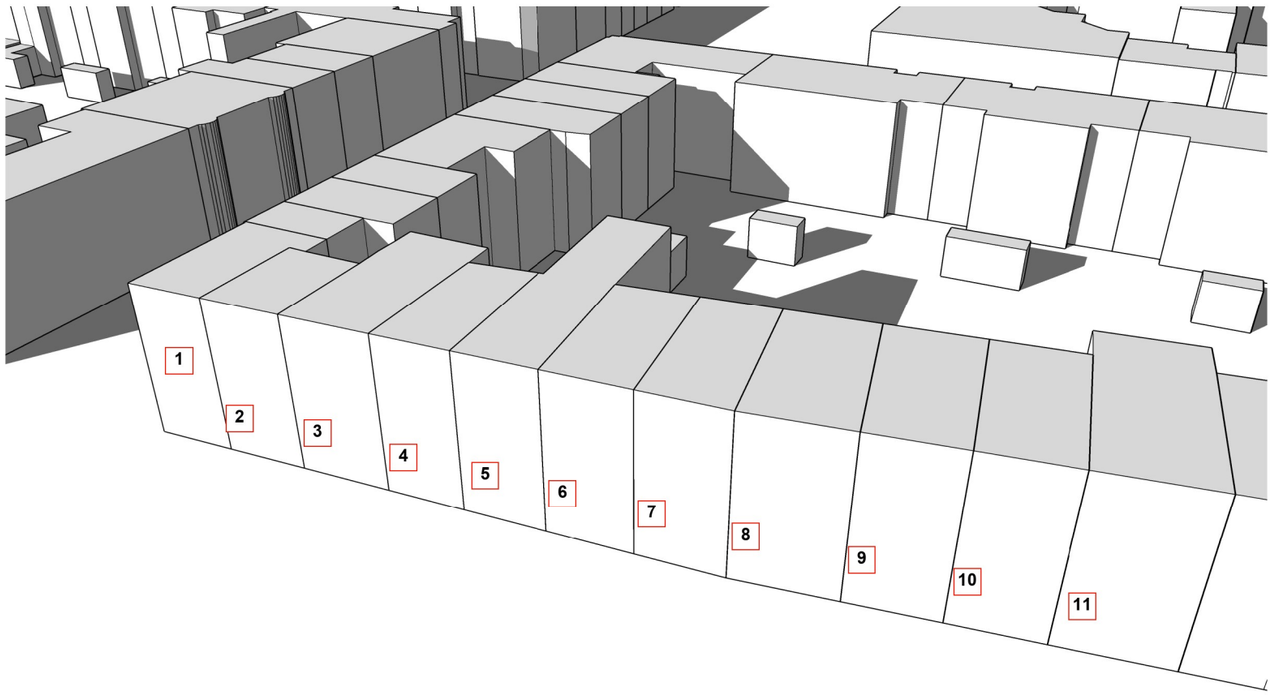

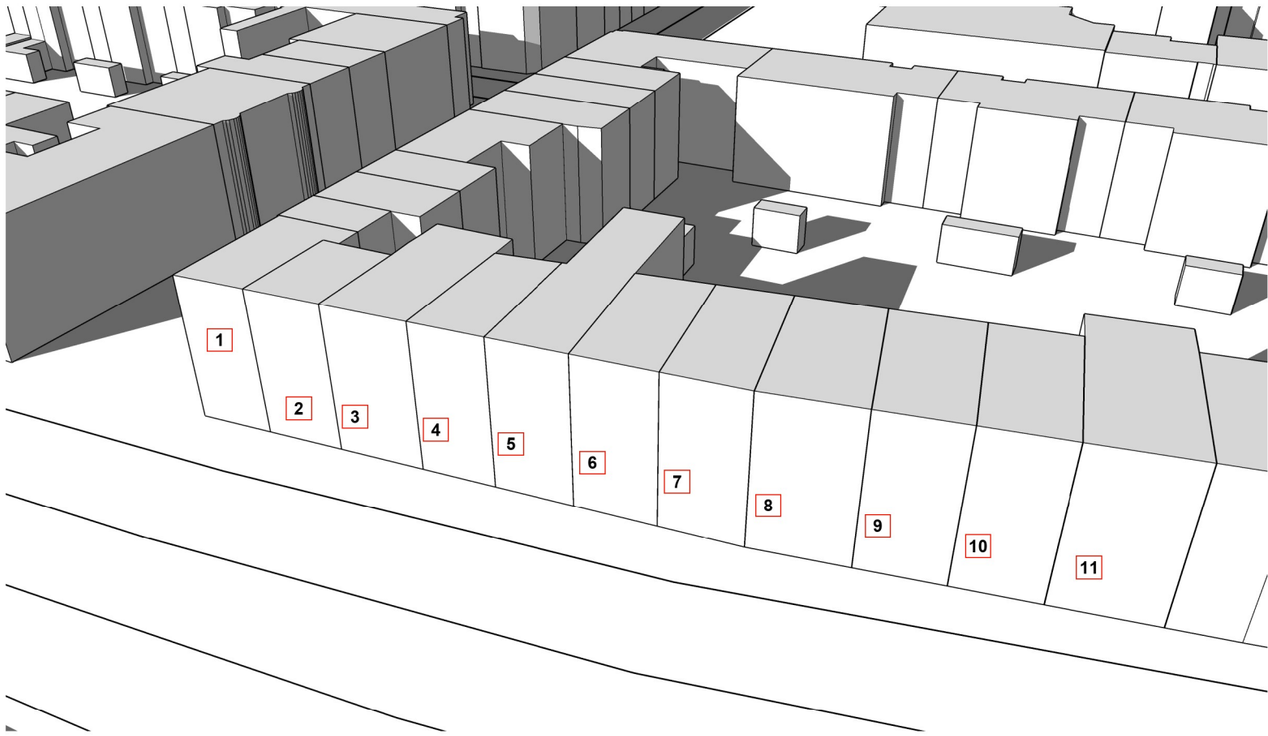

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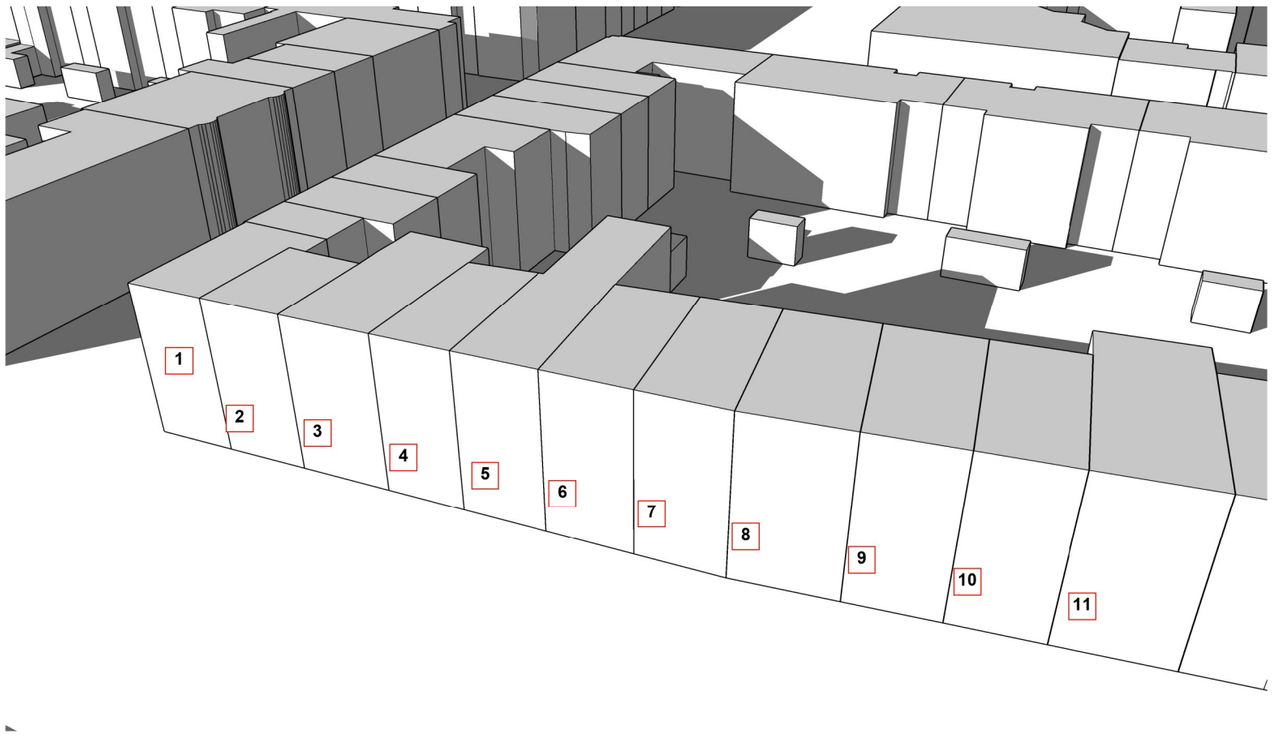

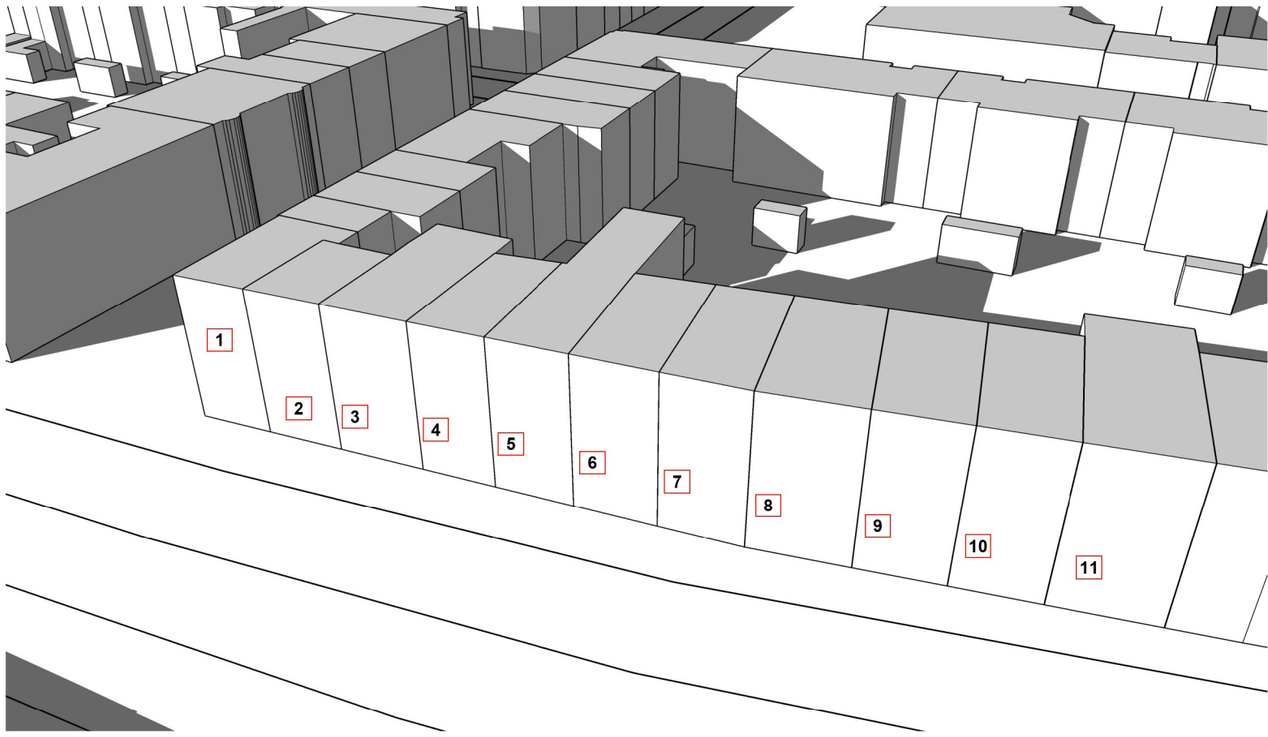

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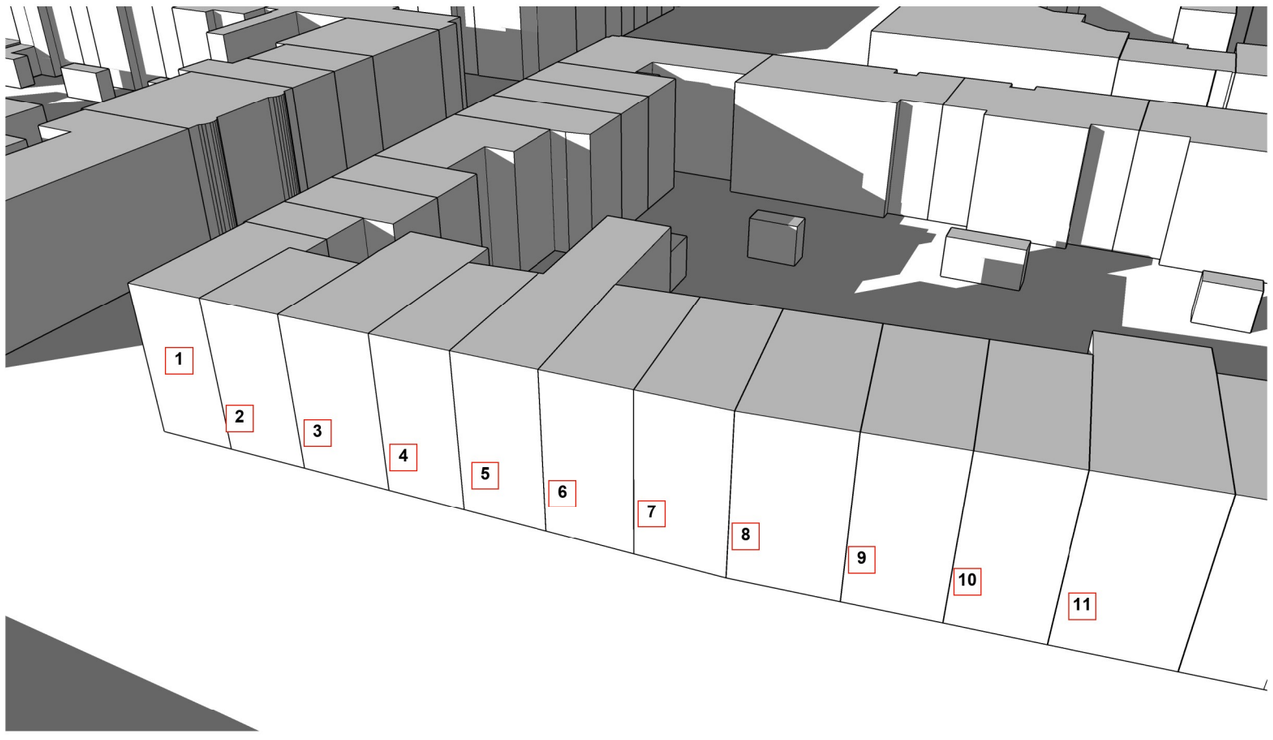

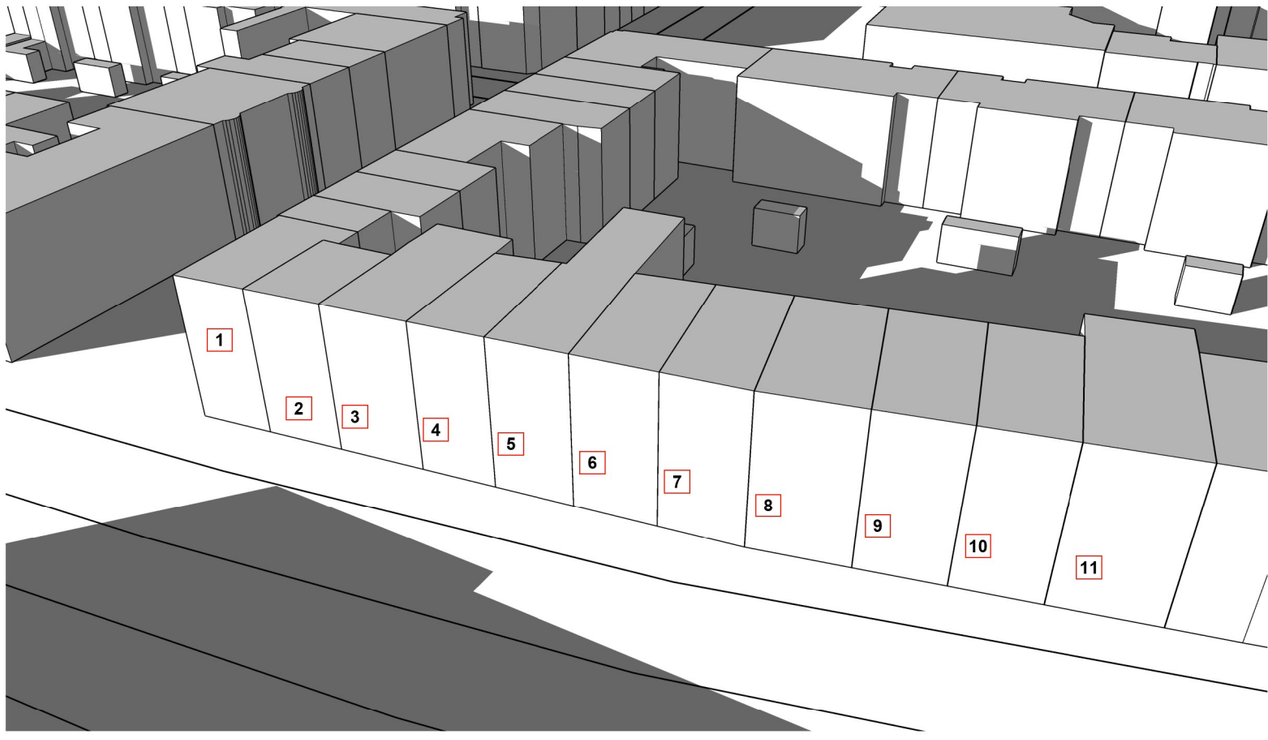

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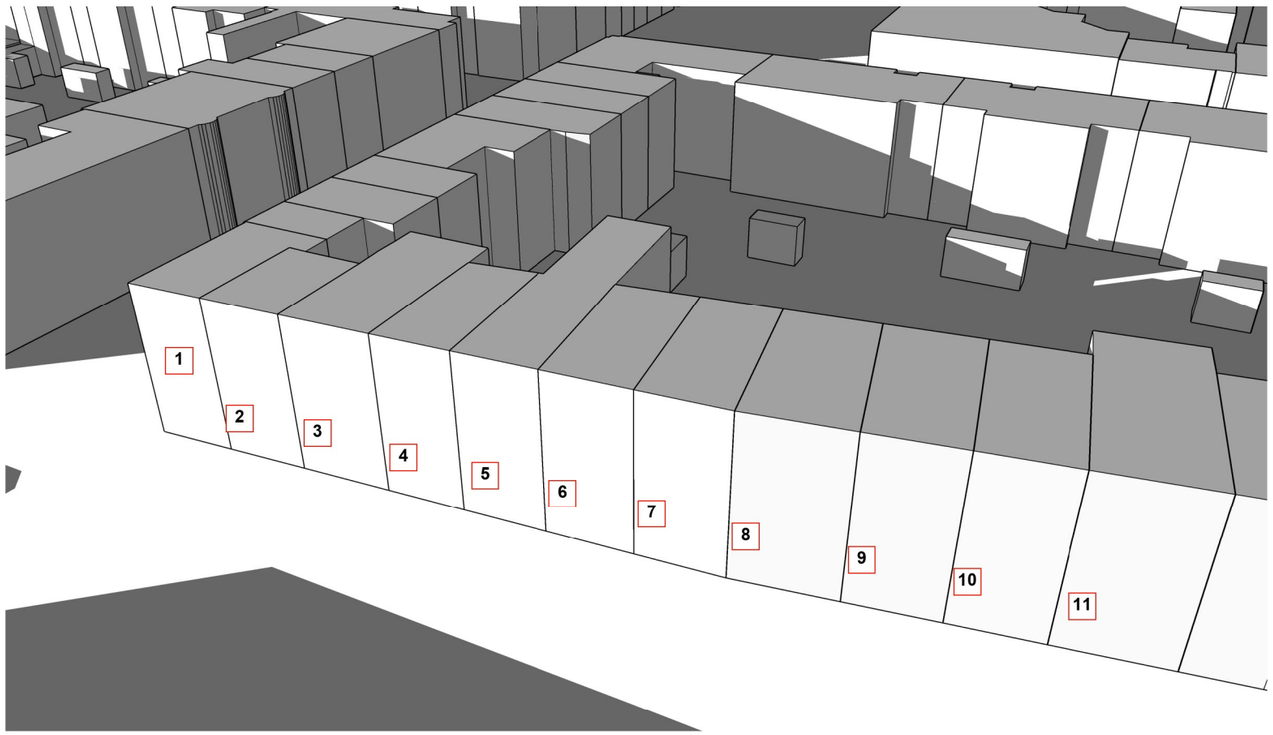

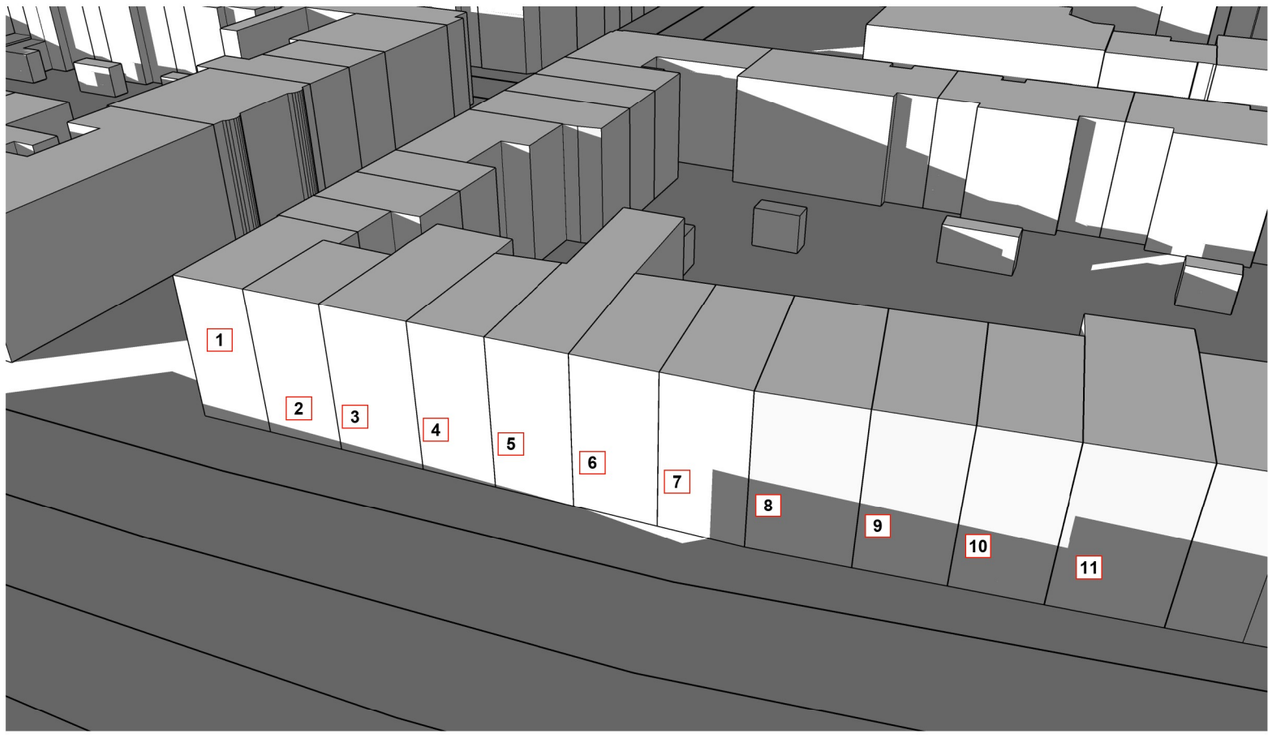

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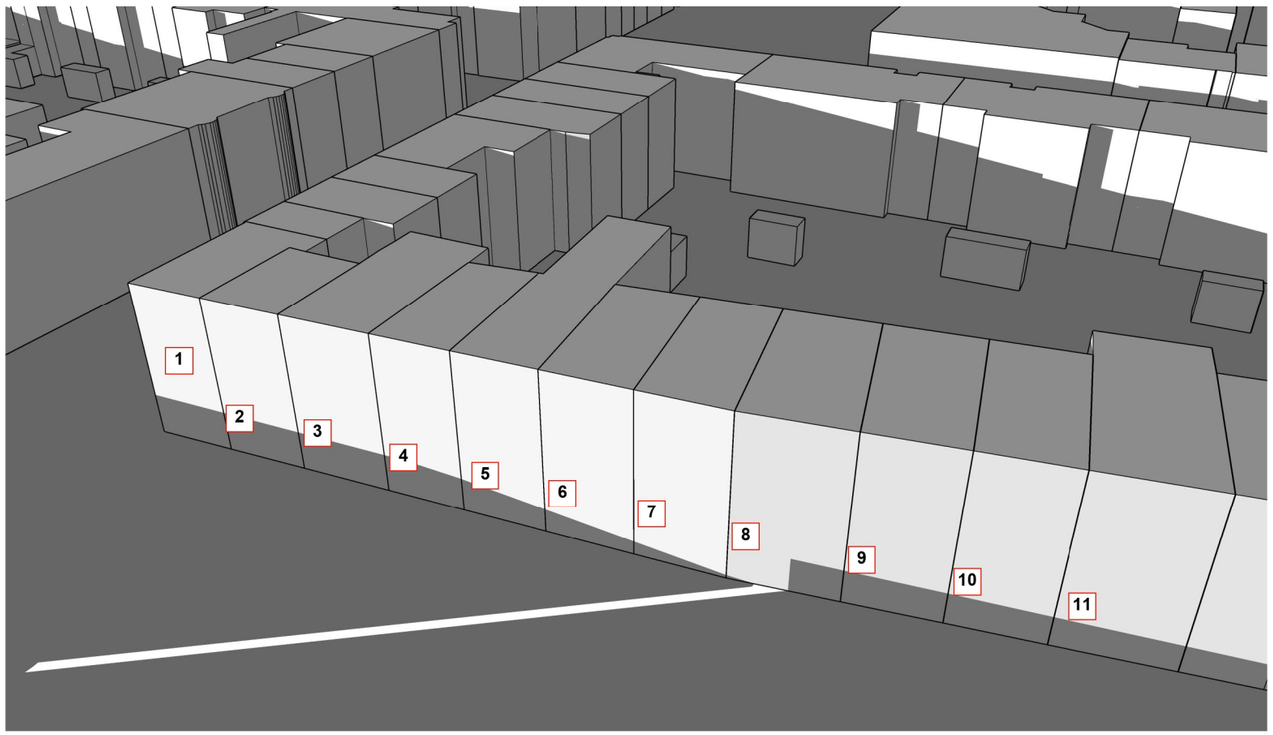

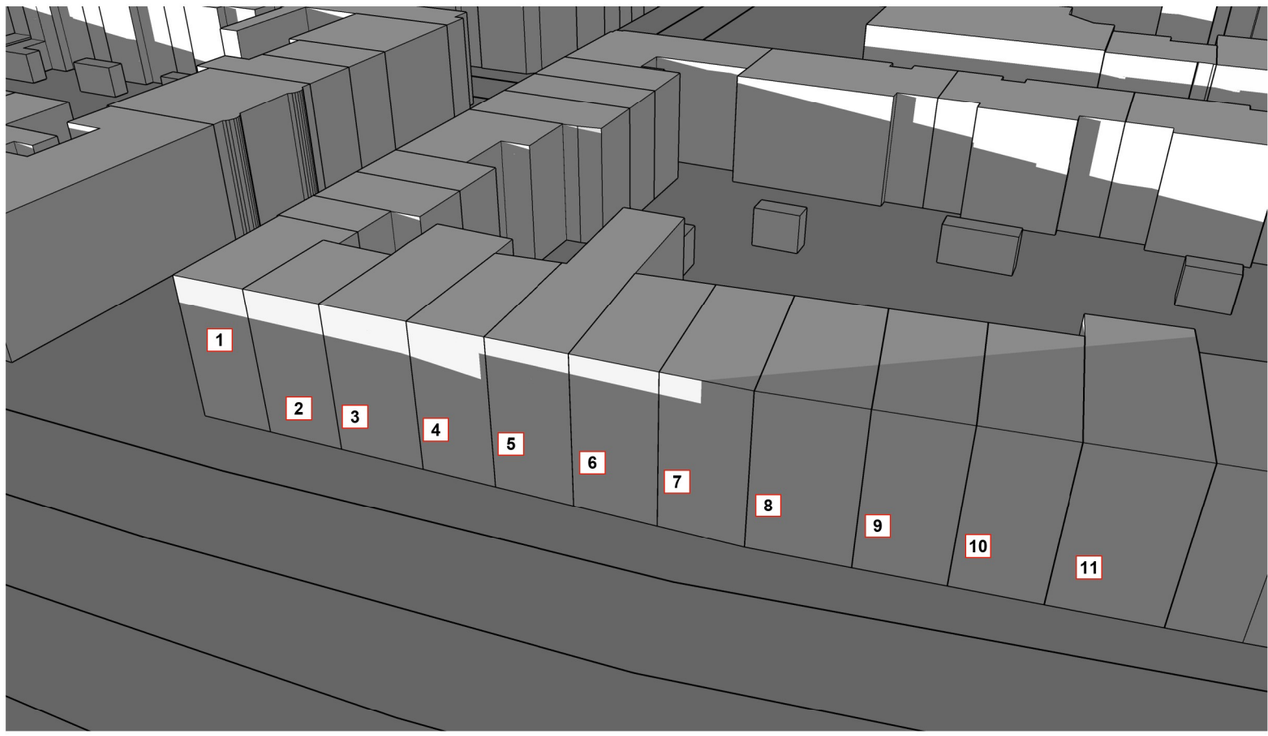

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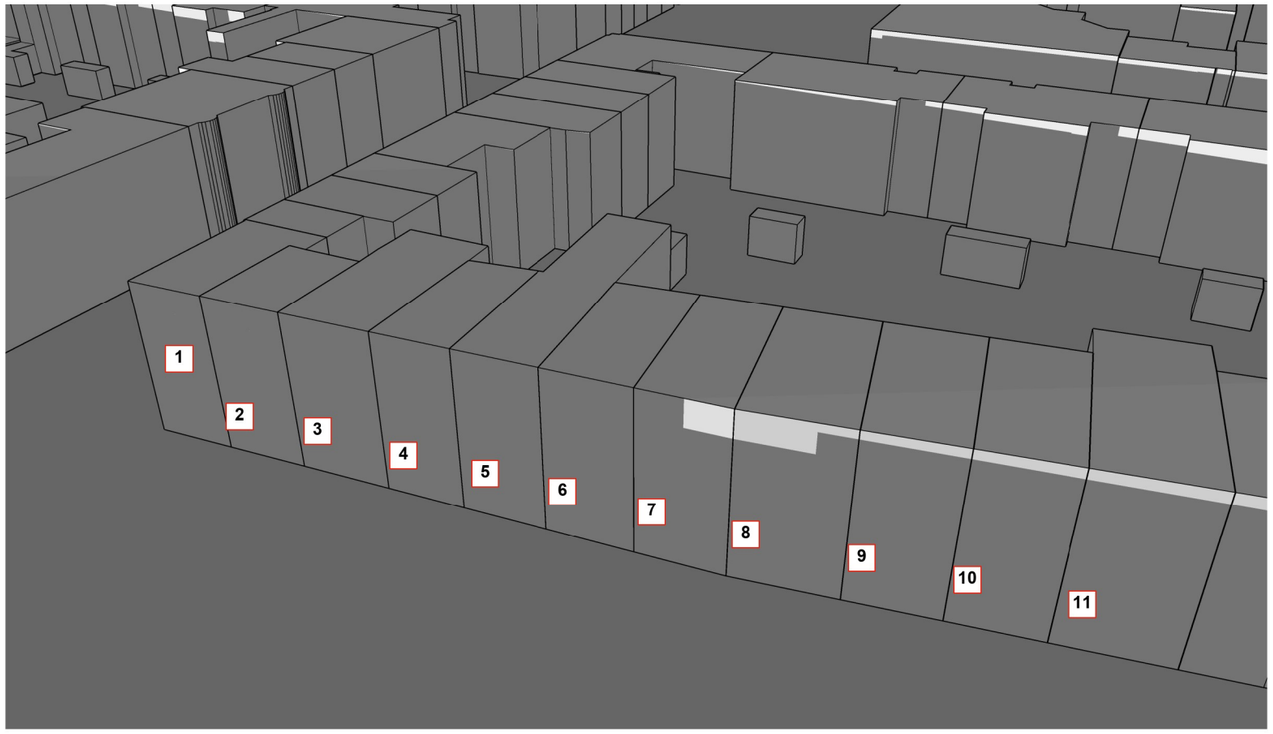

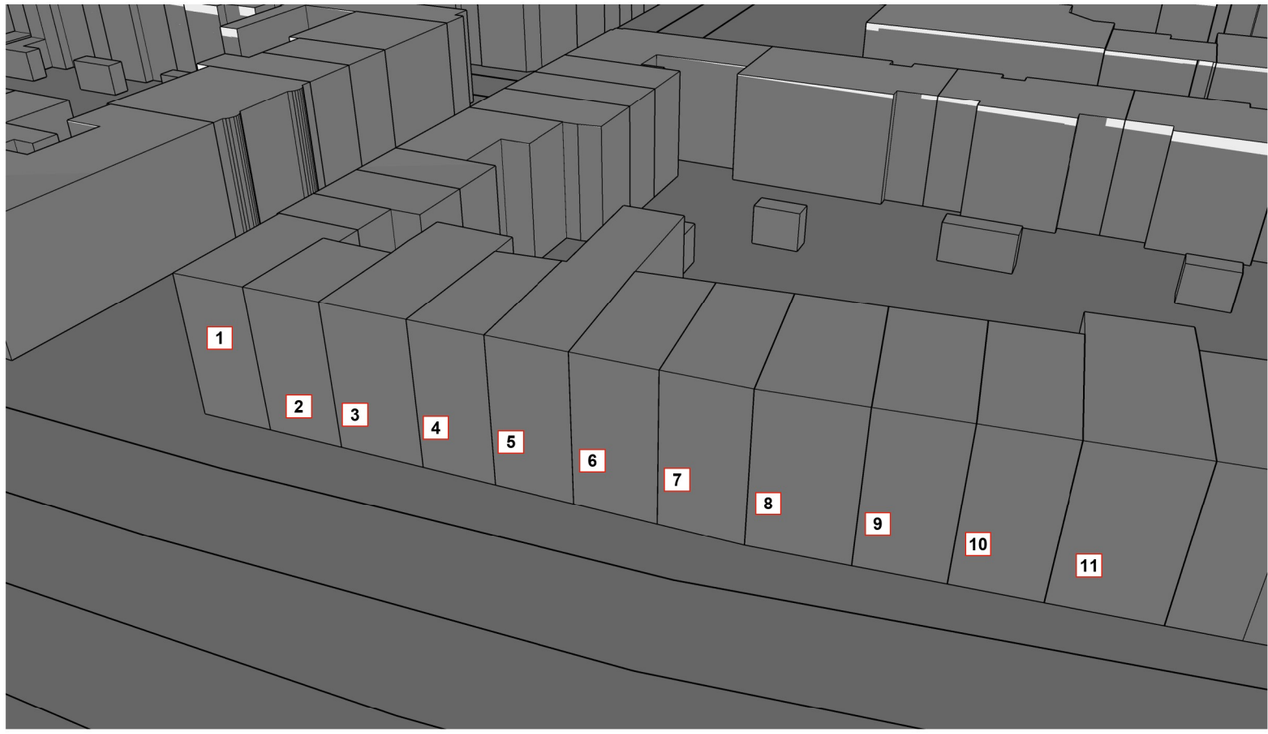

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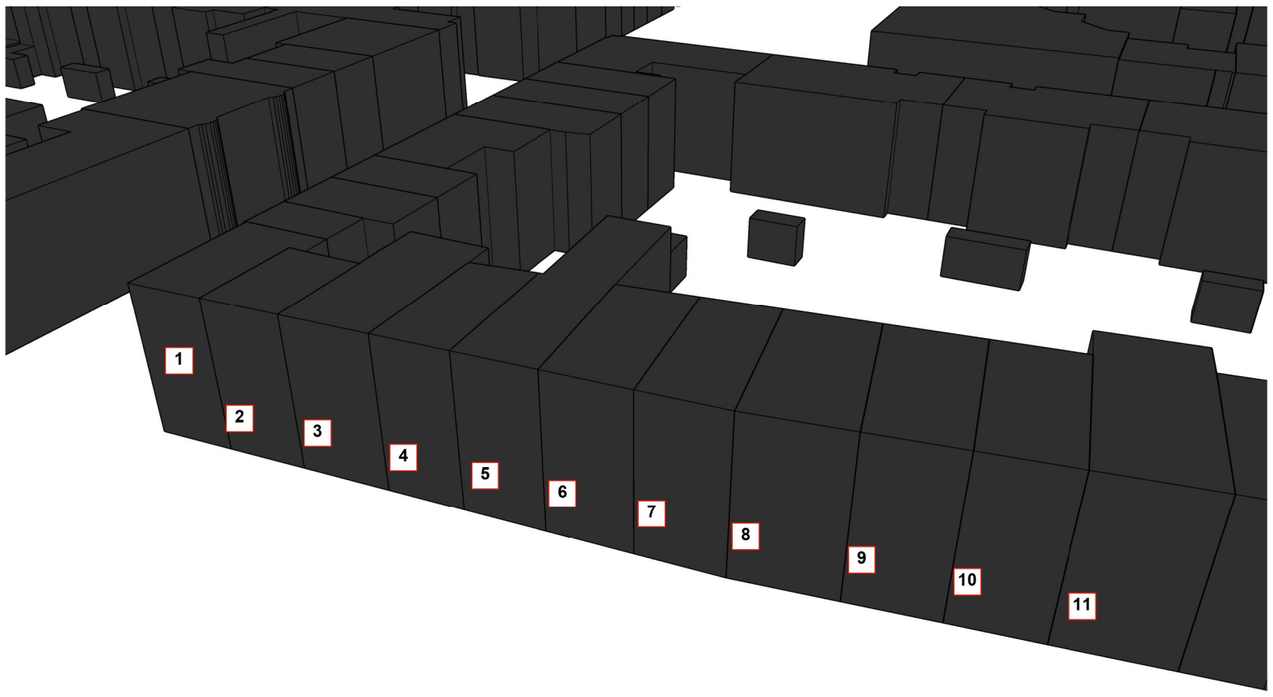

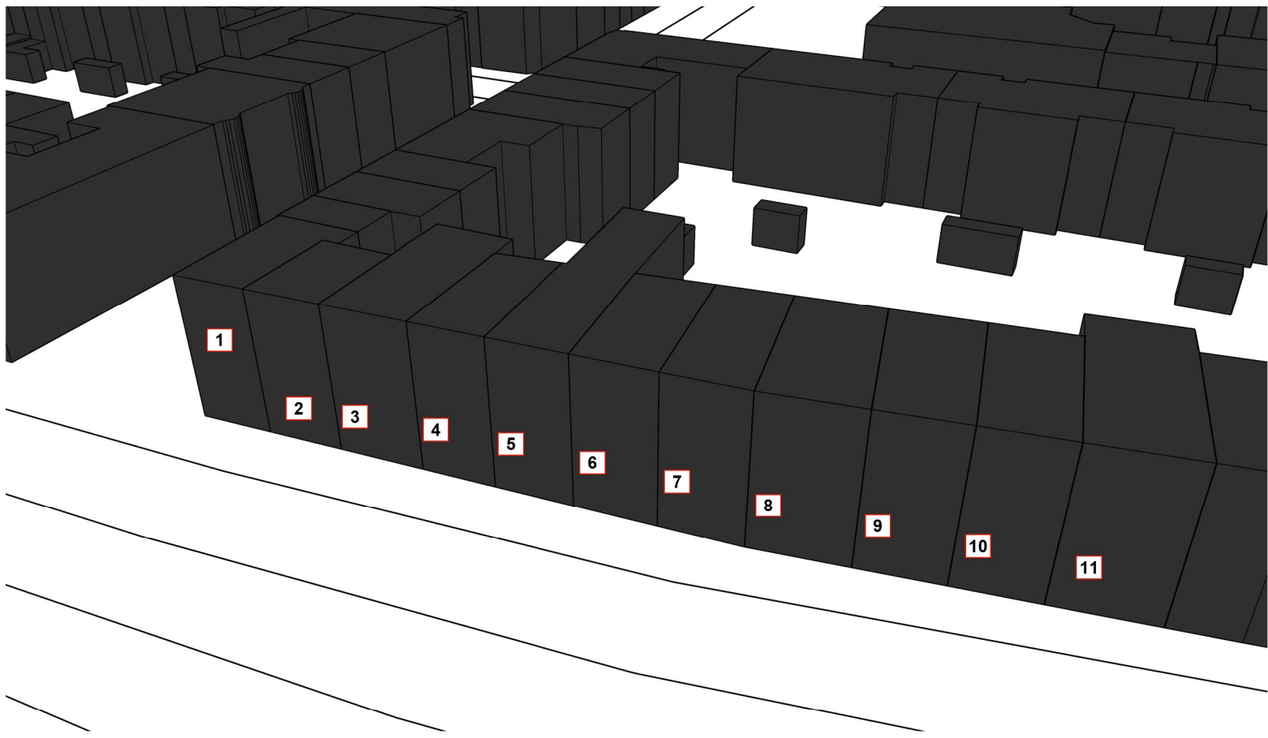

bijlage 8. resultaten 21 september Noordsingel 39 – 65 huidig vs. nieuw

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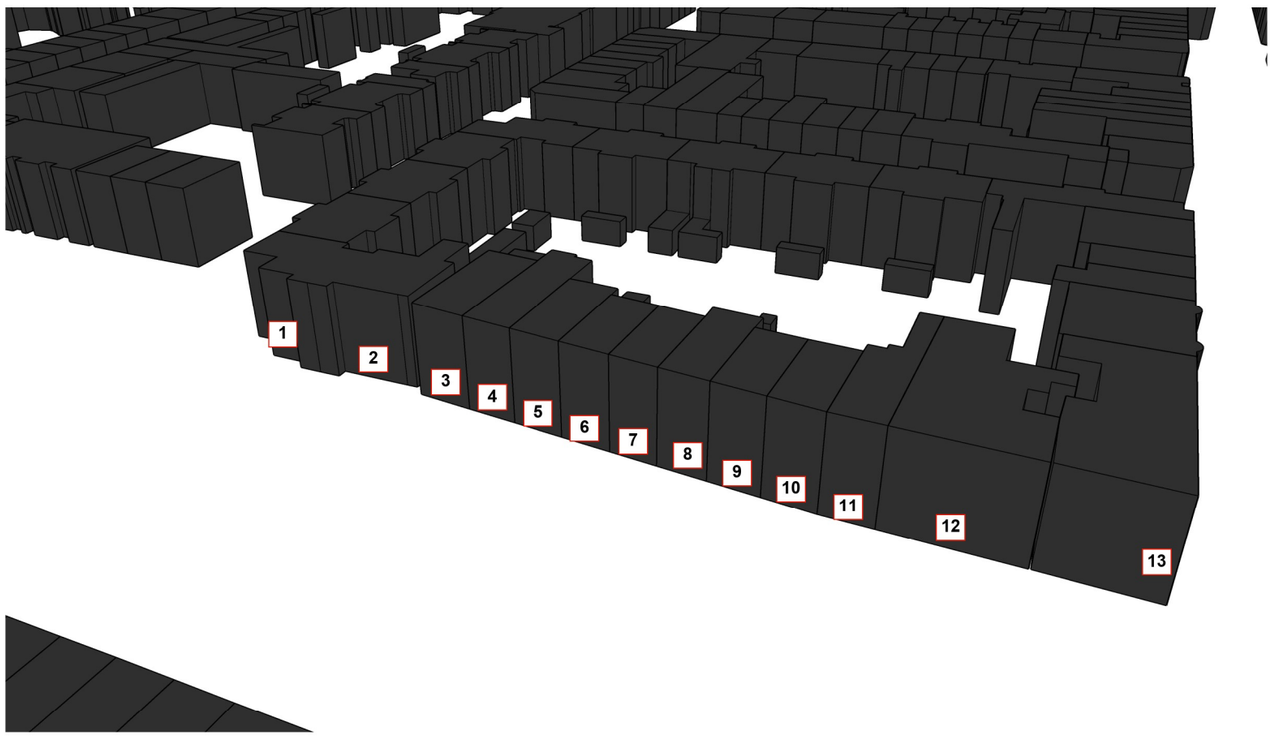

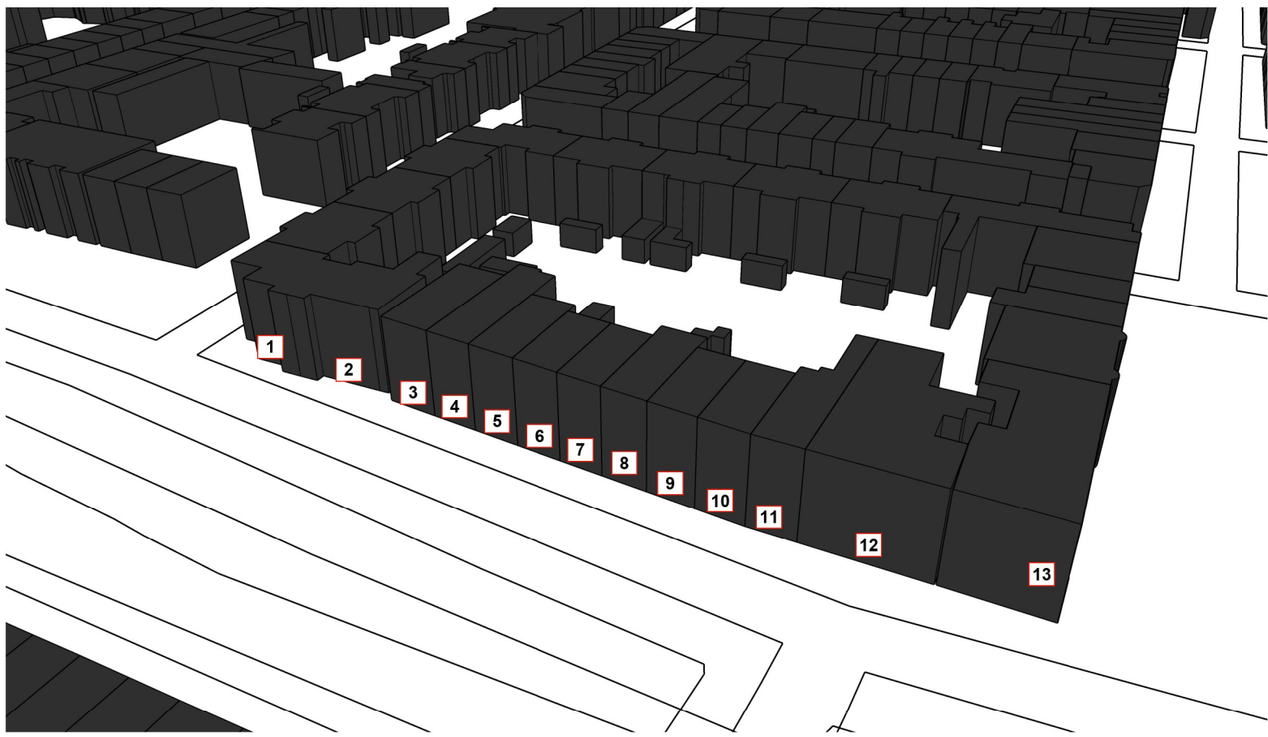

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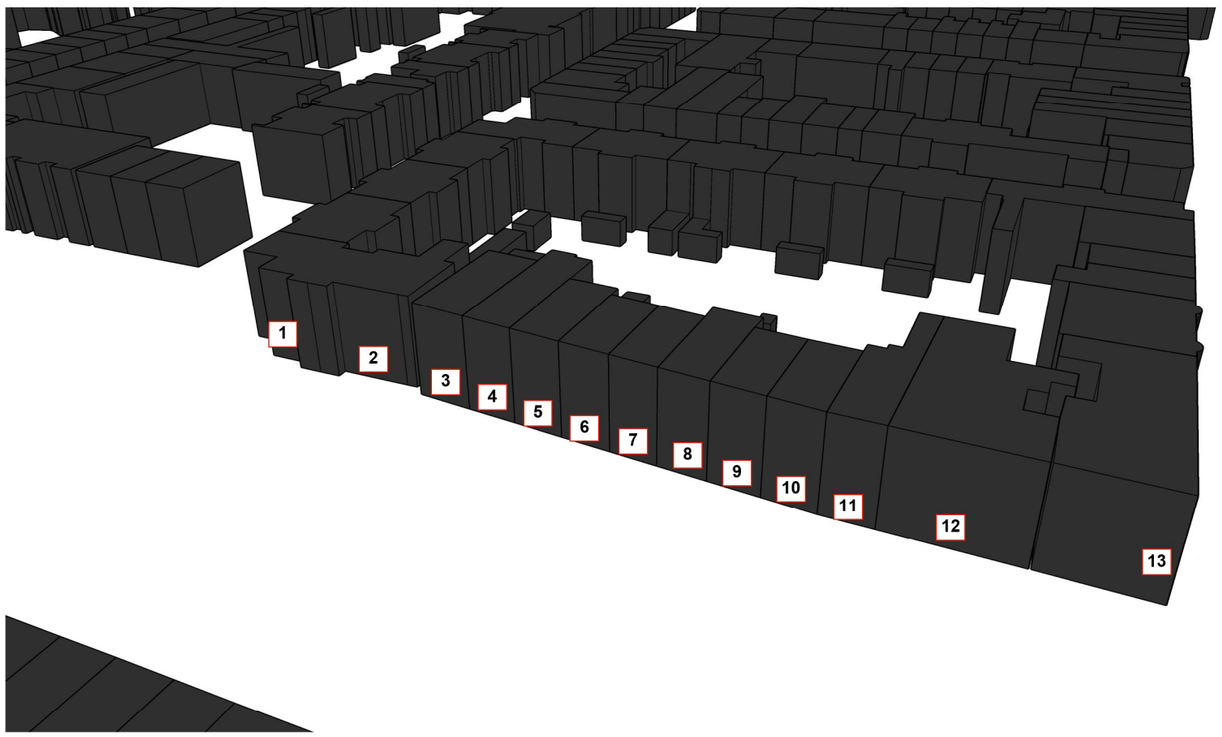

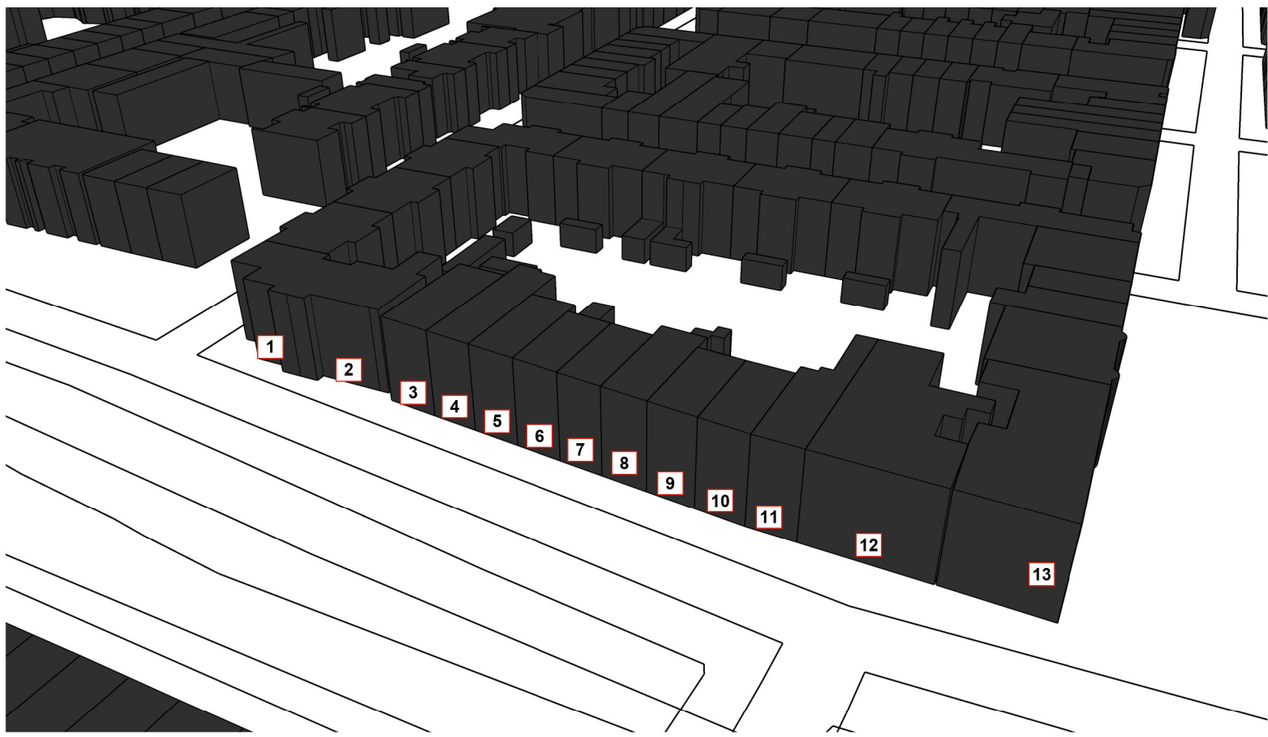

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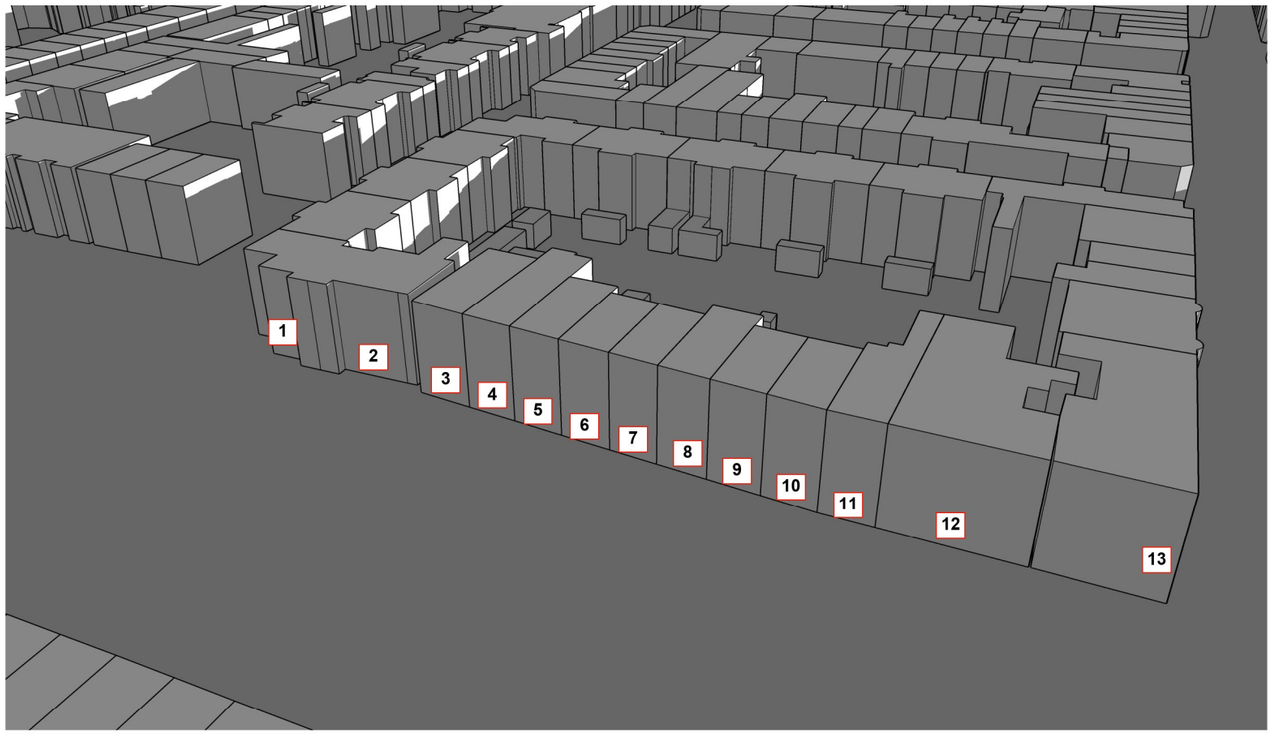

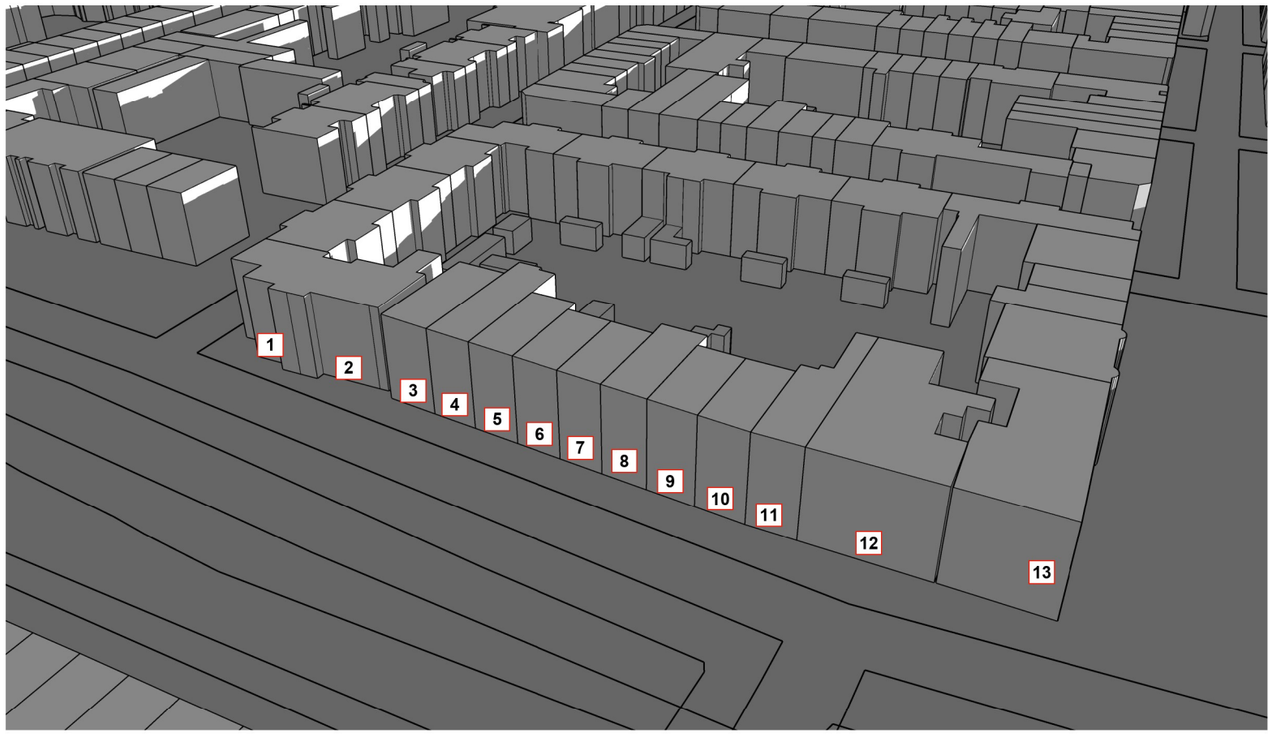

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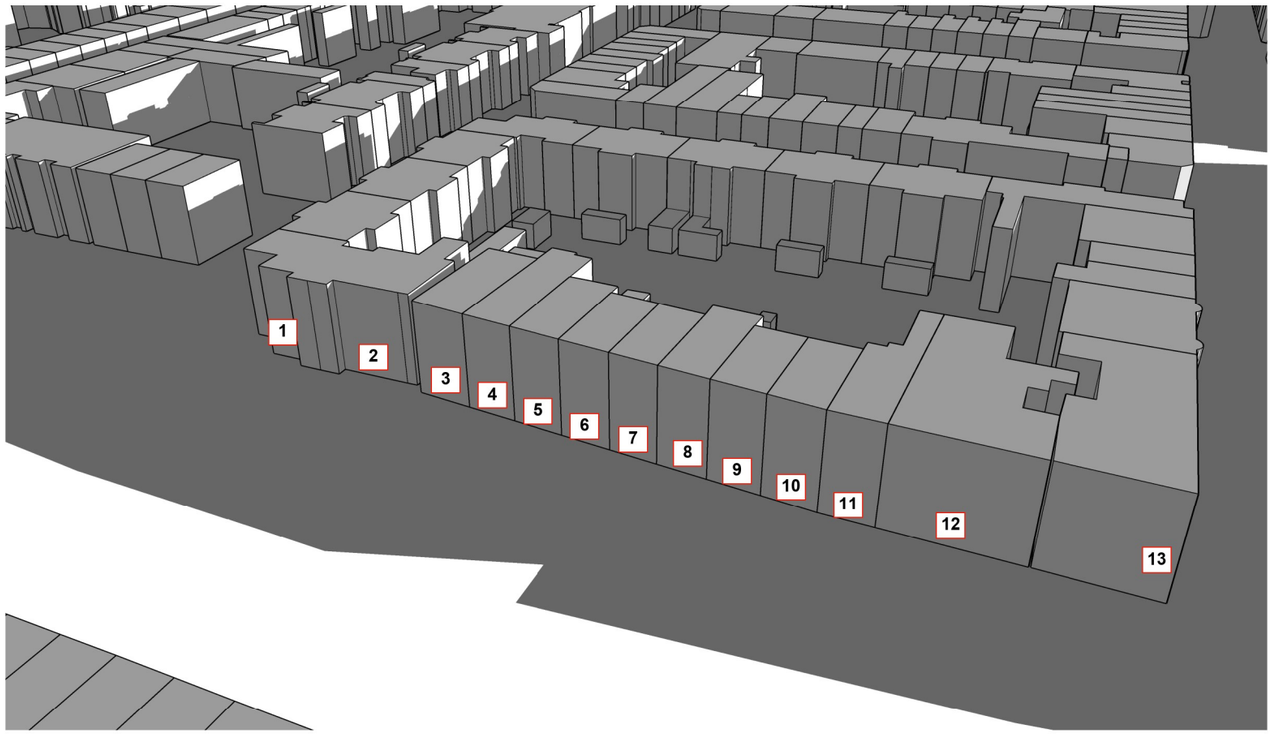
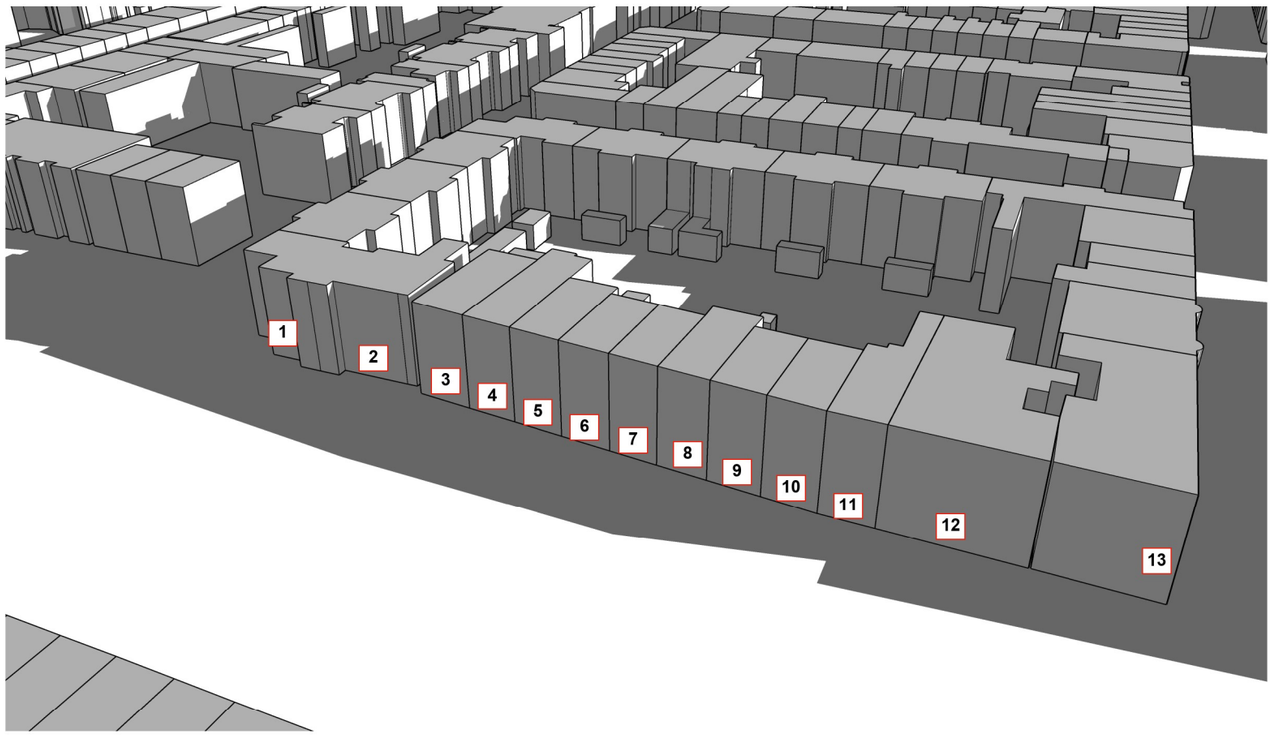


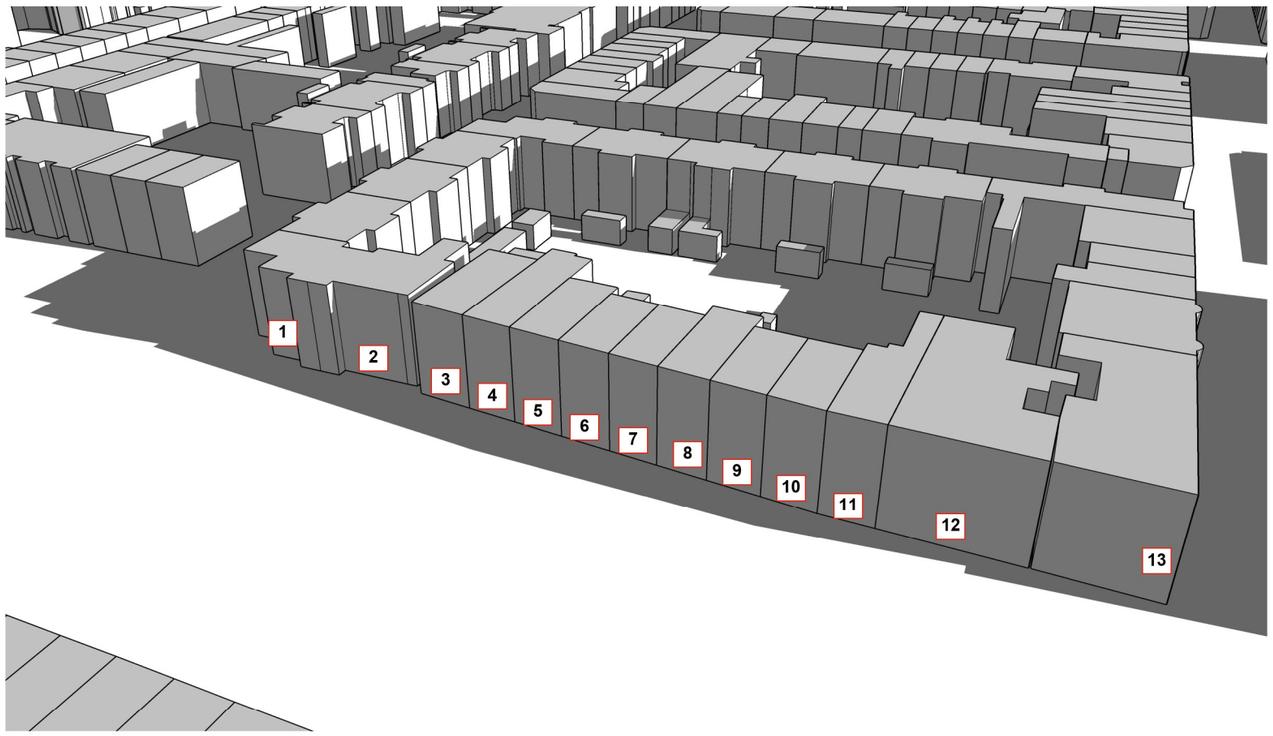


Noordsingel 39-65
21 september
08.00



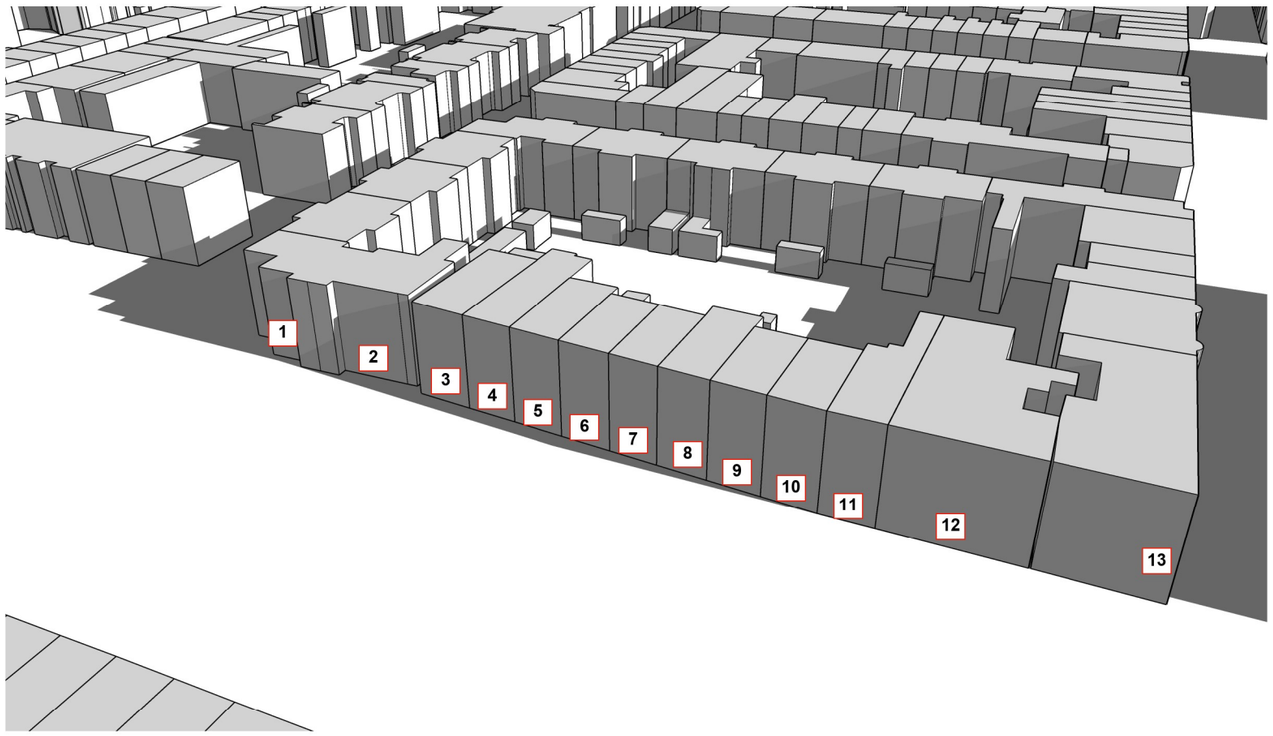


Noordsingel 39-65
21 september
08.30



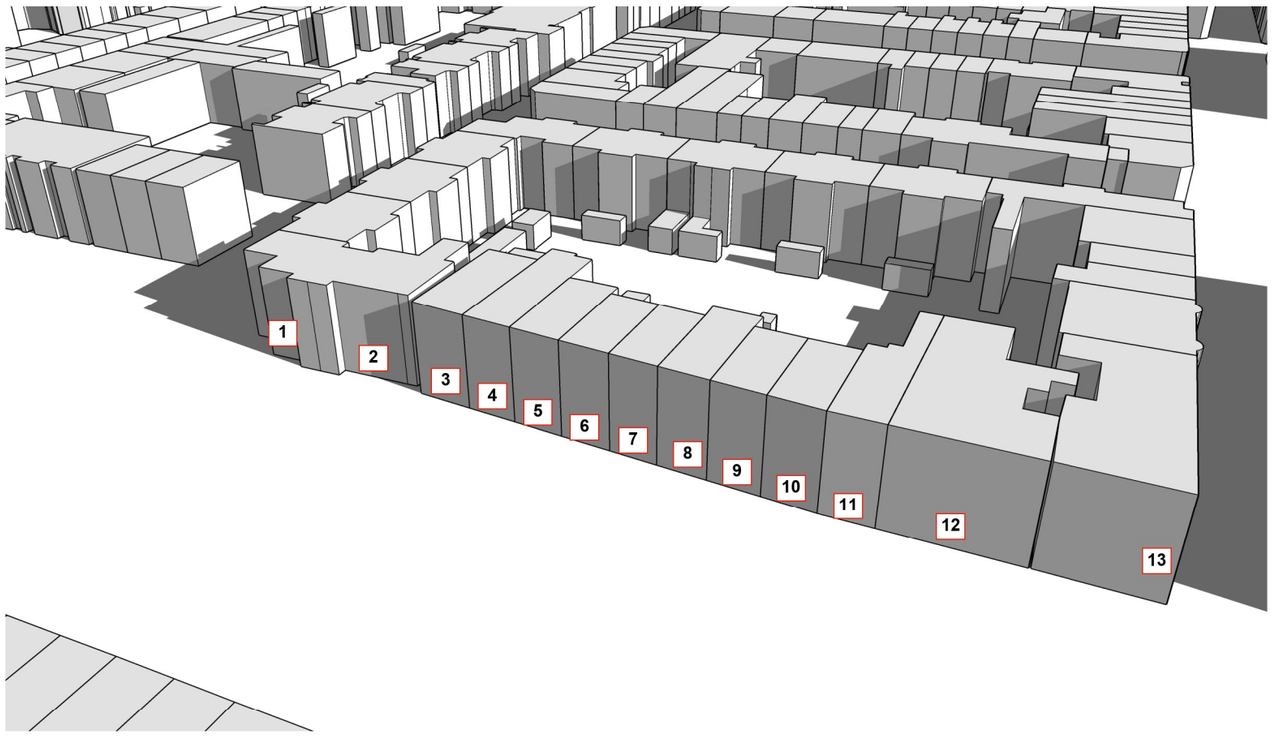


Noordsingel 39-65
21 september
09.00





Noordsingel 39-65
21 september
09.30



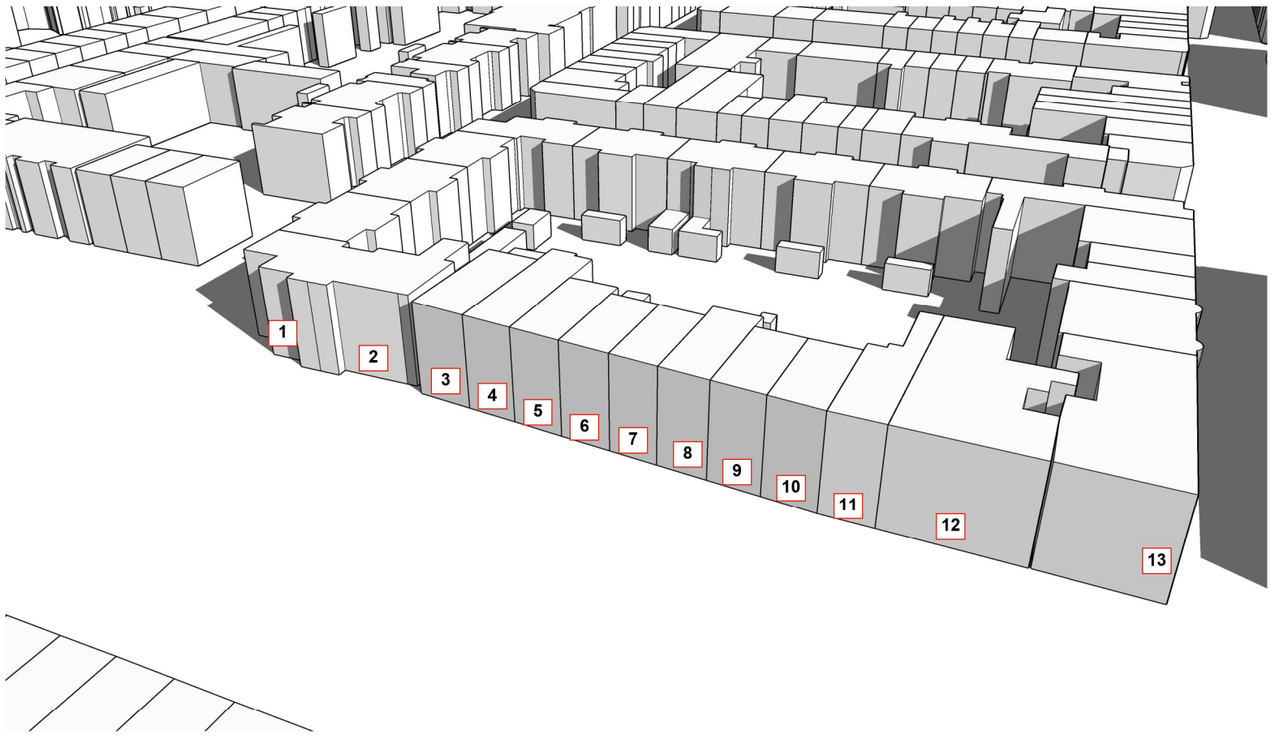


Noordsingel 39-65
21 september
10.00





Noordsingel 39-65
21 september
10.30



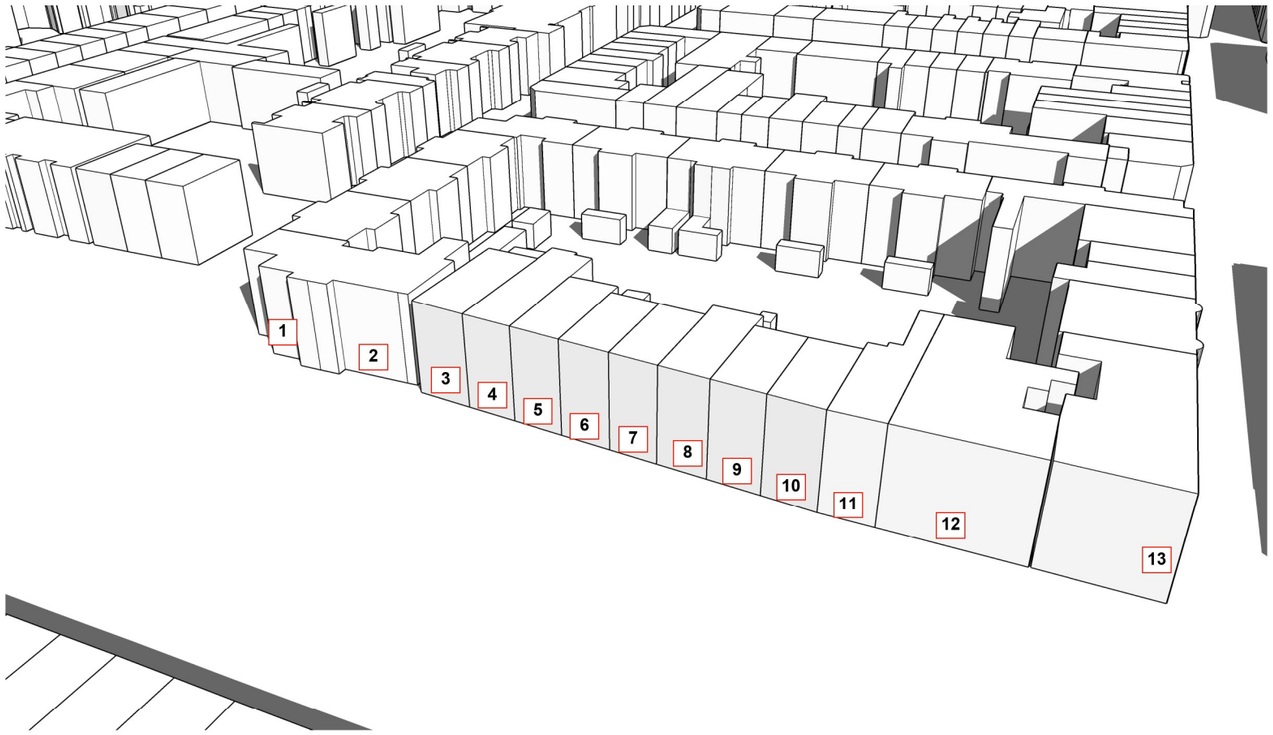


Noordsingel 39-65
21 september
11.00



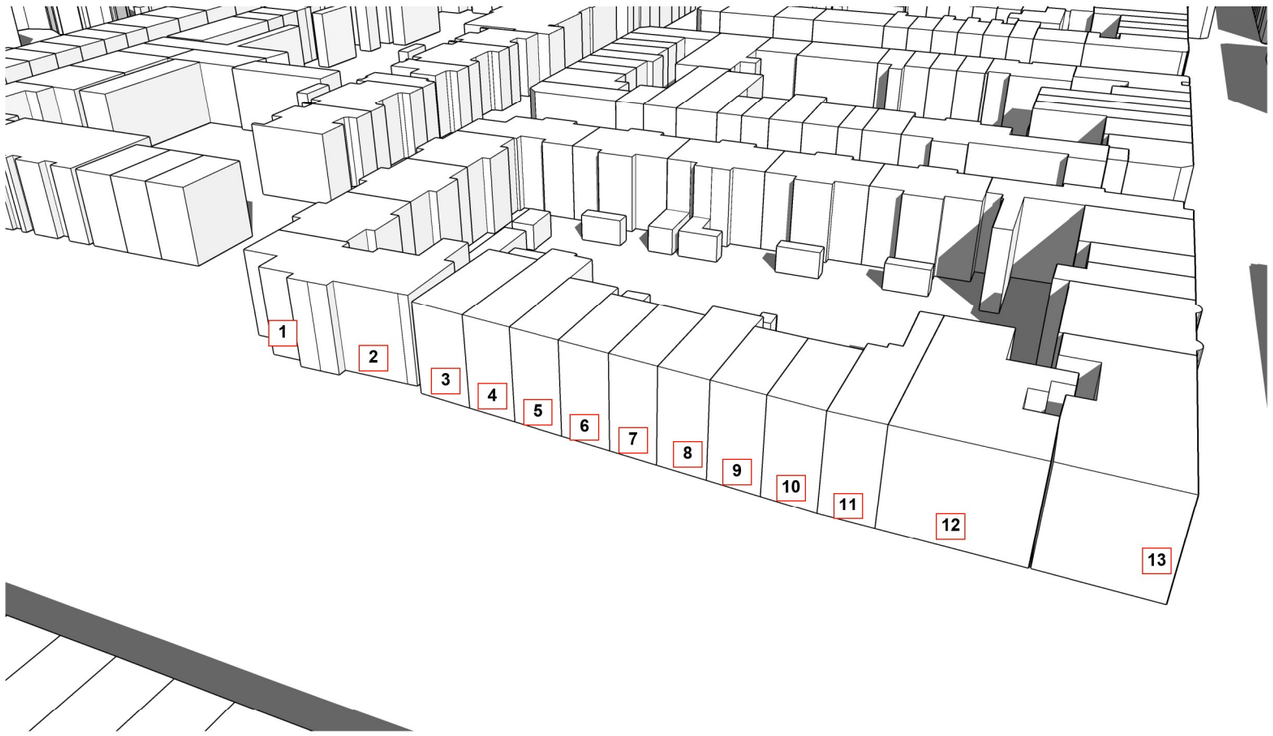


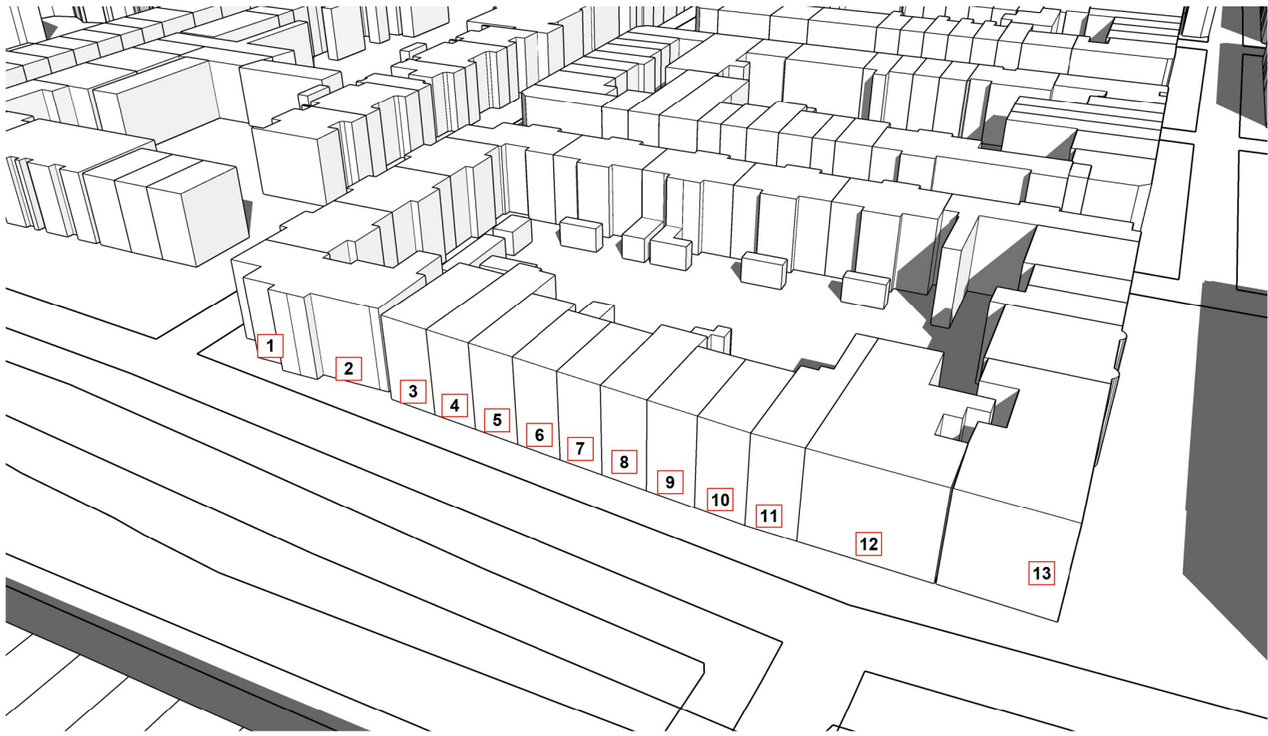
Noordsingel 39-65
21 september
11.30



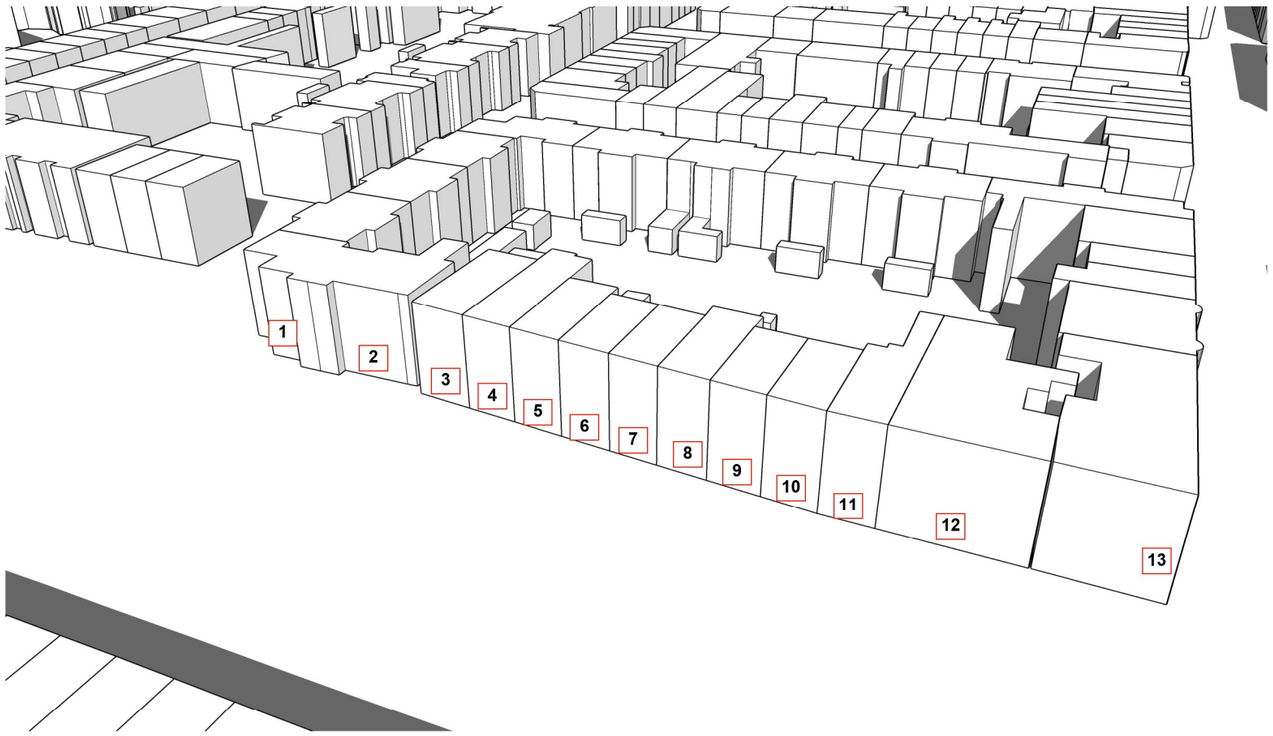


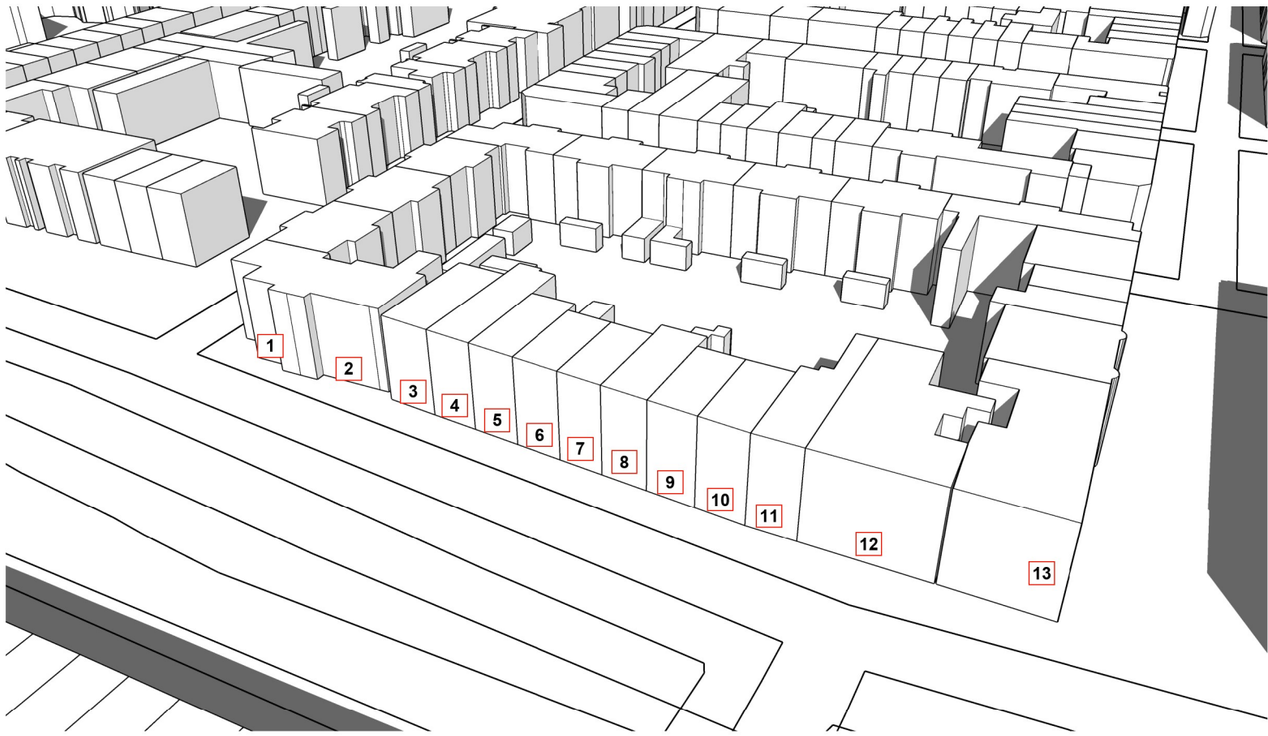
Noordsingel 39-65
21 september
12.00



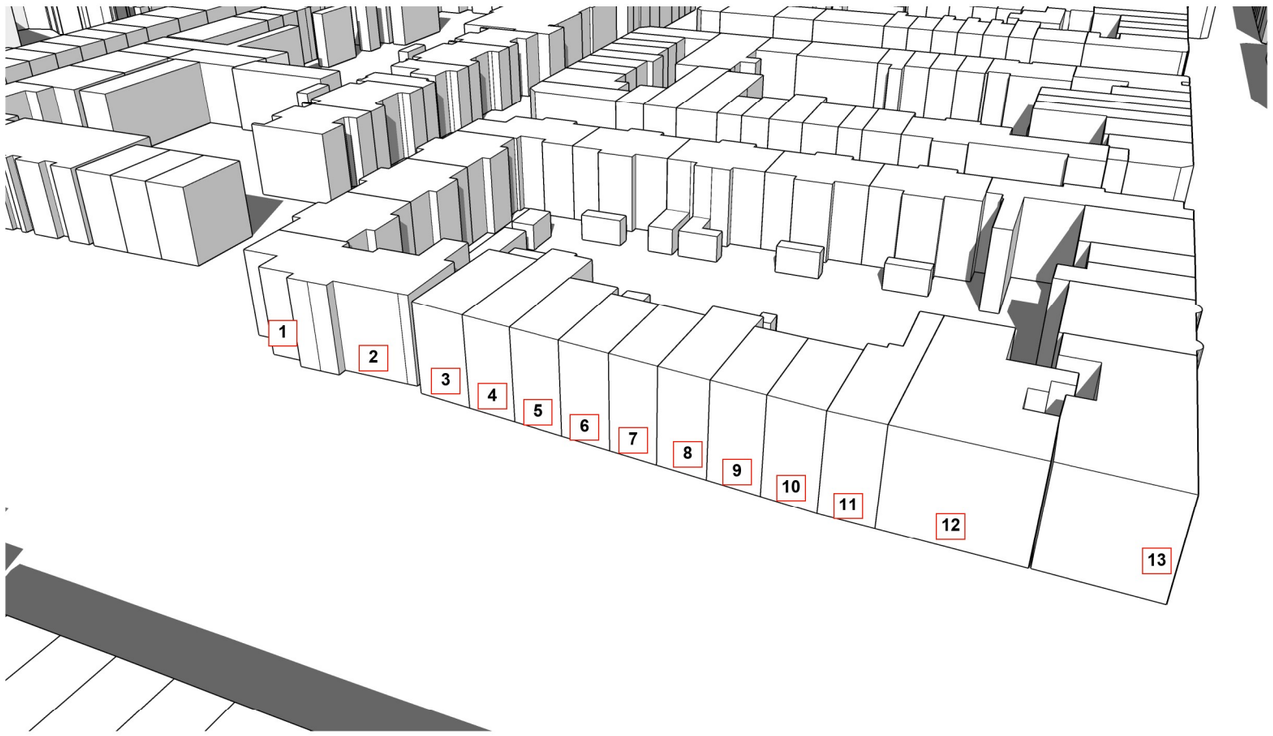


Noordsingel 39-65
21 september
12.30



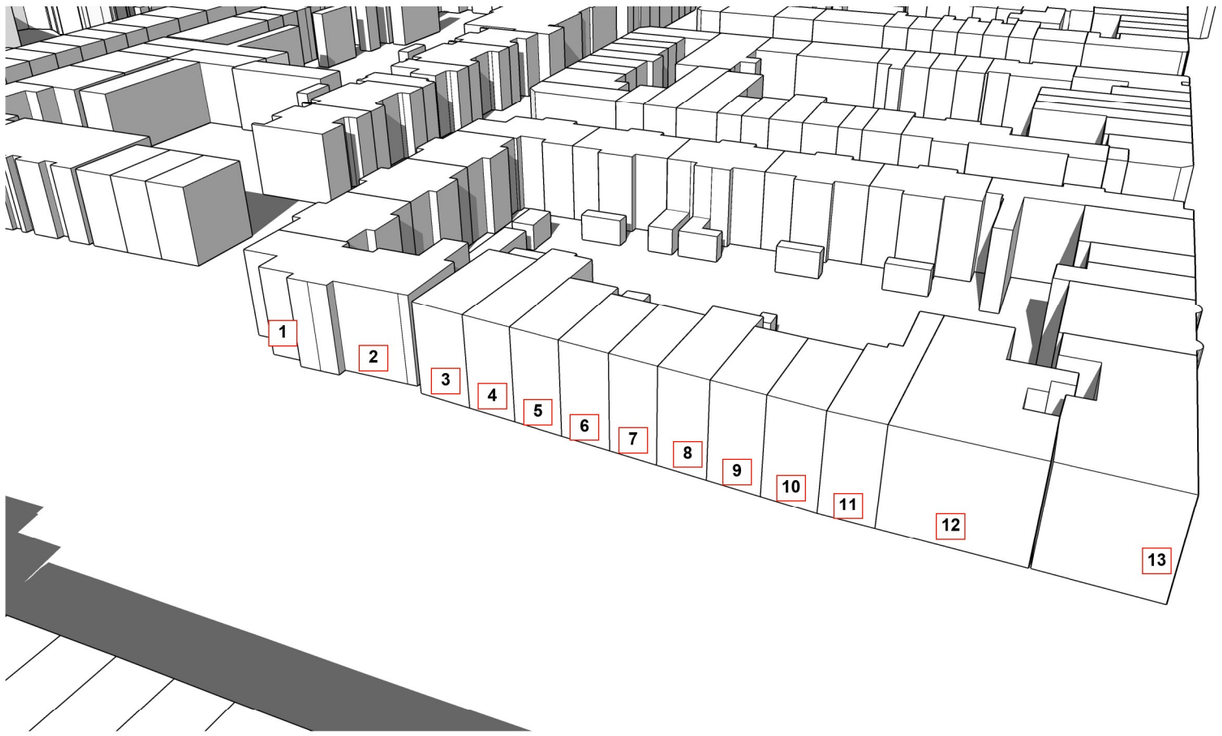


Noordsingel 39-65
21 september
13.00



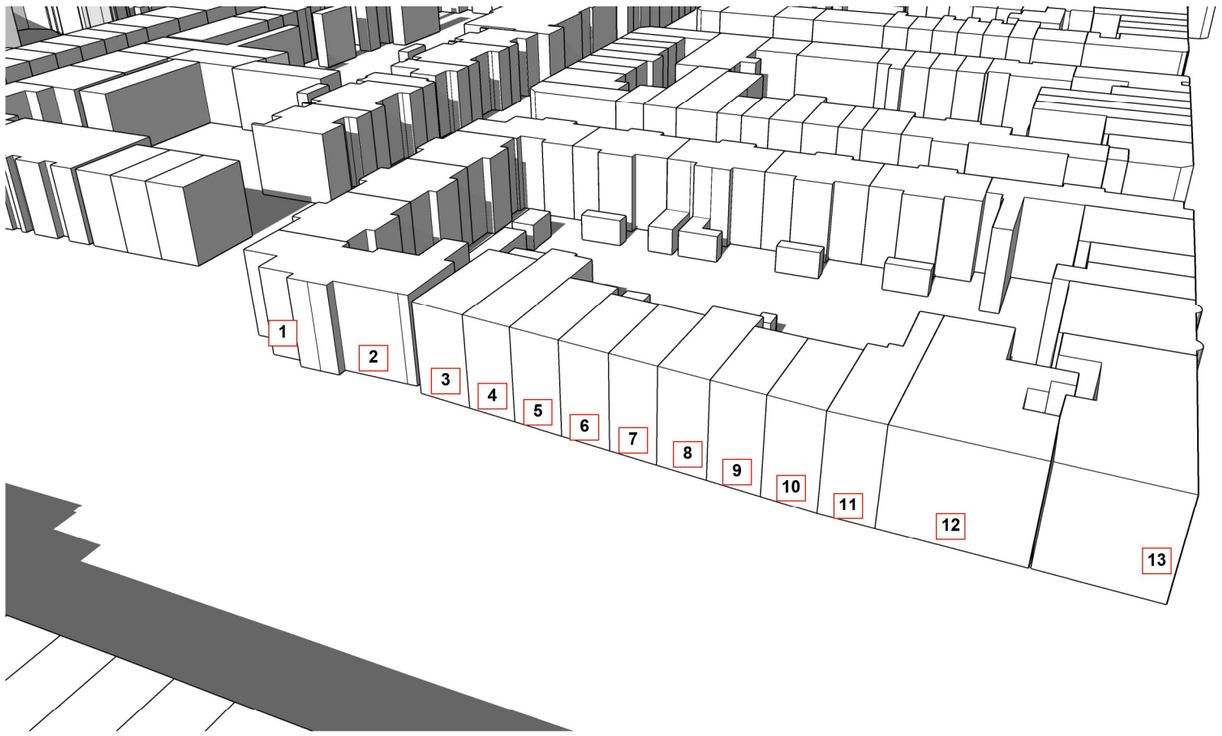


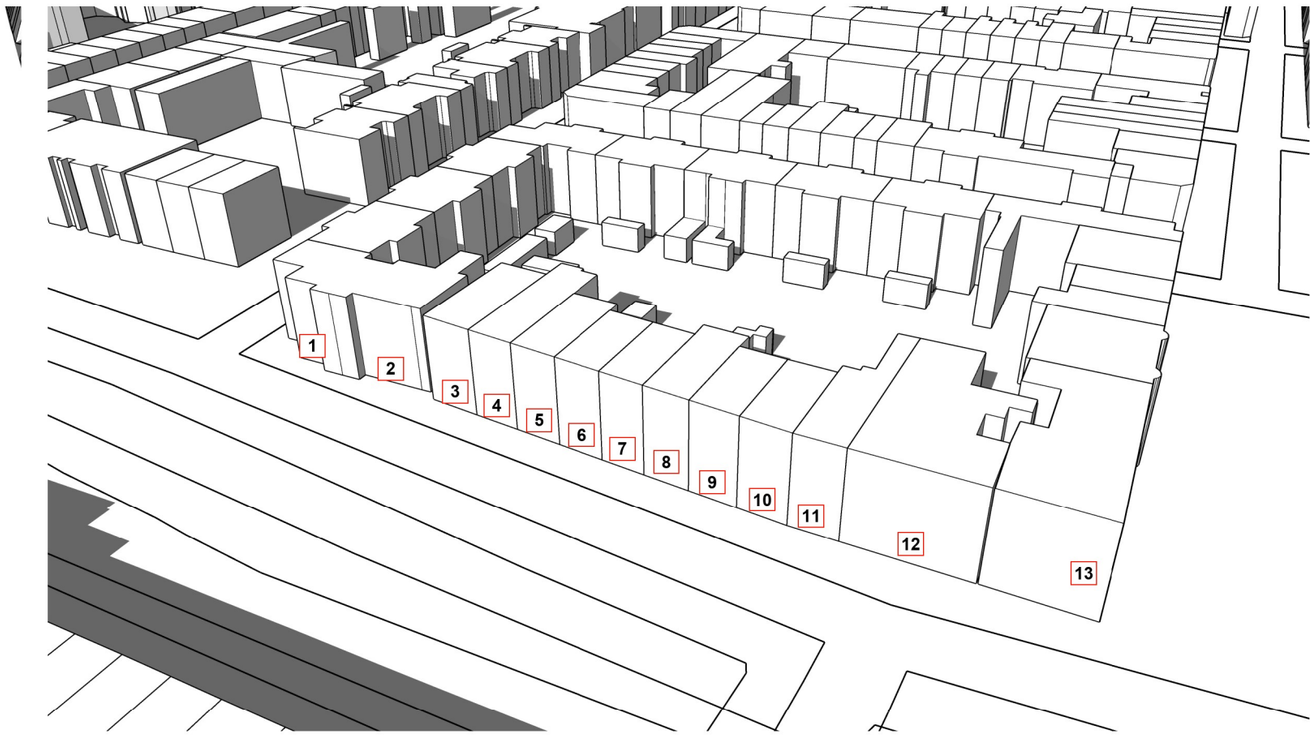
Noordsingel 39-65
21 september
13.30



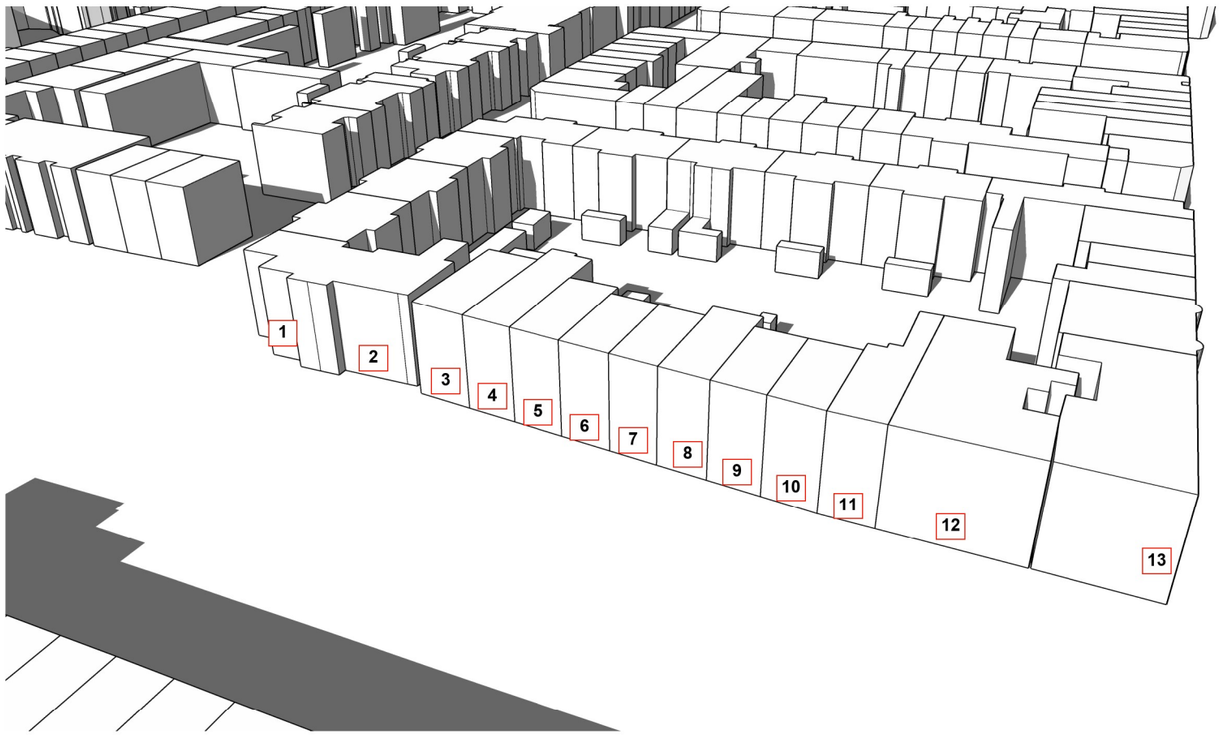


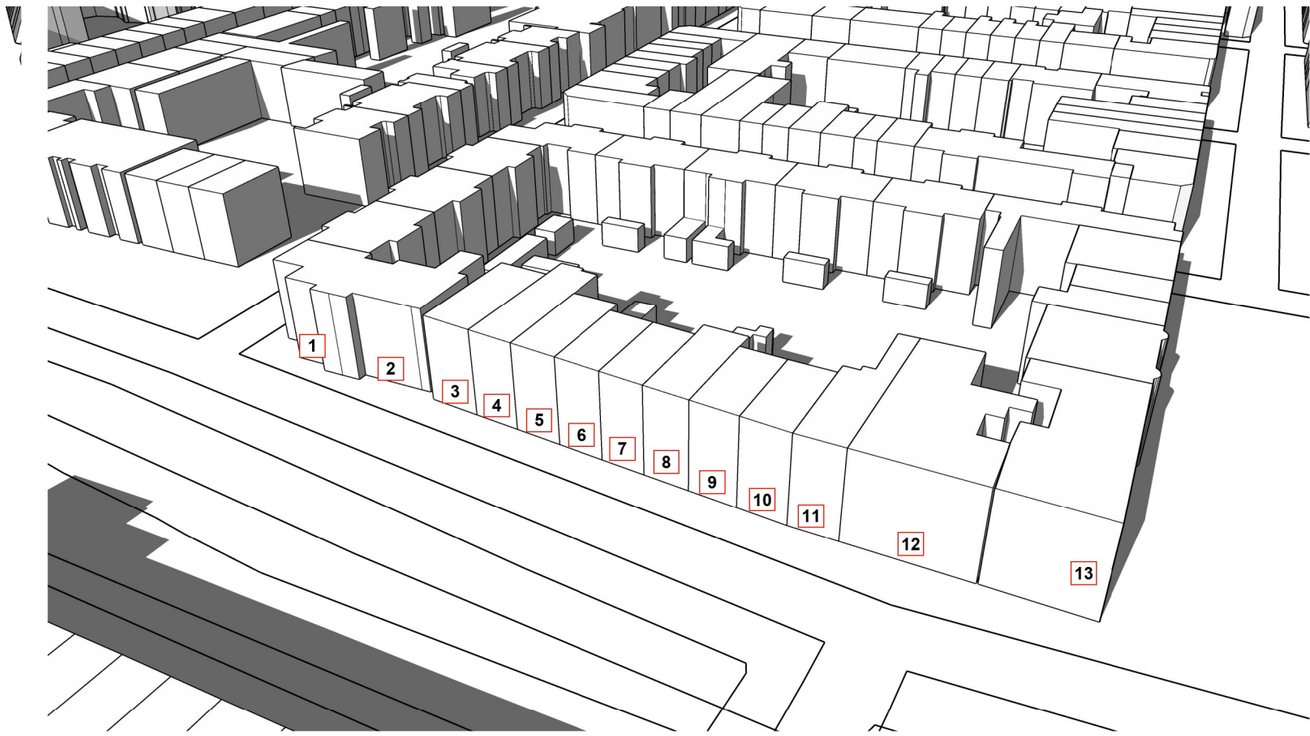
Noordsingel 39-65
21 september
14.00



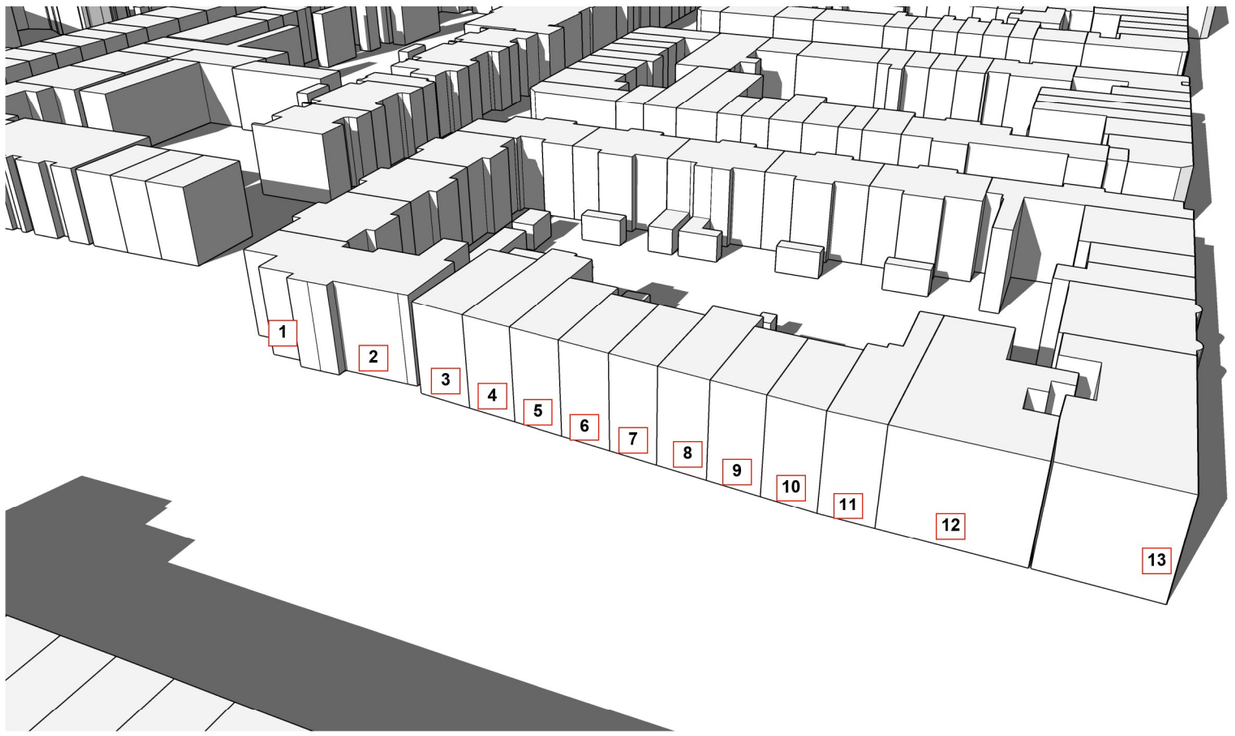


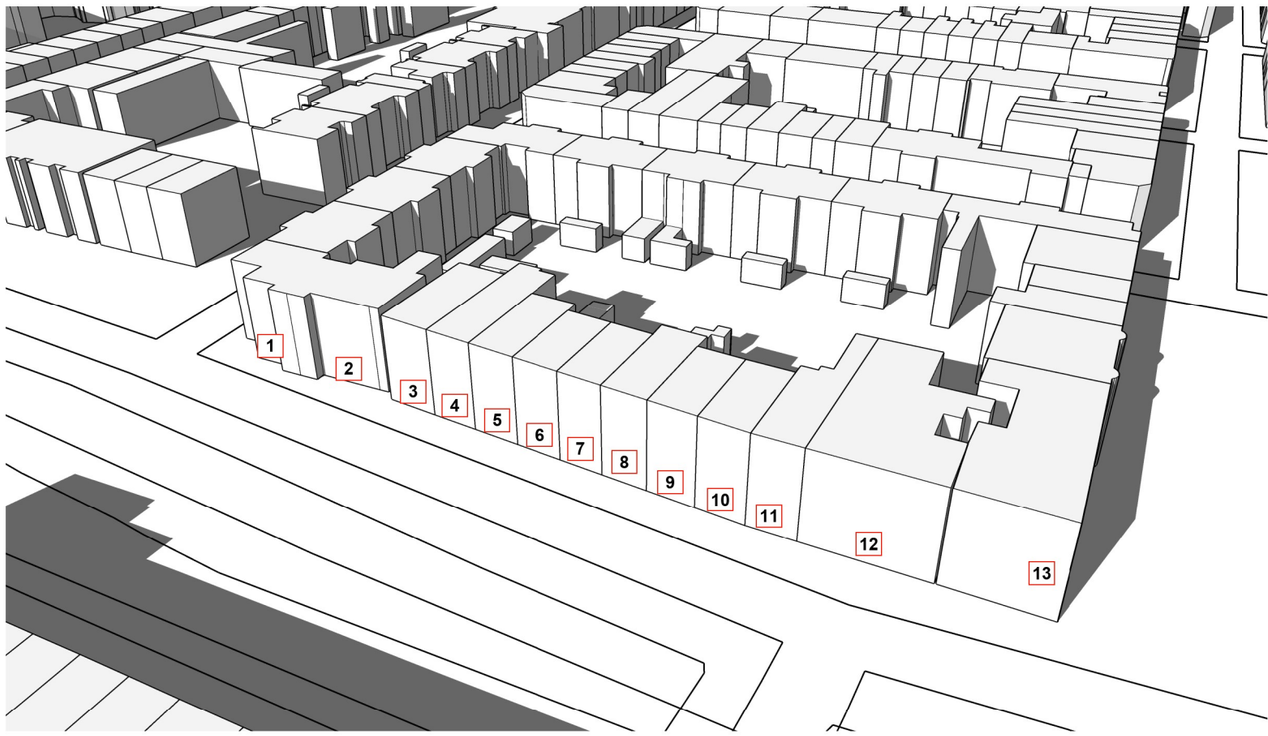
Noordsingel 39-65
21 september
14.30





Noordsingel 39-65
21 september
15.00





Noordsingel 39-65
21 september
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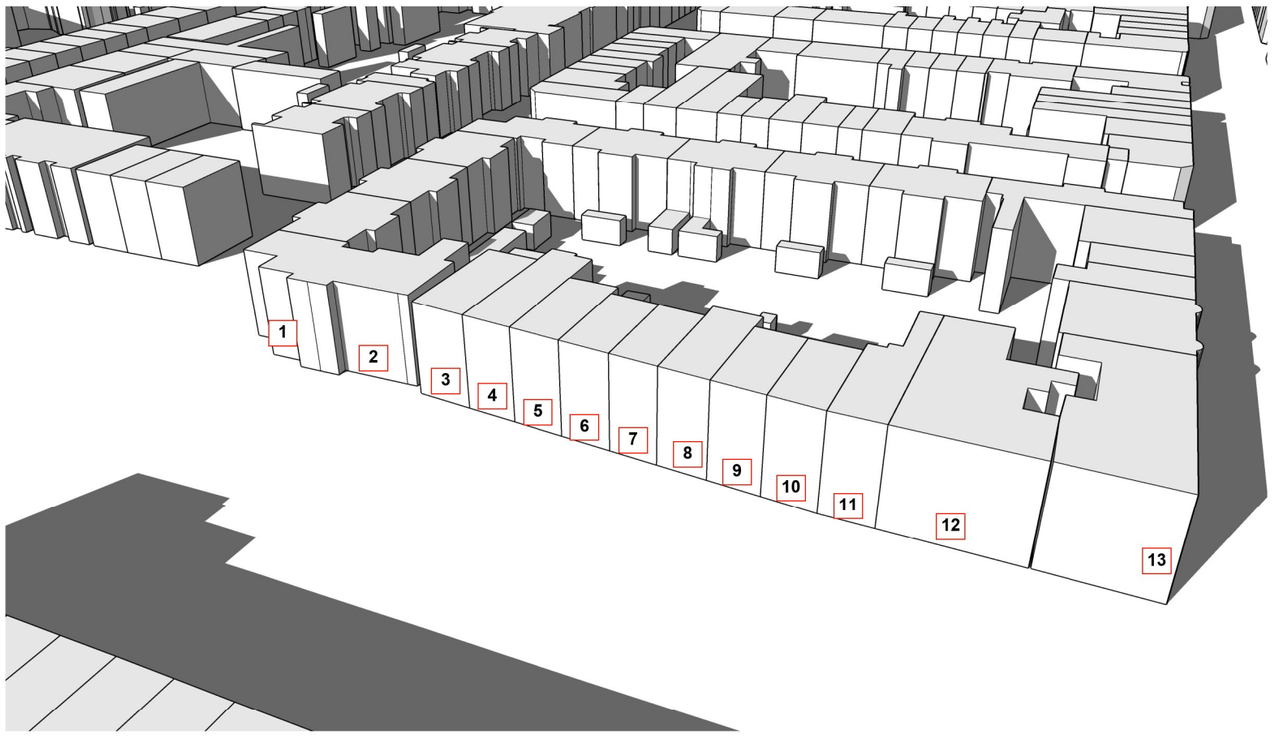
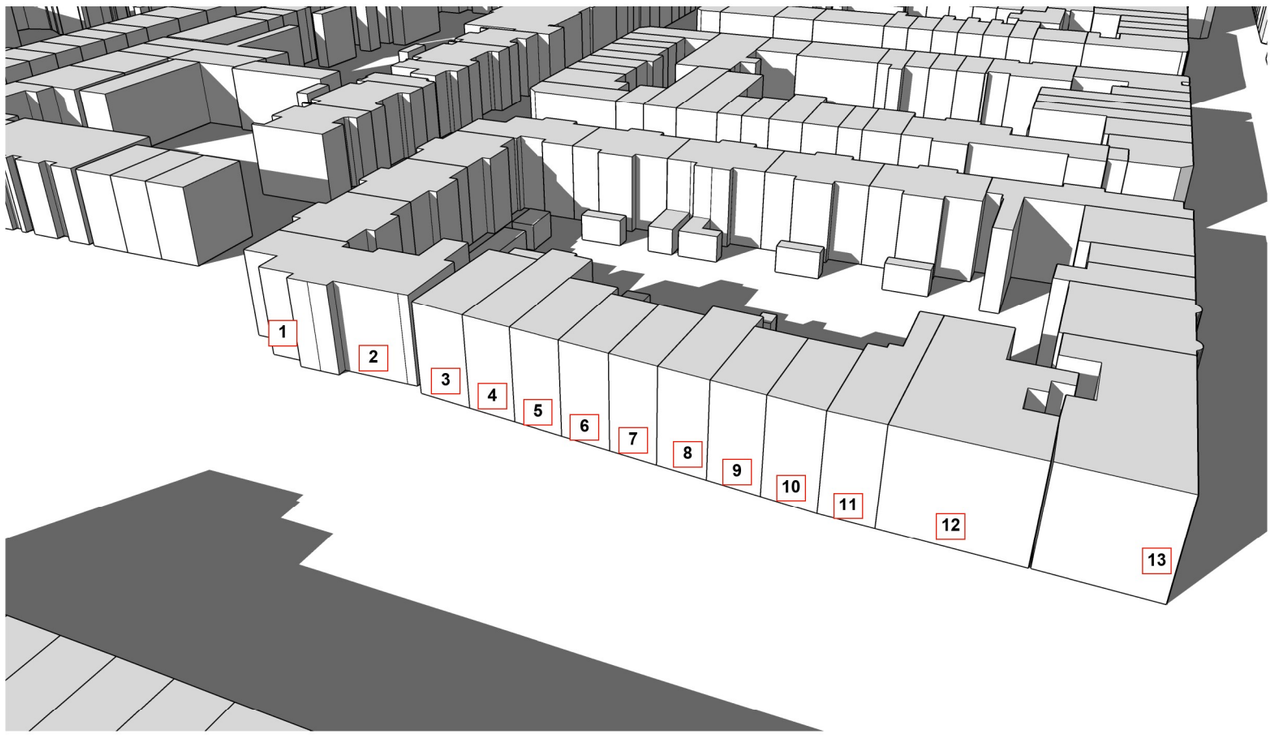


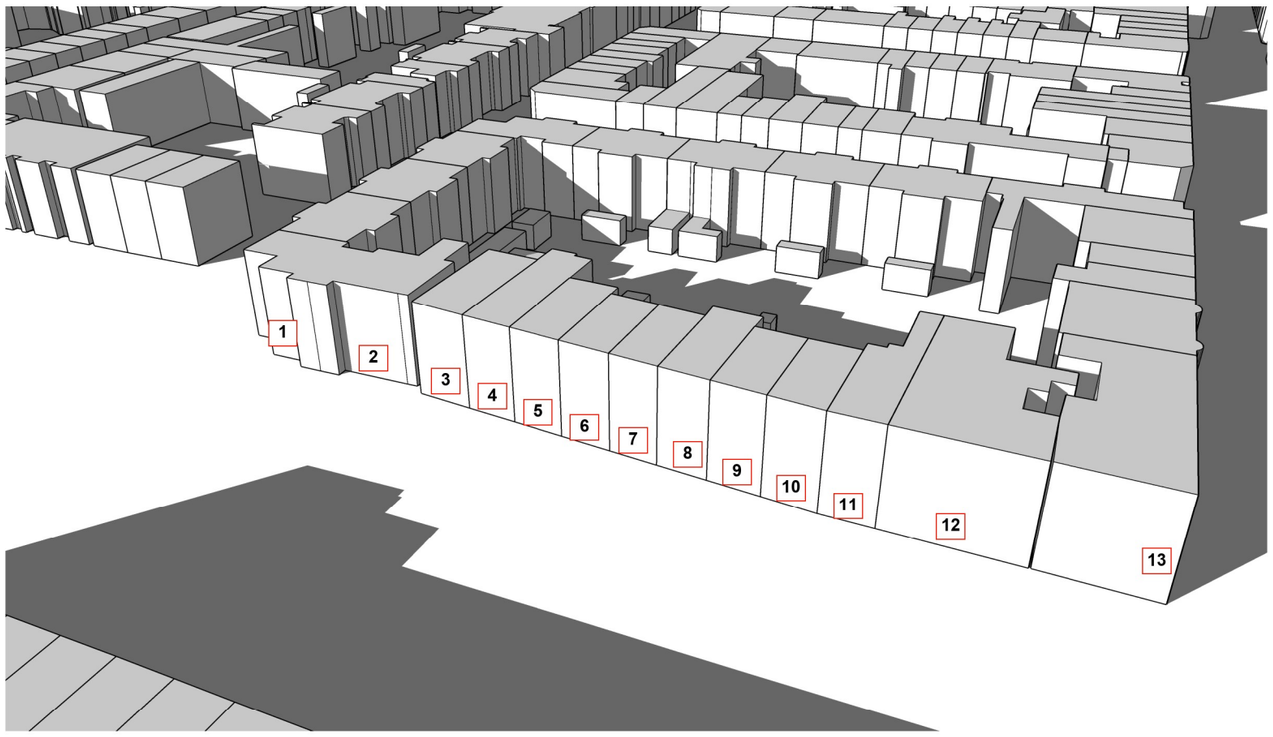


Noordsingel 39-65
21 september
16.00



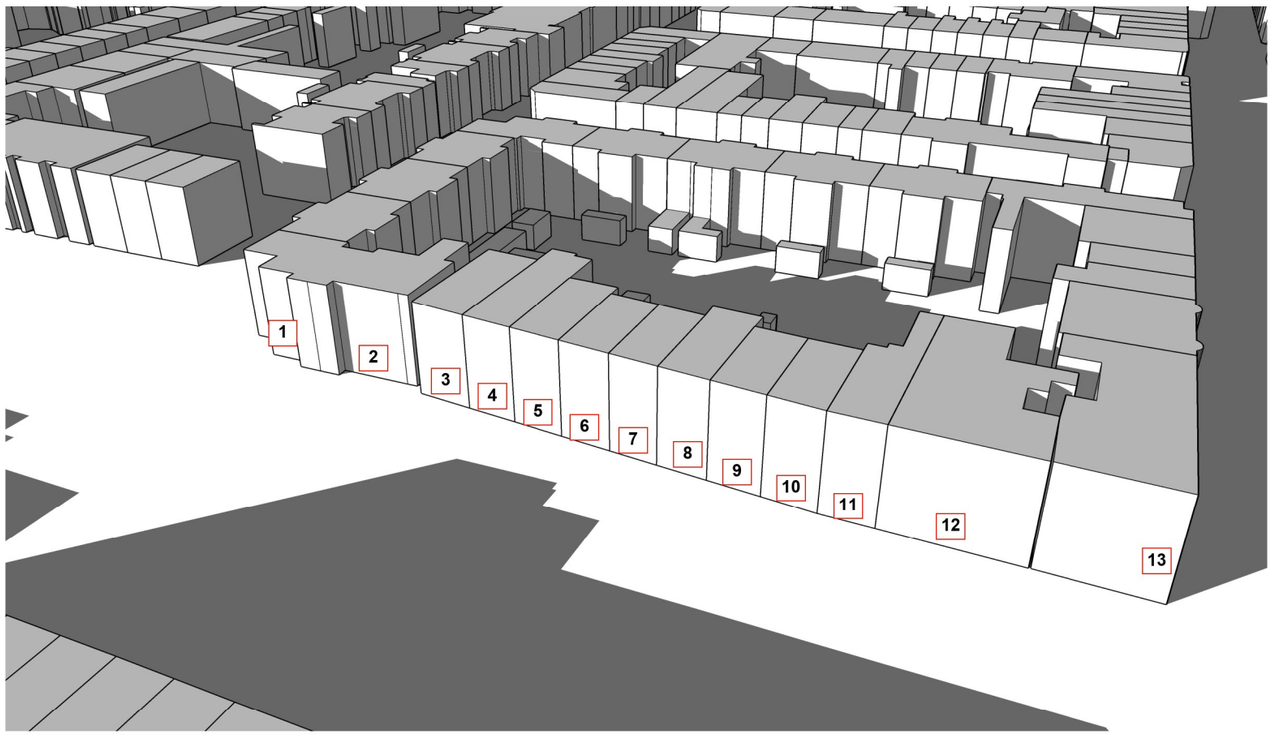


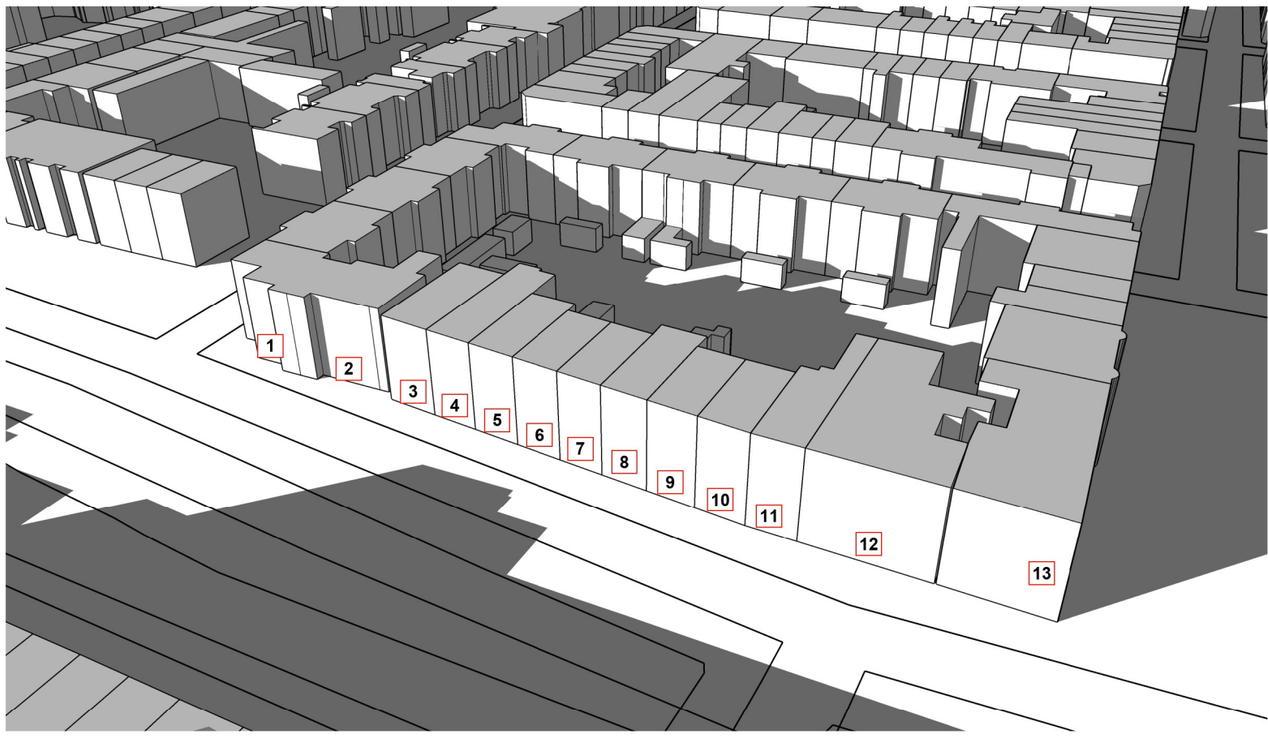
Noordsingel 39-65
21 september
16.30



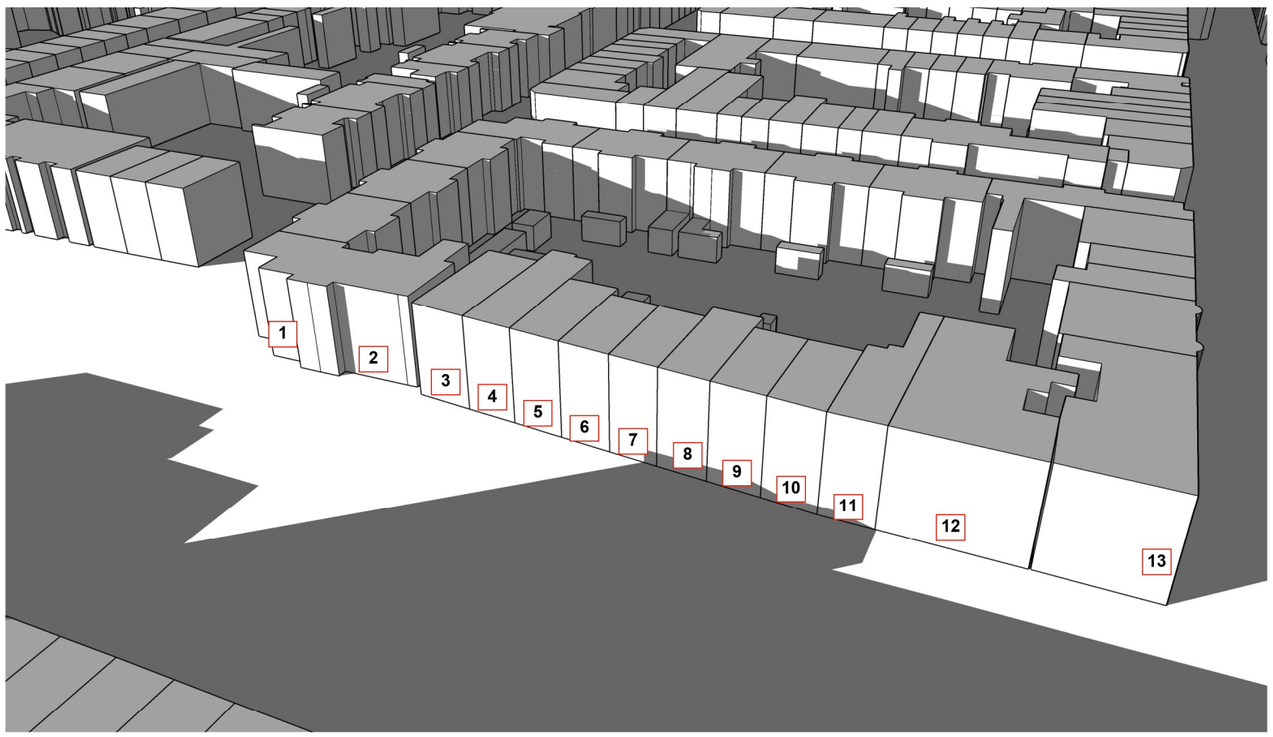


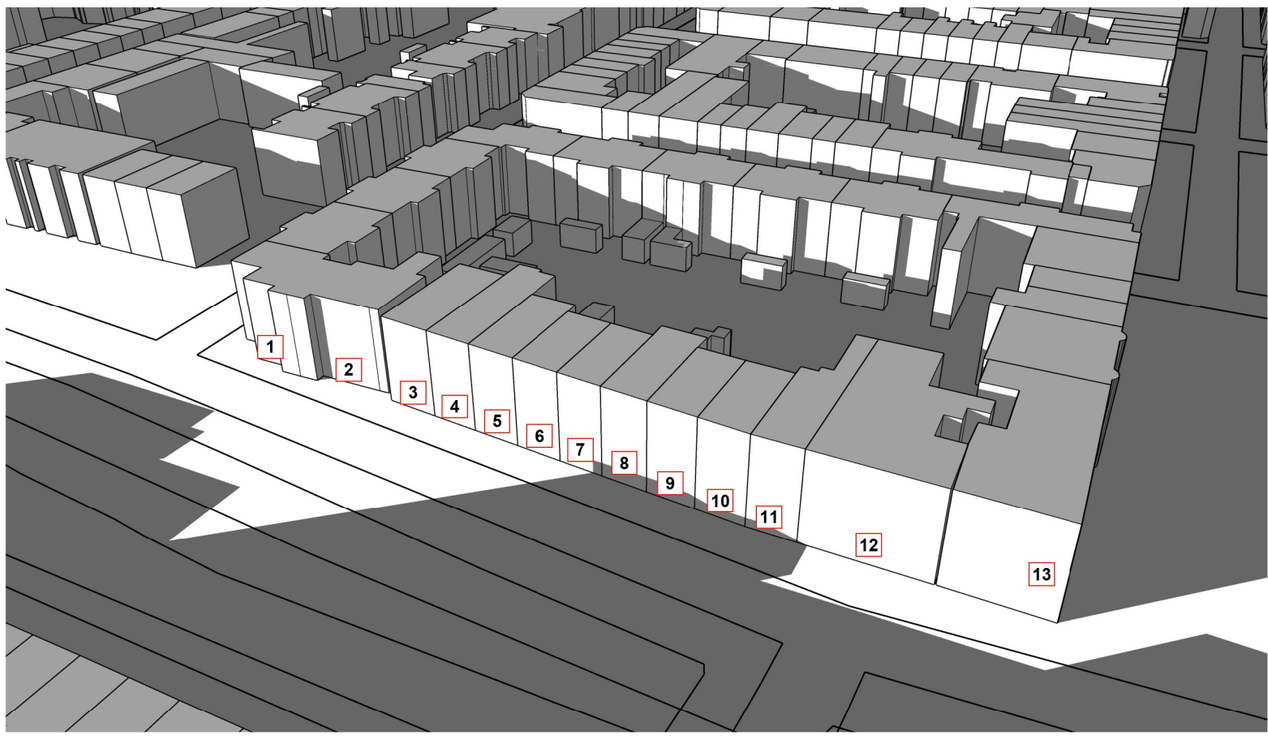
Noordsingel 39-65
21 september
17.00



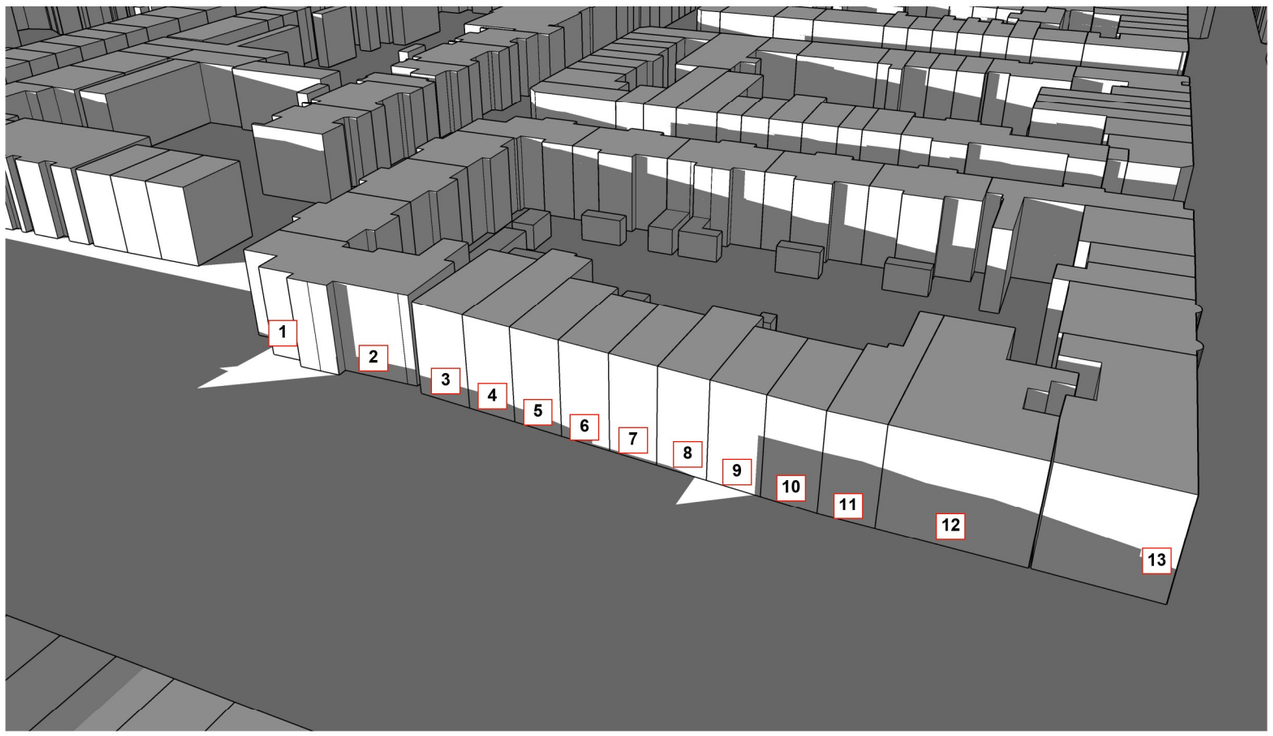


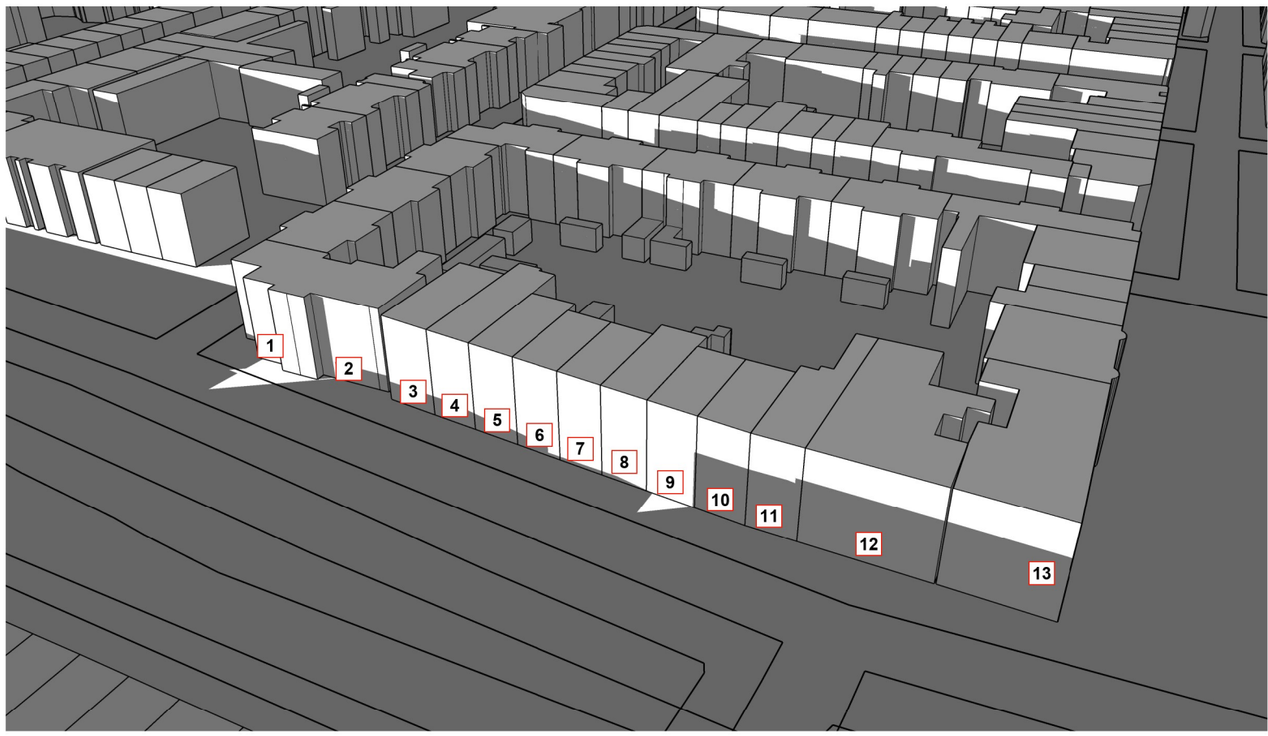
Noordsingel 39-65
21 september
17.30



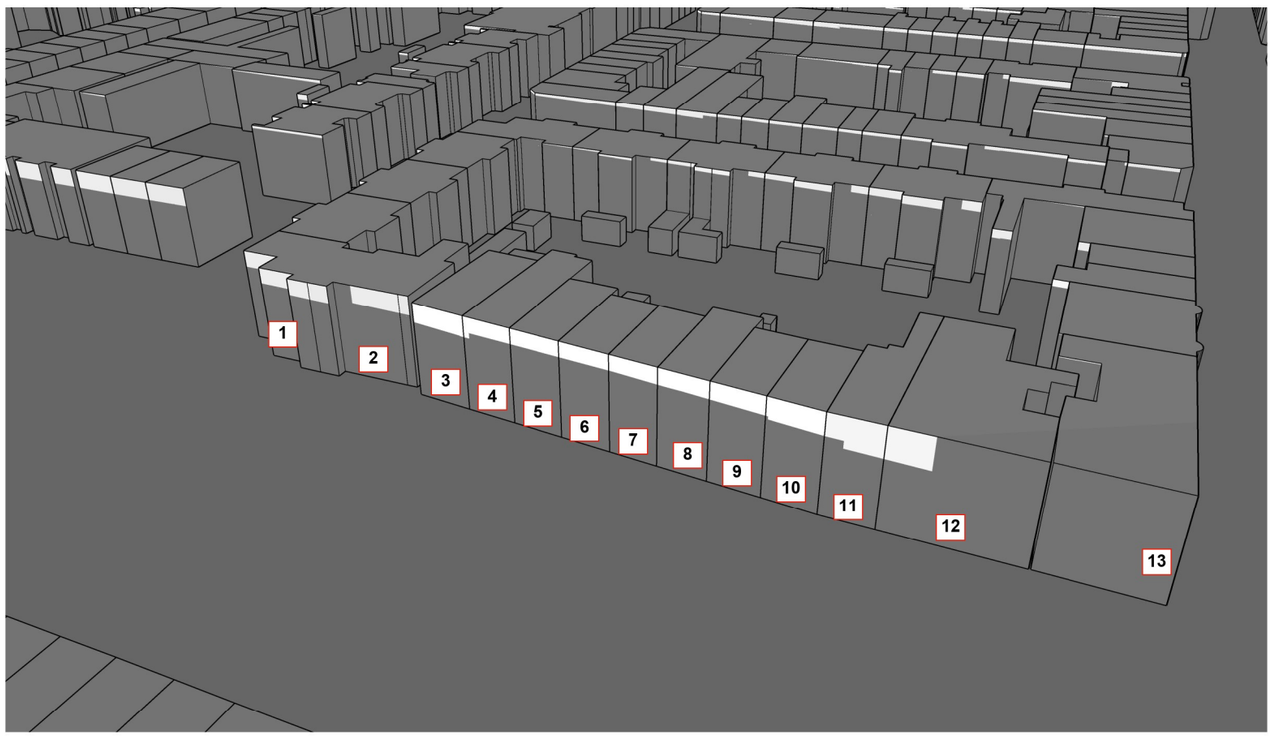


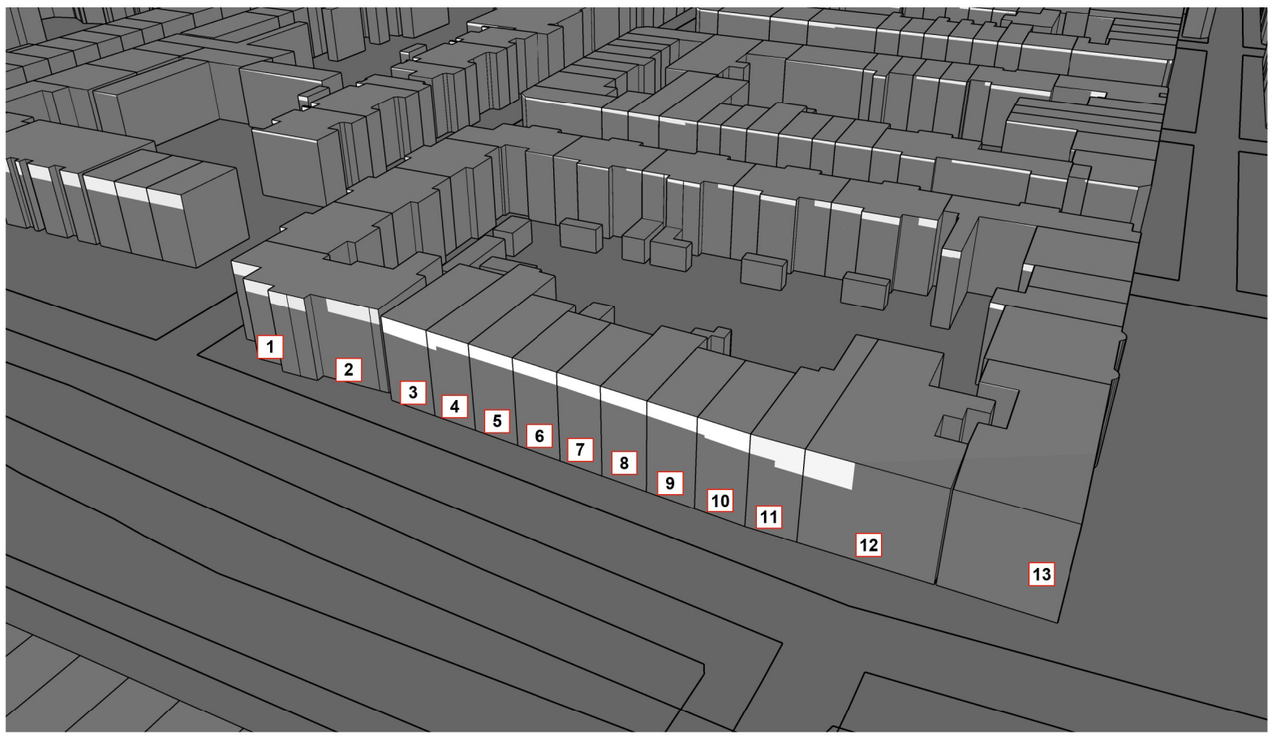
Noordsingel 39-65
21 september
18.00



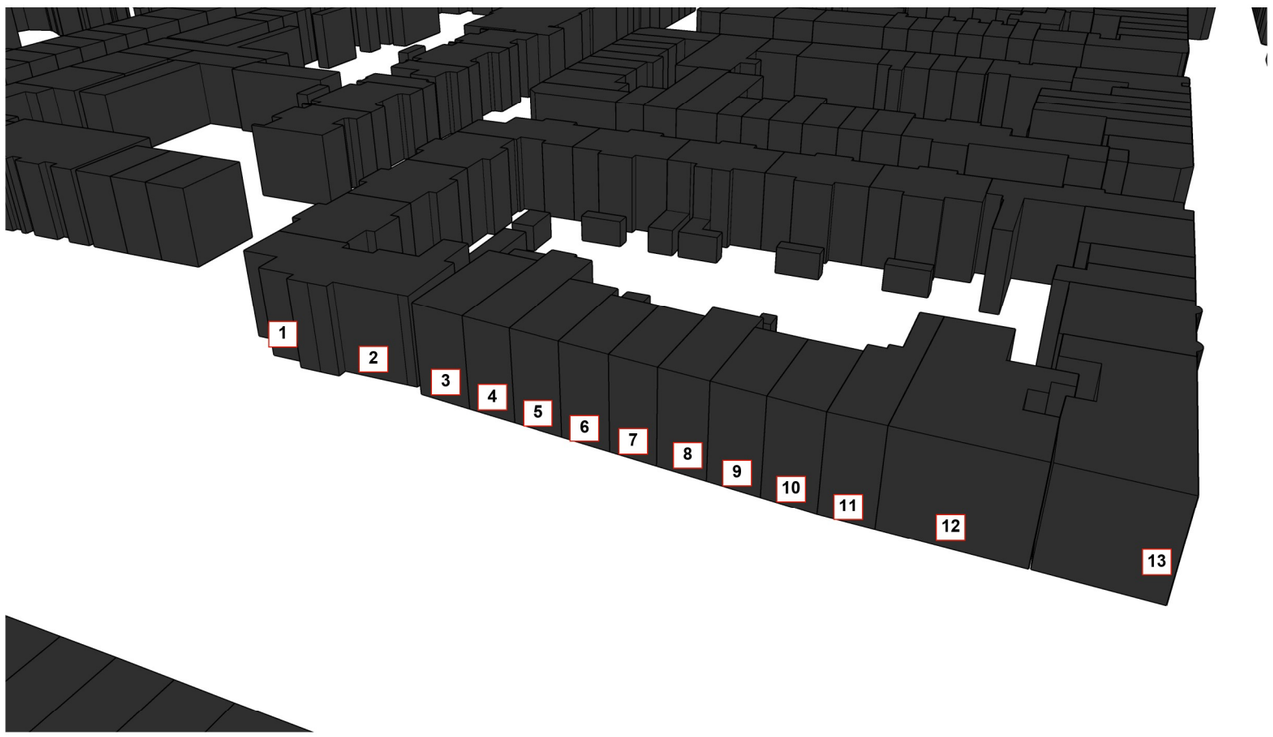


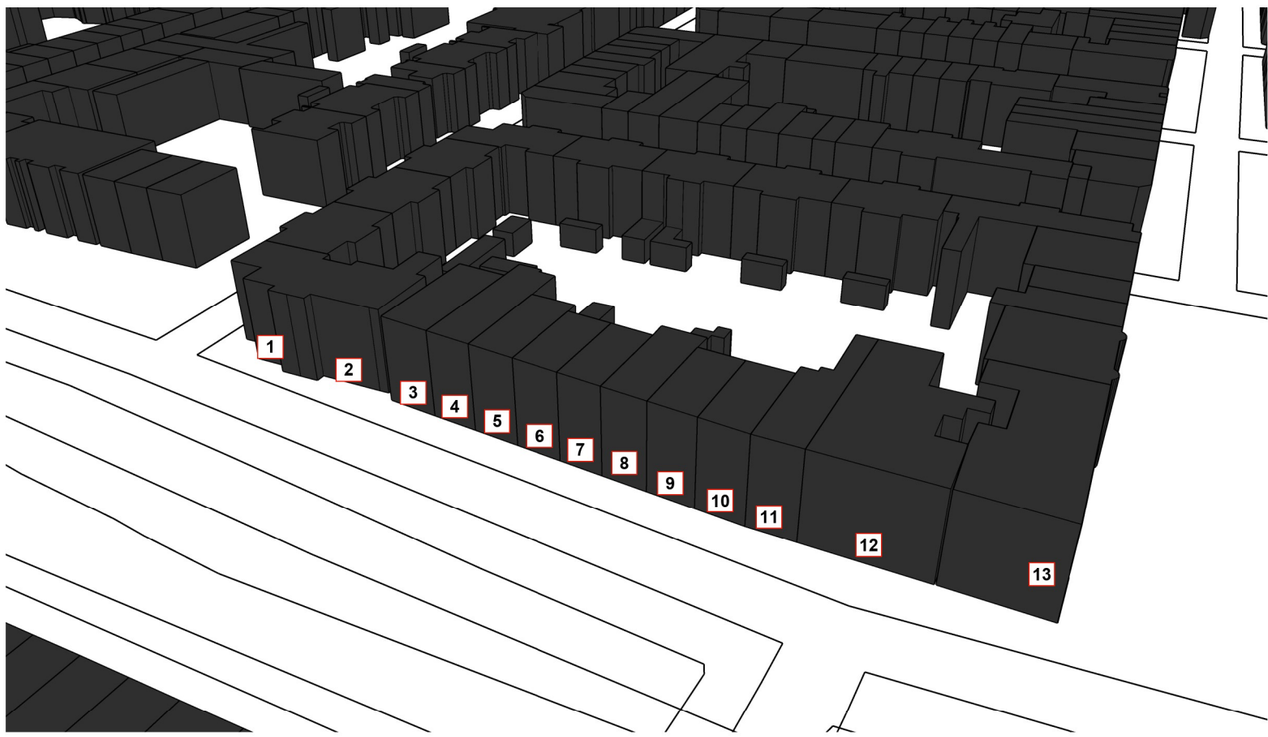
Noordsingel 39-65
21 september
18.30





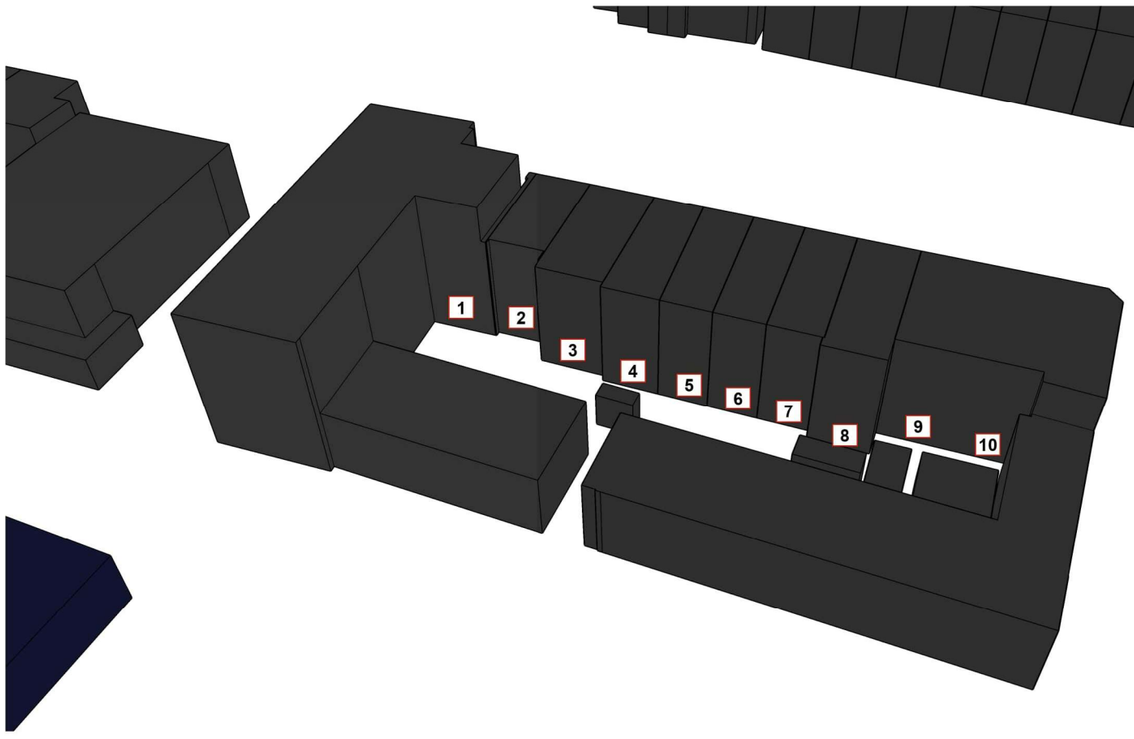
Noordsingel 39-65
21 september
19.00

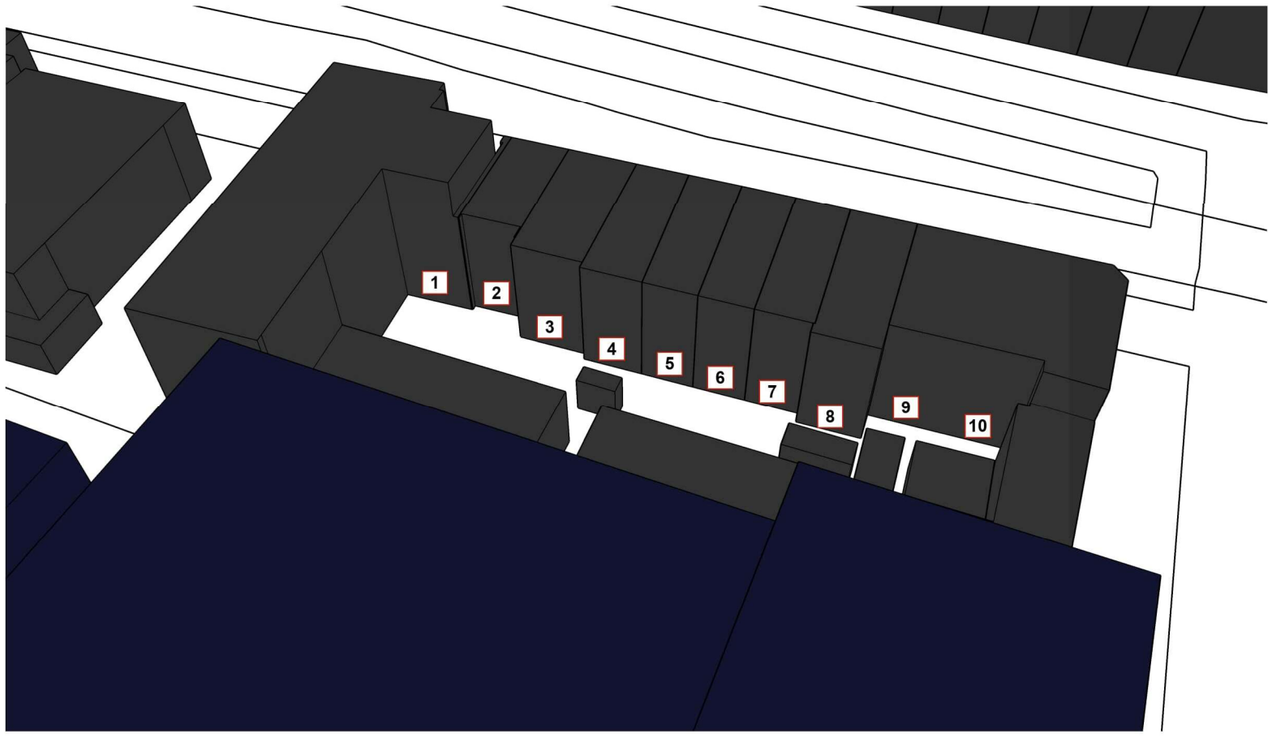




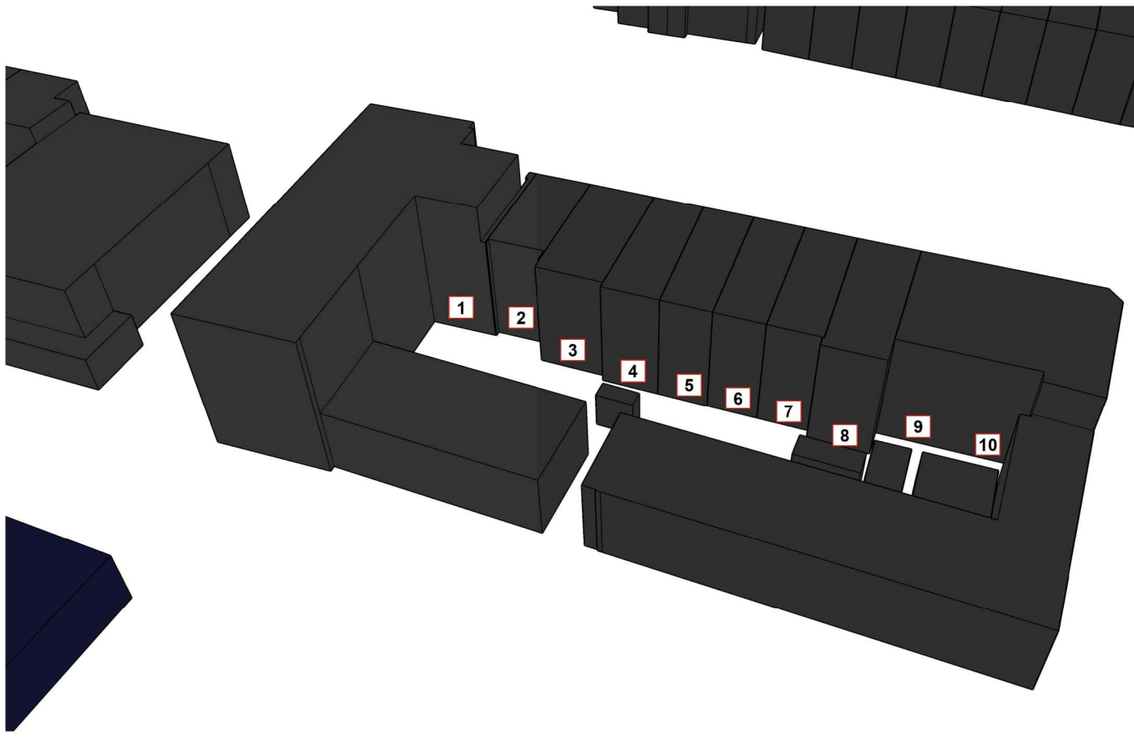
bijlage 9. resultaten 21 september Noordsingel 54 – 72 huidig vs. nieuw

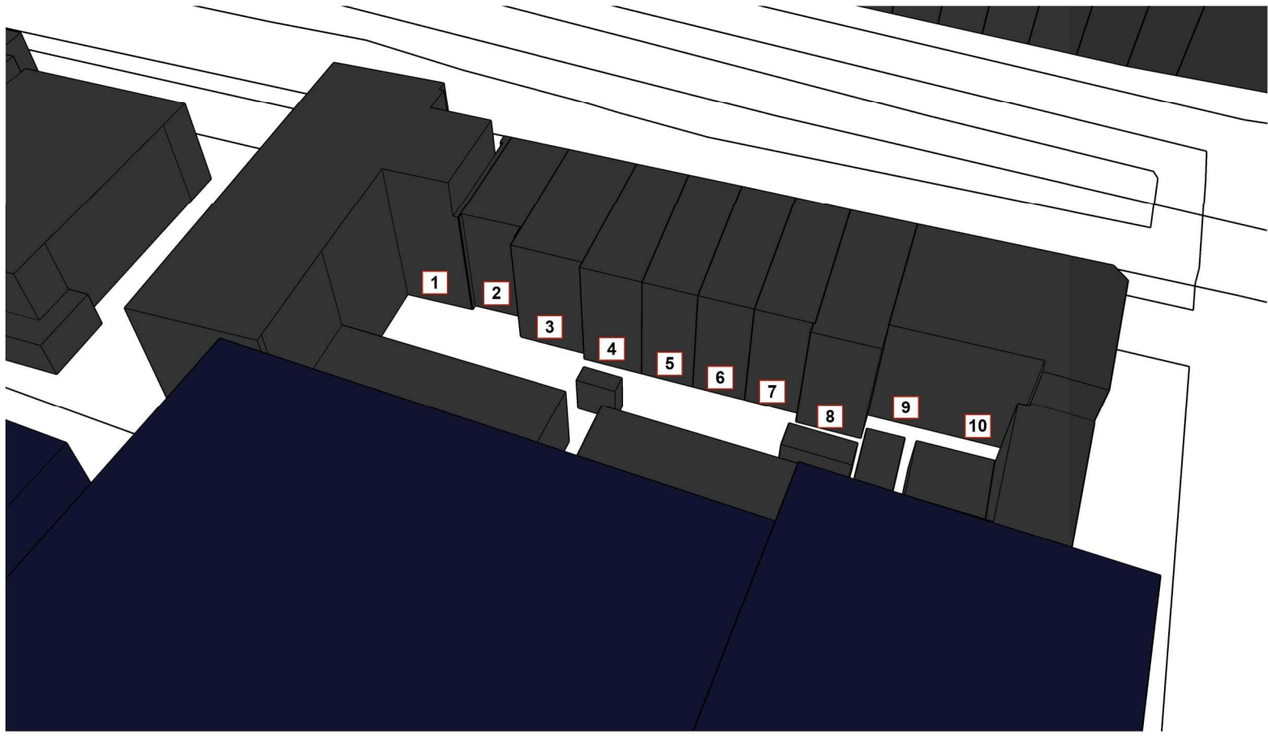
Noordsingel 54 - 72
21 september
06.00



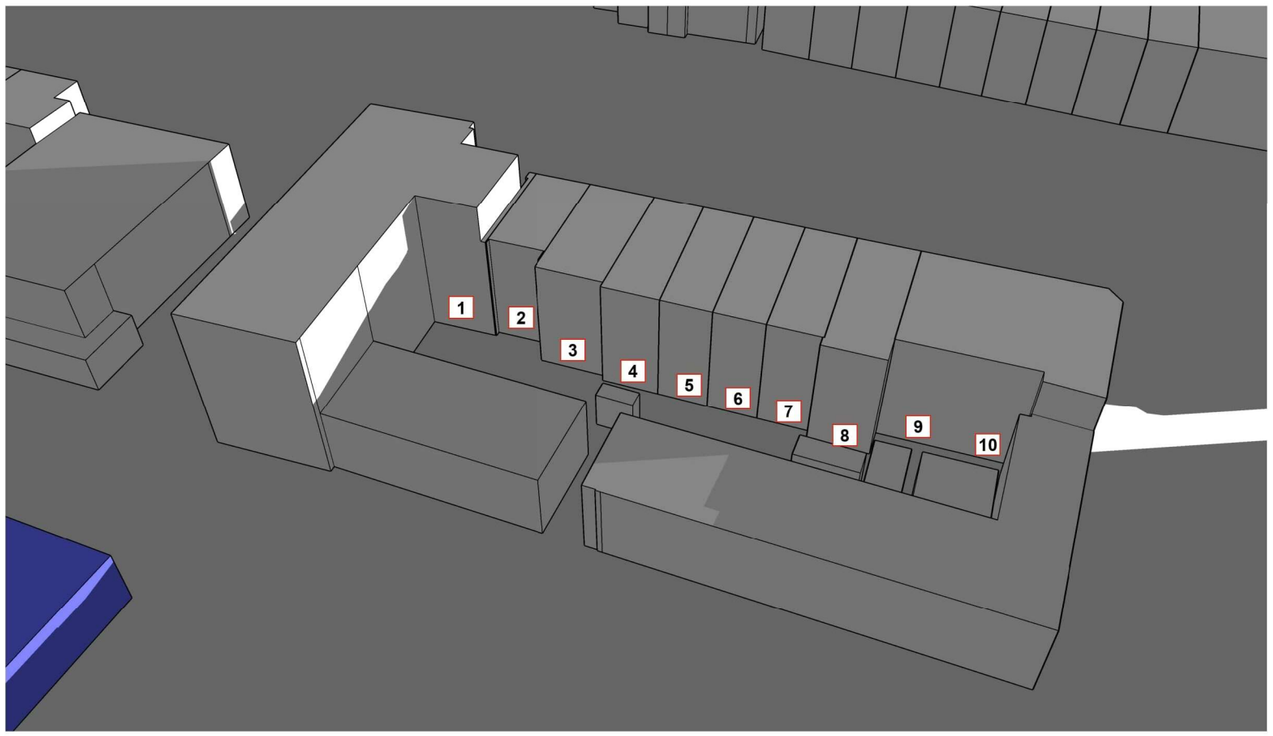


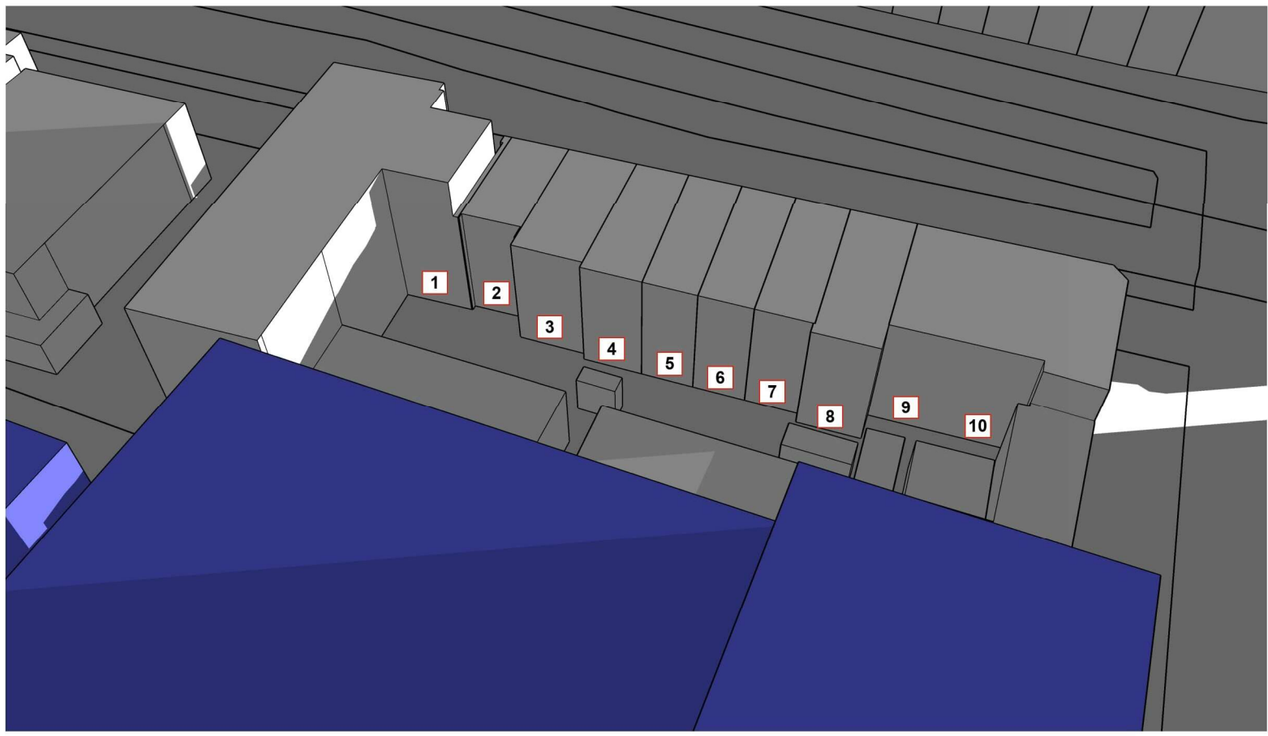
Noordsingel 54 - 72
21 september
06.30





Noordsingel 54 - 72
21 september
07.00





Noordsingel 54 - 72
21 september
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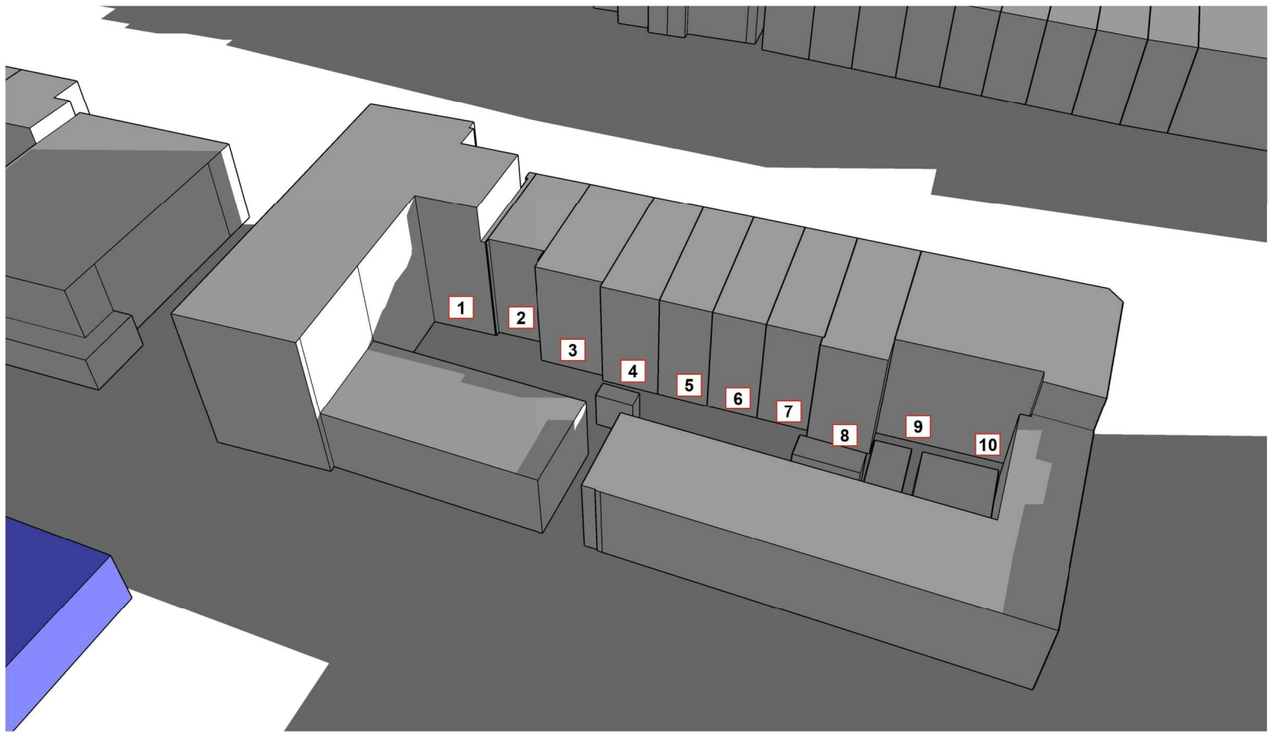
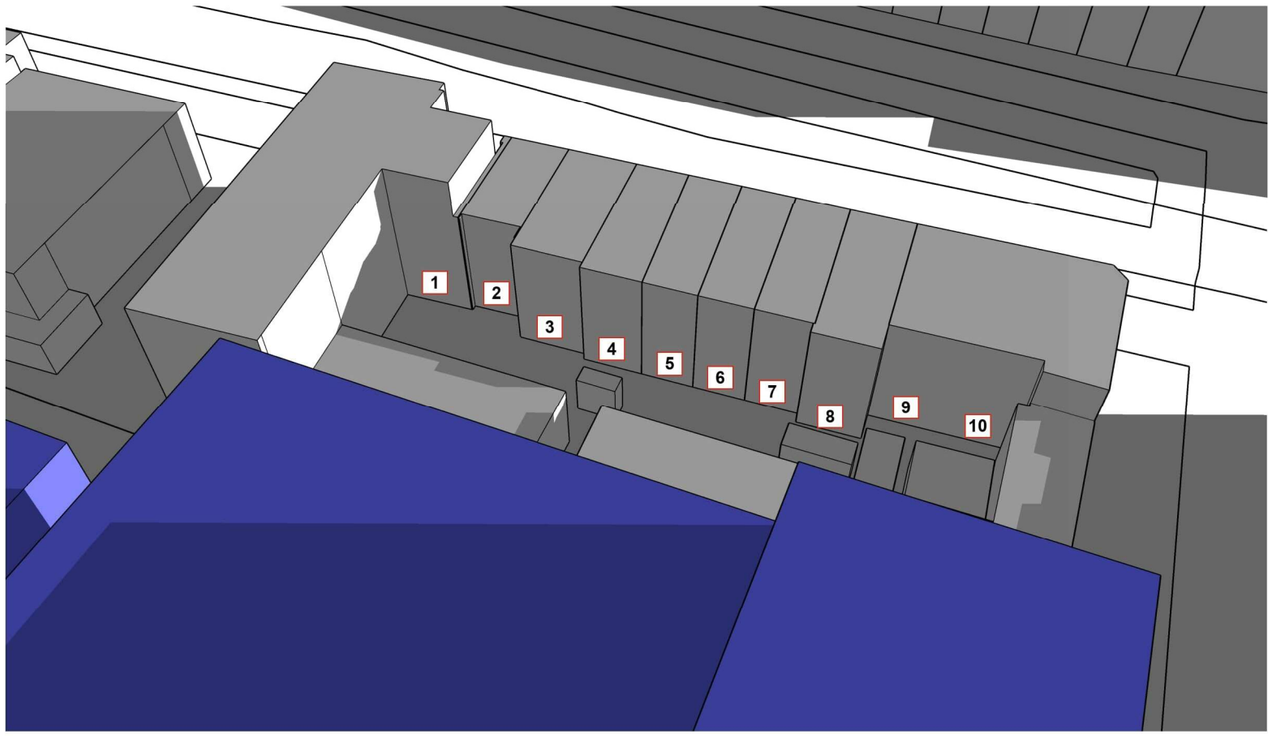
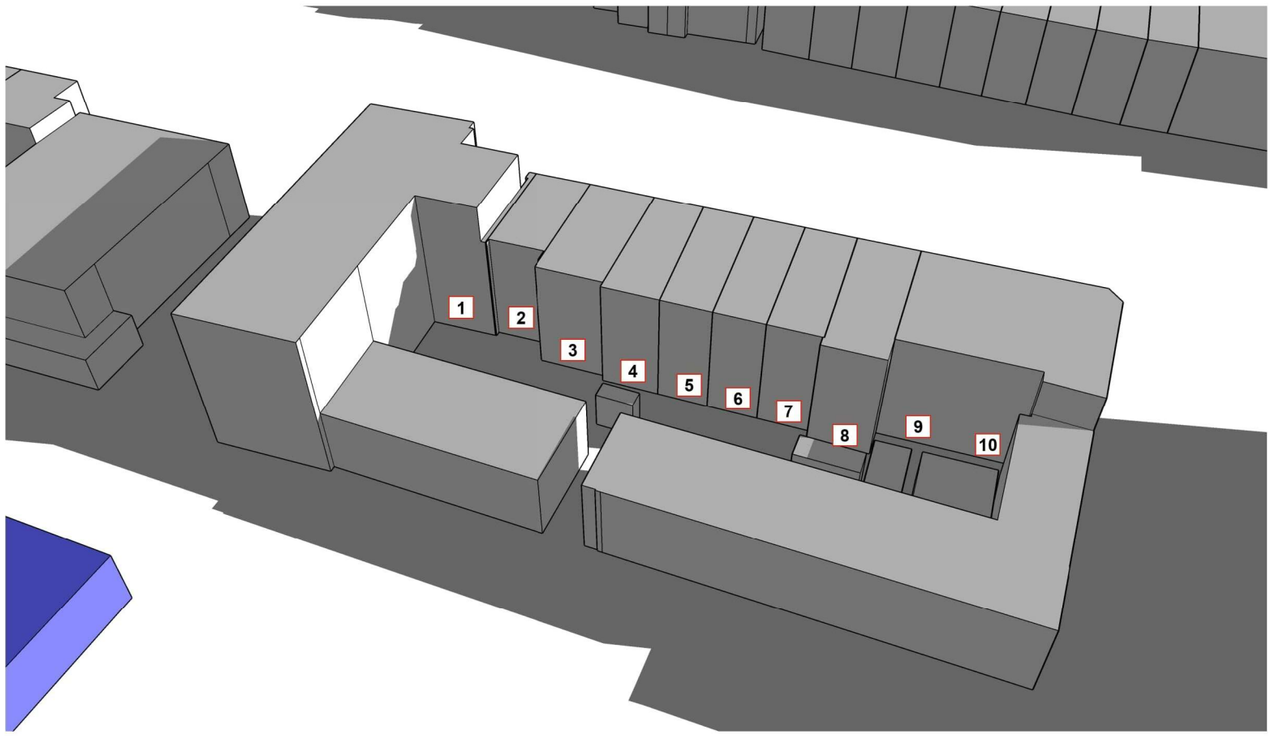
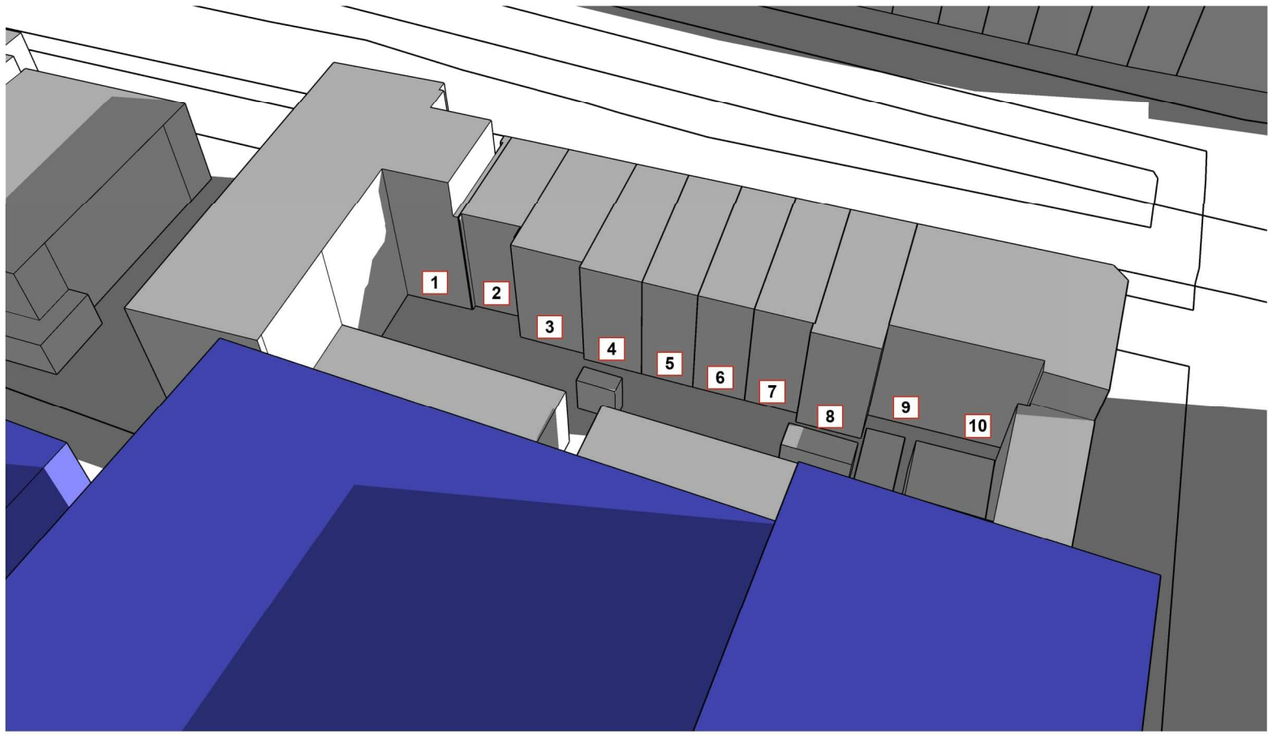




Noordsingel 54 - 72
21 september
08.00





Noordsingel 54 - 72
21 september
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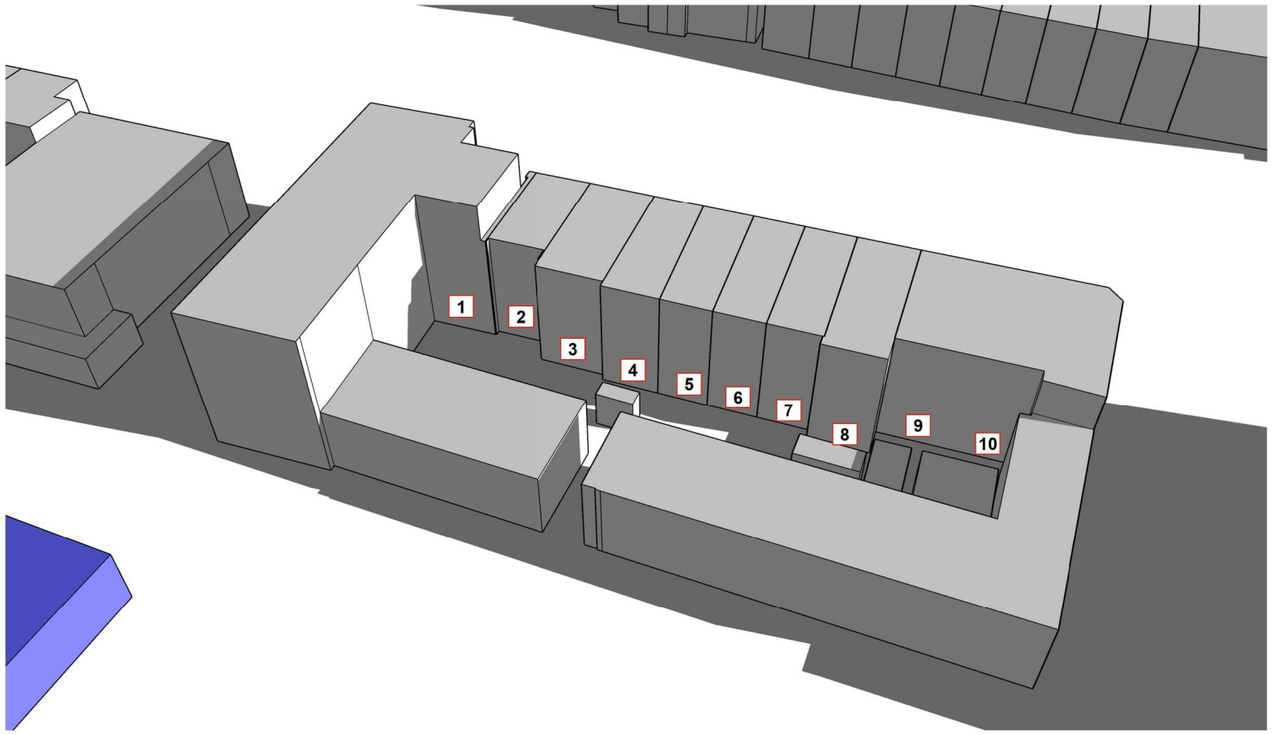
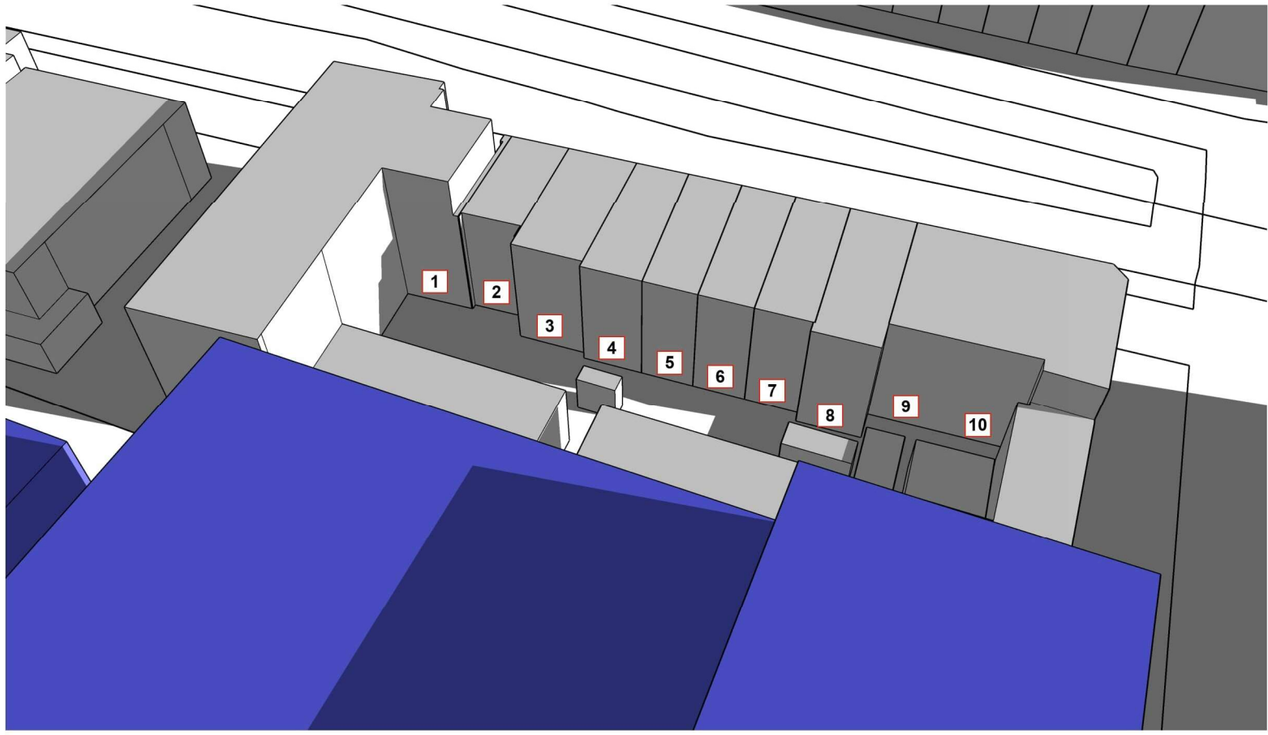
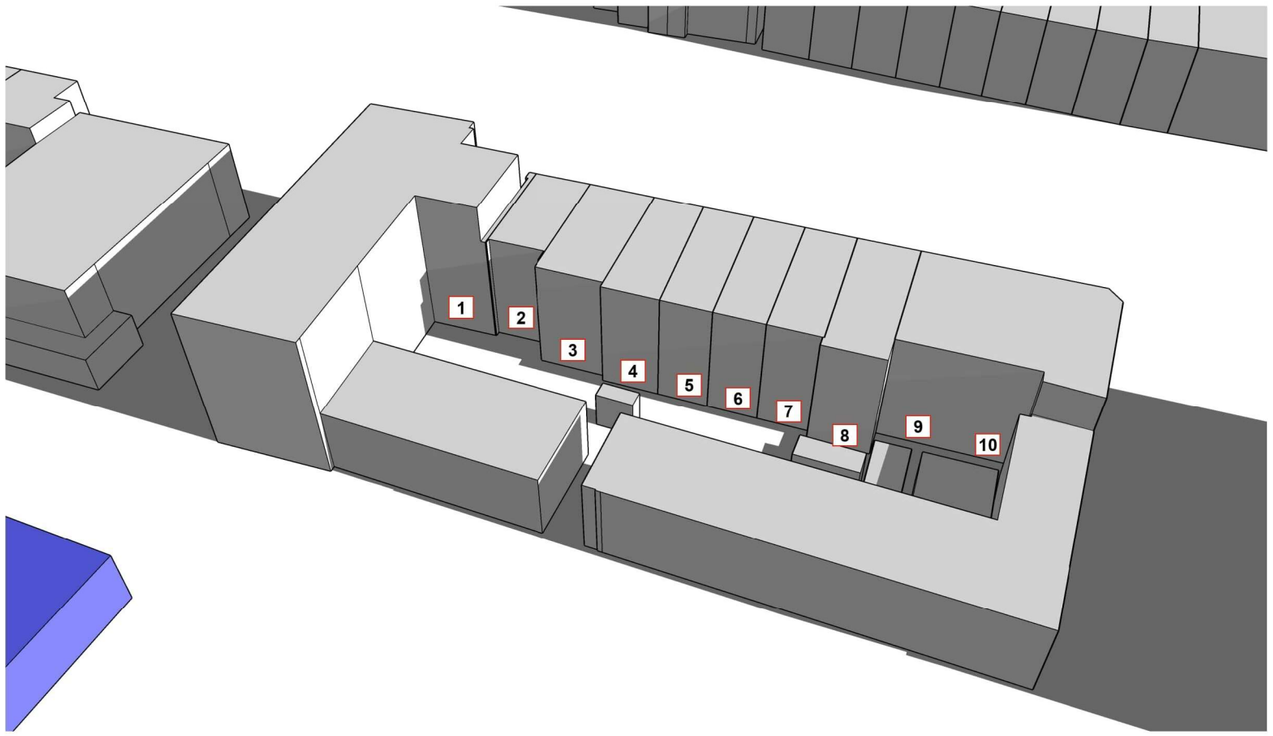
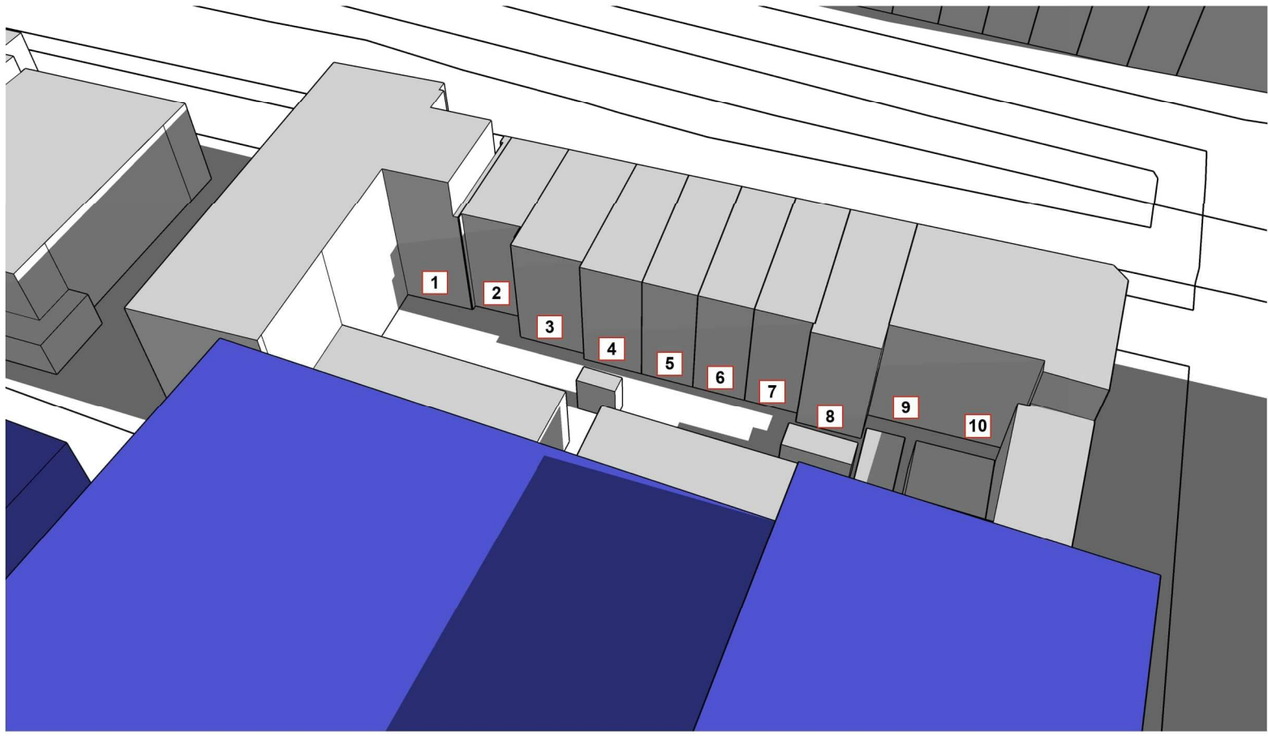


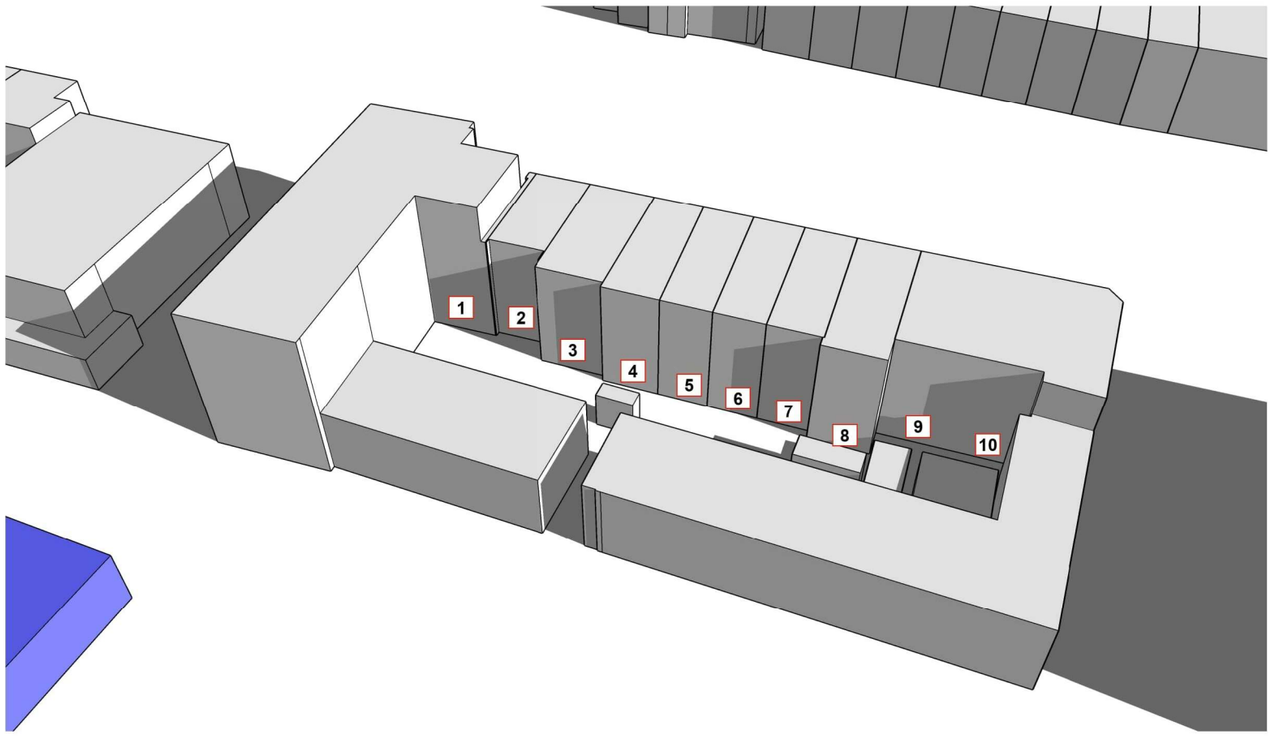


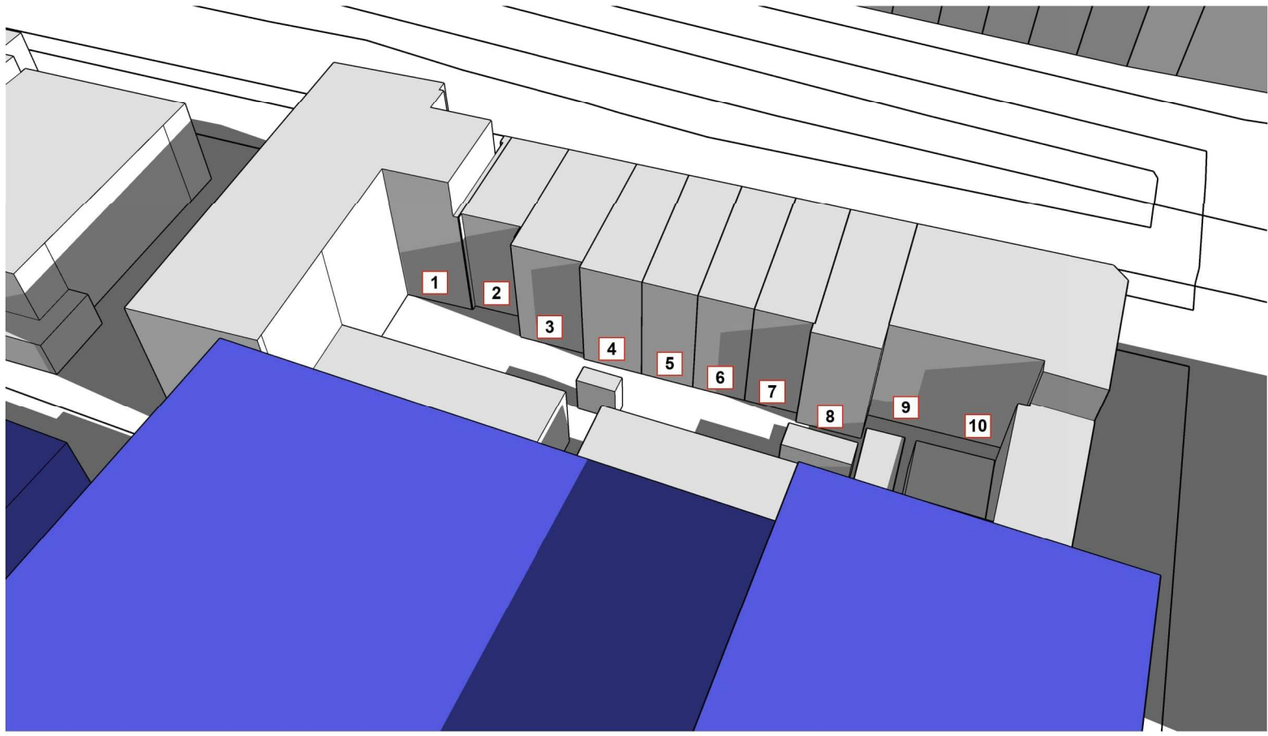
Noordsingel 54 - 72
21 september
09.00



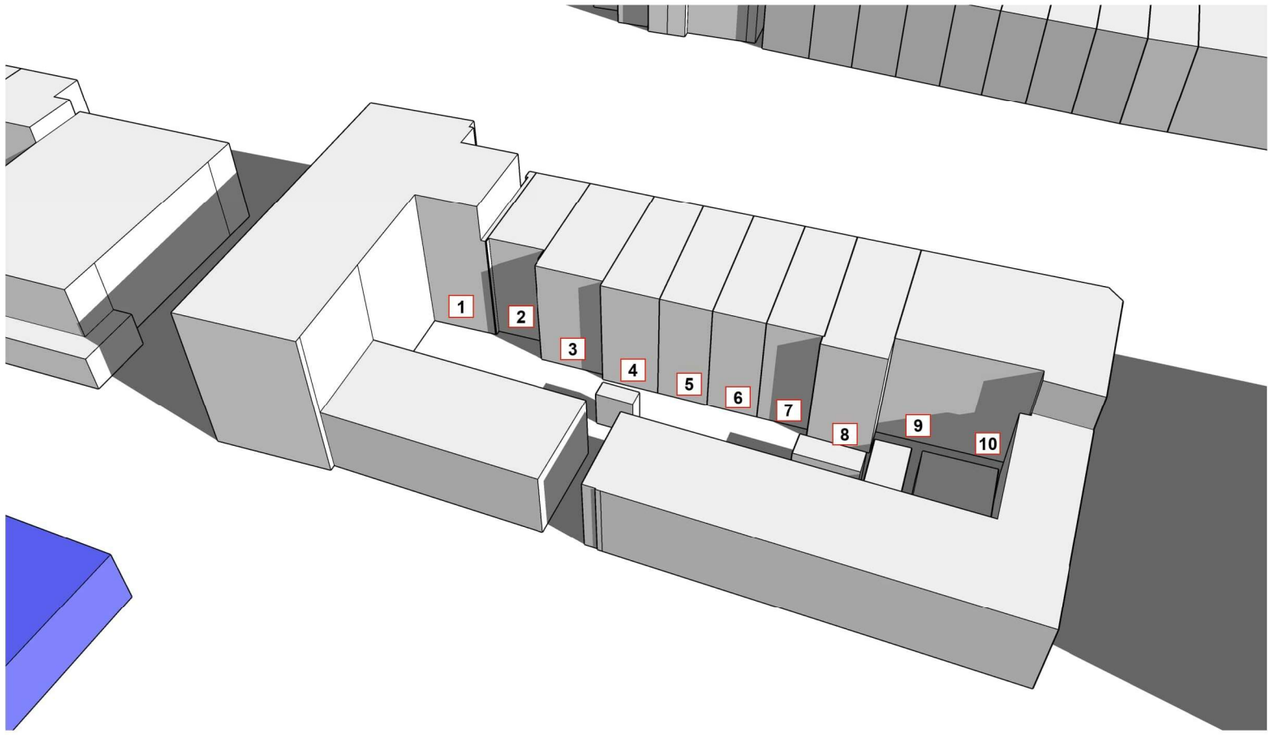


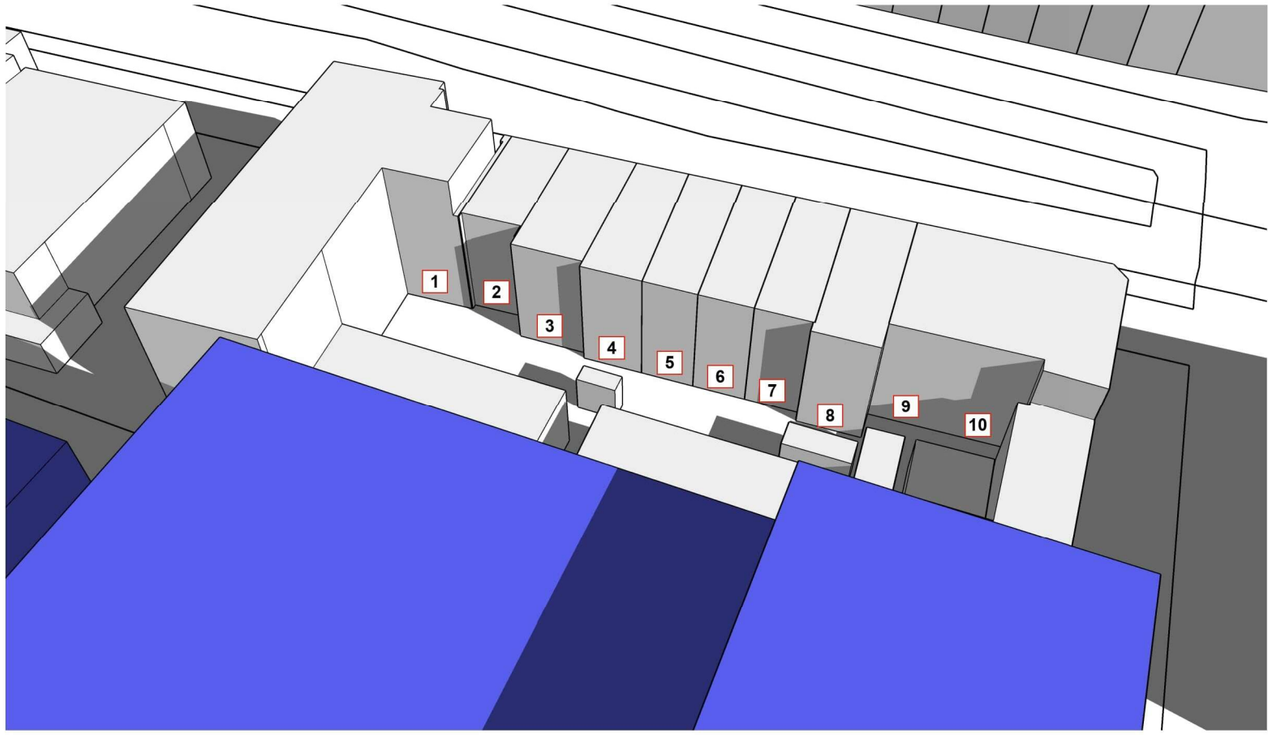
Noordsingel 54 - 72
21 september
09.30



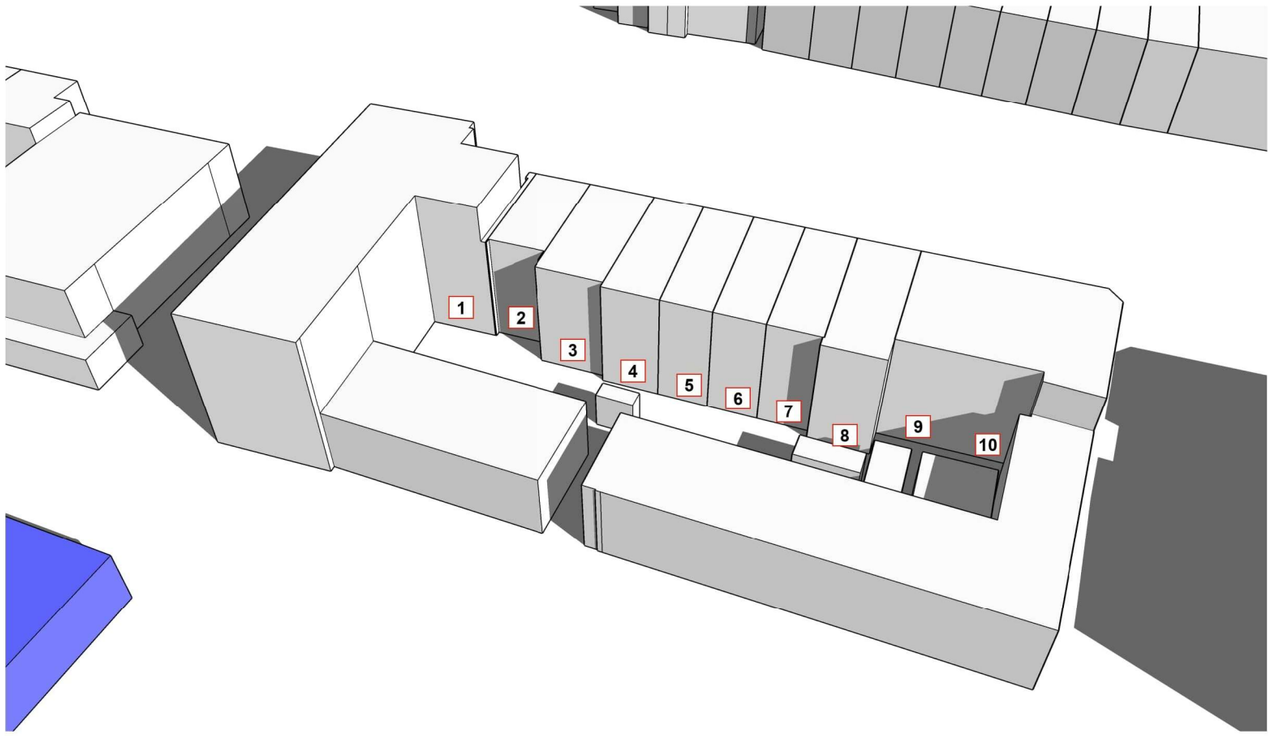


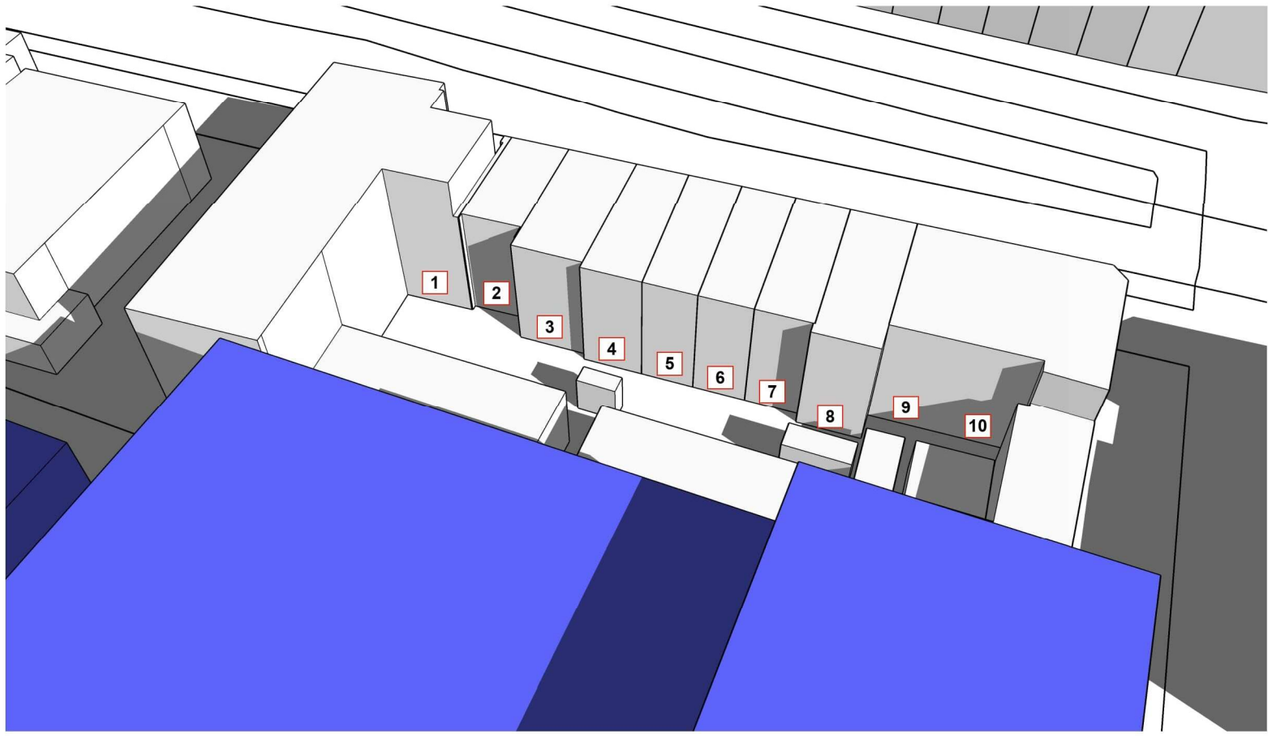
Noordsingel 54 - 72
21 september
10.00



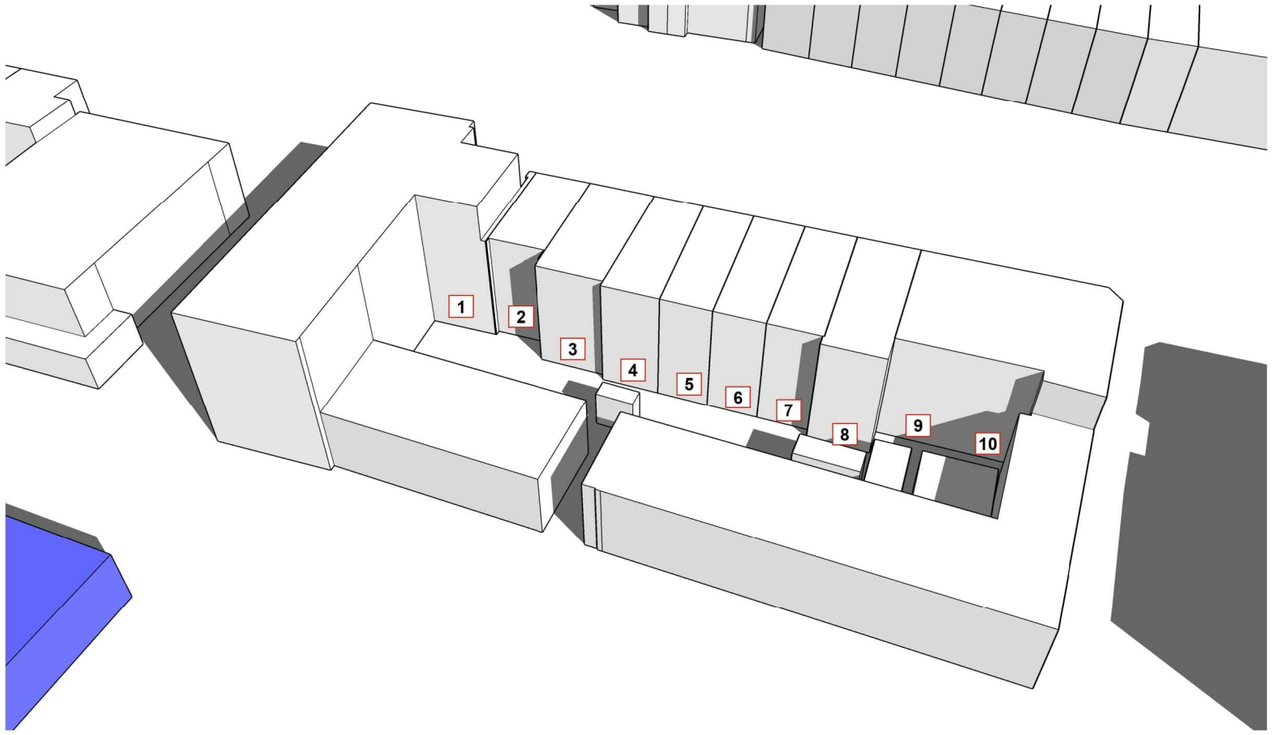


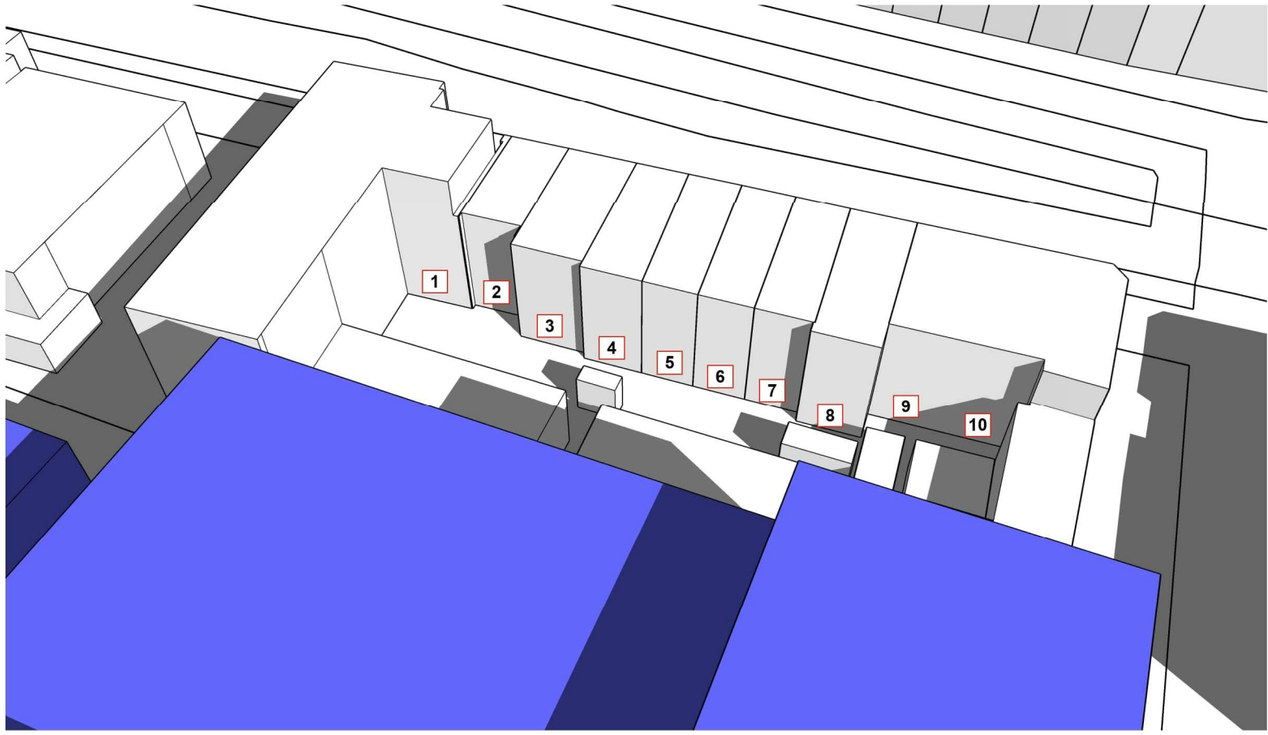
Noordsingel 54 - 72
21 september
10.30





Noordsingel 54 - 72
21 september
11.00





Noordsingel 54 - 72
21 september
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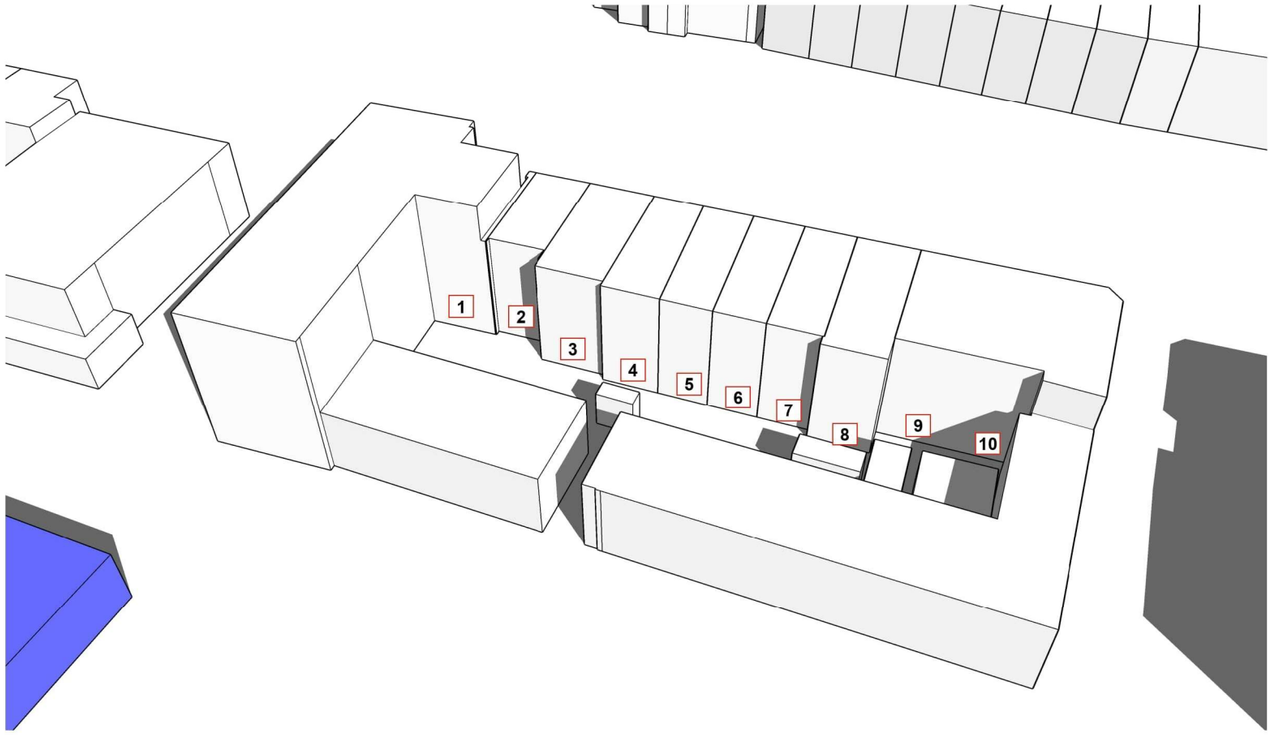

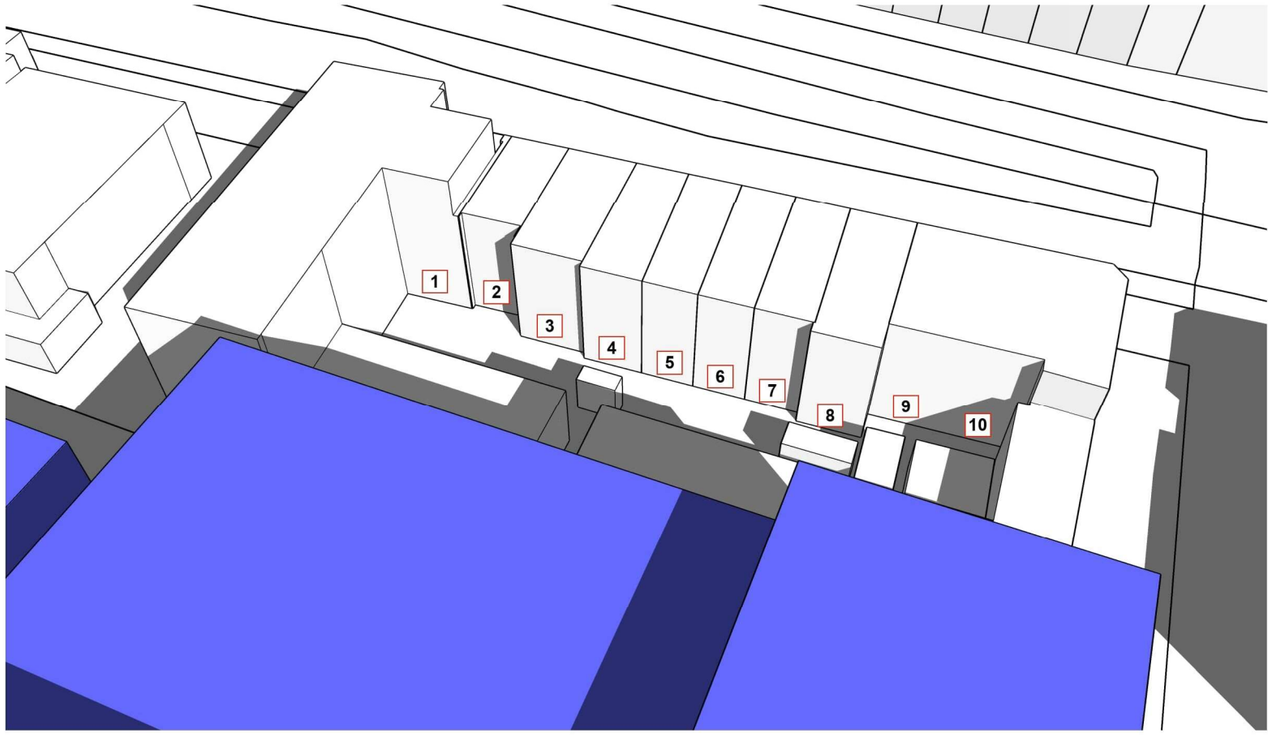

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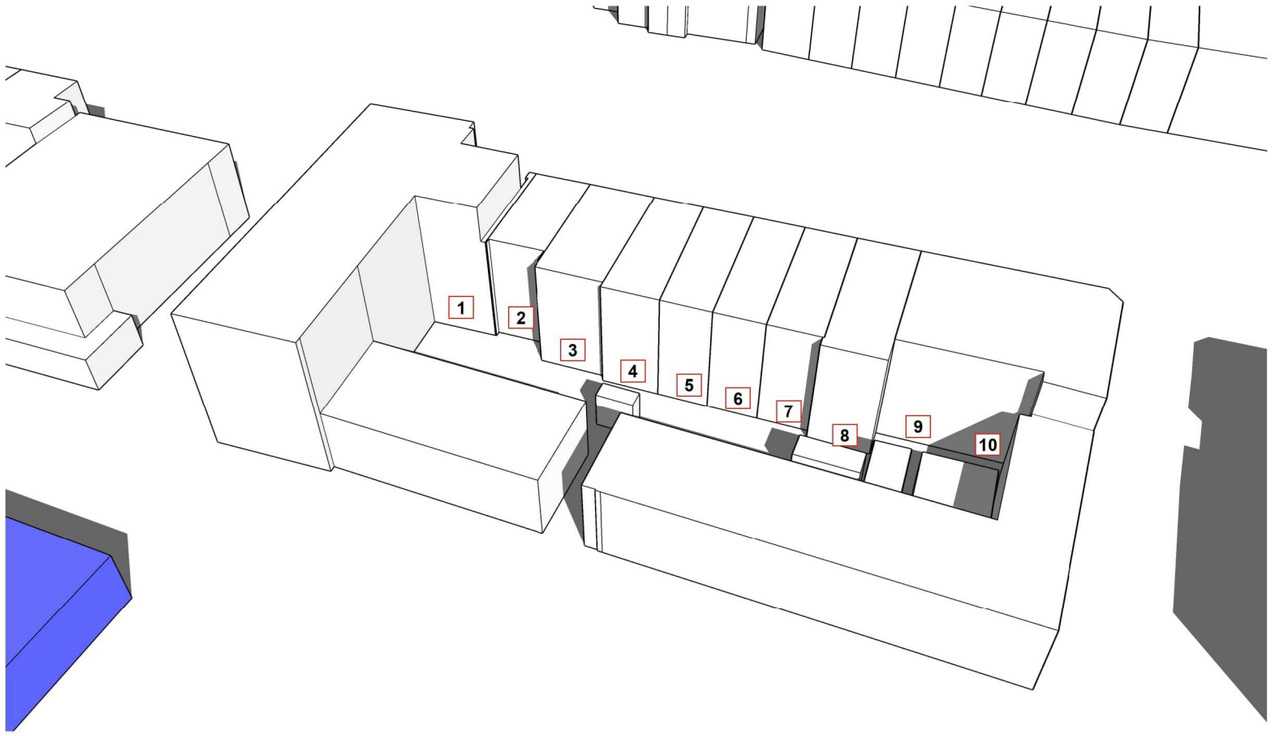

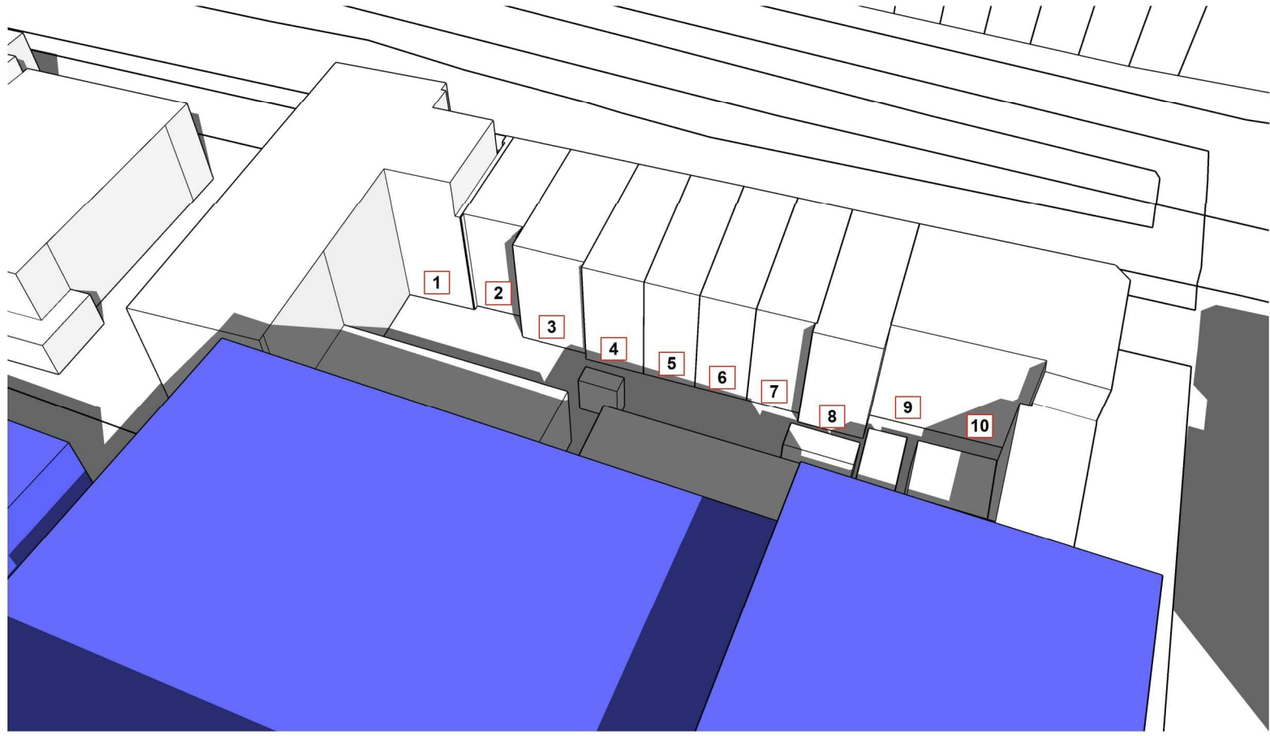

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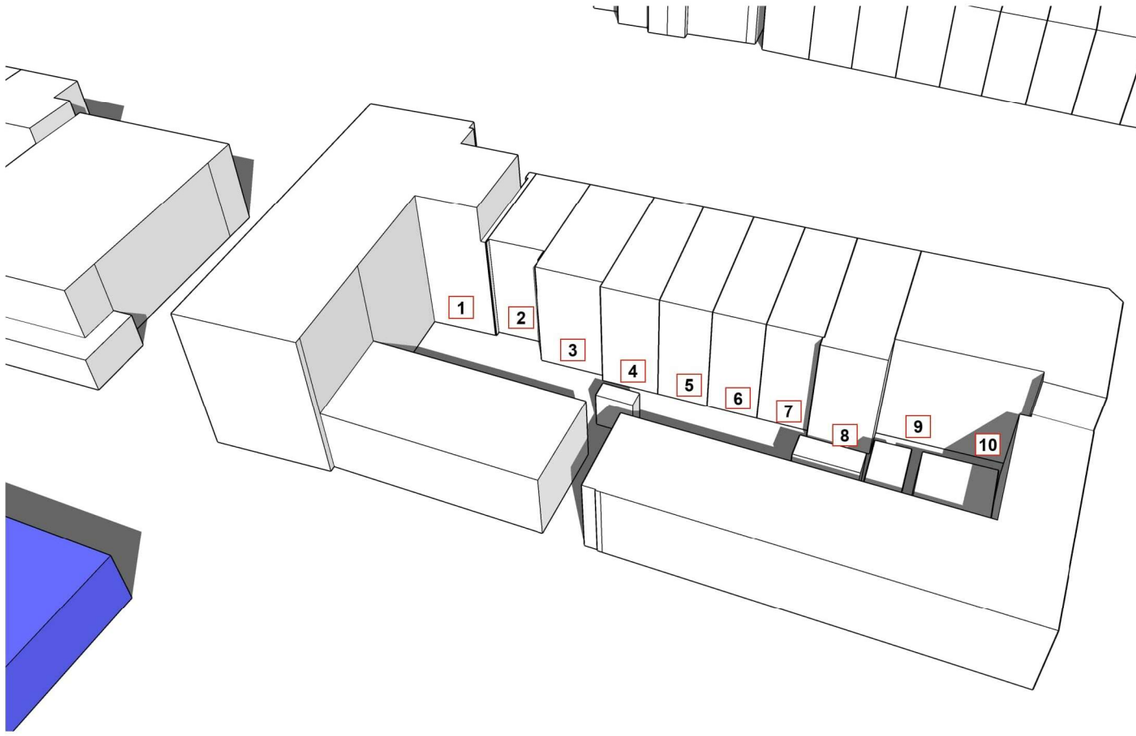

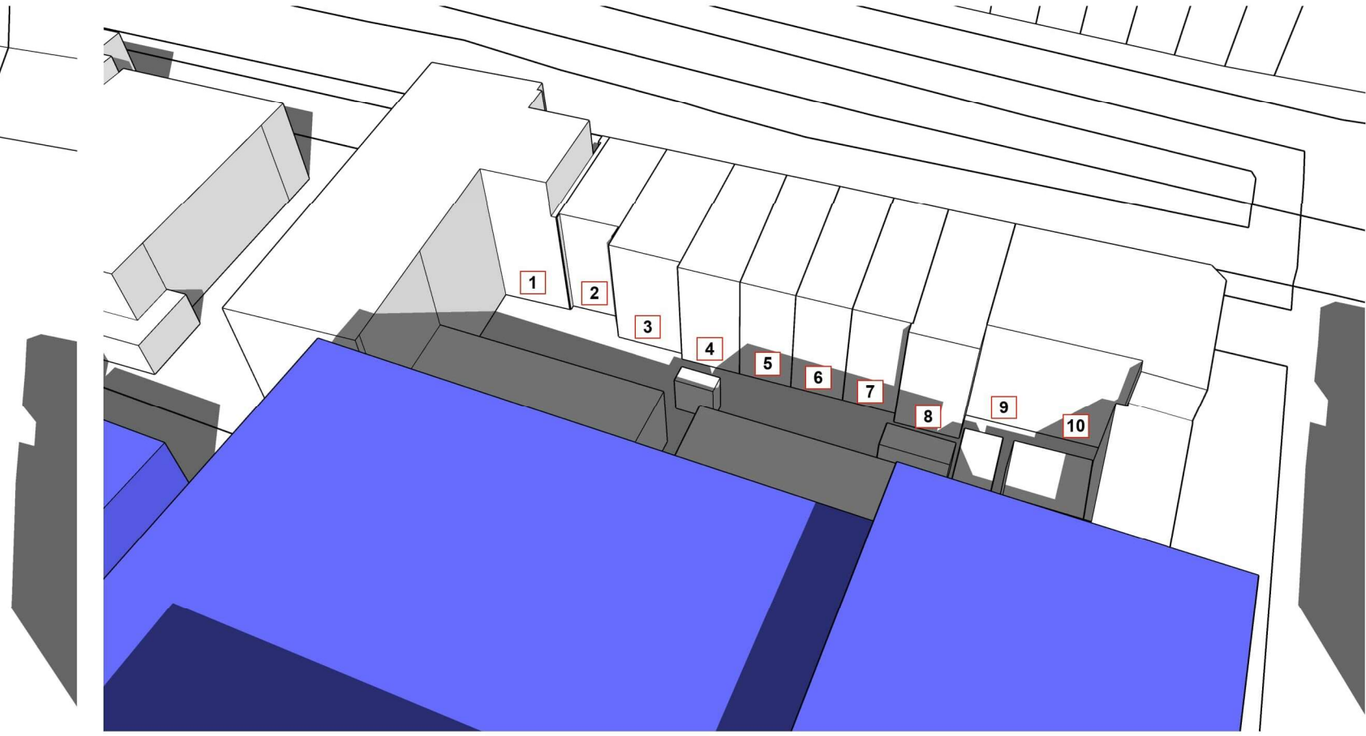

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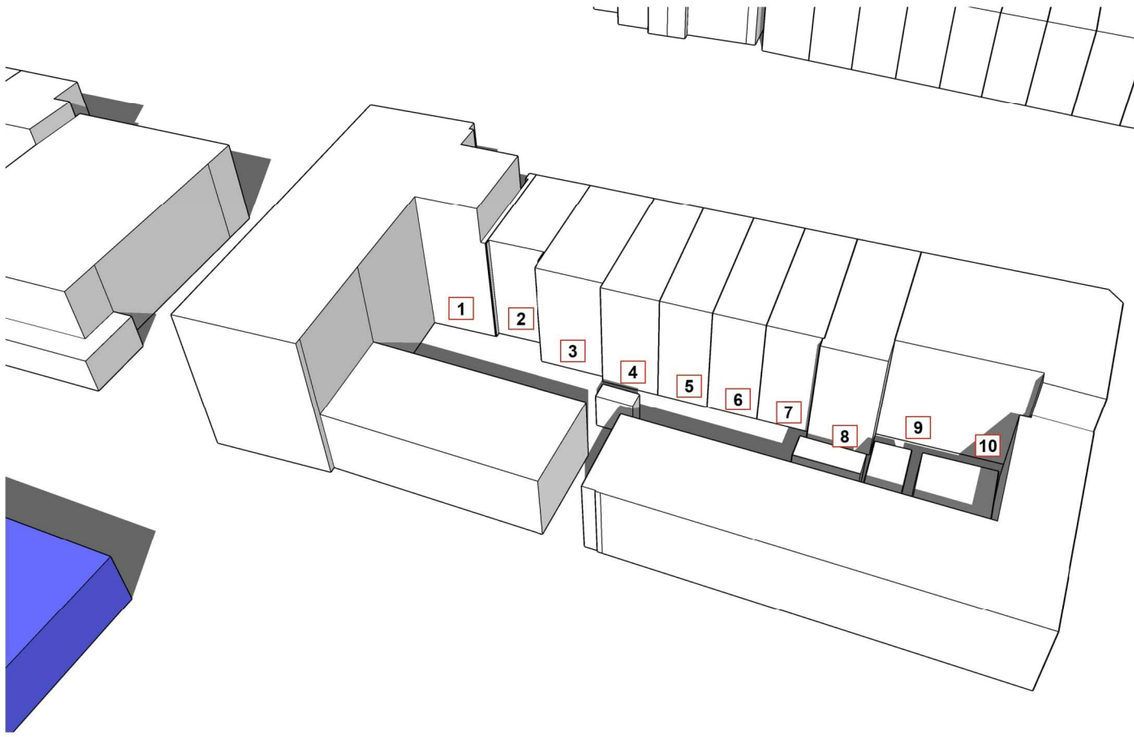
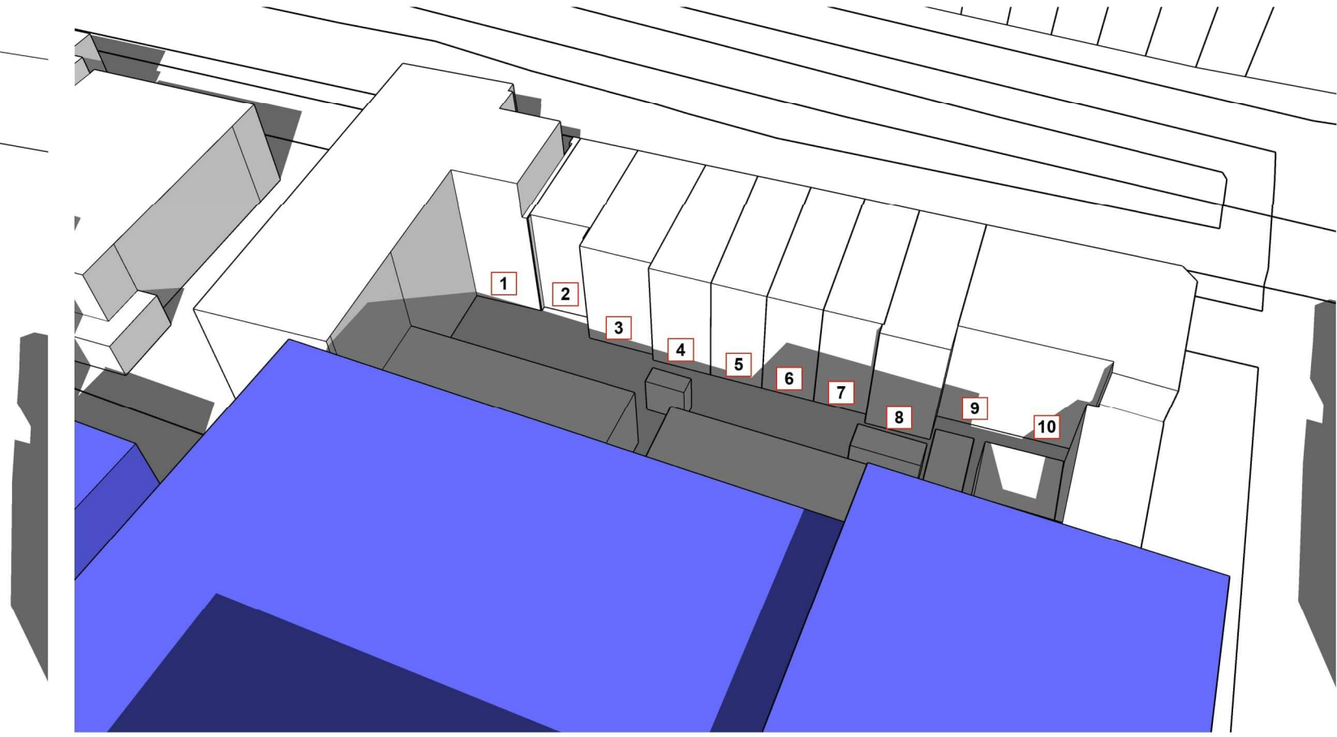
13.00





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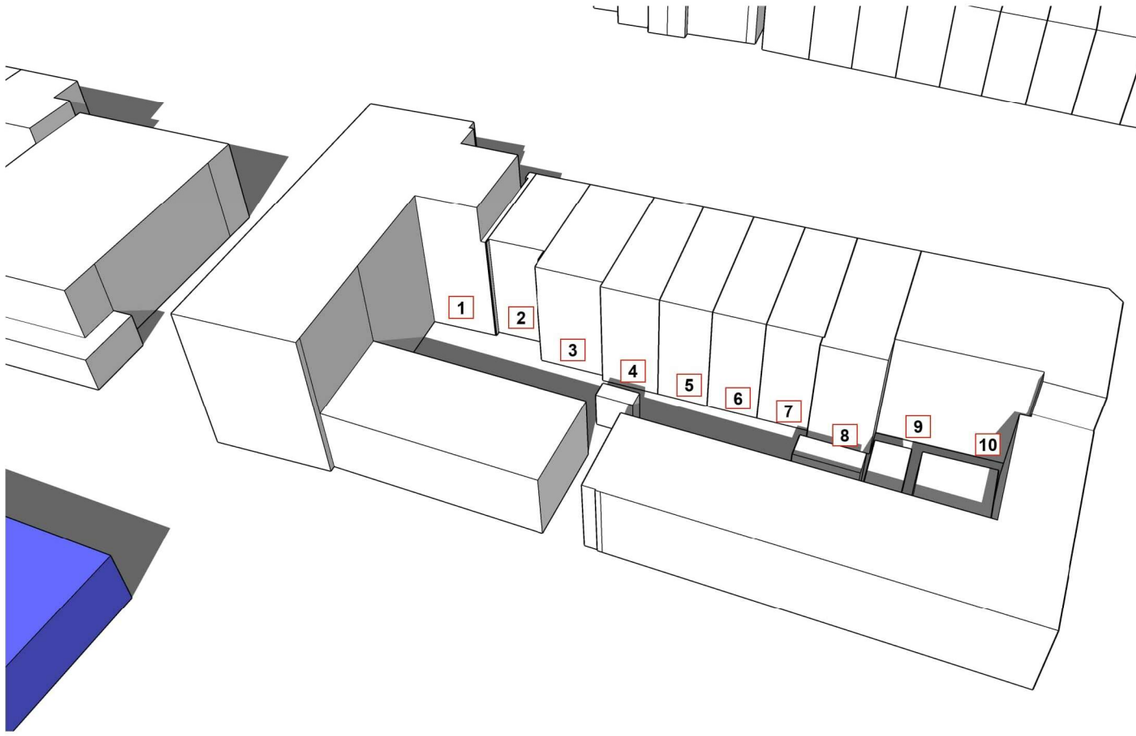

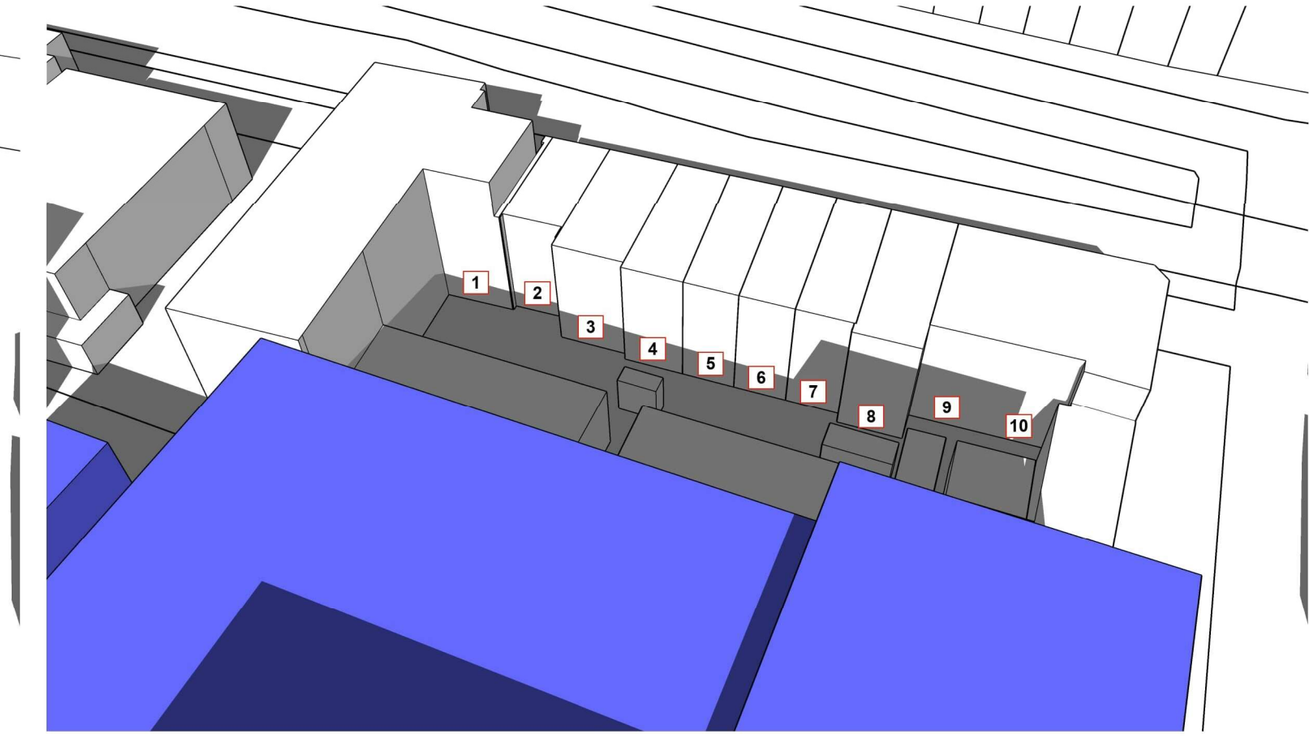

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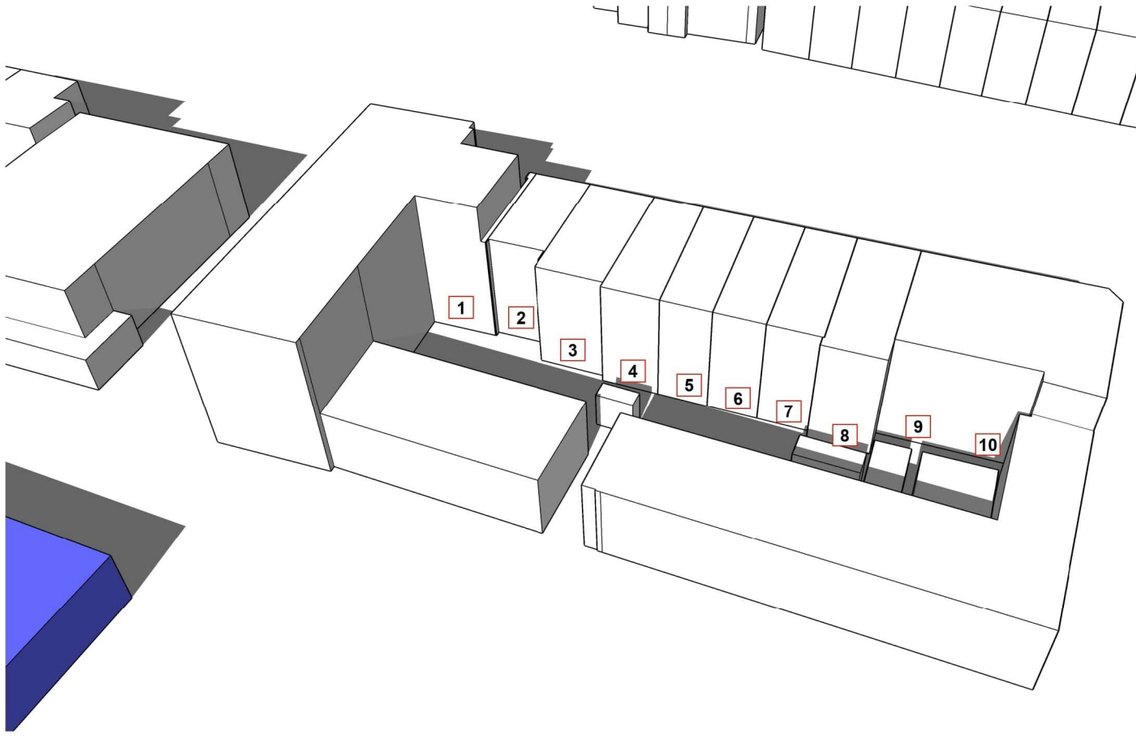

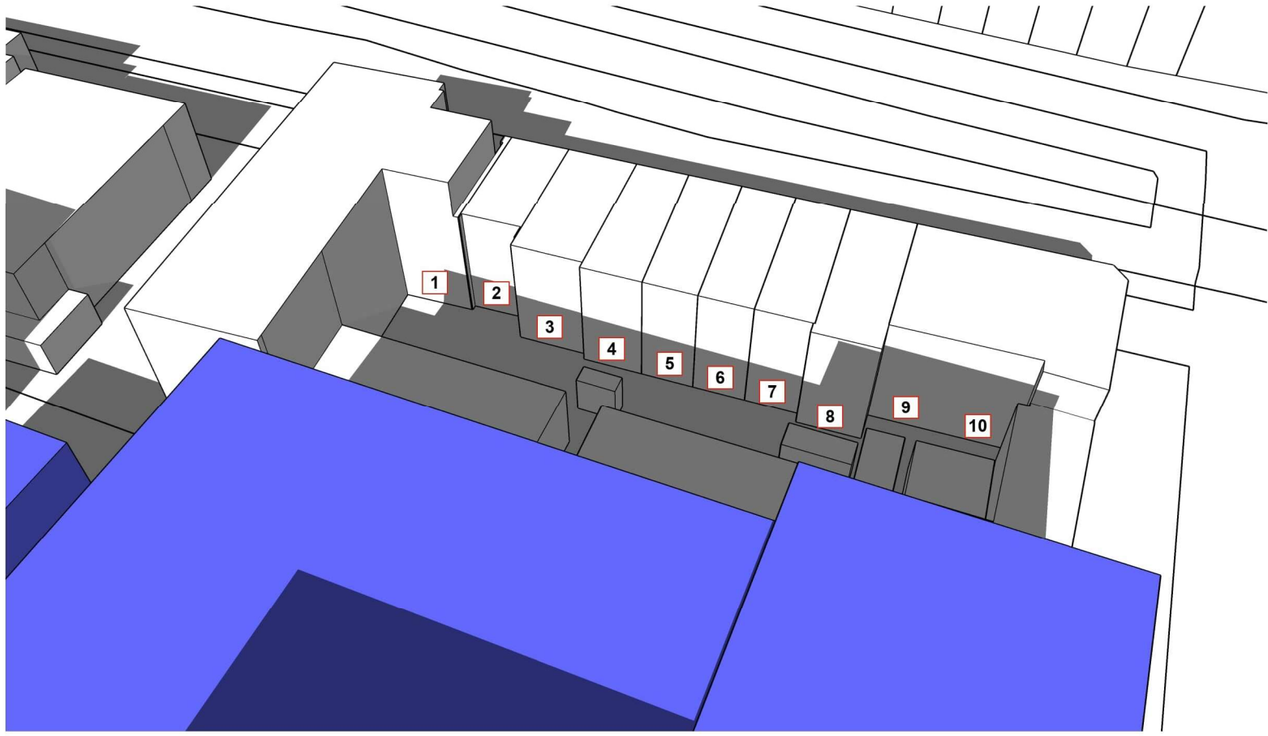

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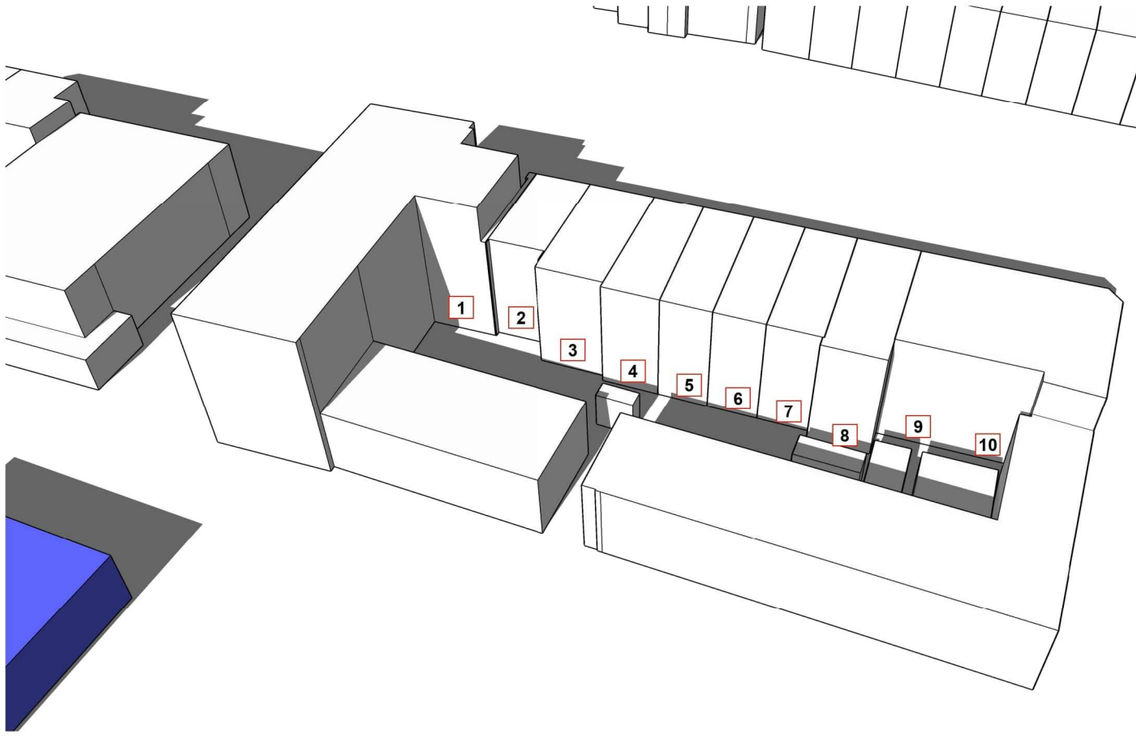

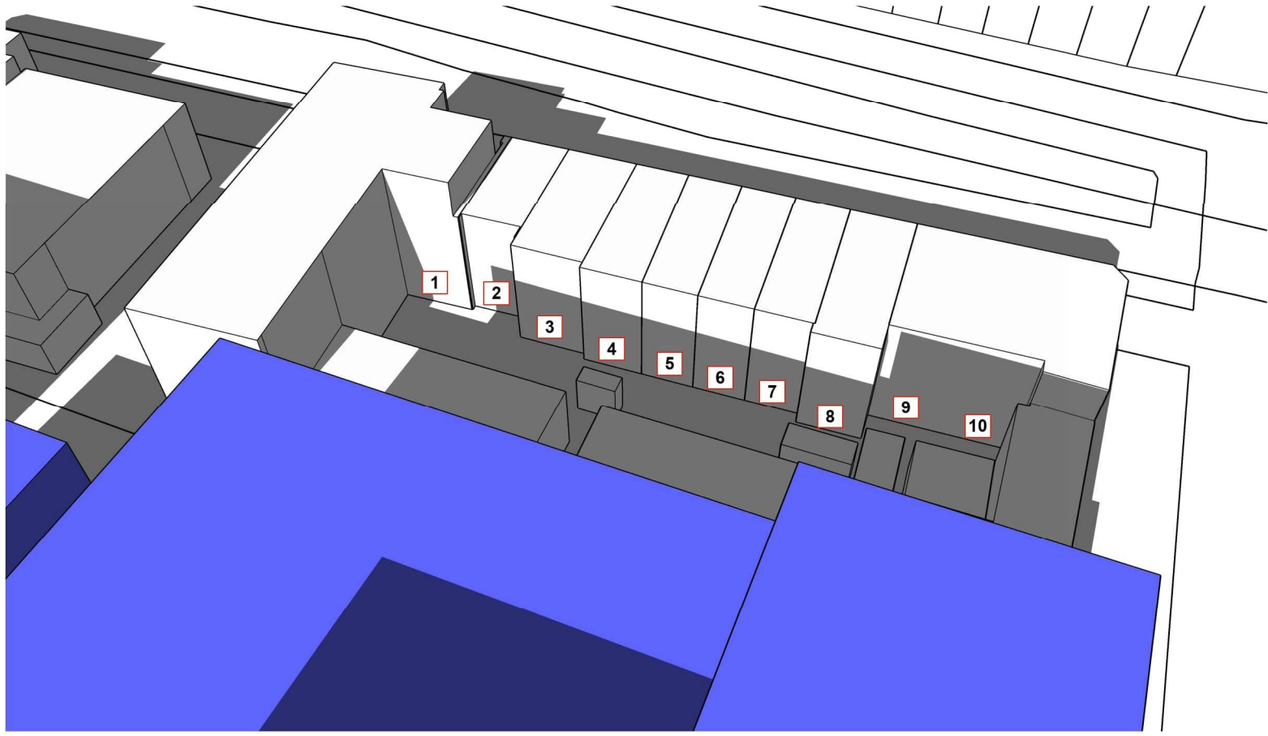

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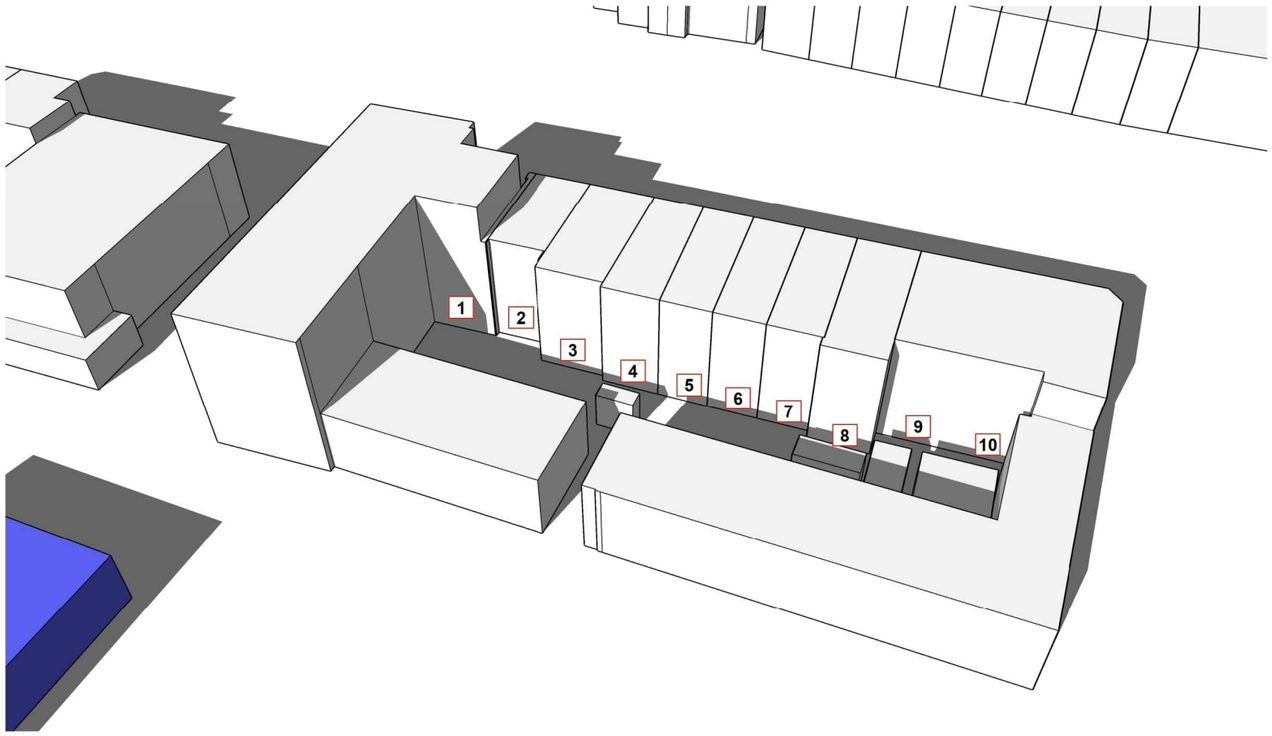

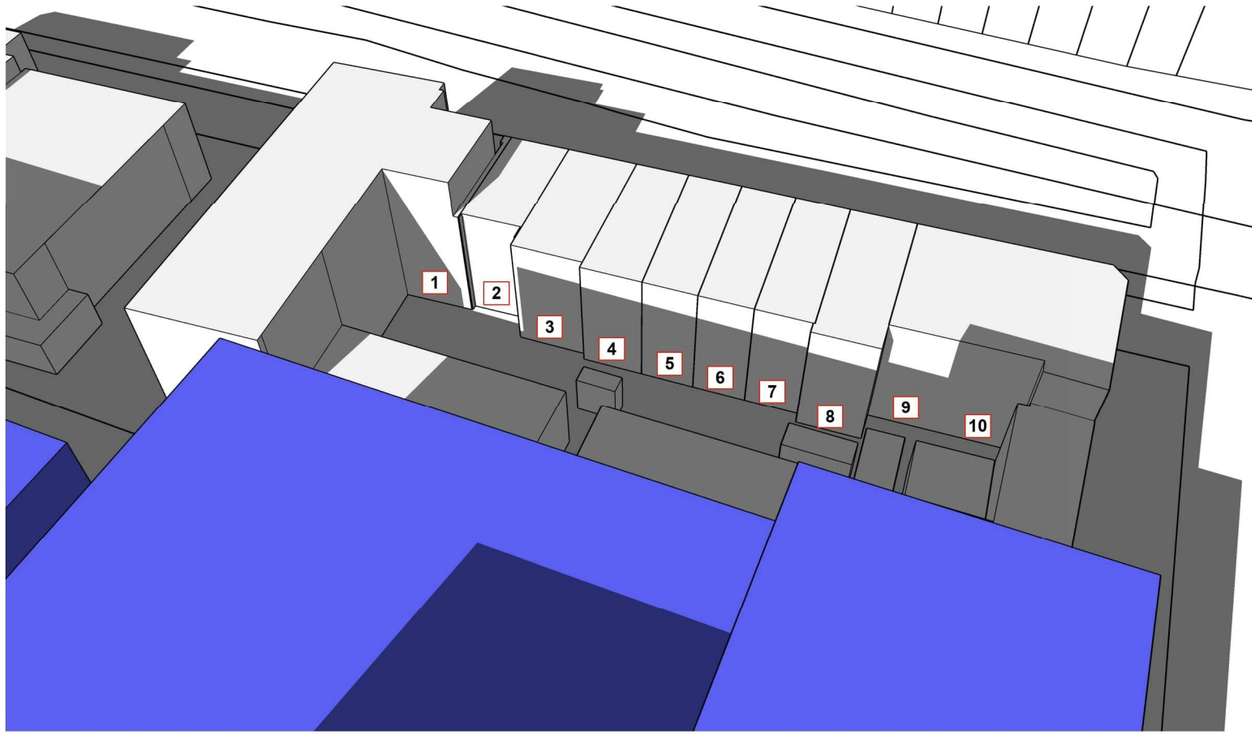

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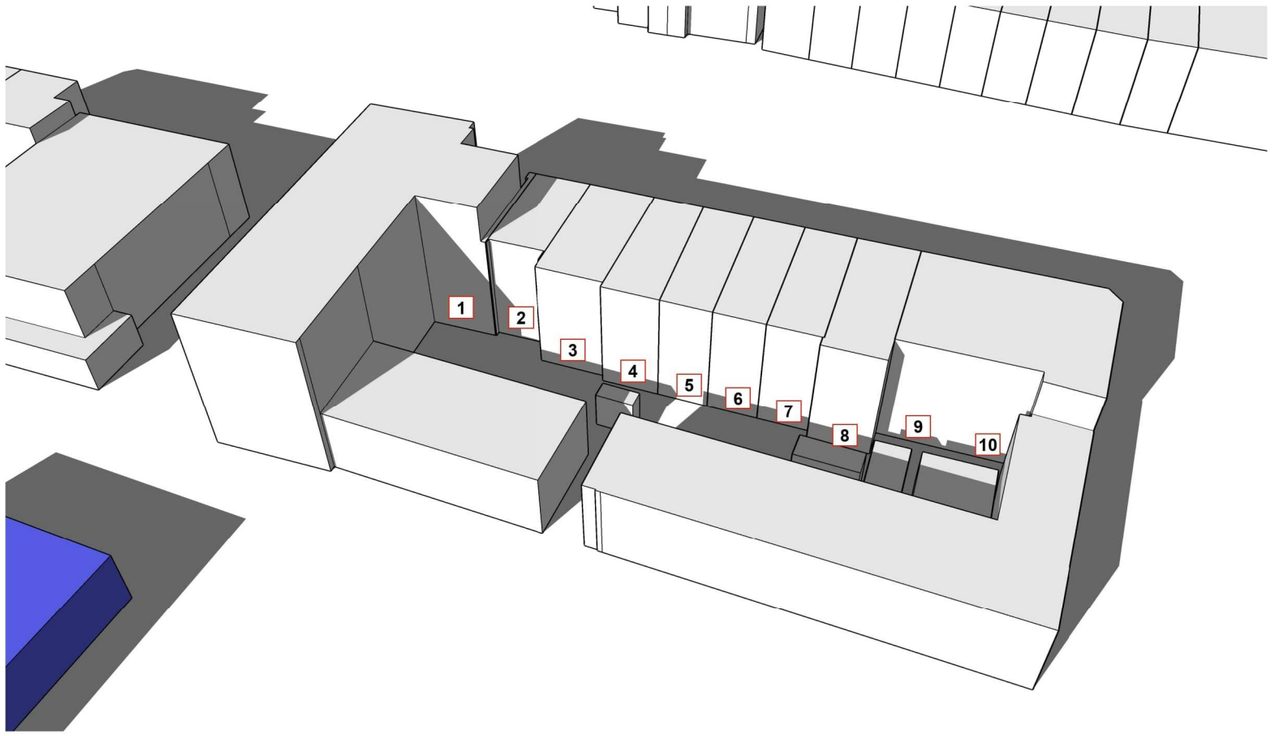

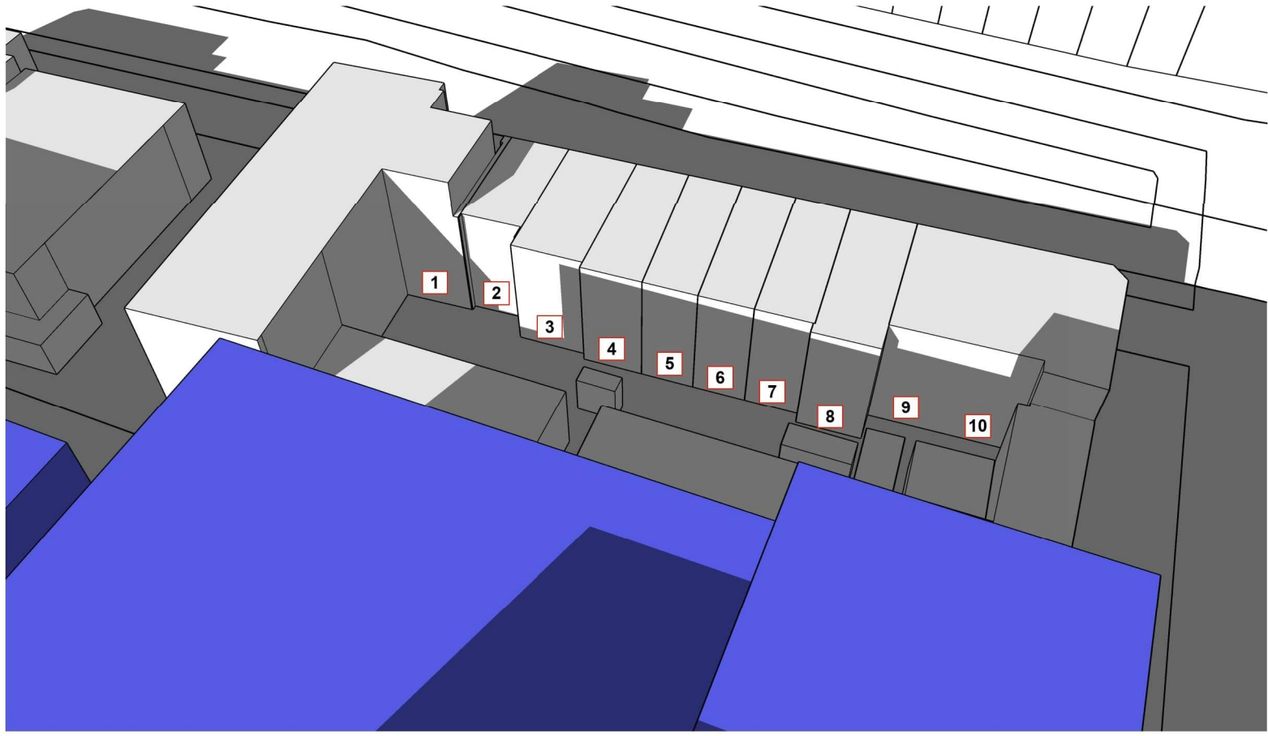

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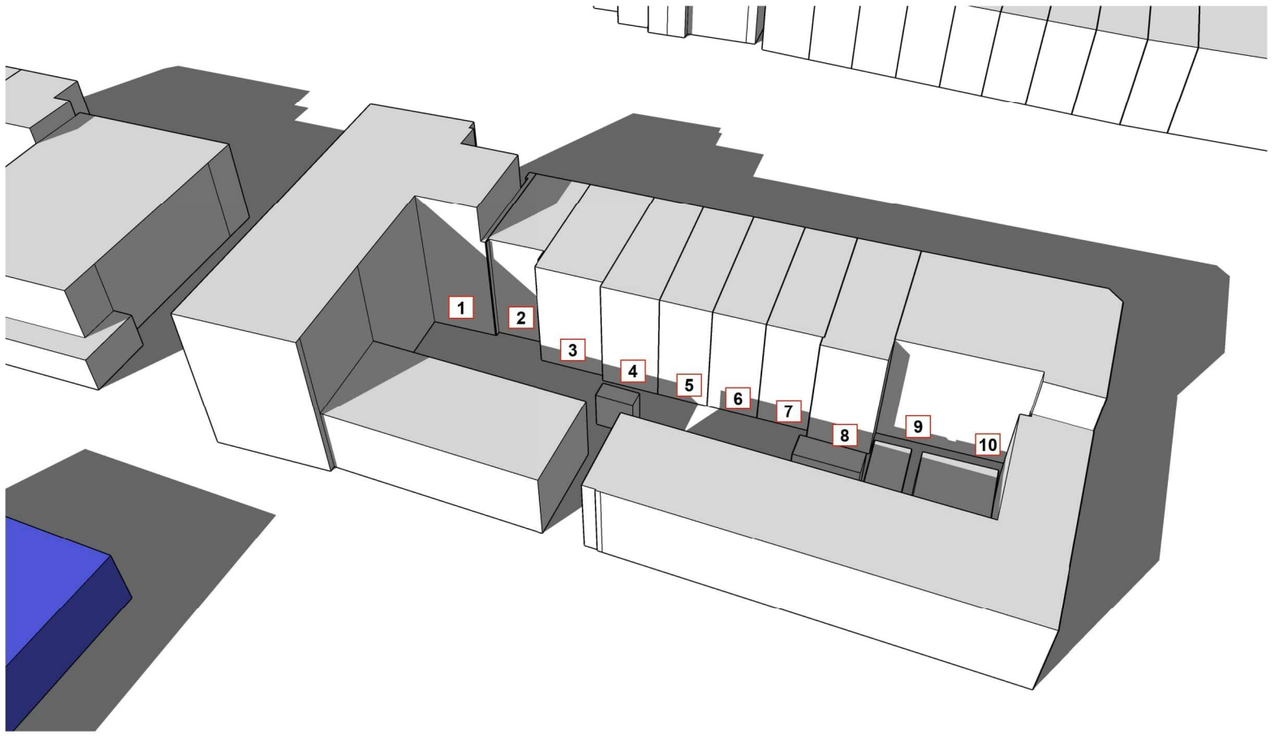

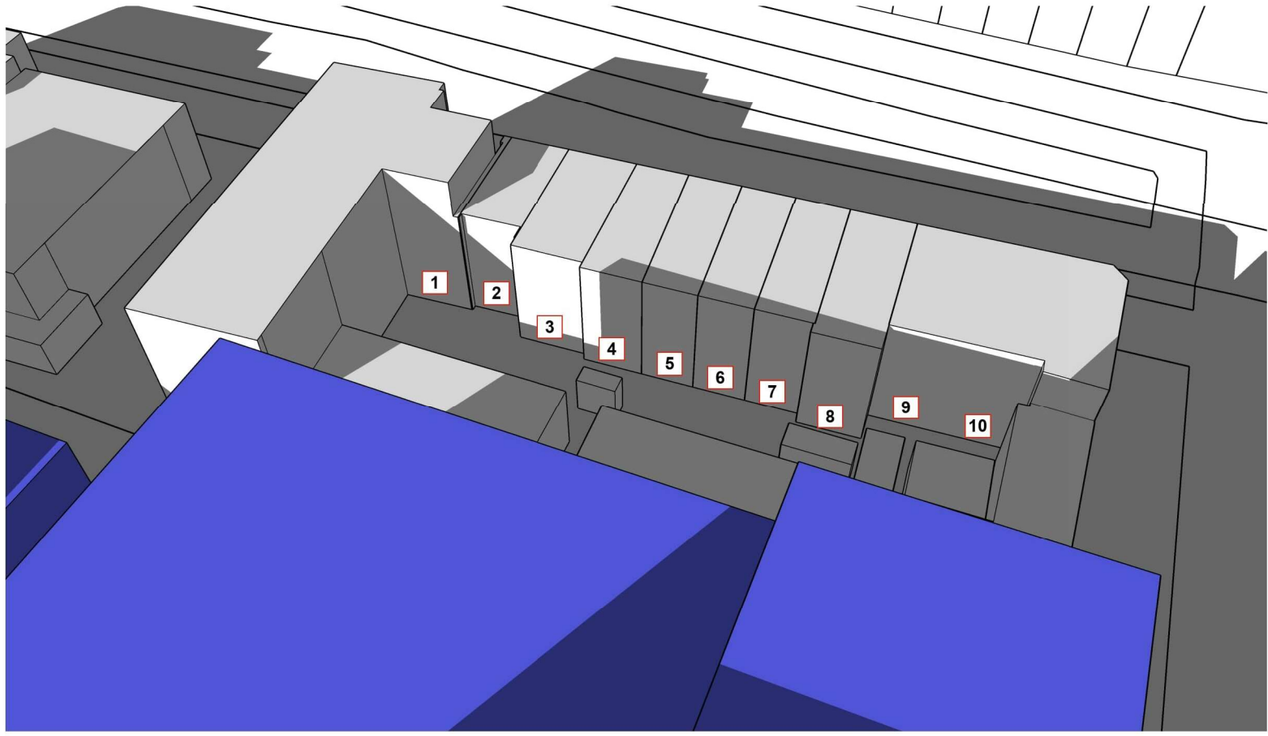

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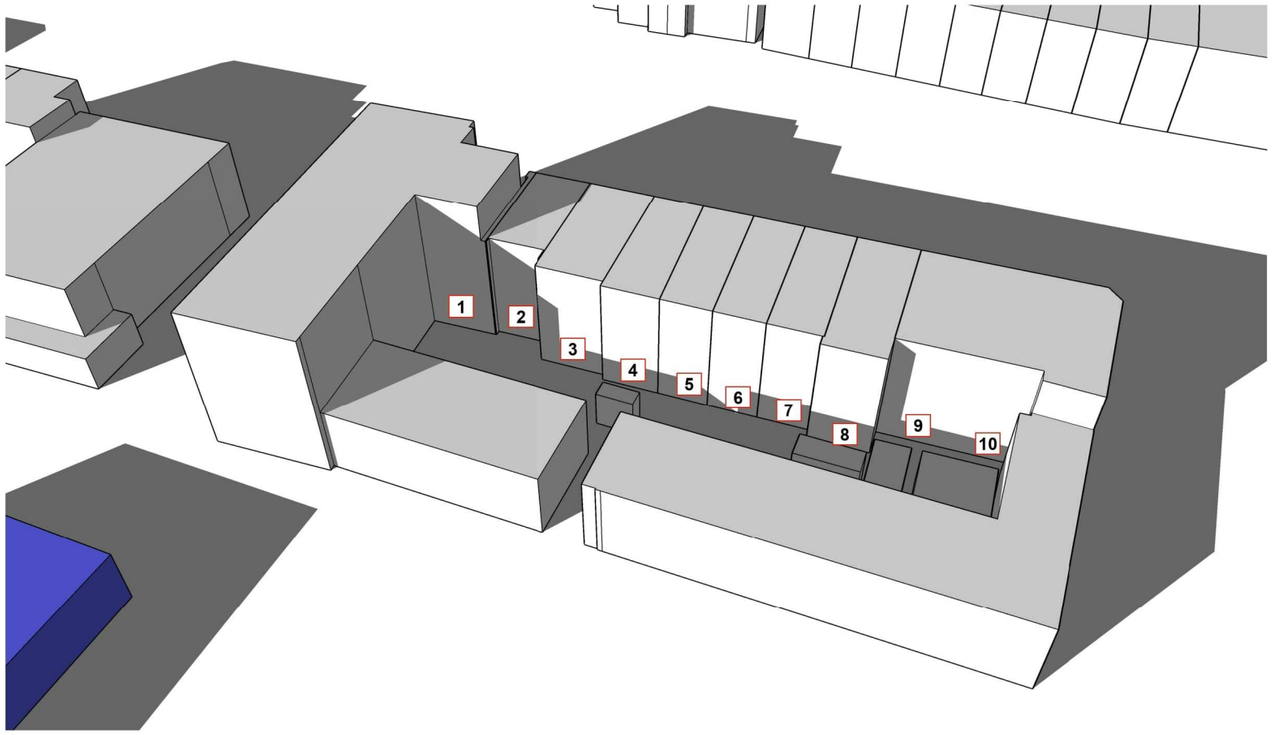

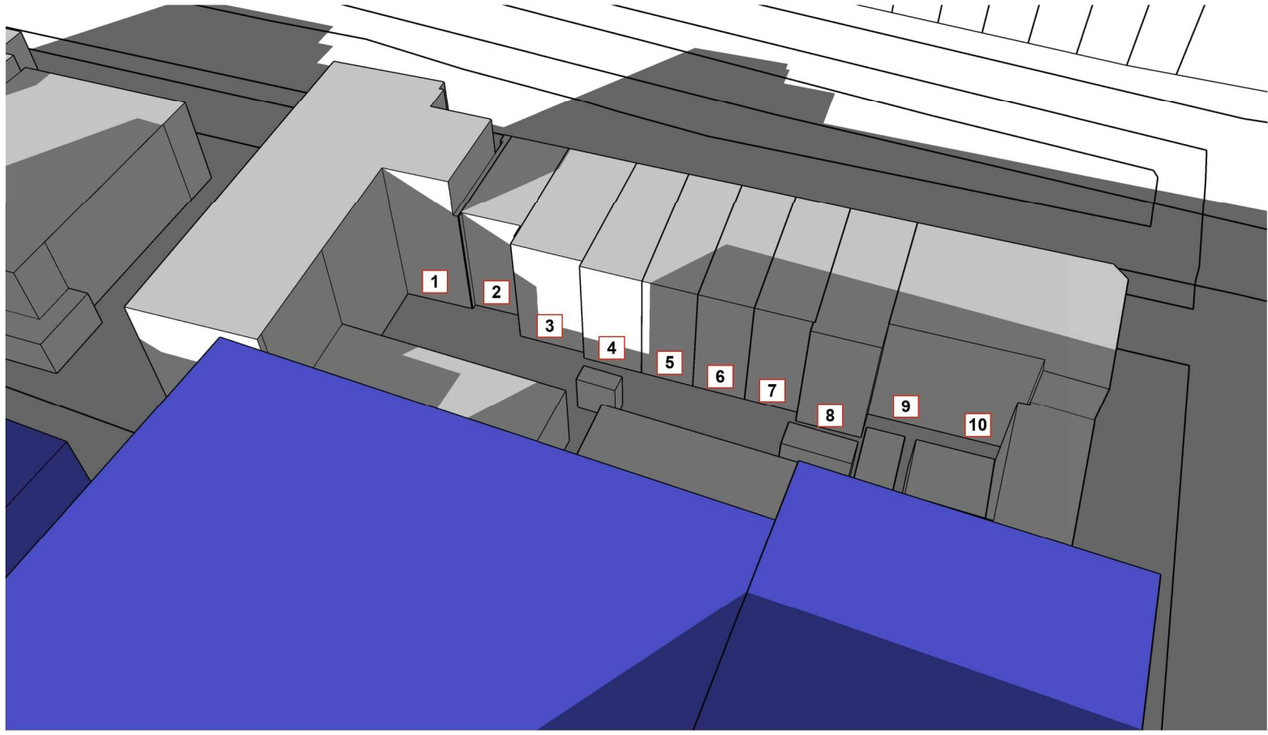

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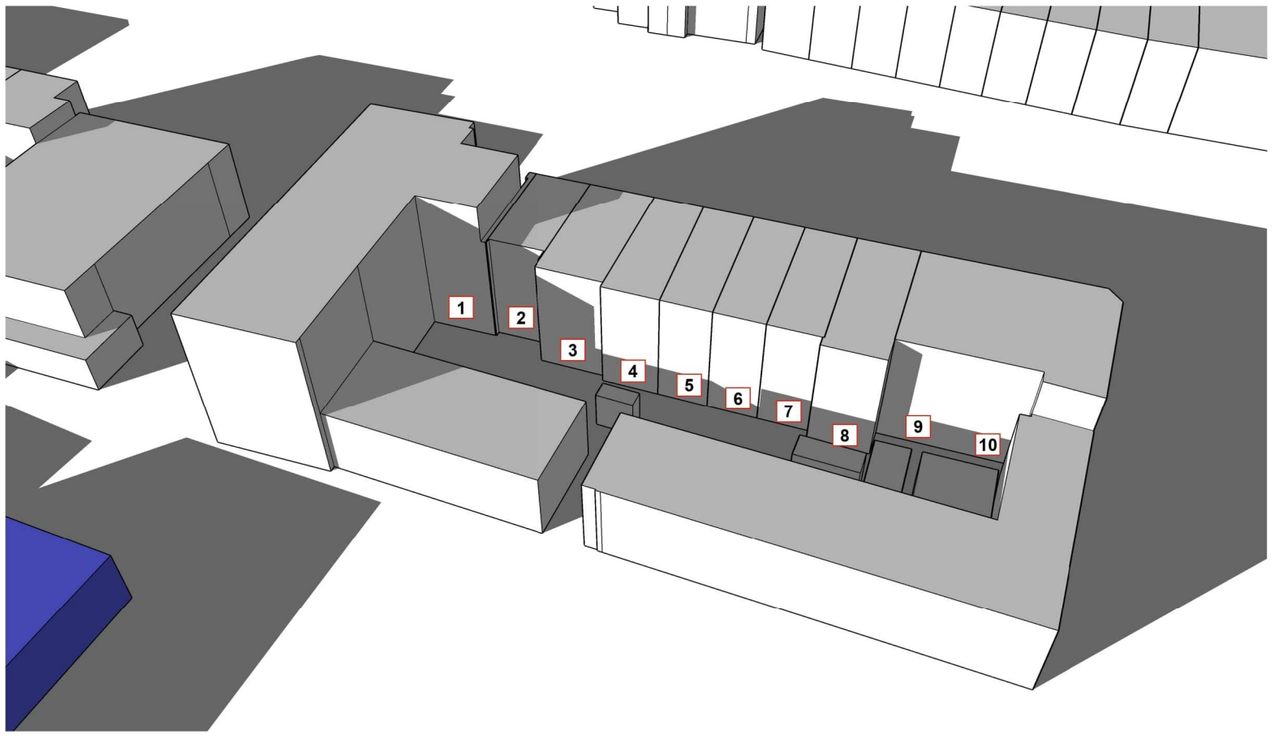

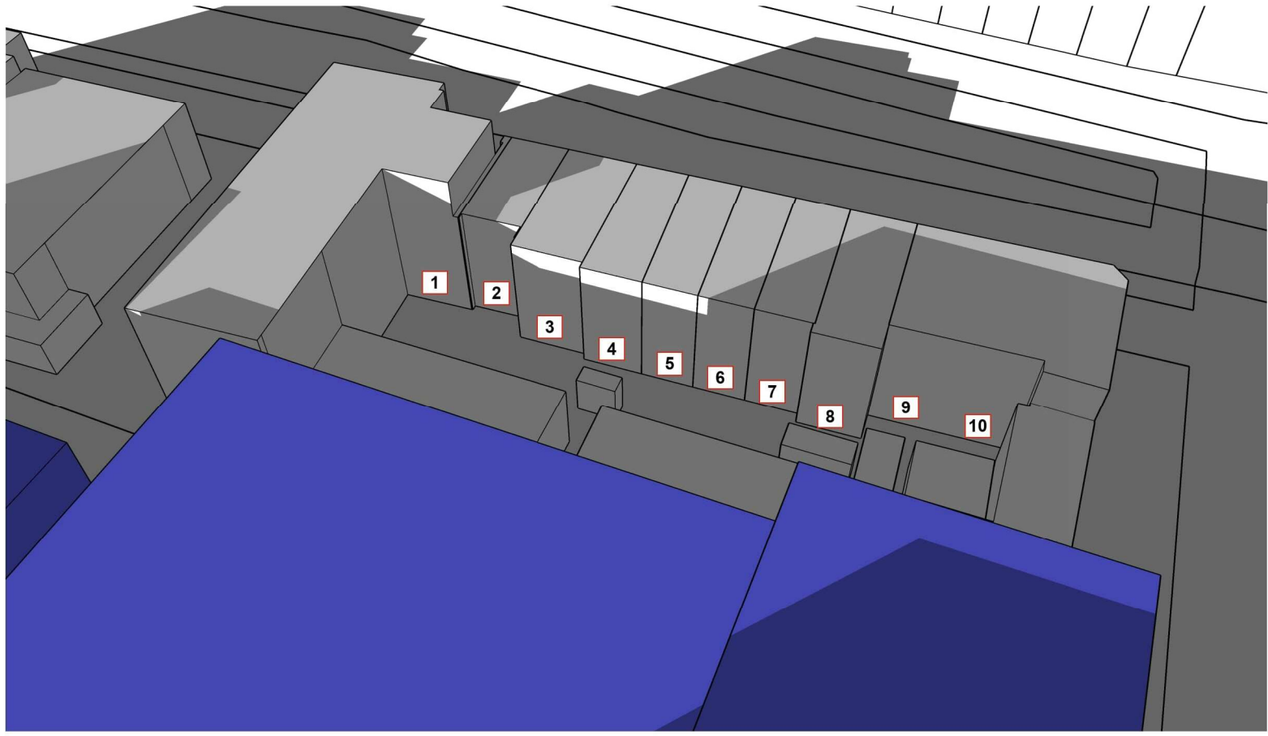

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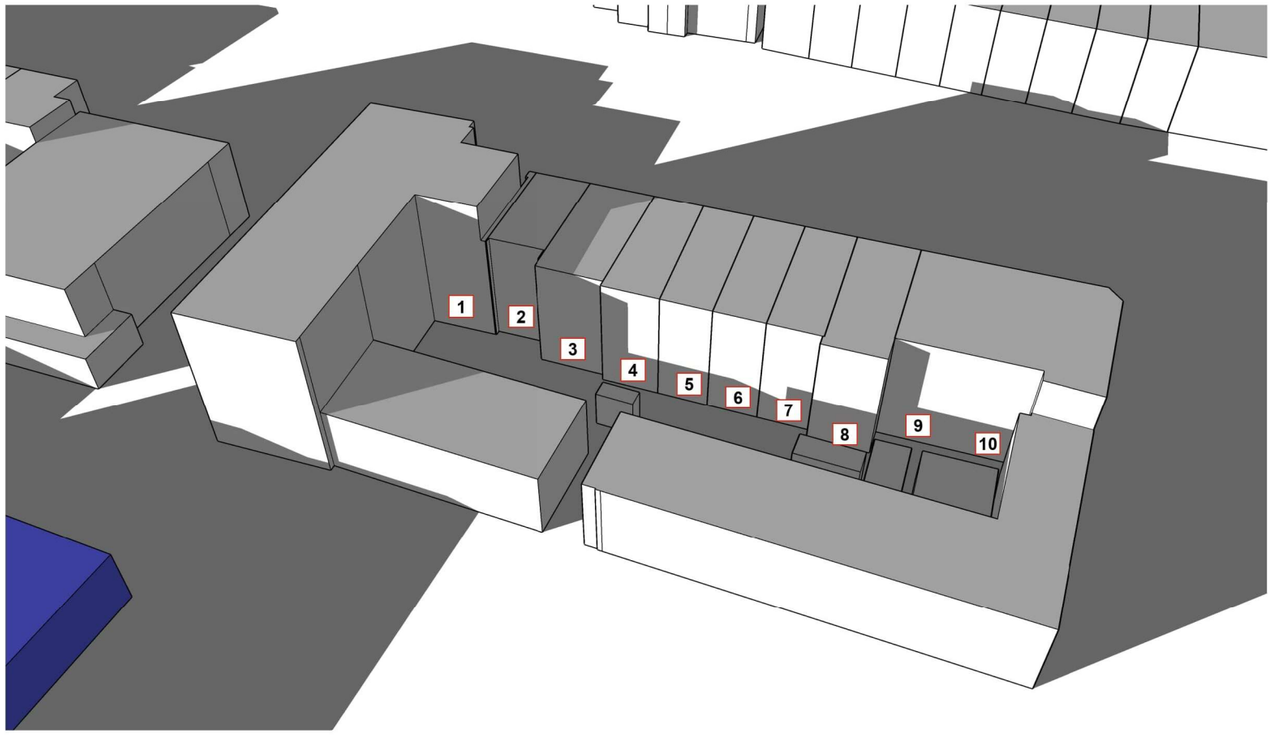

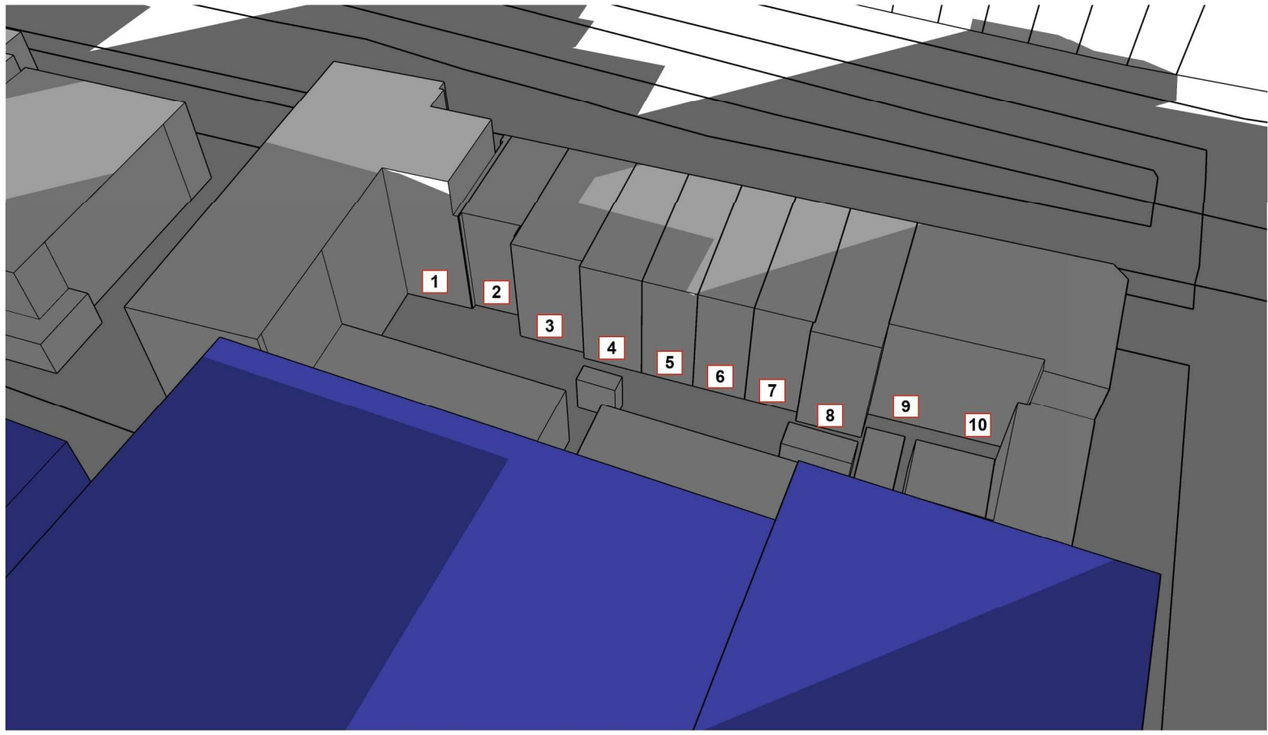

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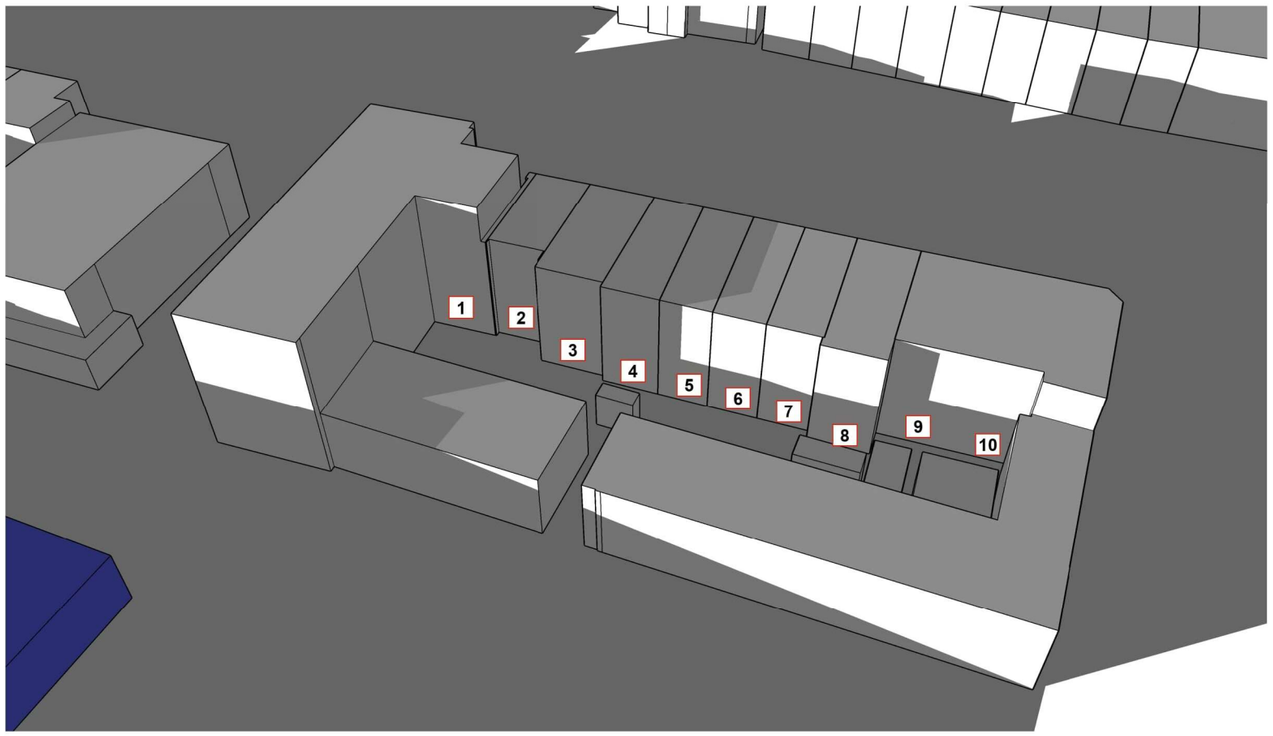

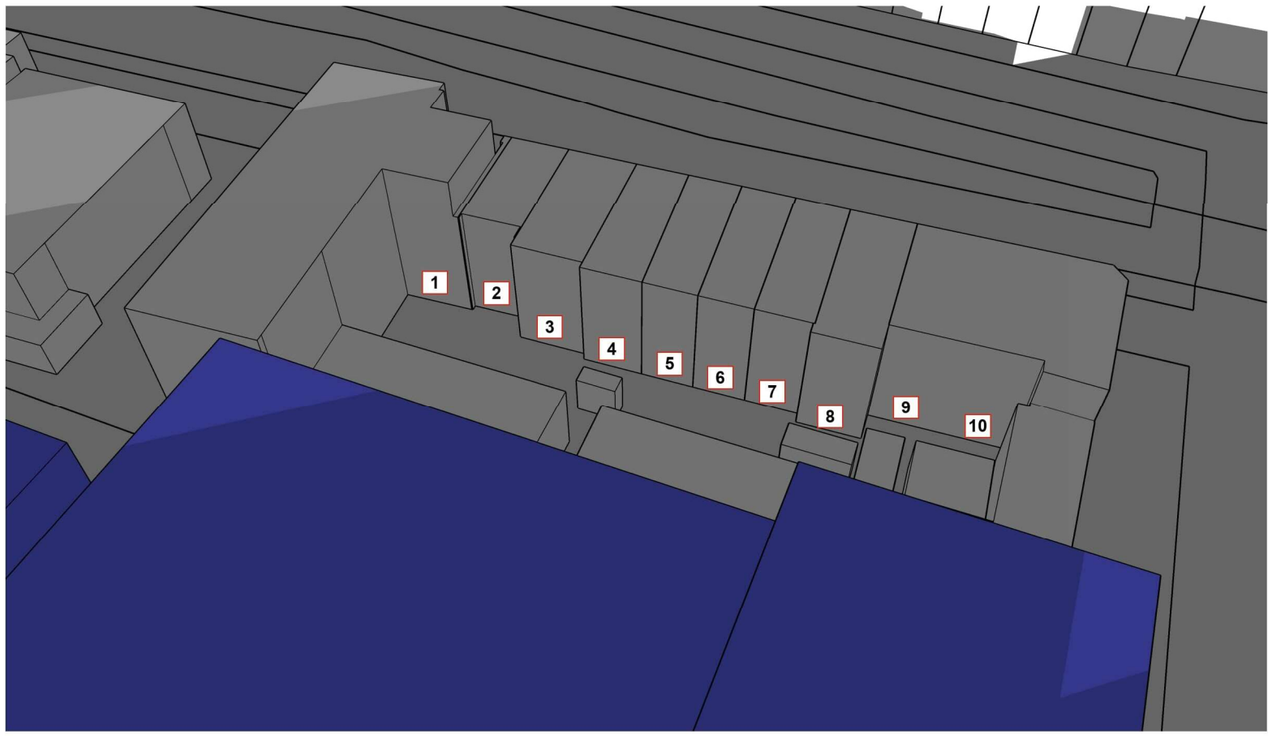

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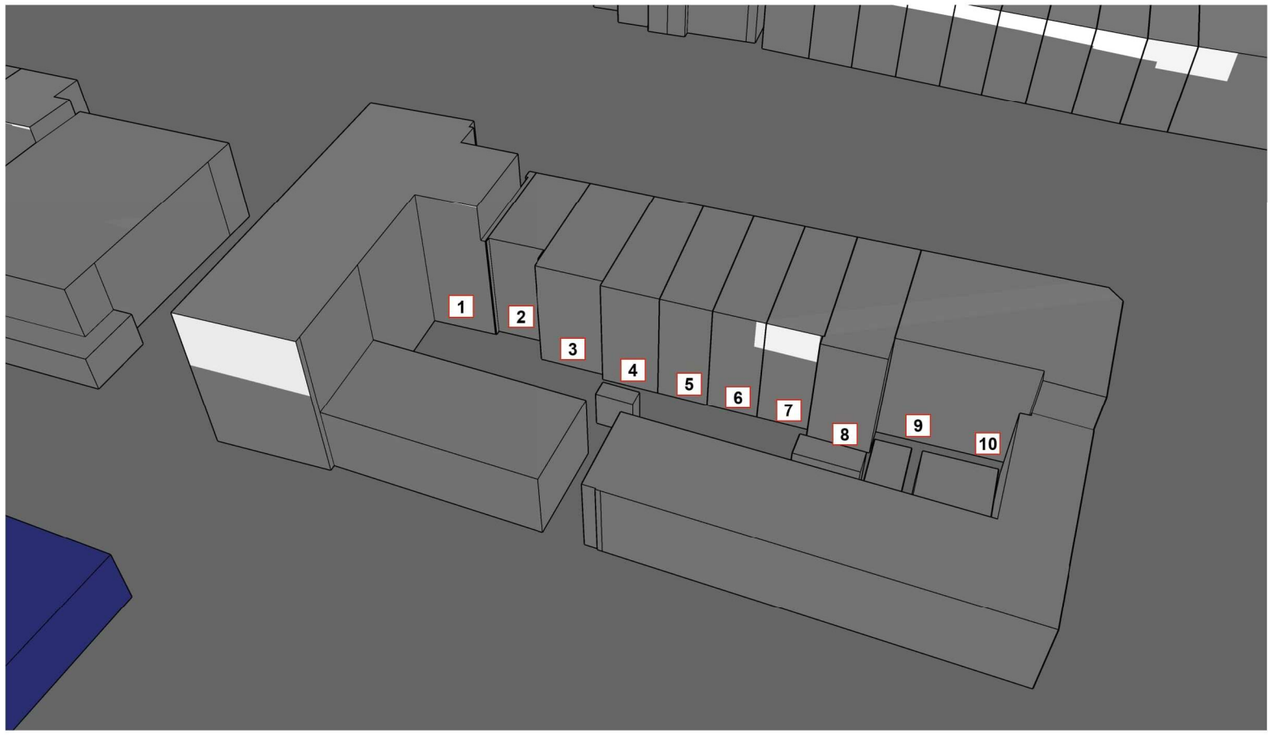

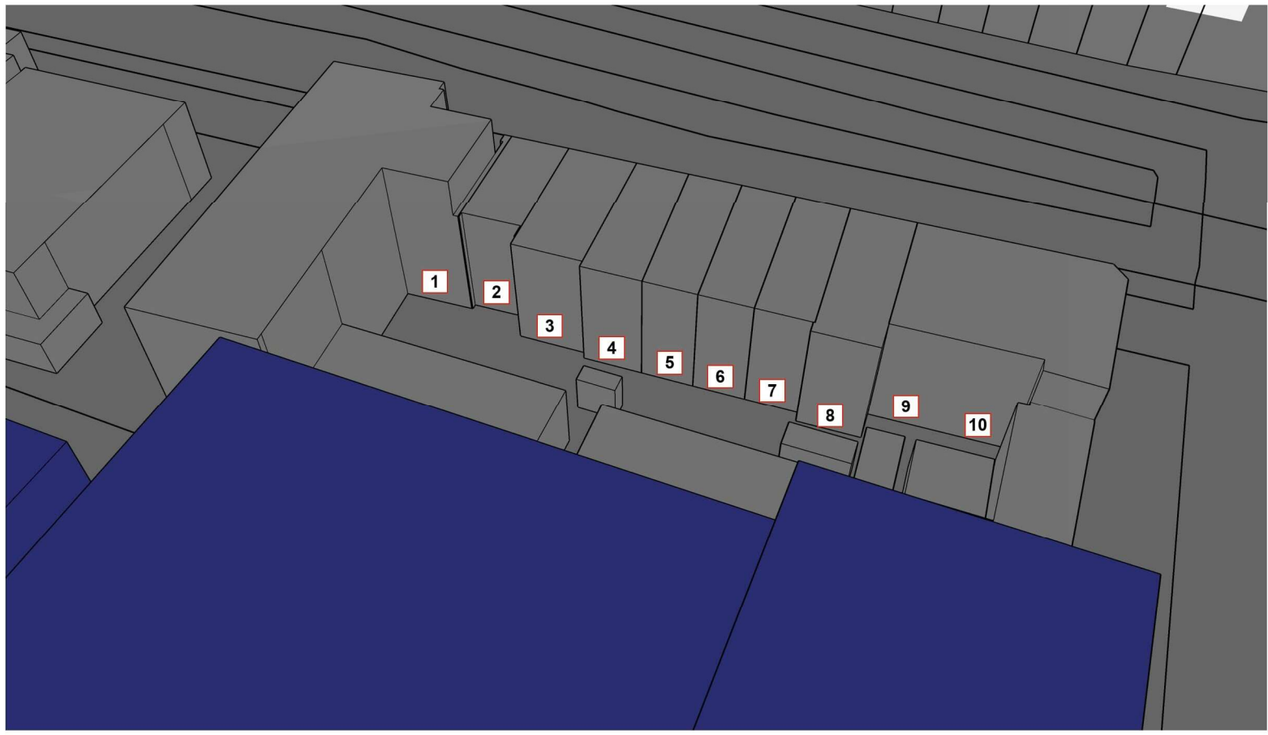

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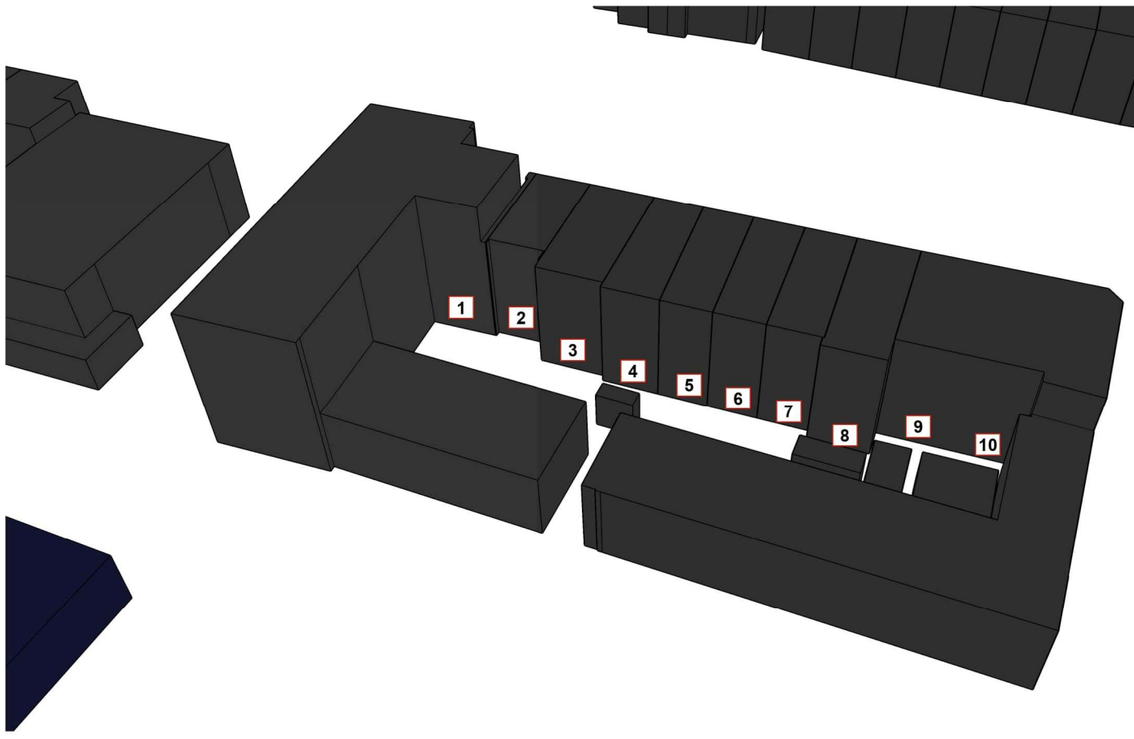

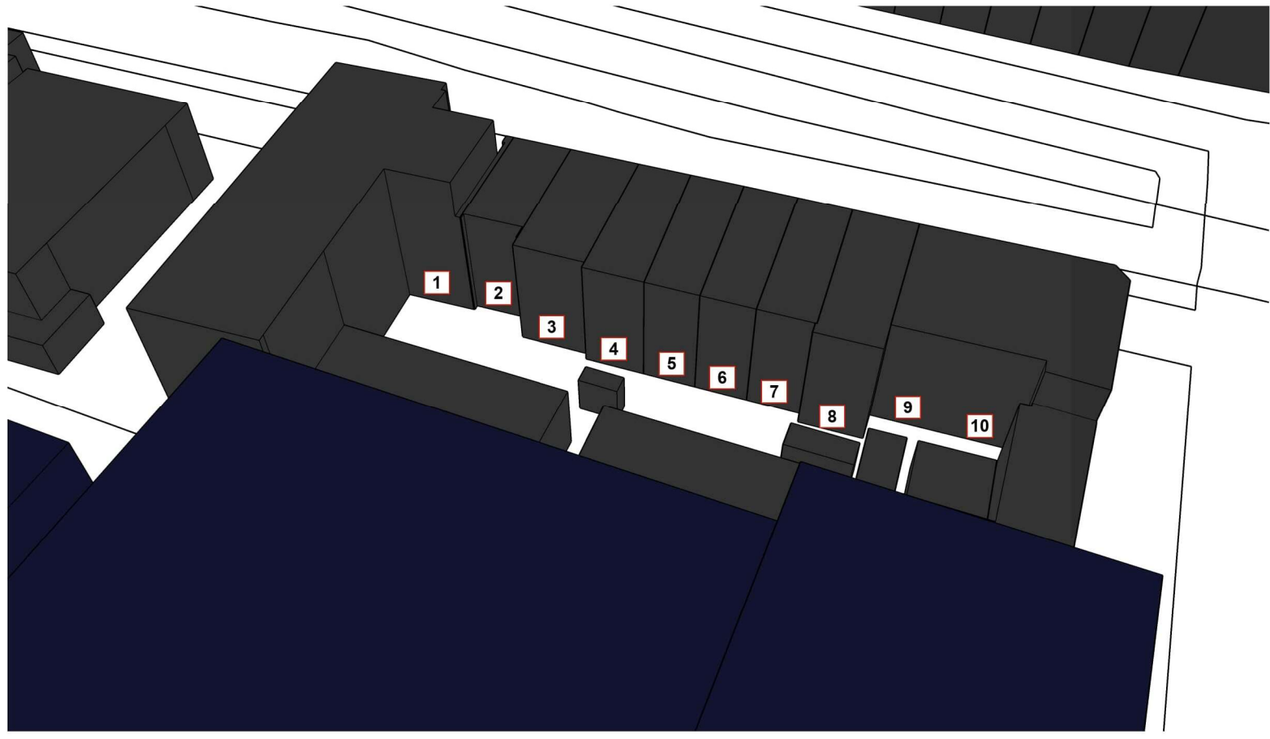

bijlage 10. resultaten 21 september Noordsingel 77 – 99 huidig vs. nieuw

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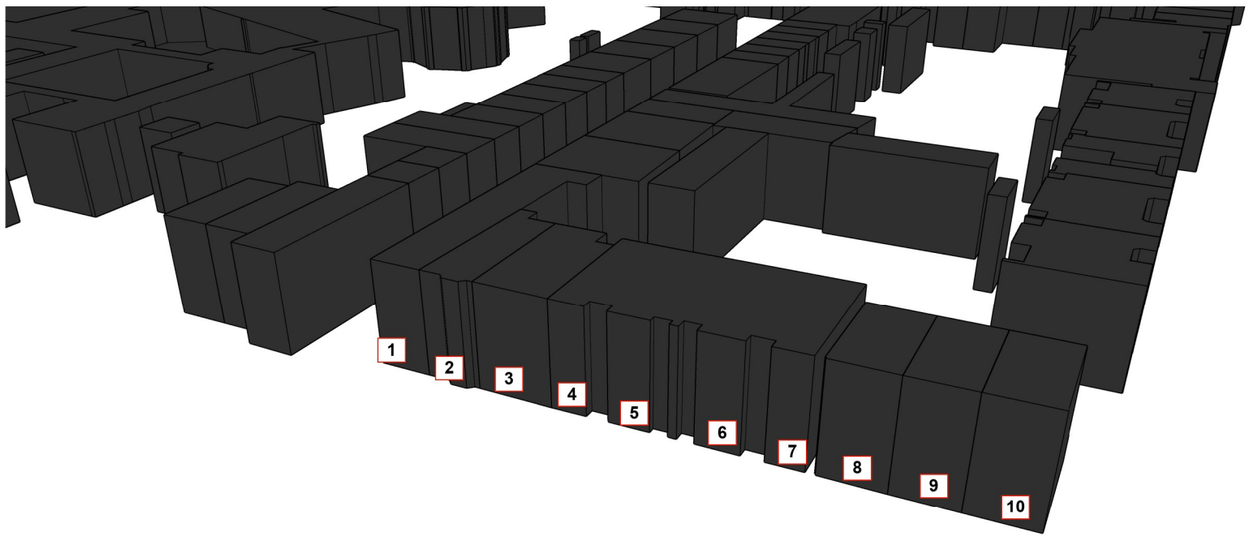
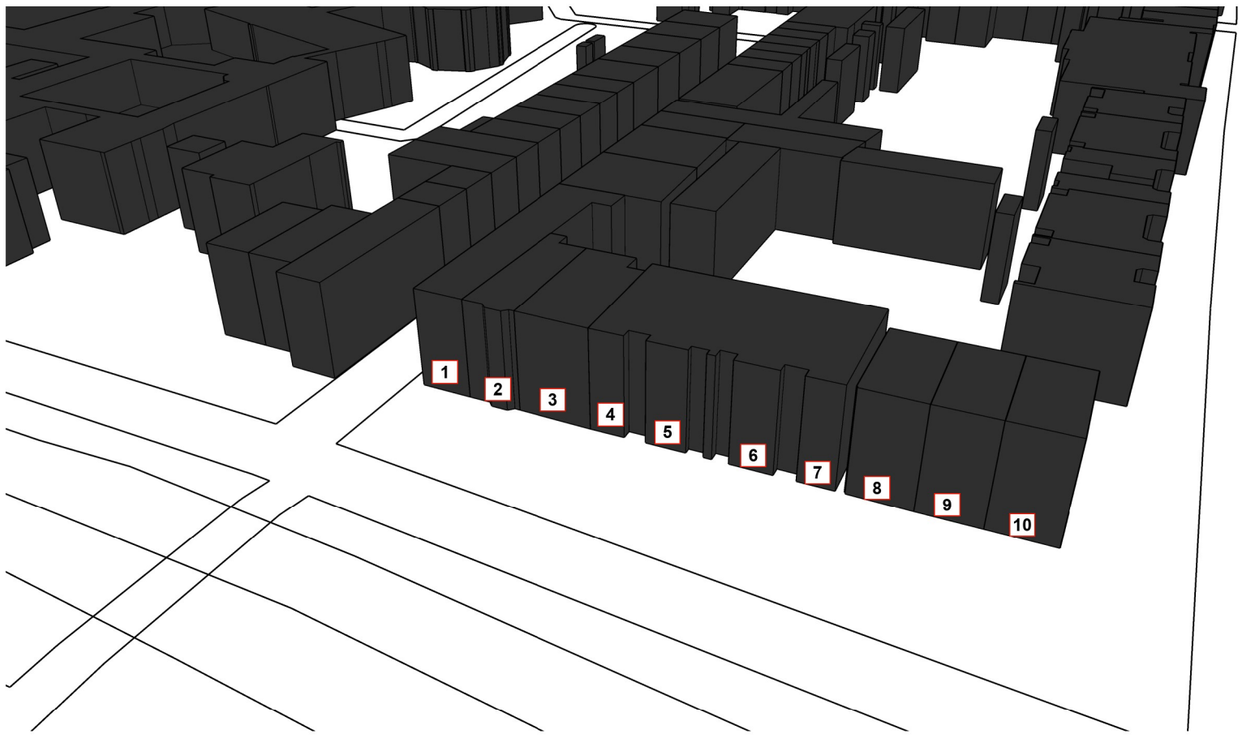
06.00





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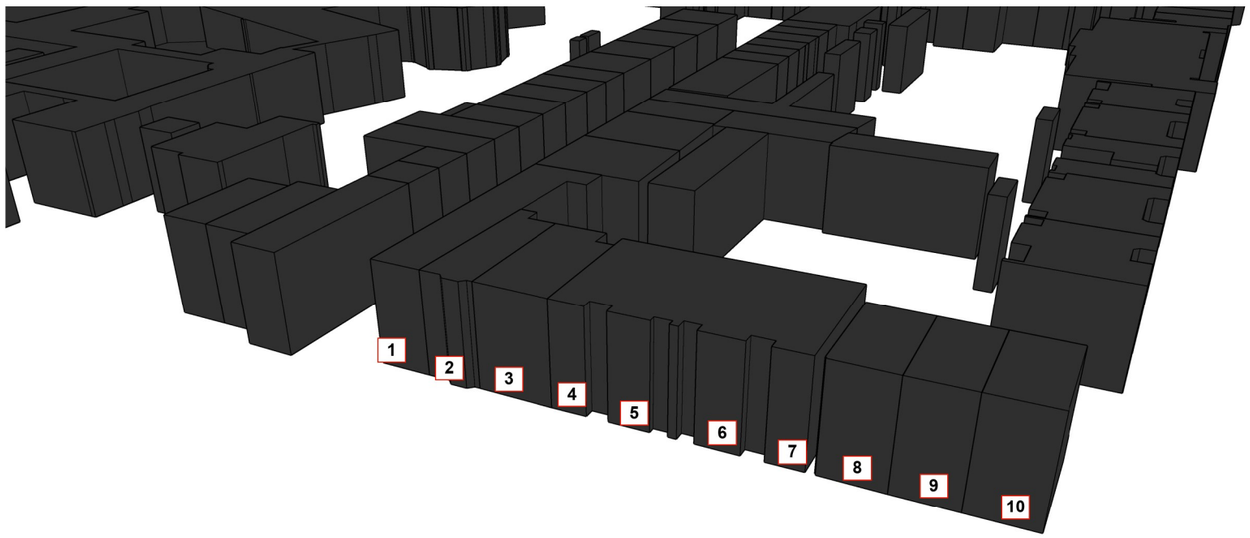

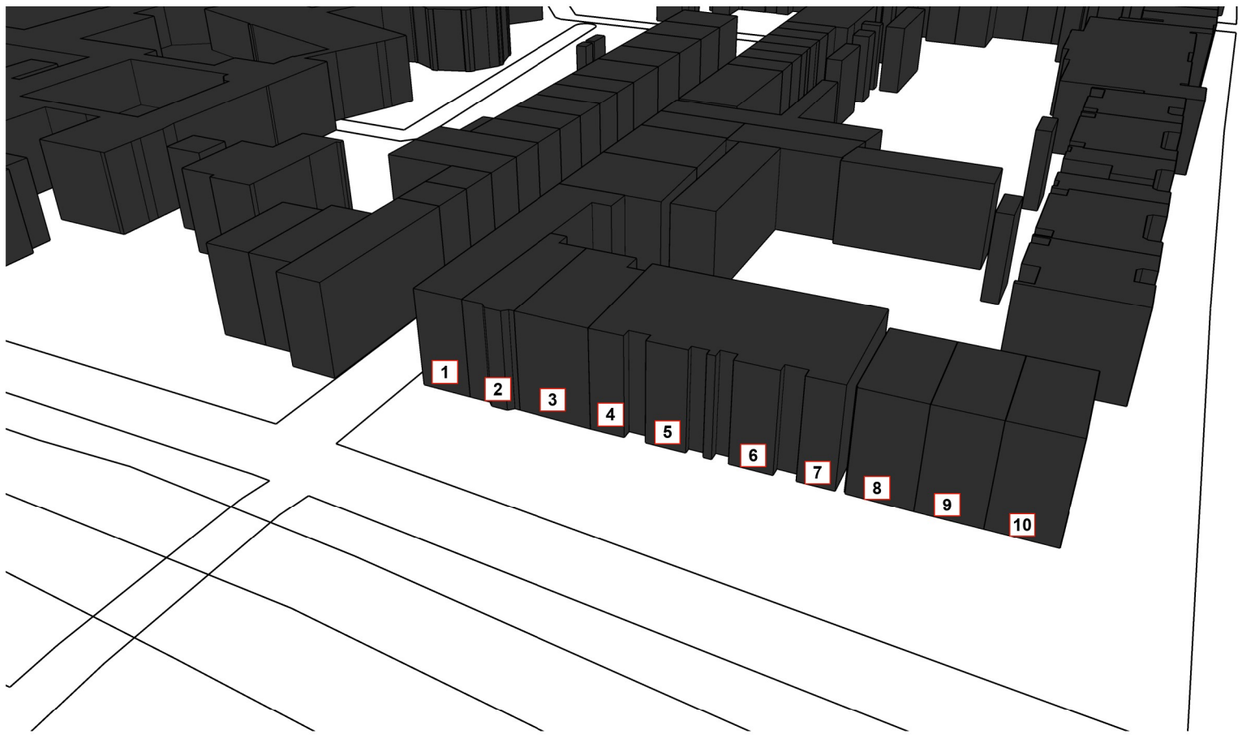

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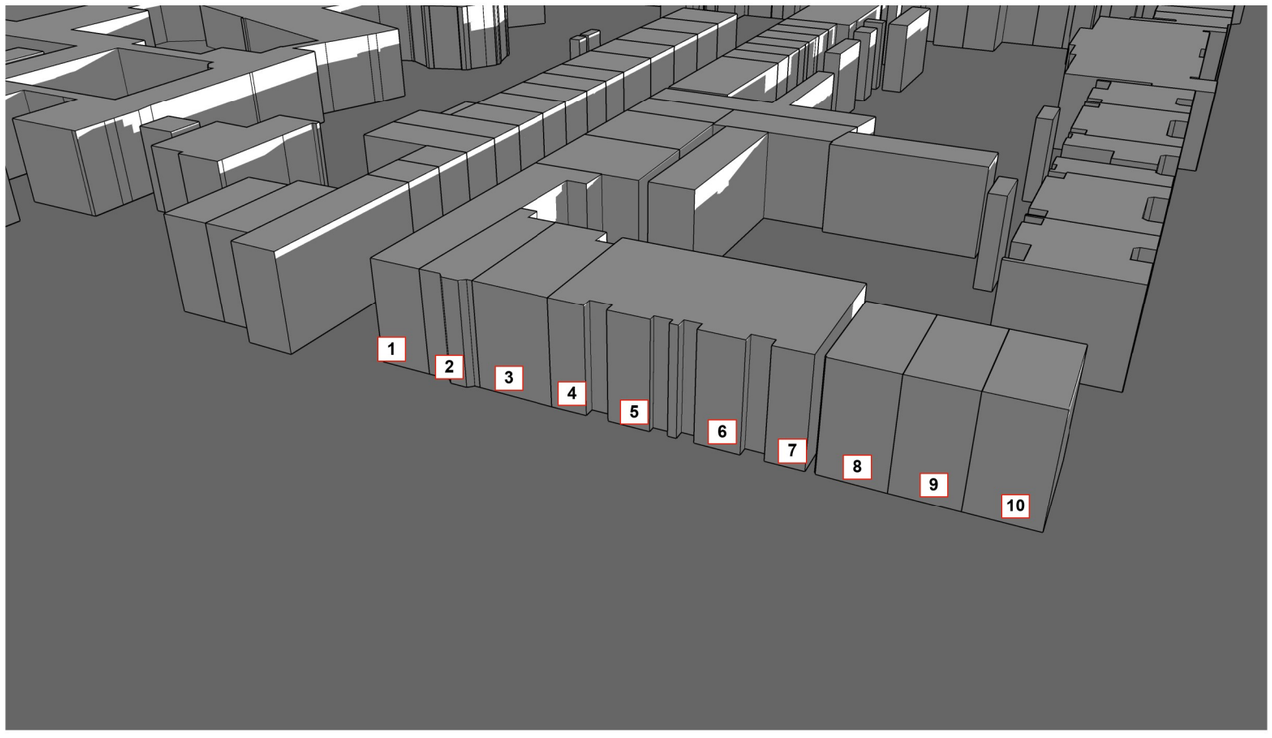

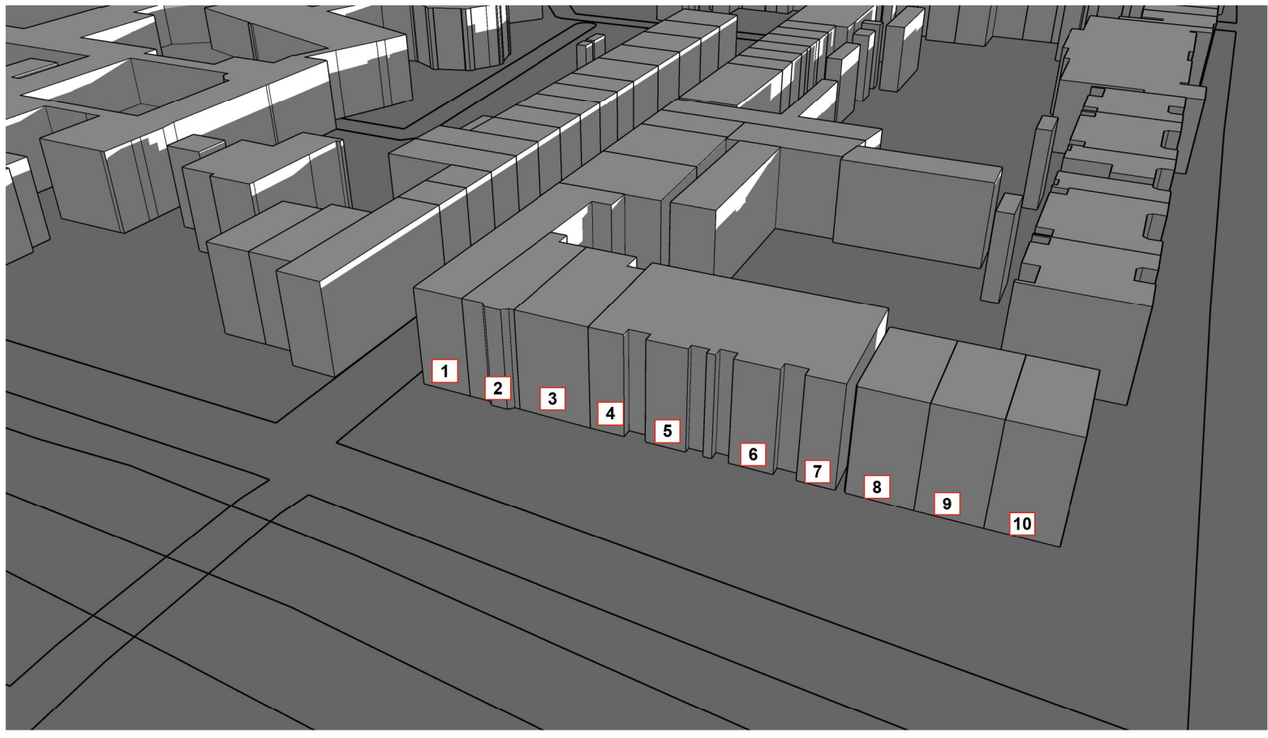

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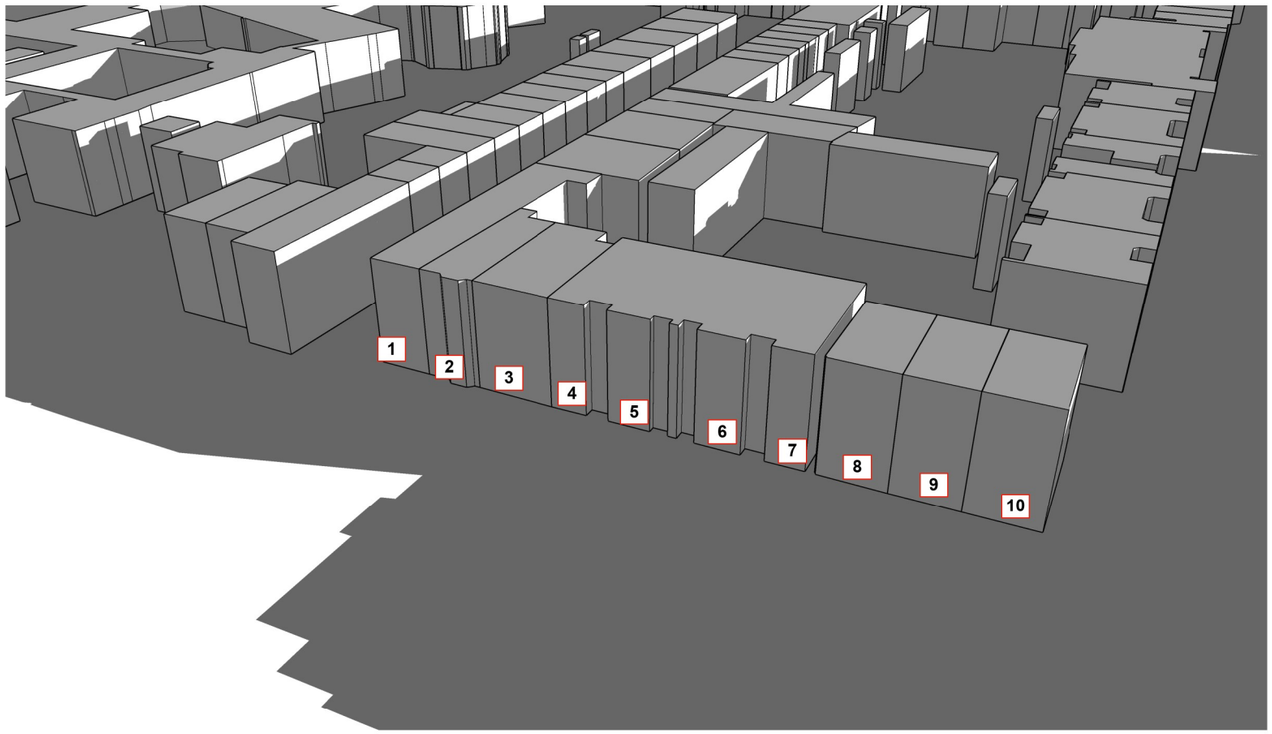

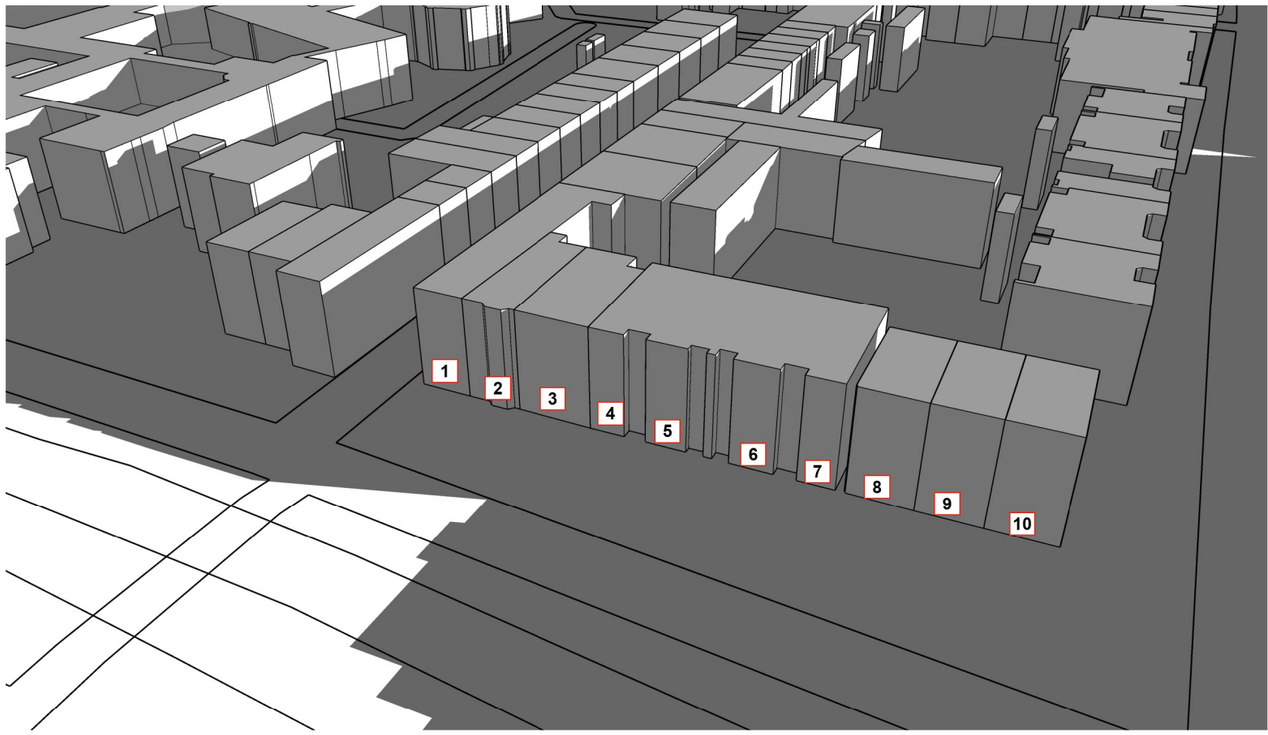

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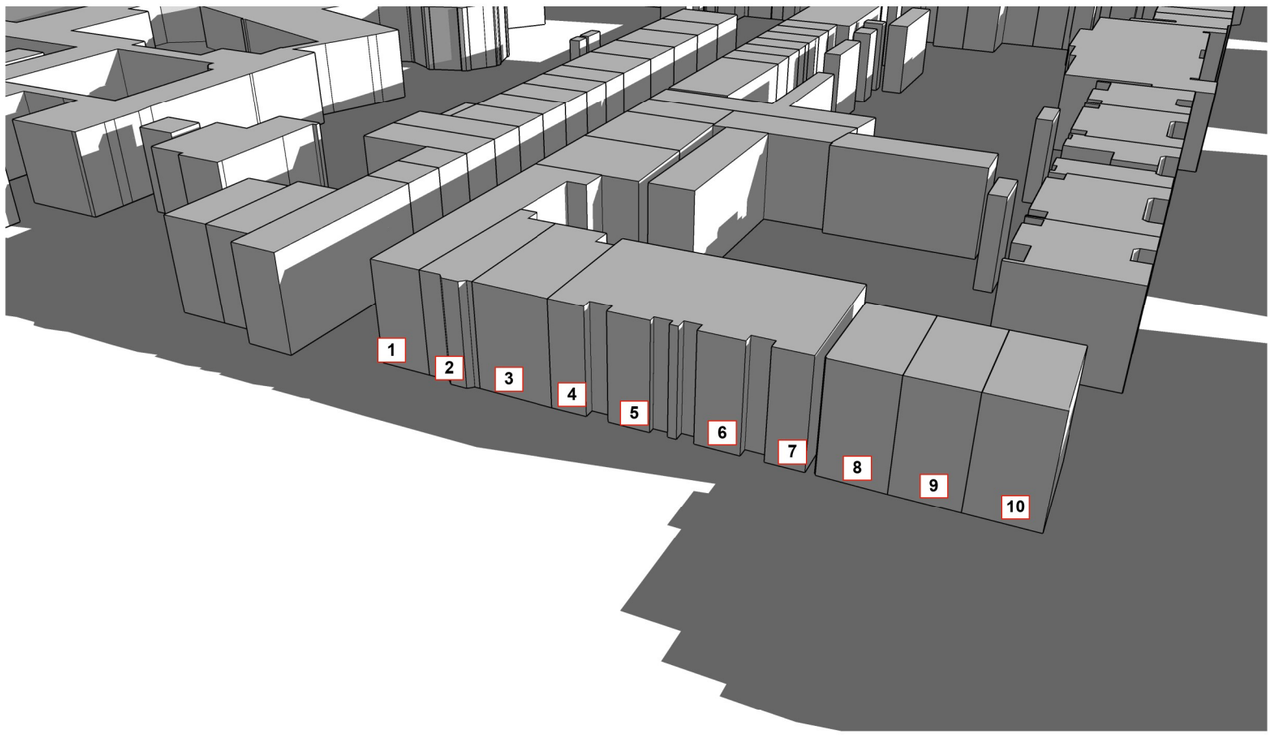
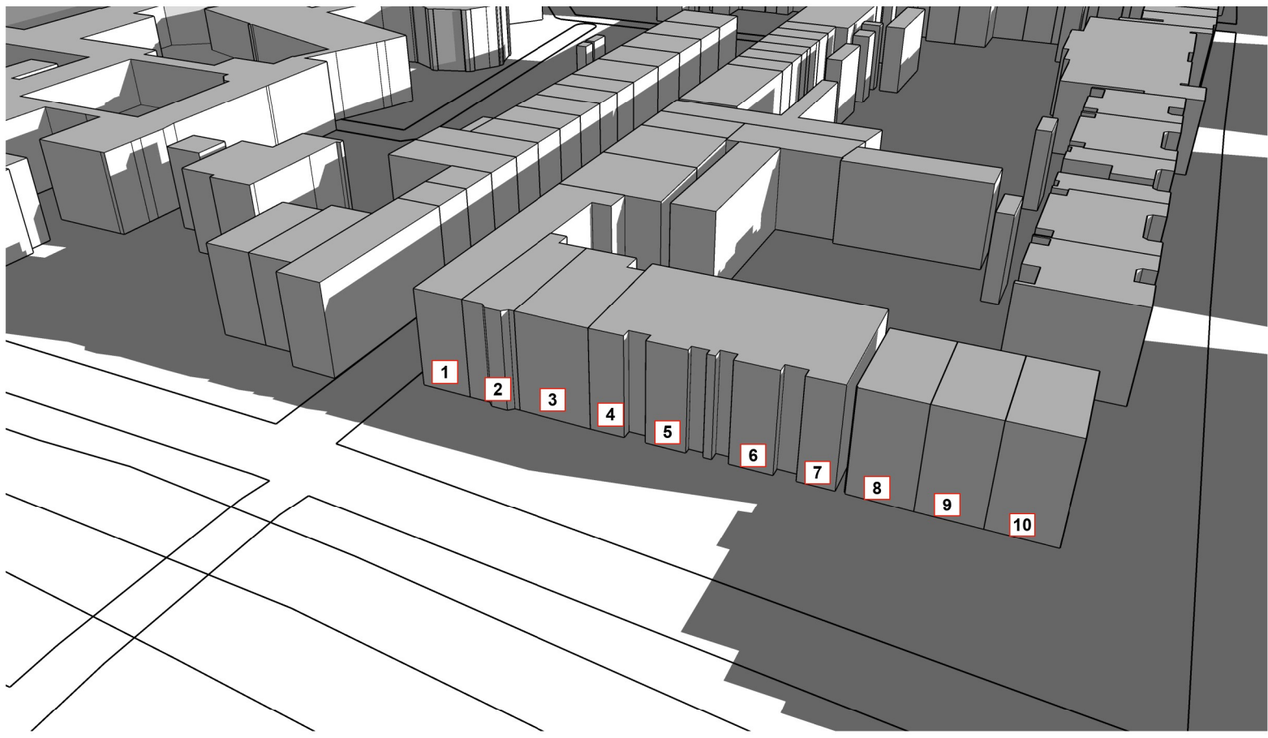
08.00





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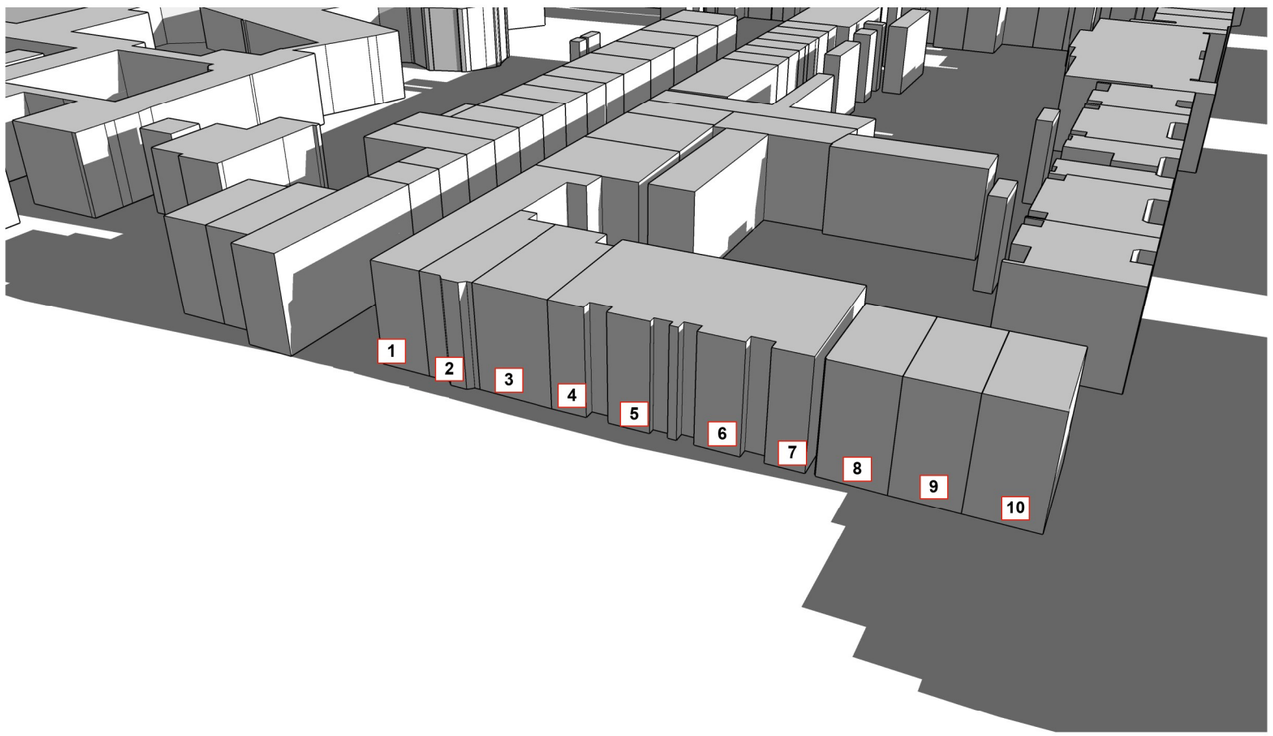

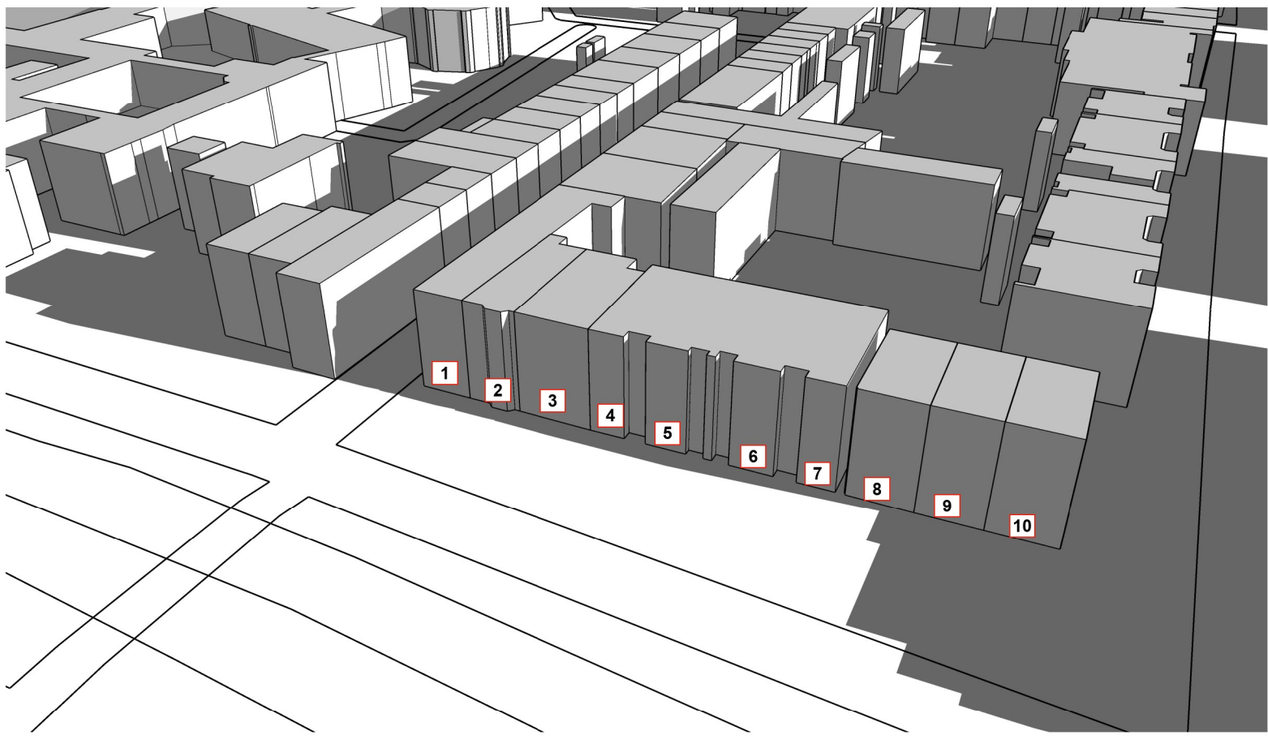

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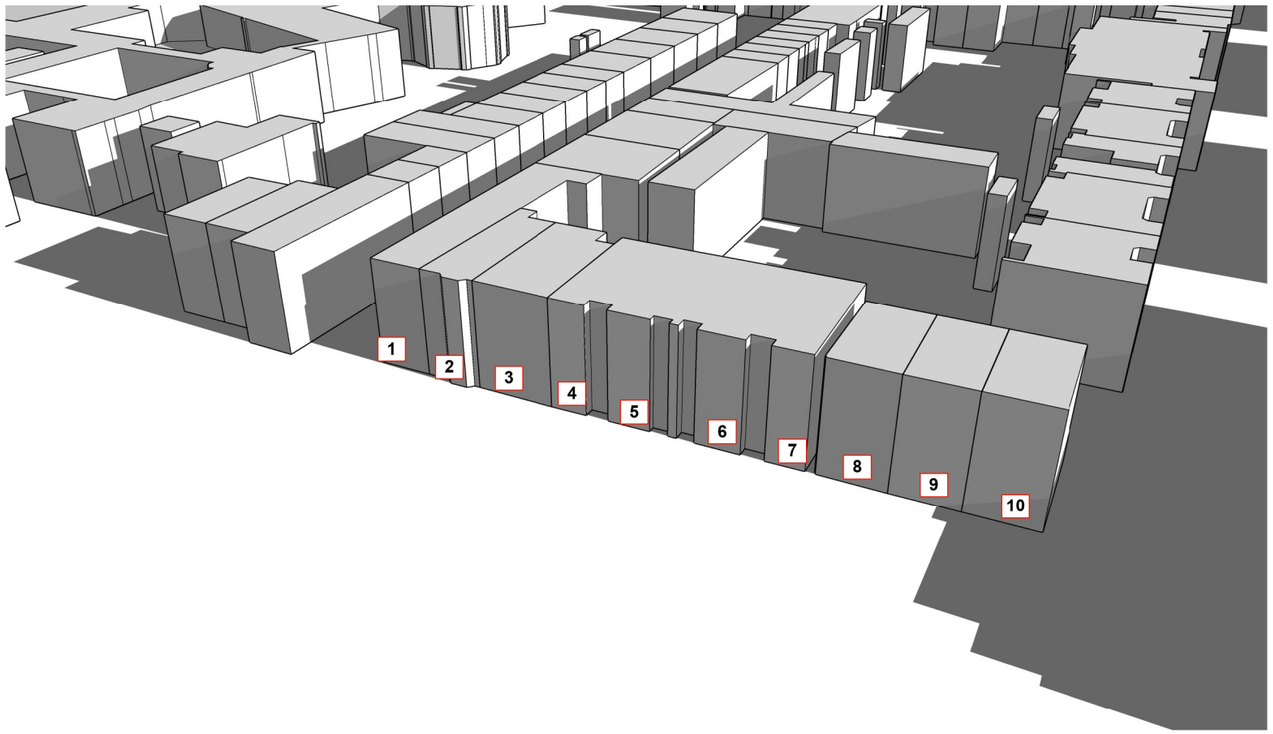

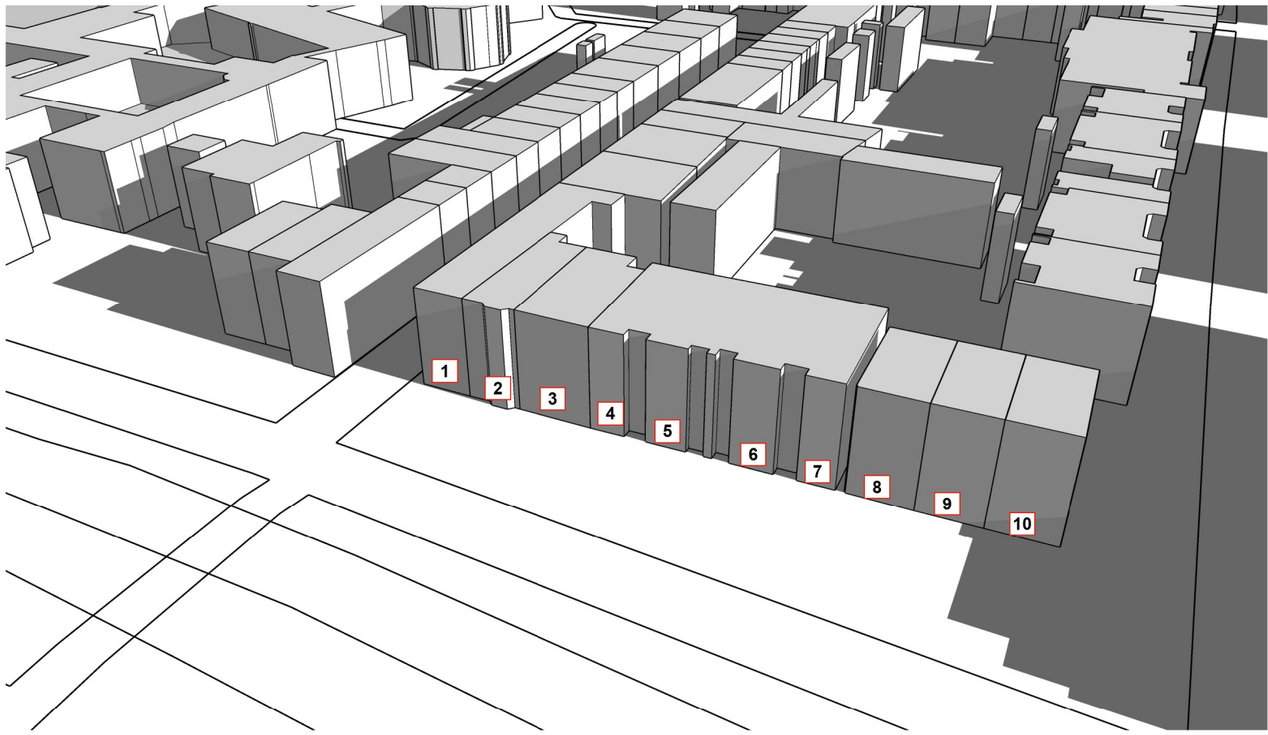

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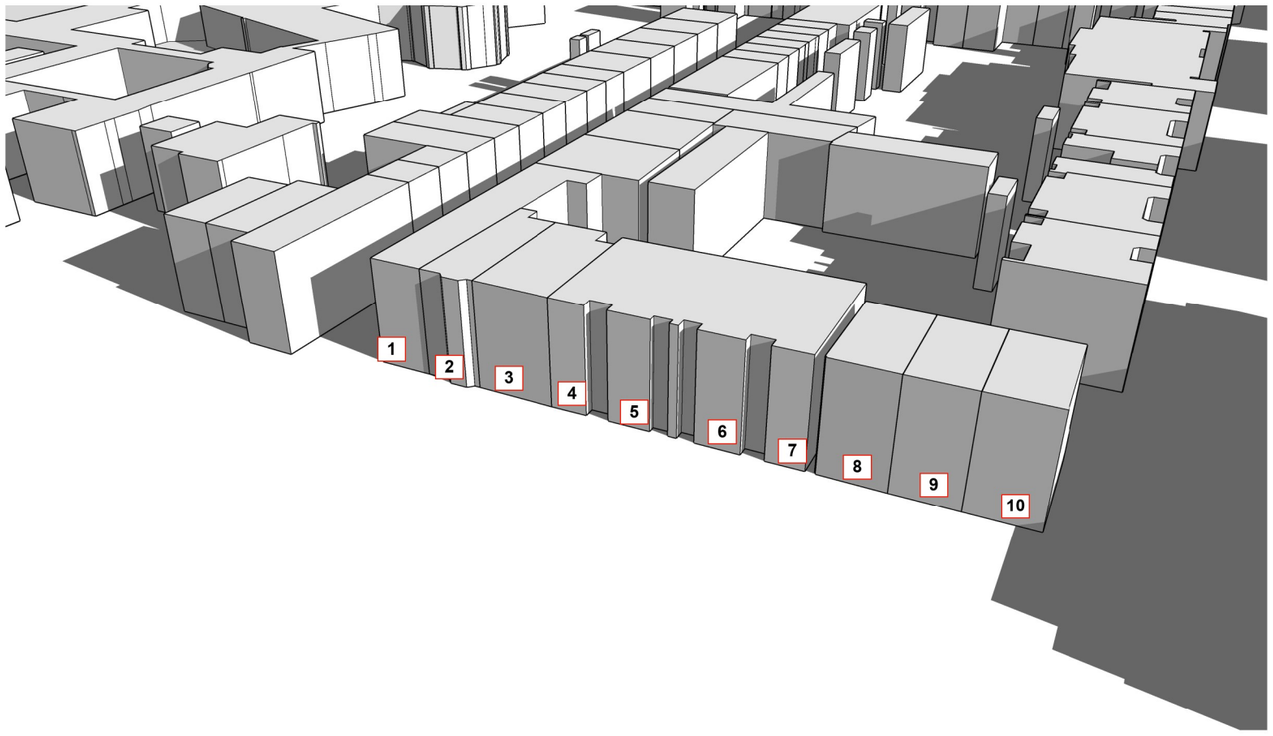

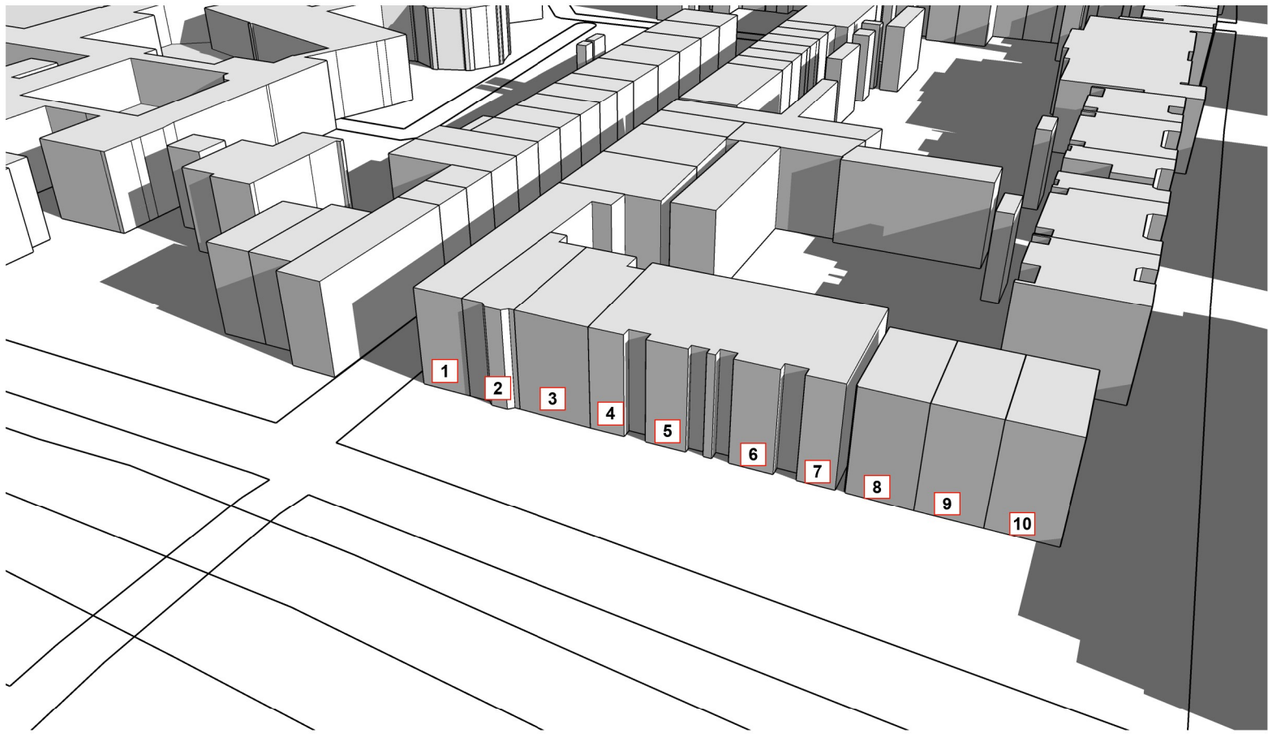

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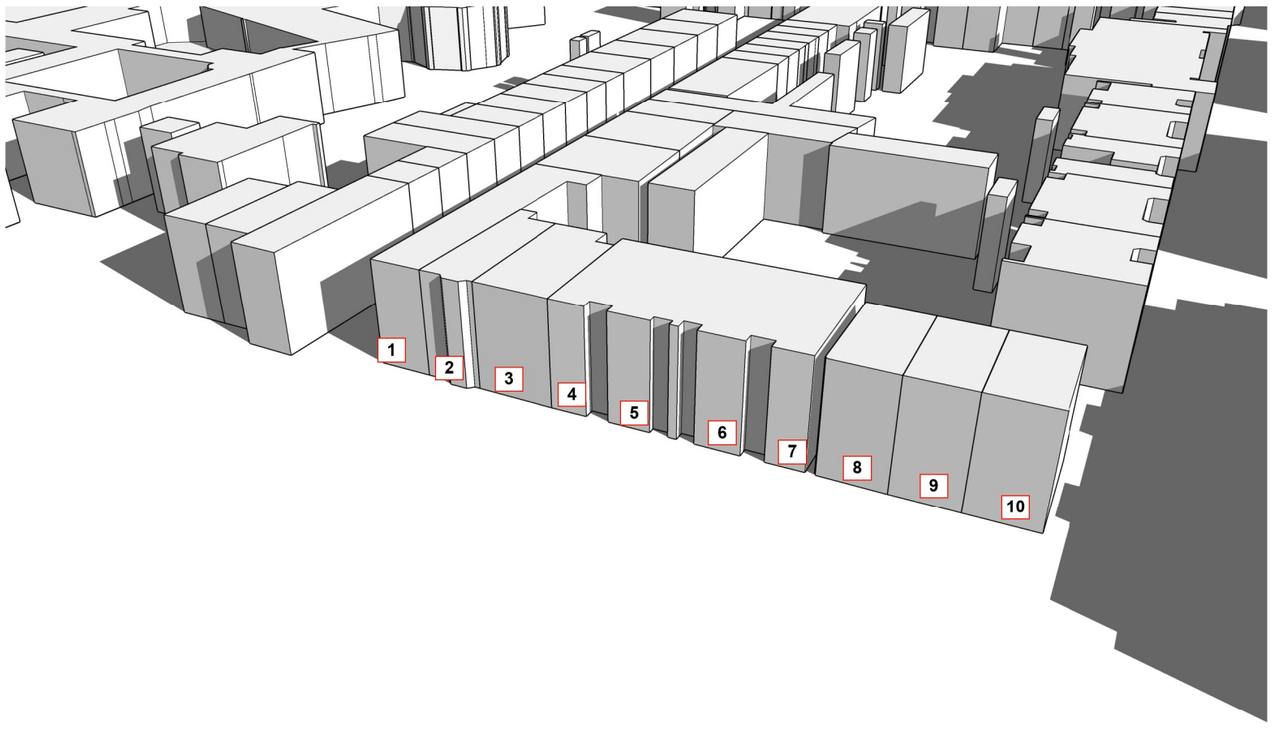

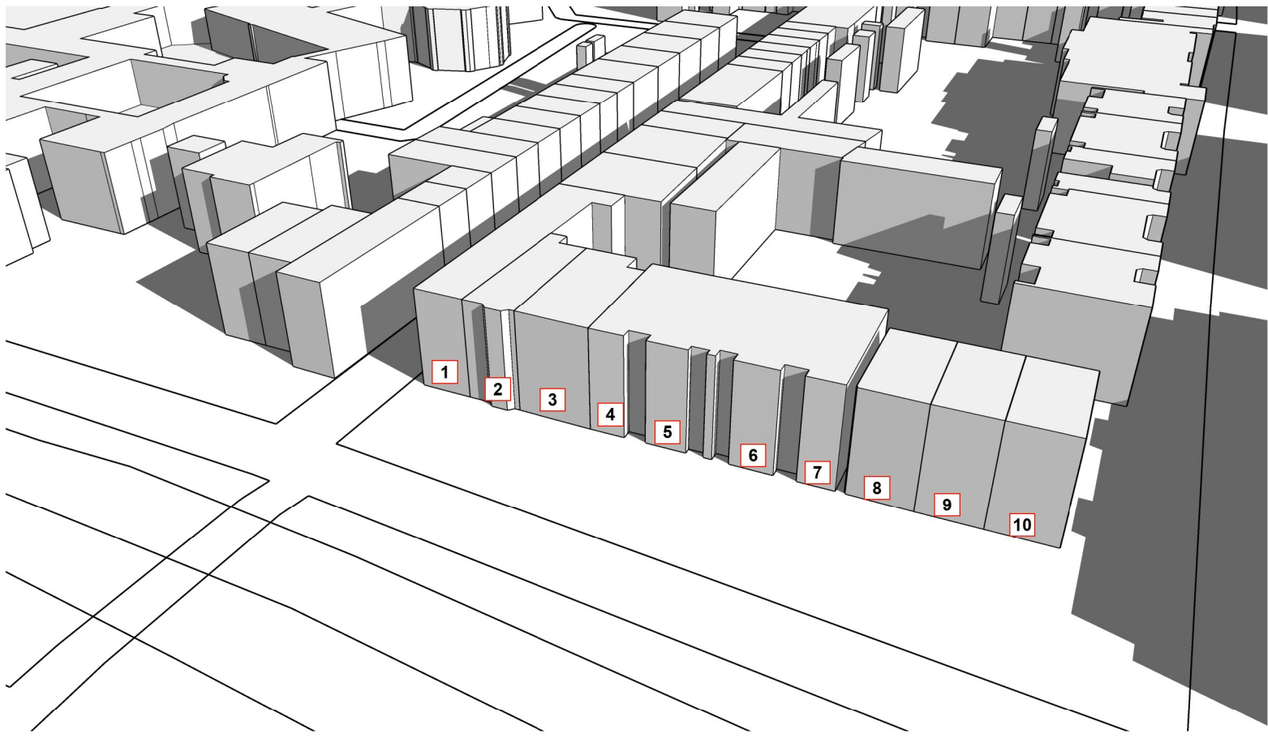

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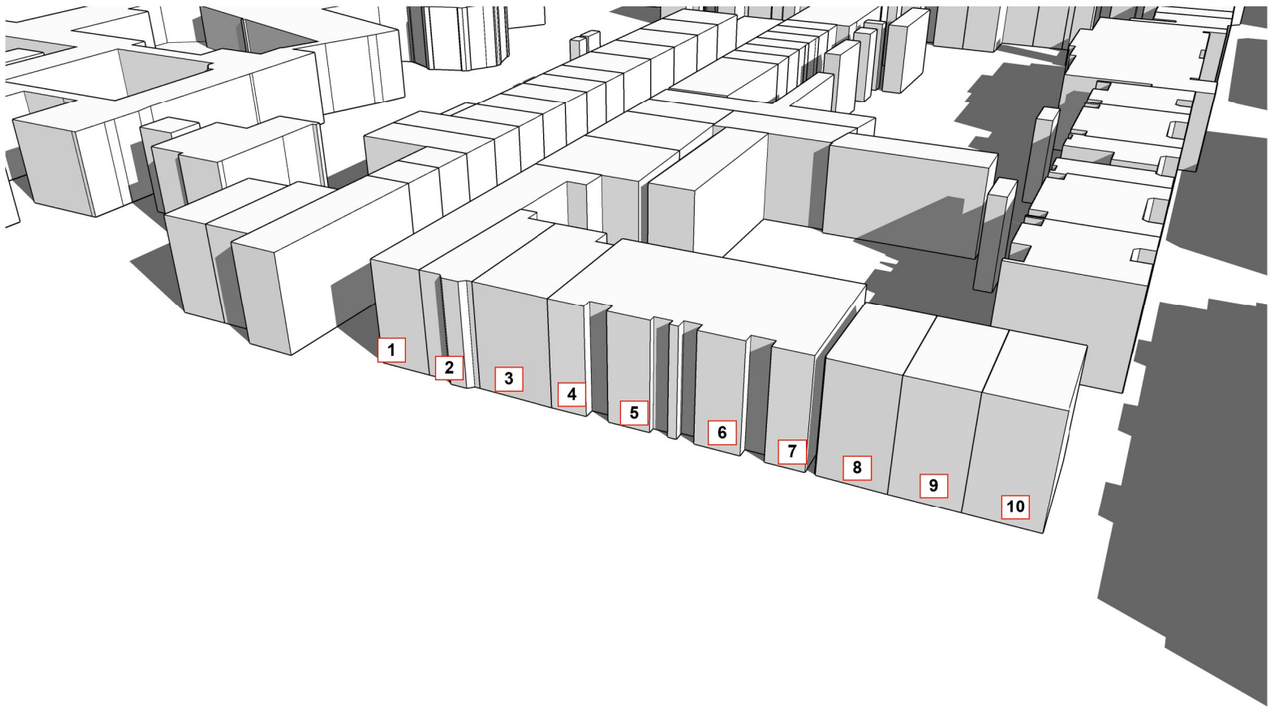

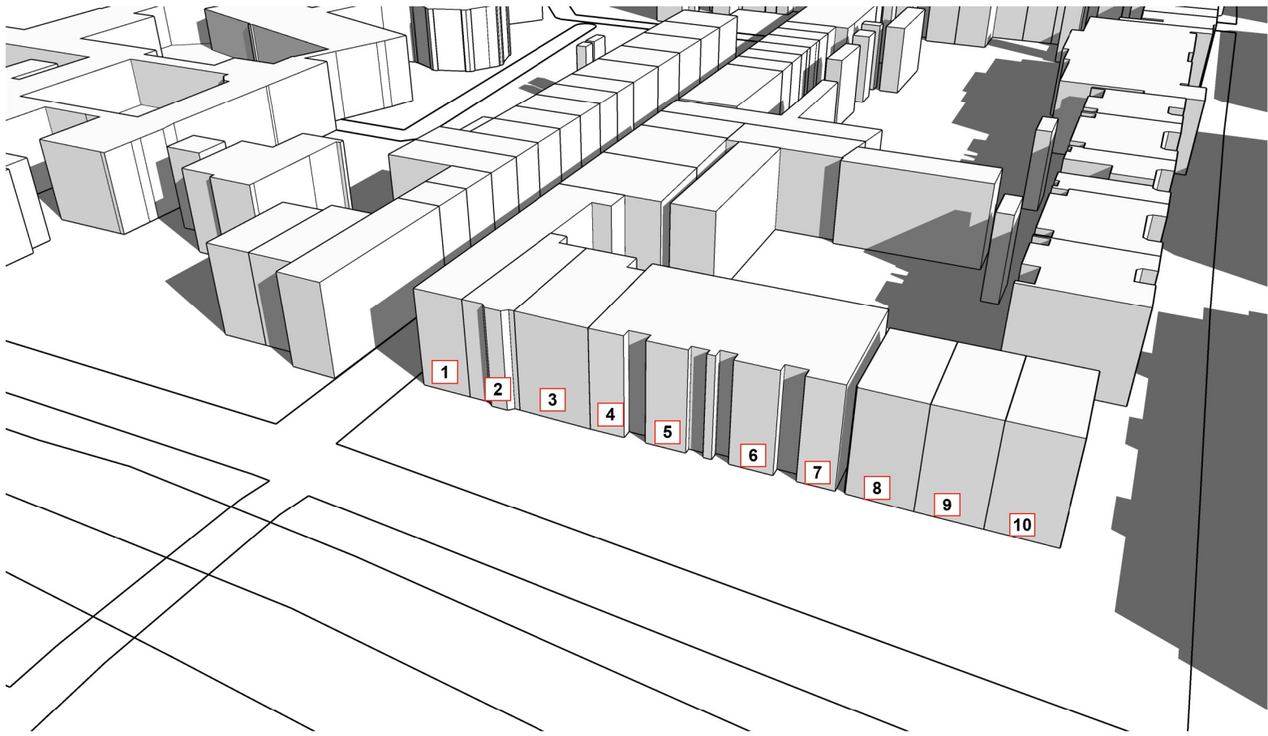

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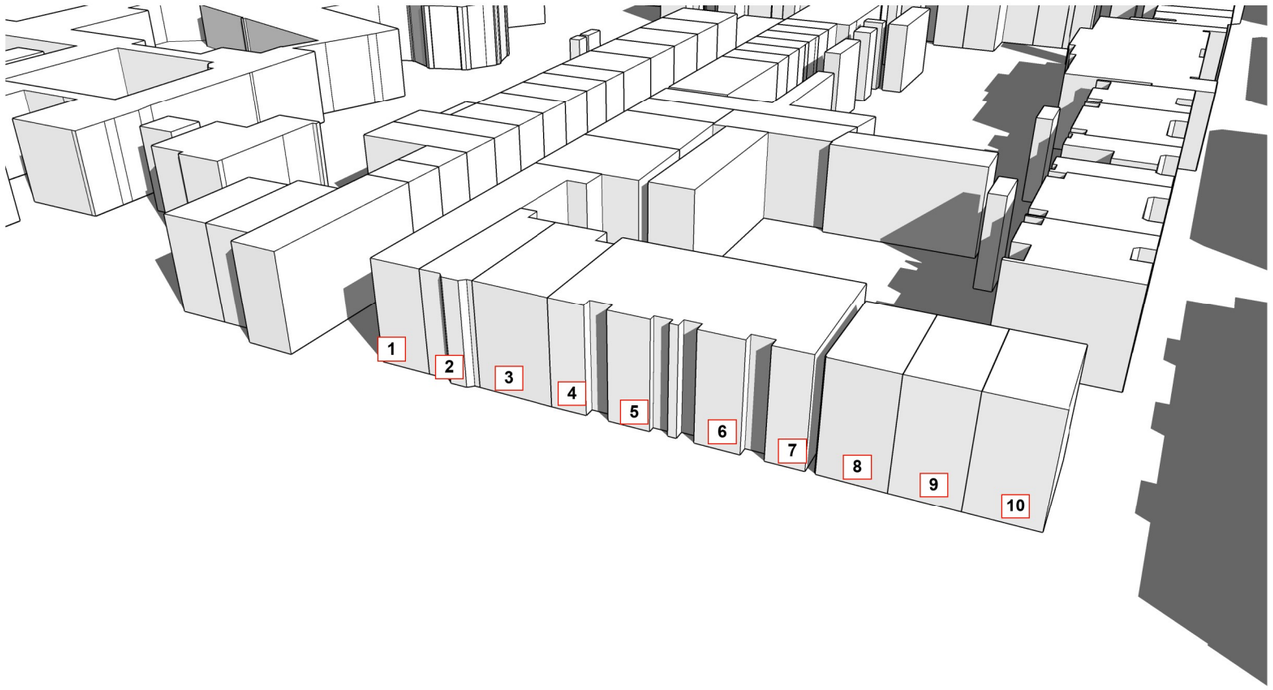
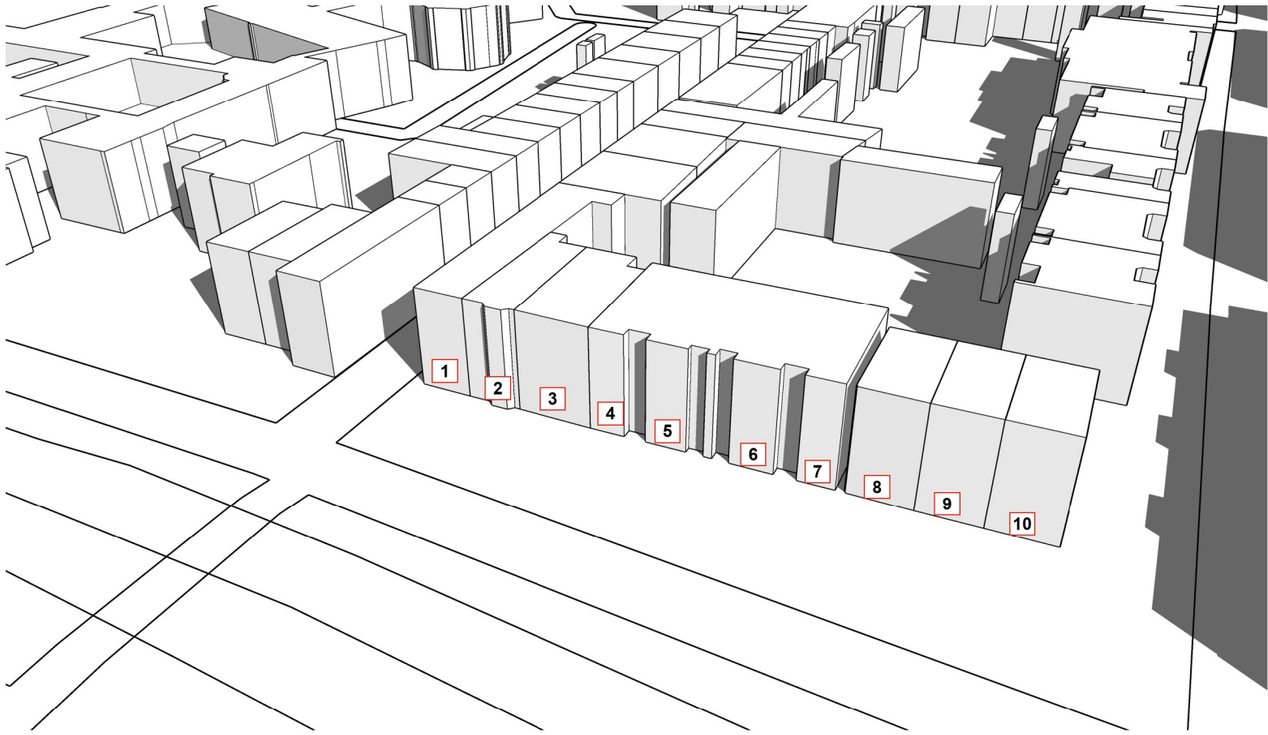
11.00





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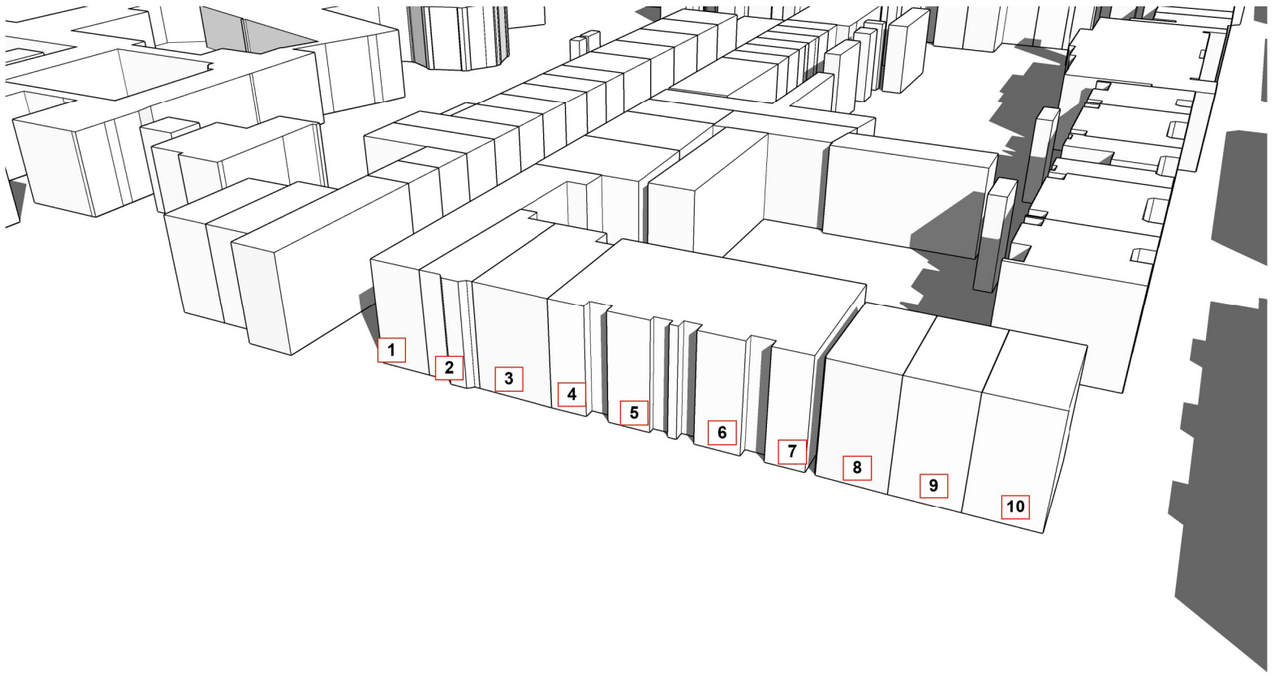

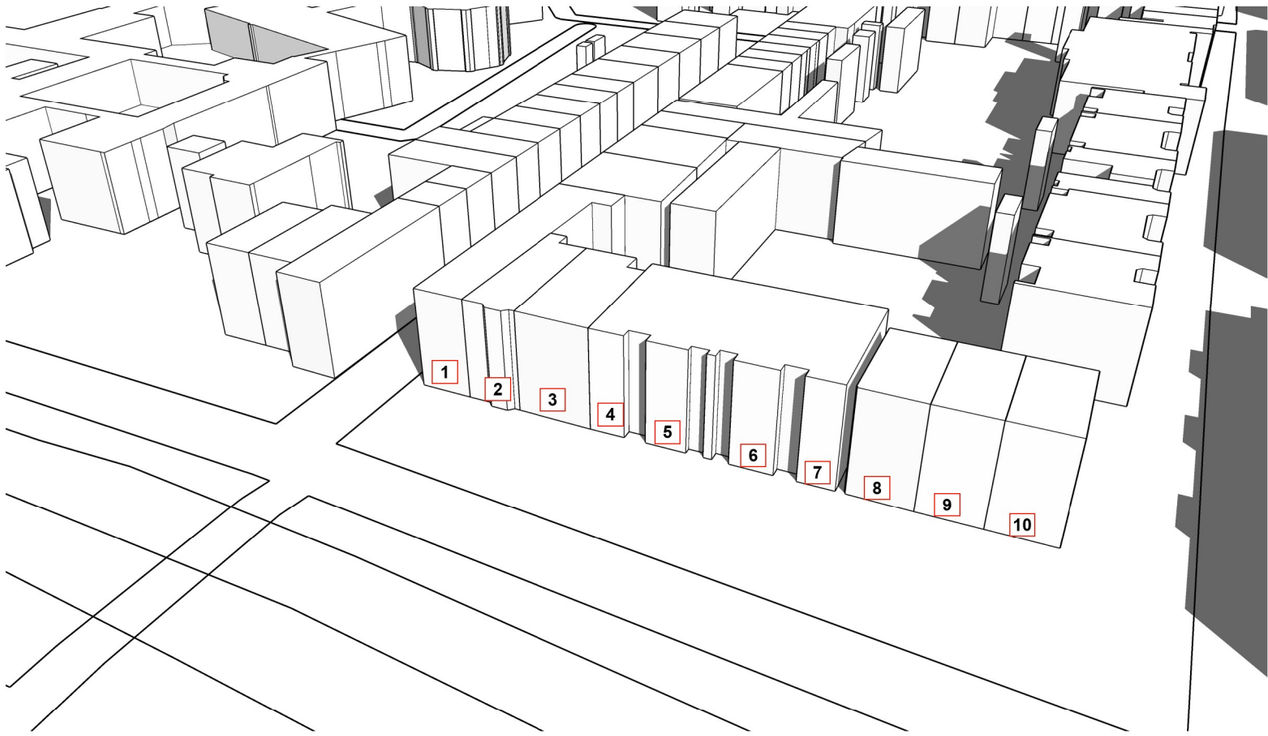

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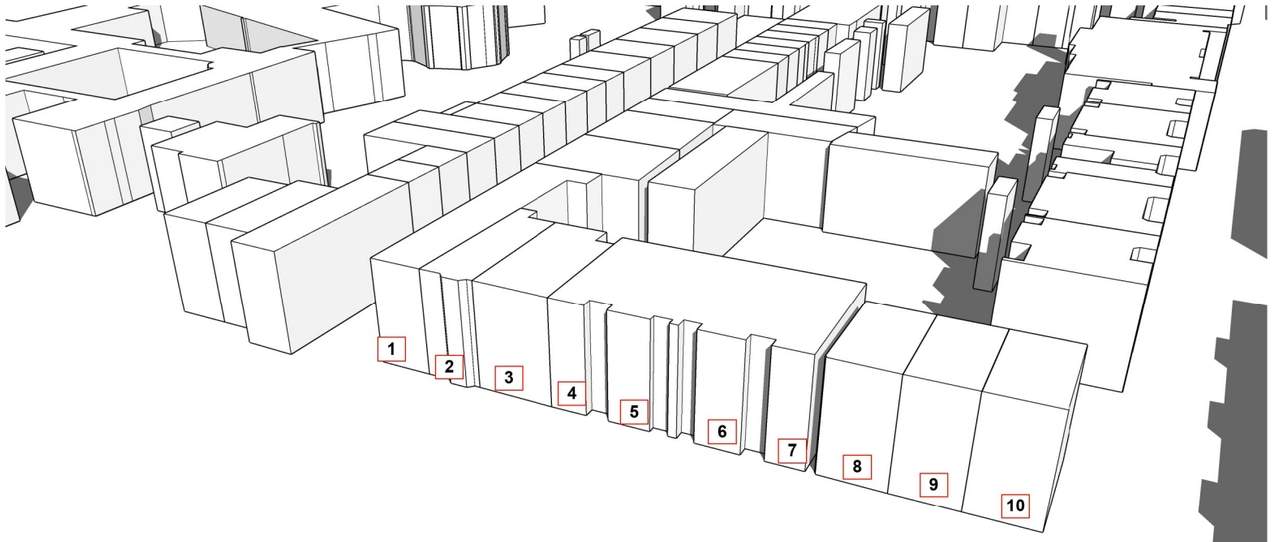
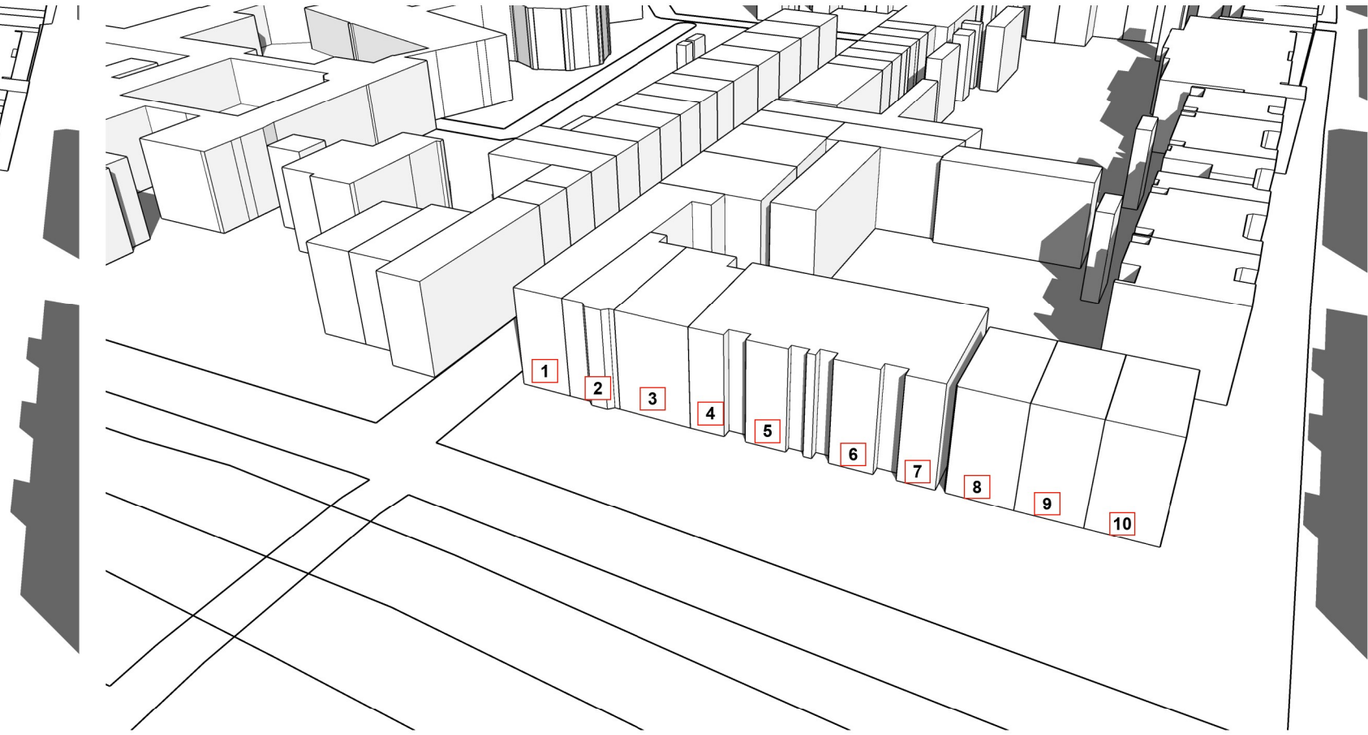
12.00





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21 september
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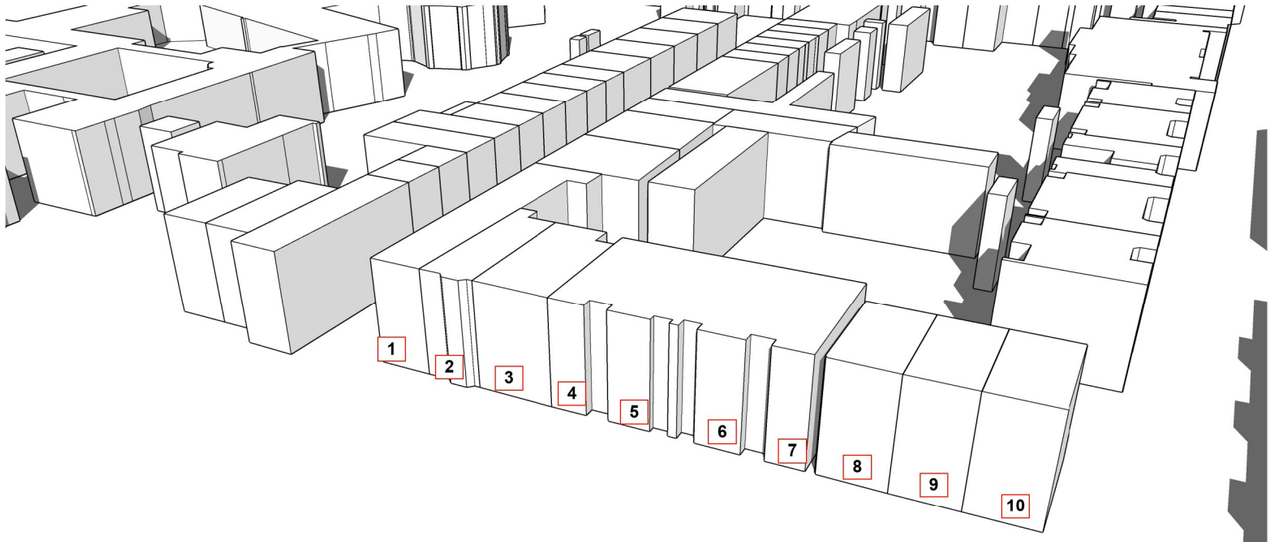

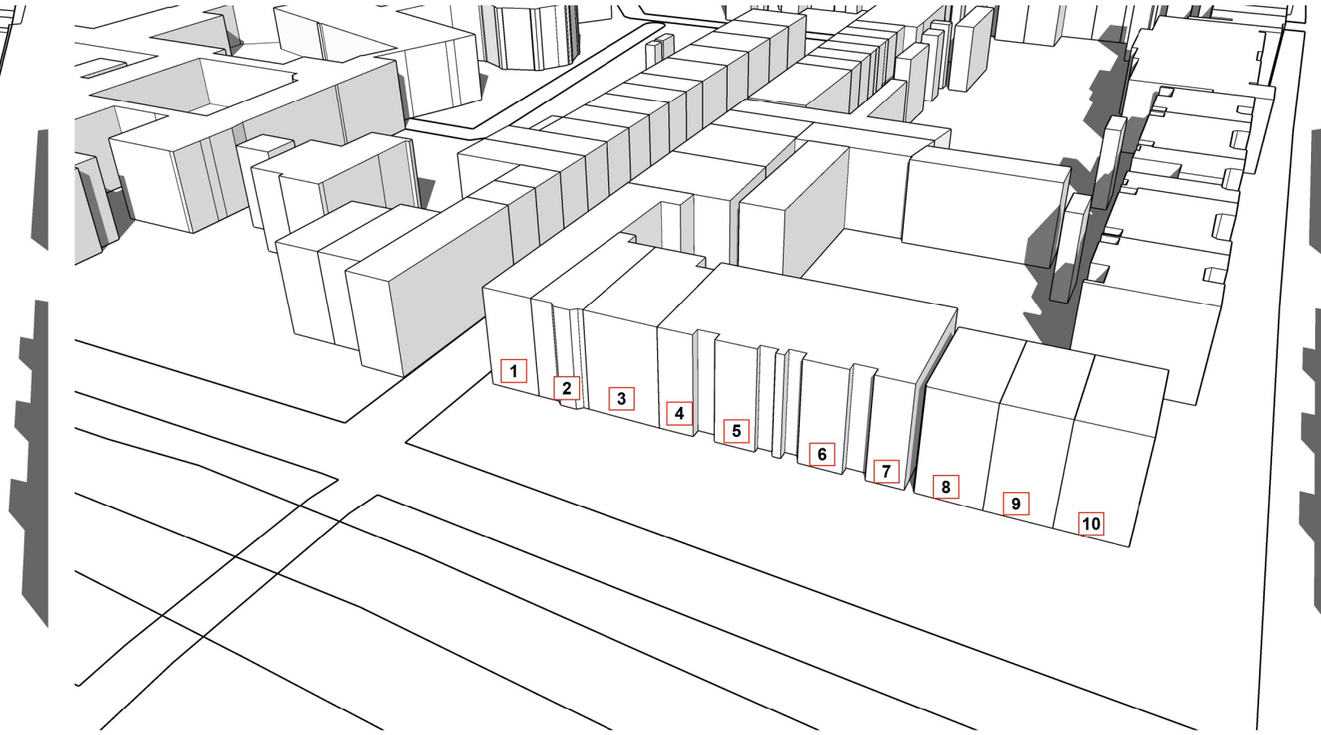

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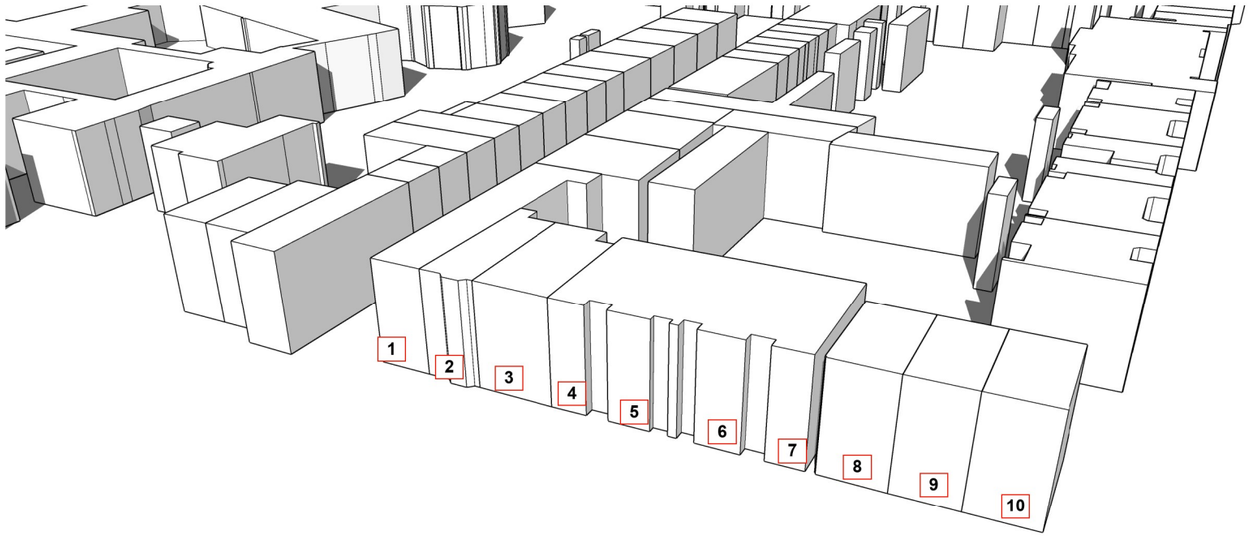
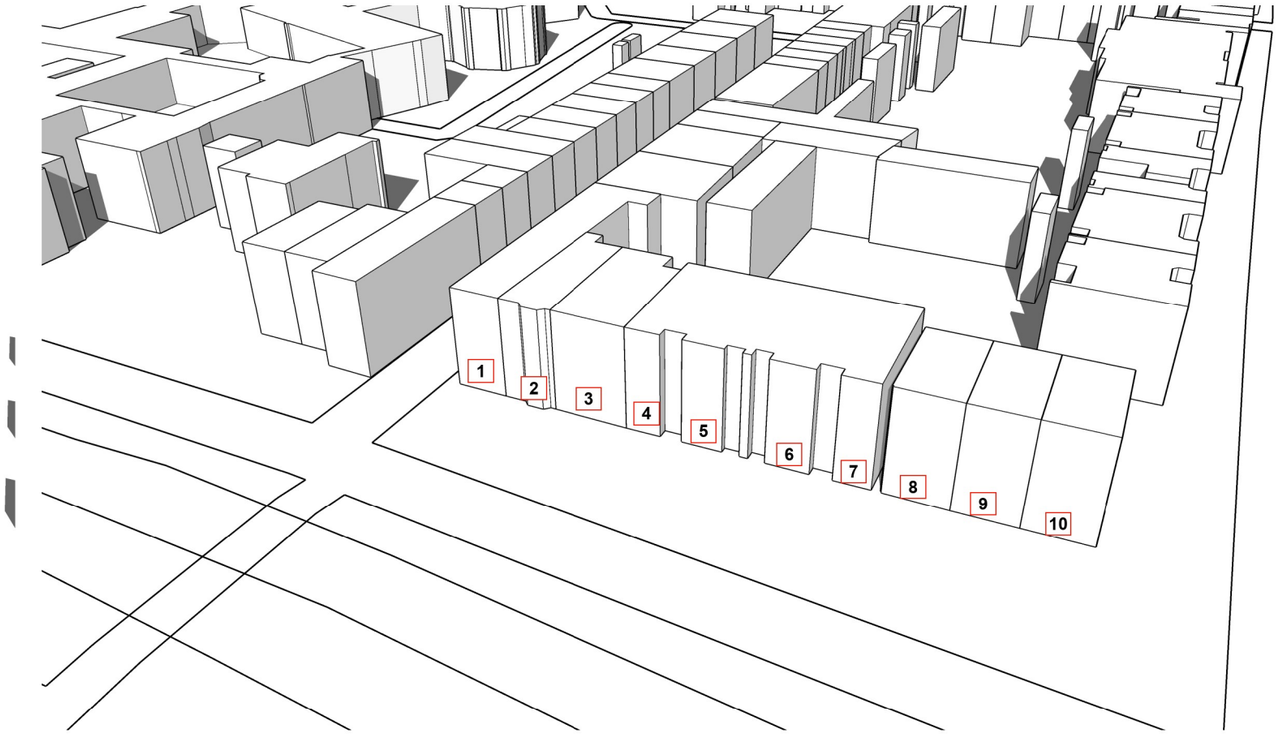
21 september
13.00





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21 september
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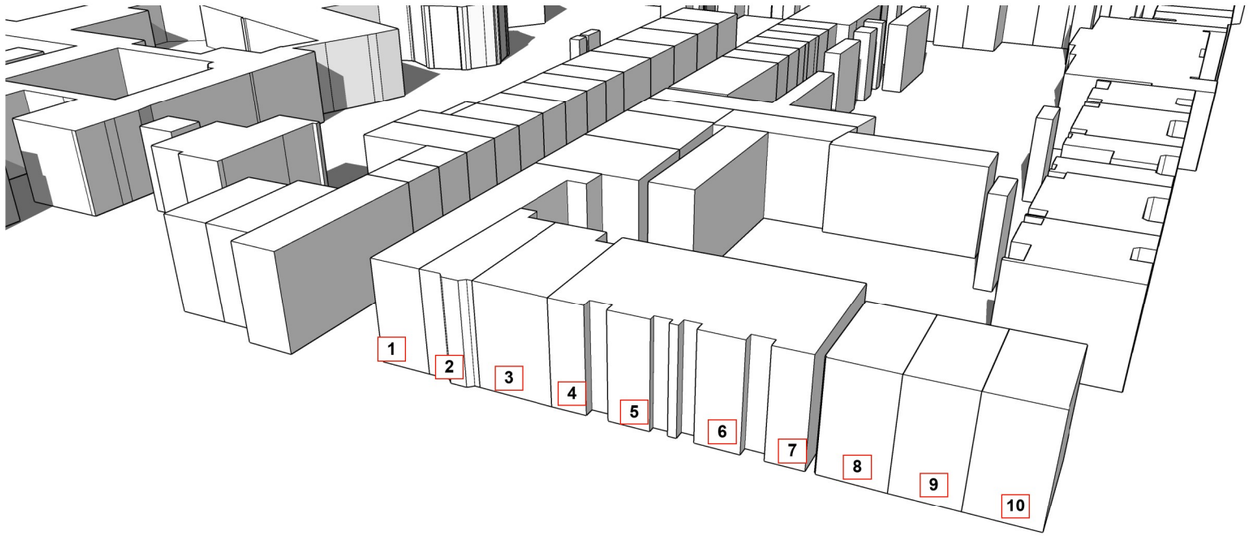

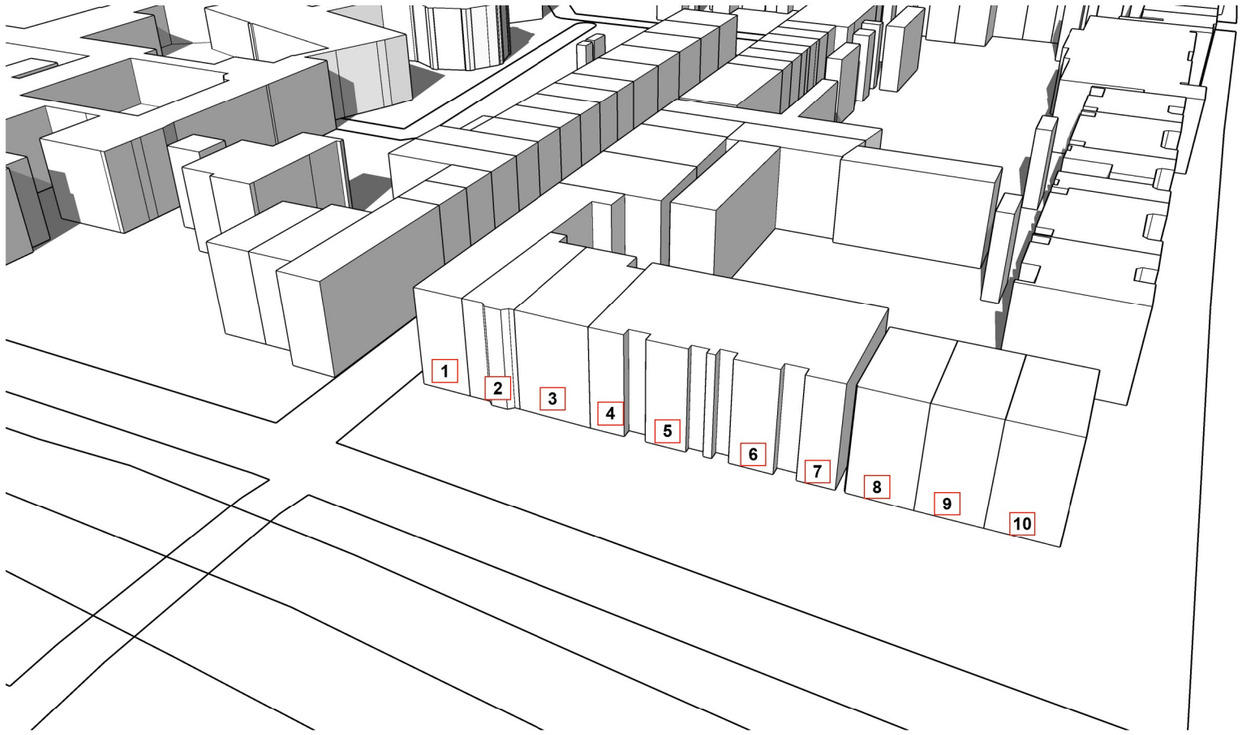

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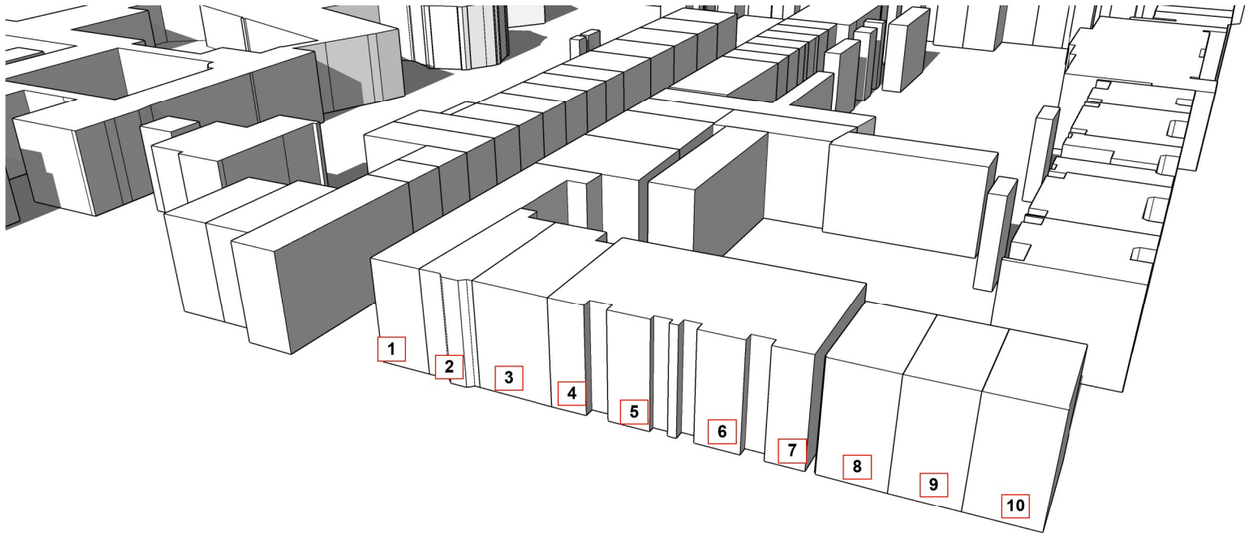
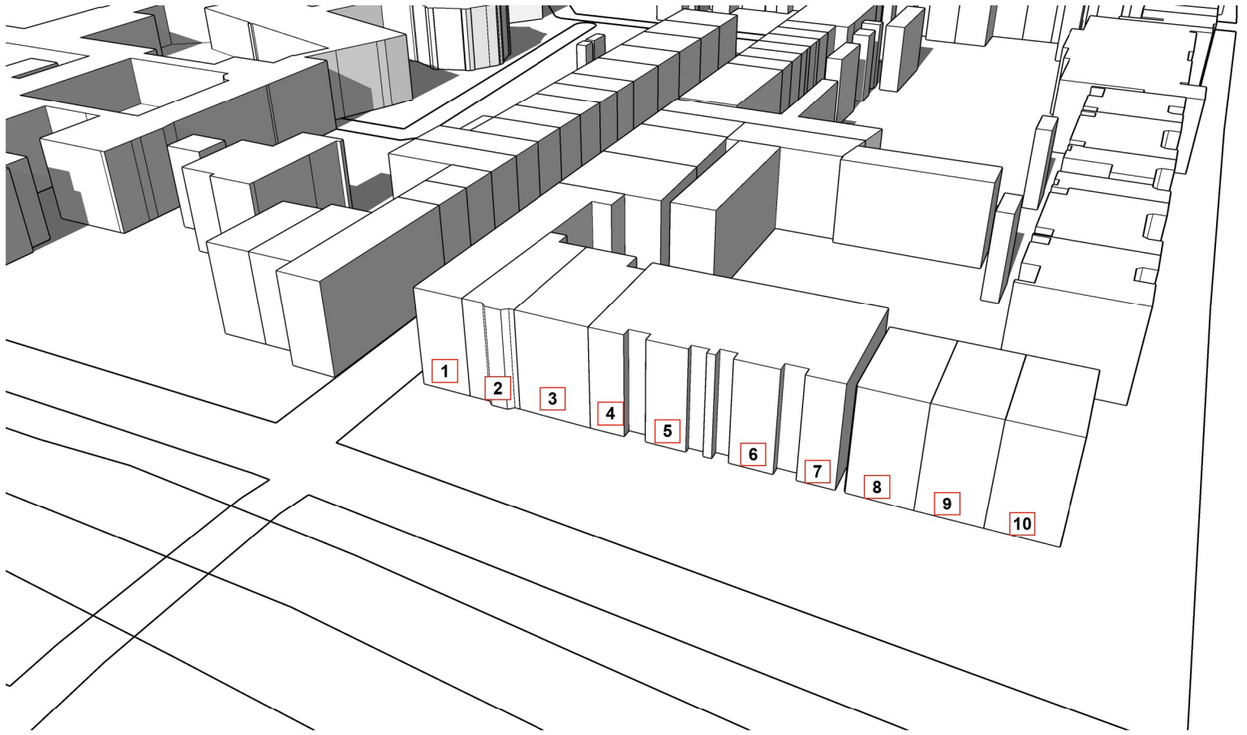
21 september
14.00





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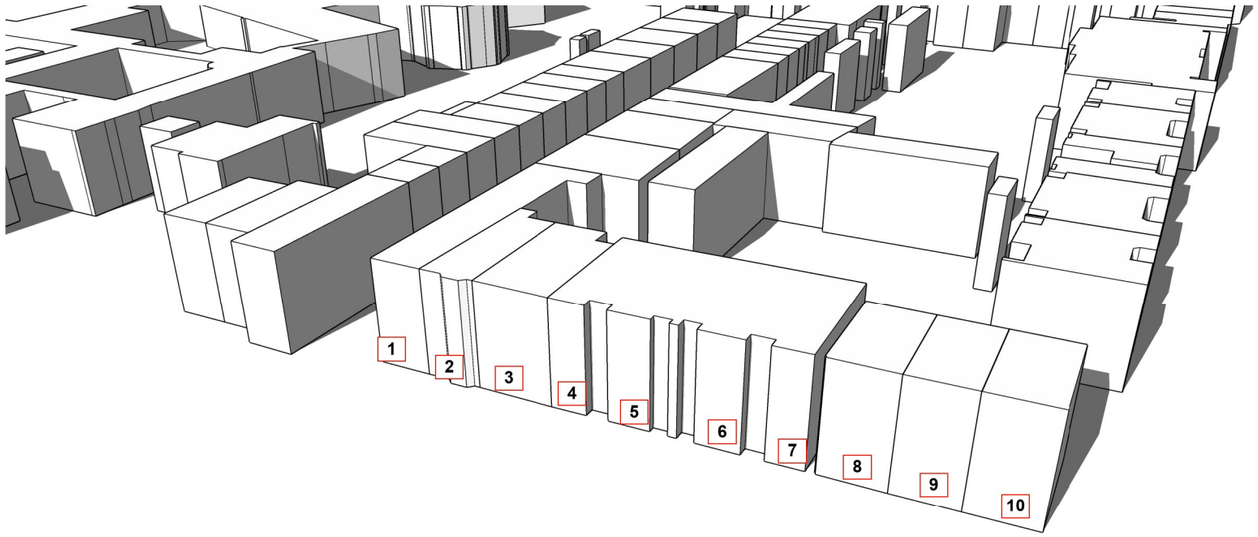

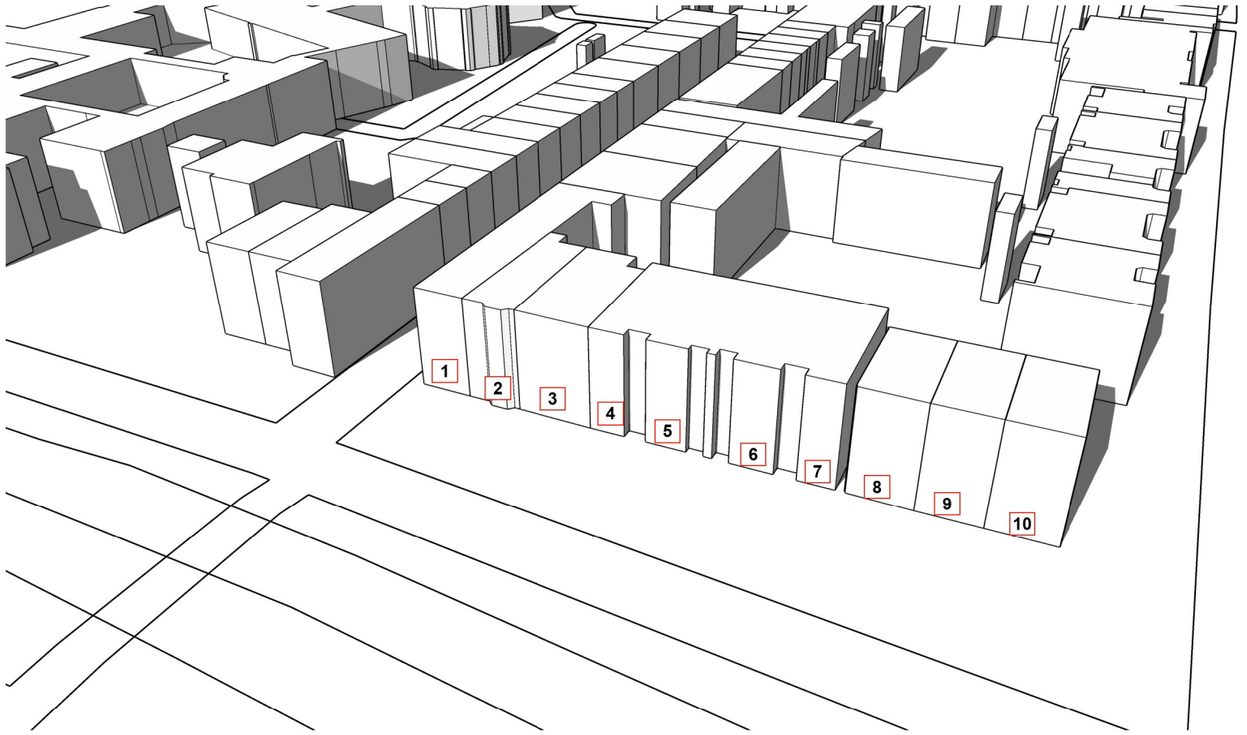

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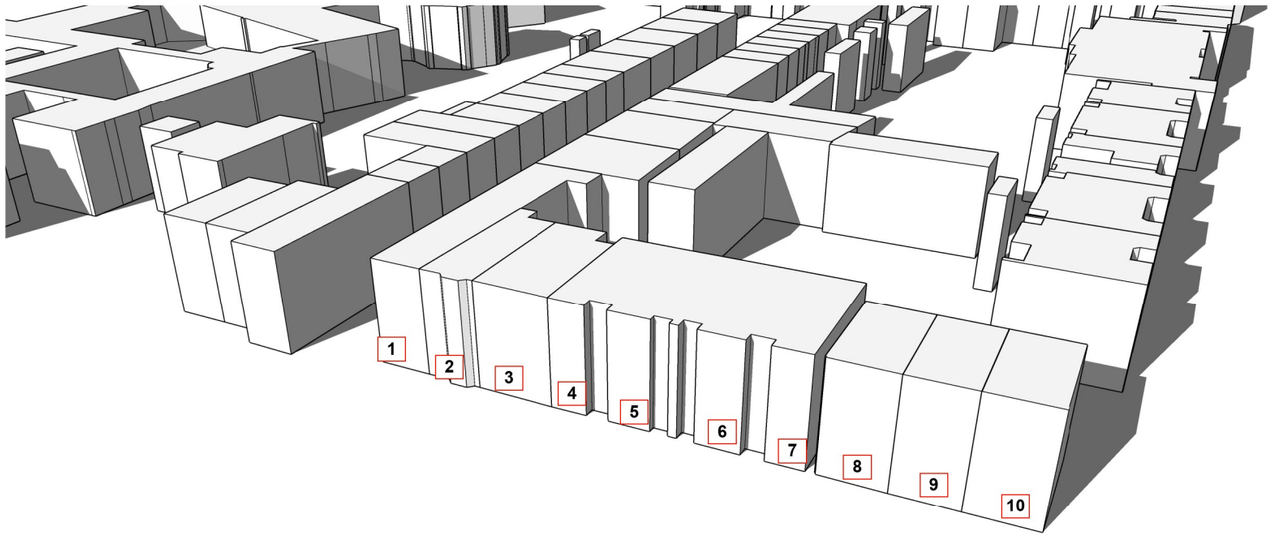

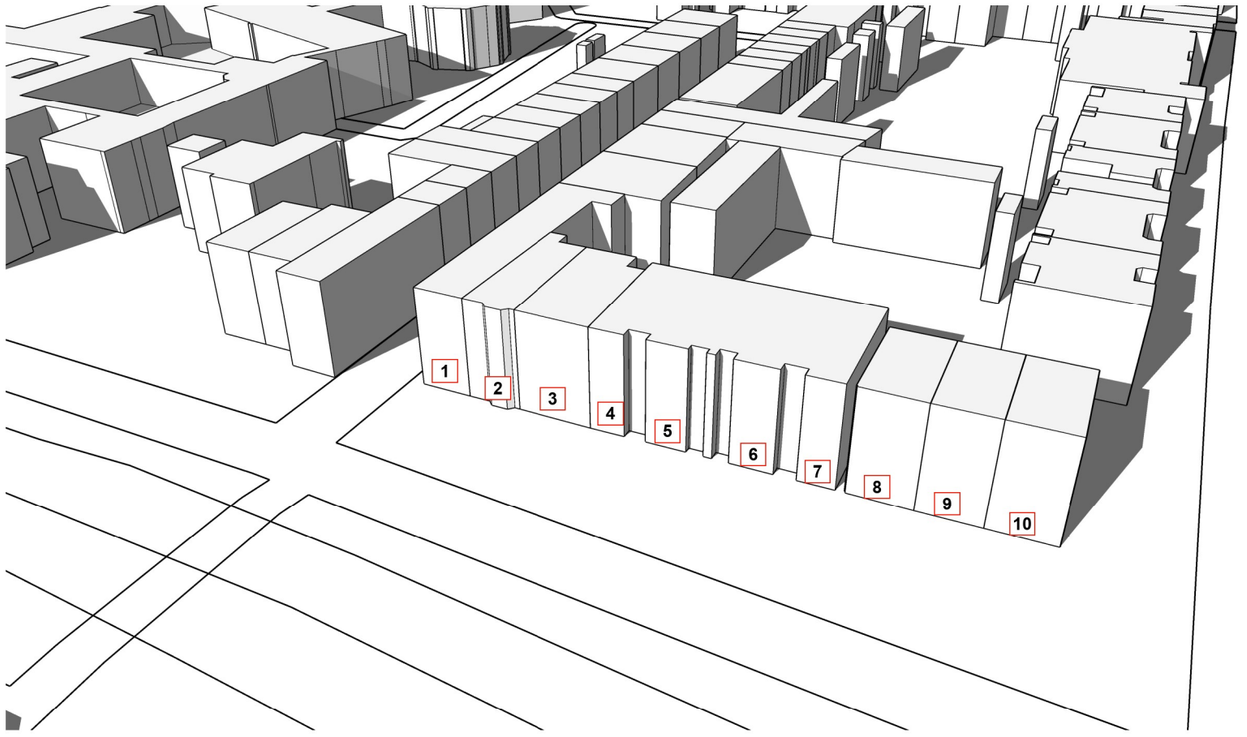

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21 september
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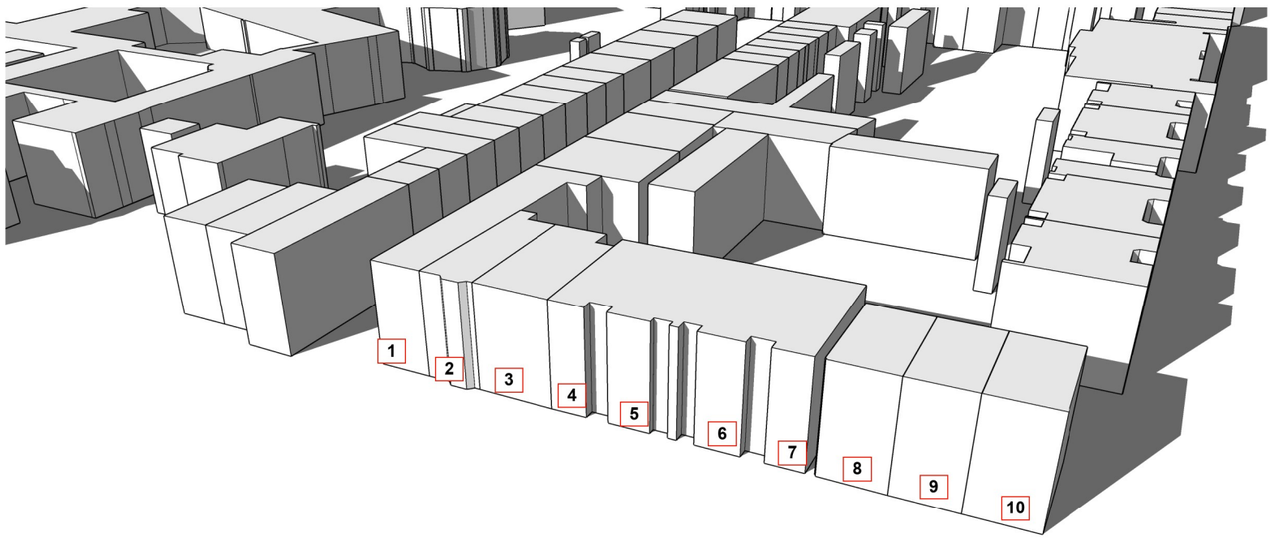

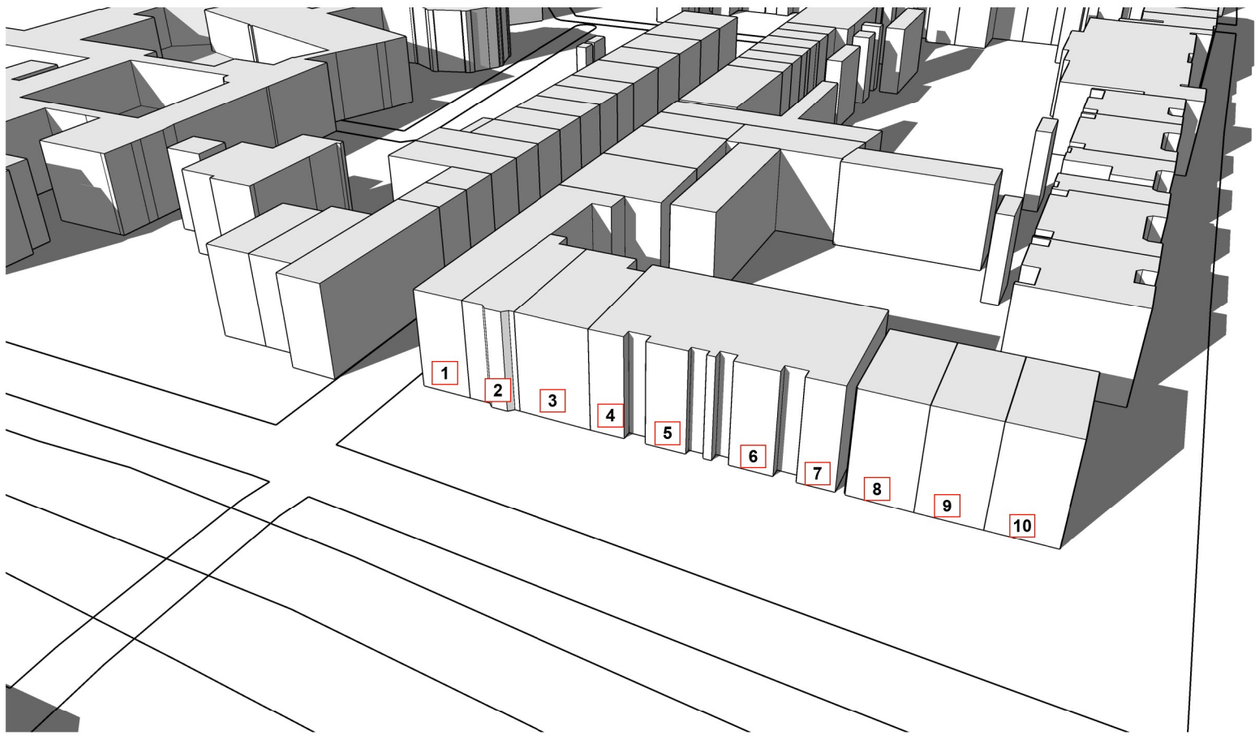

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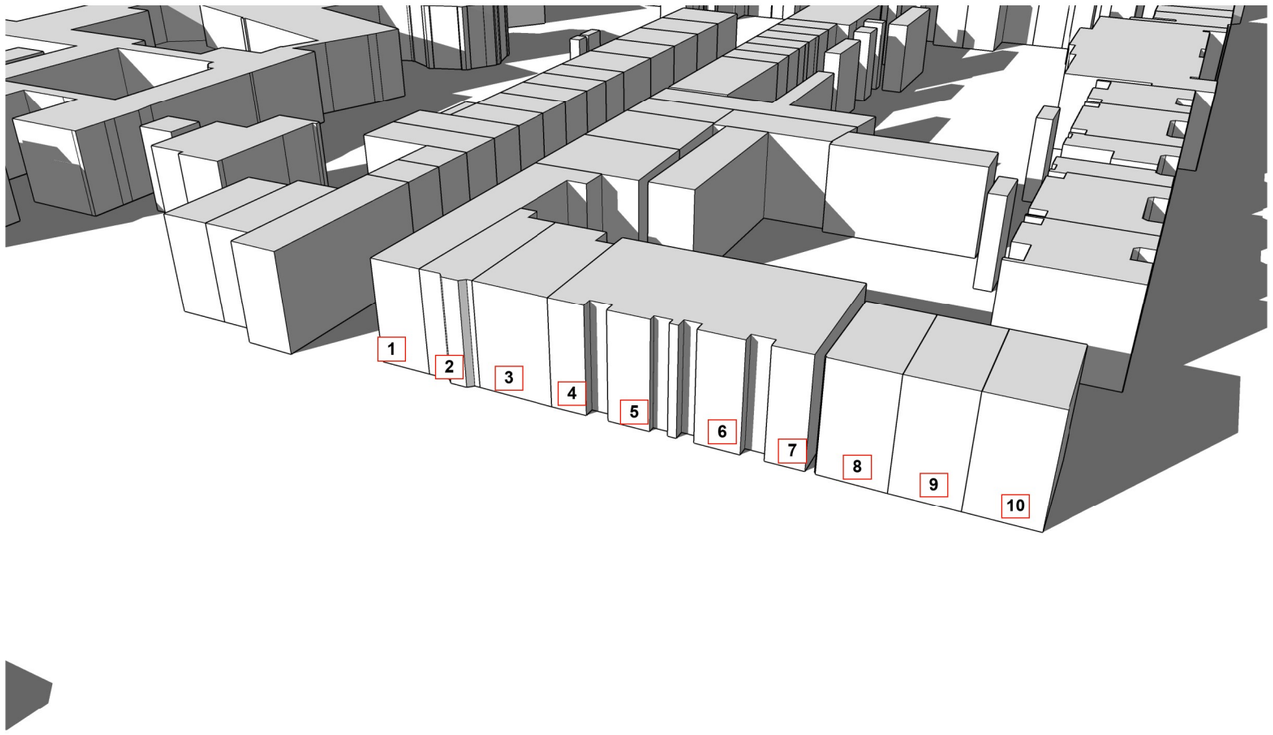
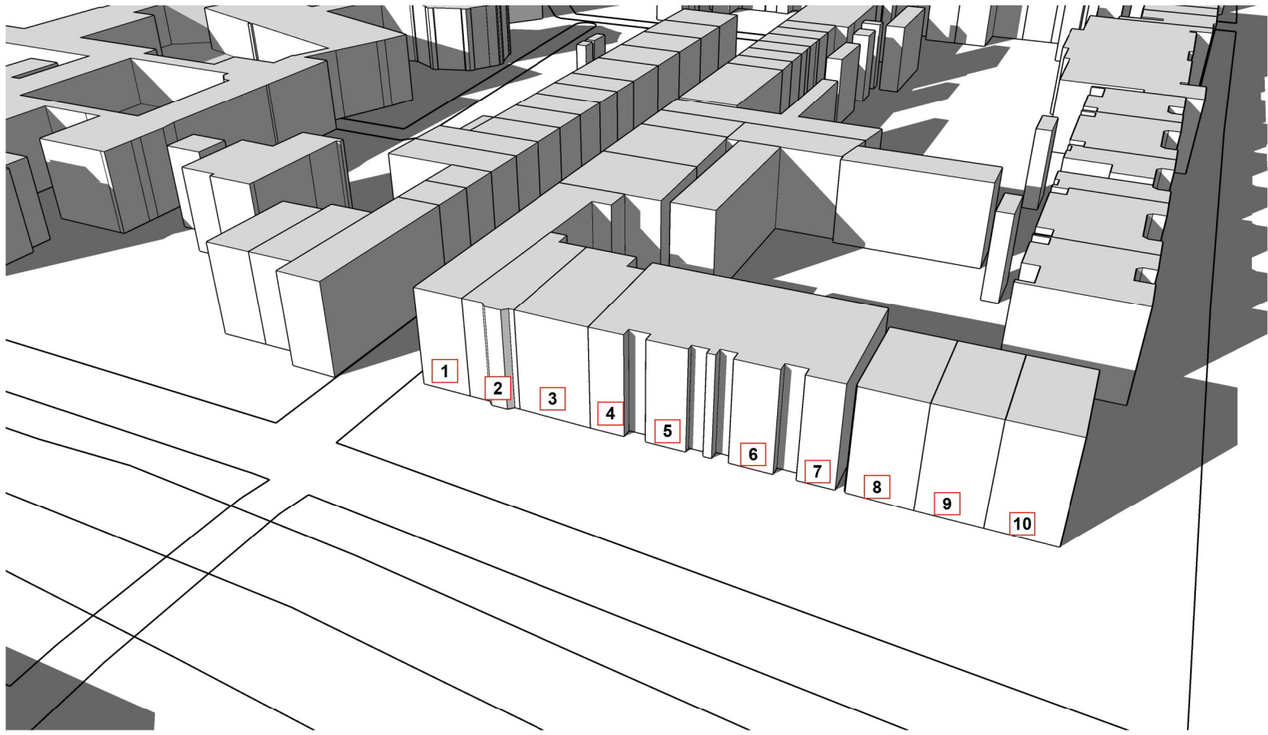
16.00





Noordsingel 77 - 99
21 september
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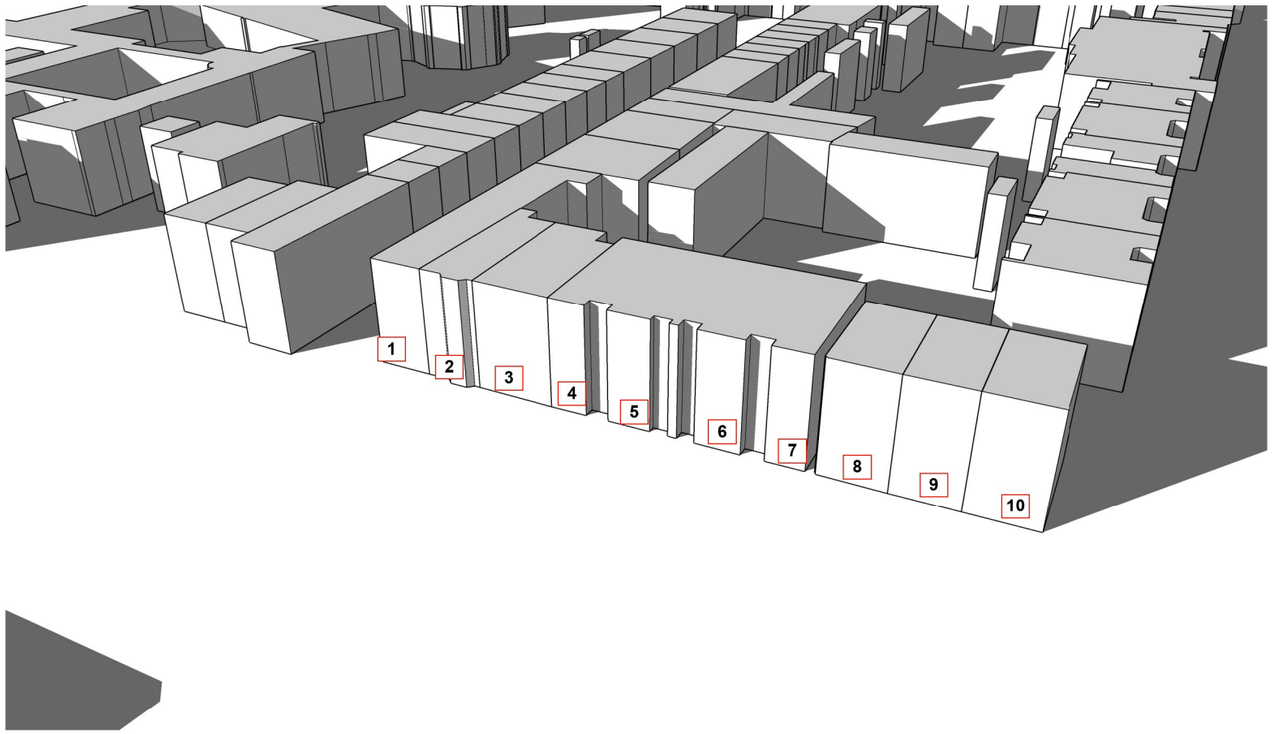

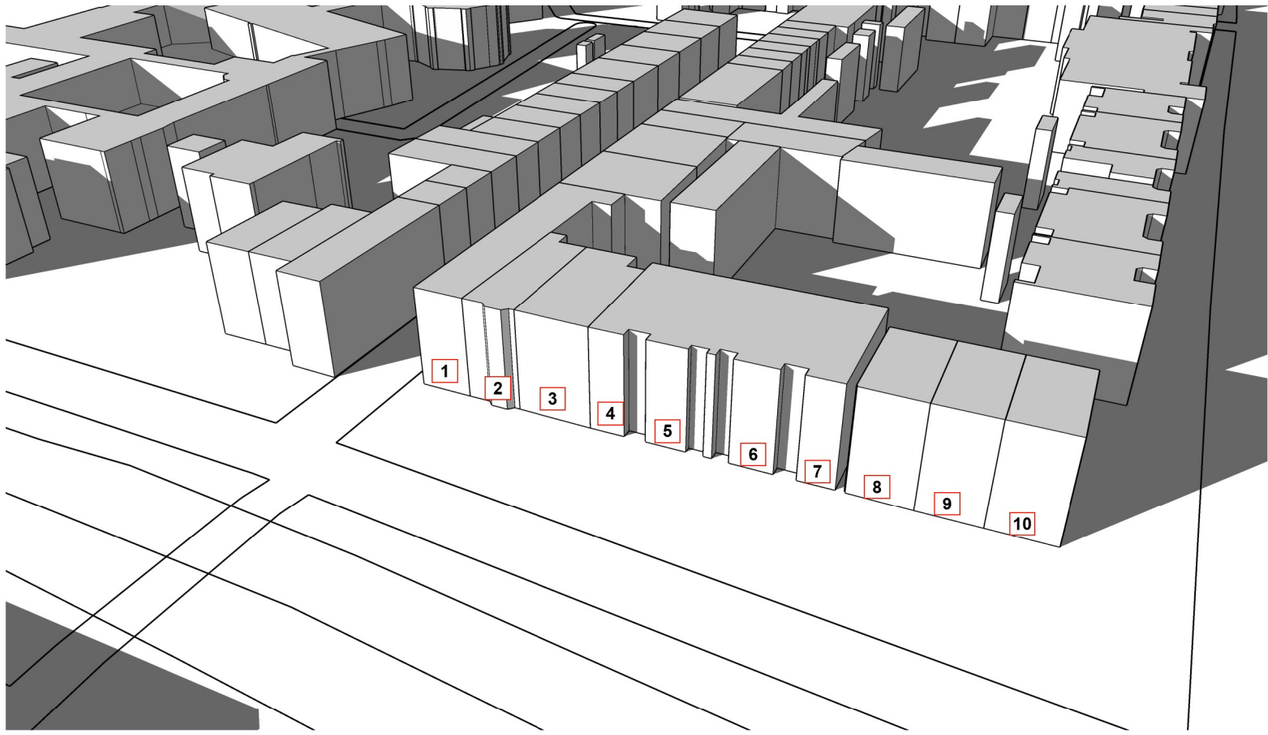

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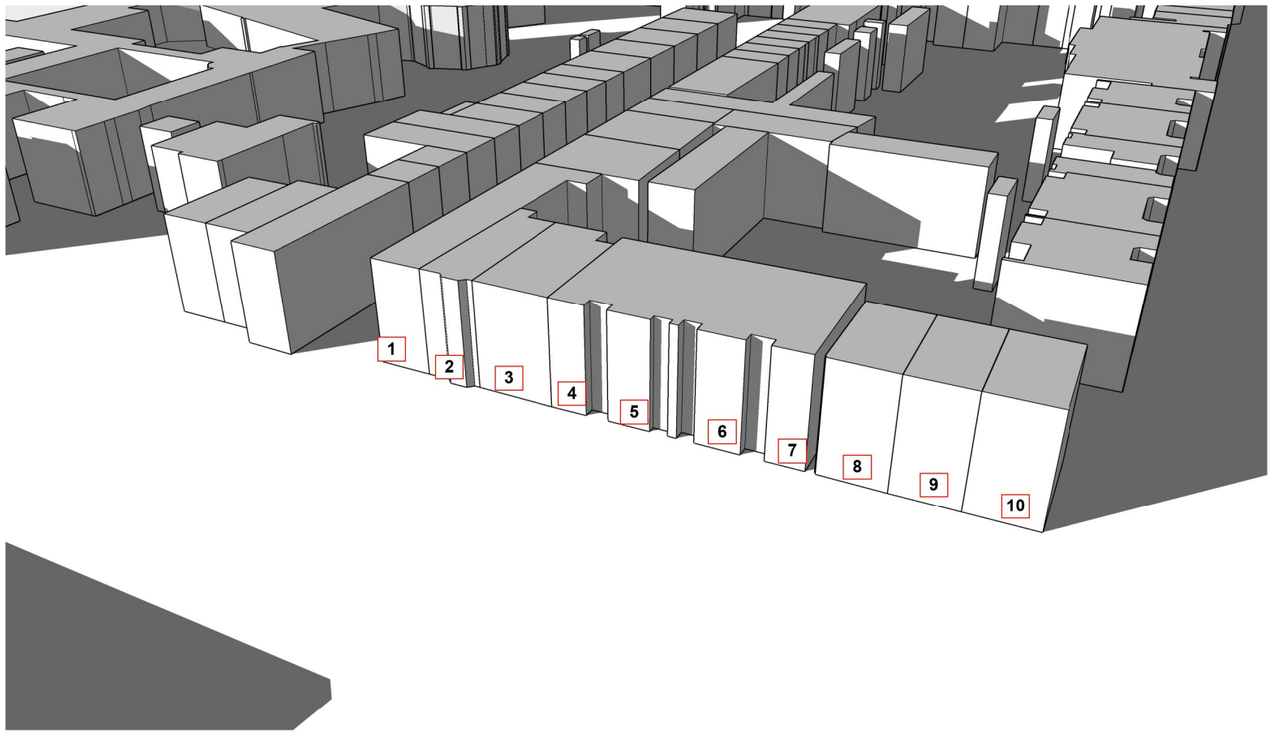

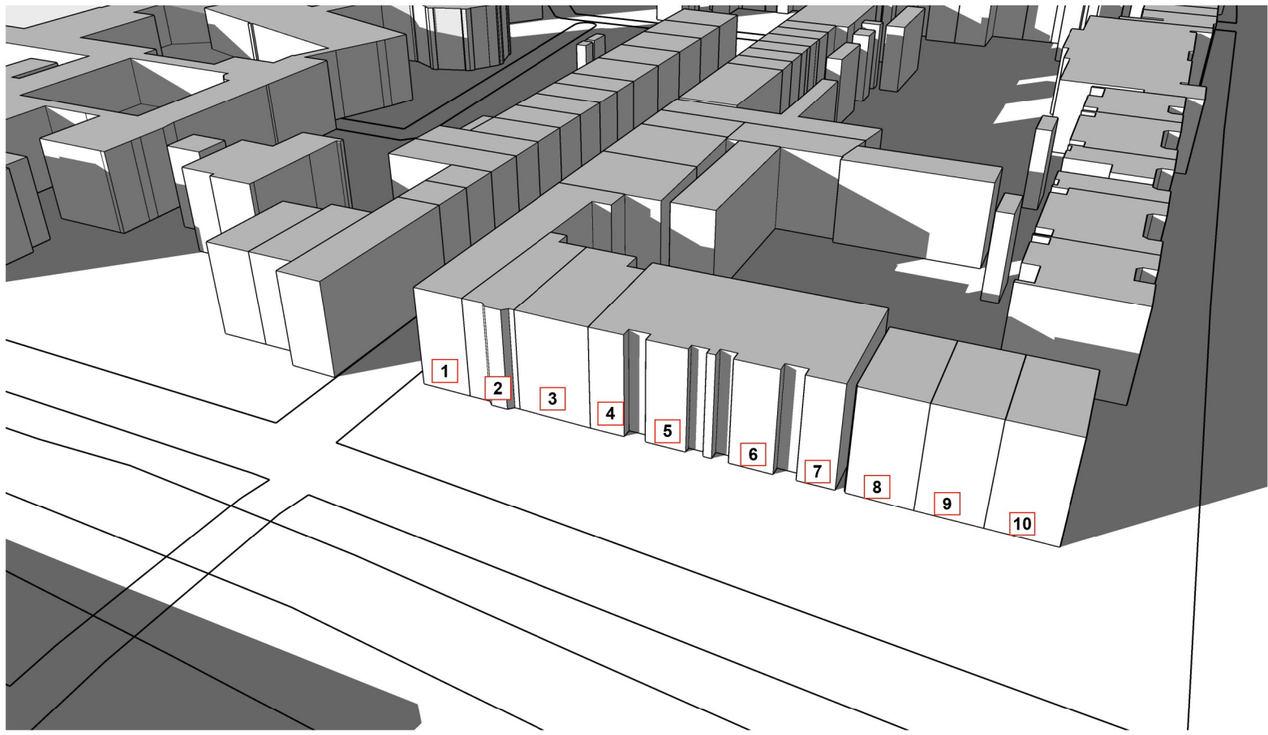

Noordsingel 77 - 99
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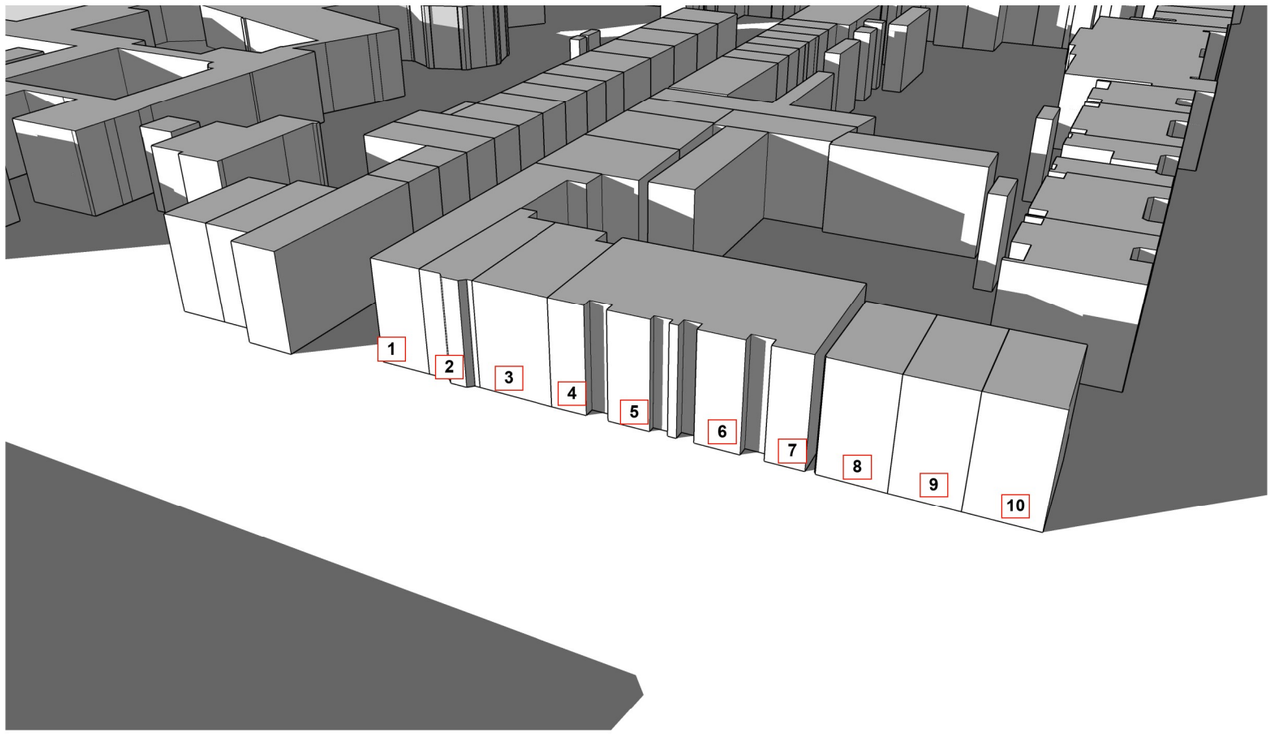
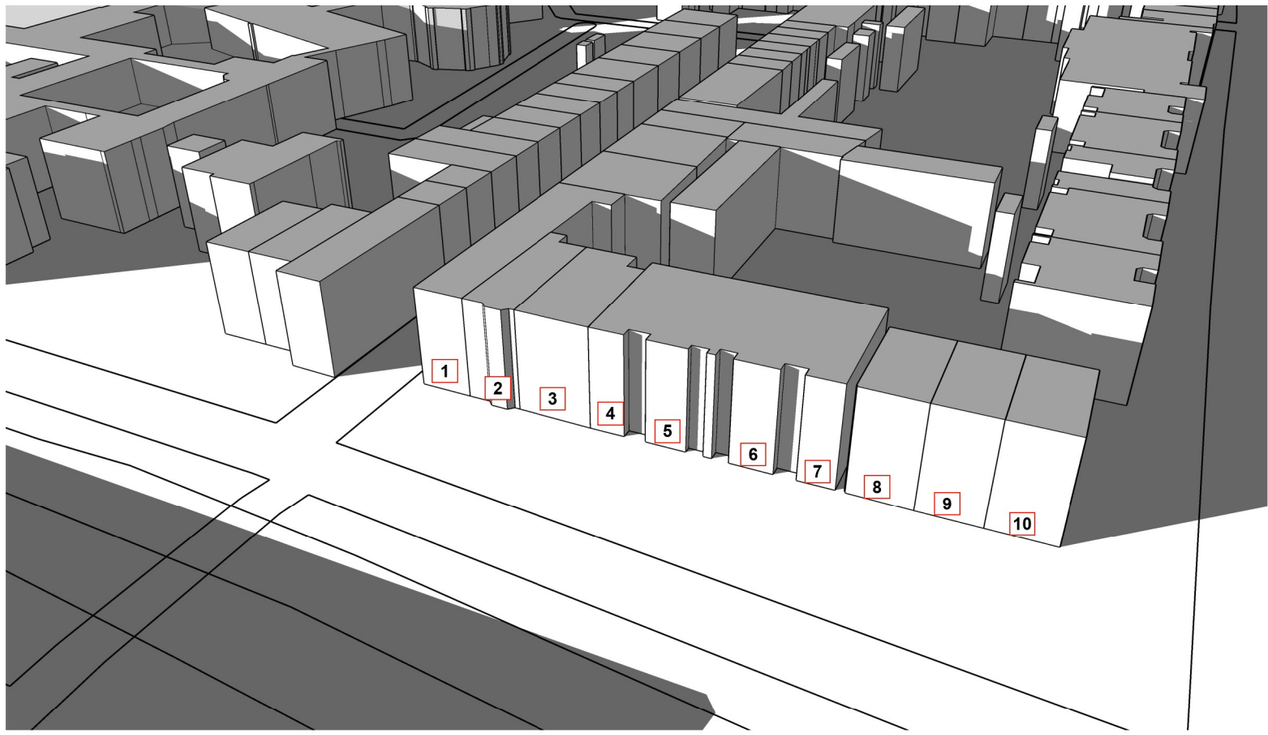
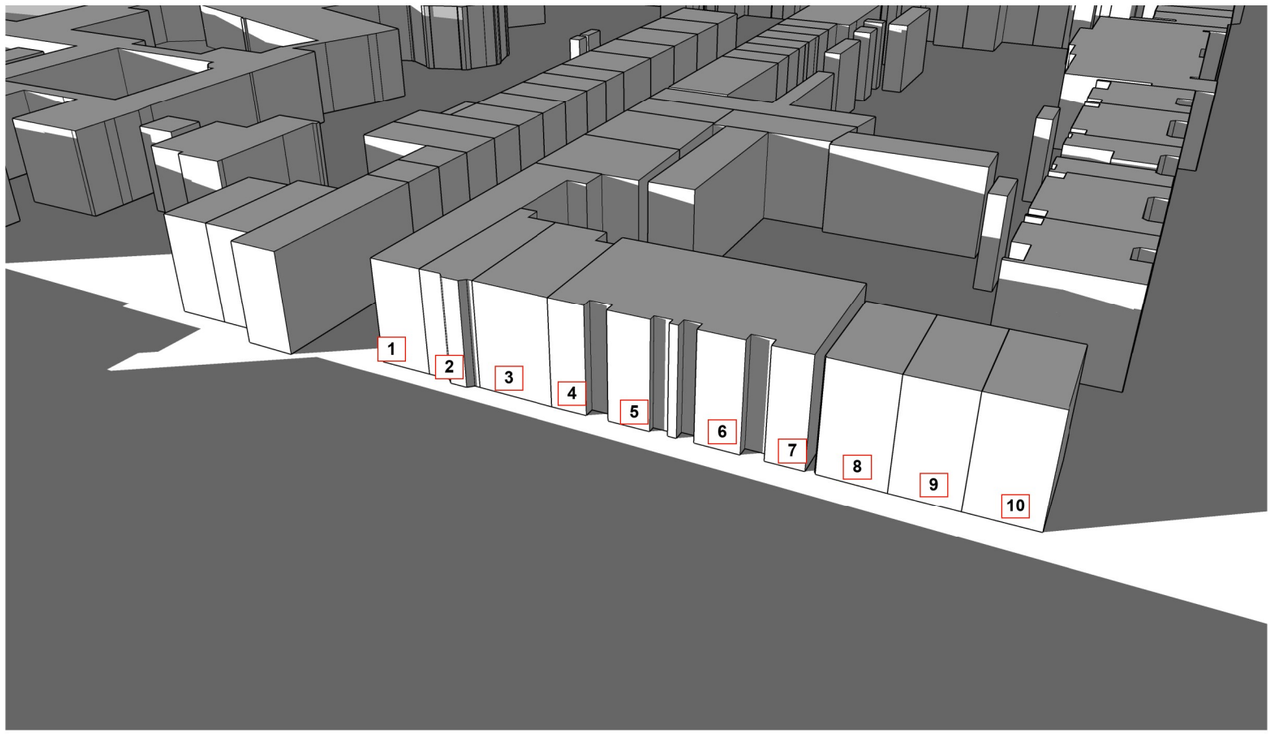
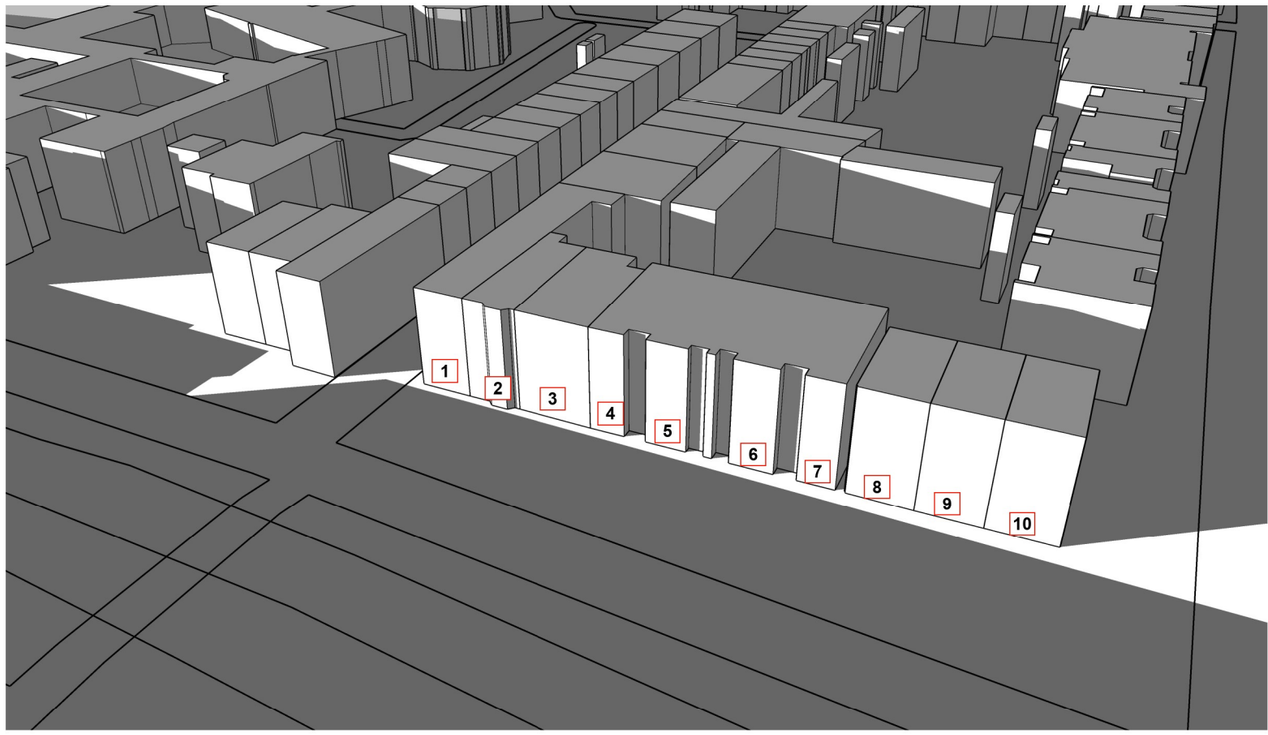




Noordsingel 77 - 99
21 september
18.00





Noordsingel 77 - 99
21 september
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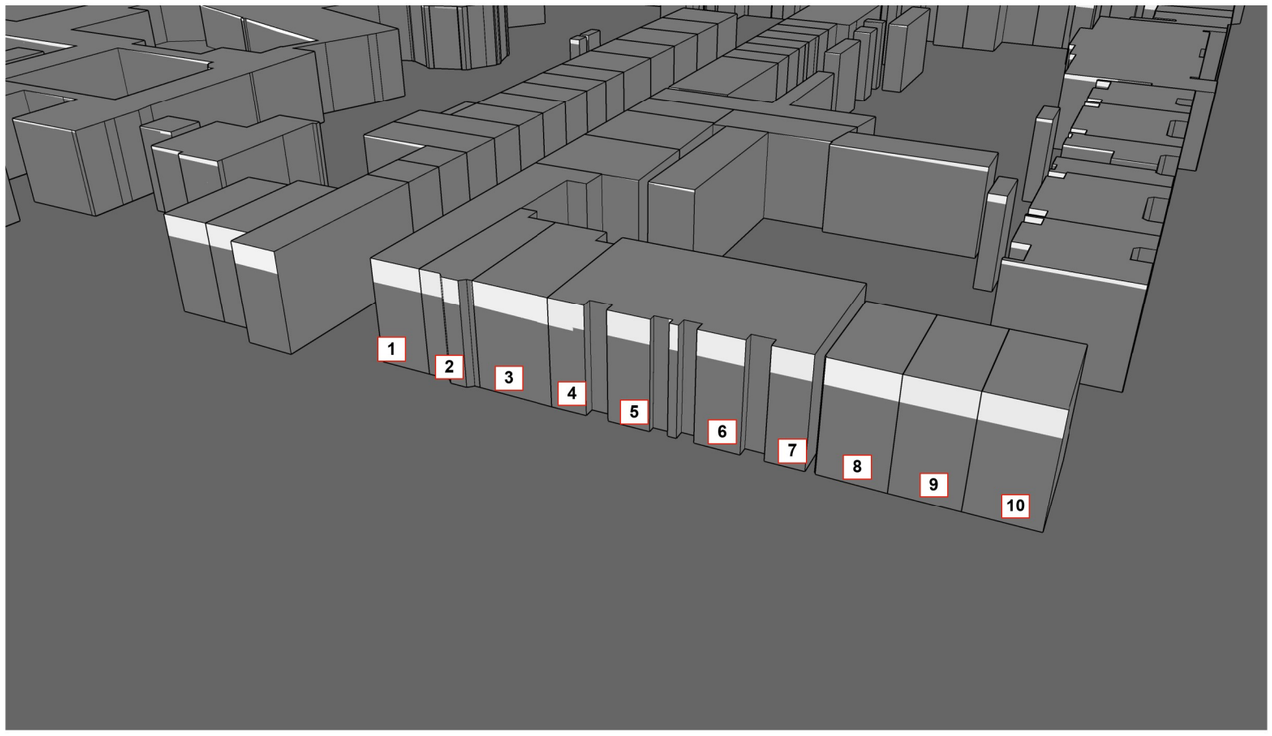

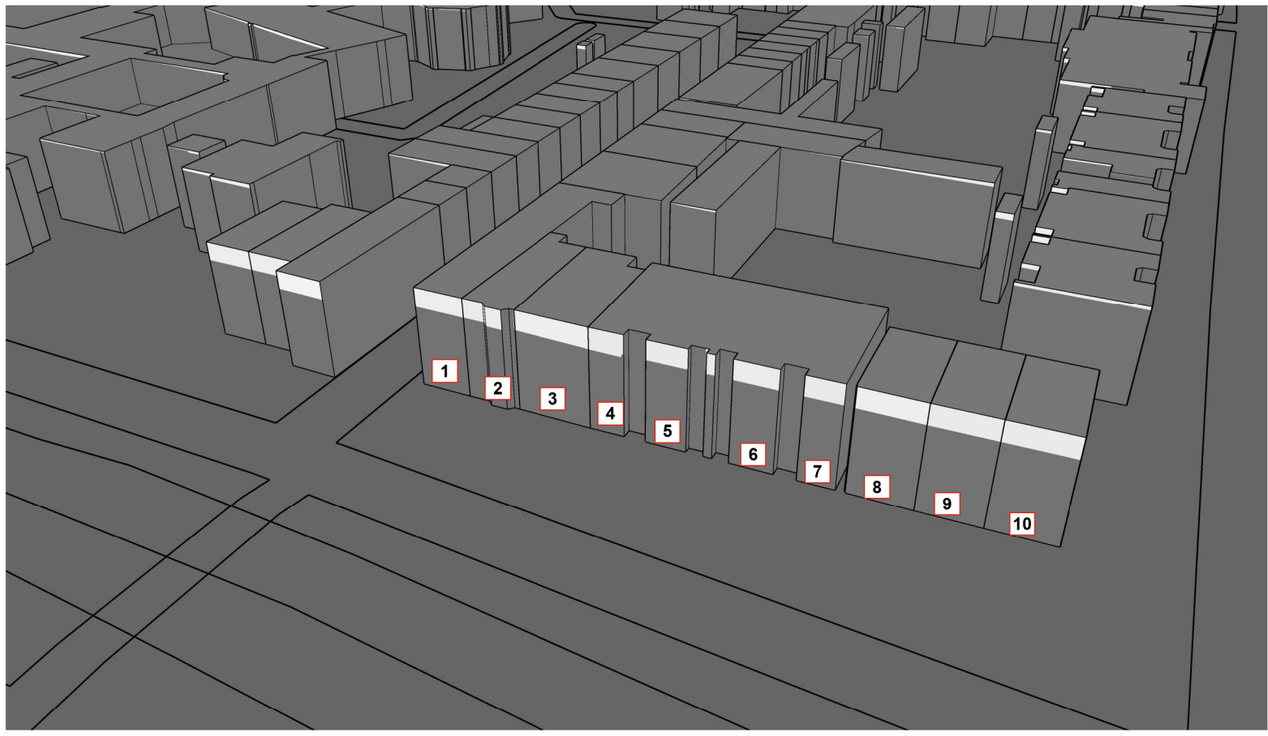

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21 september
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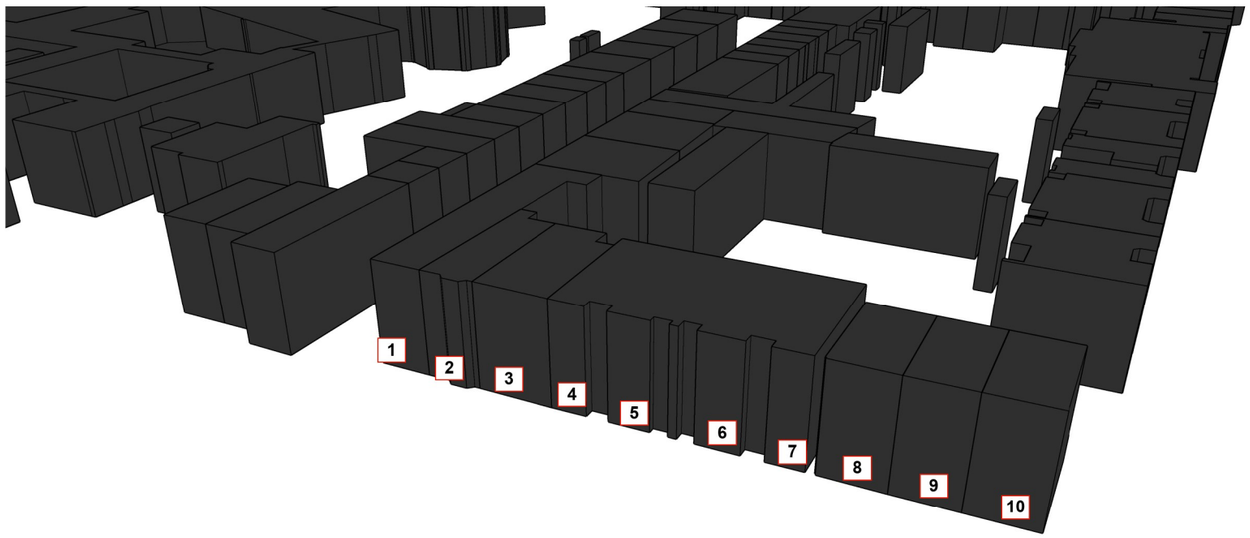

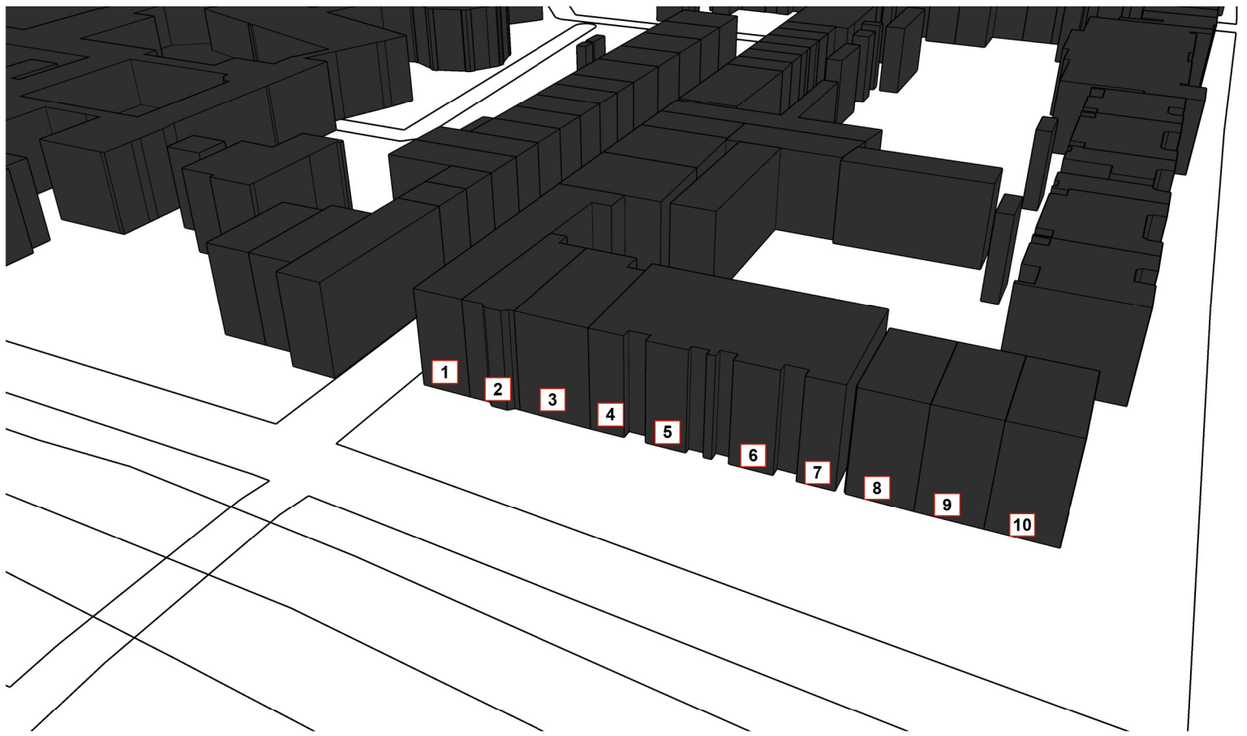

bijlage 11. resultaten 21 september Noordsingel 108 – 130 huidig vs. nieuw

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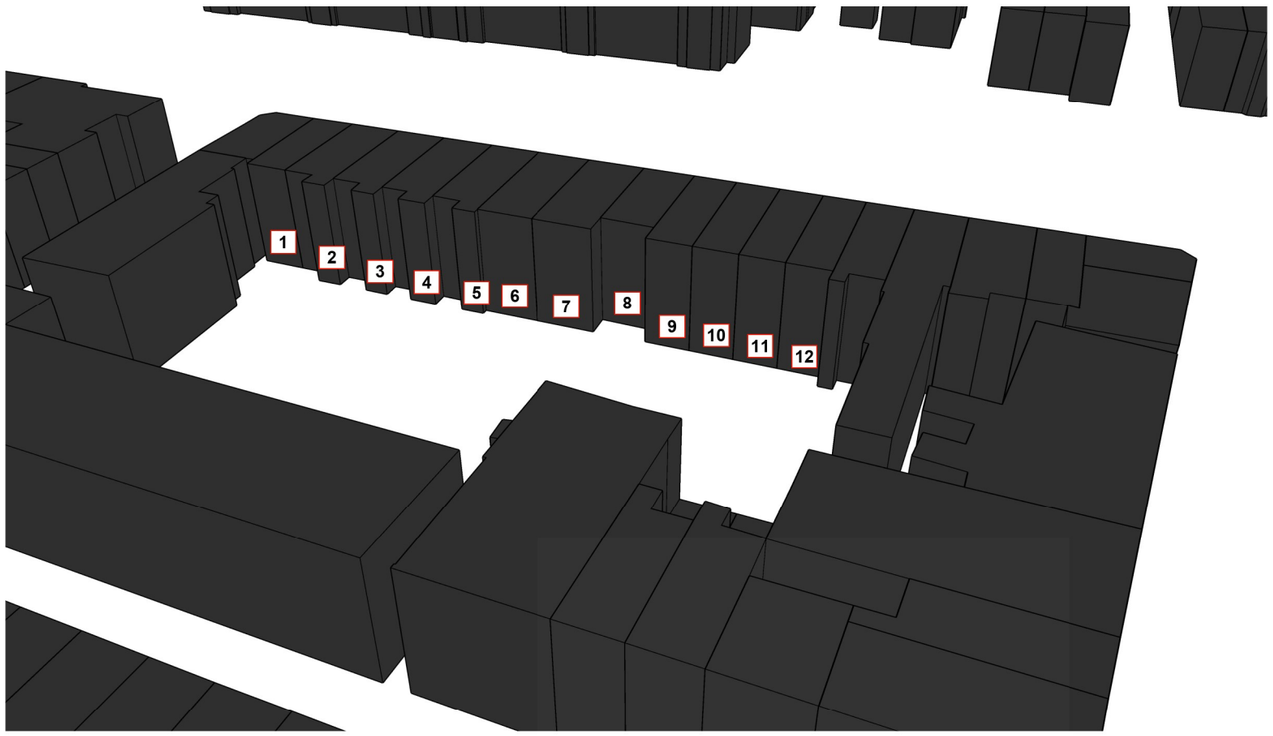
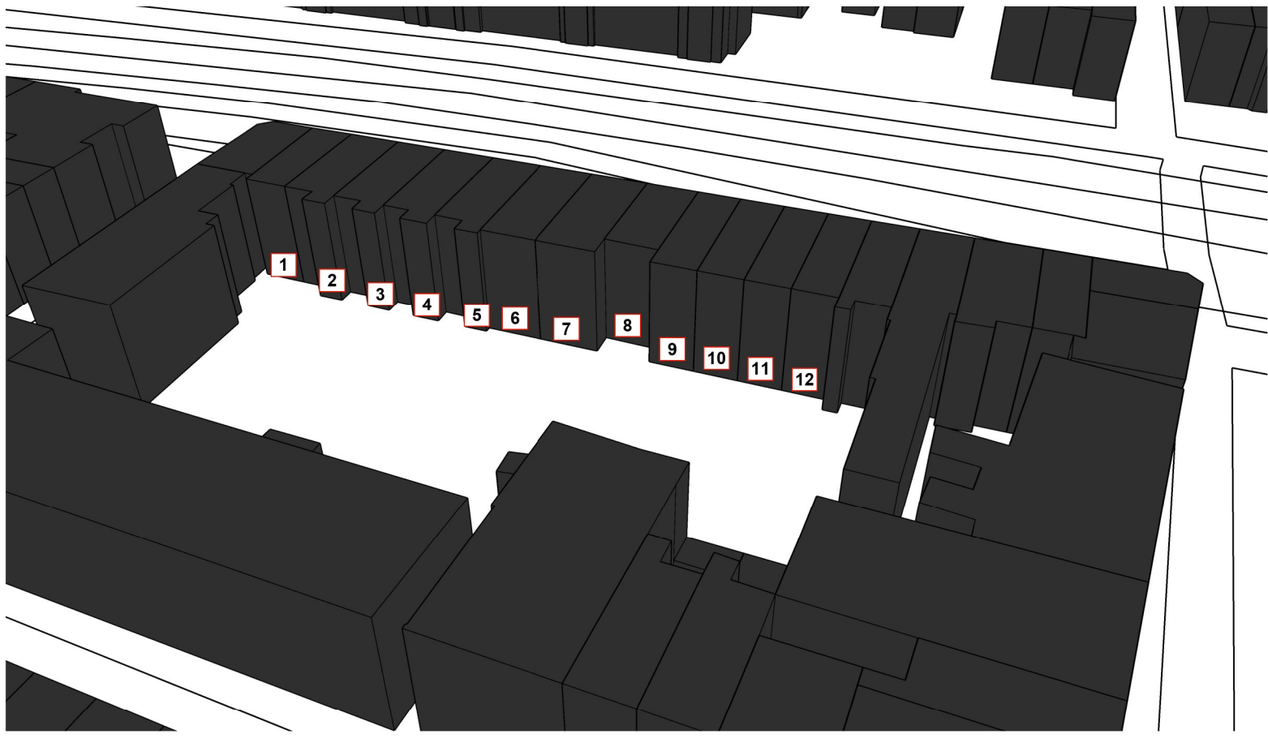
21 september
06.00





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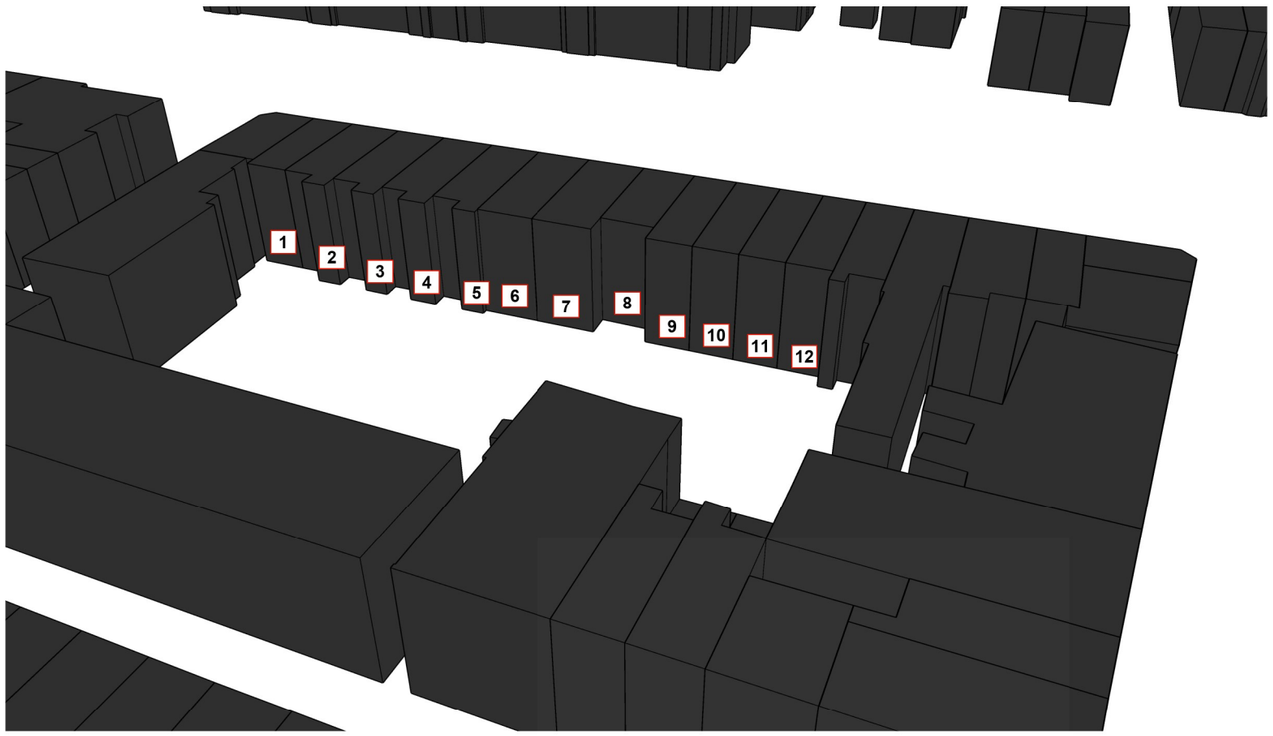
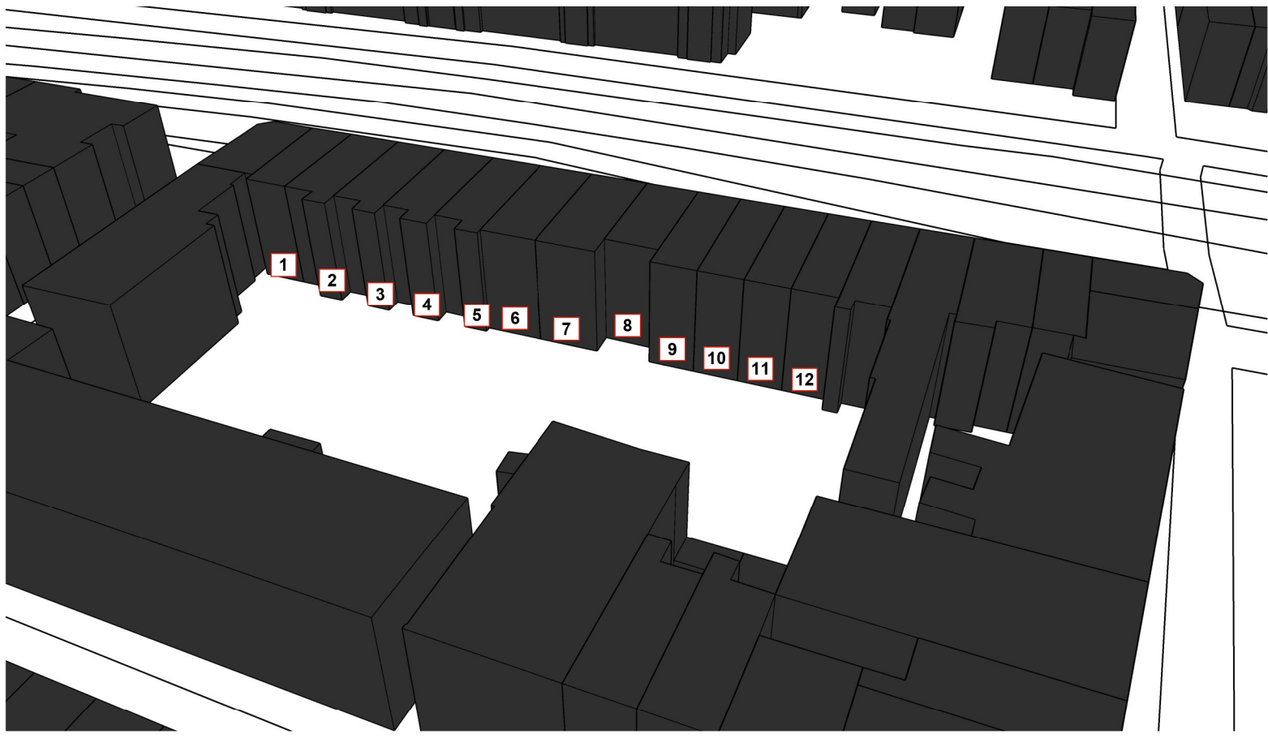
21 september
06.30





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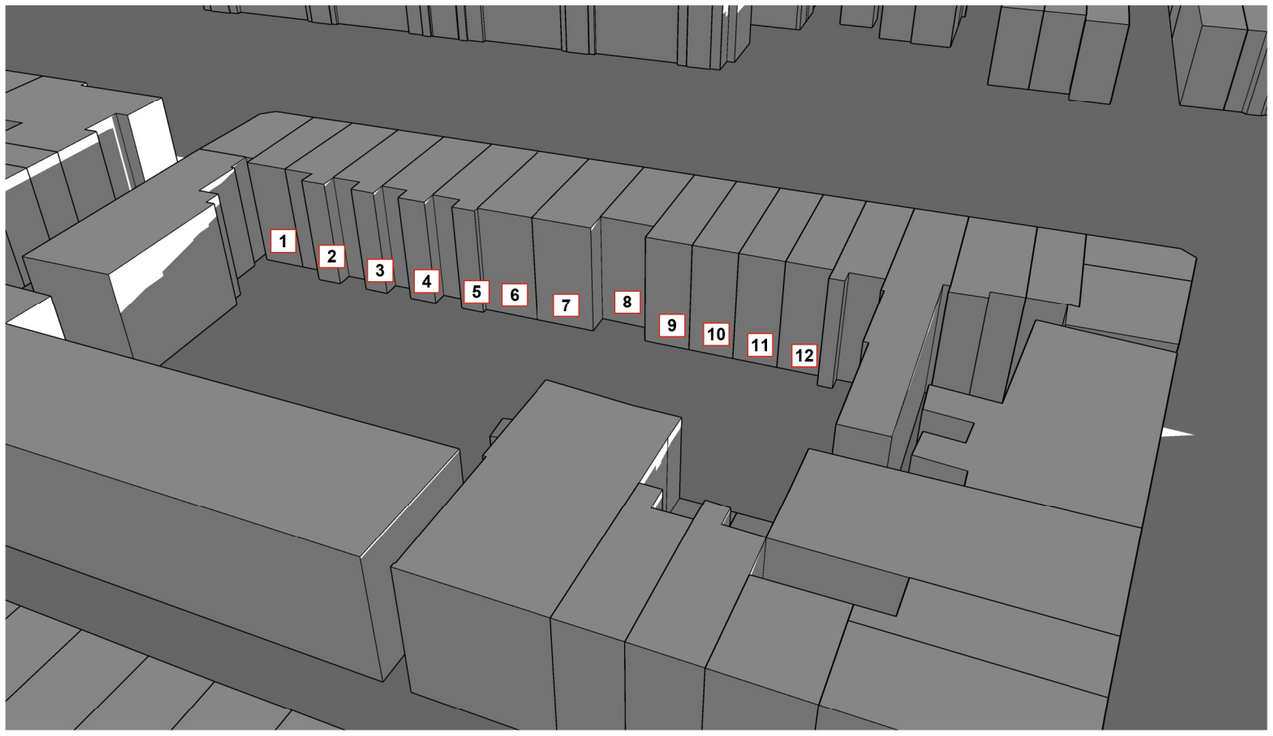
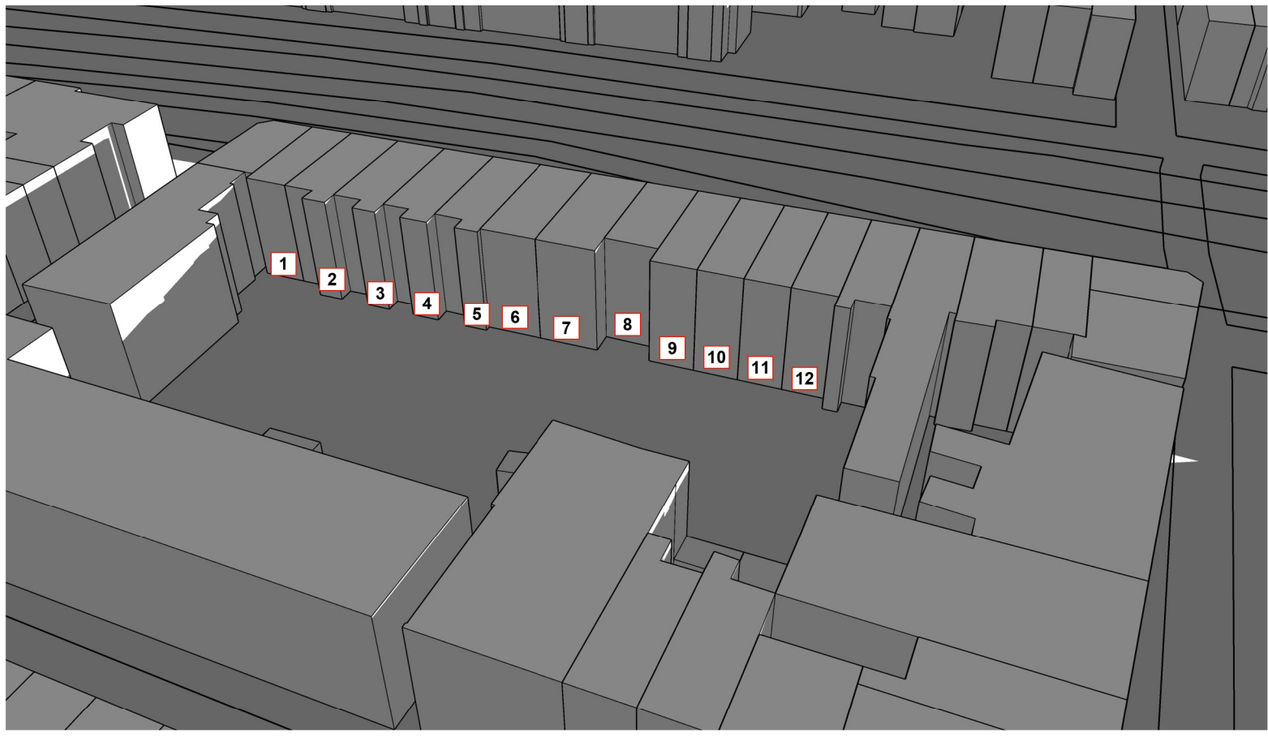
21 september
07.00





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21 september
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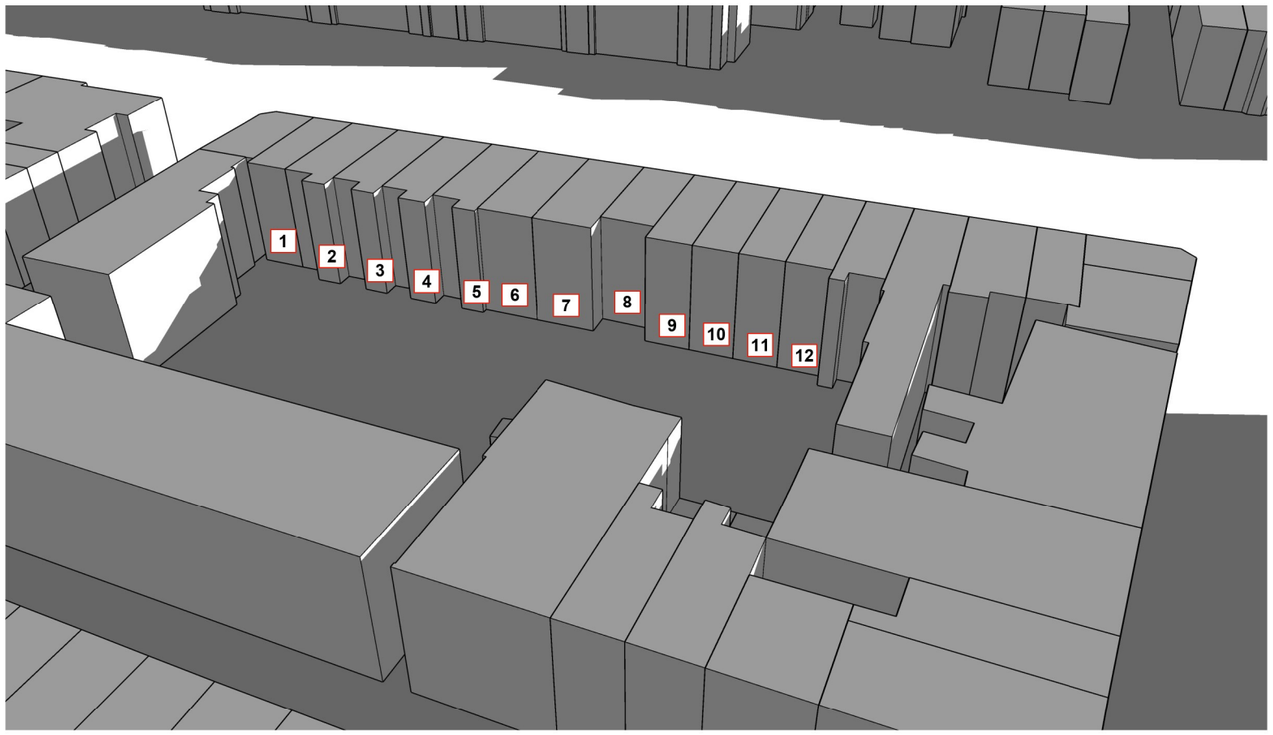
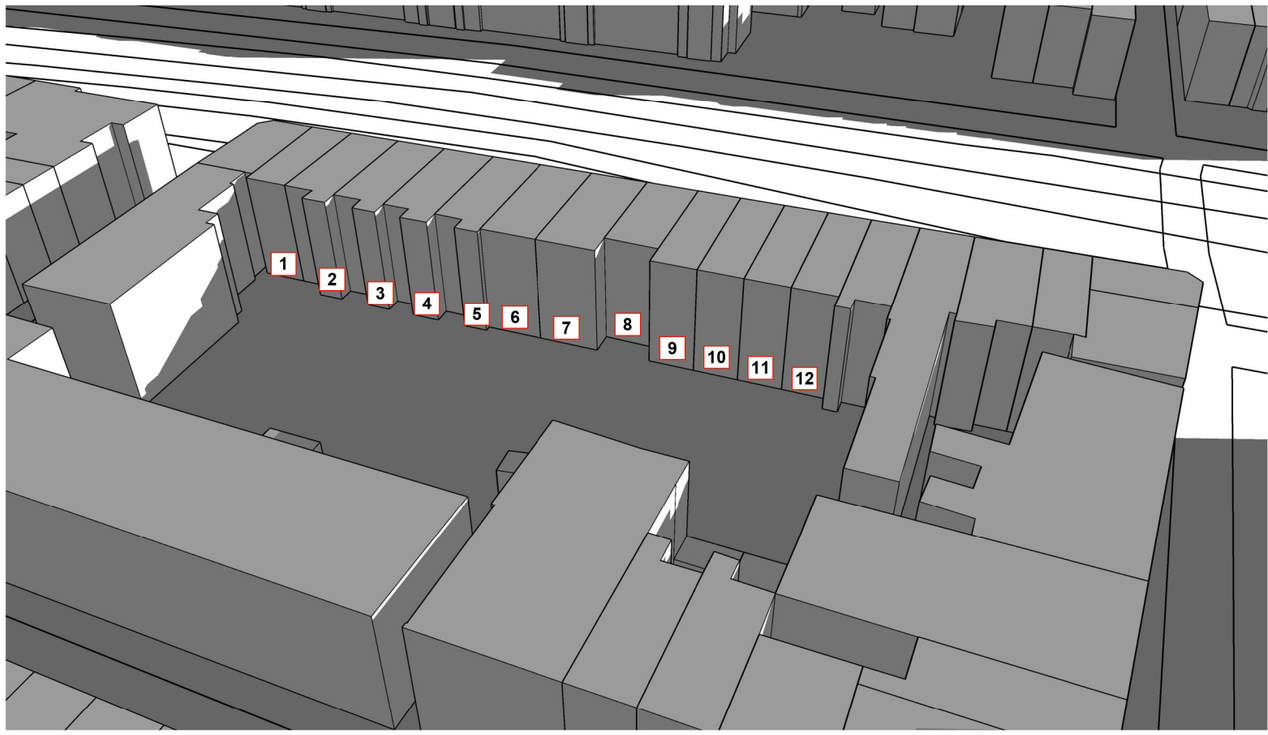
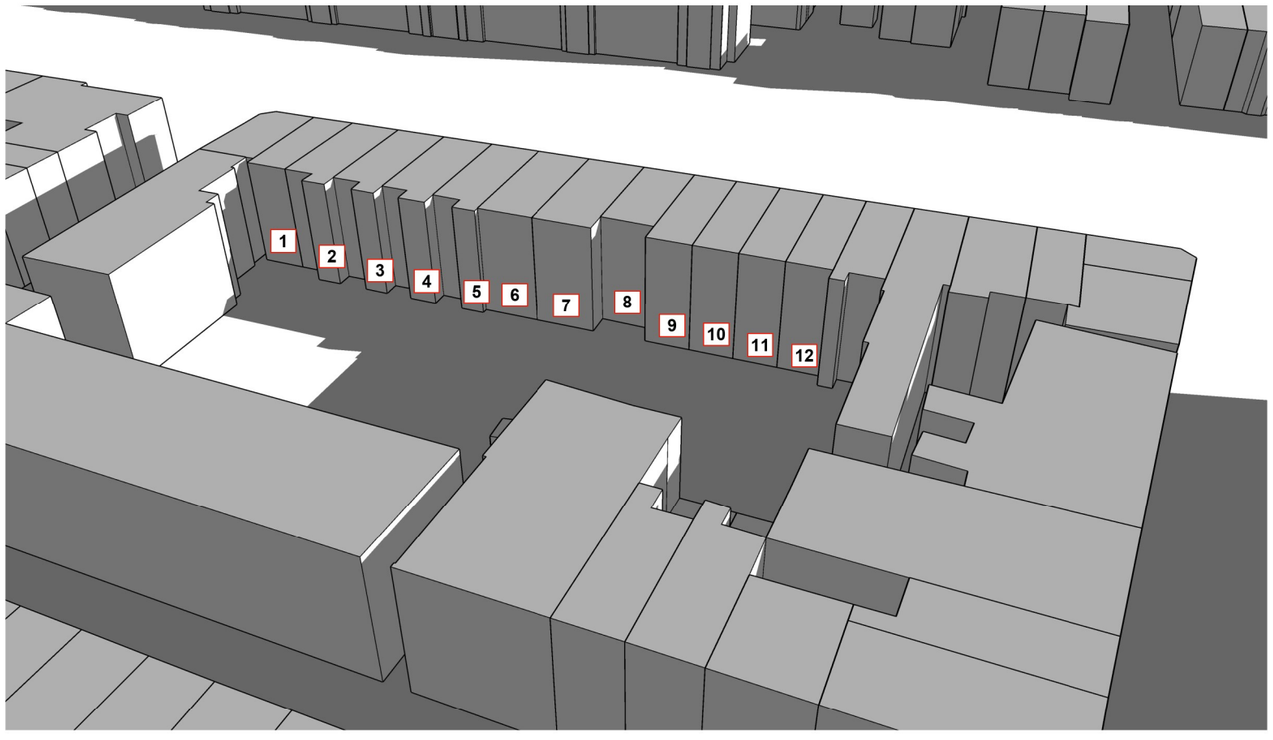
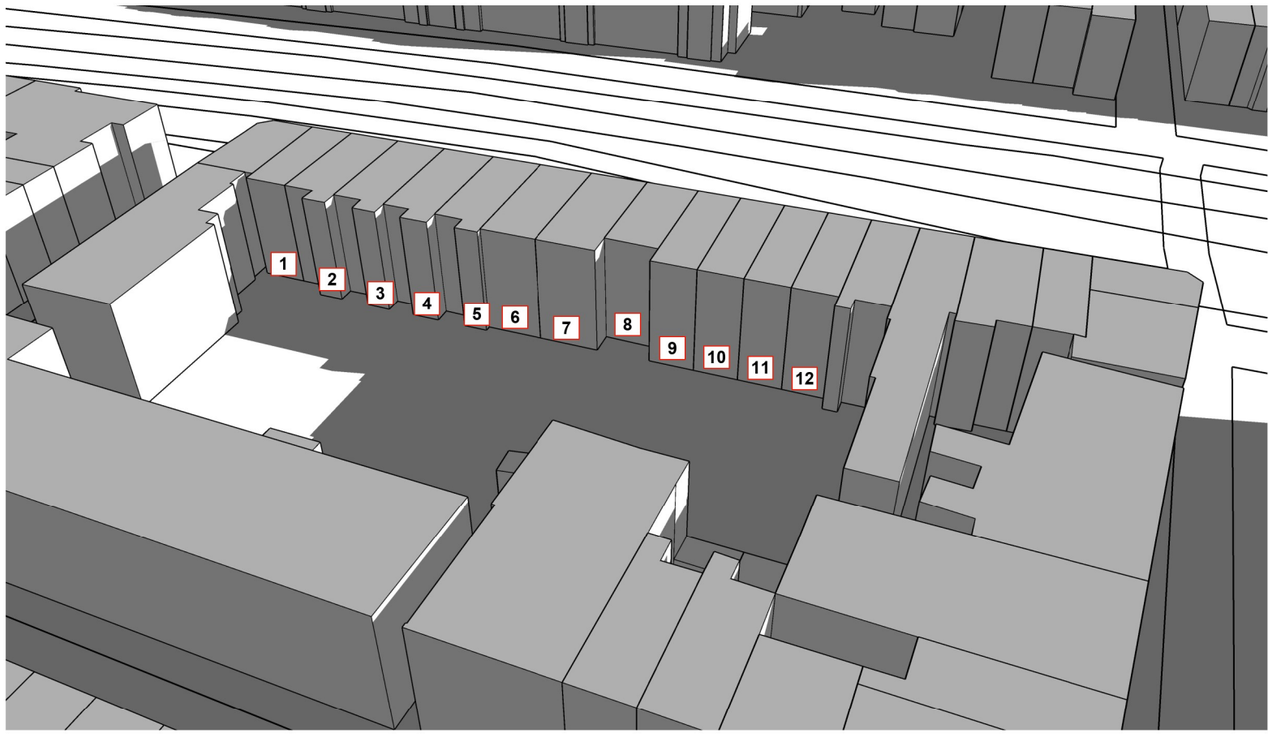




Noordsingel 108 - 130
21 september
08.00





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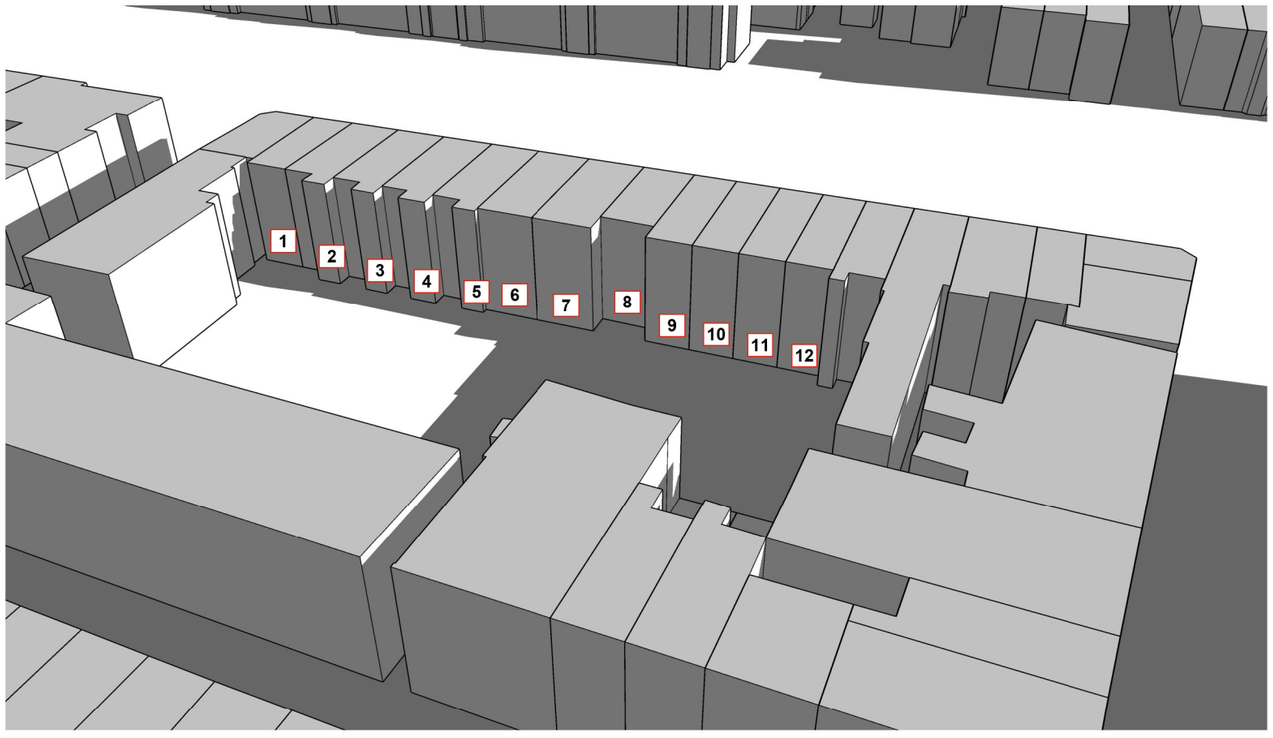
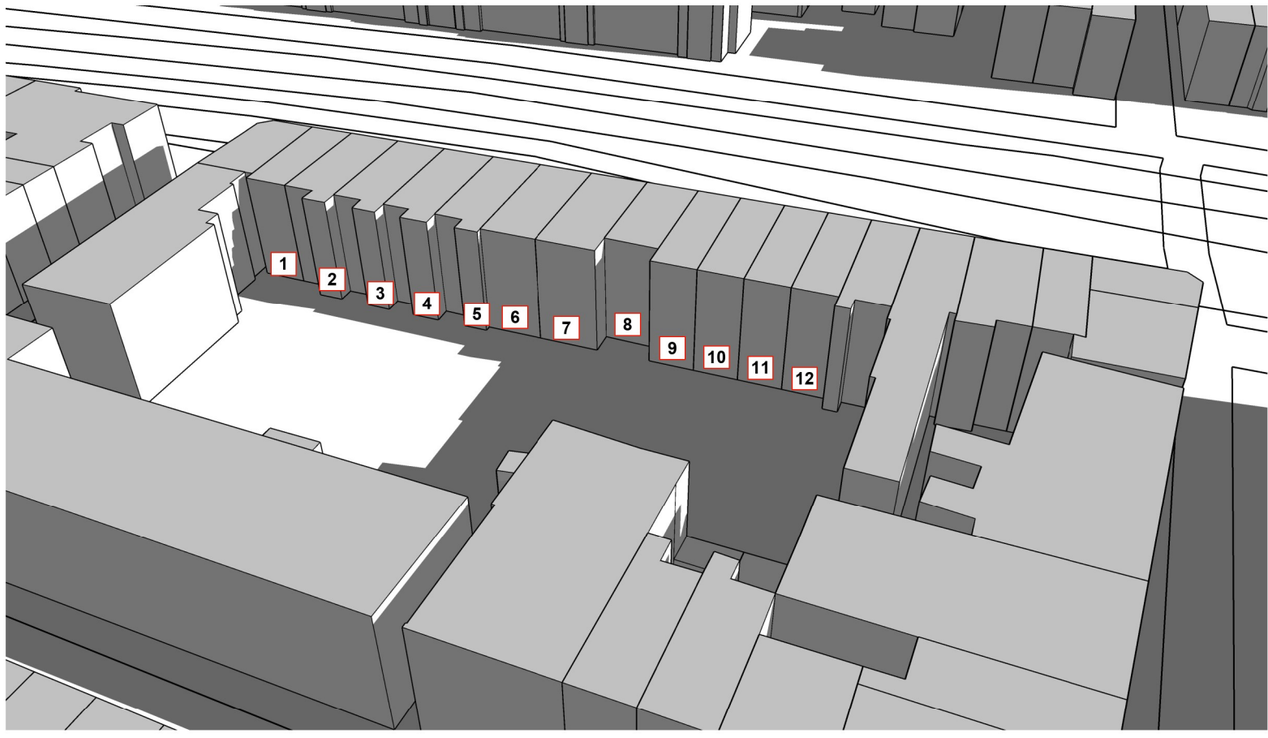
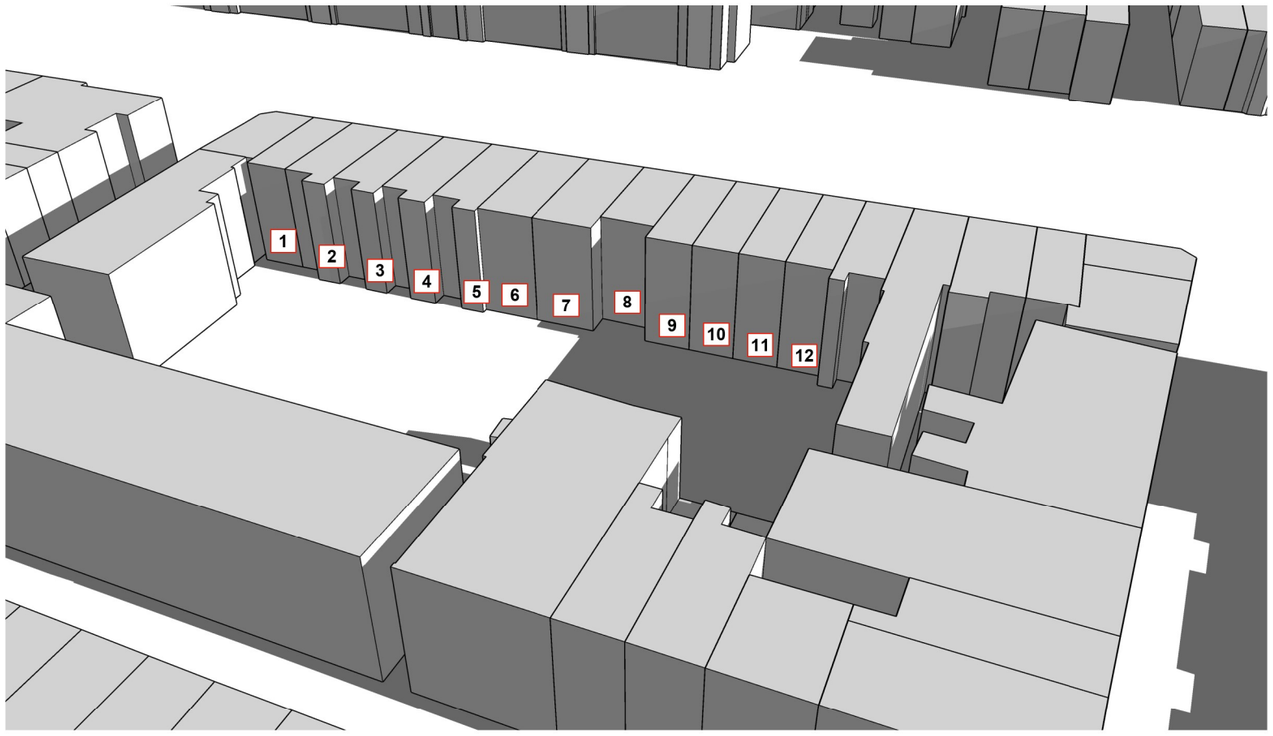
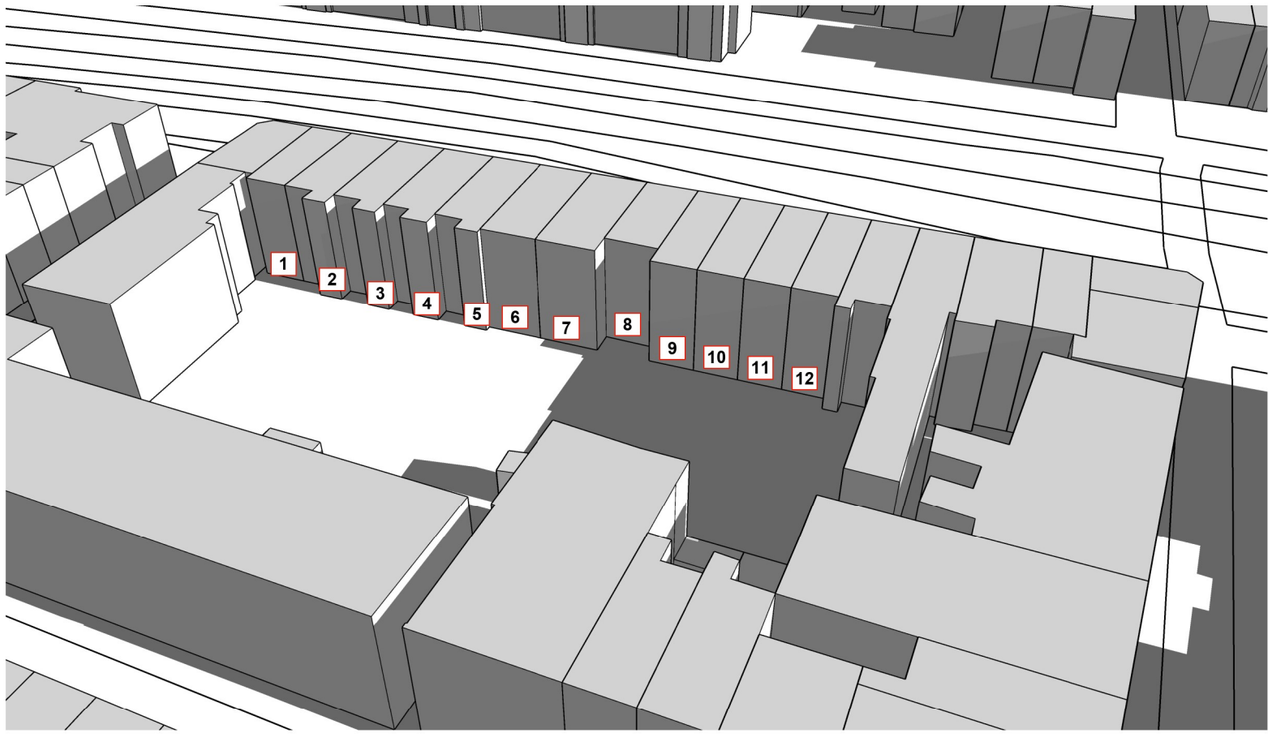
21 september
08.30





Noordsingel 108 - 130
21 september
09.00





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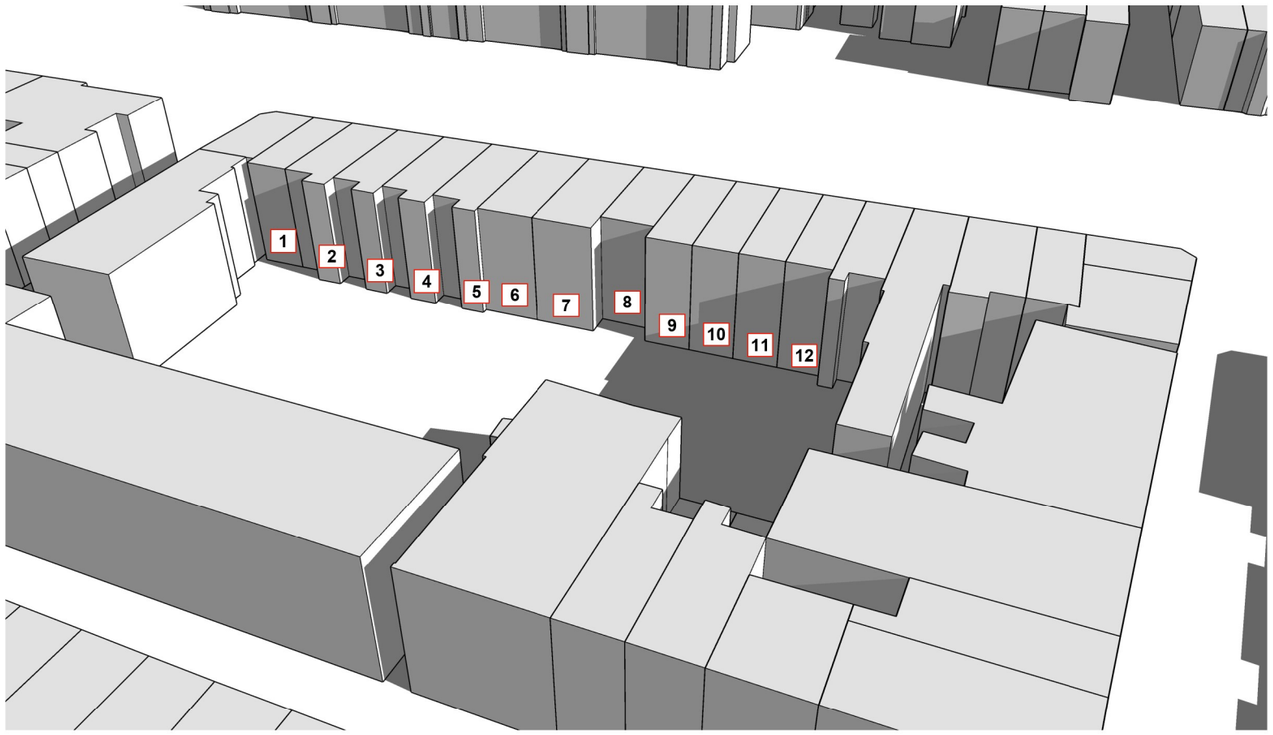
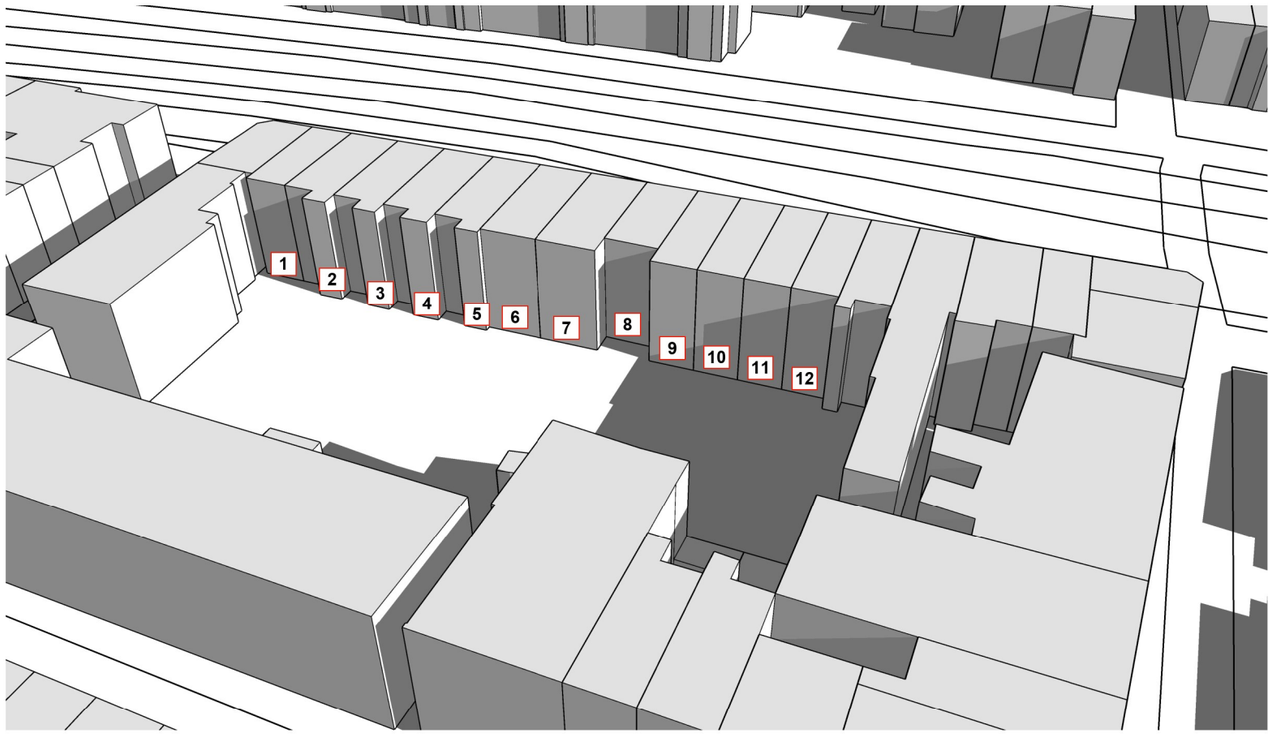
21 september
09.30





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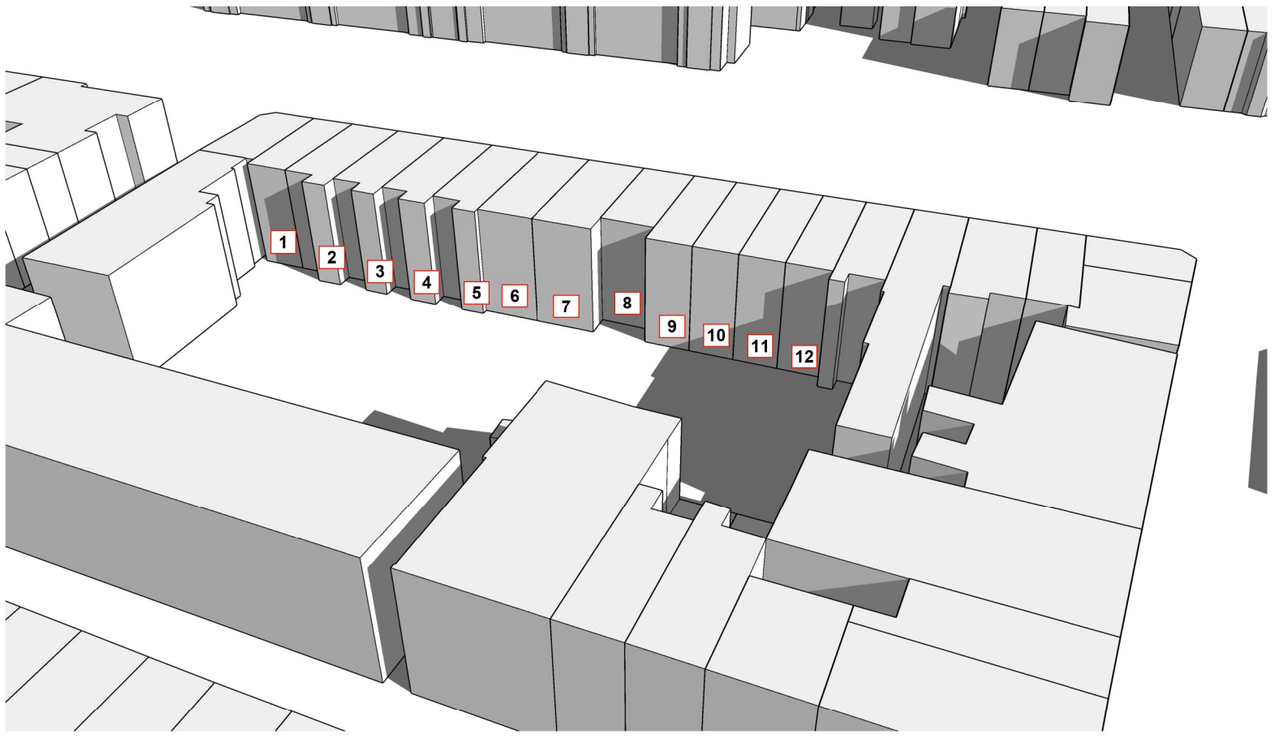
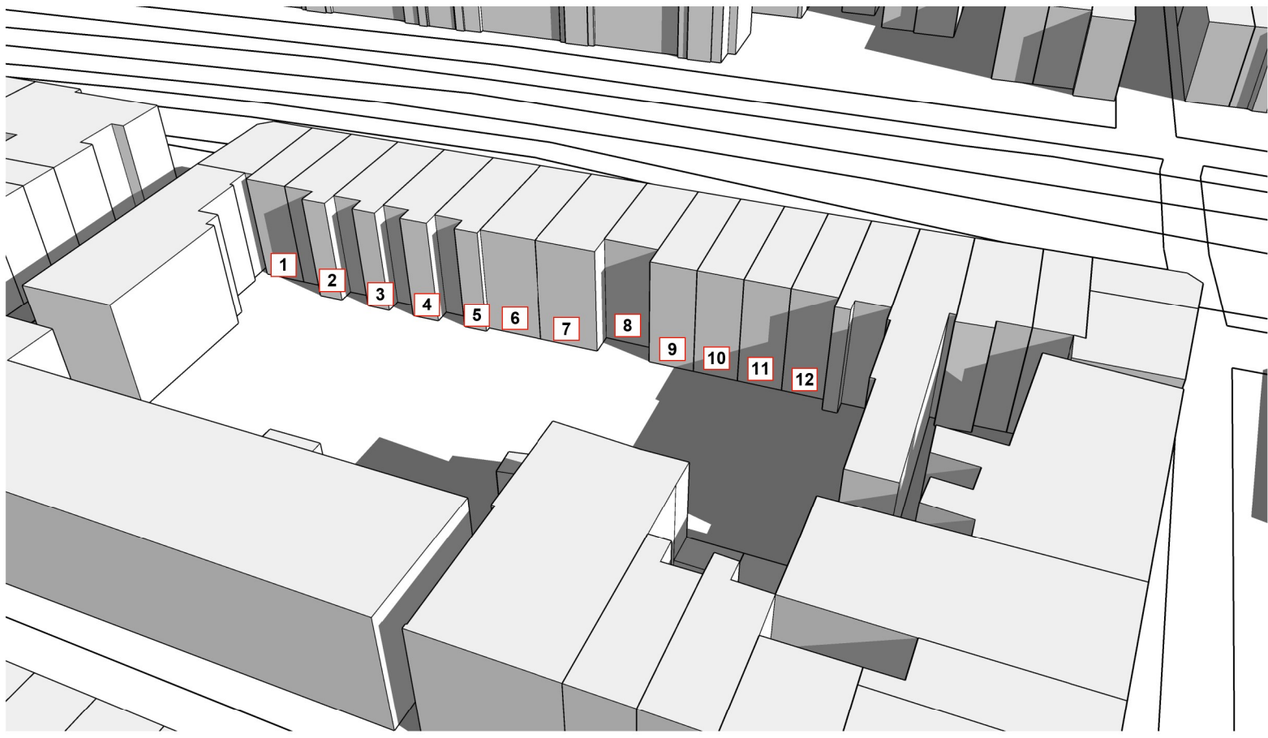
21 september
10.00





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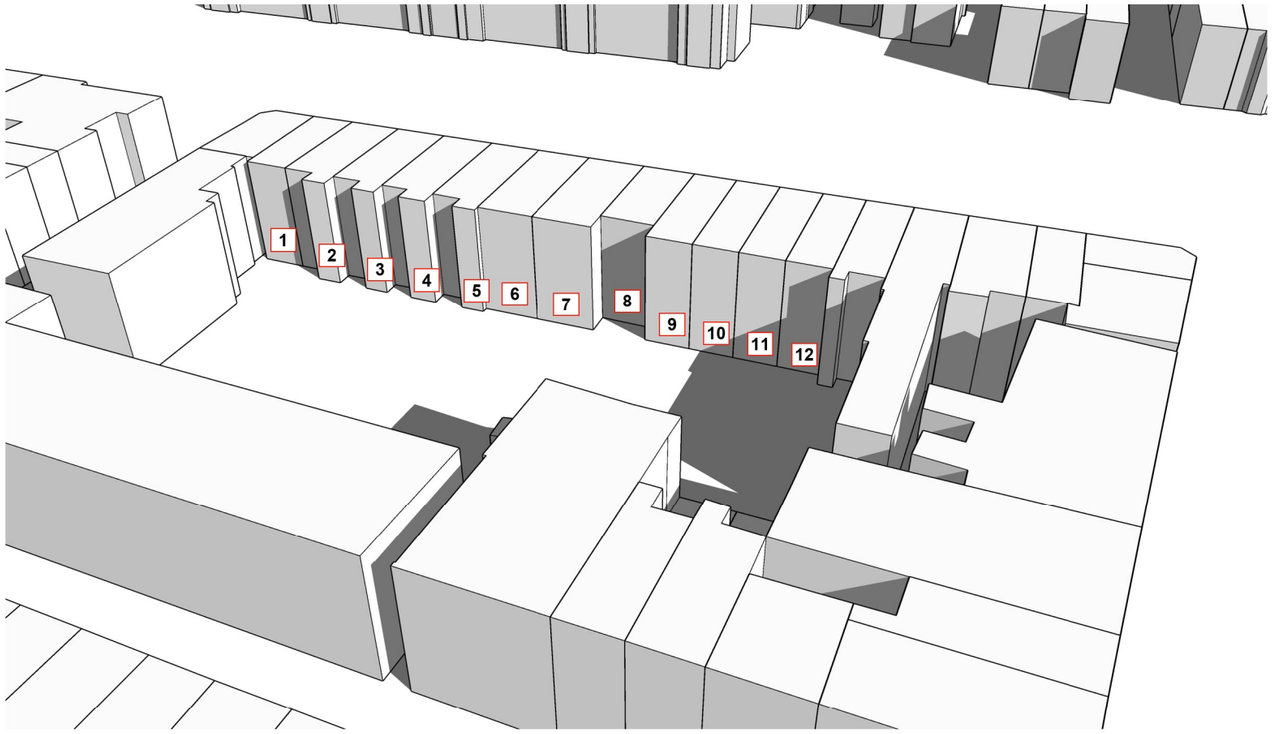
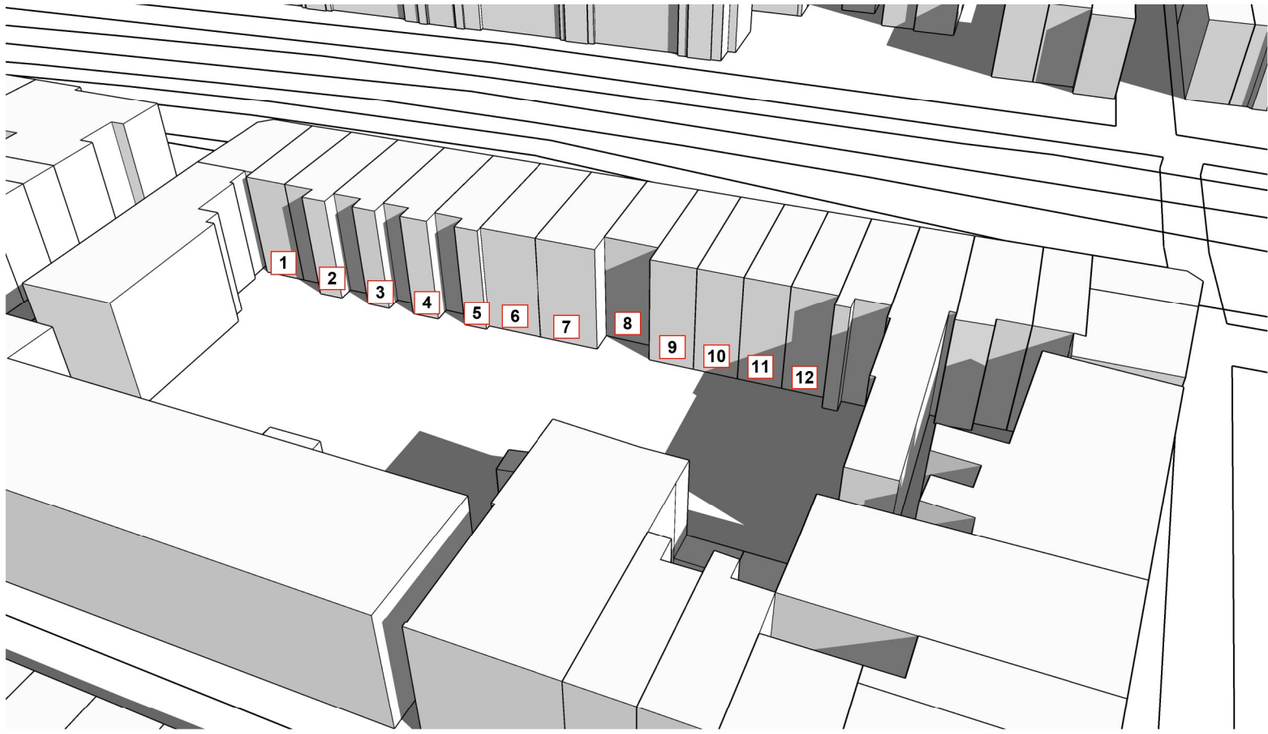
21 september
10.30





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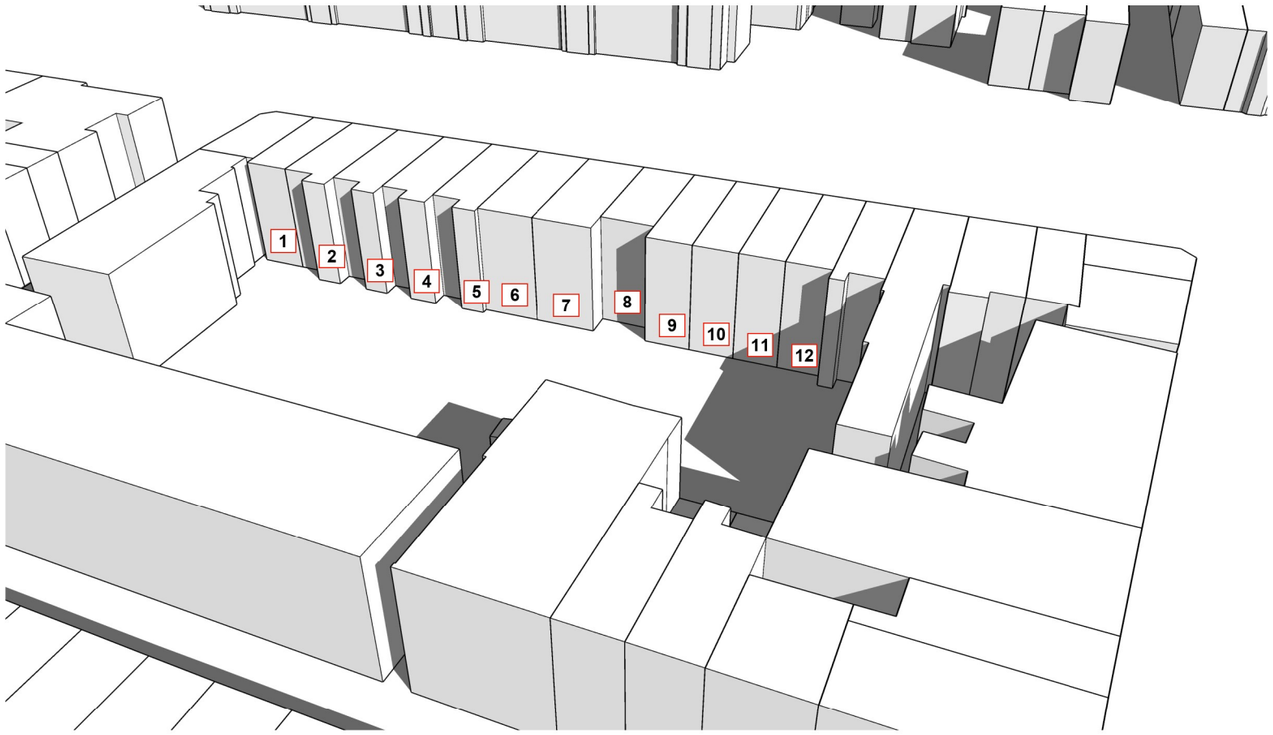
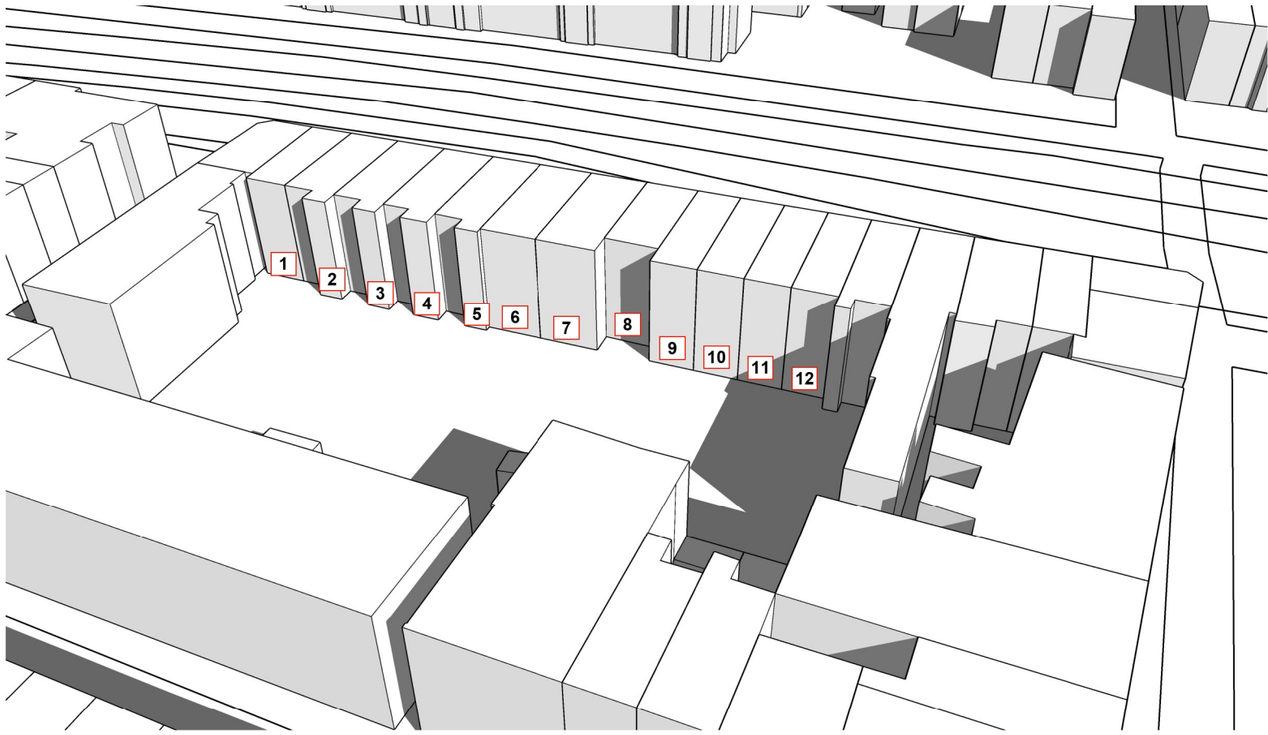
21 september
11.00





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21 september
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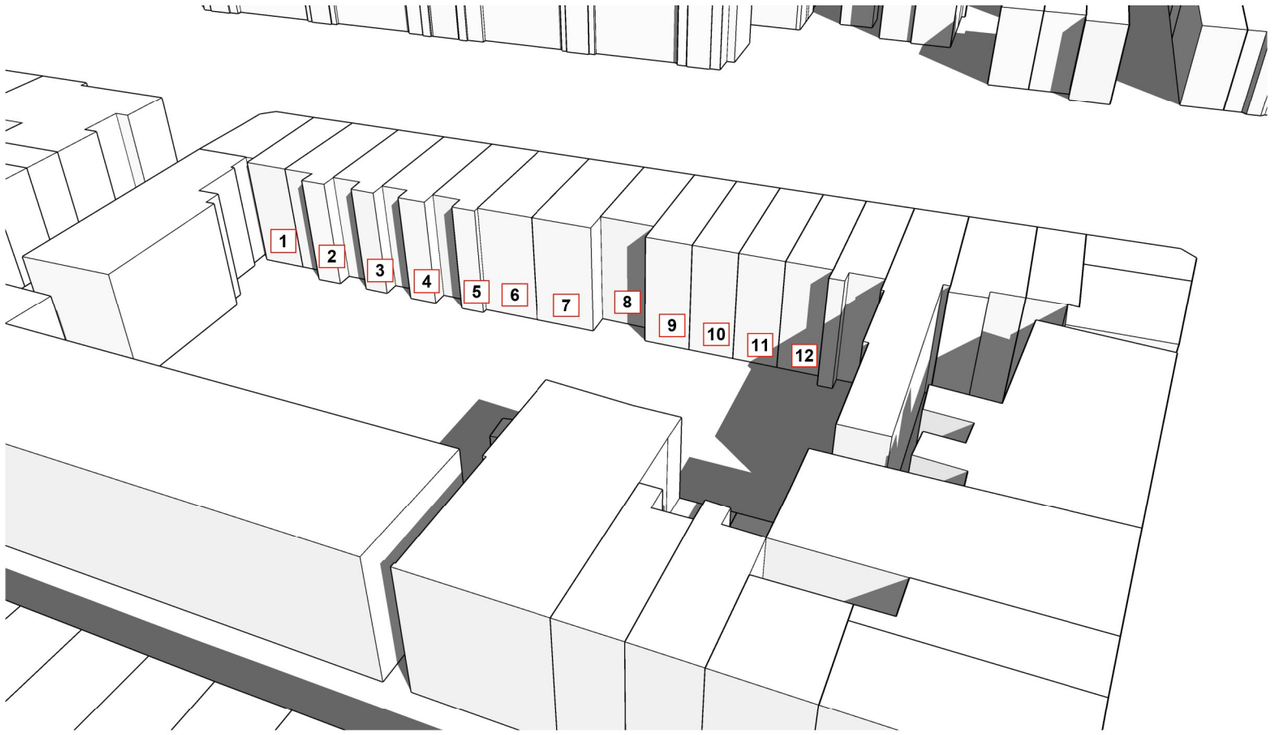
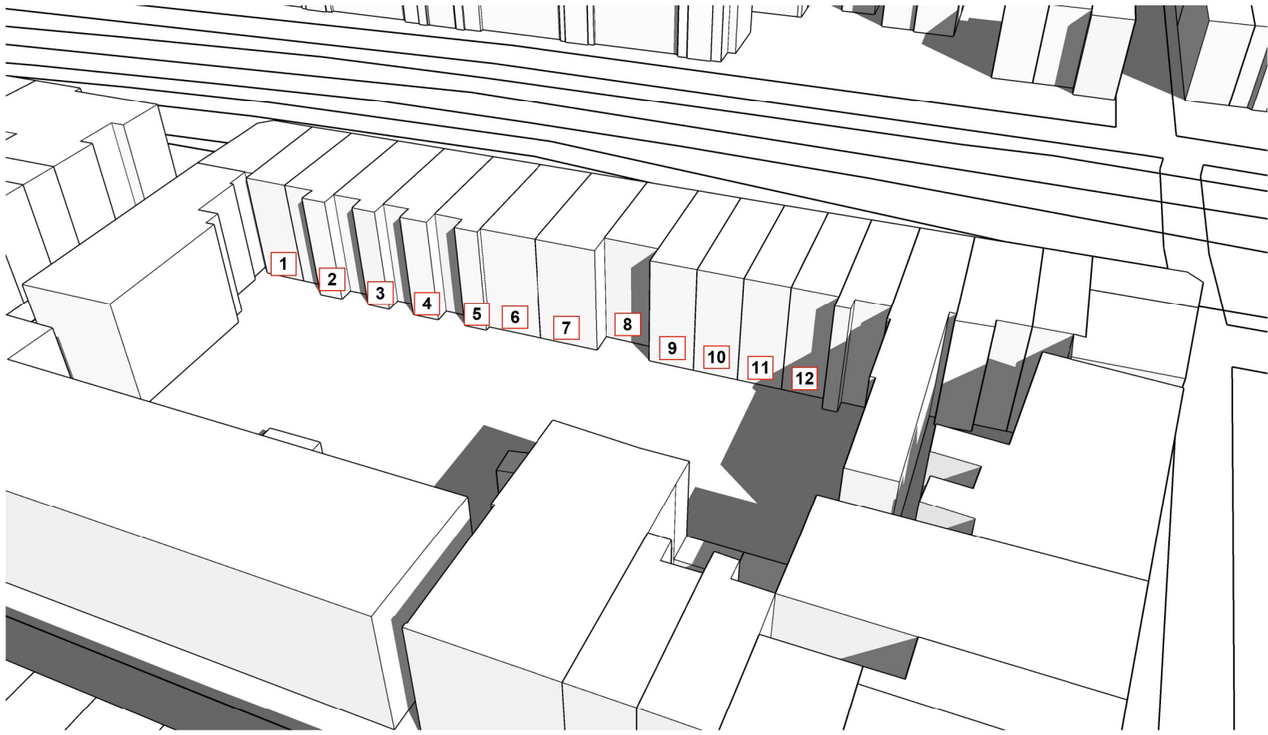
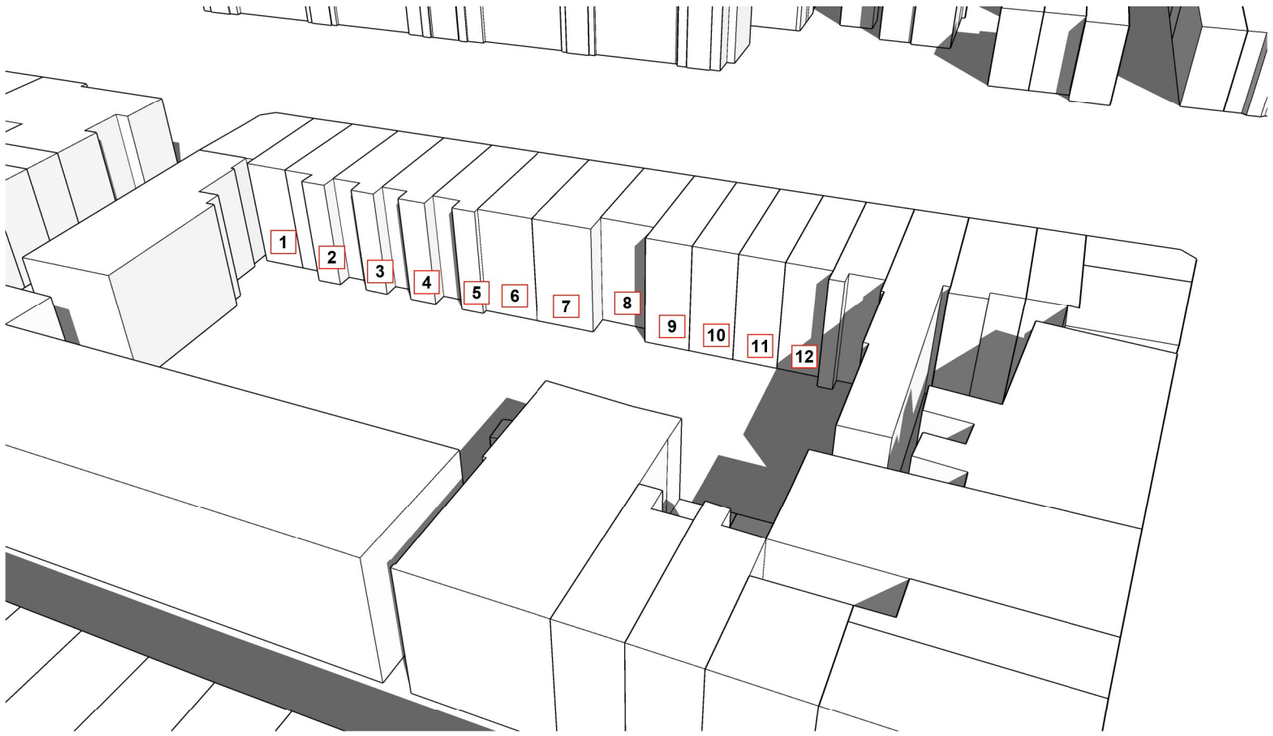
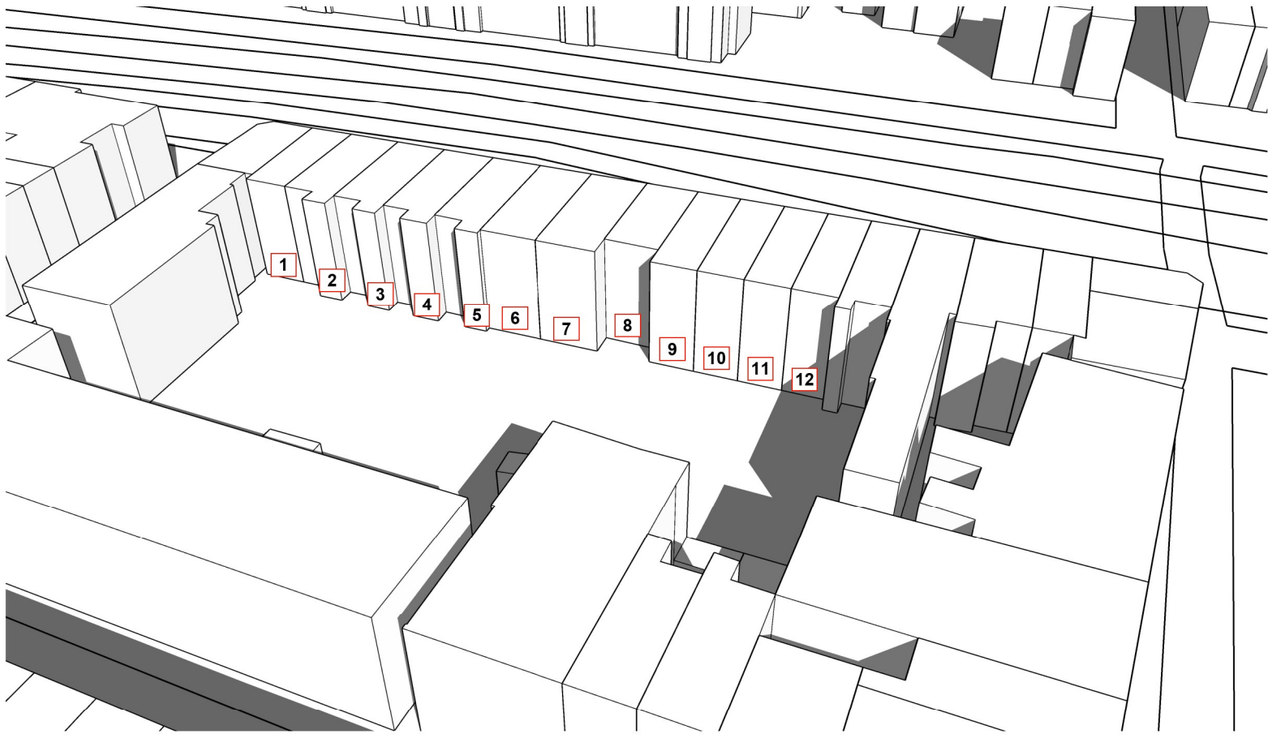


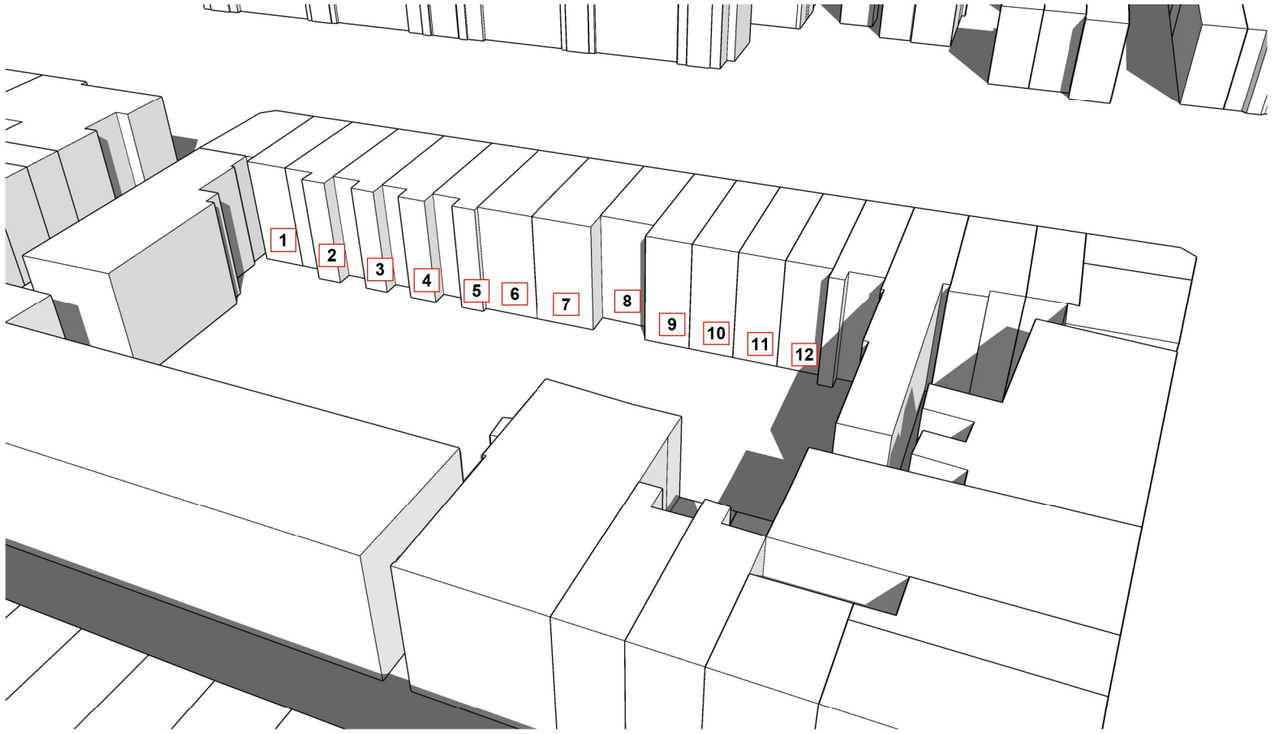


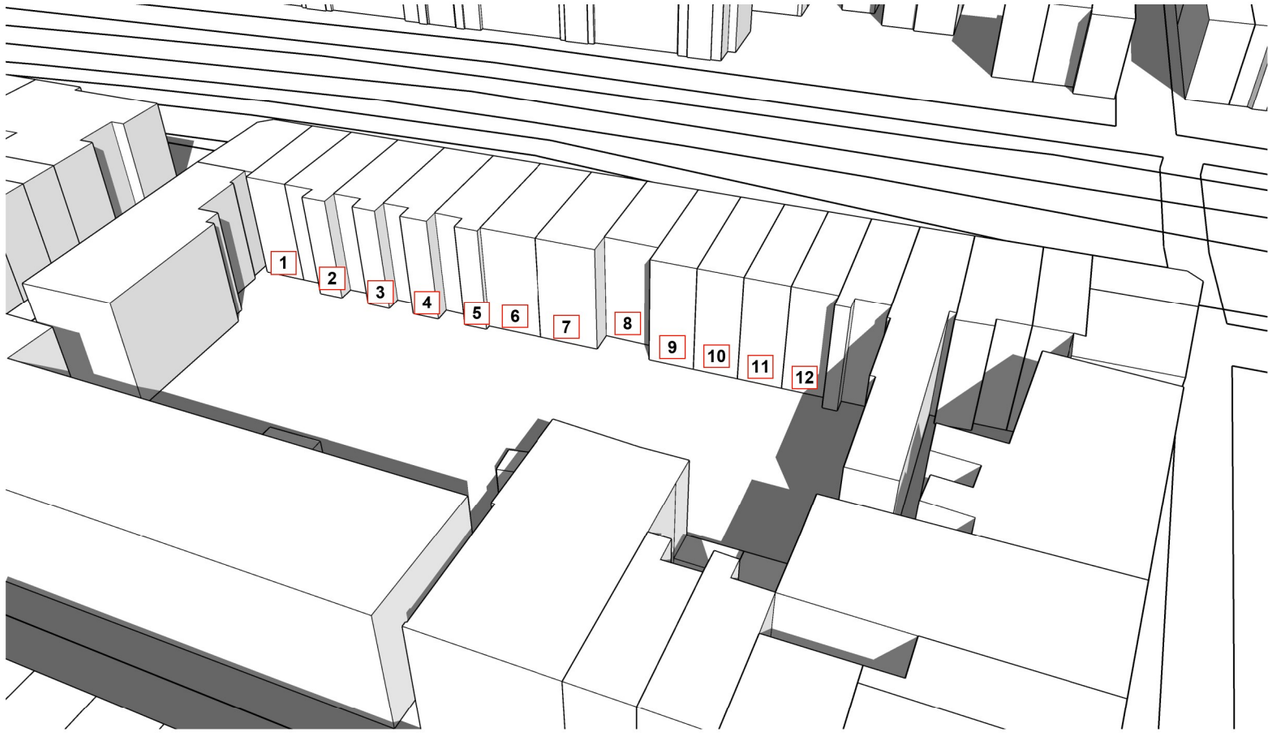
Noordsingel 108 - 130
21 september
12.00



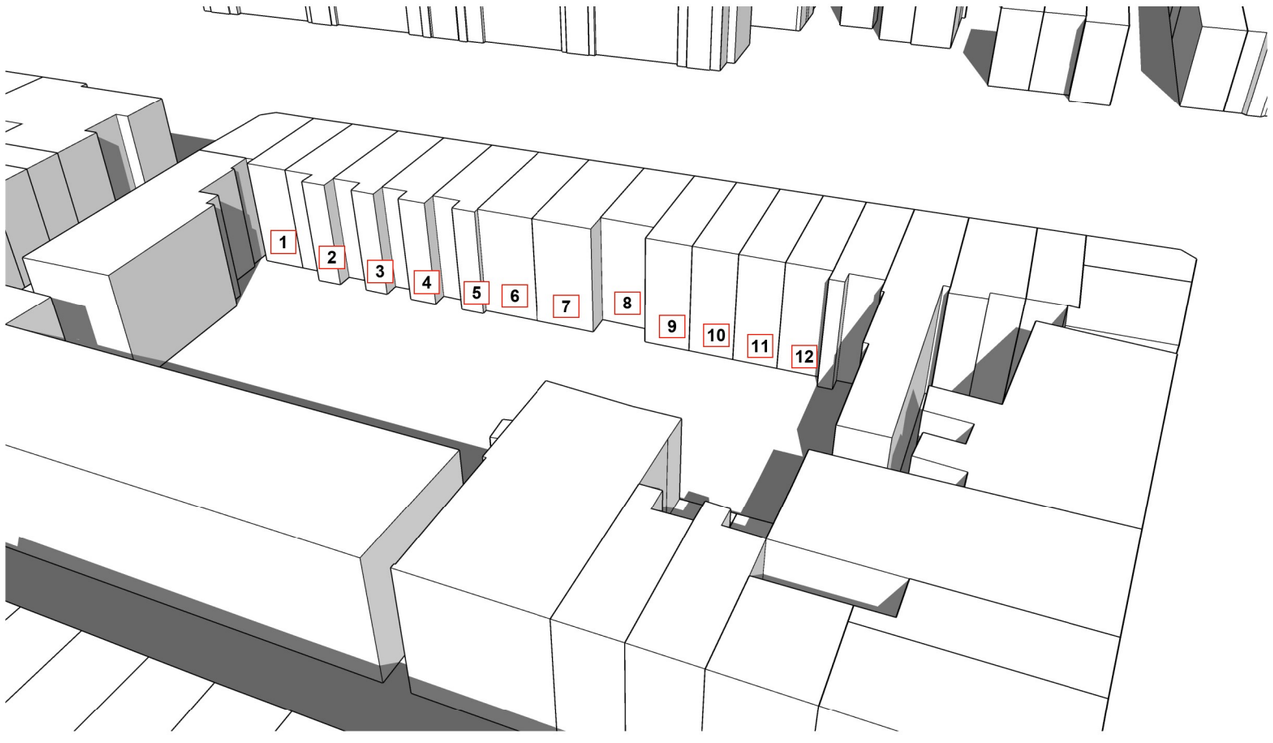


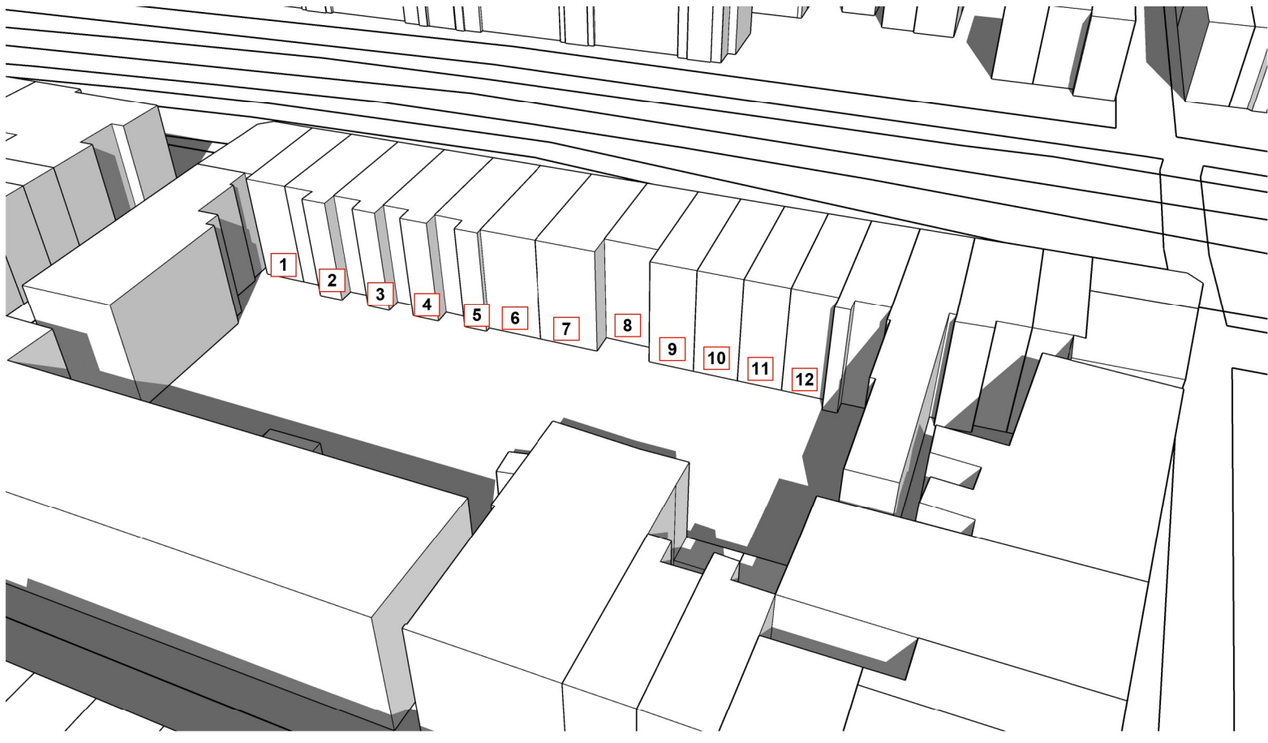
Noordsingel 108 - 130
21 september
12.30



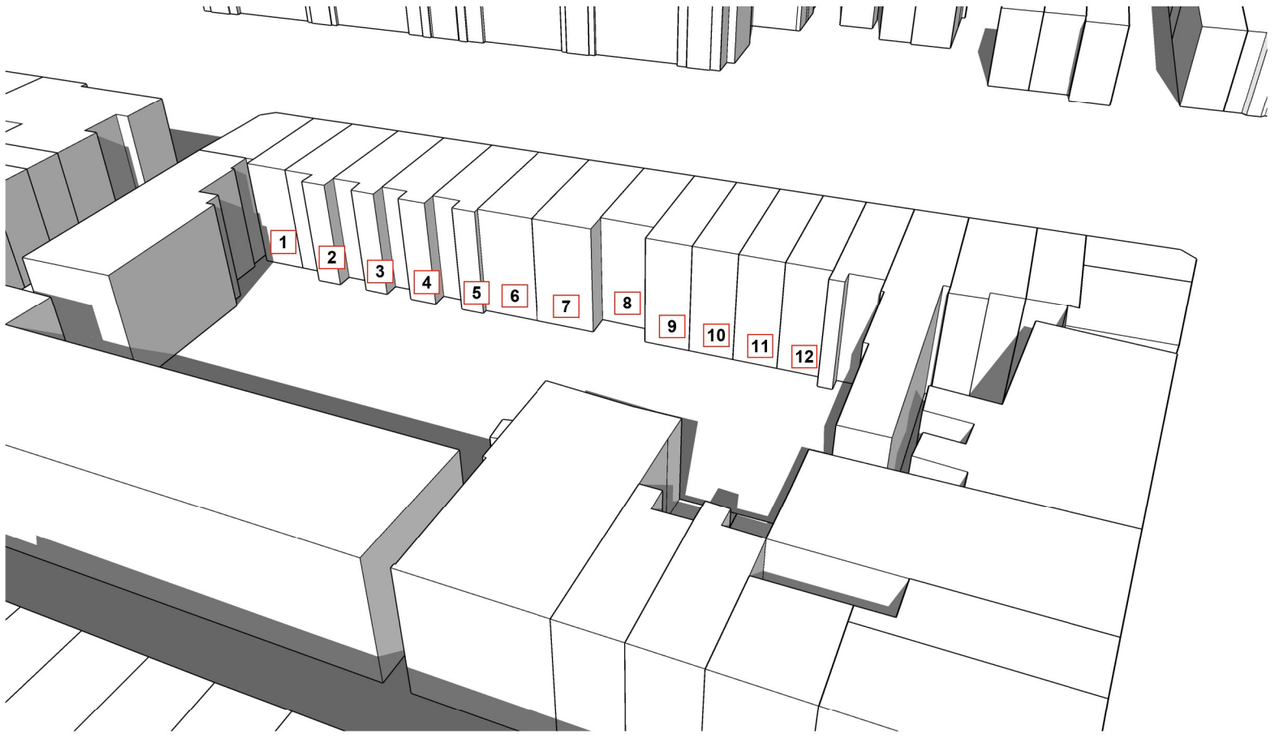


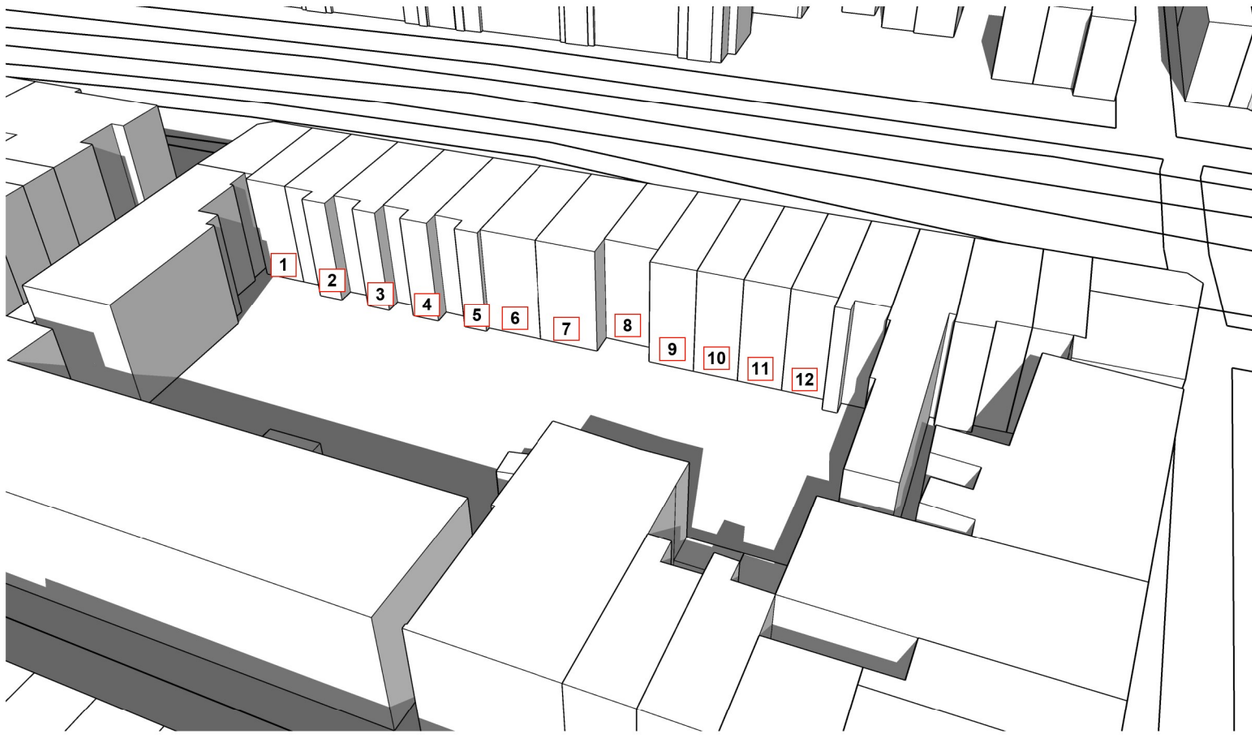
Noordsingel 108 - 130
21 september
13.00



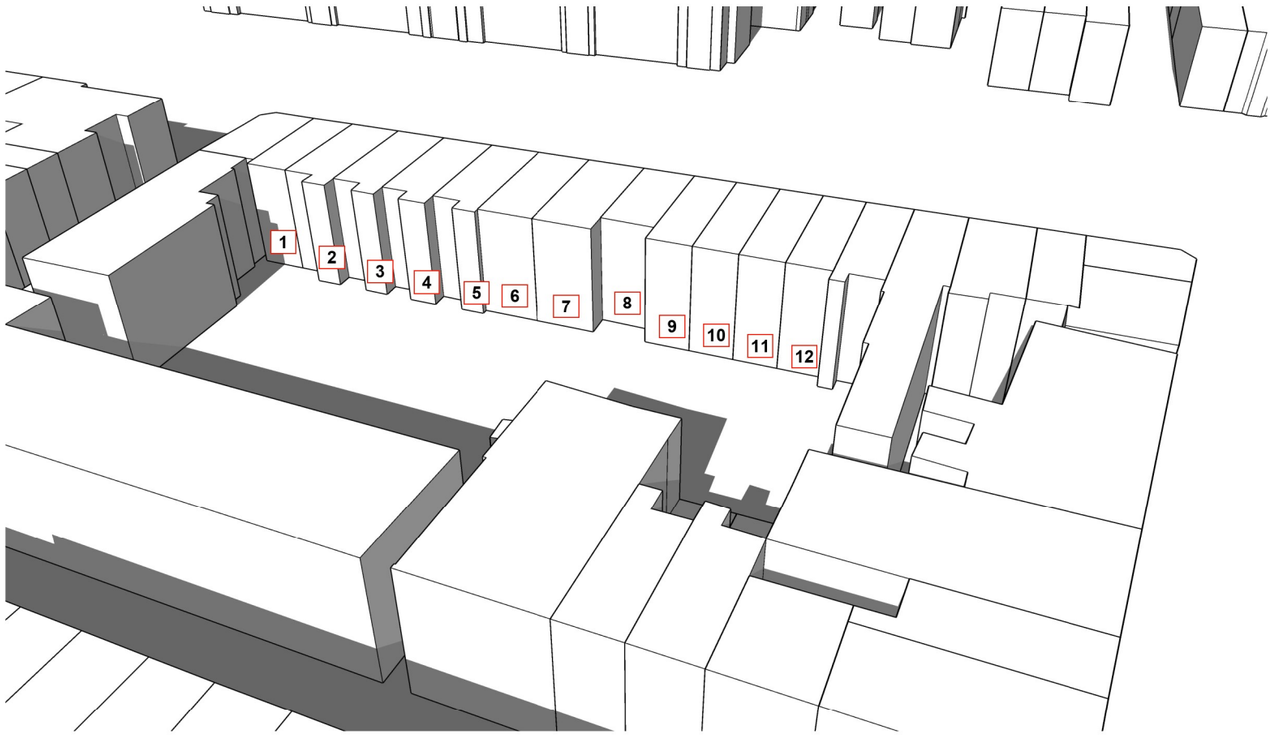


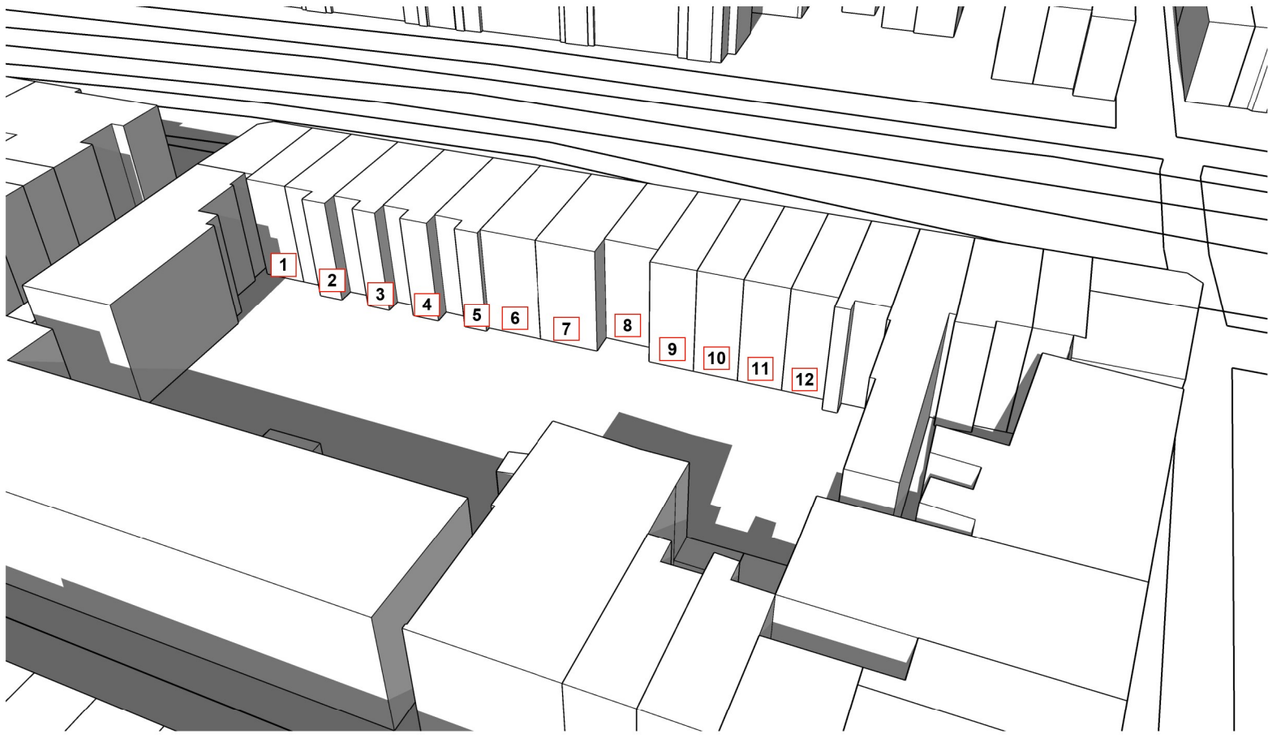
Noordsingel 108 - 130
21 september
13.30



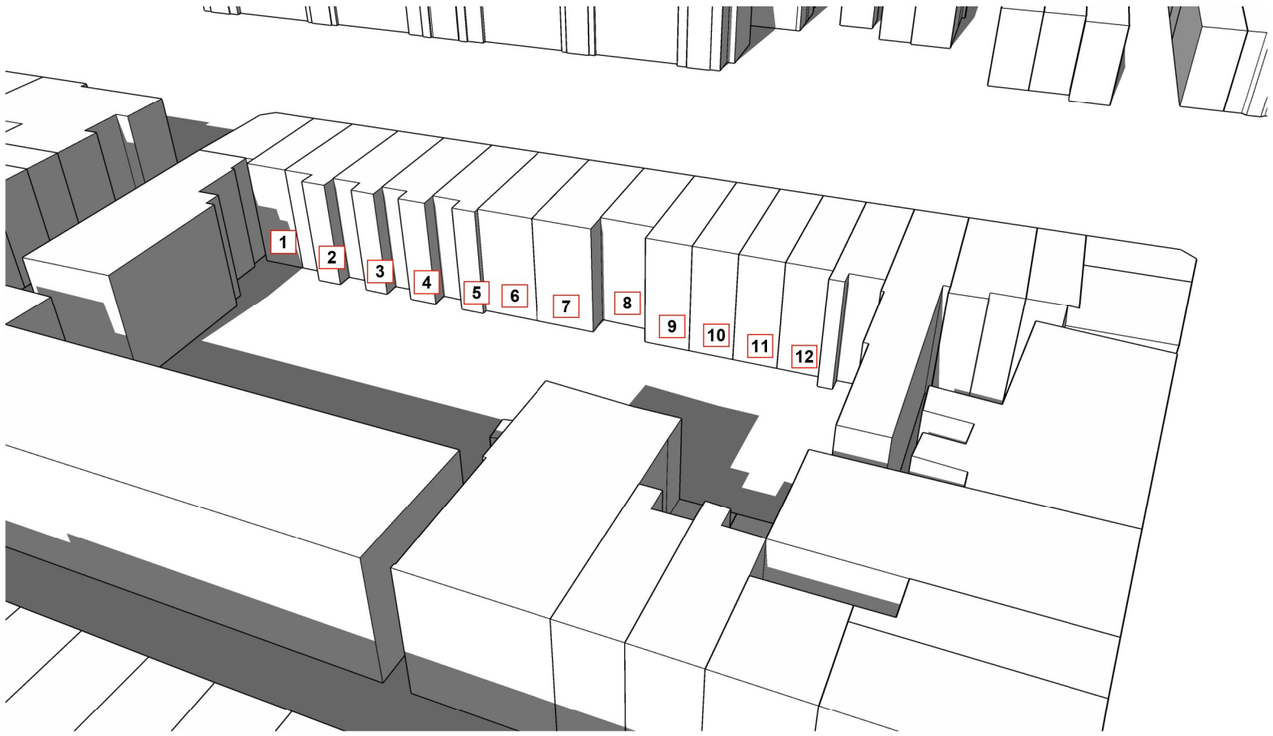


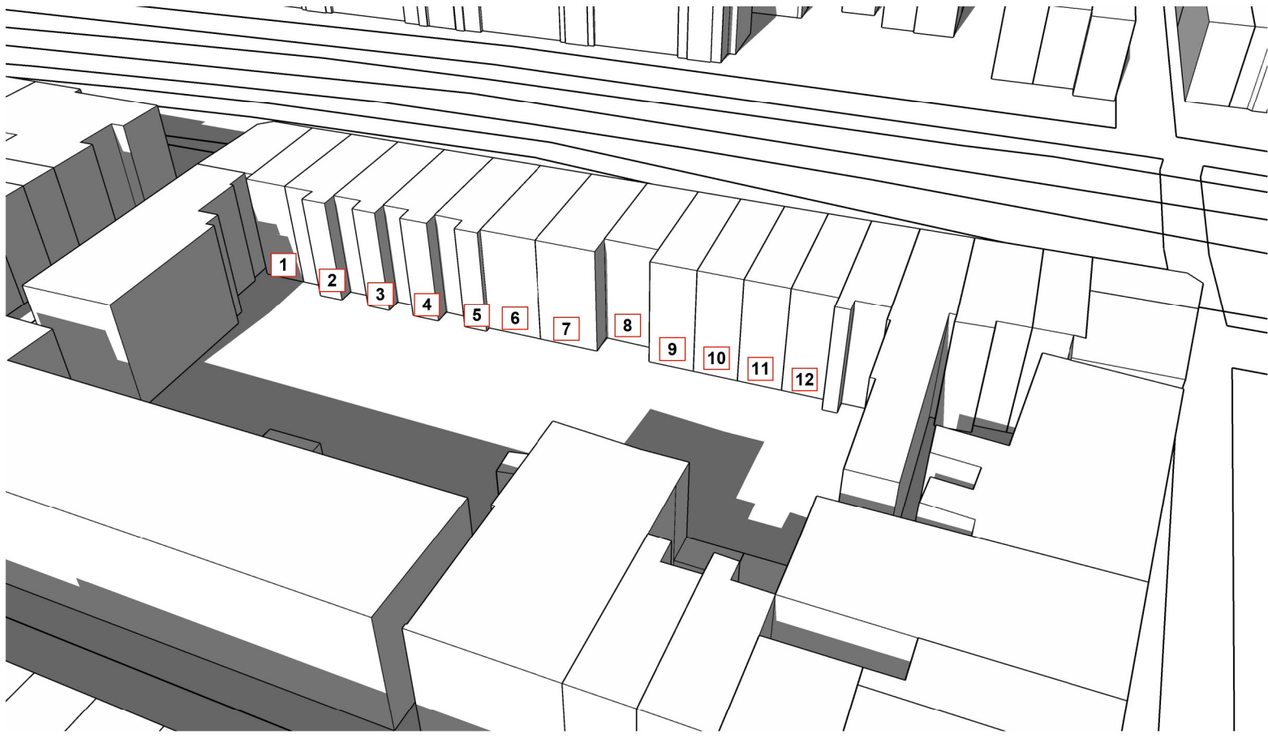
Noordsingel 108 - 130
21 september
14.00



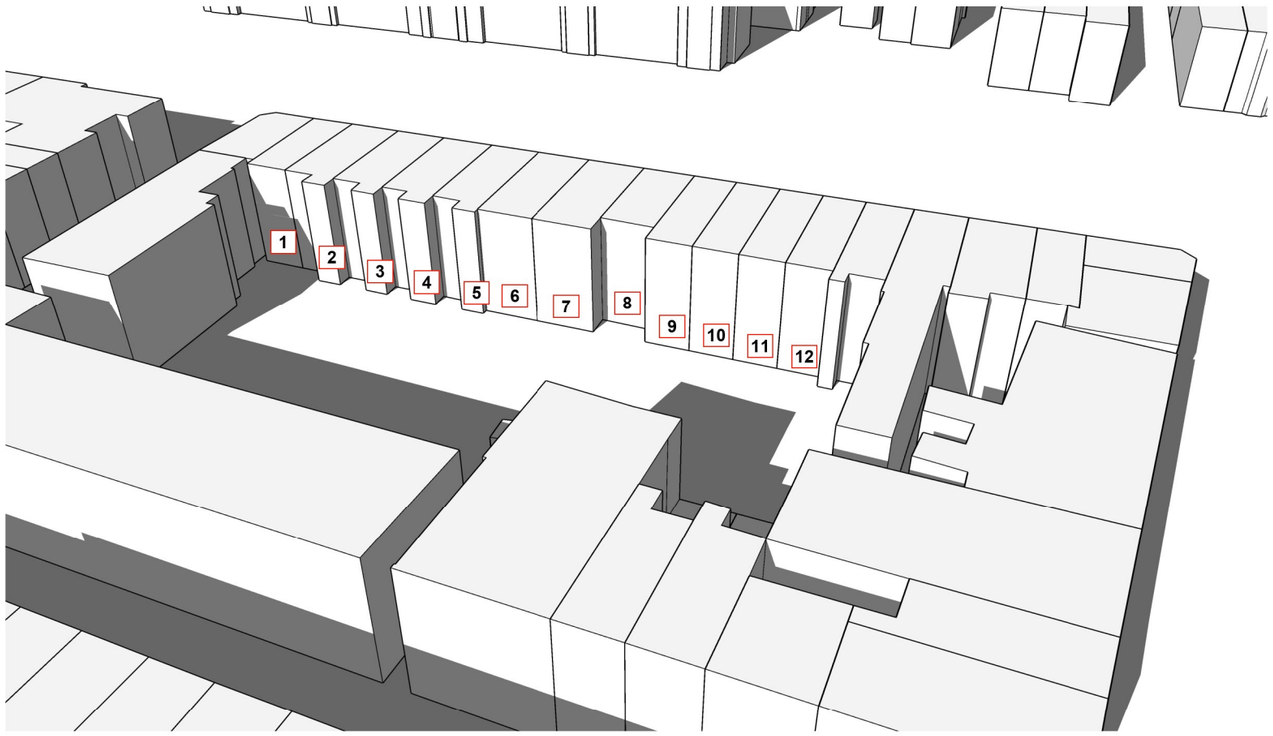


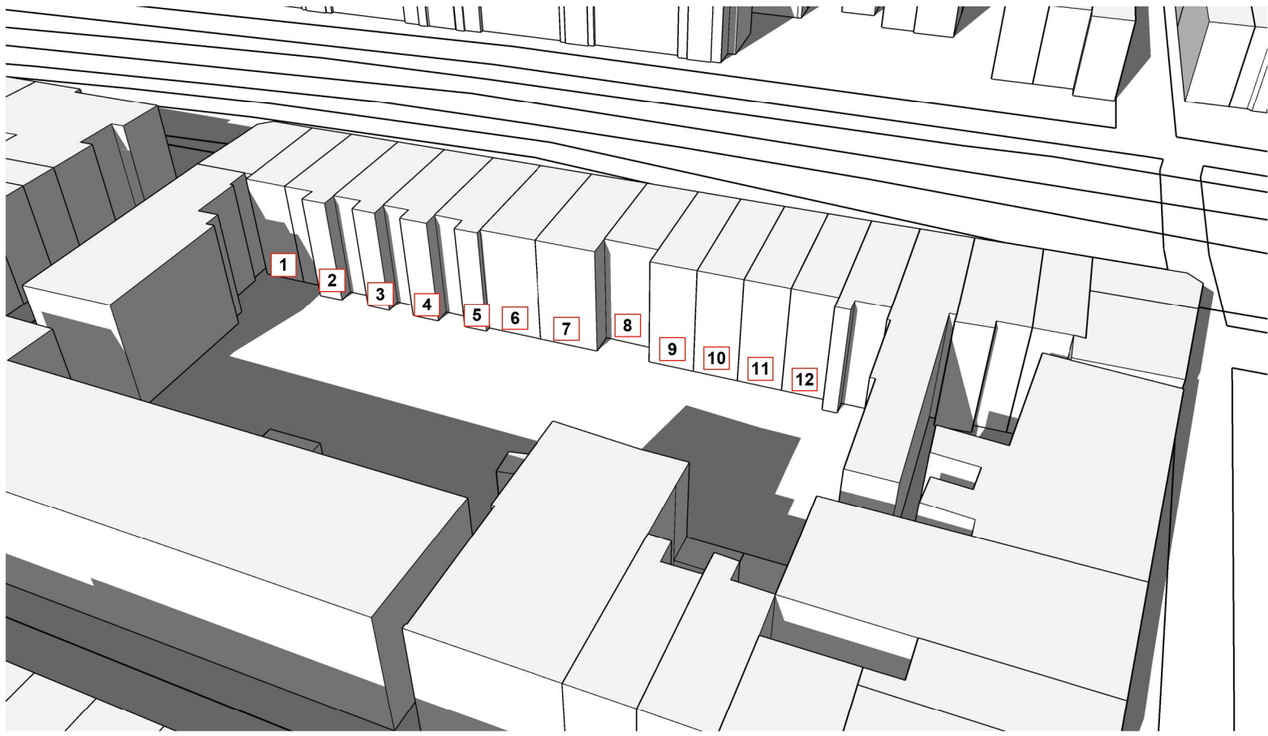
Noordsingel 108 - 130
21 september
14.30



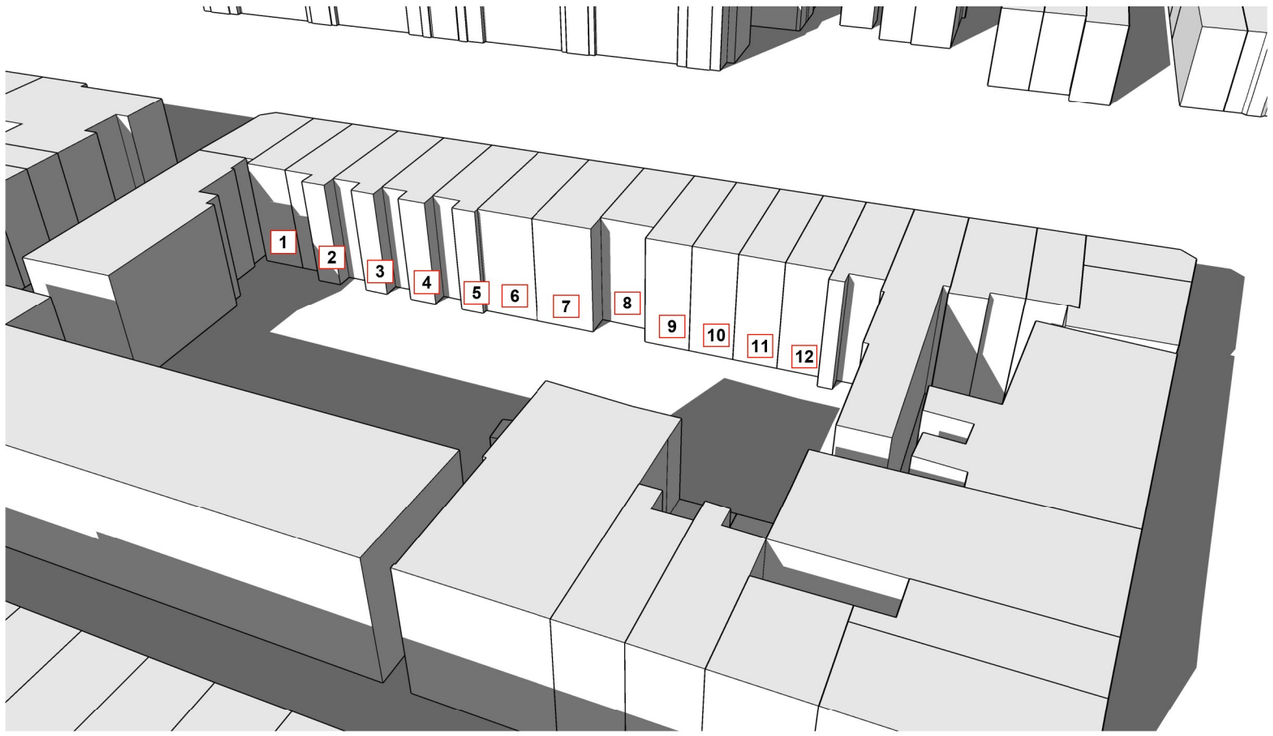


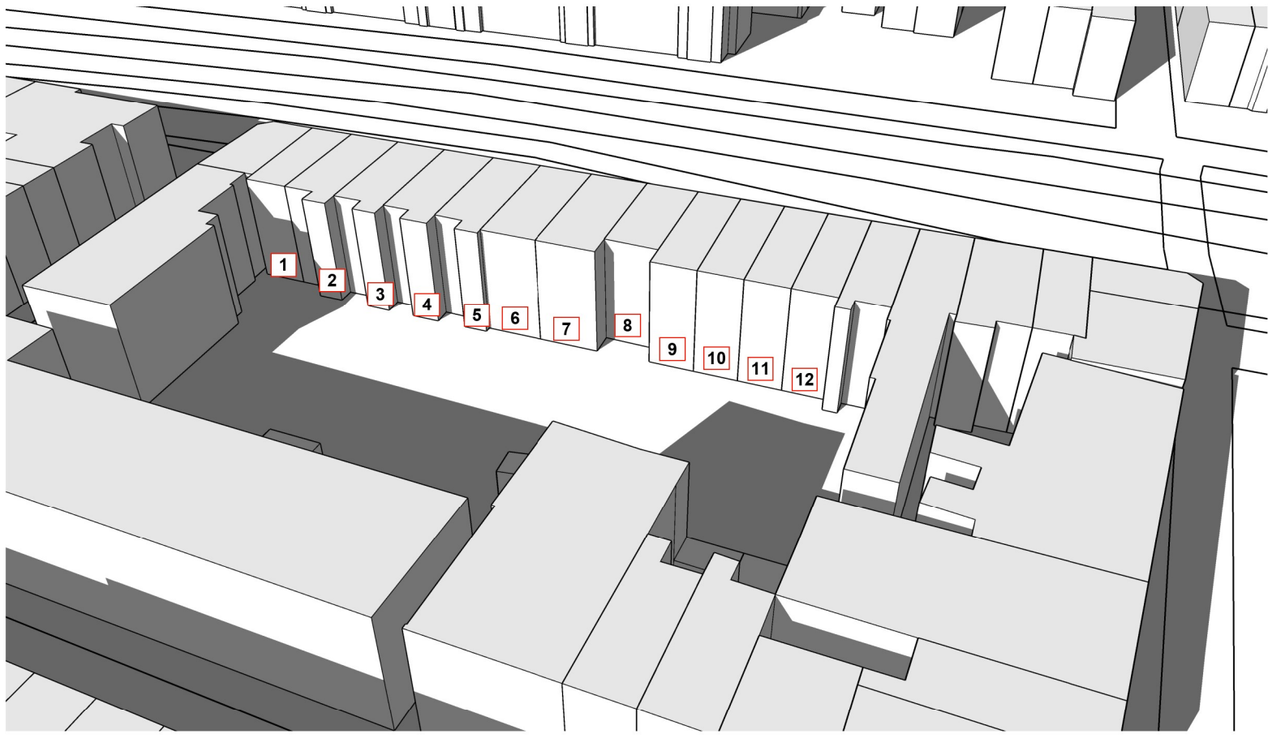
Noordsingel 108 - 130
21 september
15.00





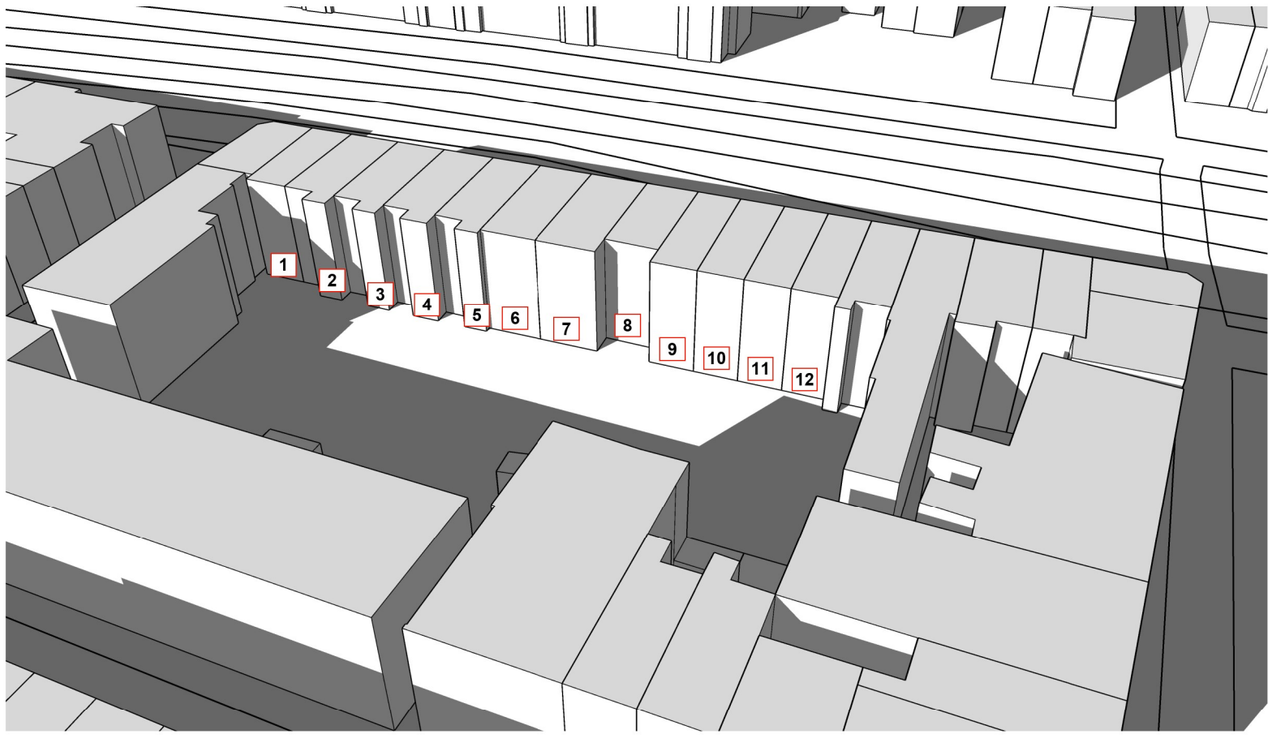
Noordsingel 108 - 130
21 september
15.30





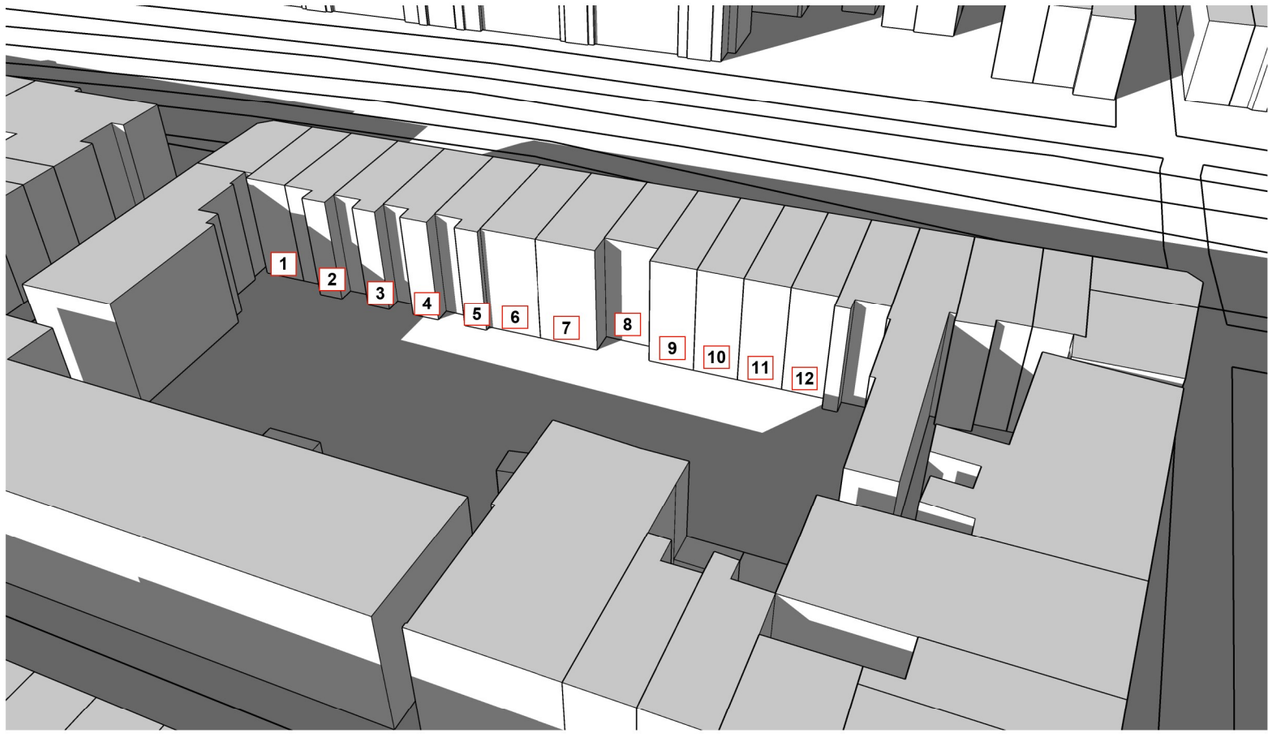
Noordsingel 108 - 130
21 september
16.00





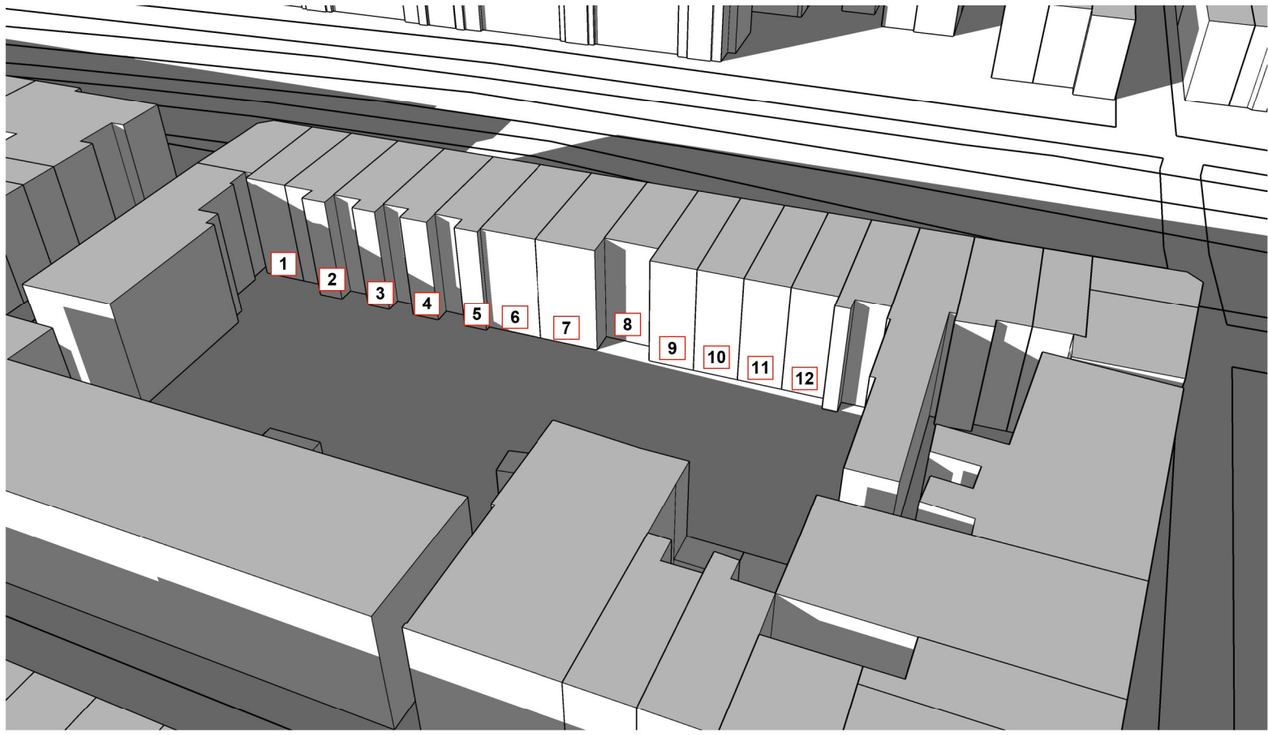
Noordsingel 108 - 130
21 september
16.30



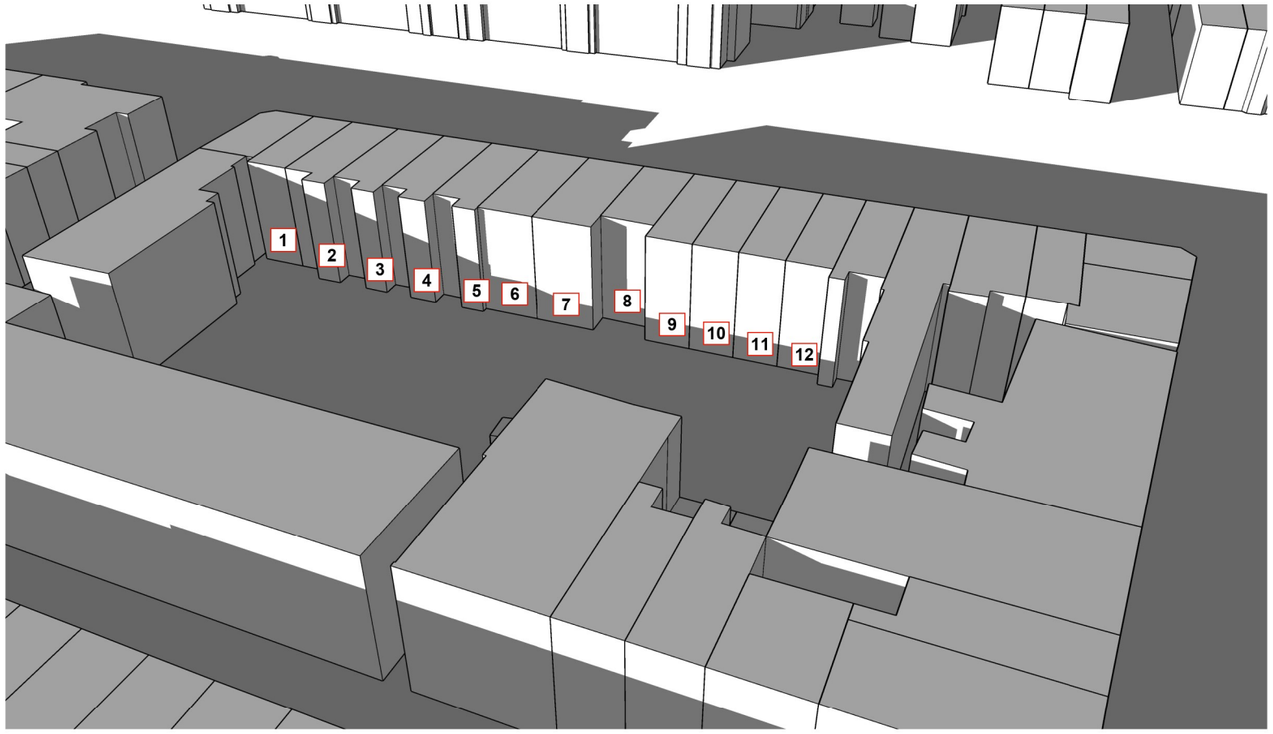


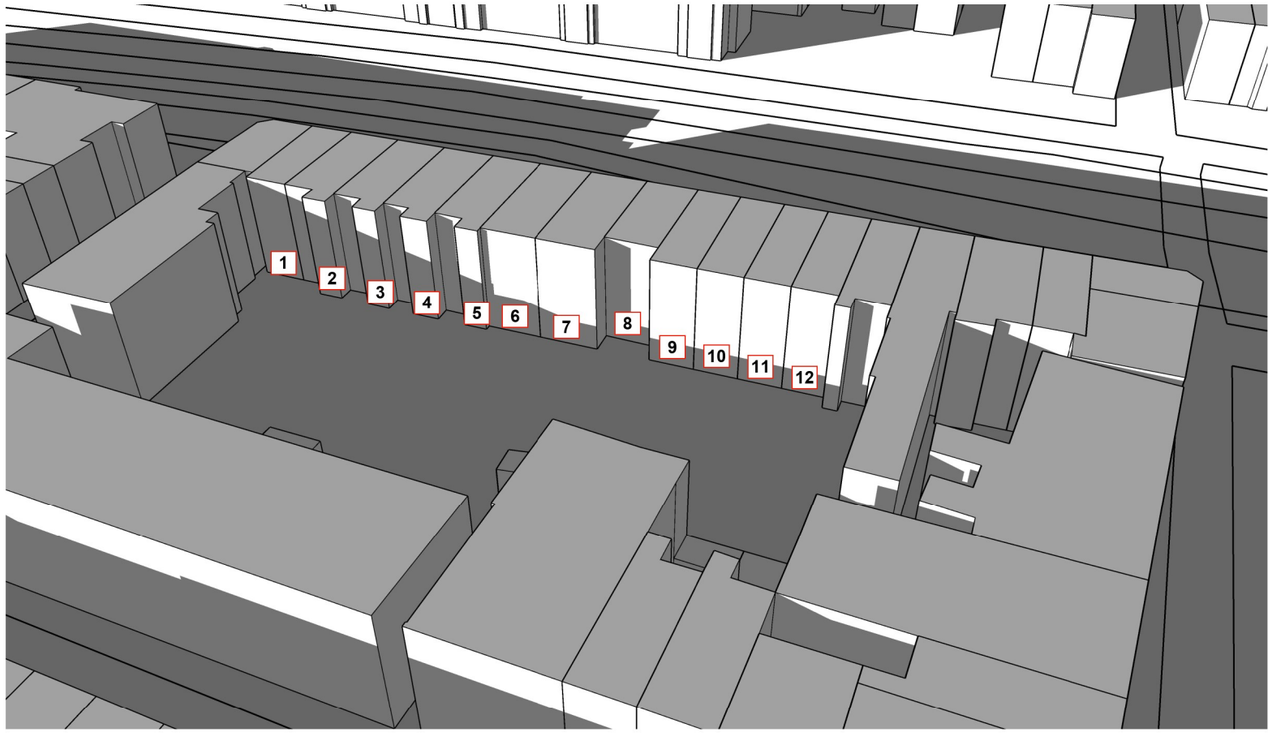
Noordsingel 108 - 130
21 september
17.00



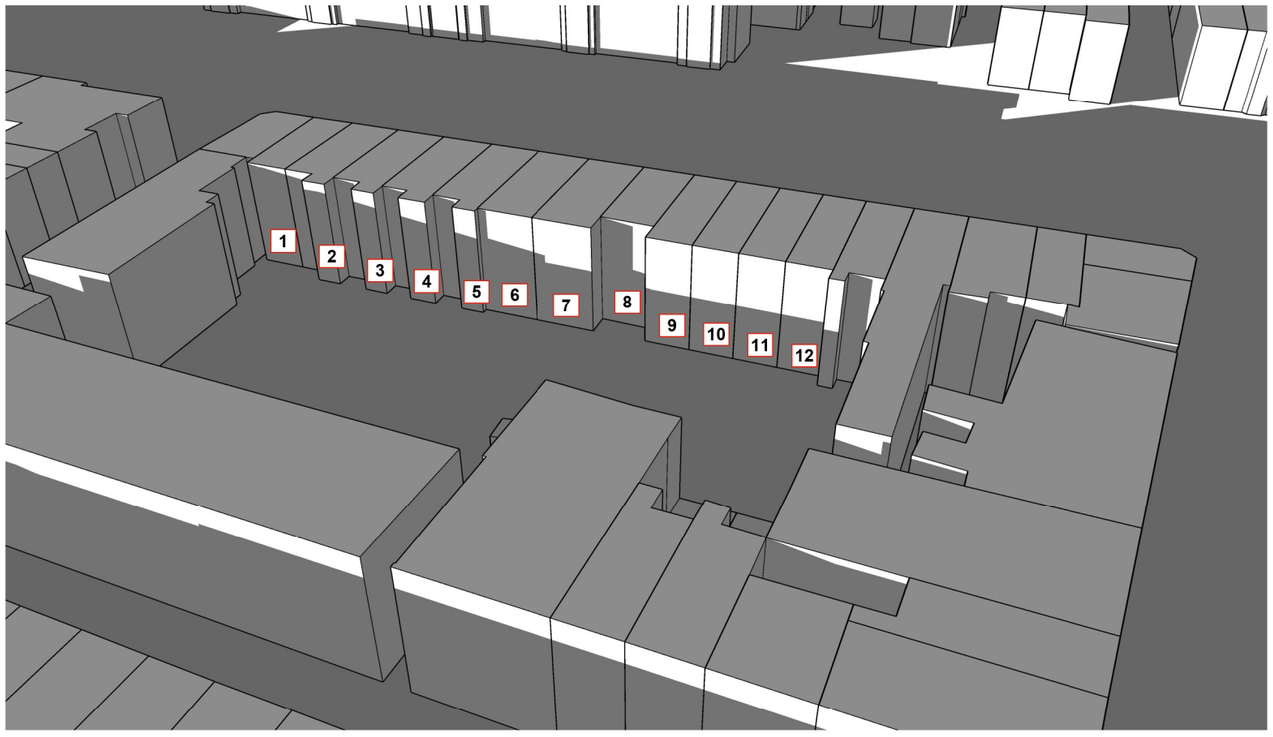


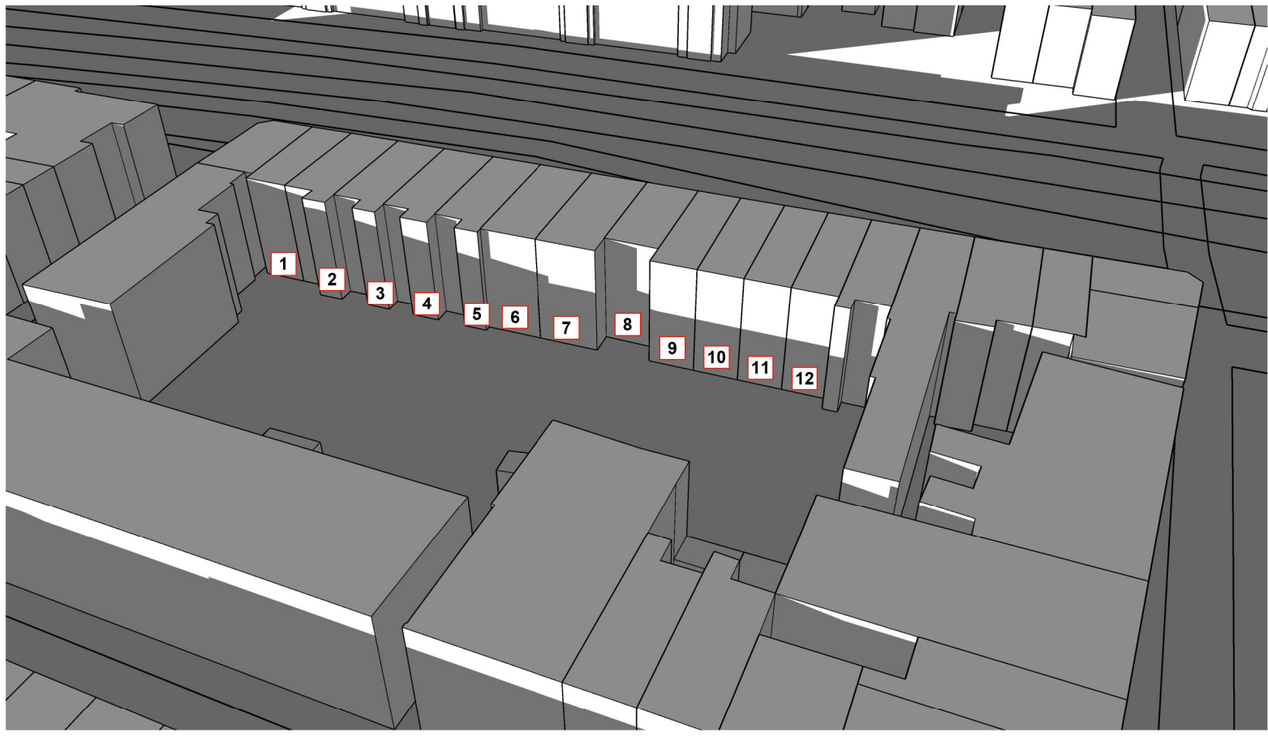
Noordsingel 108 - 130
21 september
17.30





Noordsingel 108 - 130
21 september
18.00





Noordsingel 108 - 130
21 september
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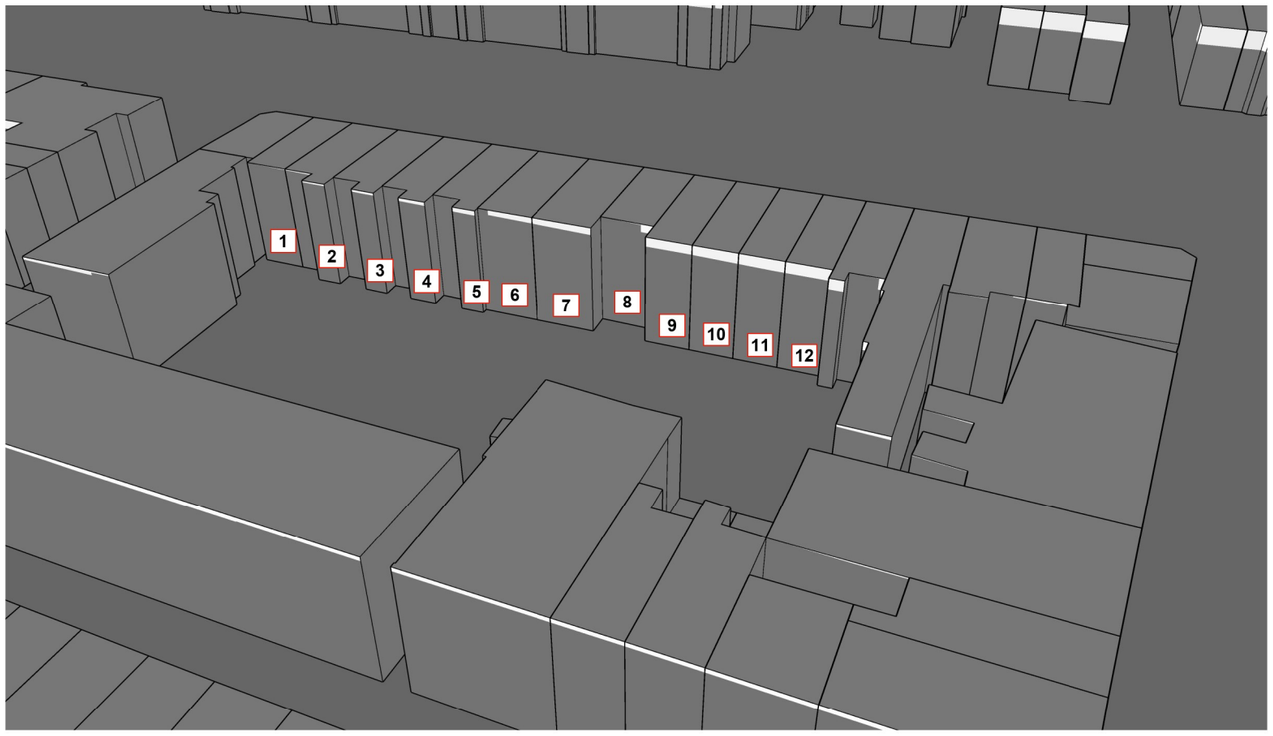
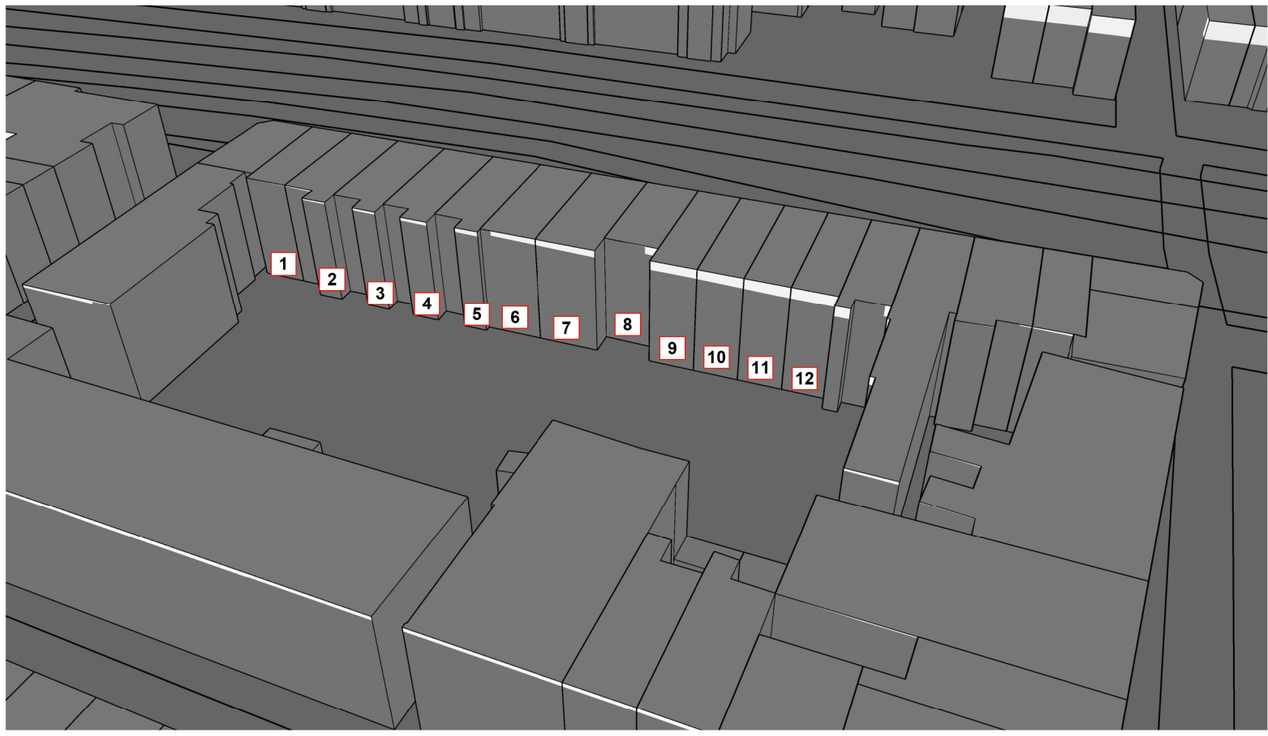
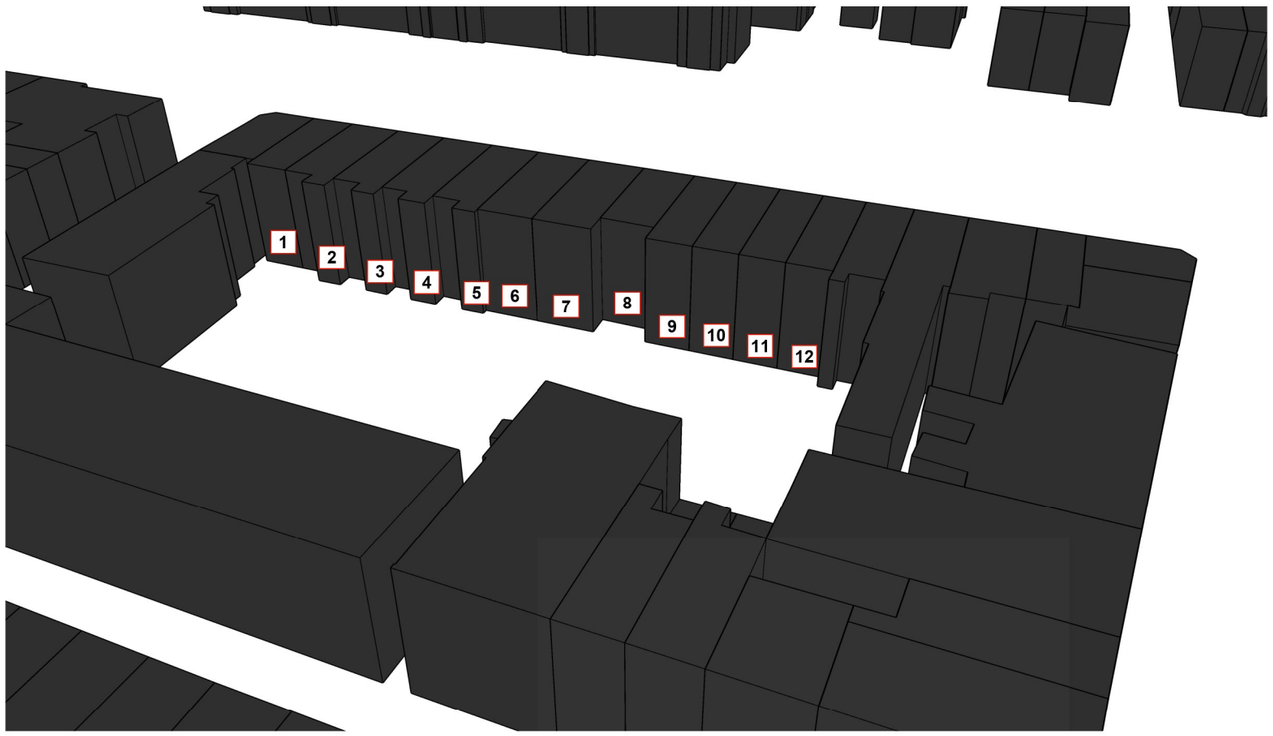
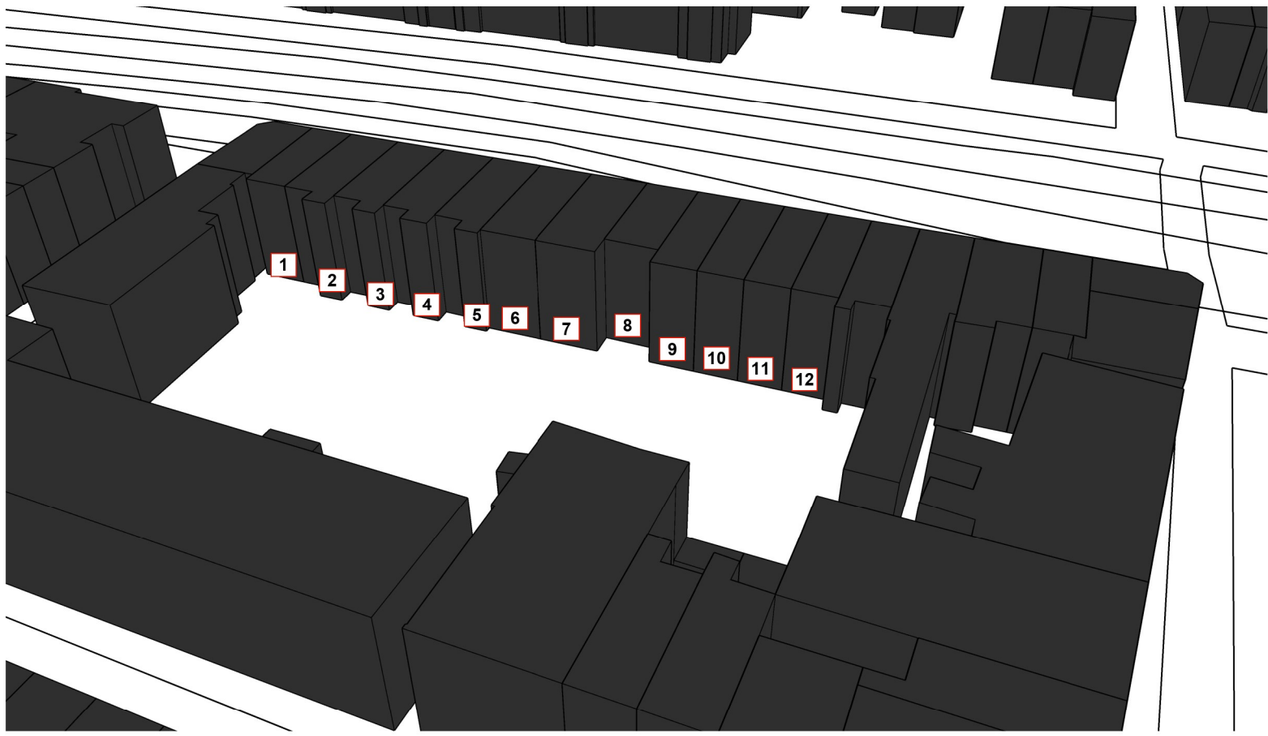




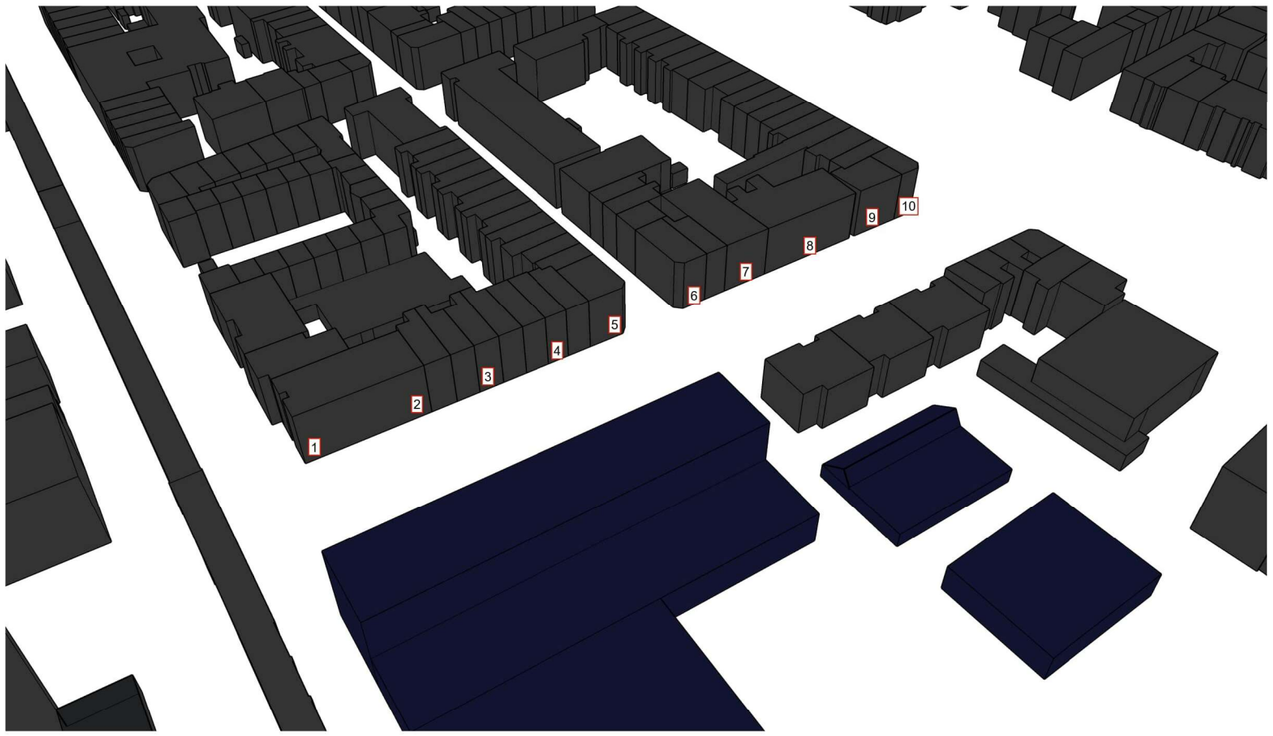
Noordsingel 108 - 130
21 september
19.00





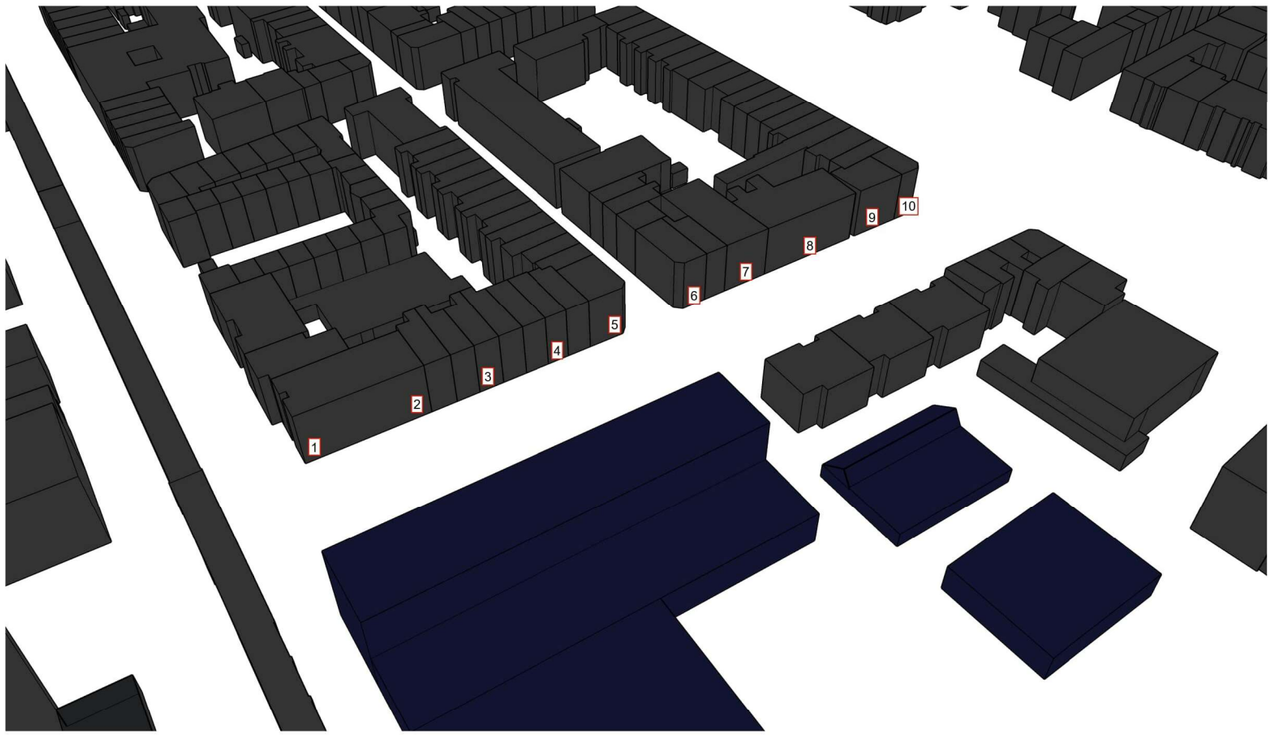
bijlage 12. resultaten 21 september Teilingerstraat (noordzijde) huidig vs. nieuw

Teilingerstraat Noordzijde
21 september
06.00



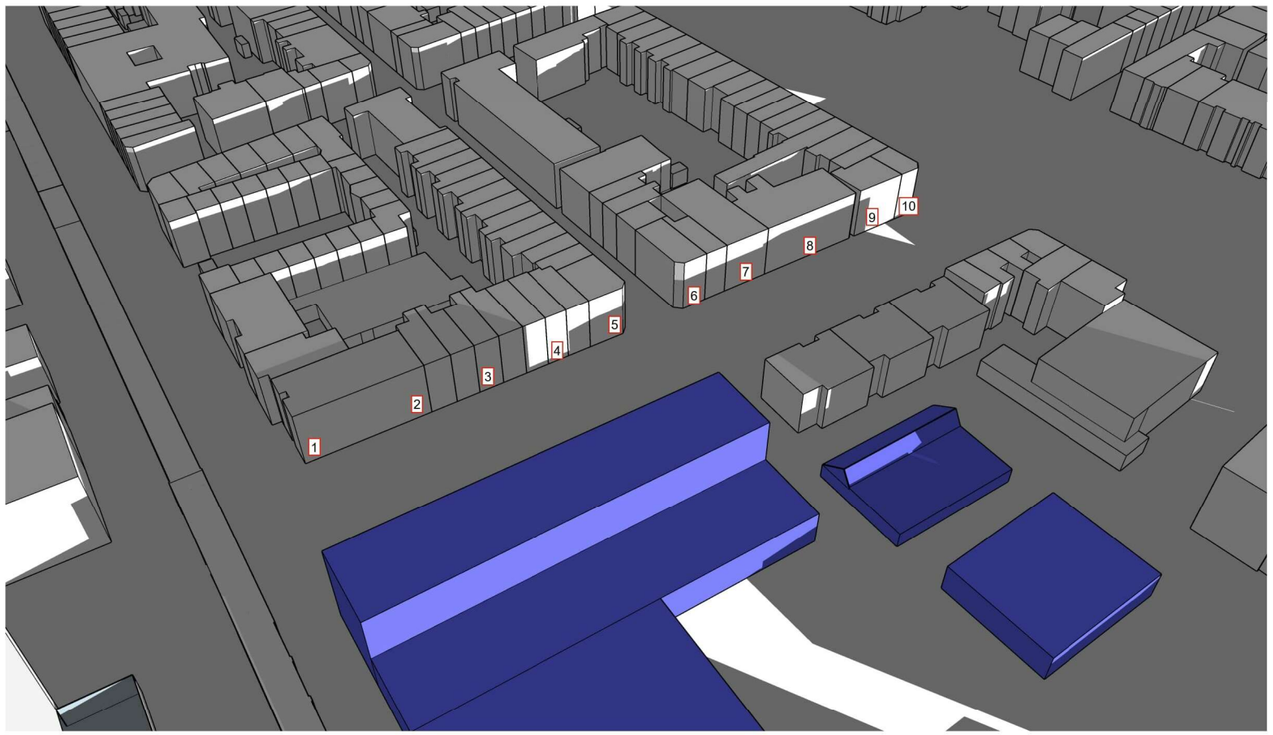


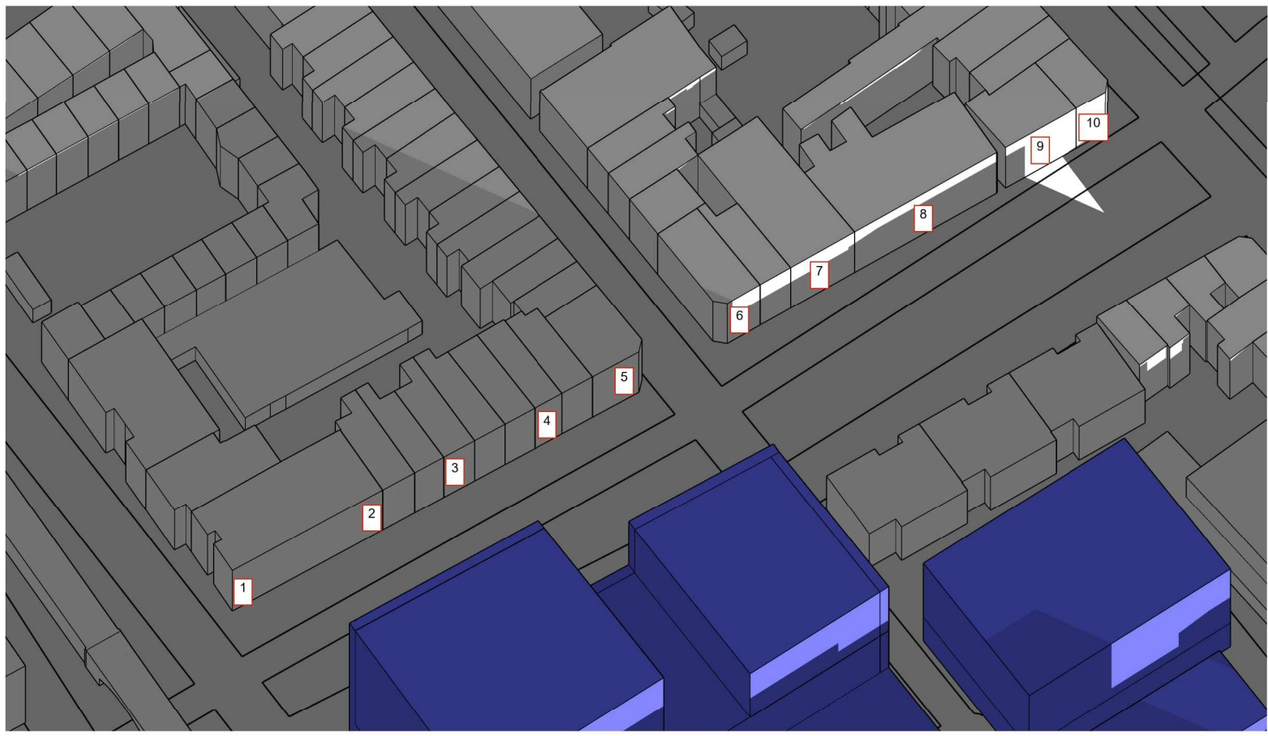
Teilingerstraat Noordzijde
21 september
06.30



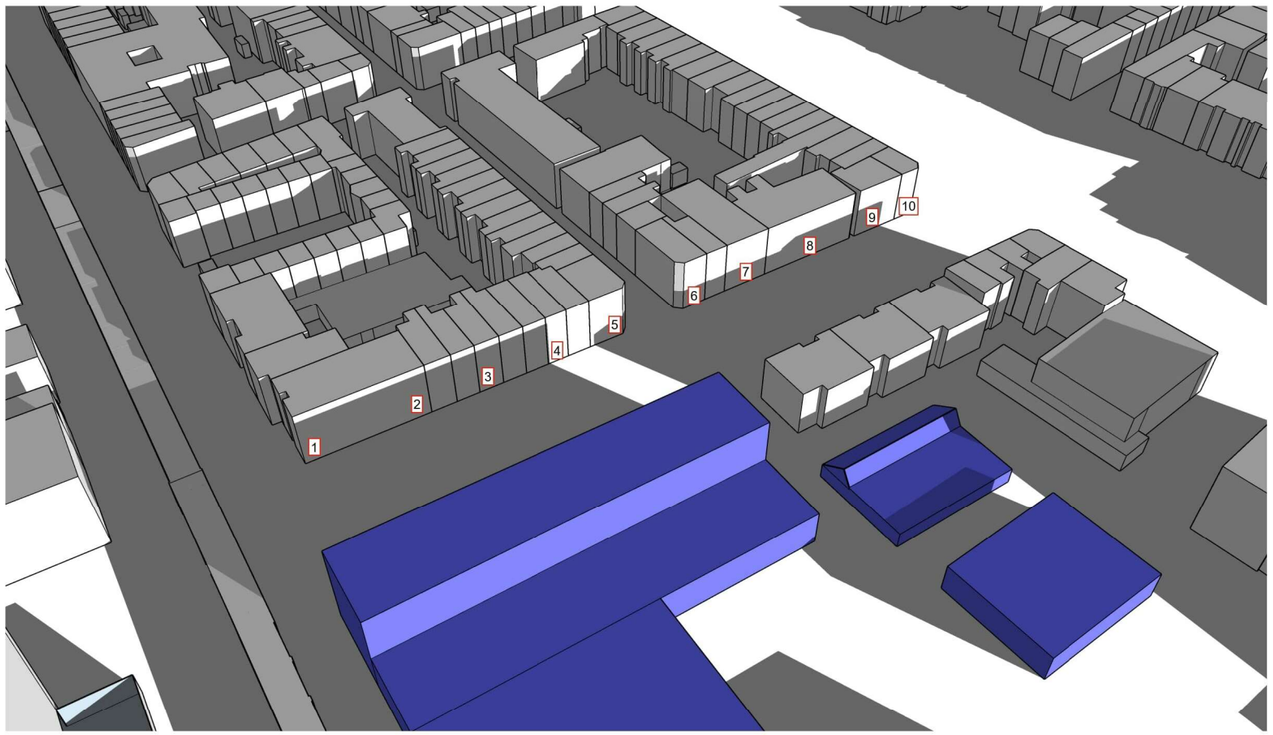


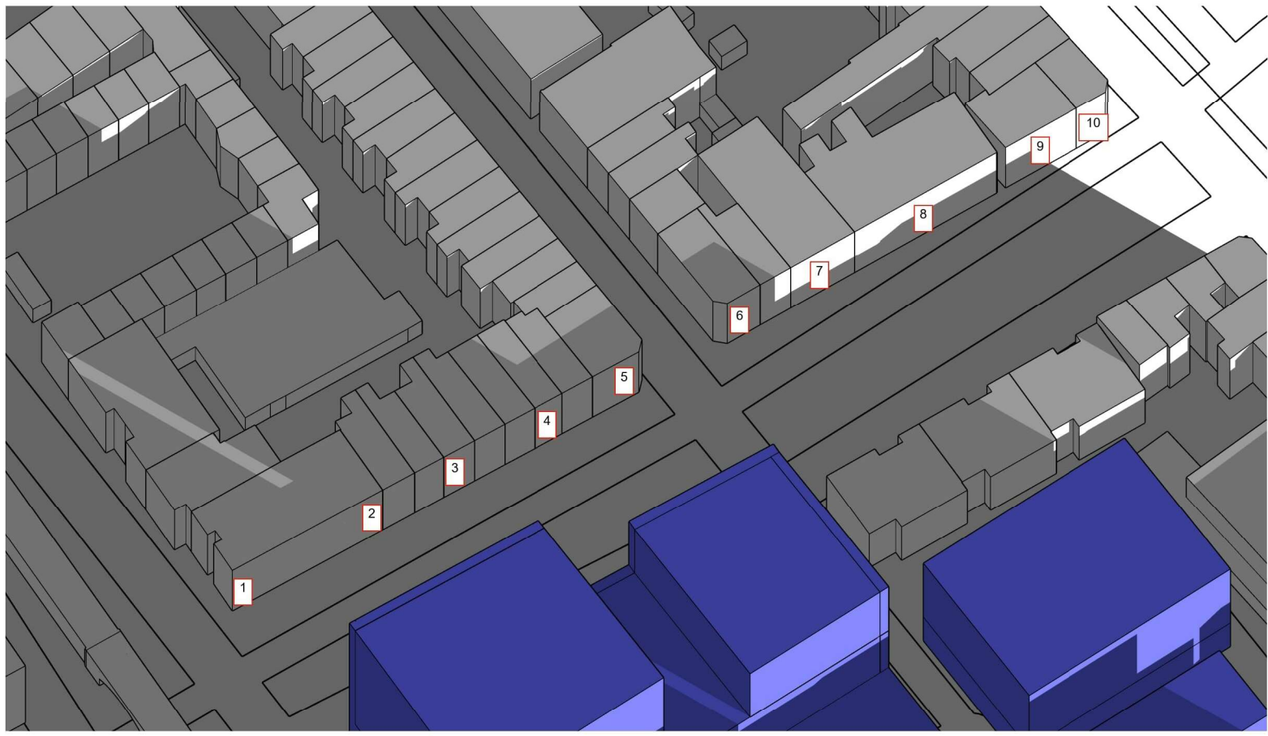
Teilingerstraat Noordzijde
21 september
07.00



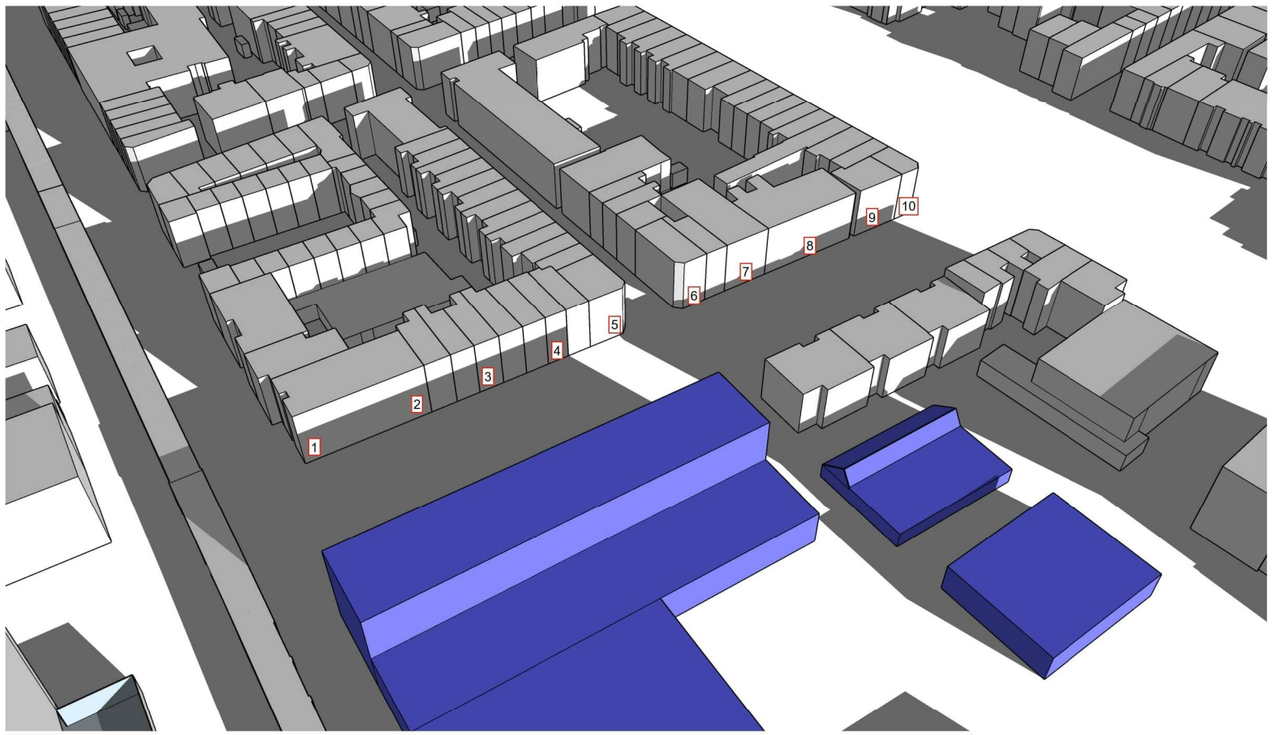


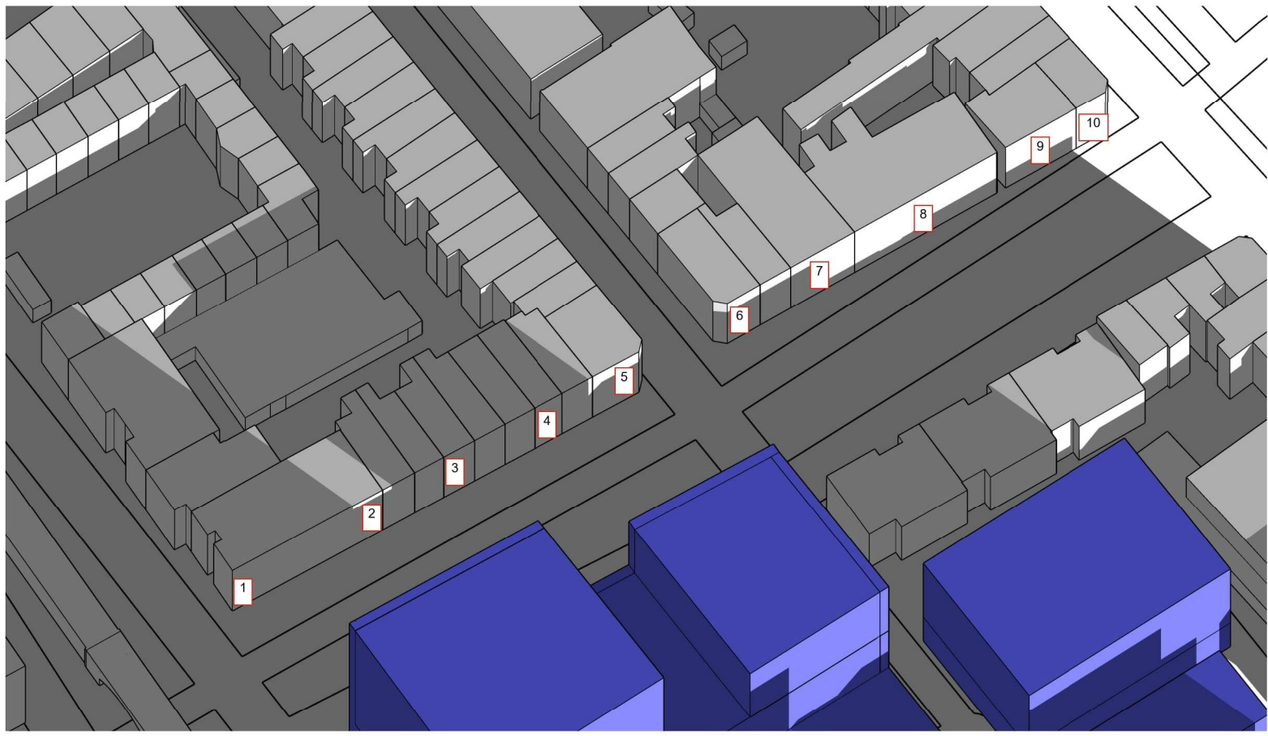
Teilingerstraat Noordzijde
21 september
07.30



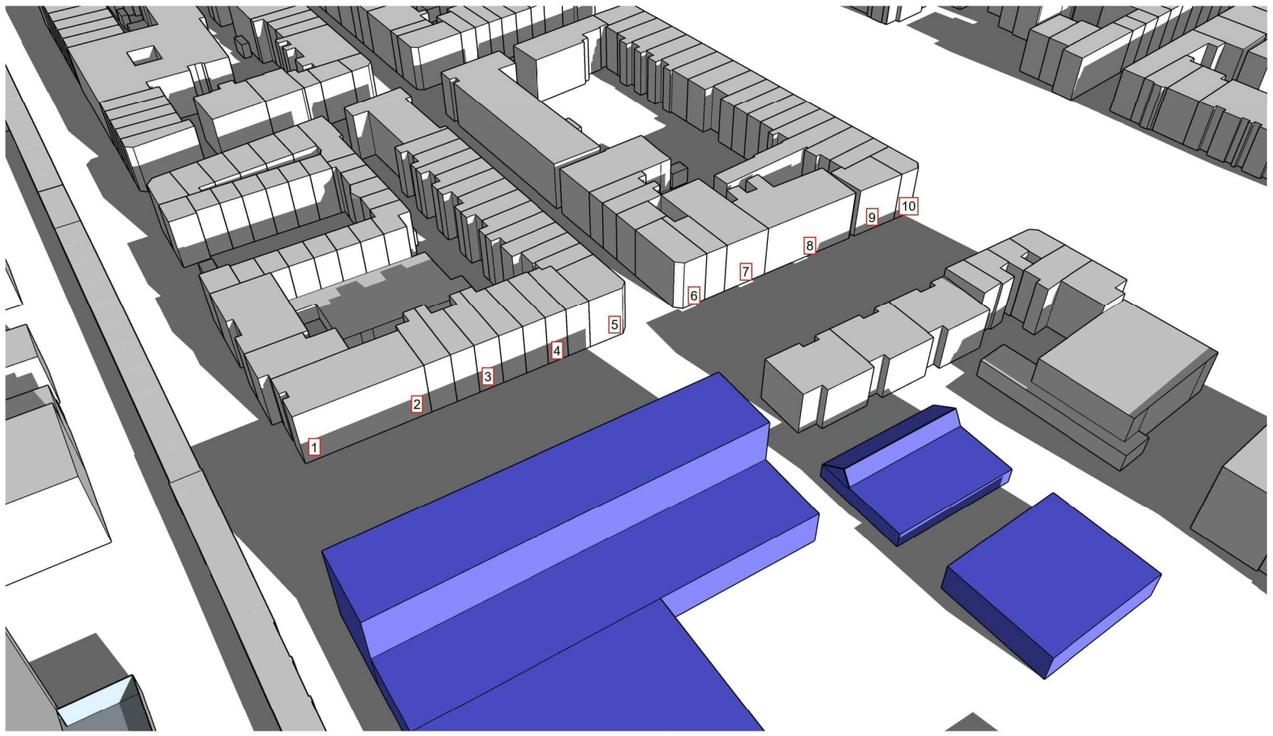


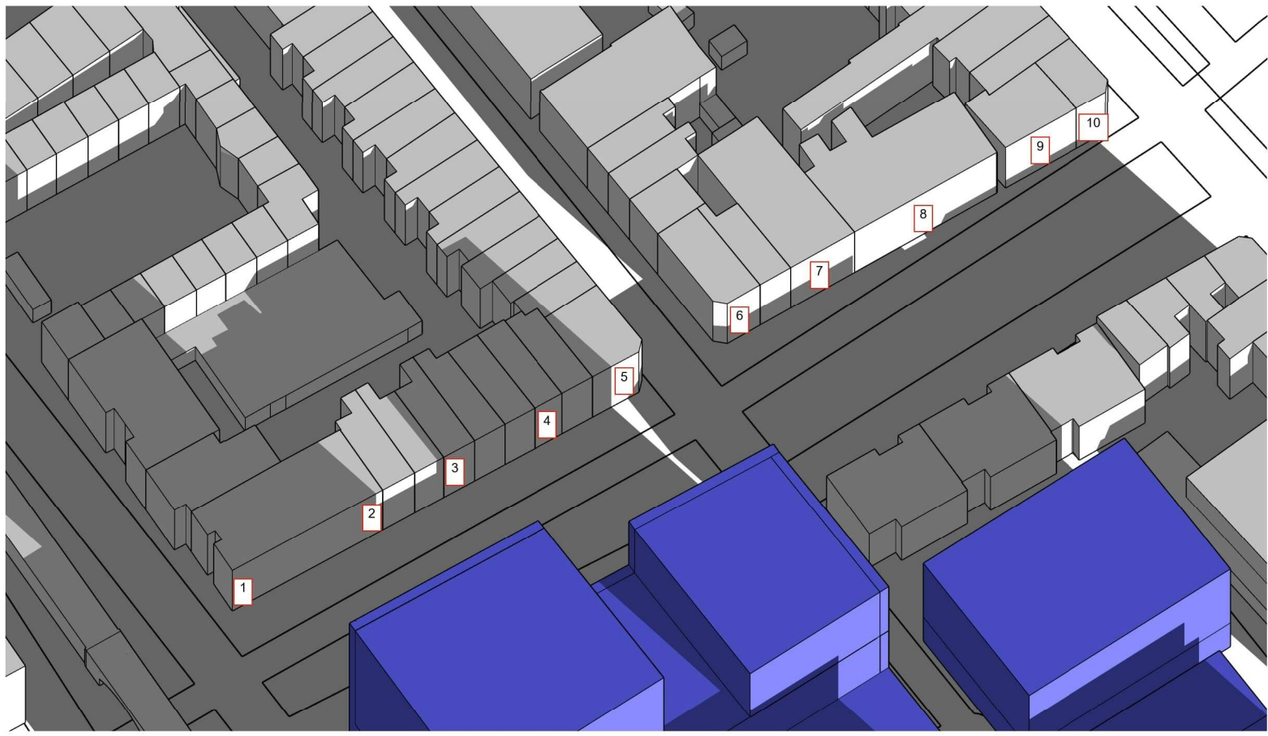
Teilingerstraat Noordzijde
21 september
08.00



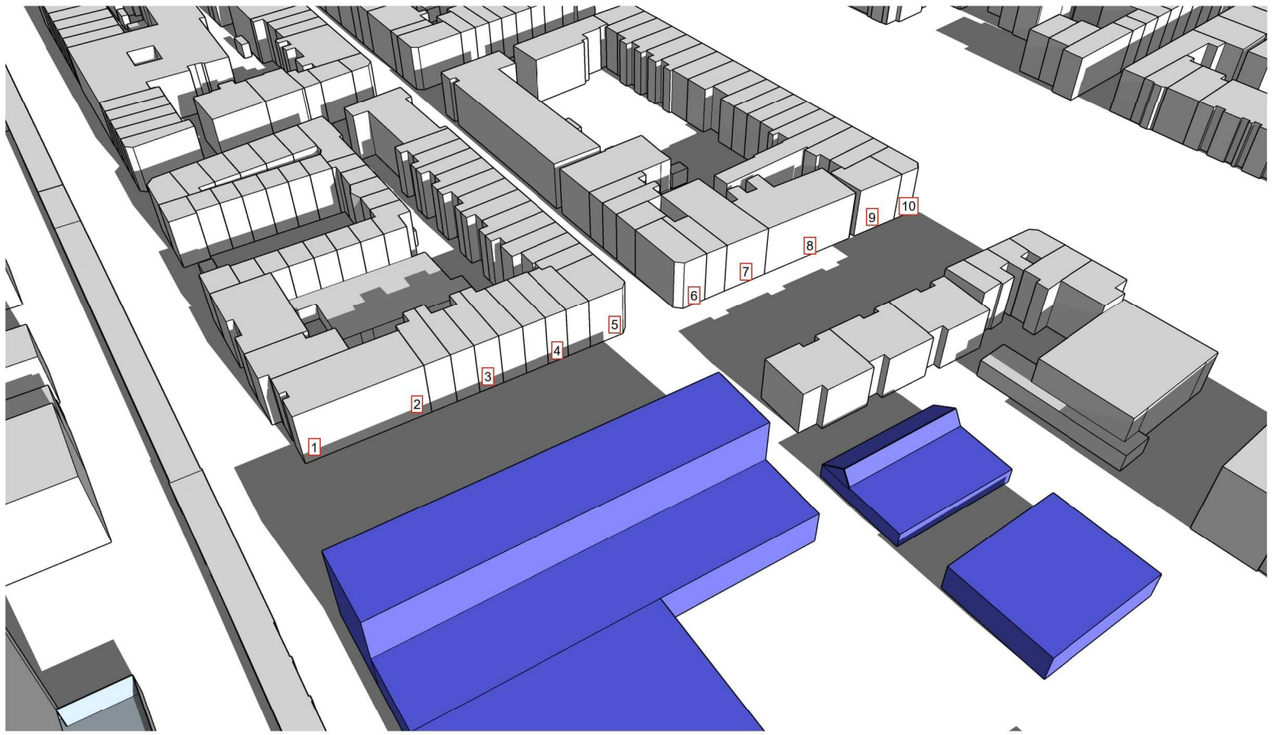


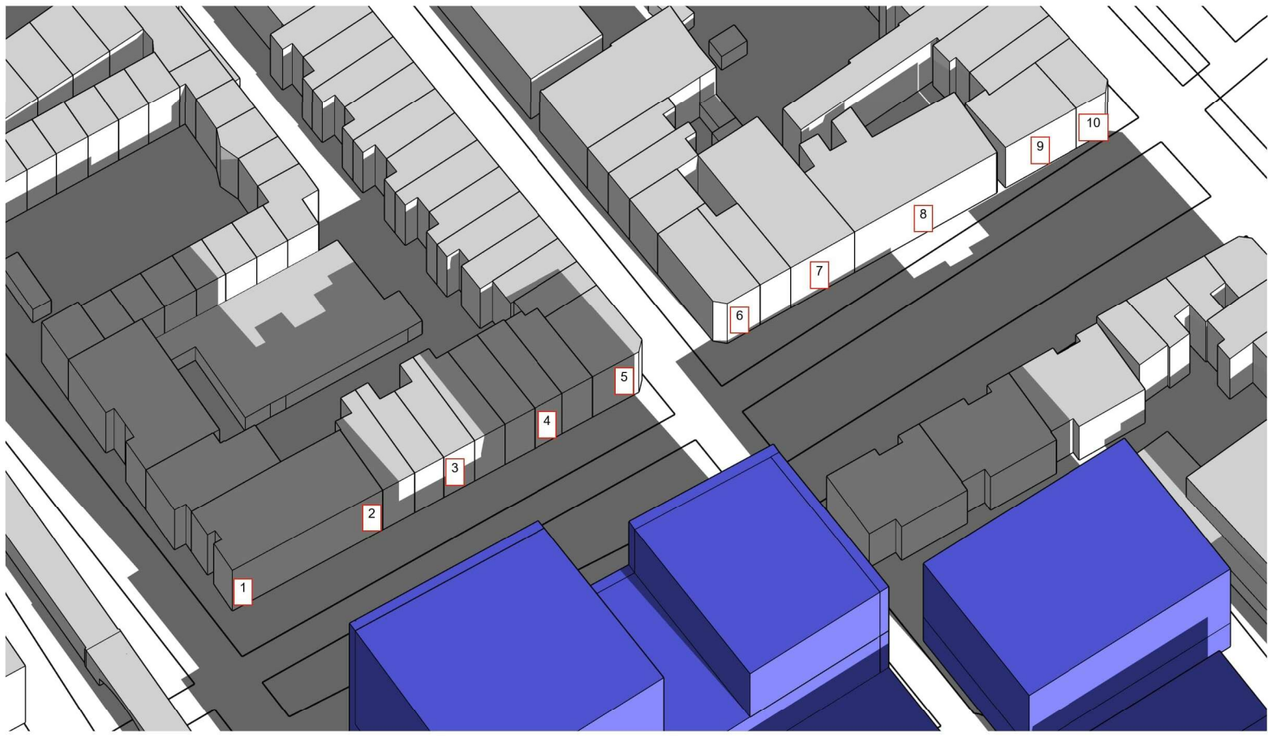
Teilingerstraat Noordzijde
21 september
08.30



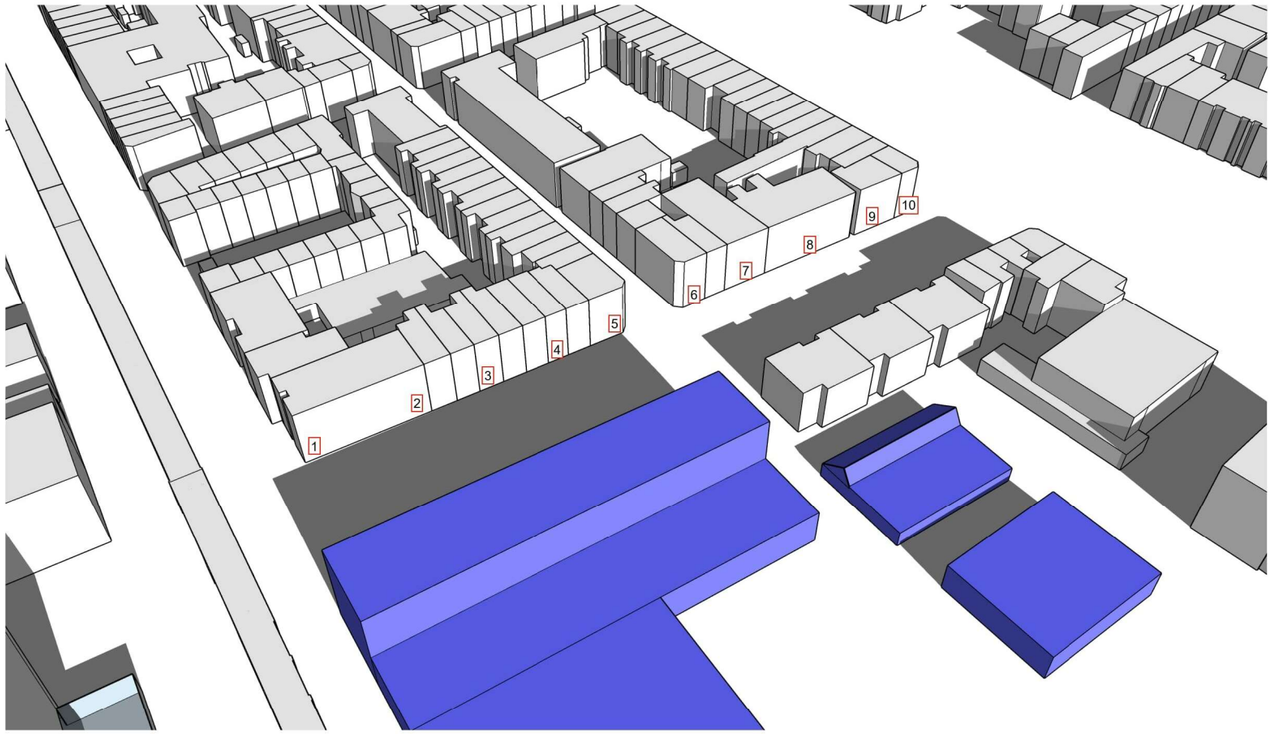


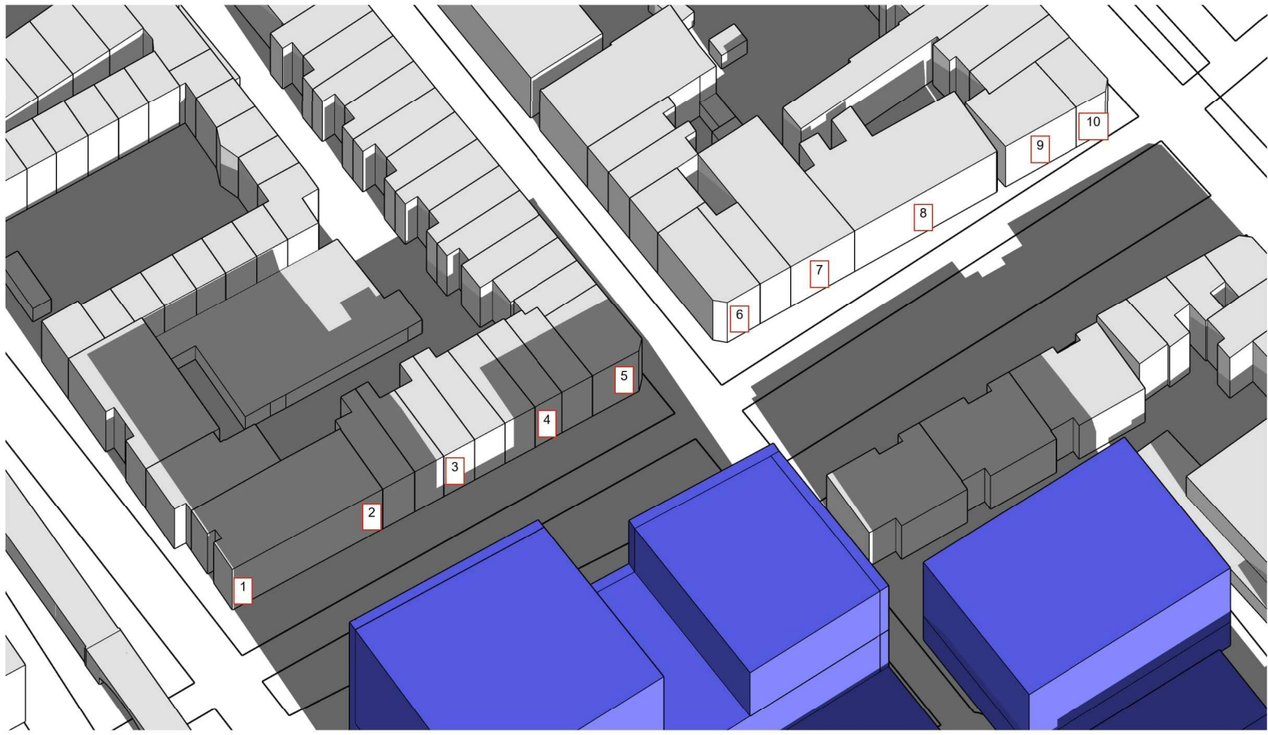
Teilingerstraat Noordzijde
21 september
09.00



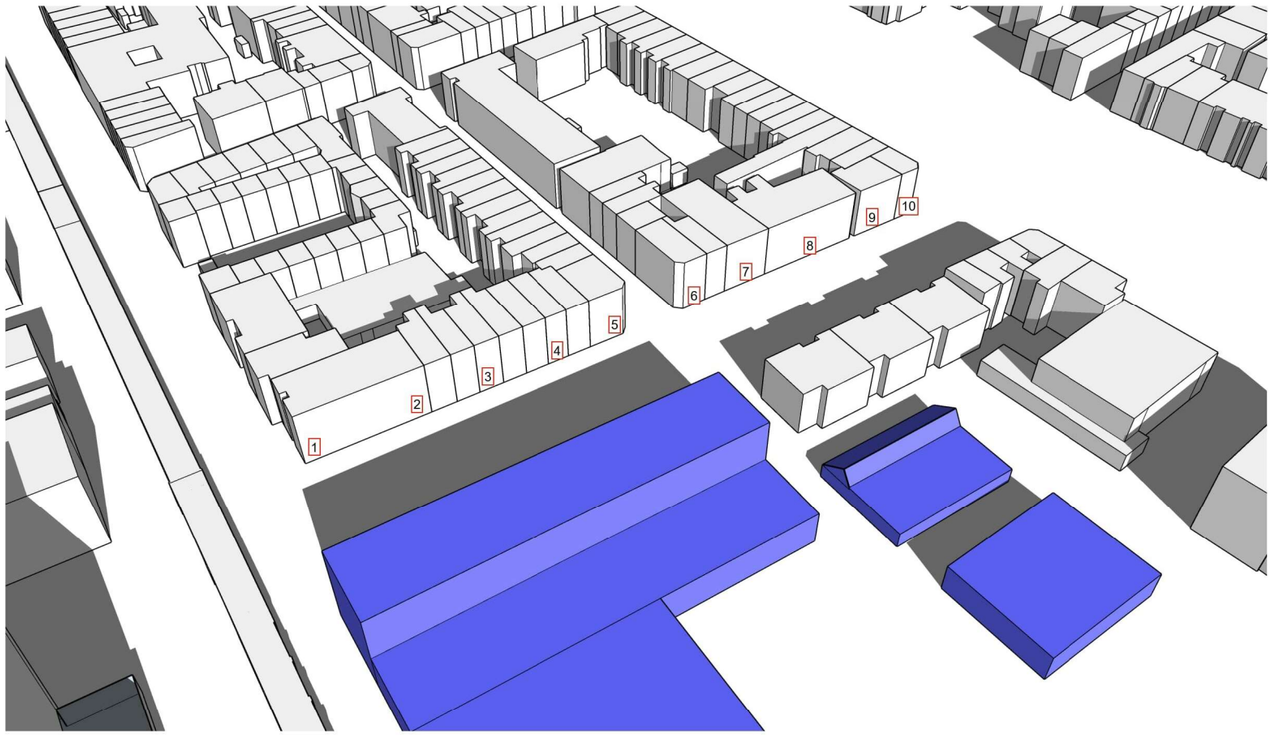


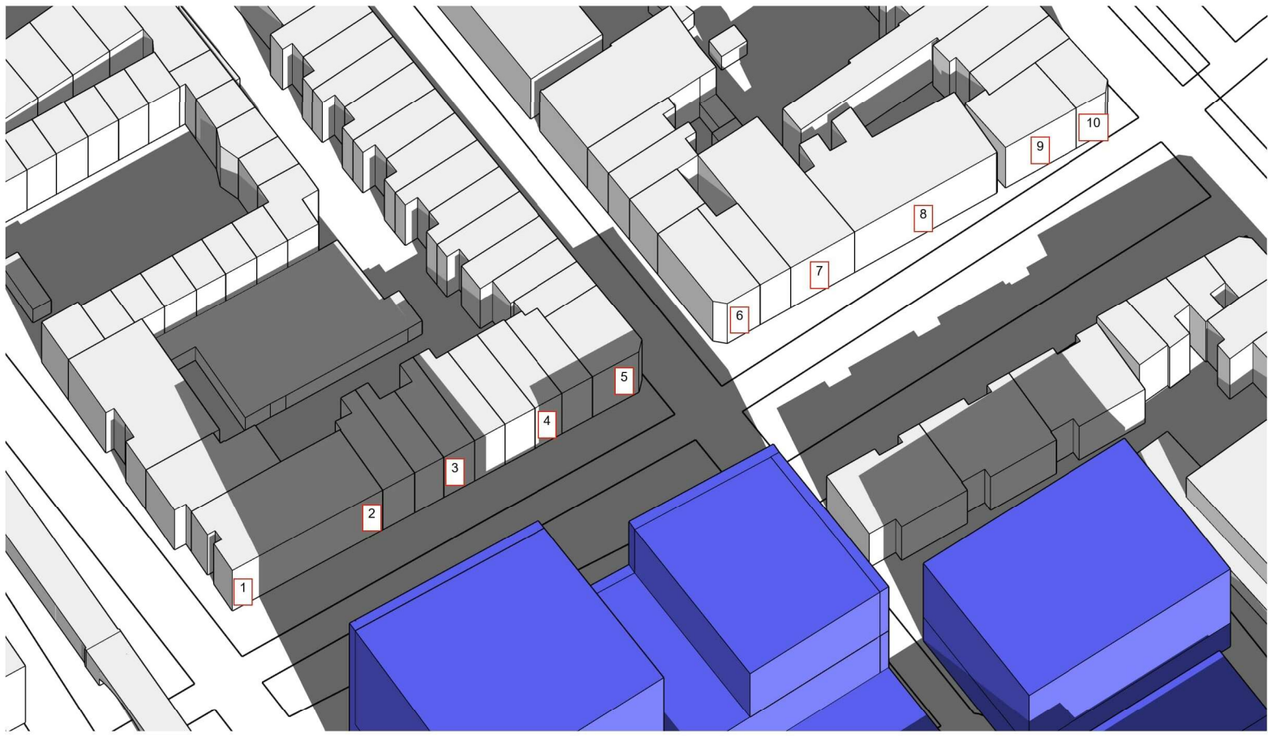
Teilingerstraat Noordzijde
21 september
09.30



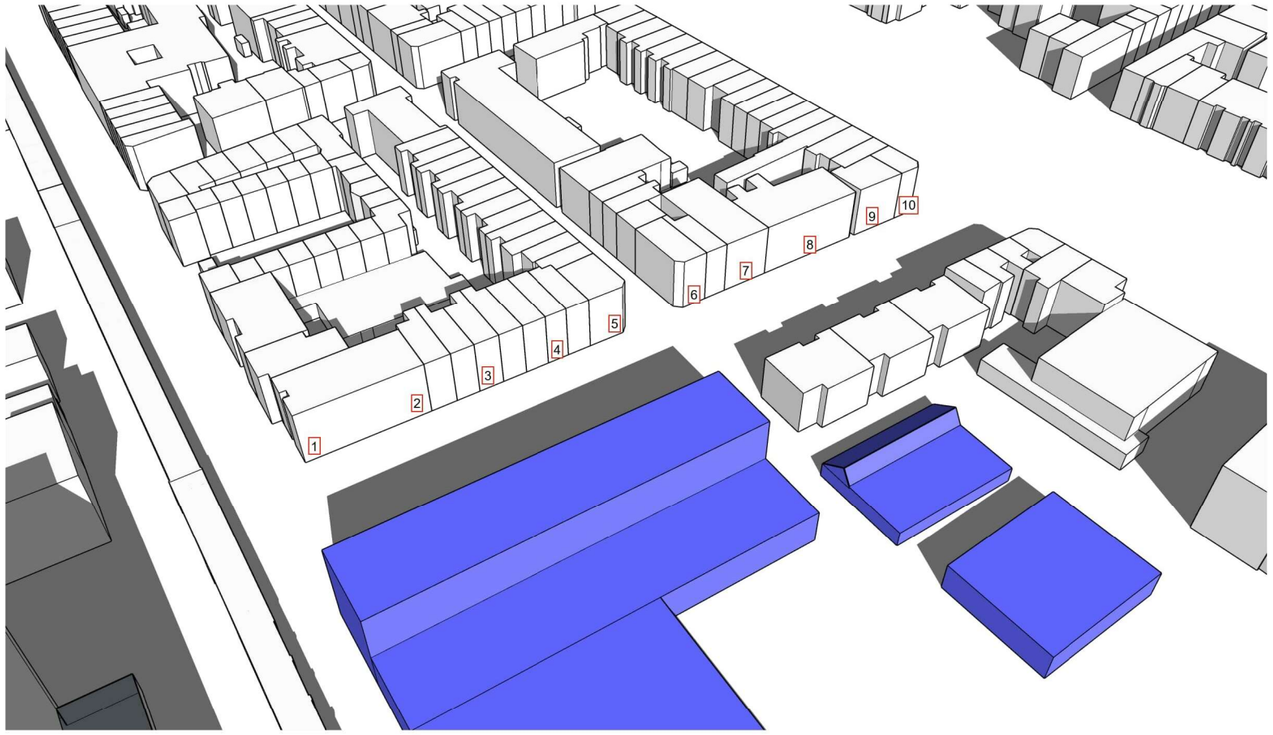


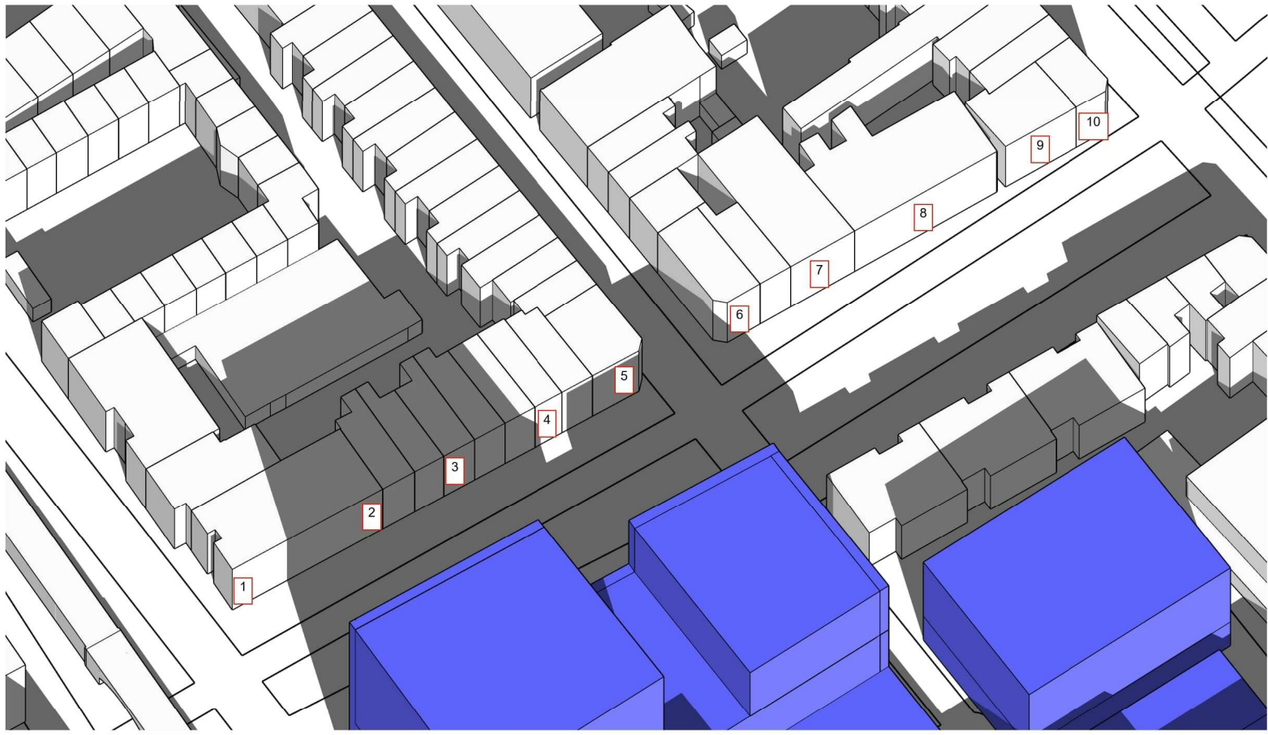
Teilingerstraat Noordzijde
21 september
10.00



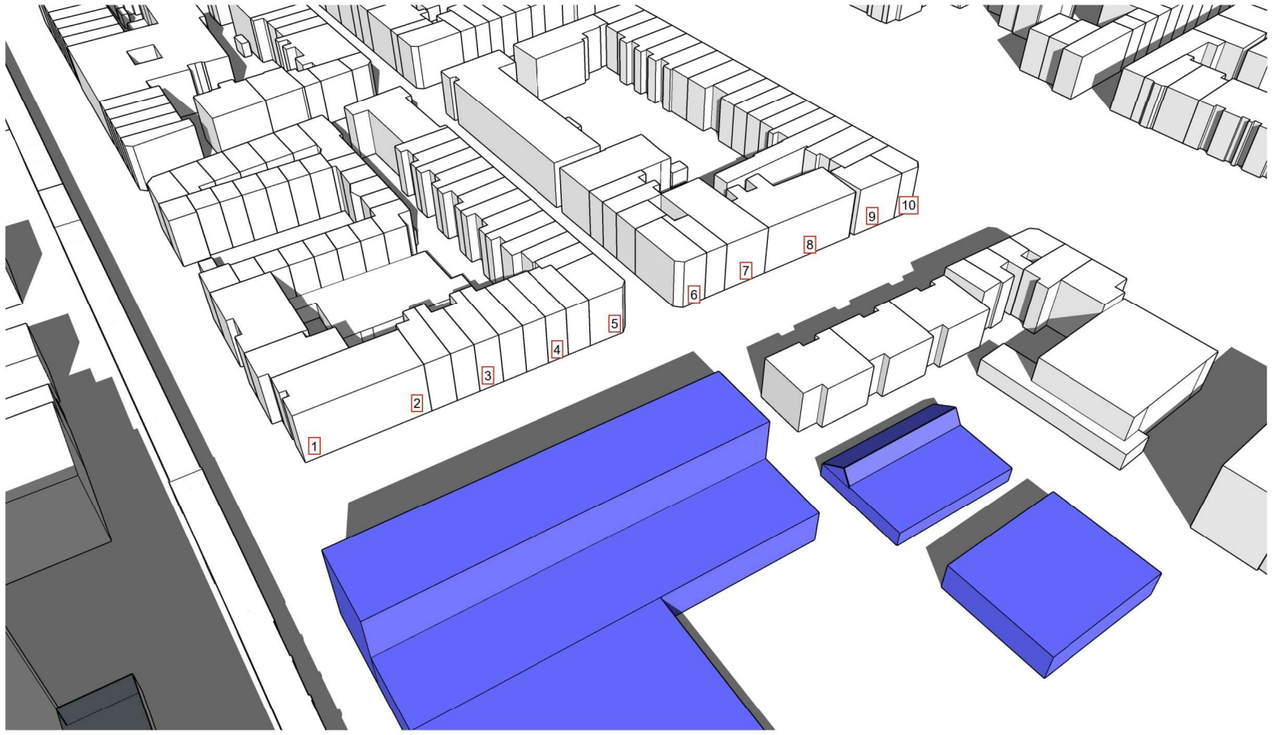


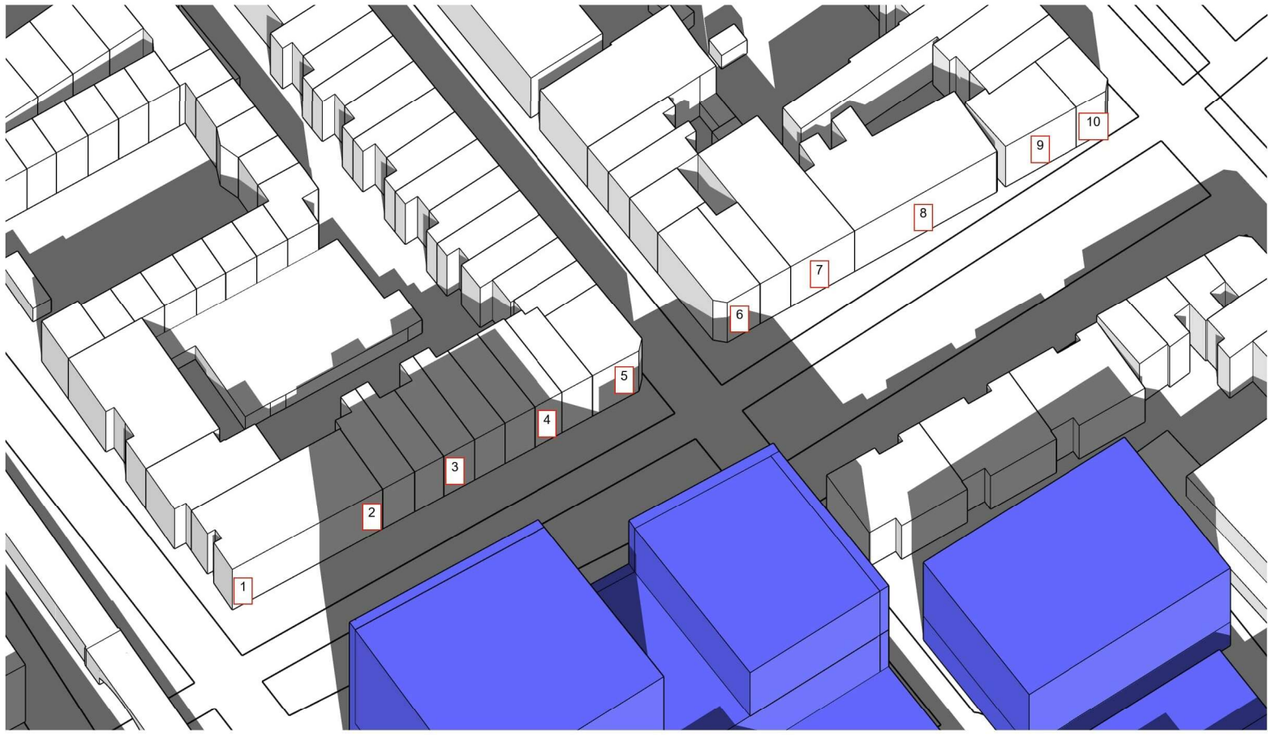
Teilingerstraat Noordzijde
21 september
10.30



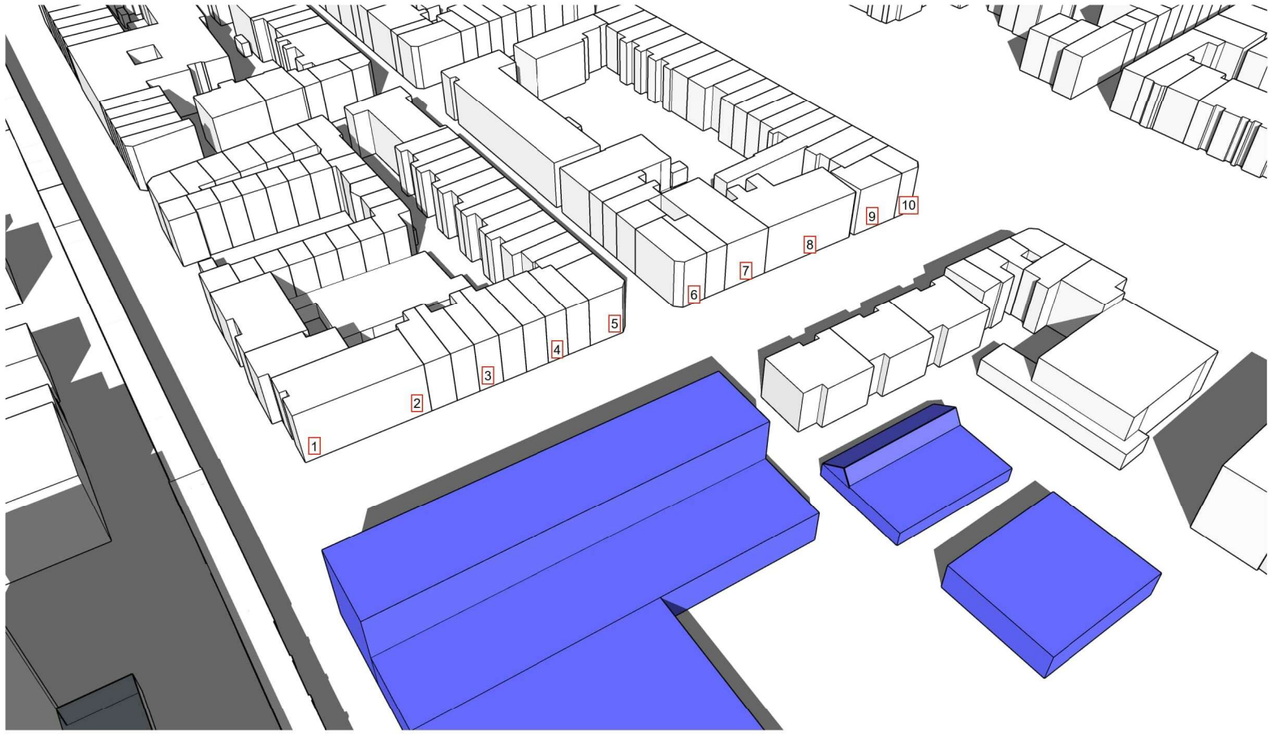


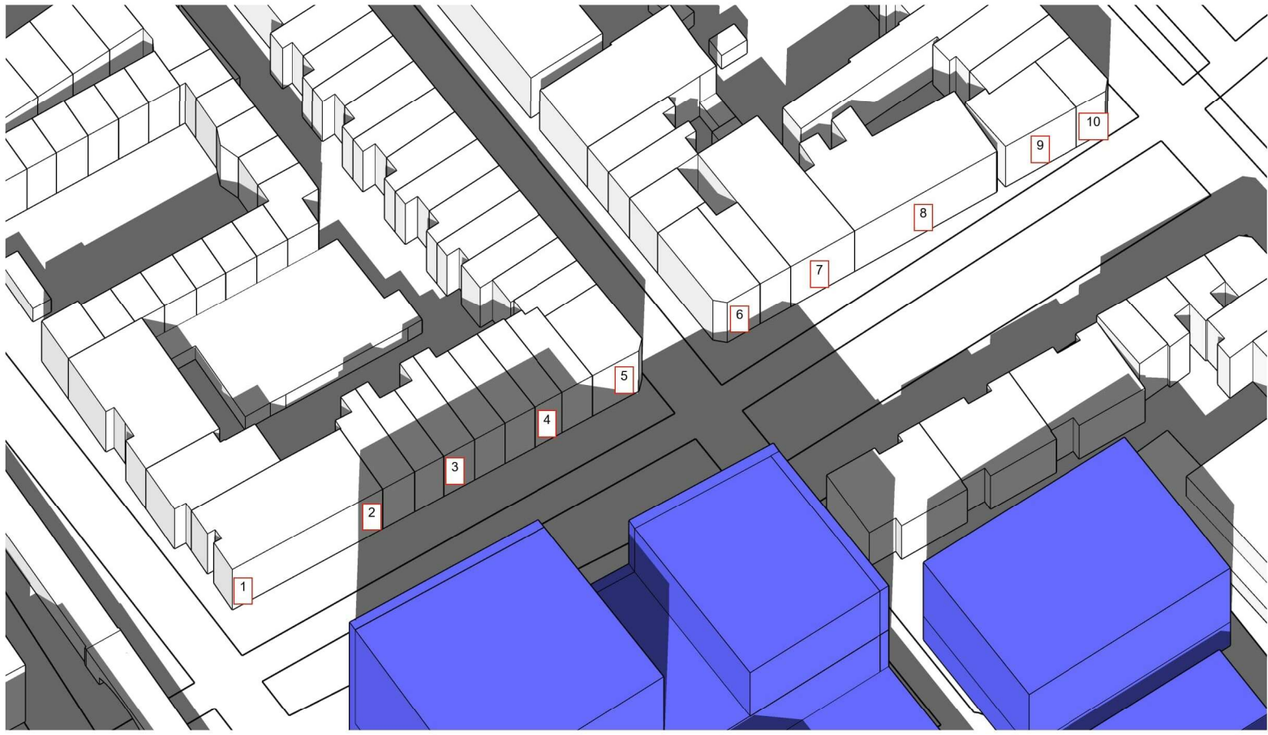
Teilingerstraat Noordzijde
21 september
11.00



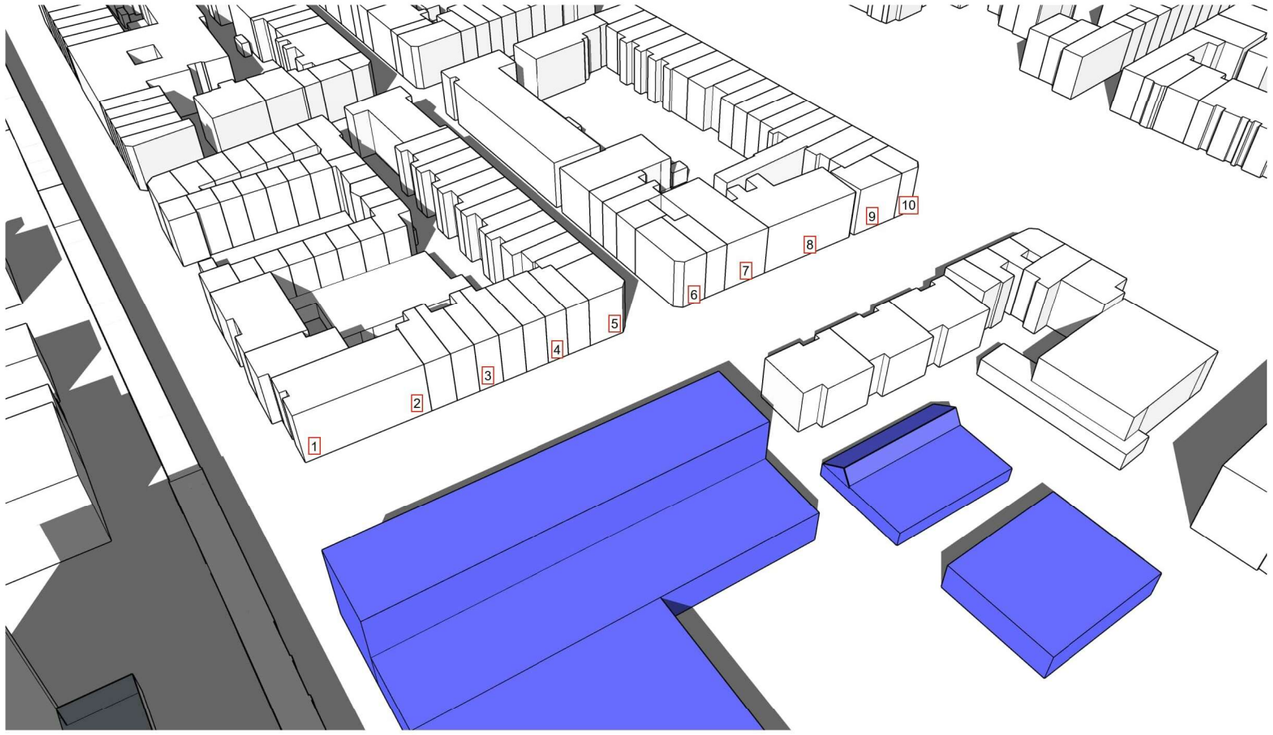


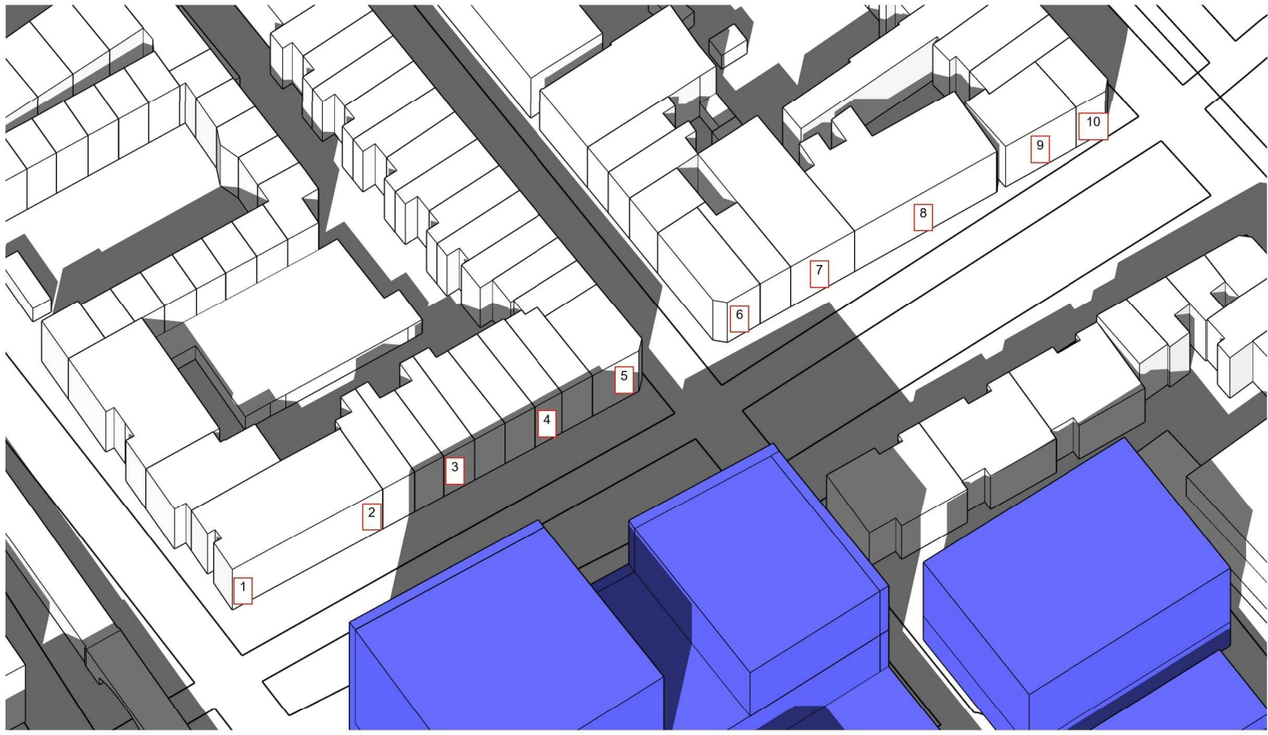
Teilingerstraat Noordzijde
21 september
11.30



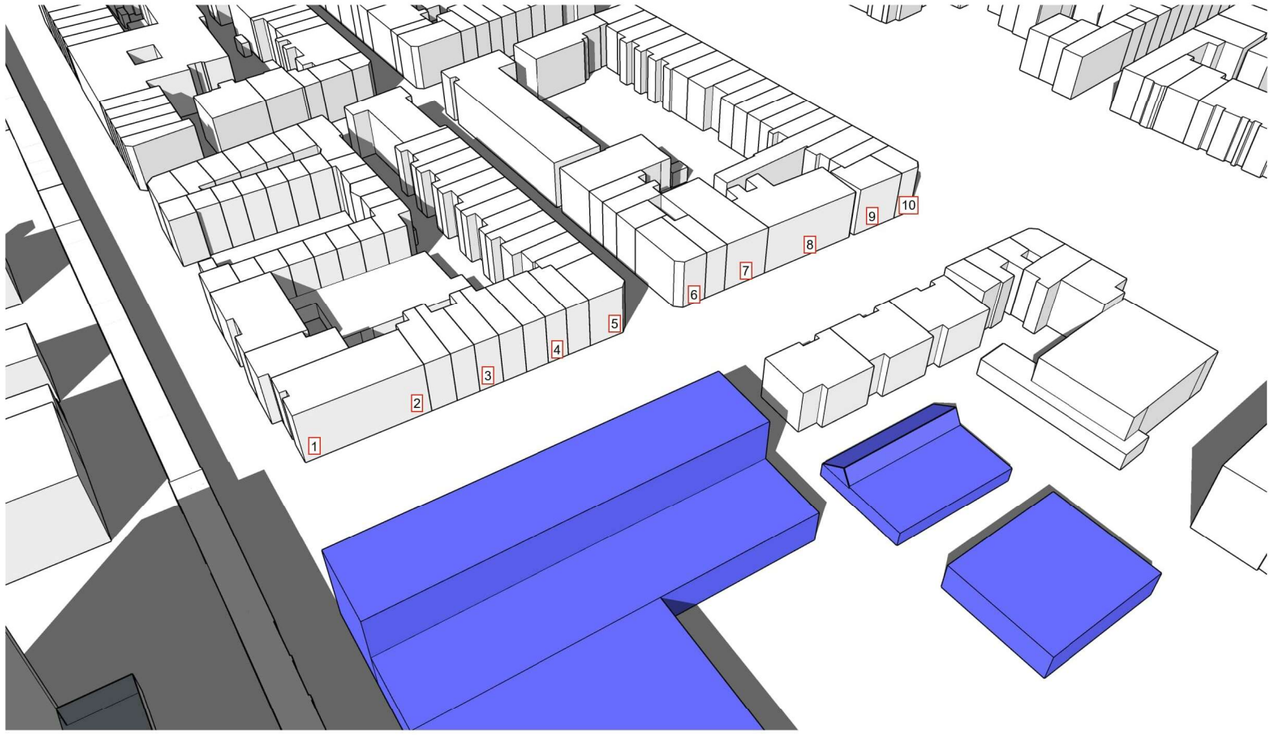


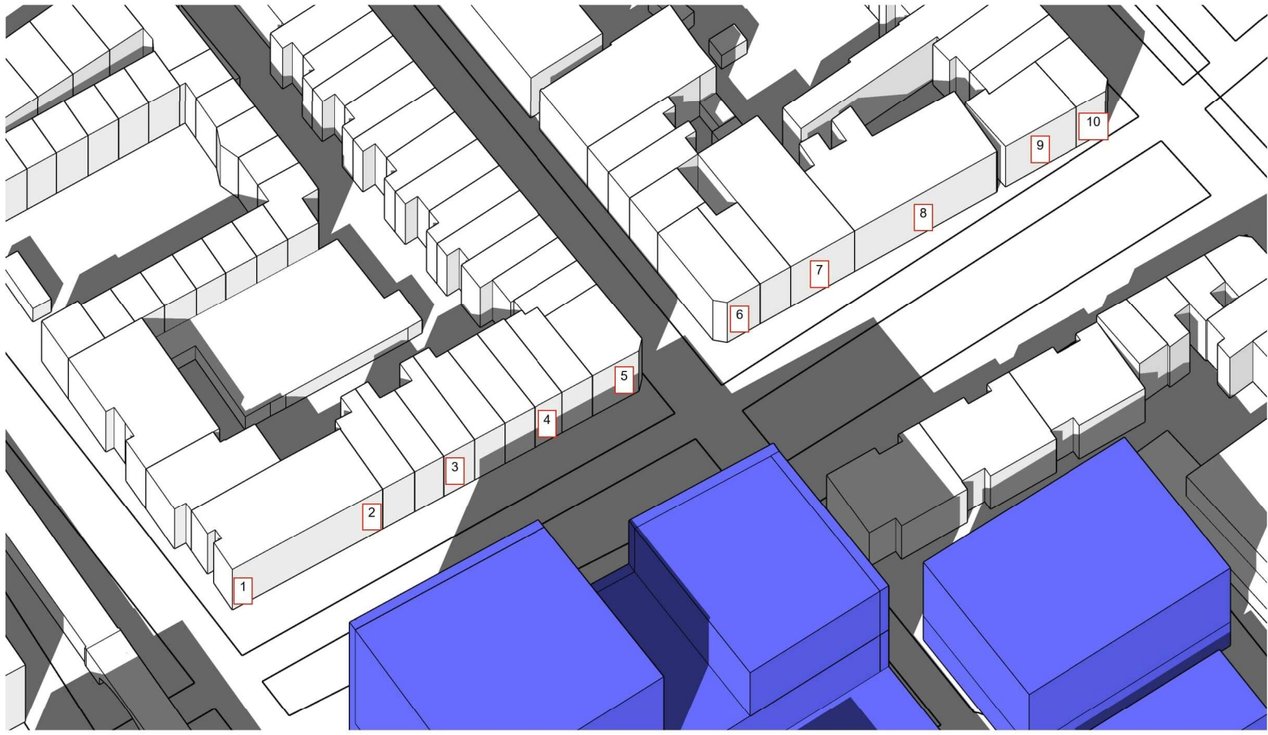
Teilingerstraat Noordzijde
21 september
12.00



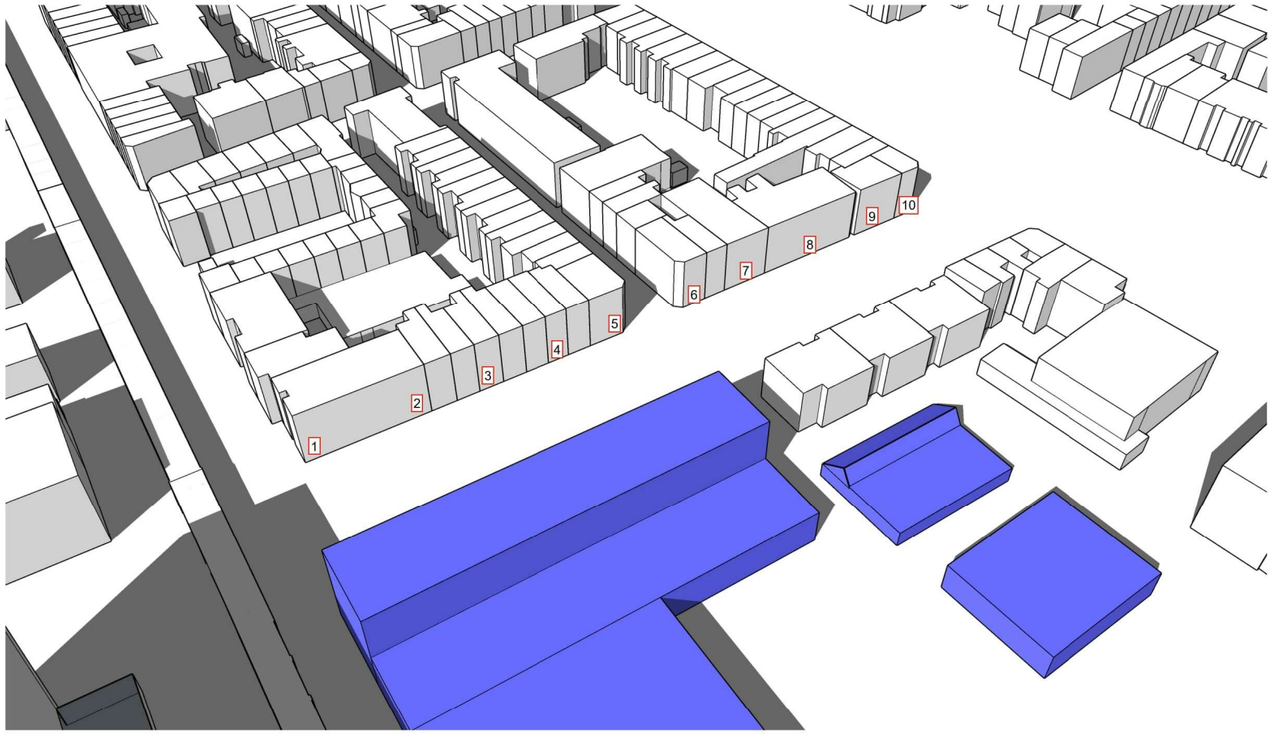


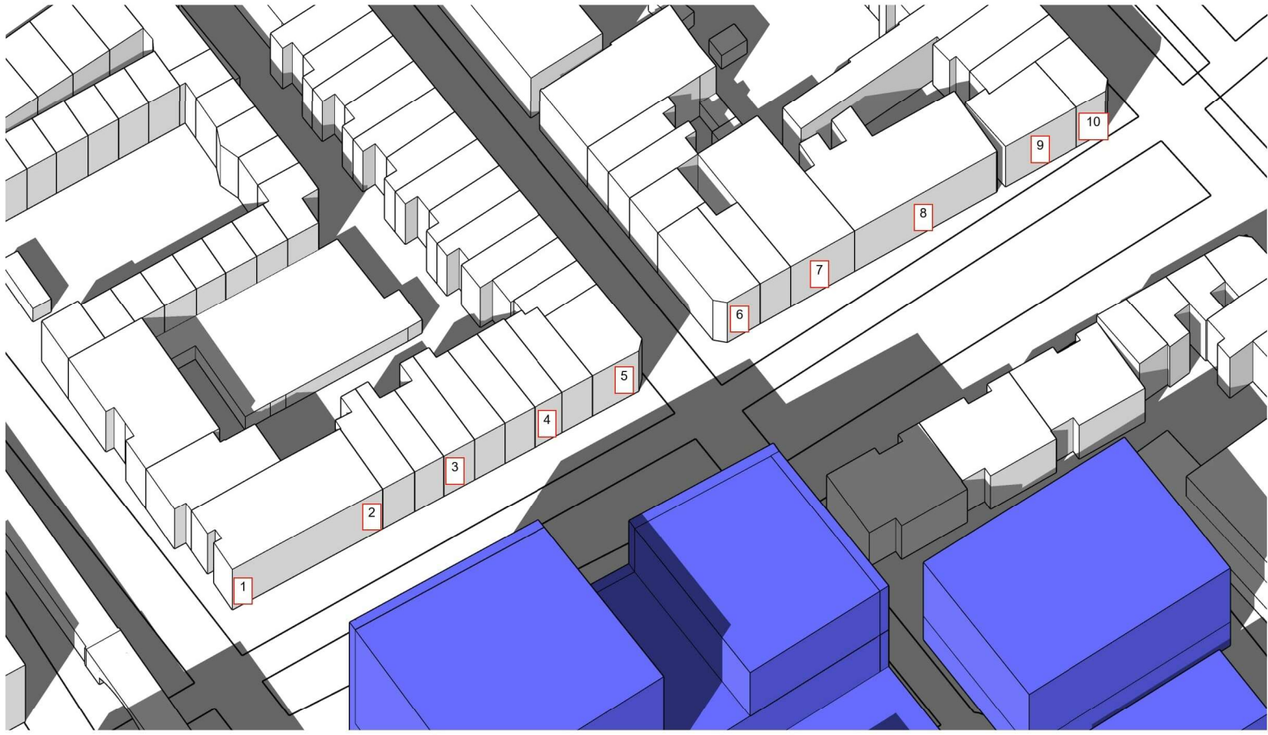
Teilingerstraat Noordzijde
21 september
12.30



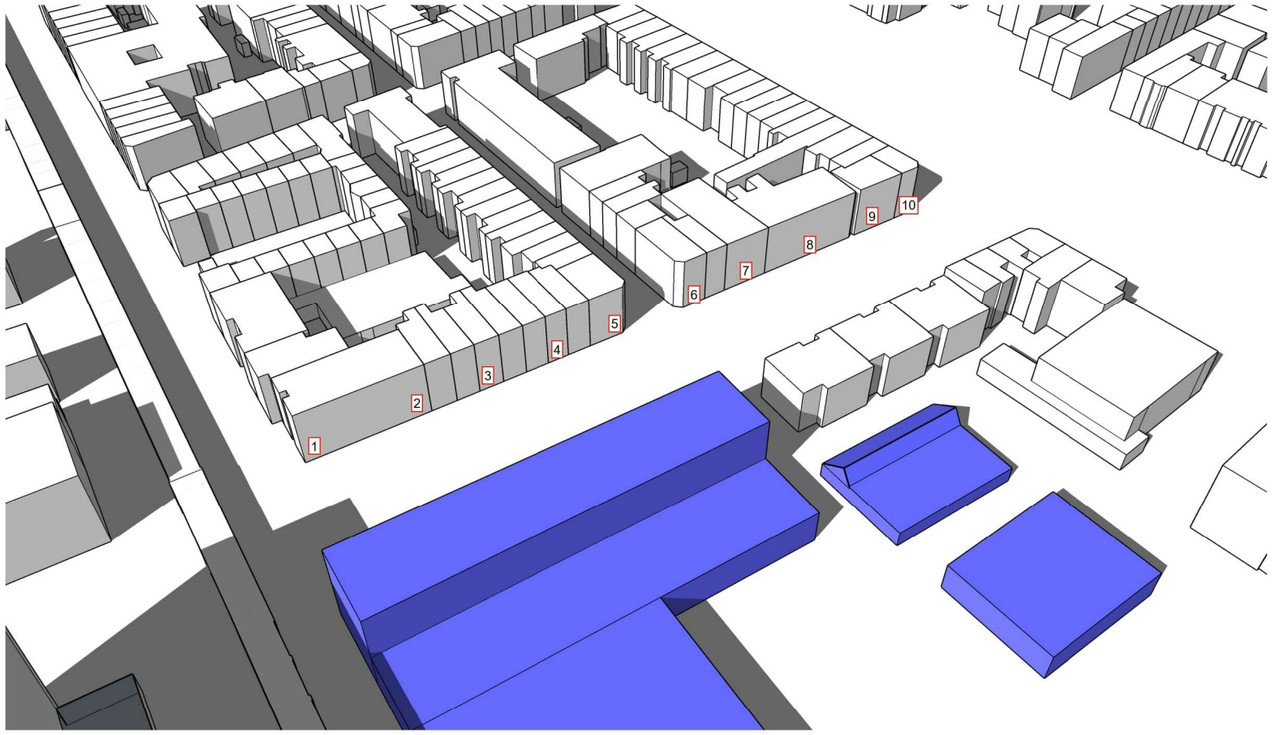


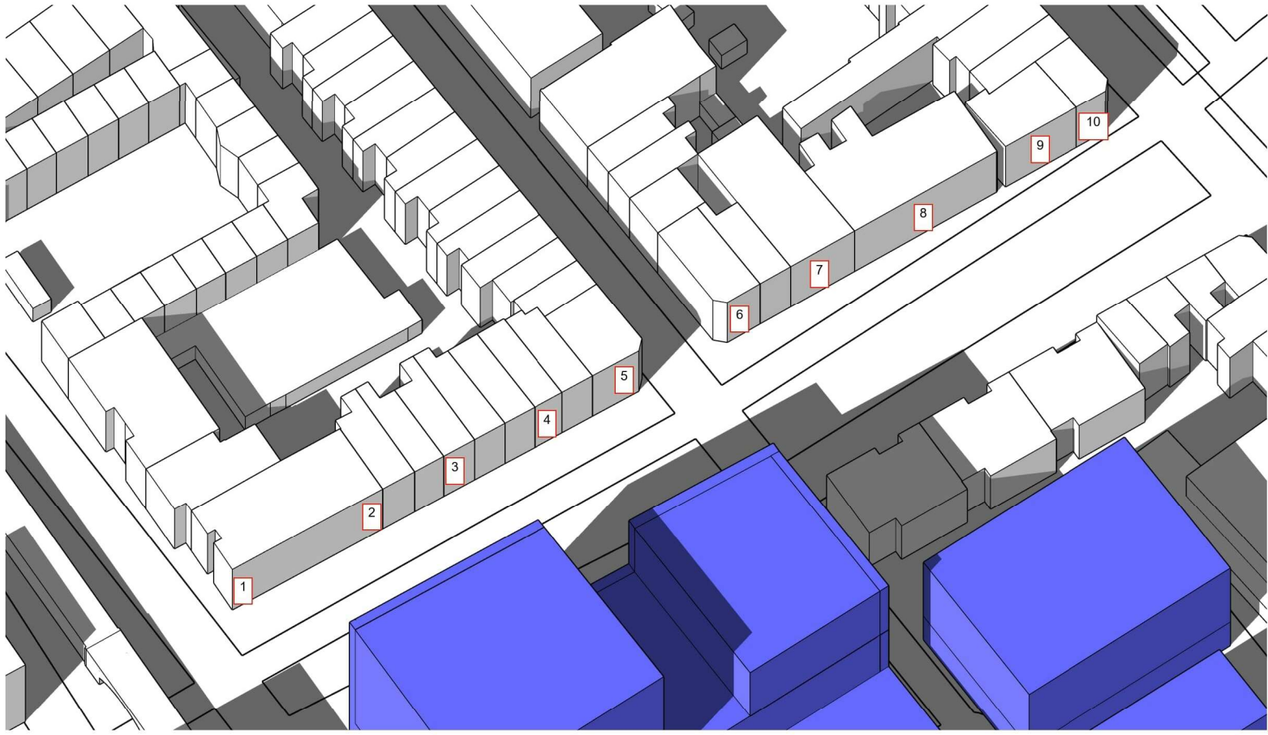
Teilingerstraat Noordzijde
21 september
13.00



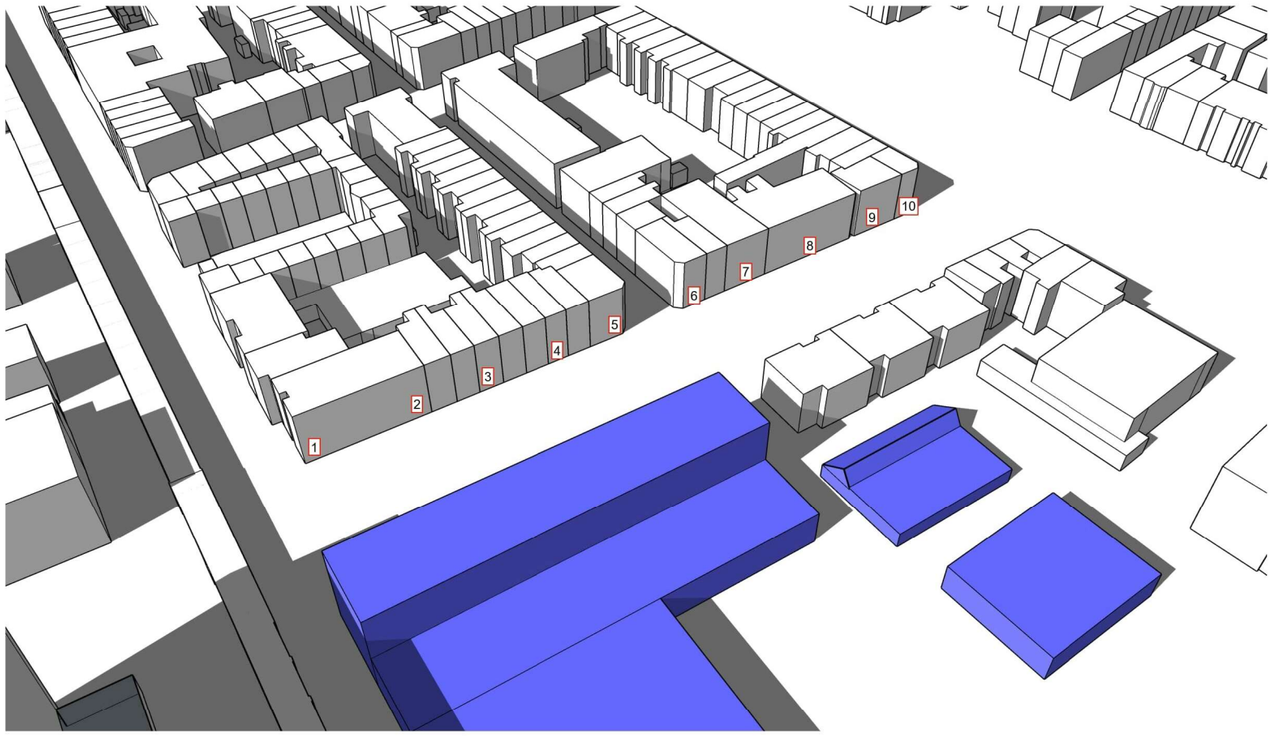


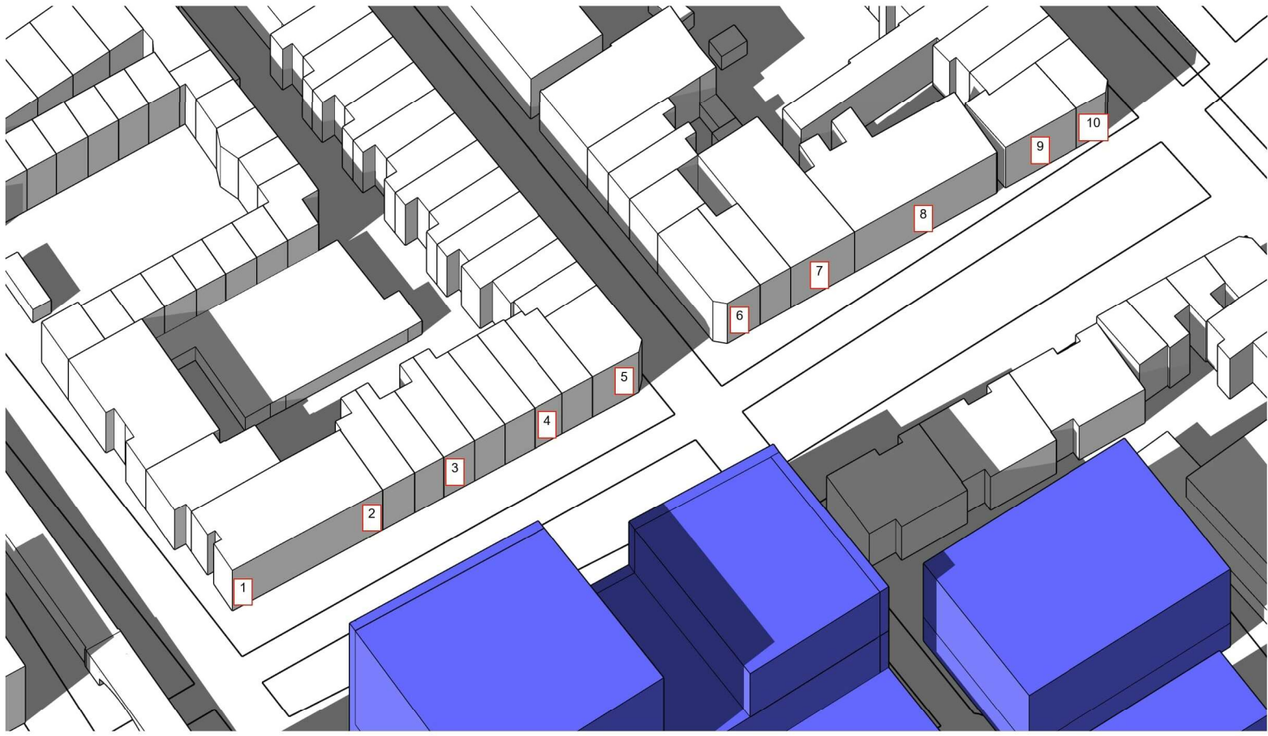
Teilingerstraat Noordzijde
21 september
13.30



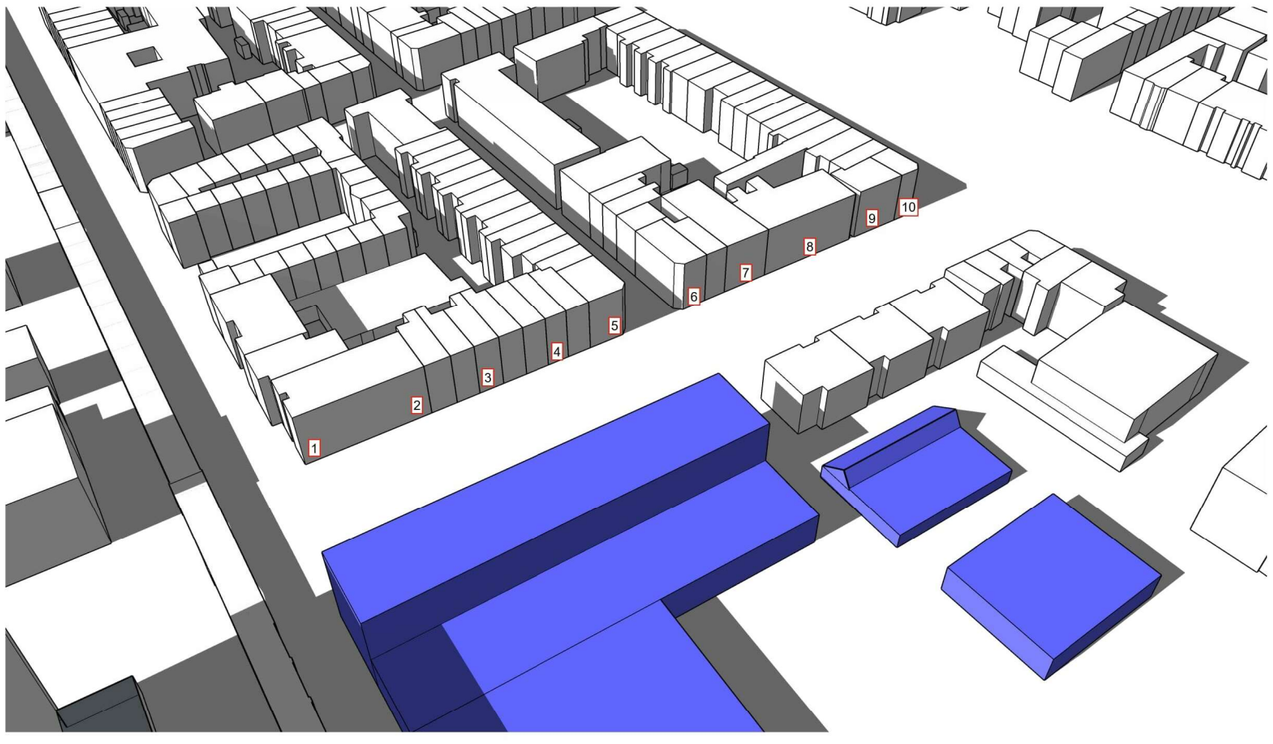


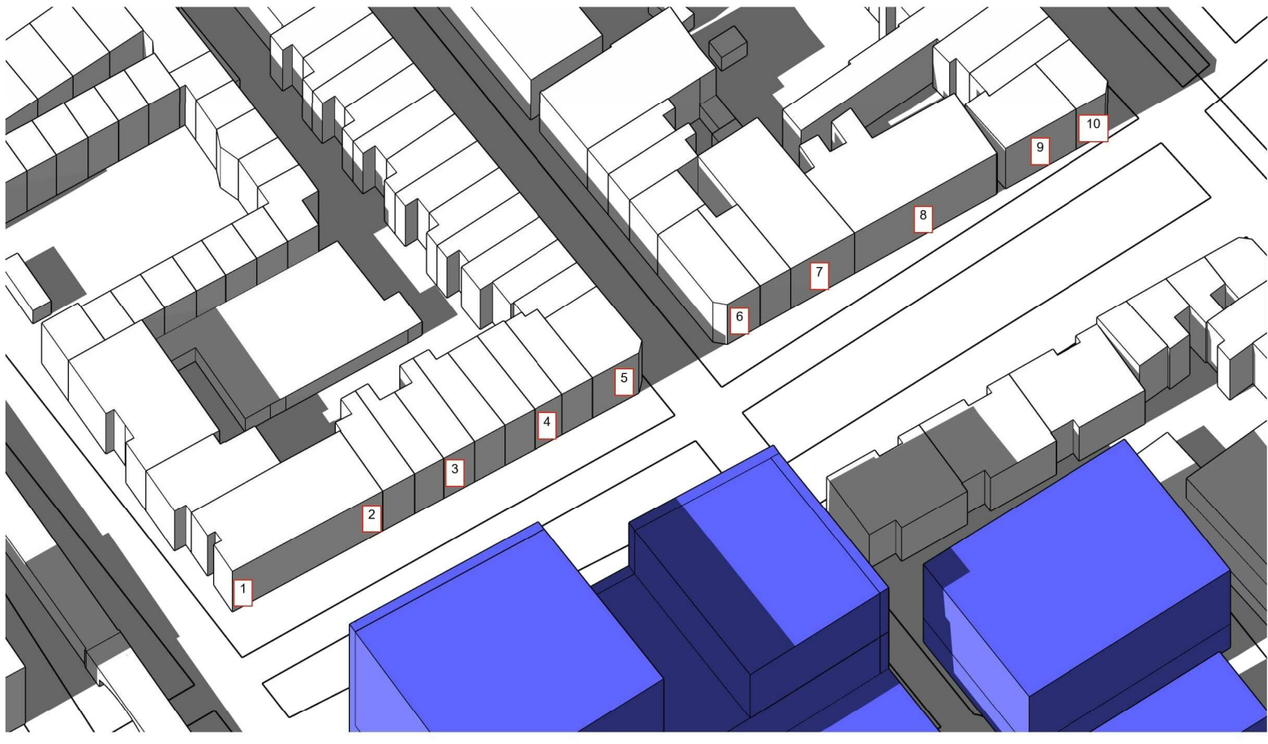
Teilingerstraat Noordzijde
21 september
14.00





Teilingerstraat Noordzijde
21 september
14.30





Teilingerstraat Noordzijde
21 september
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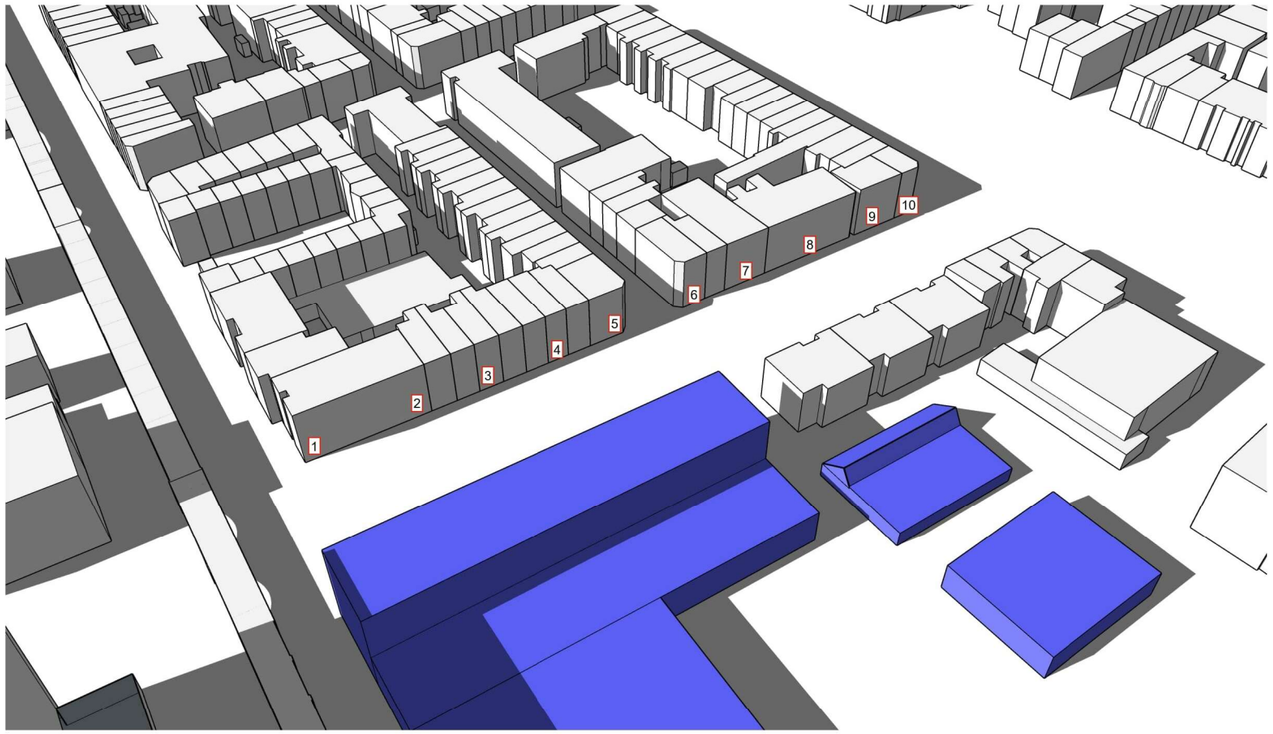
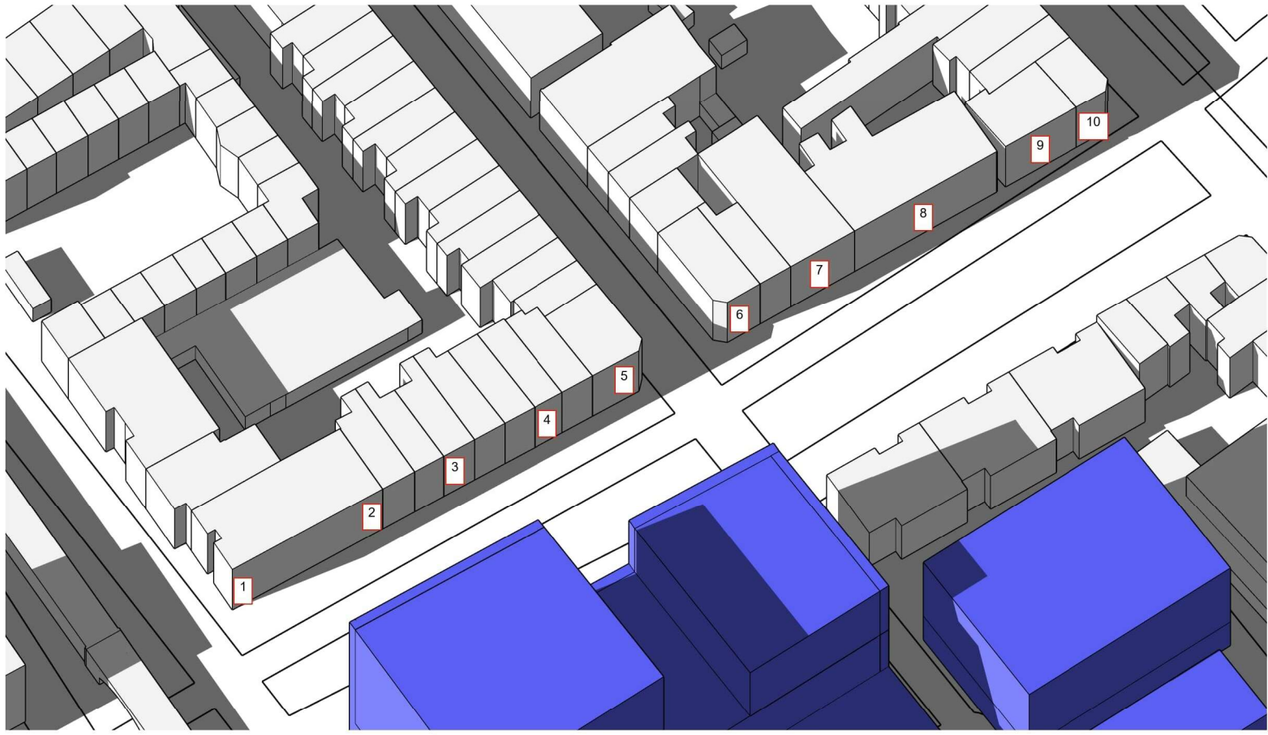
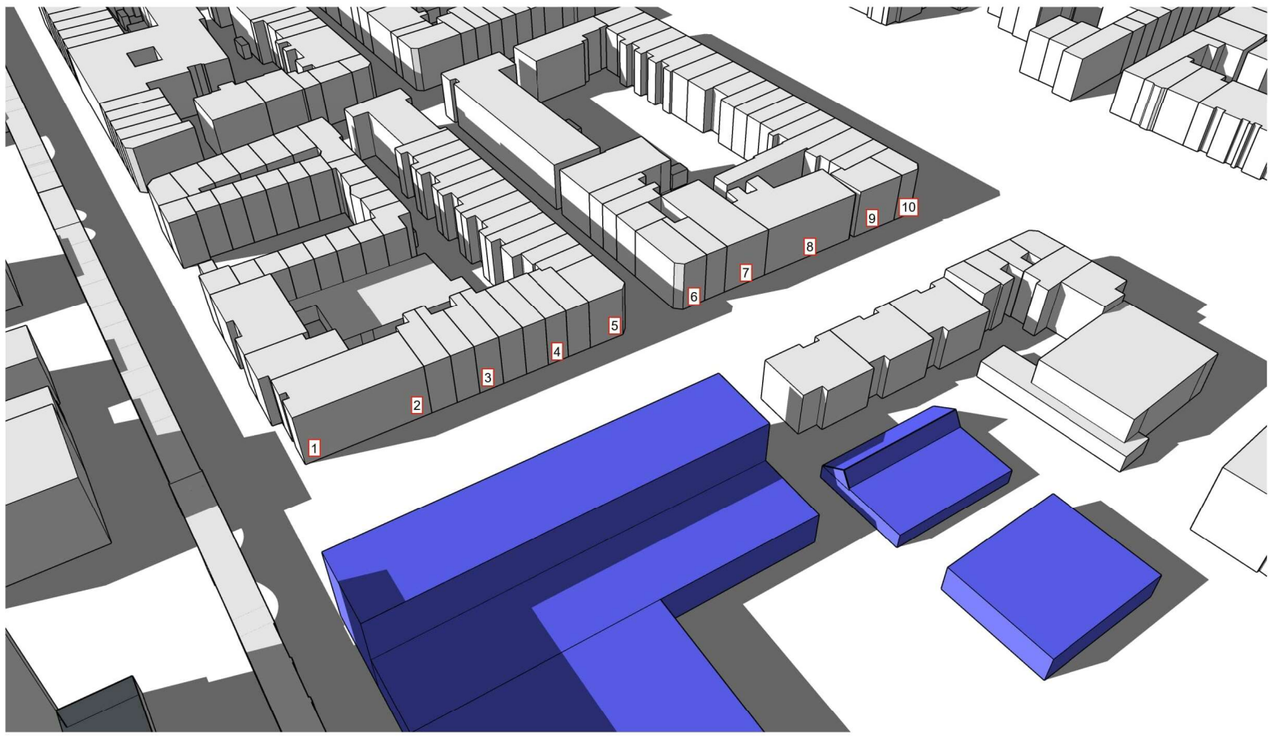
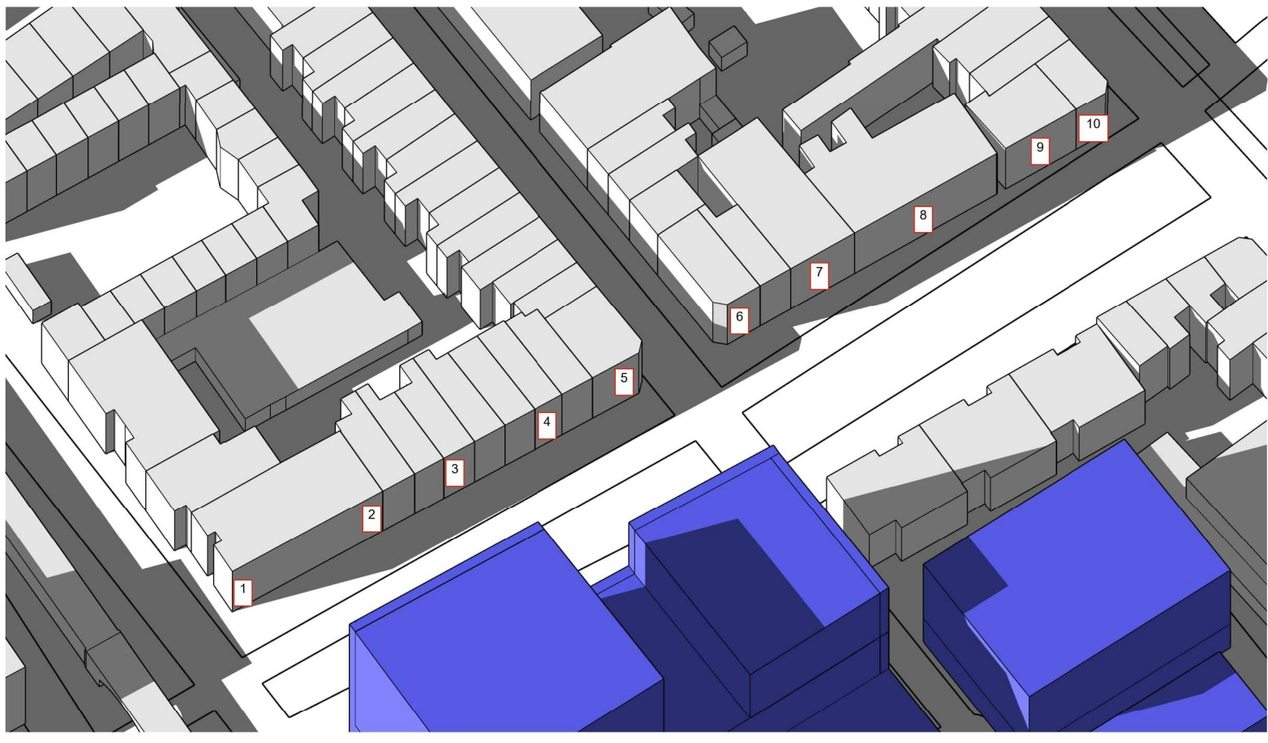


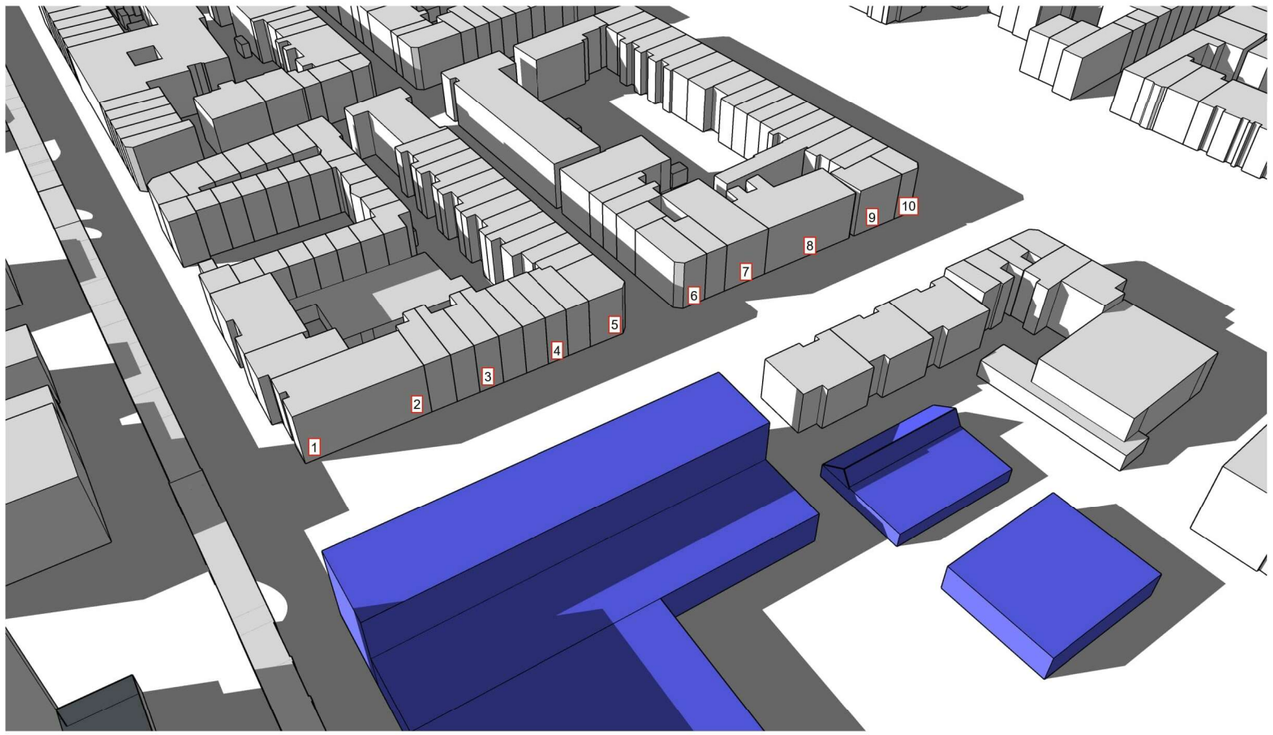


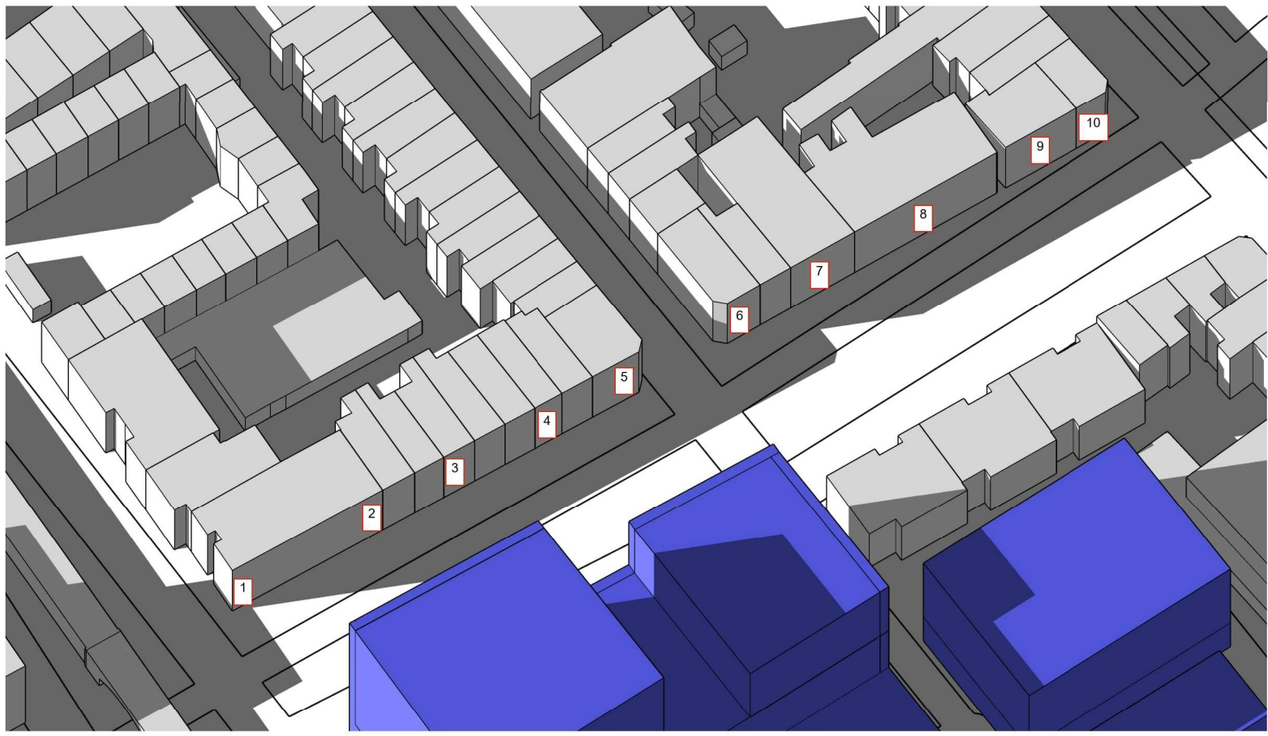
Teilingerstraat Noordzijde
21 september
15.30



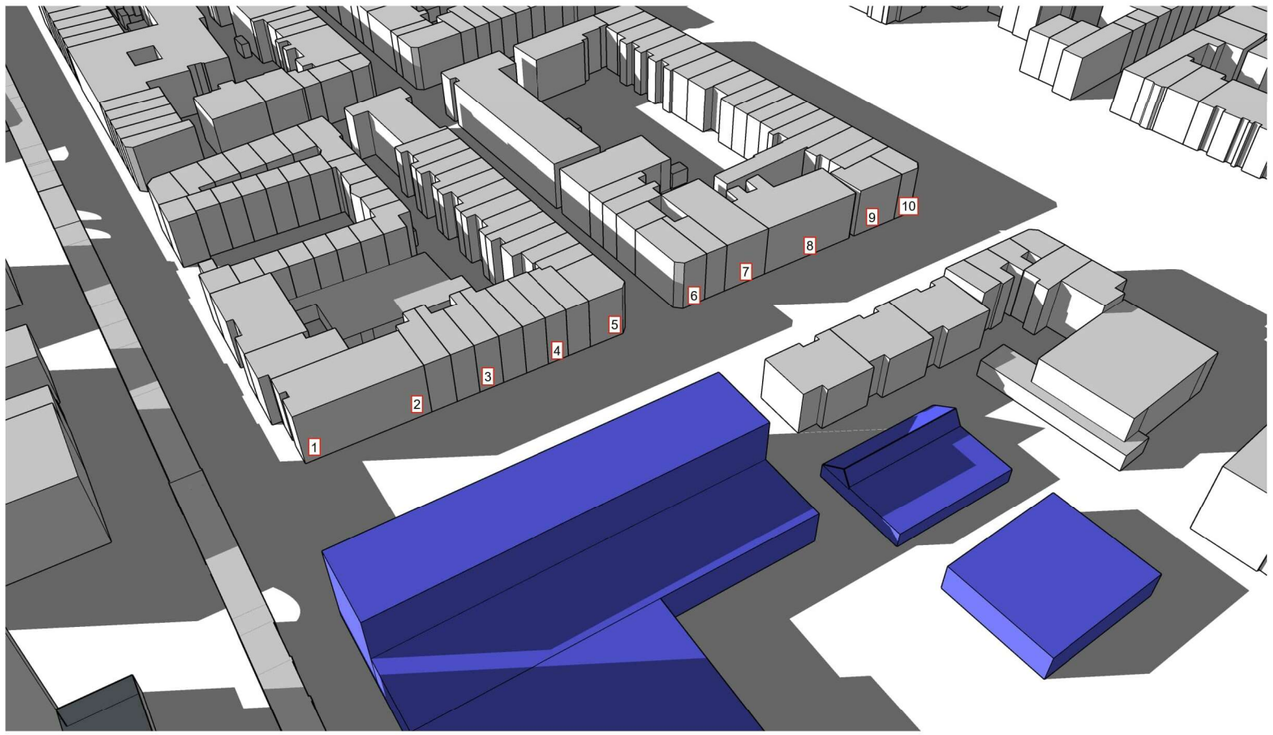


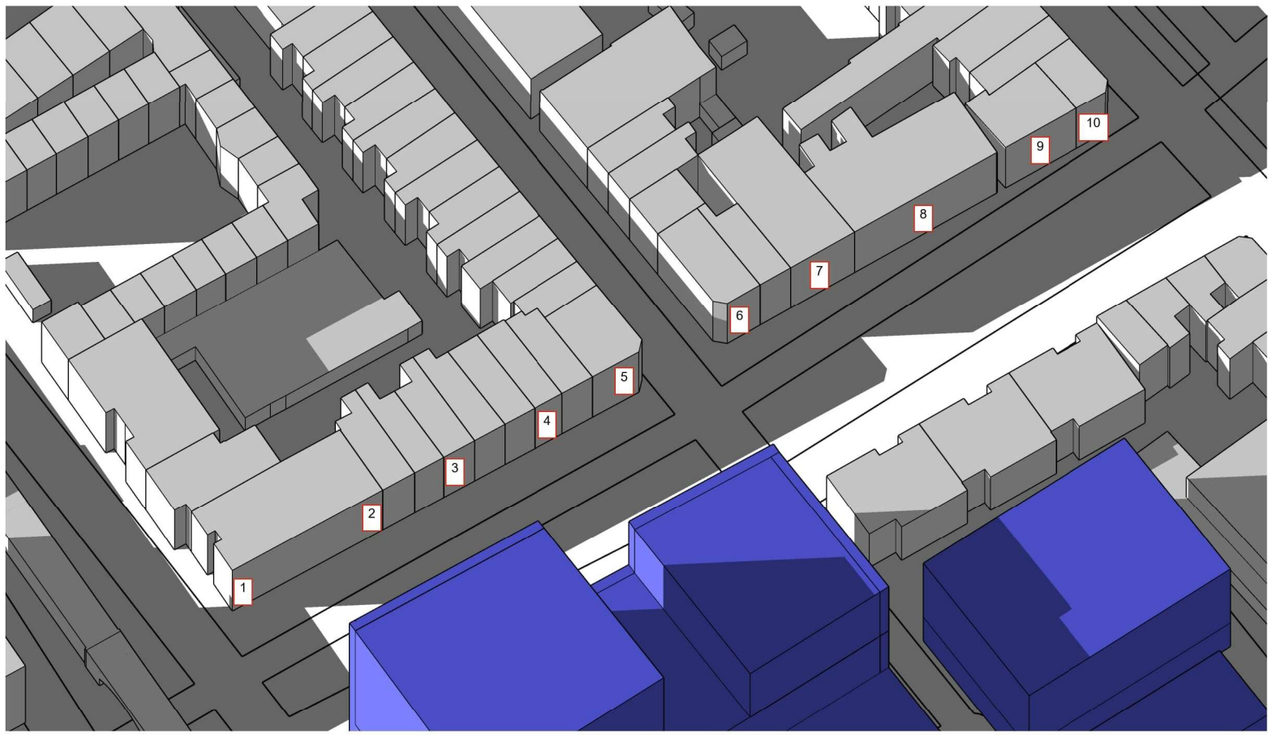
Teilingerstraat Noordzijde
21 september
16.00



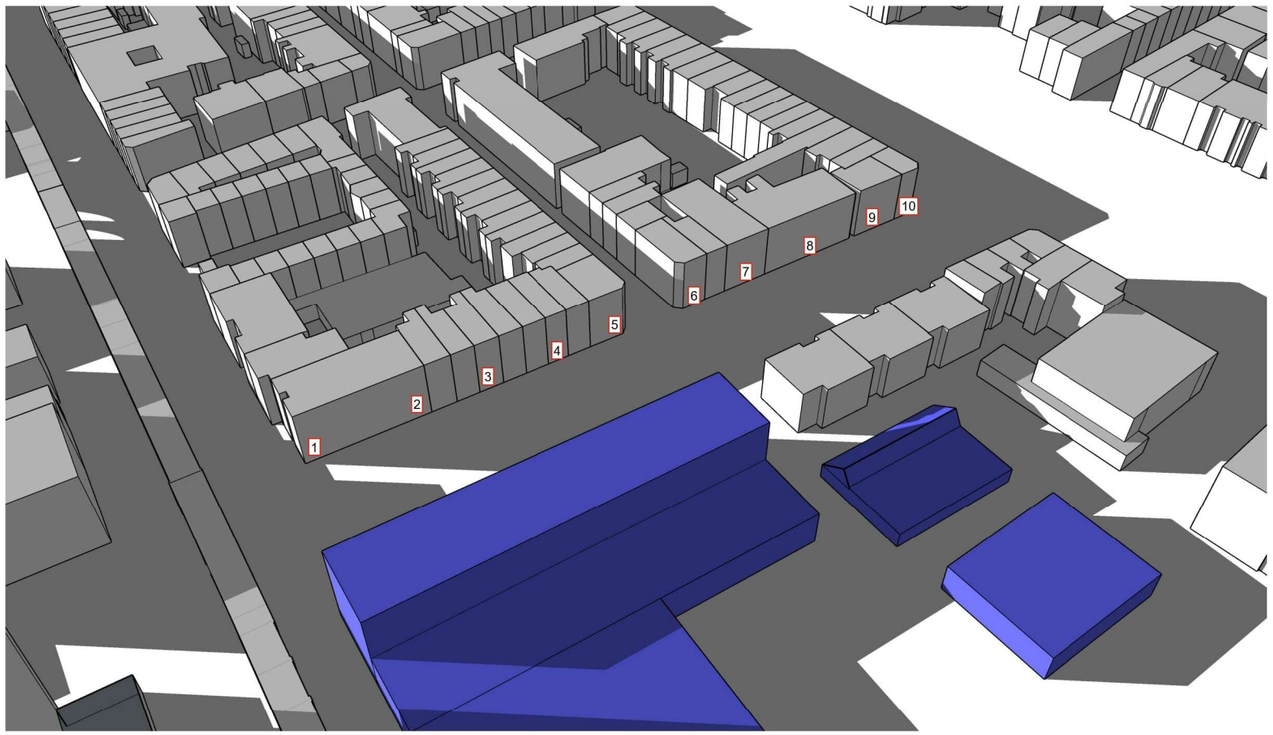


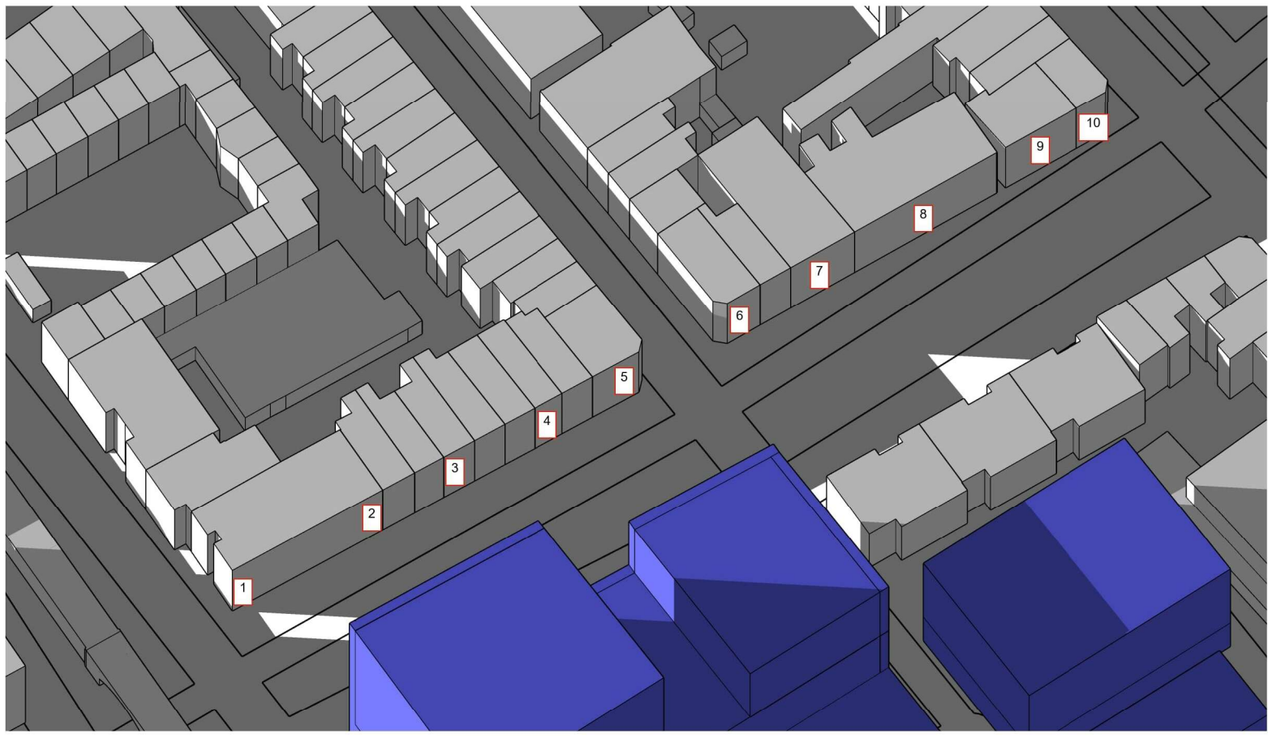
Teilingerstraat Noordzijde
21 september
16.30





Teilingerstraat Noordzijde
21 september
17.00





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21 september
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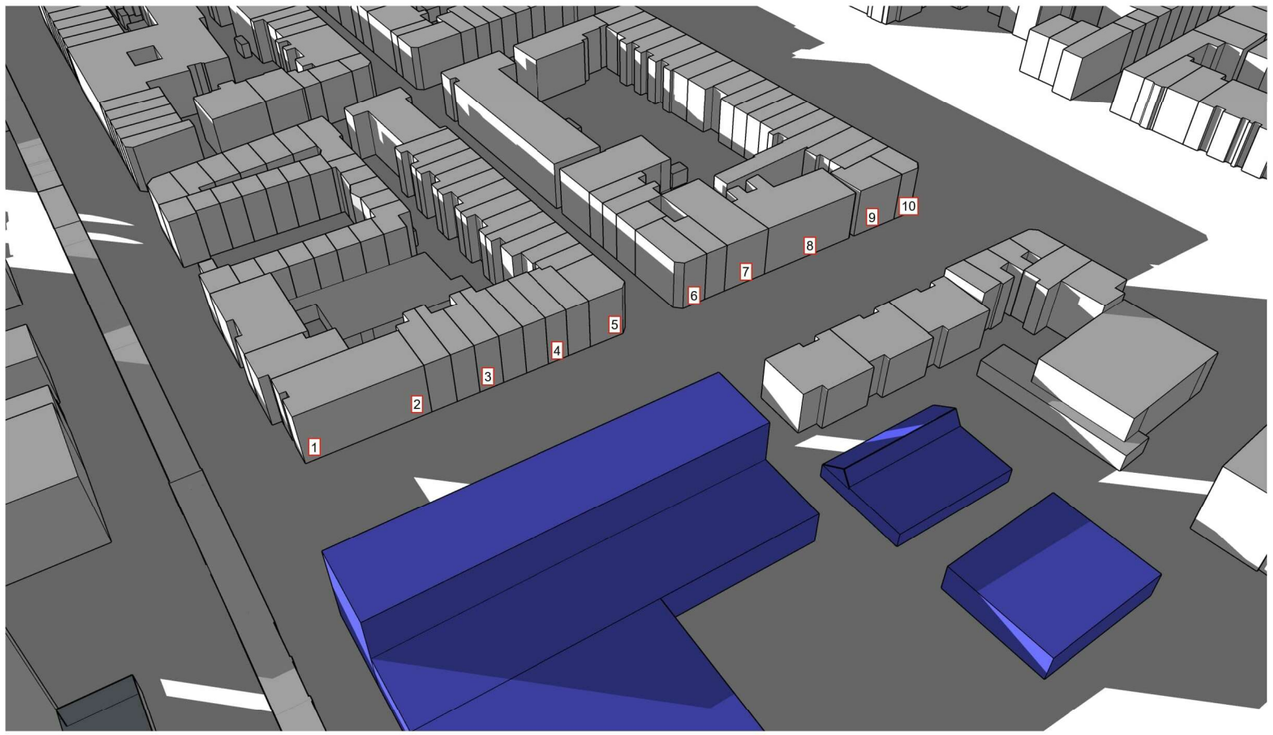
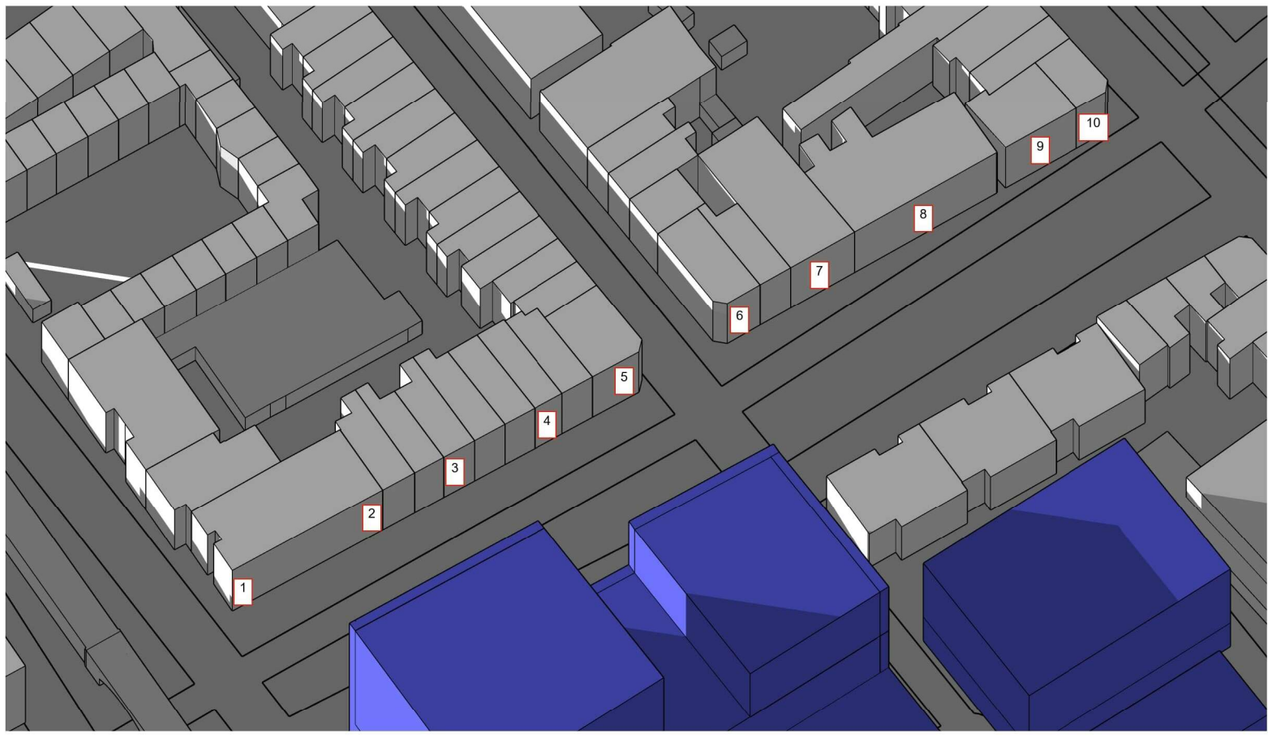
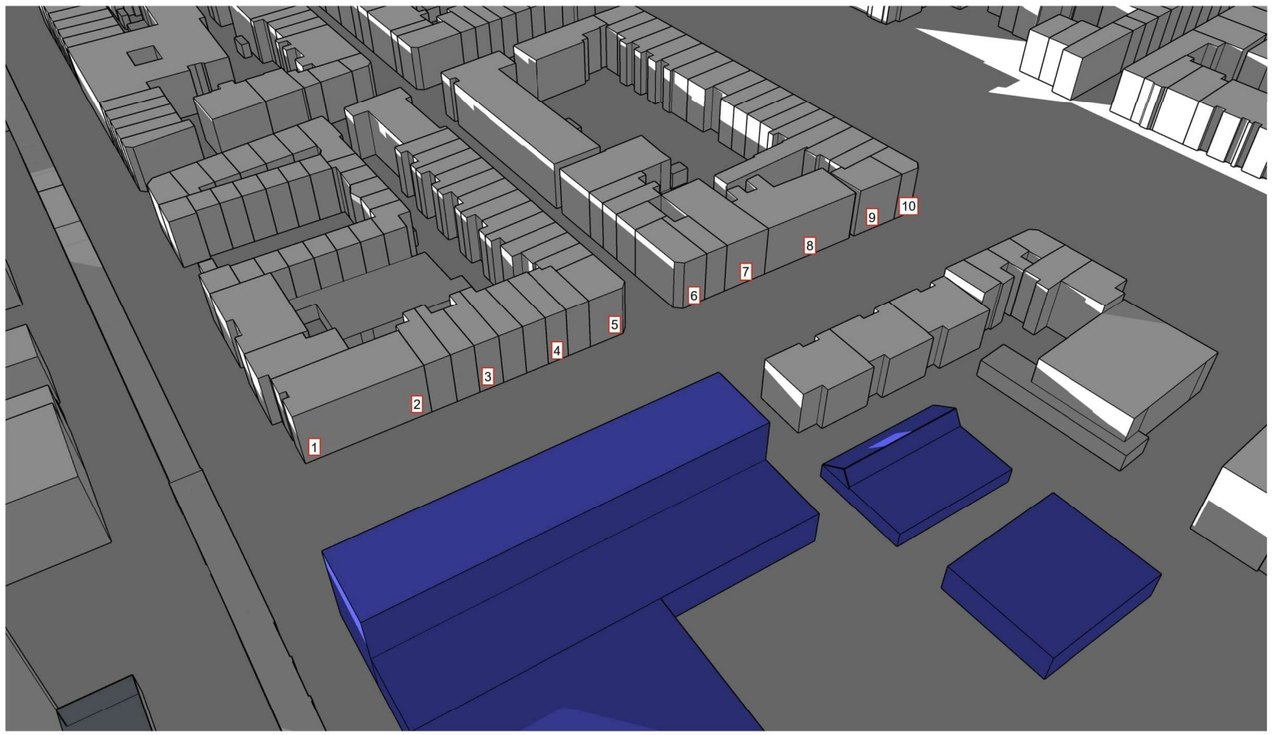
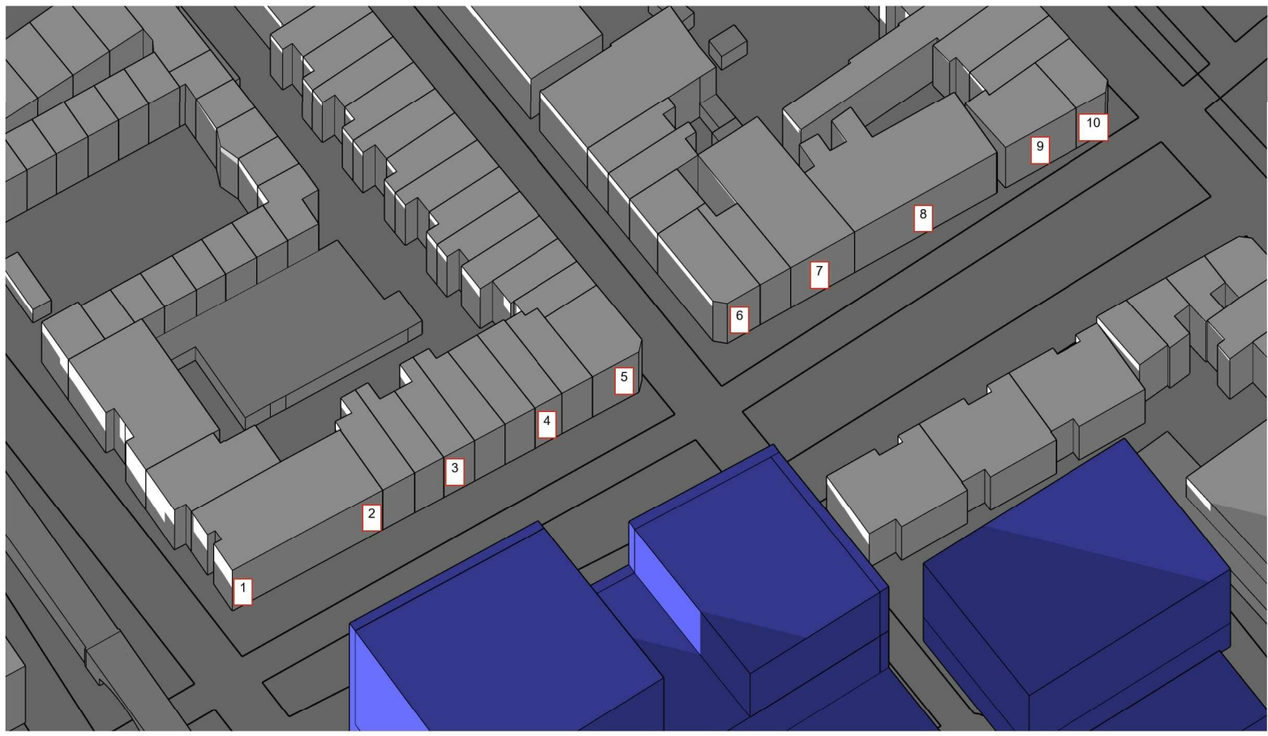


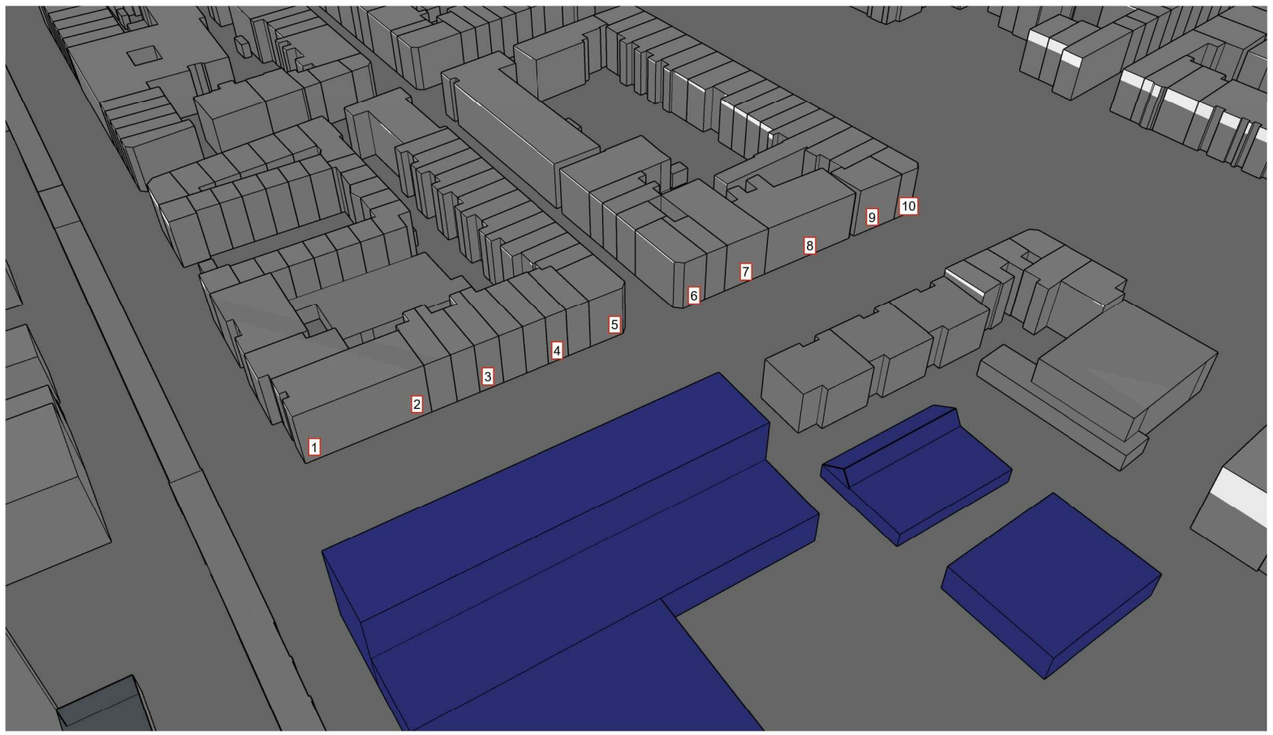


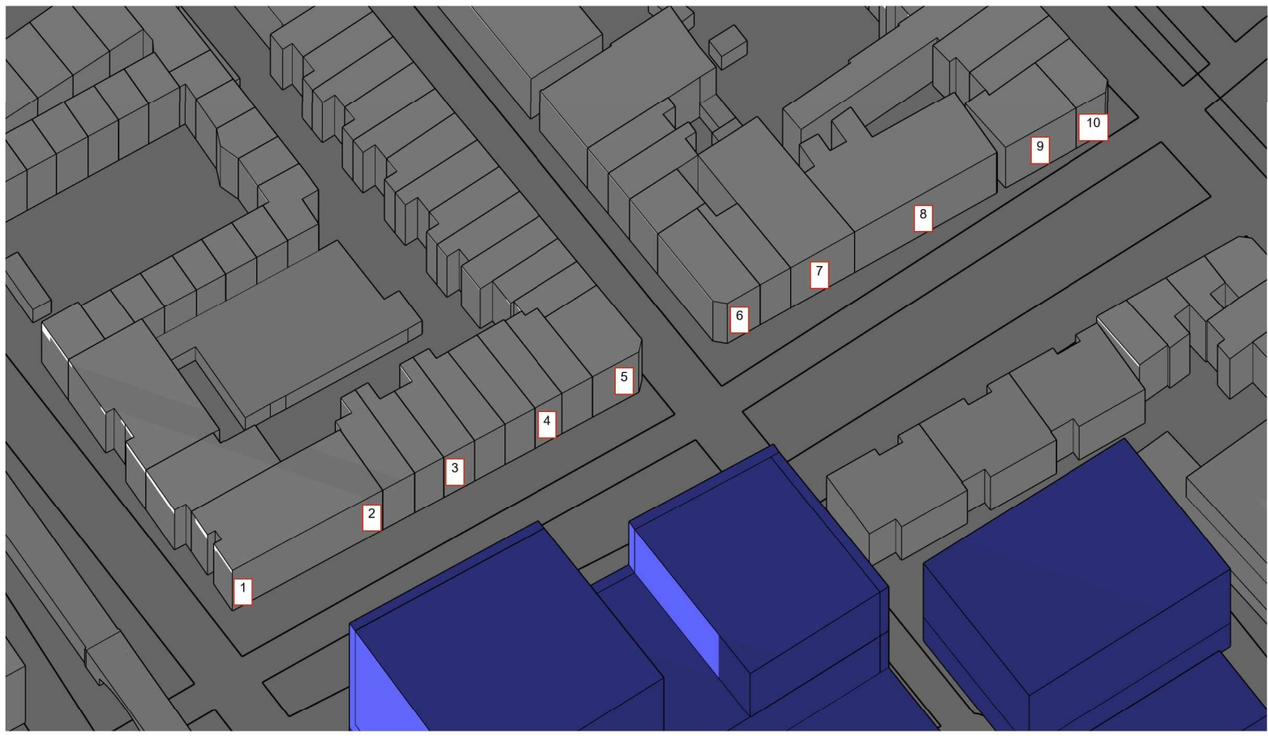
Teilingerstraat Noordzijde
21 september
18.00



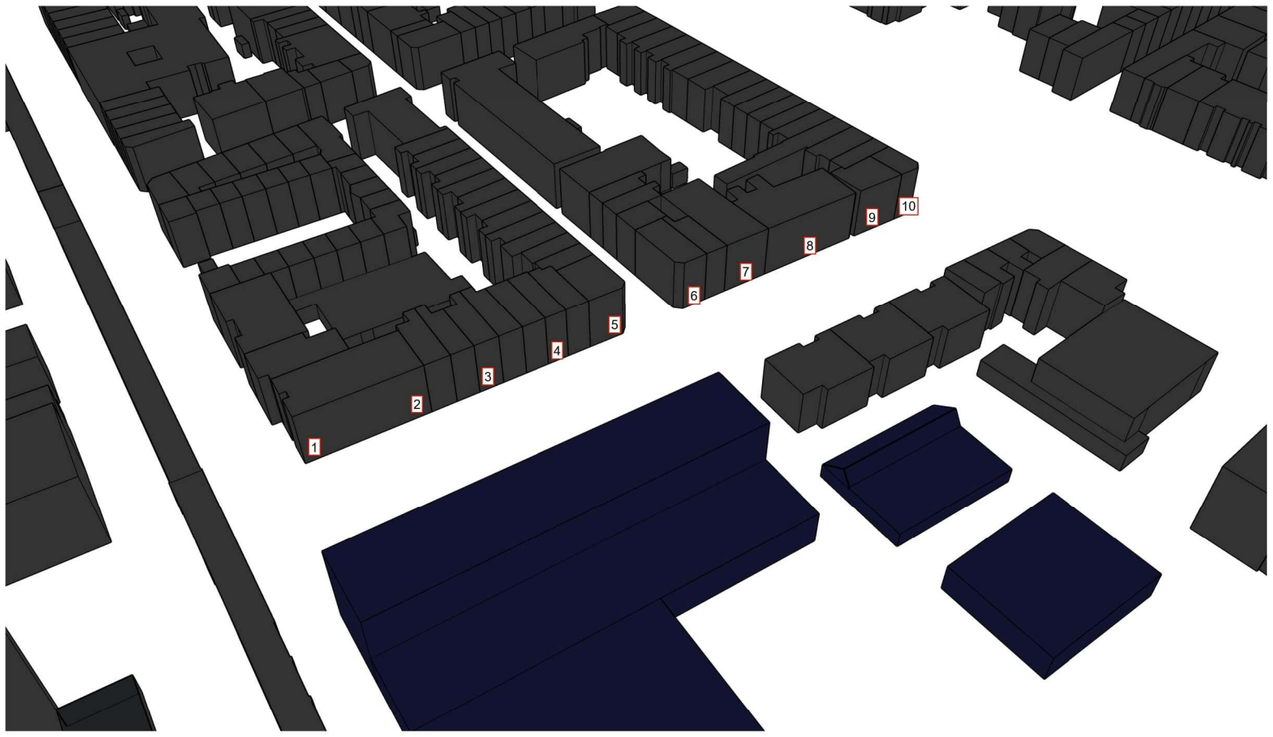


Teilingerstraat Noordzijde
21 september
18.30





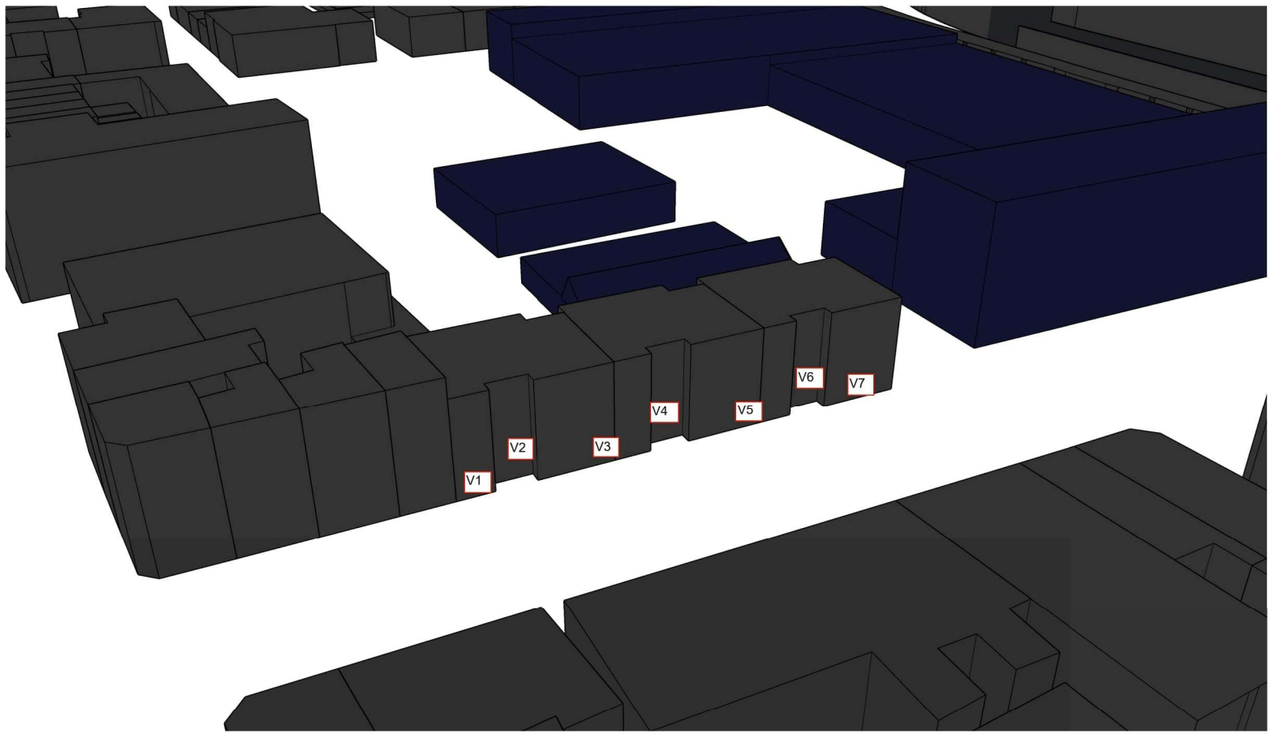
Teilingerstraat Noordzijde
21 september
19.00

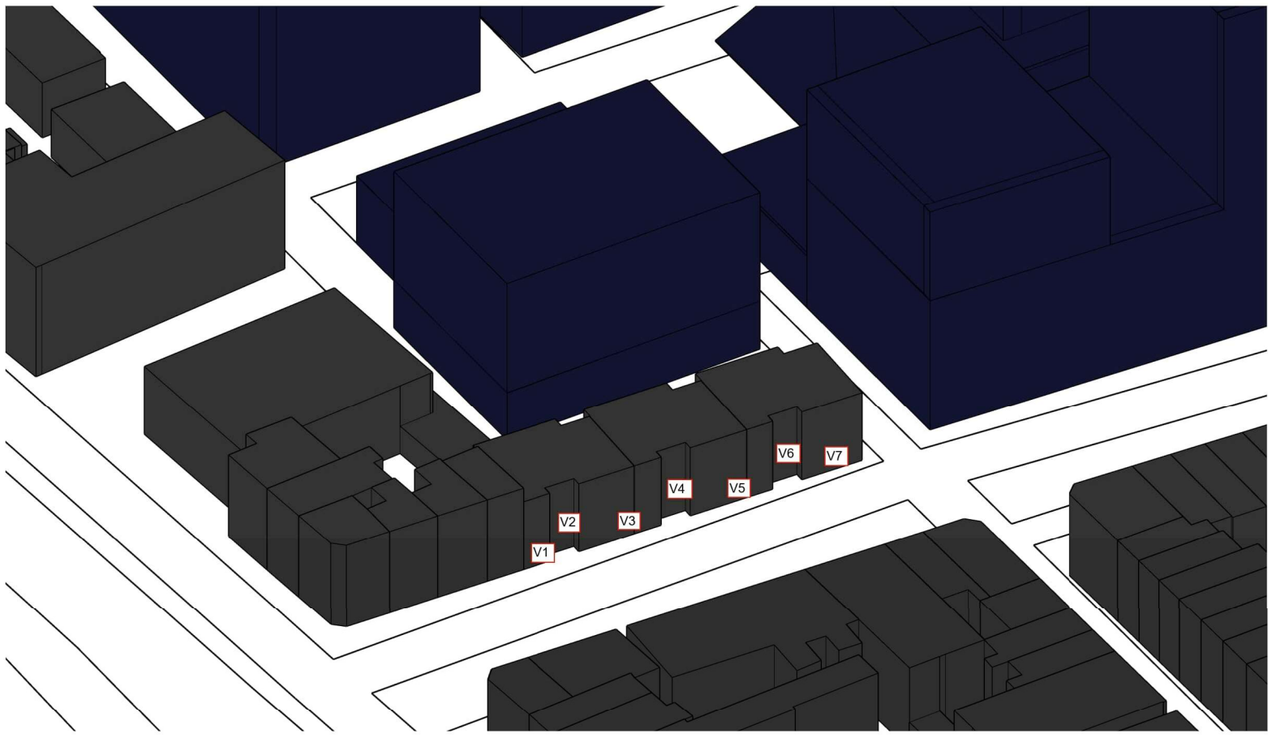




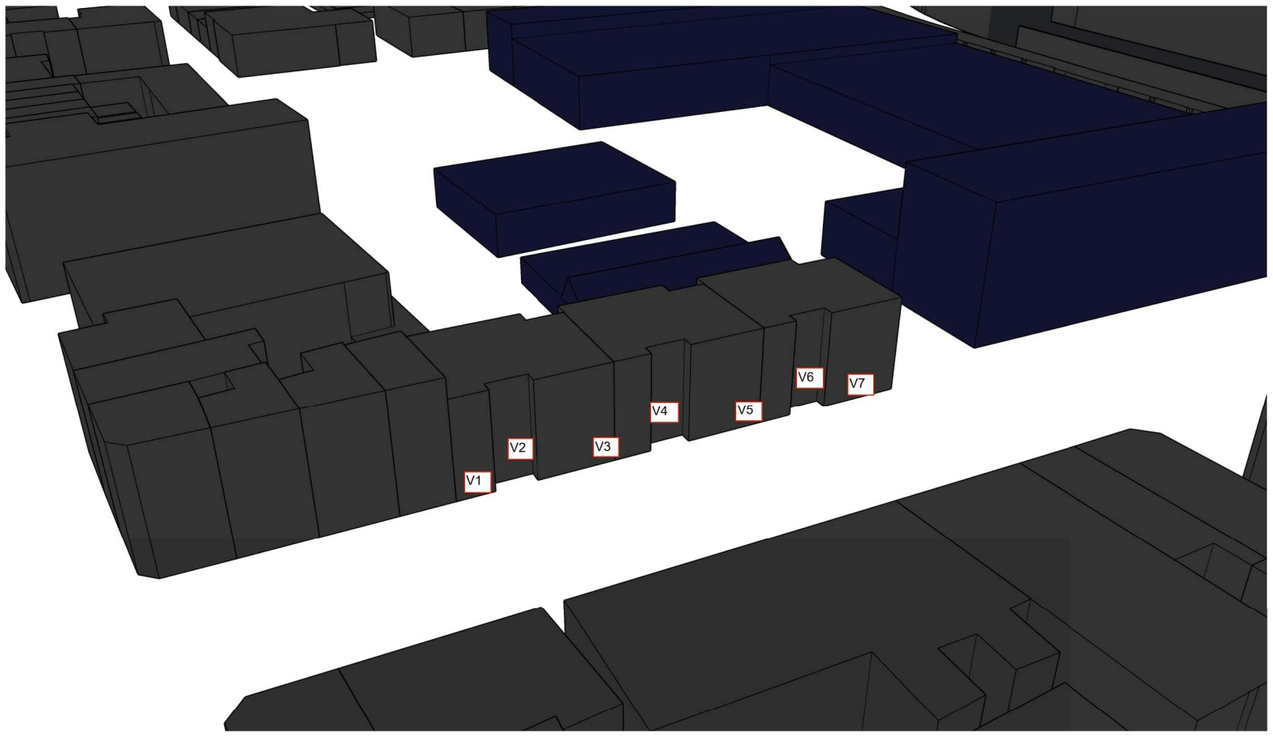
bijlage 13a. resultaten 21 september Teilingerstraat Zuid (voorgevels) huidig vs. nieuw

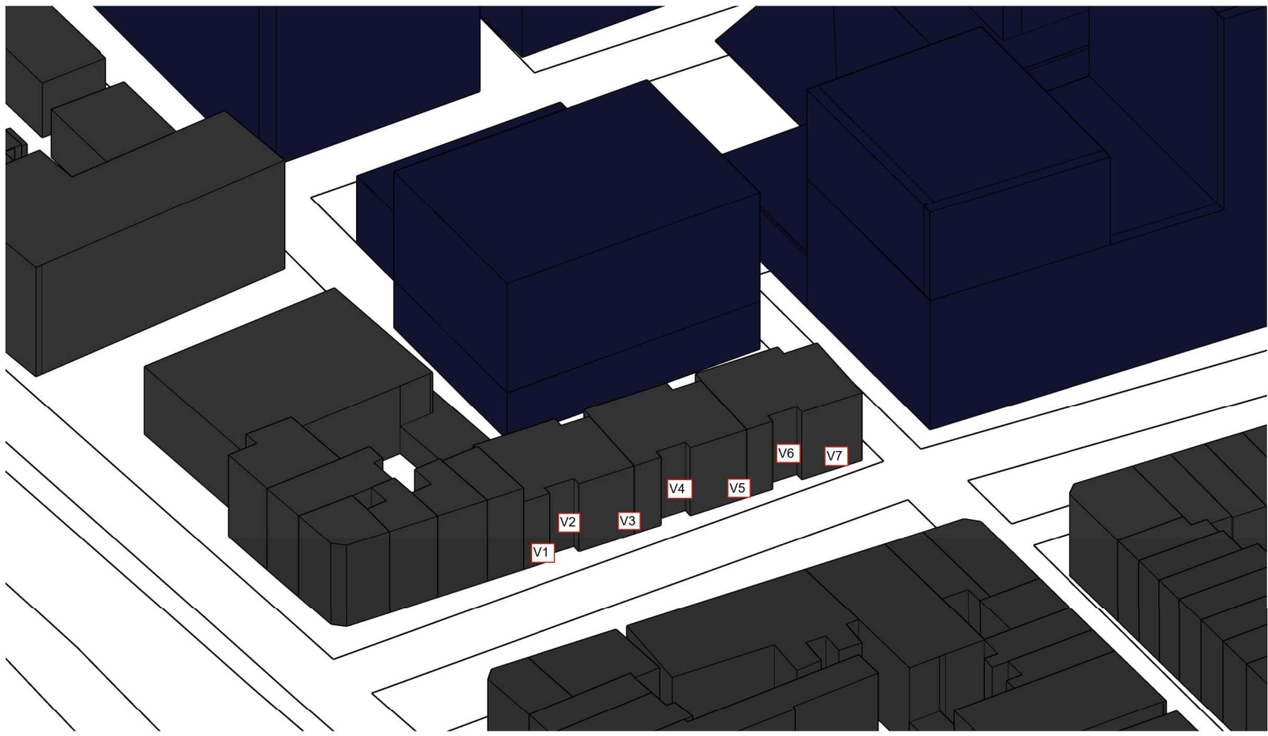
Teilingerstraat Zuidzijde voorgevel
21 september
06.00



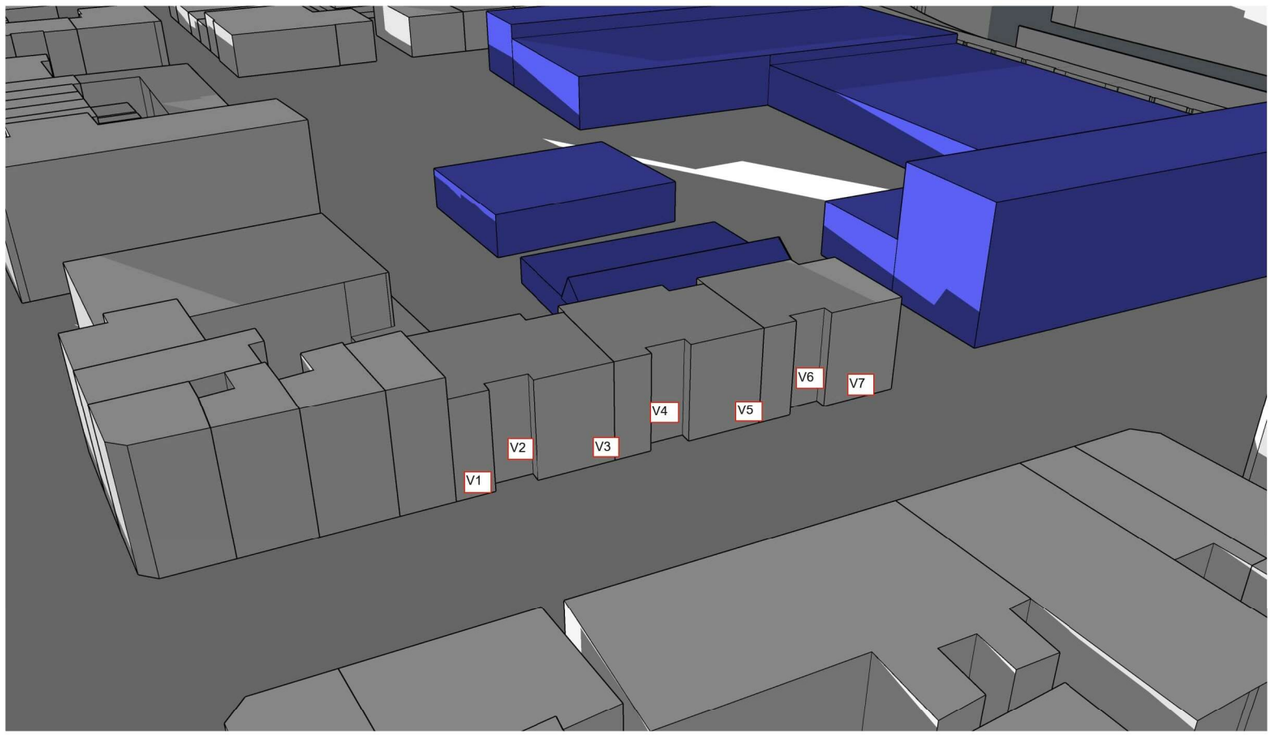


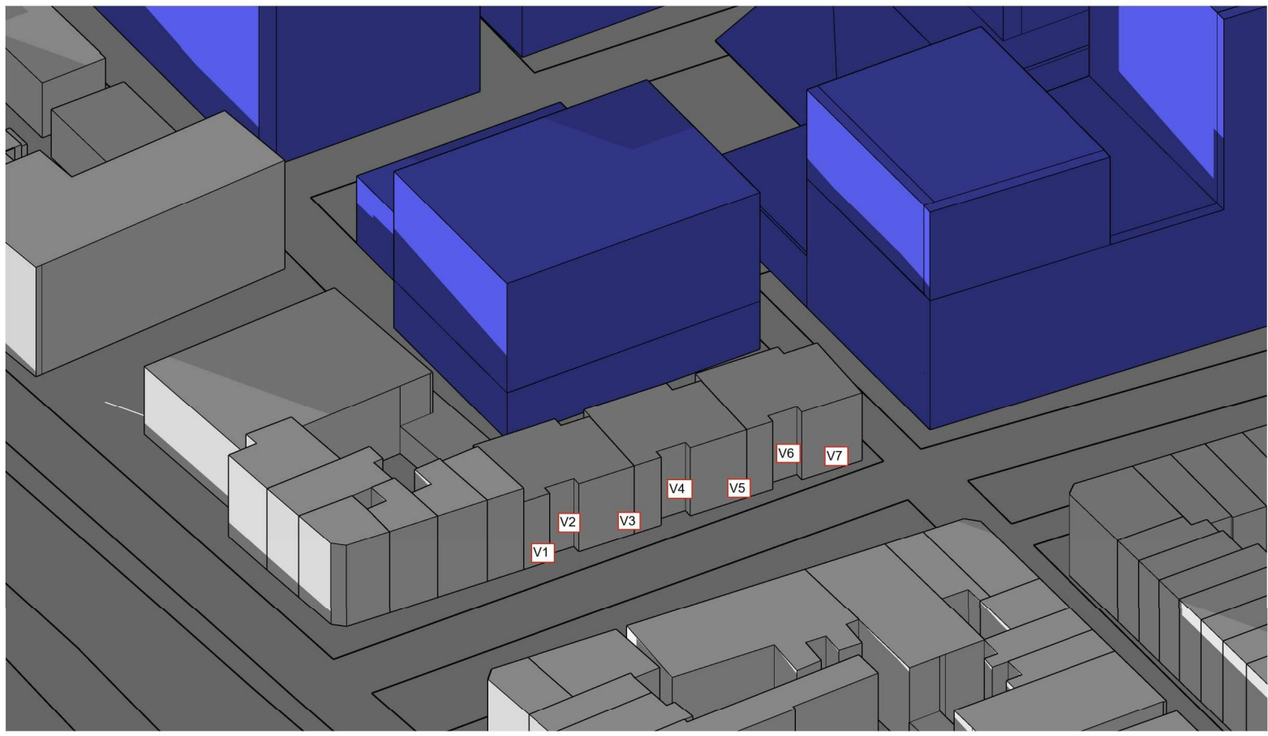
Teilingerstraat Zuidzijde voorgevel
21 september
06.30





Teilingerstraat Zuidzijde voorgevel
21 september
07.00





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21 september
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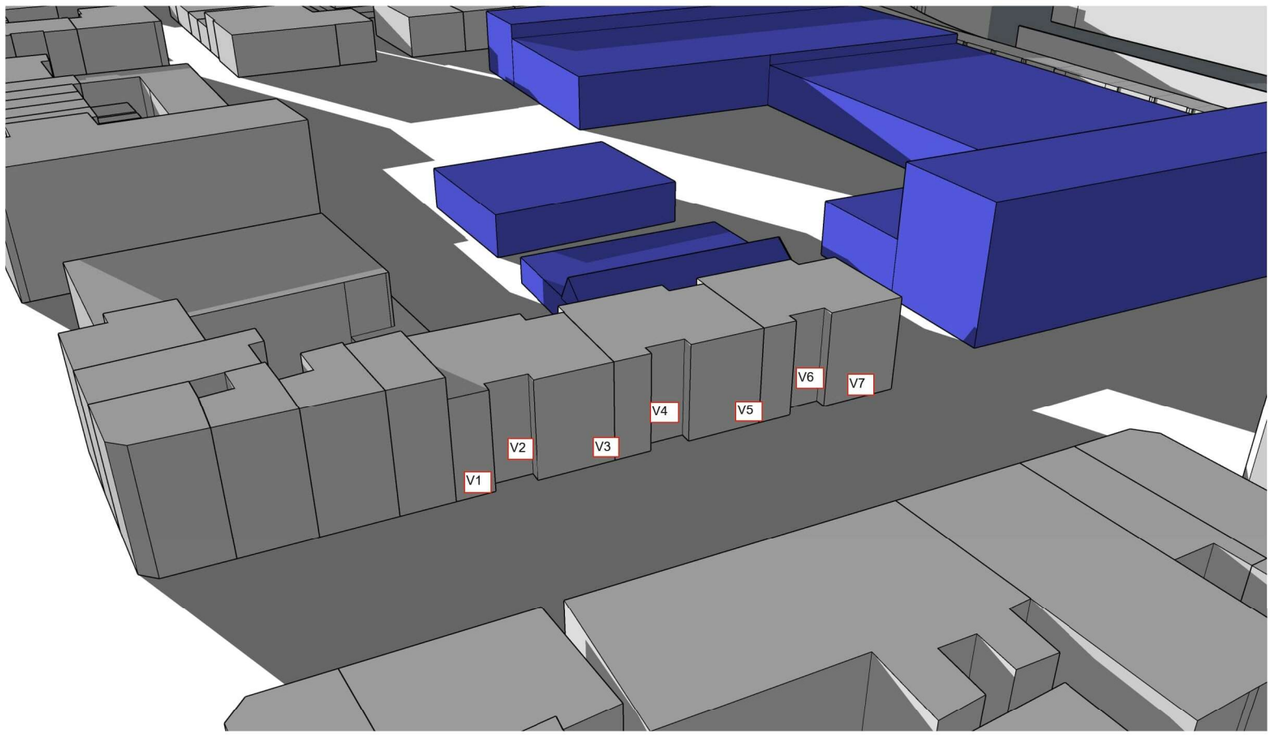
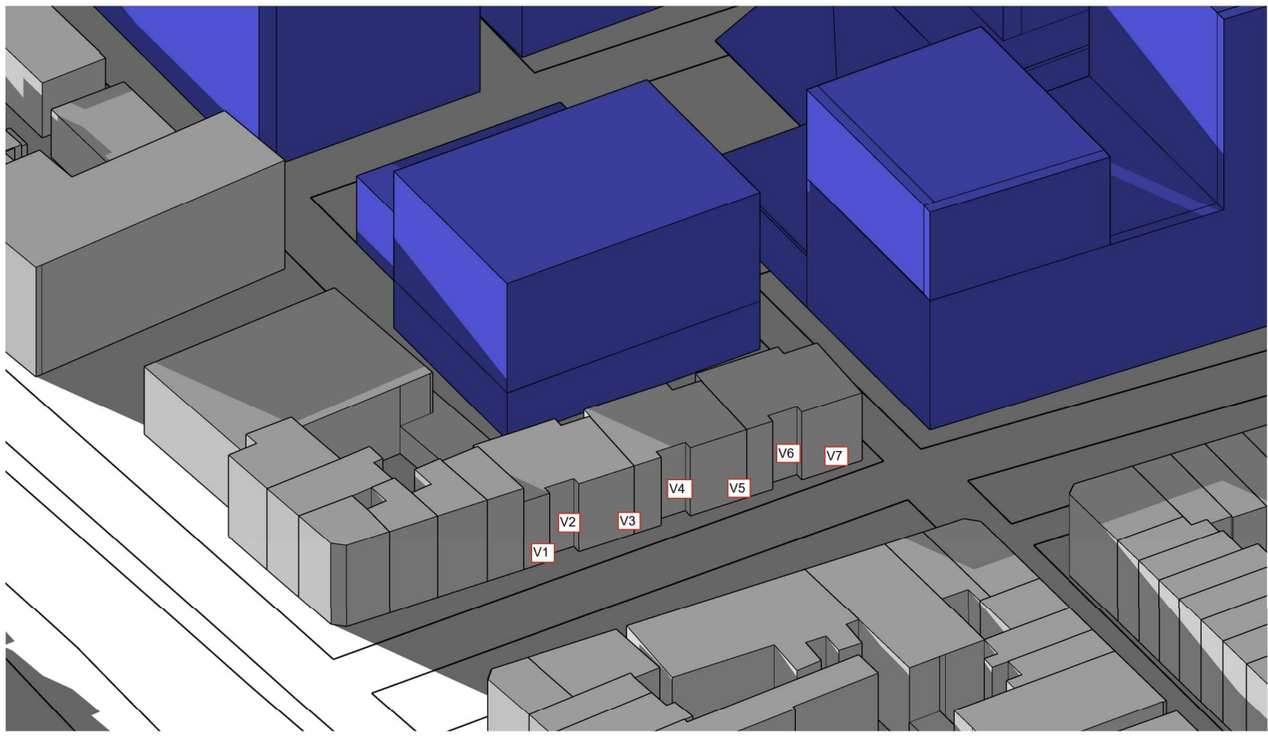
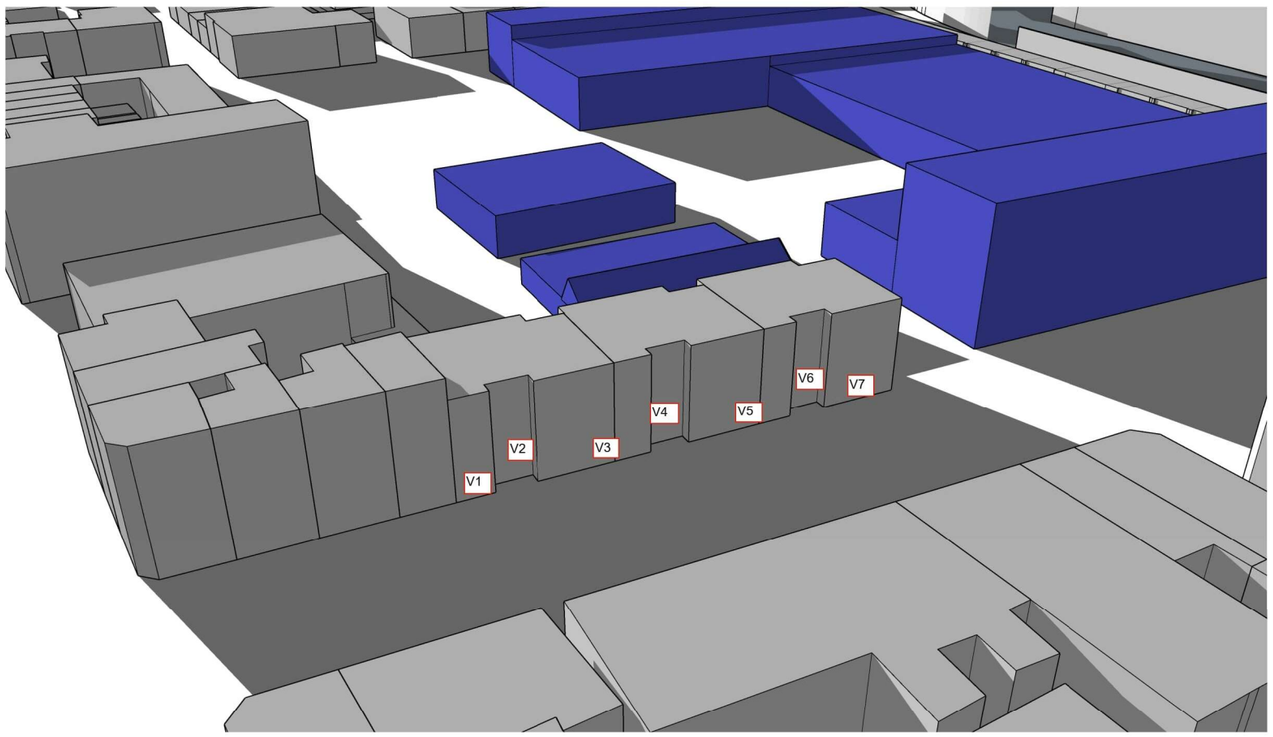
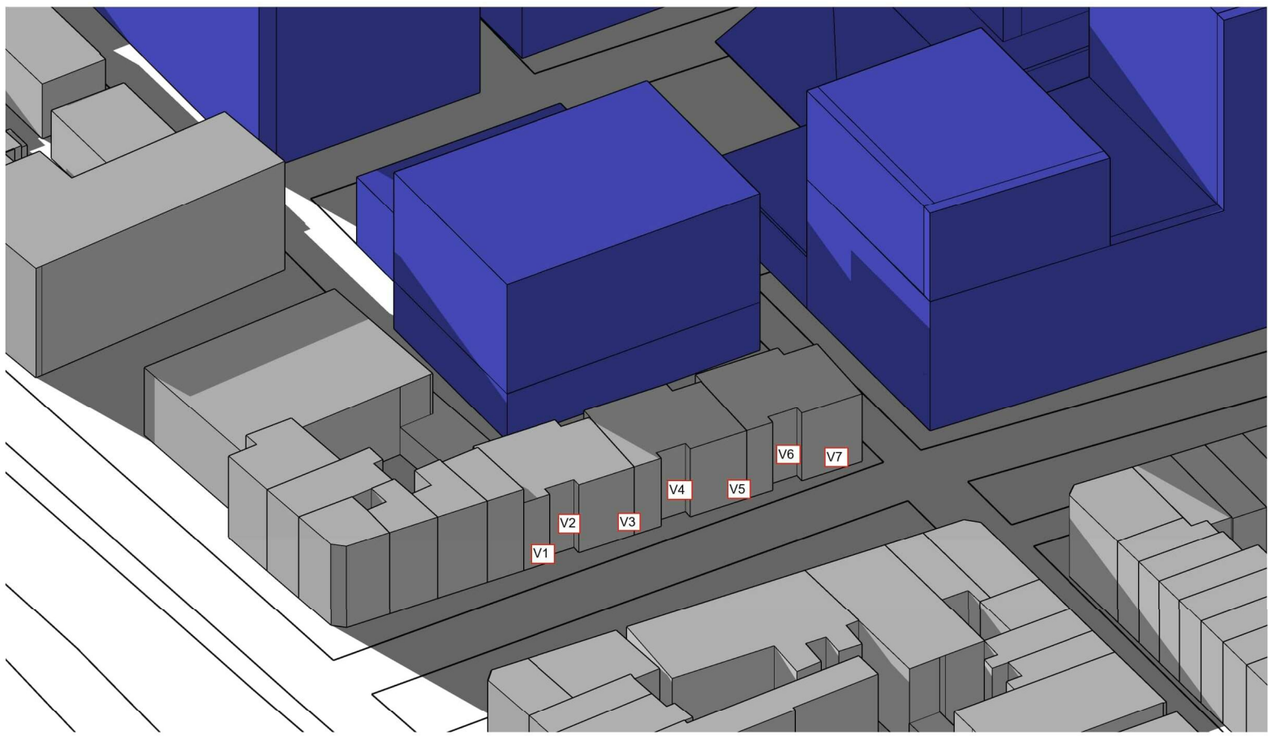




Teilingerstraat Zuidzijde voorgevel
21 september
08.00





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21 september
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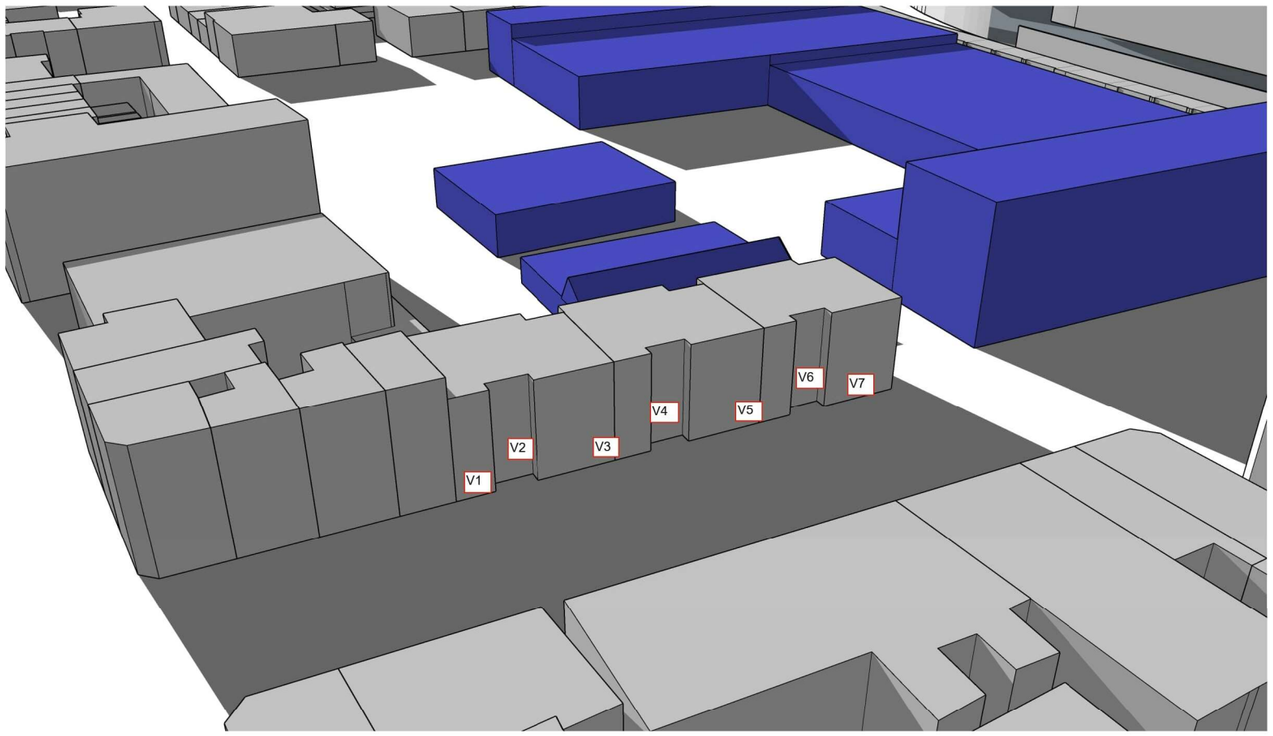
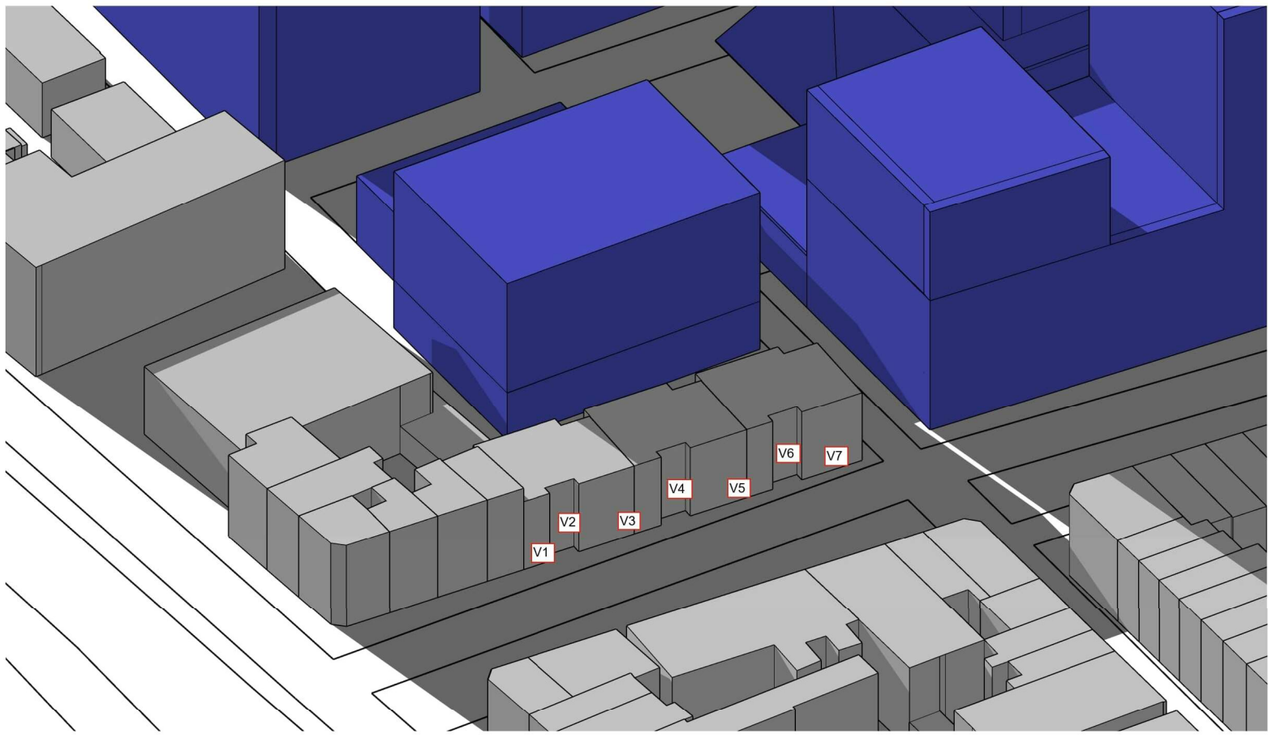
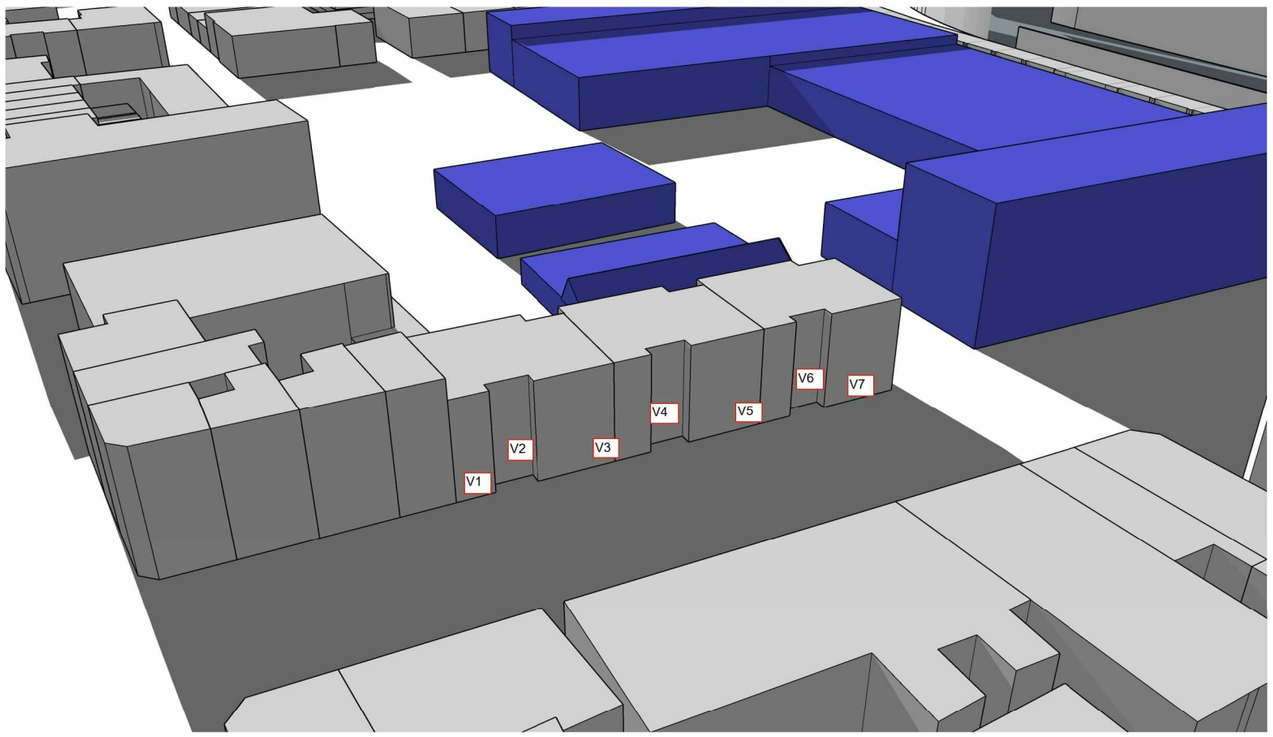
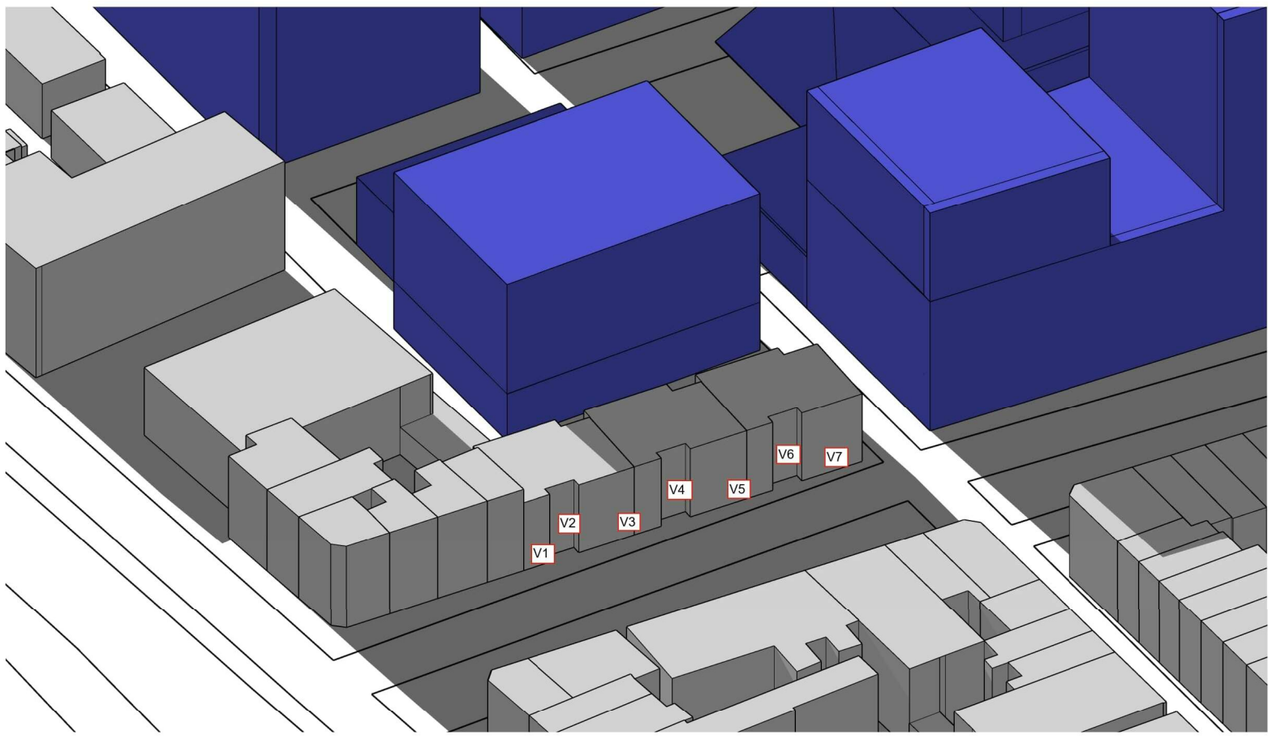


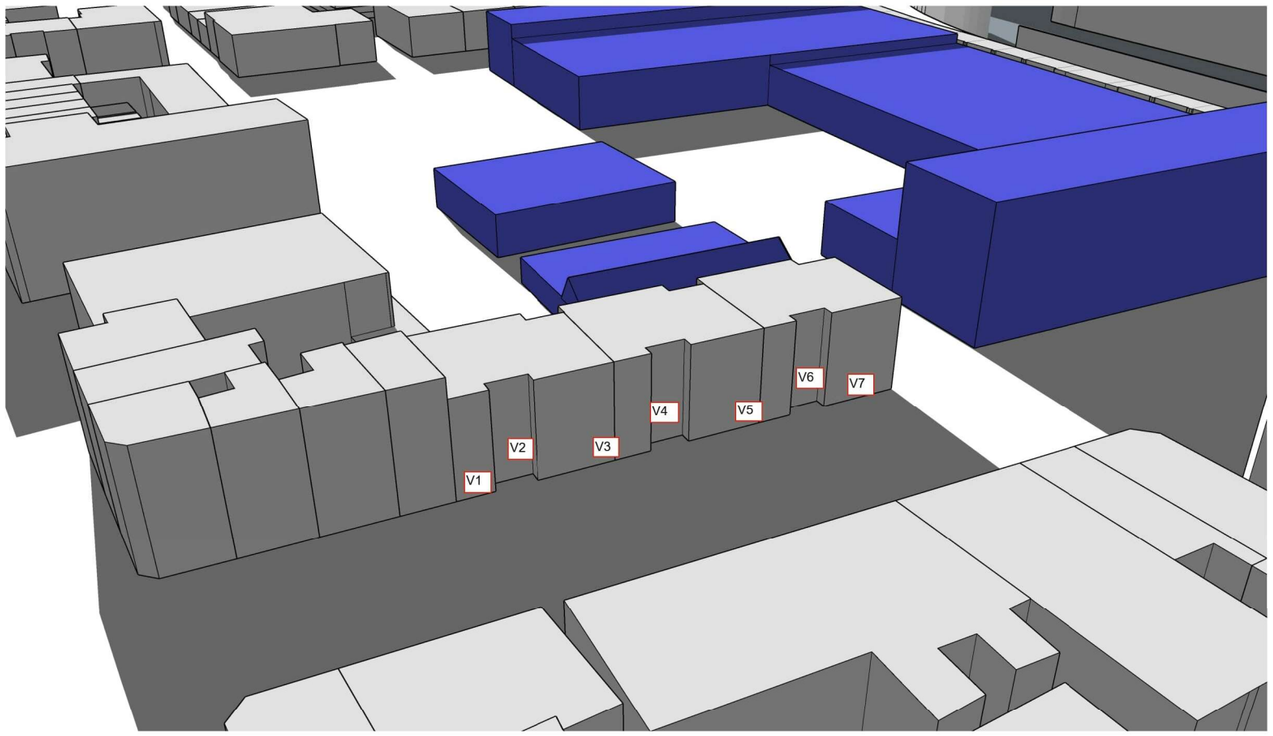


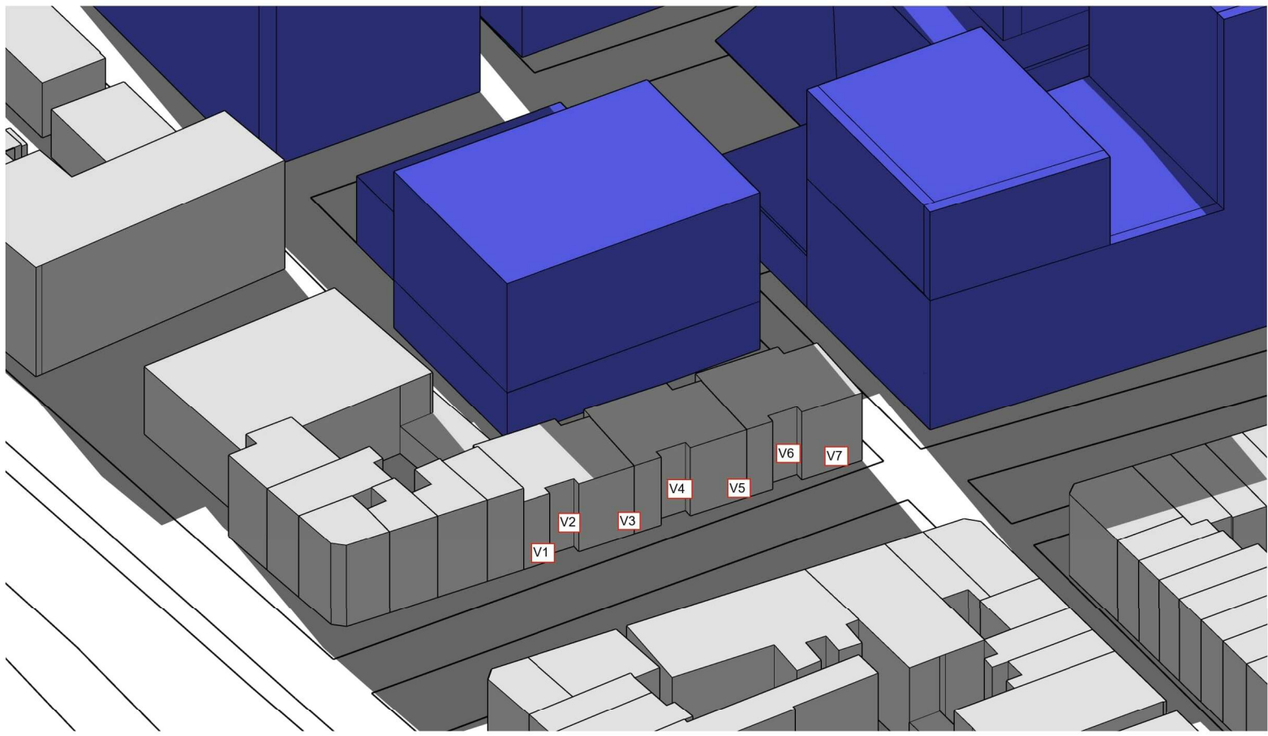
Teilingerstraat Zuidzijde voorgevel
21 september
09.00





Teilingerstraat Zuidzijde voorgevel
21 september
09.30





Teilingerstraat Zuidzijde voorgevel
21 september
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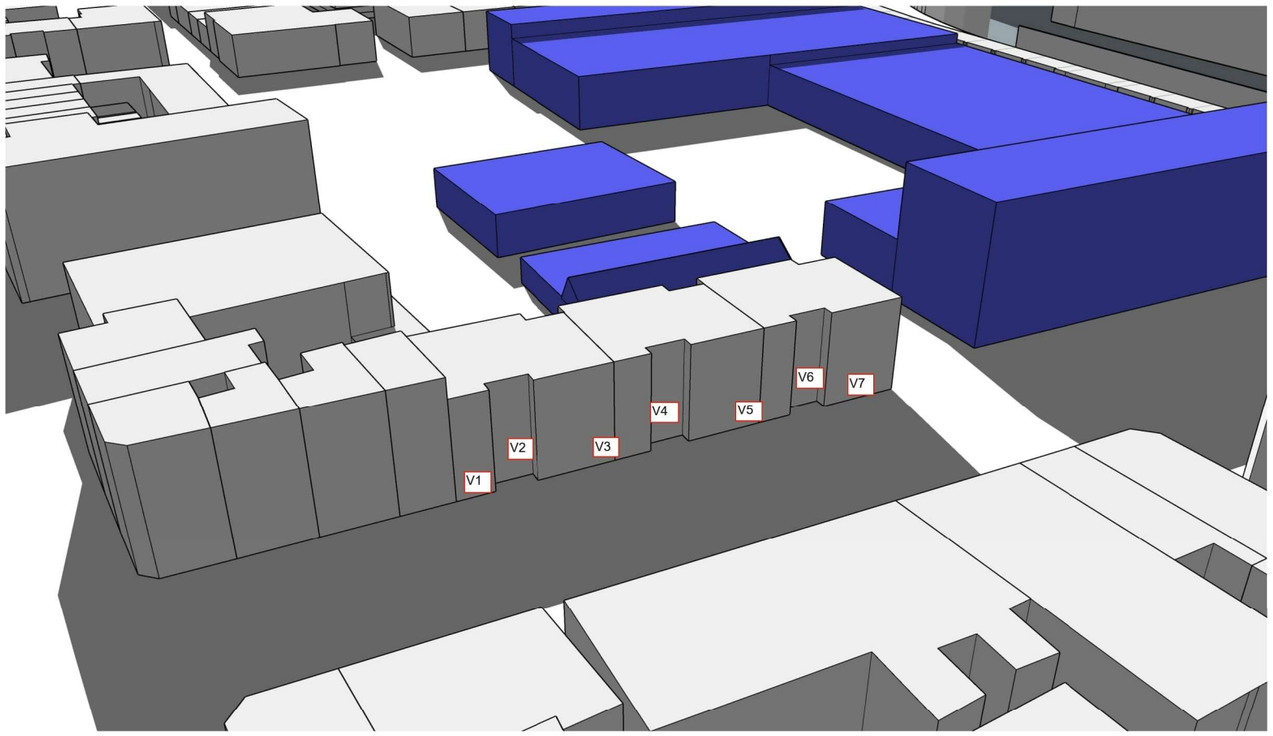

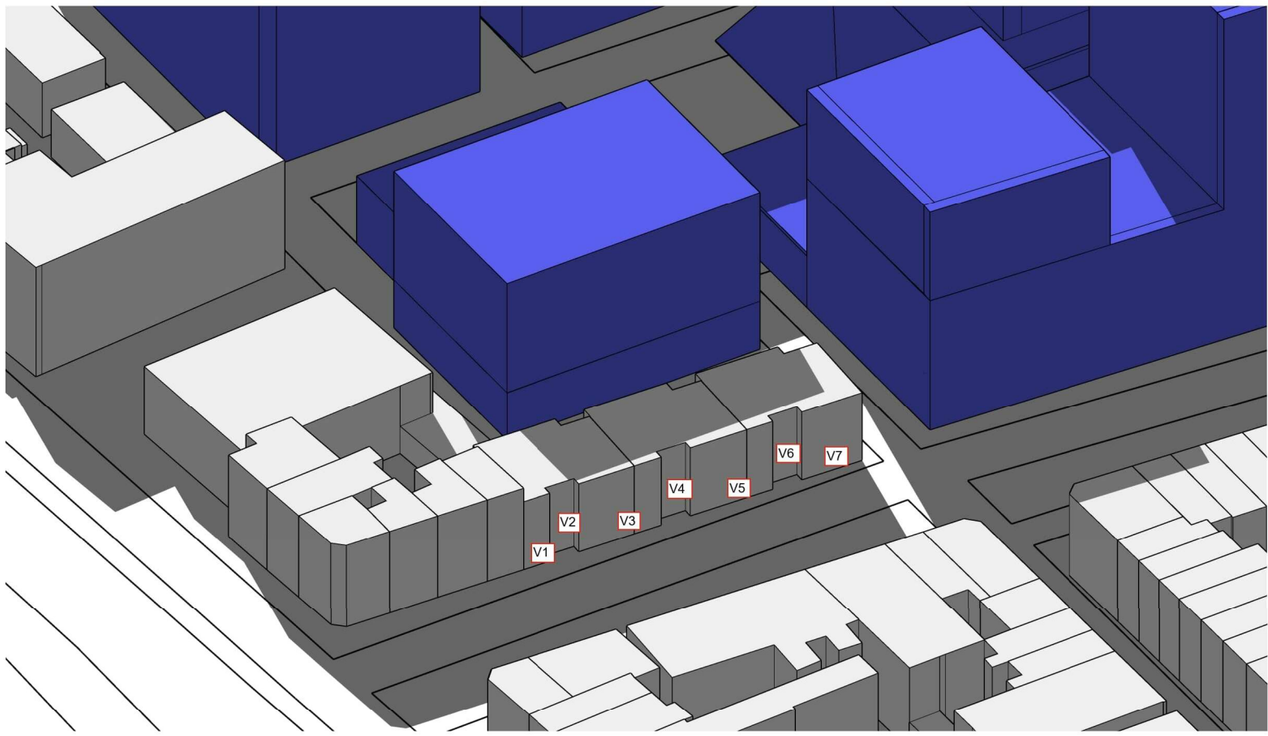

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21 september
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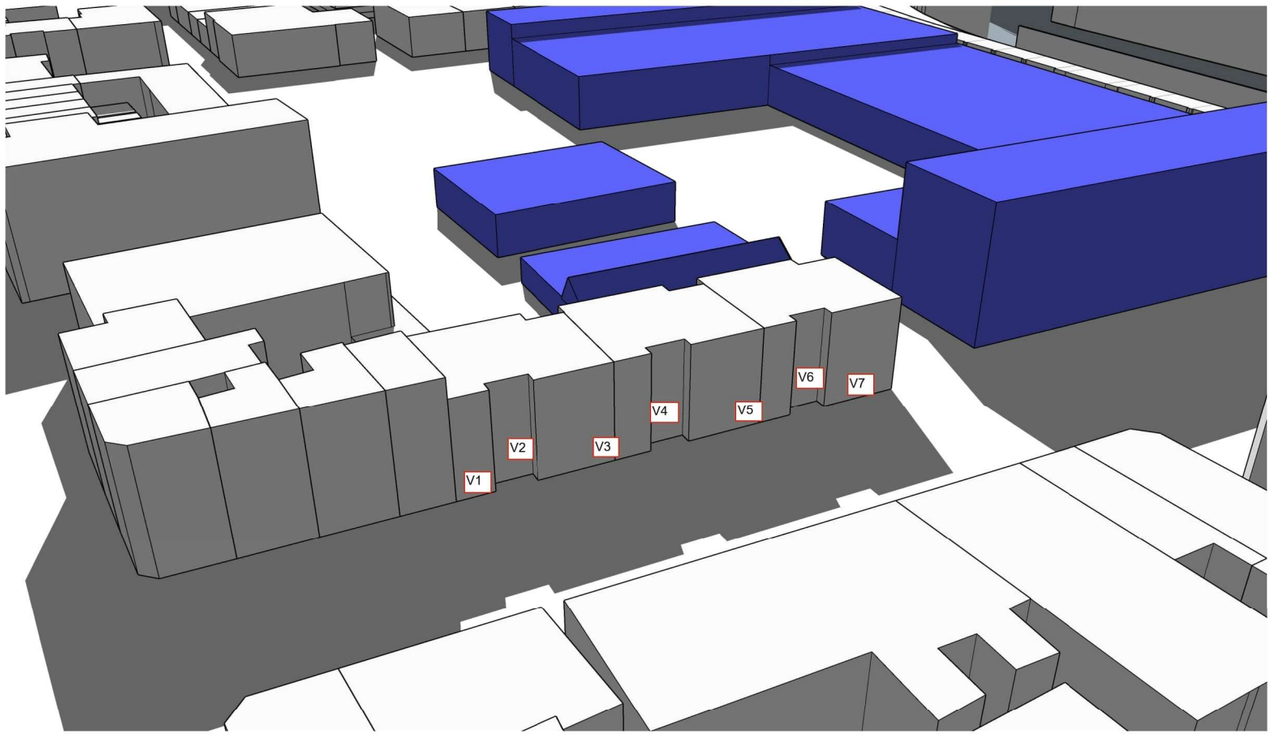
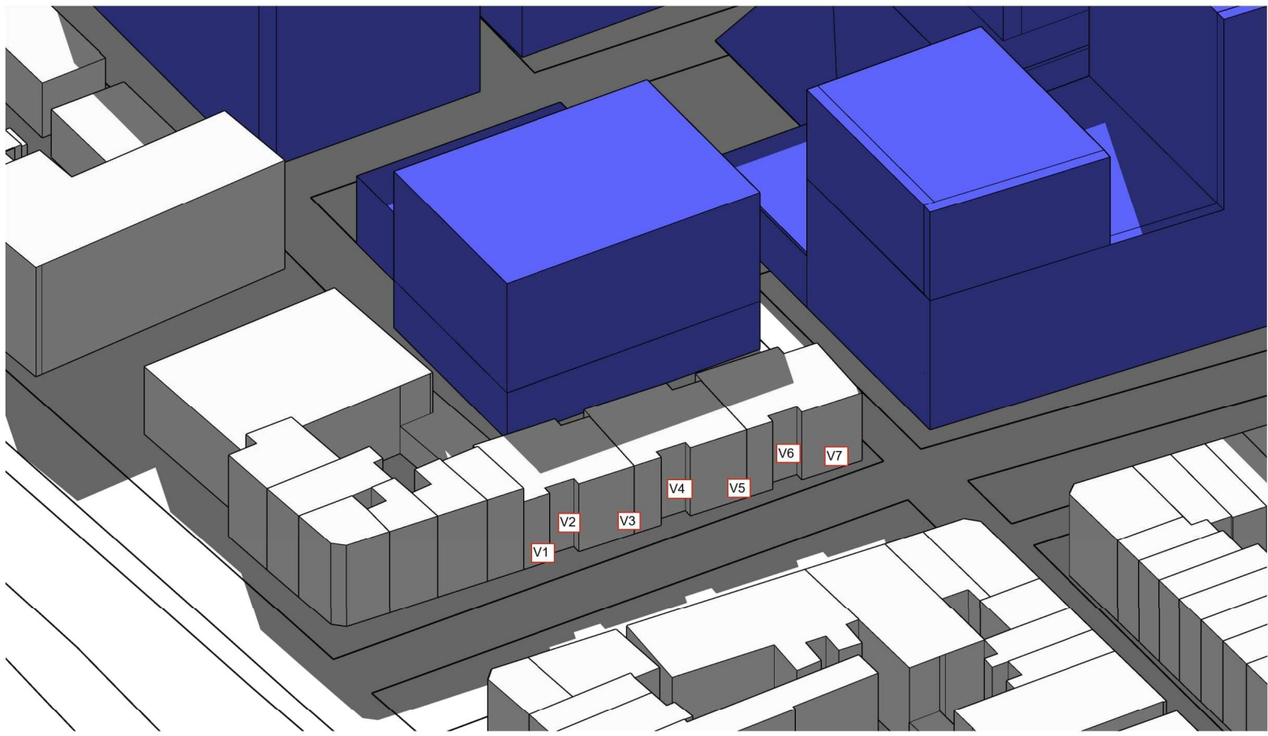
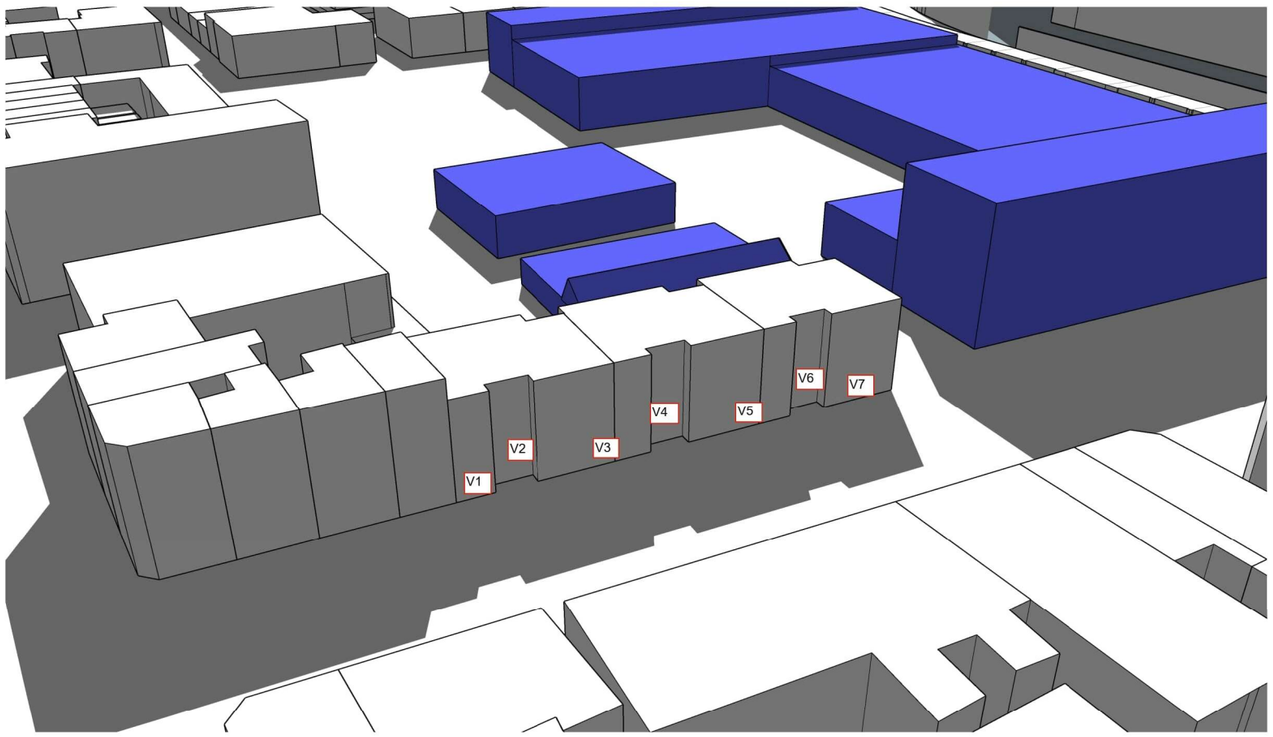
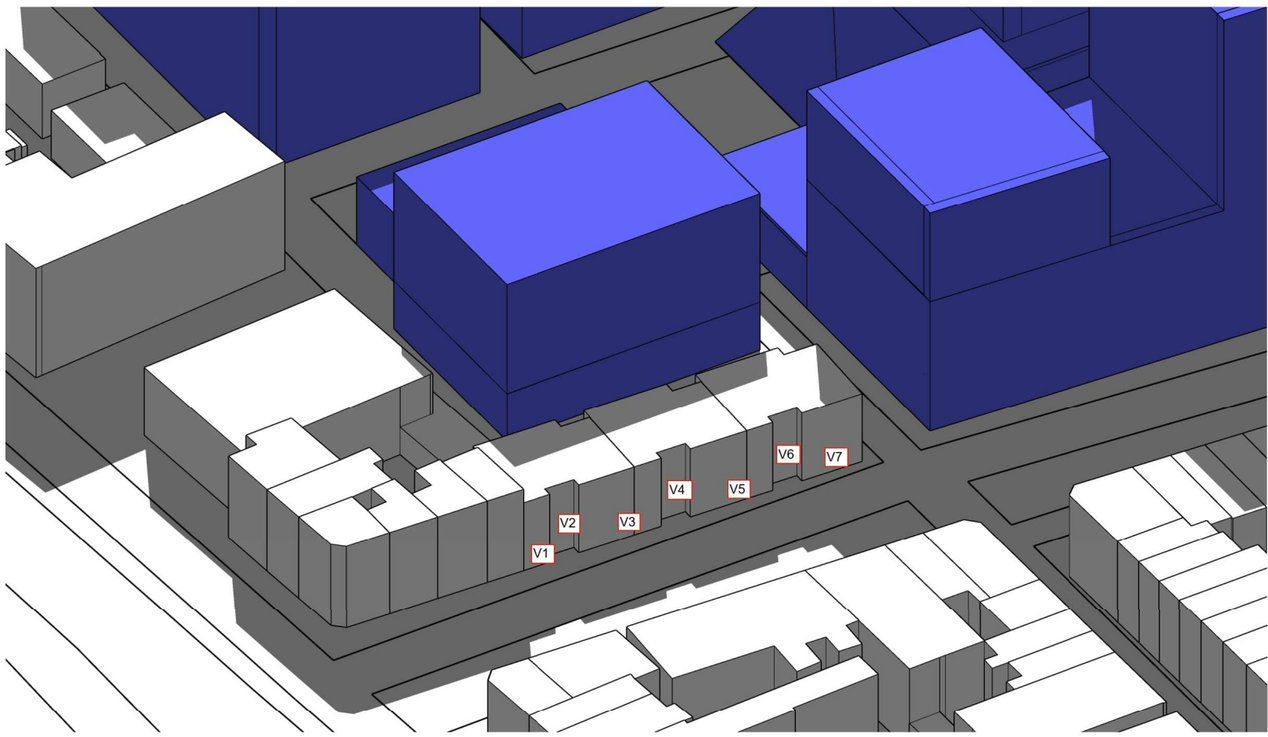




Teilingerstraat Zuidzijde voorgevel
21 september
11.00





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21 september
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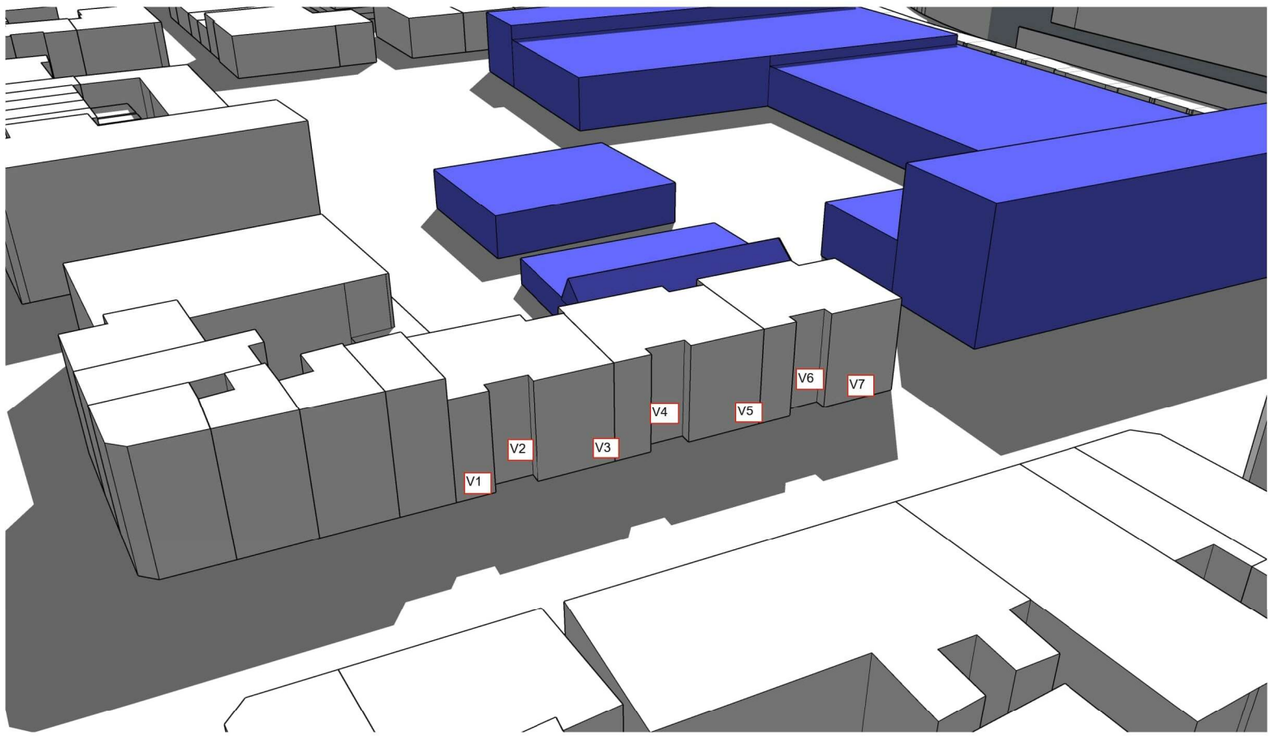
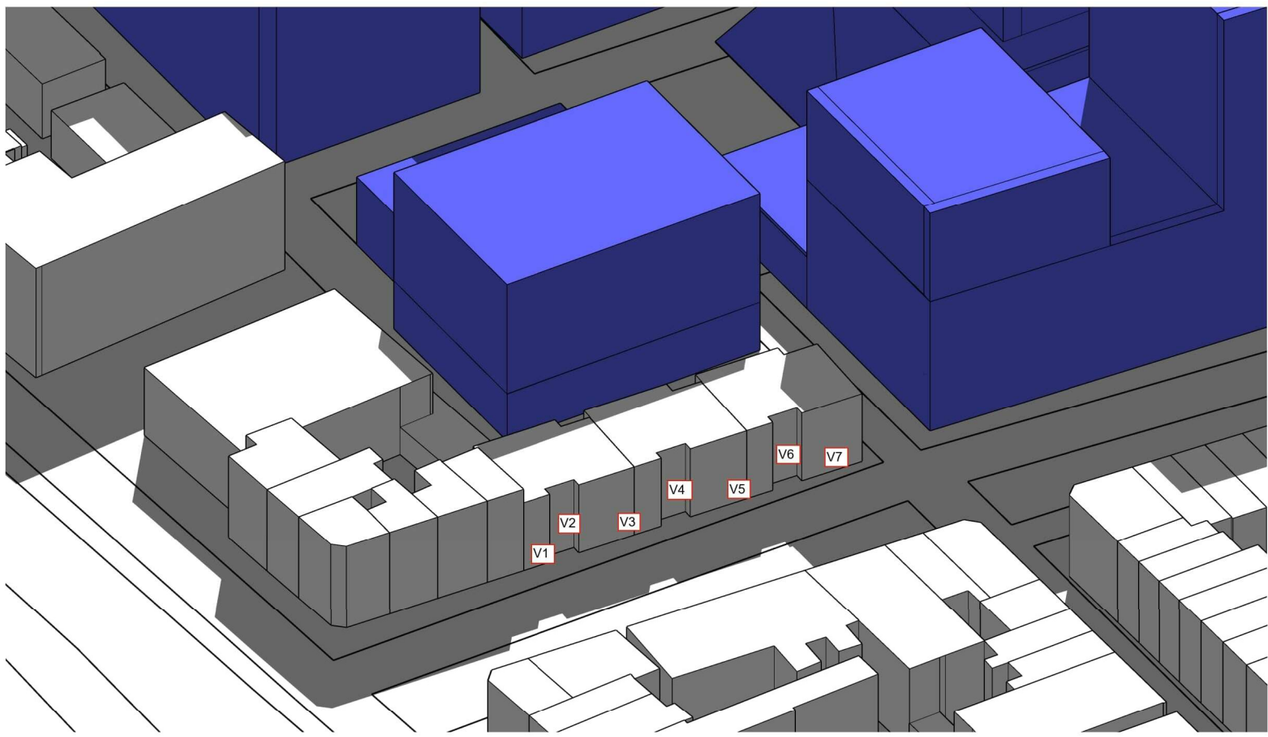
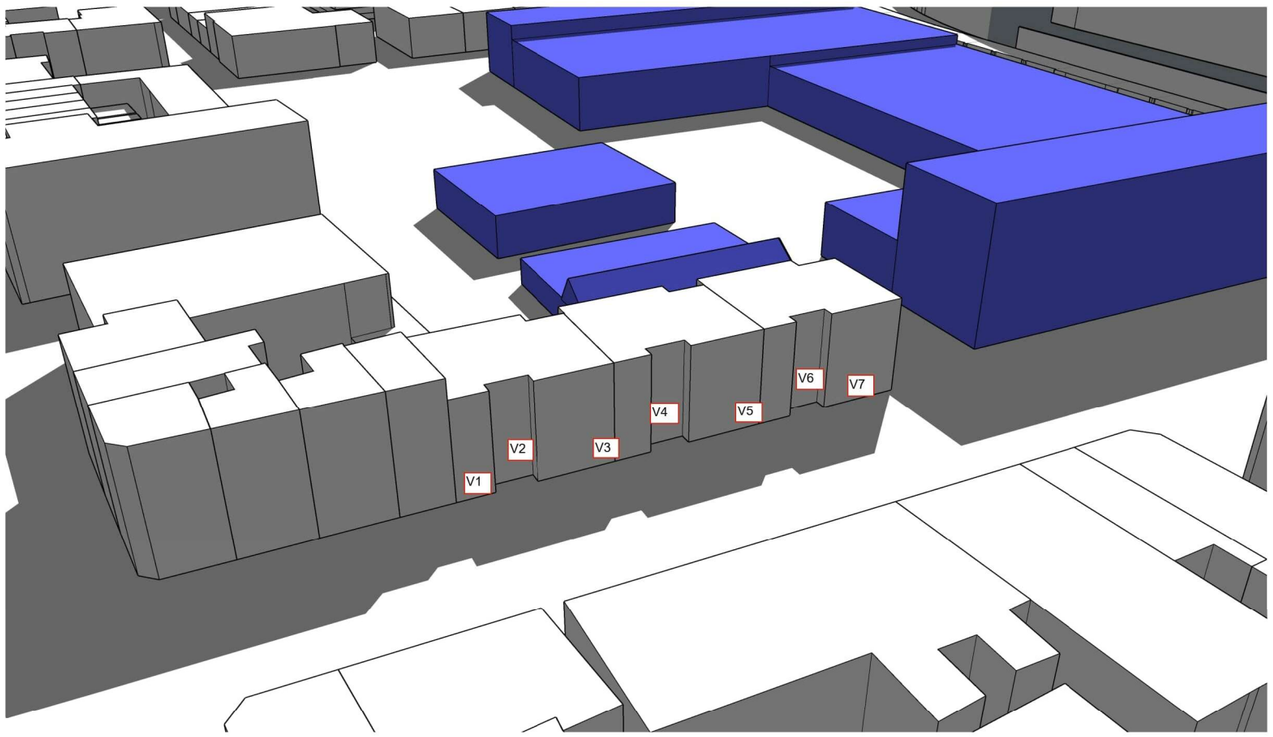
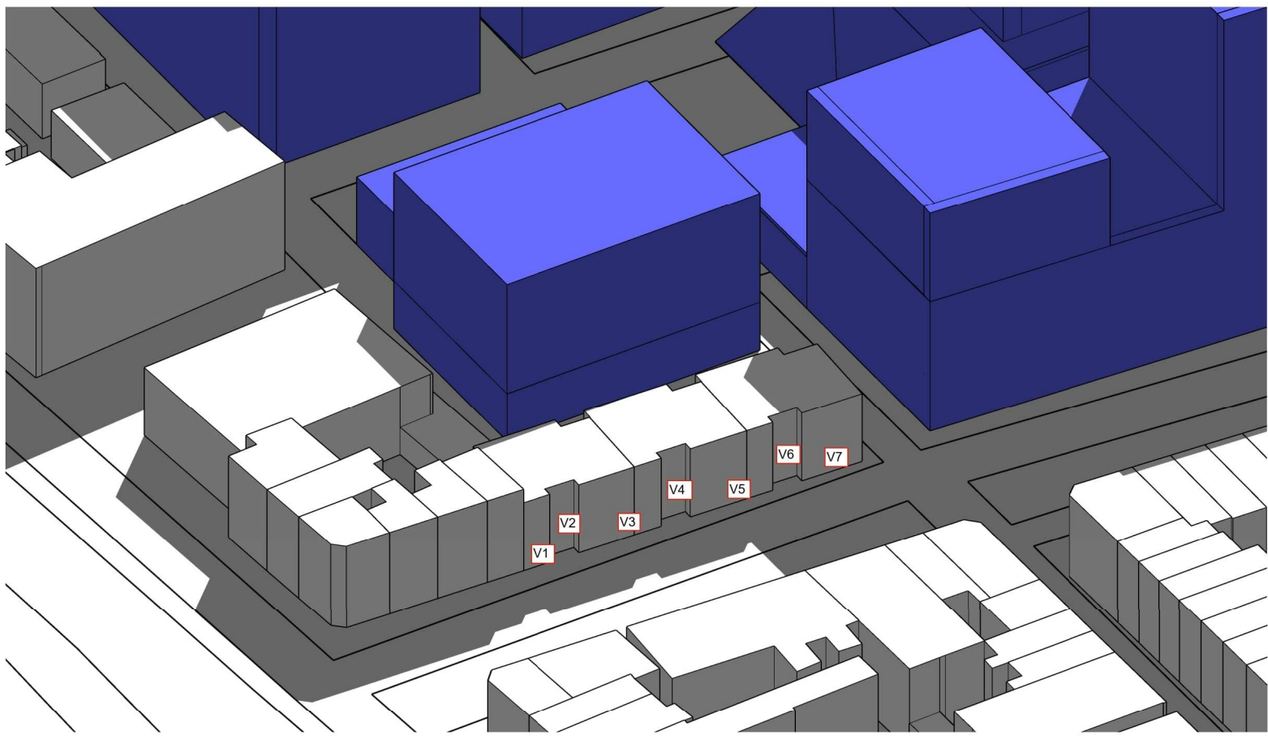




Teilingerstraat Zuidzijde voorgevel
21 september
12.00





Teilingerstraat Zuidzijde voorgevel
21 september
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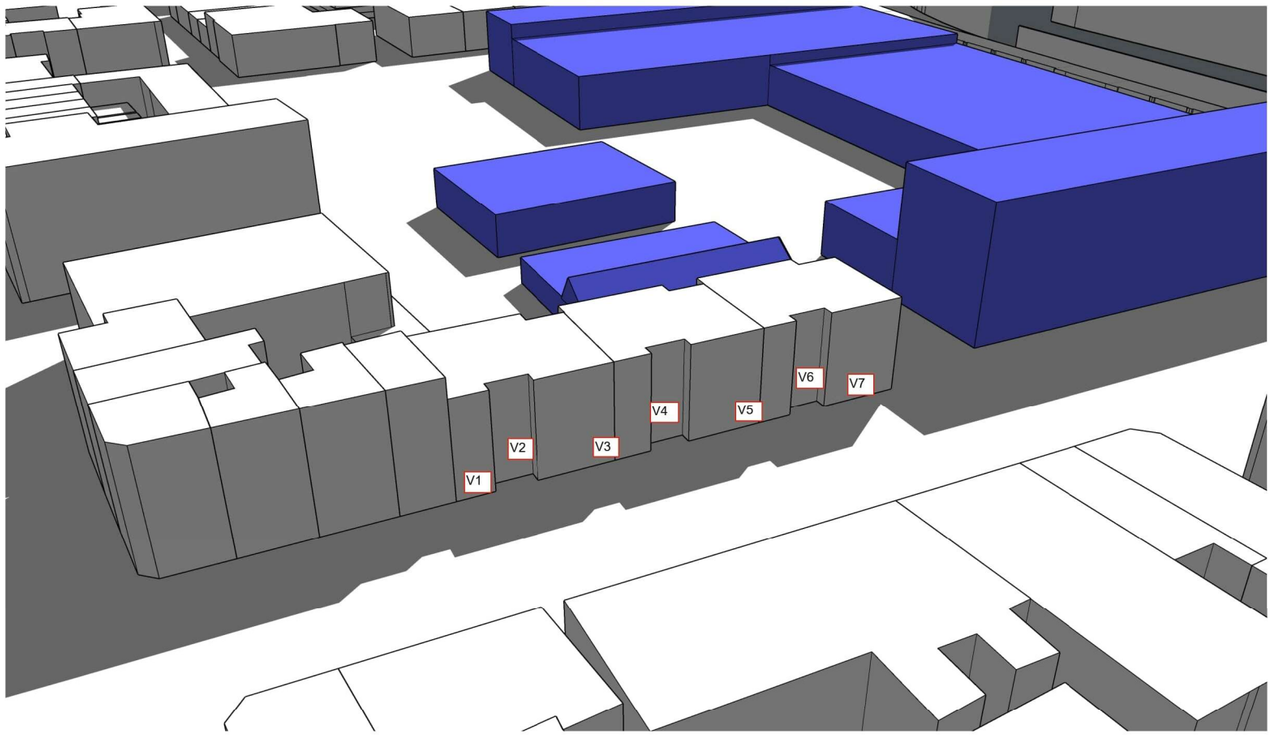
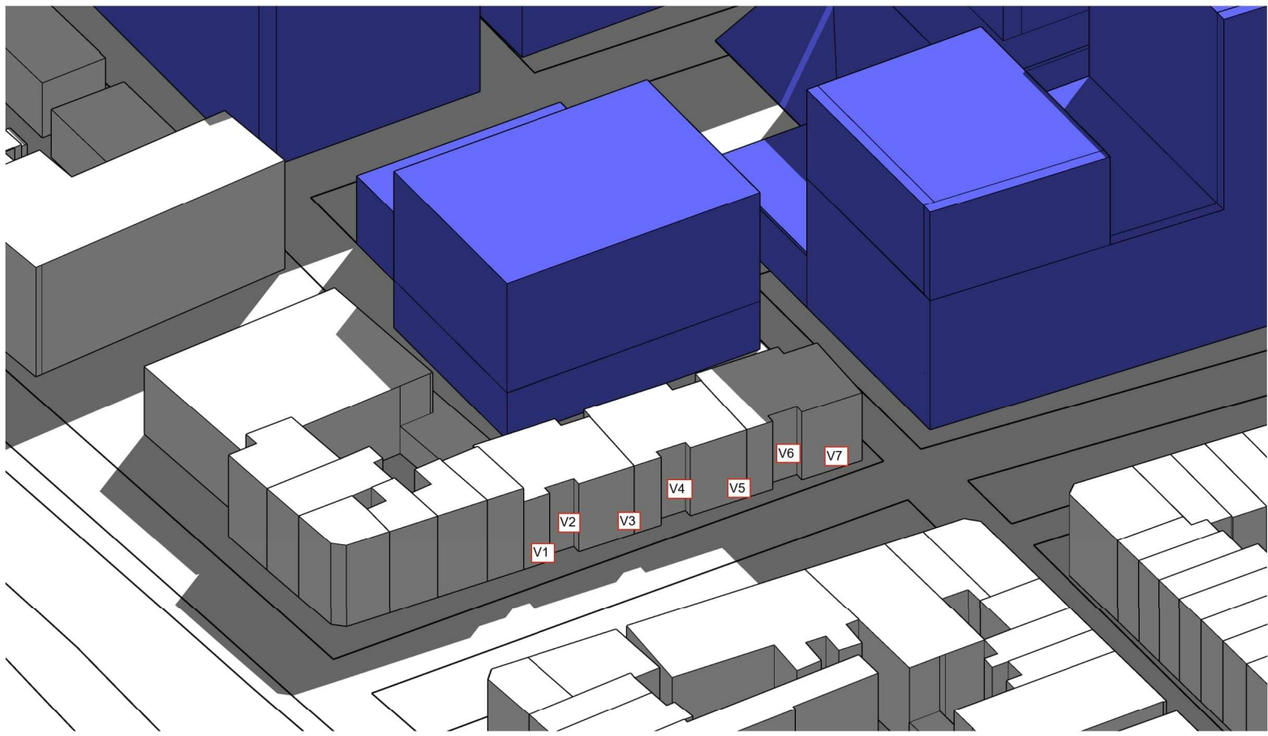
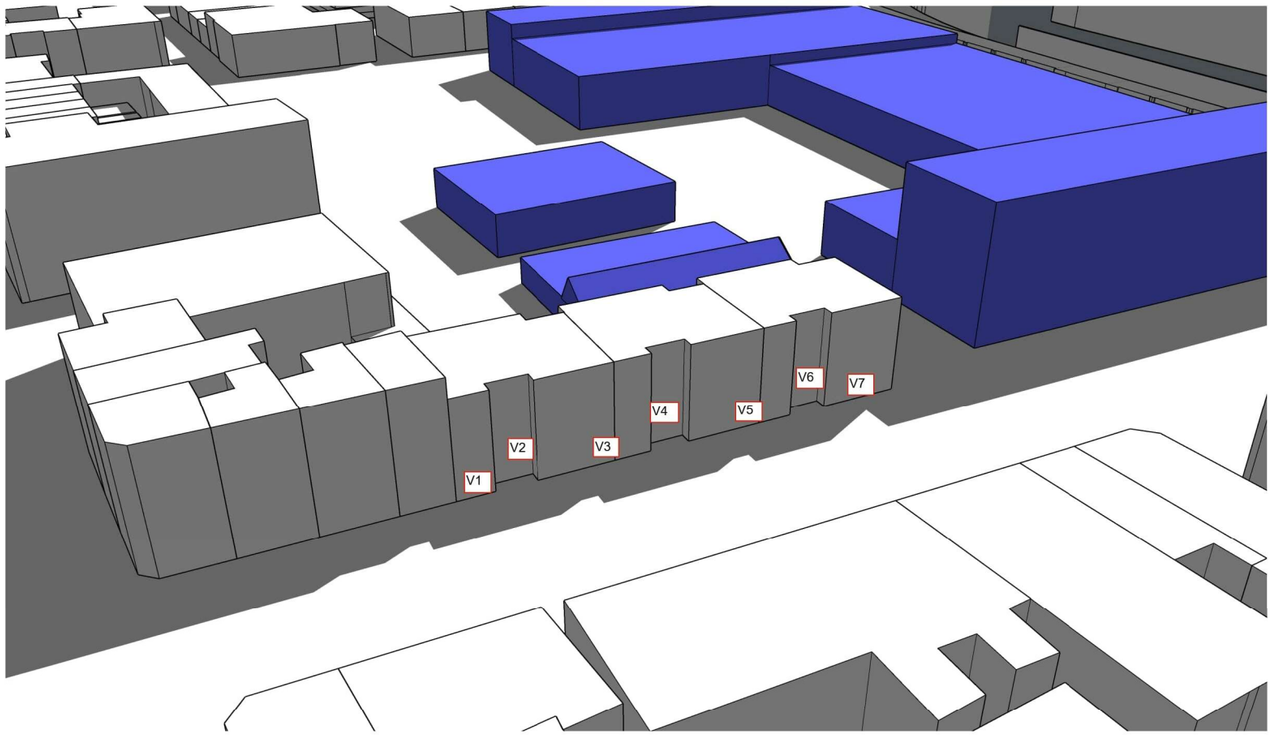
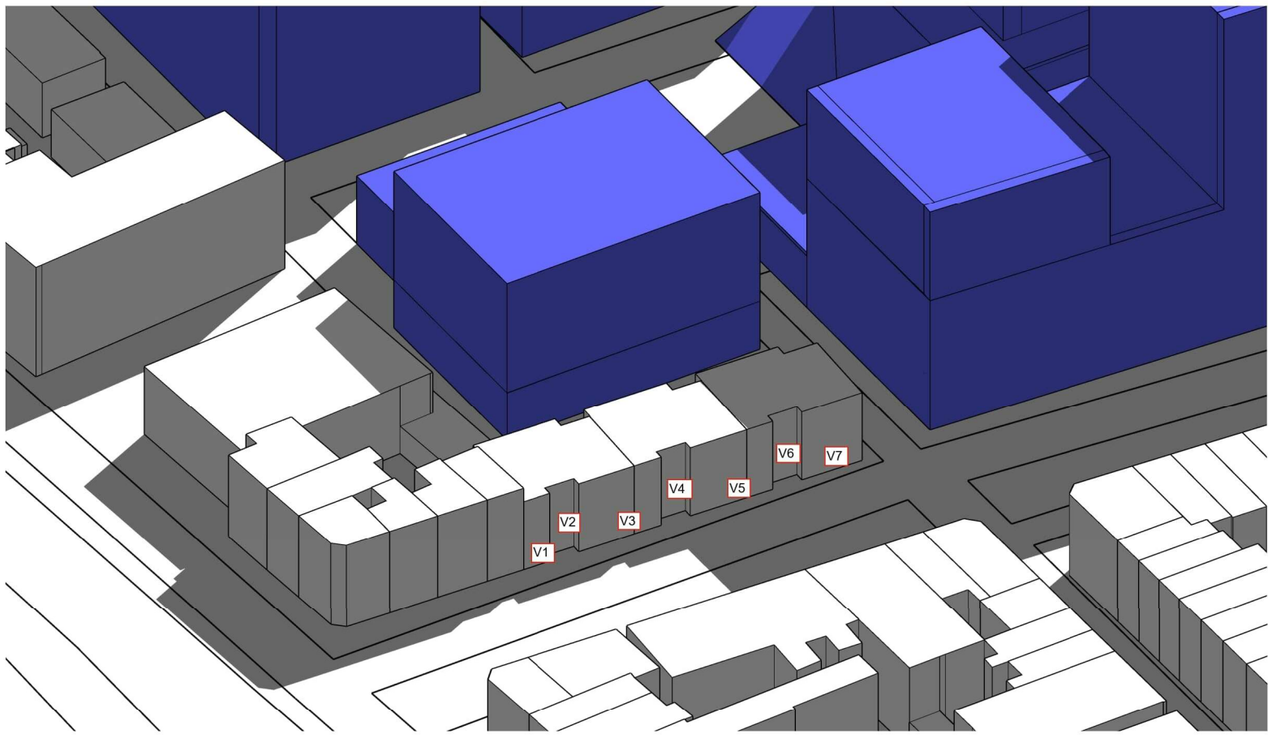




Teilingerstraat Zuidzijde voorgevel
21 september
13.00





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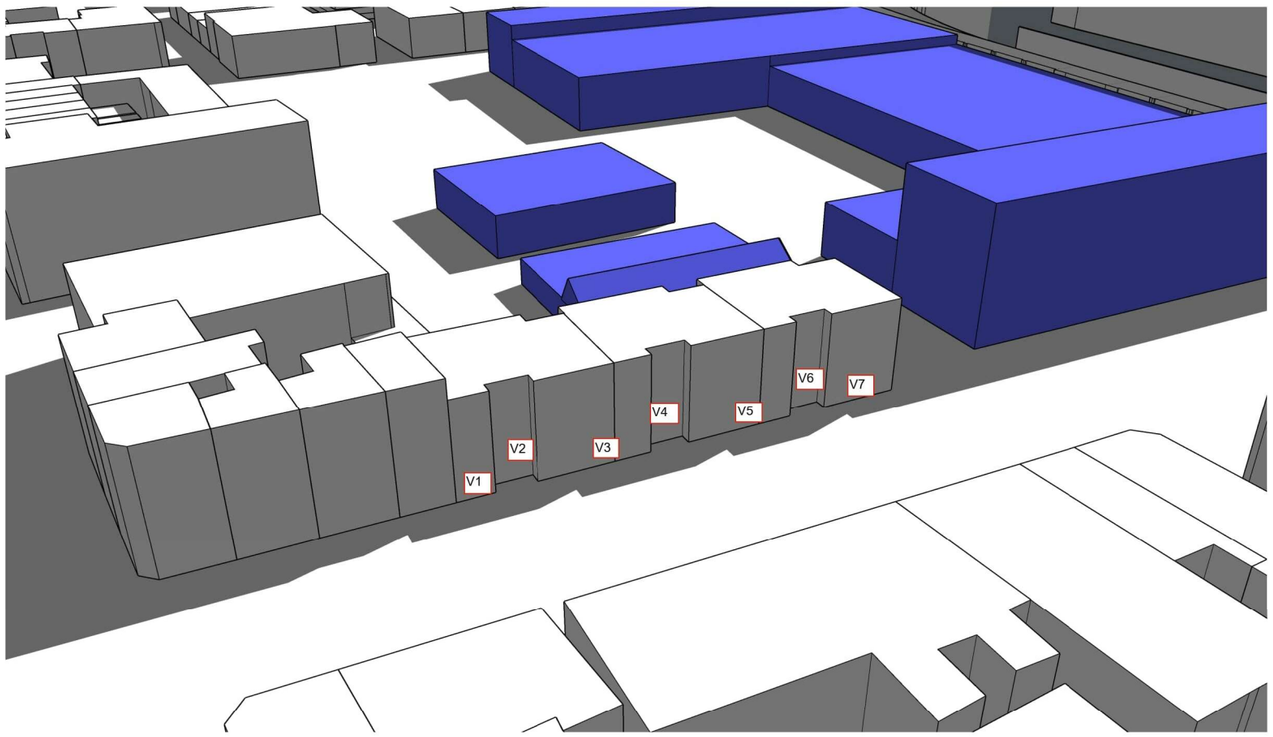
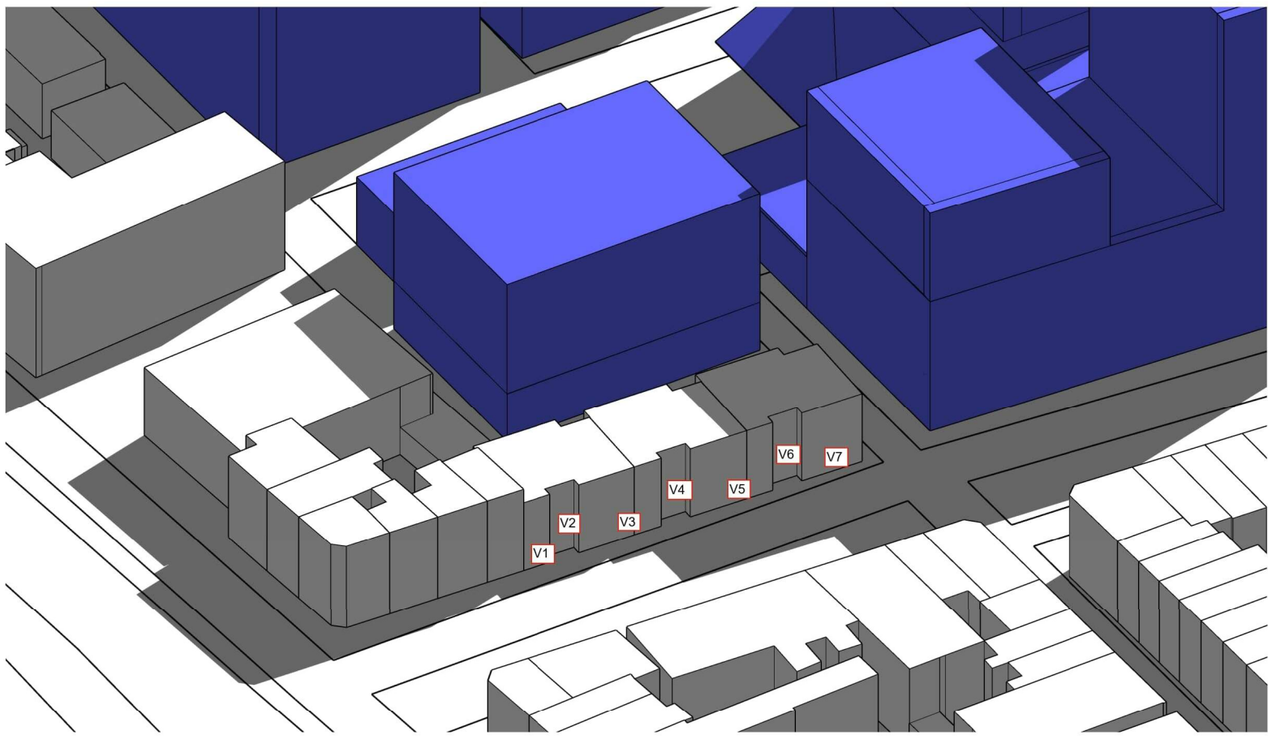
21 september
13.30





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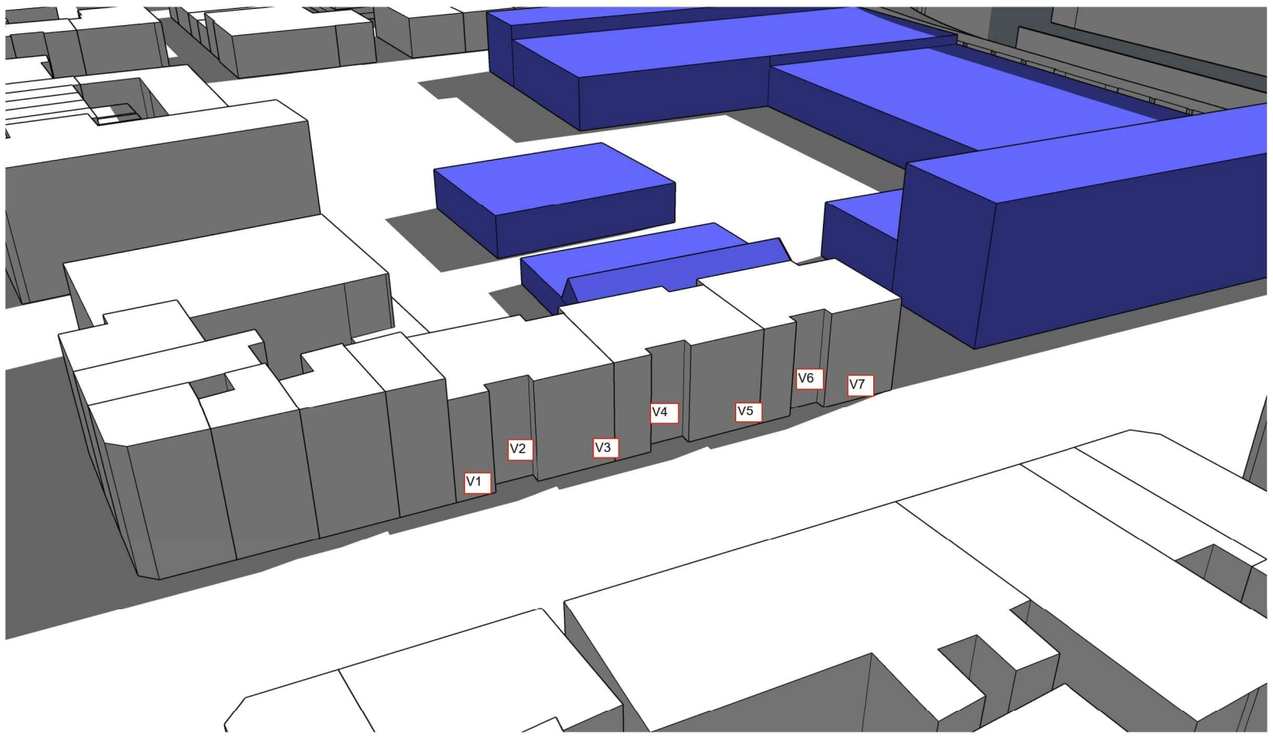
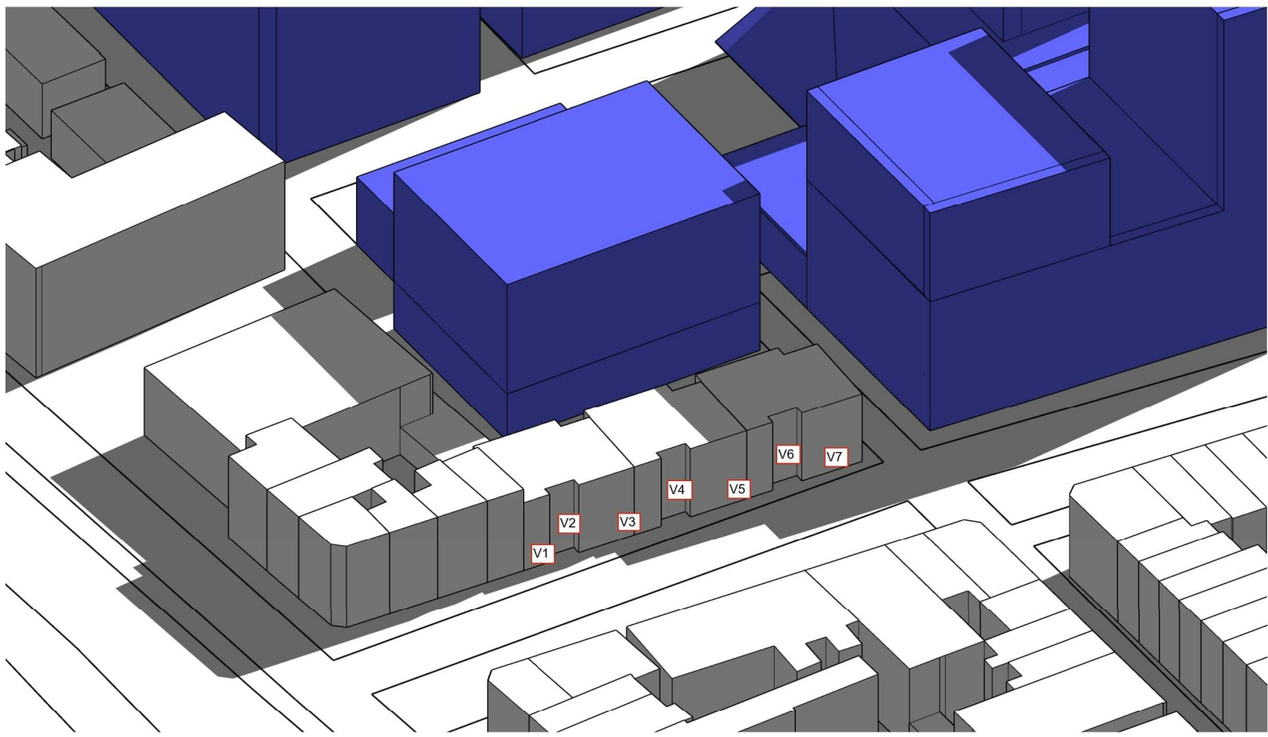
21 september
14.00





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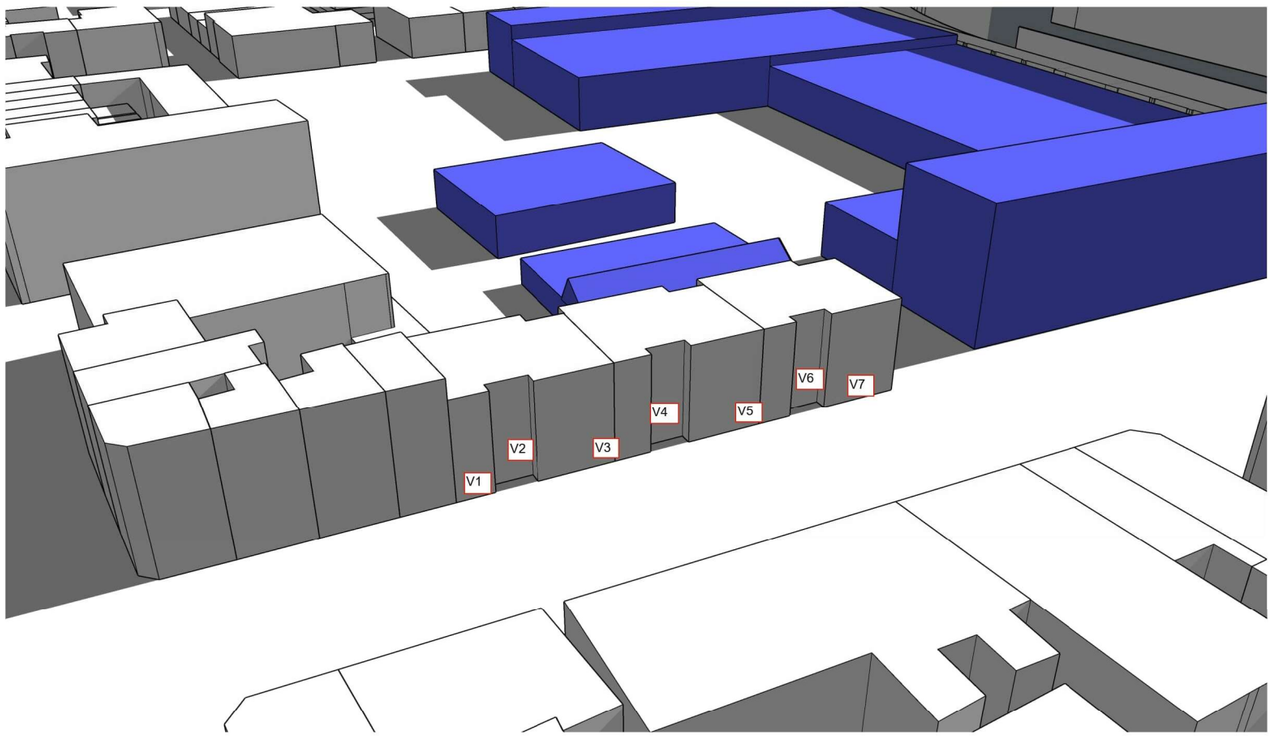
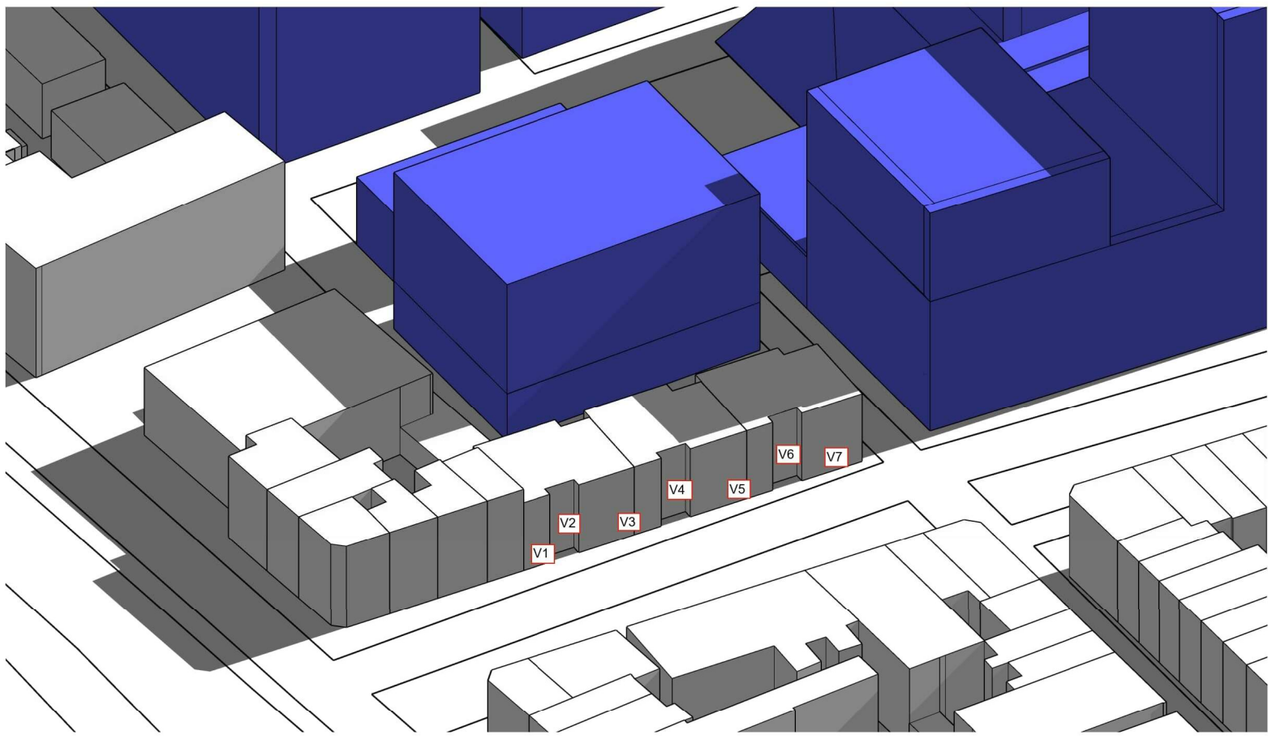
21 september
14.30





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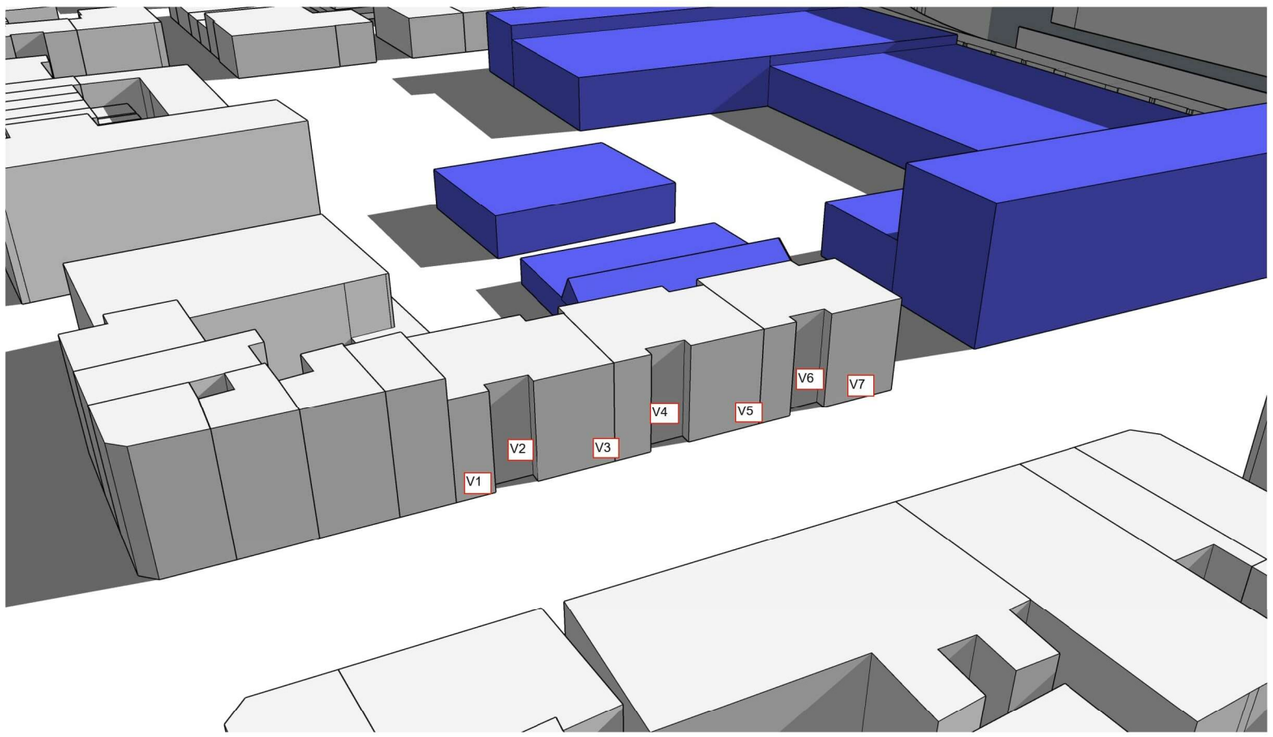

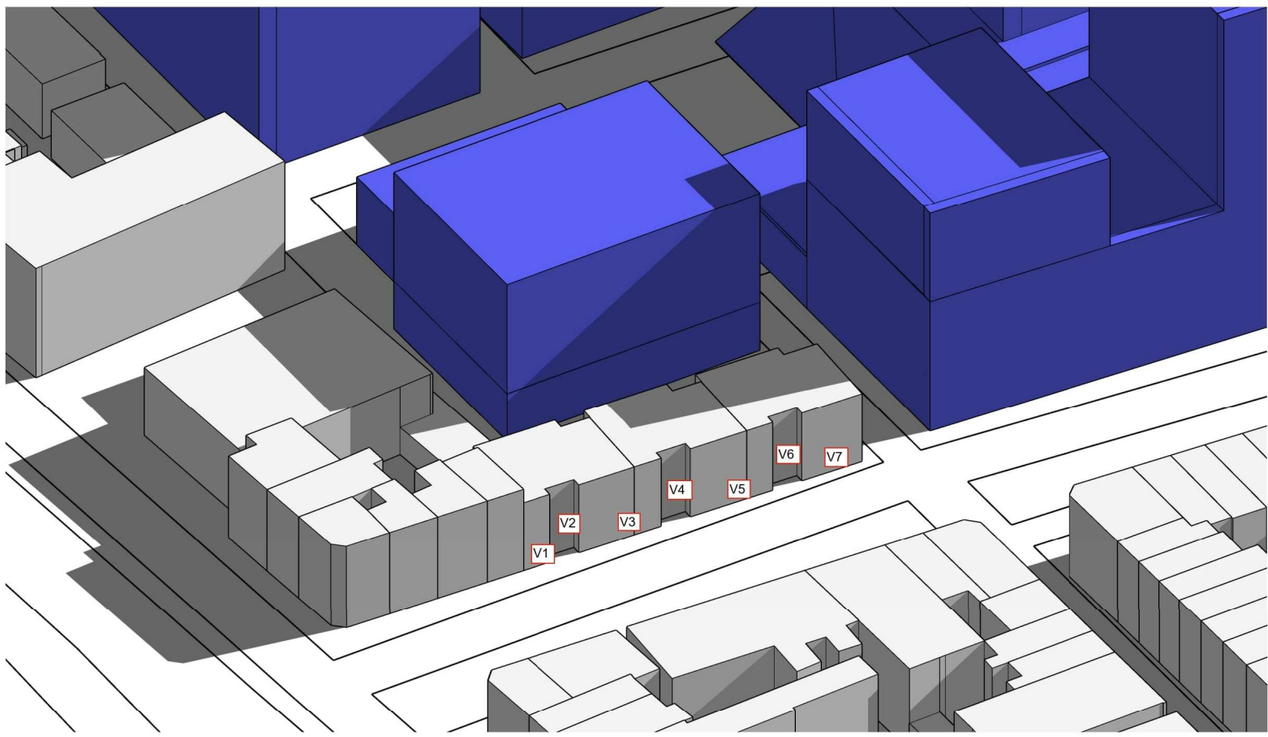

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21 september
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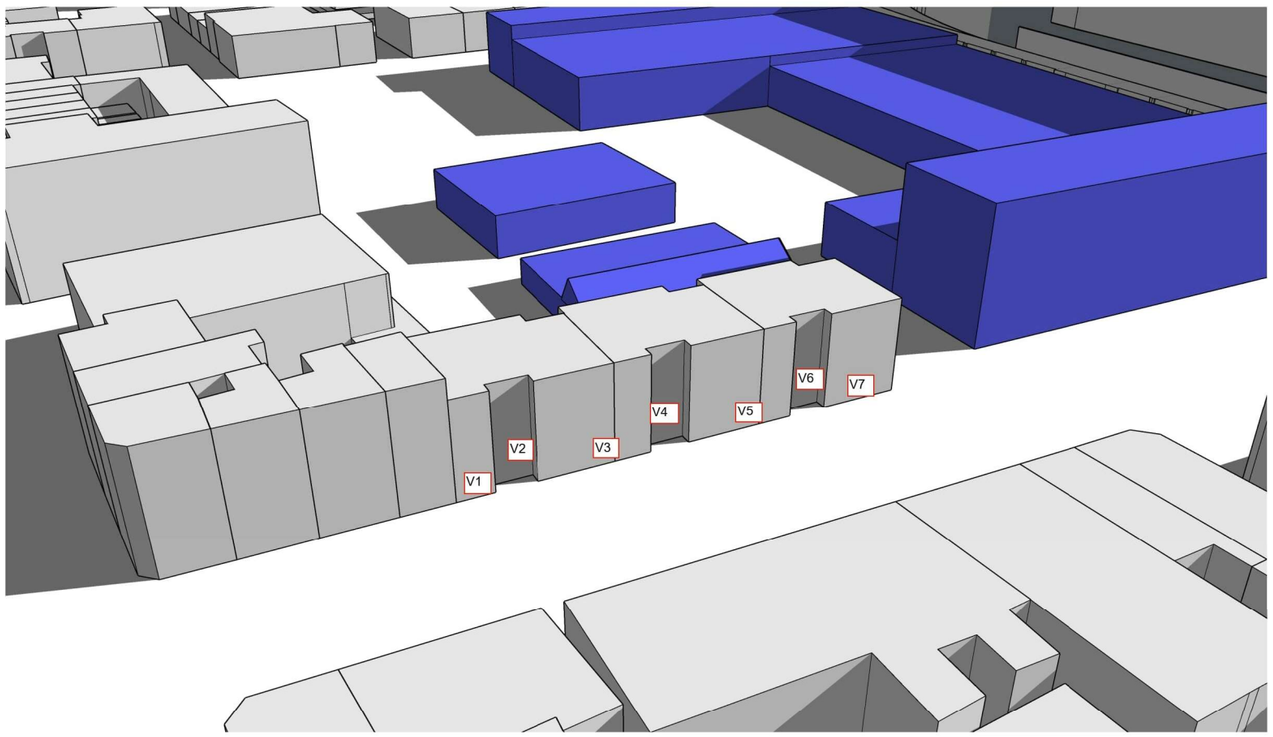

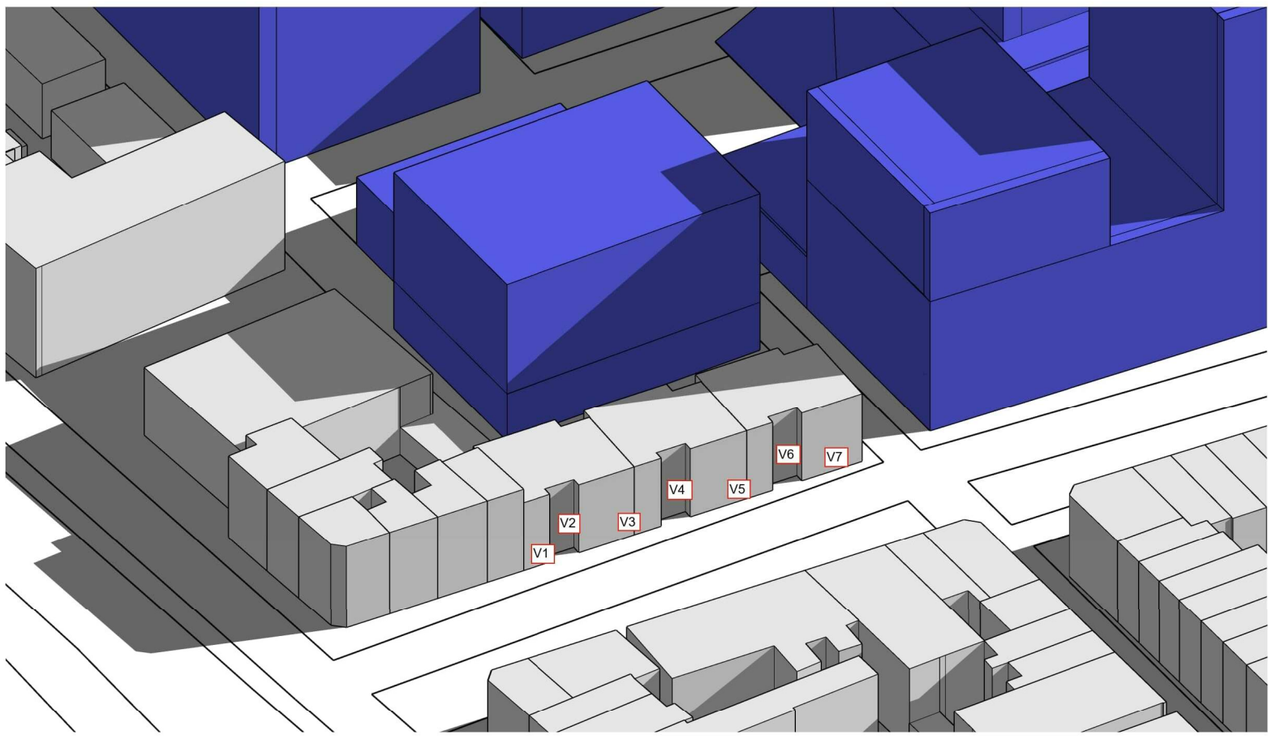

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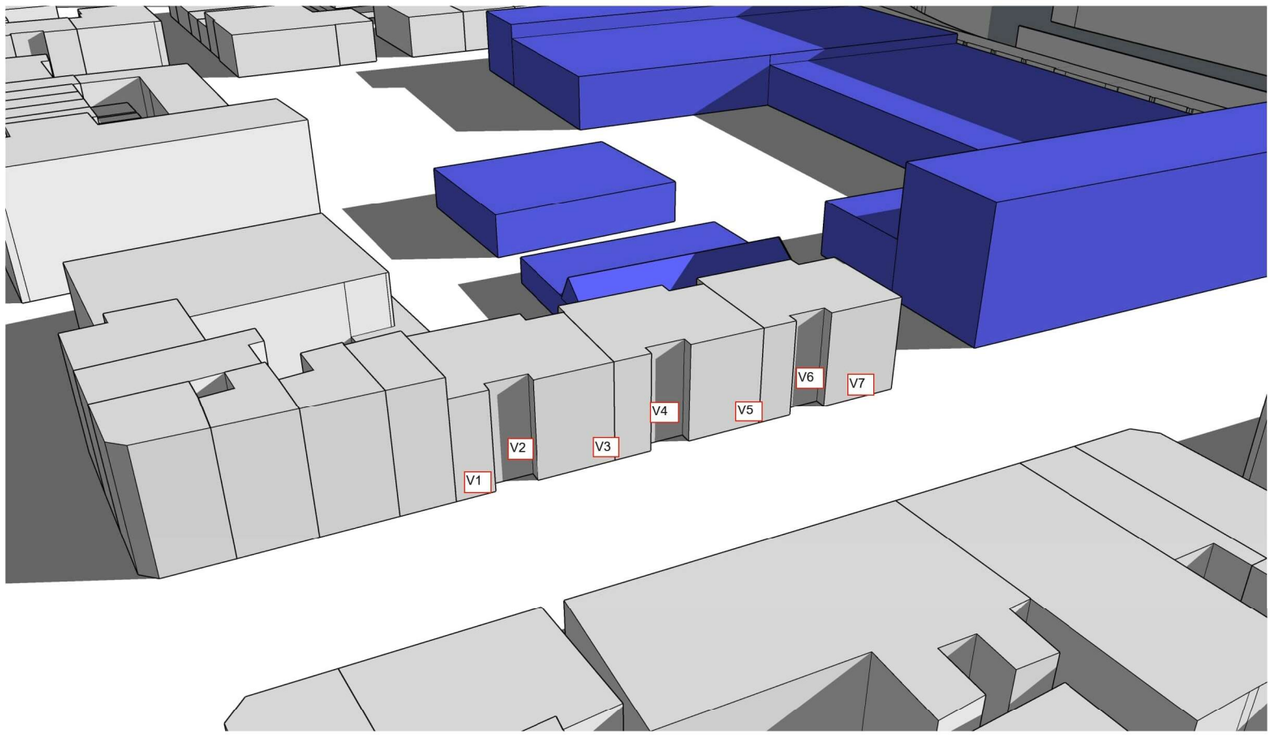

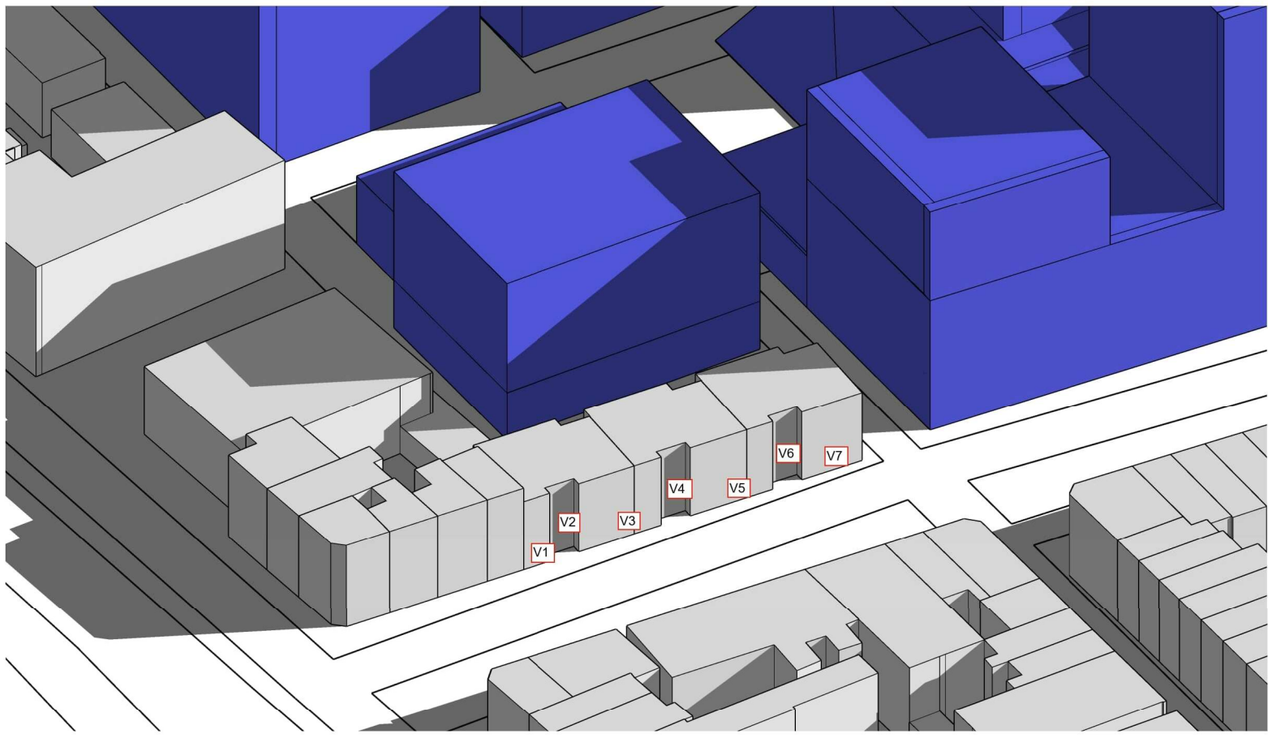

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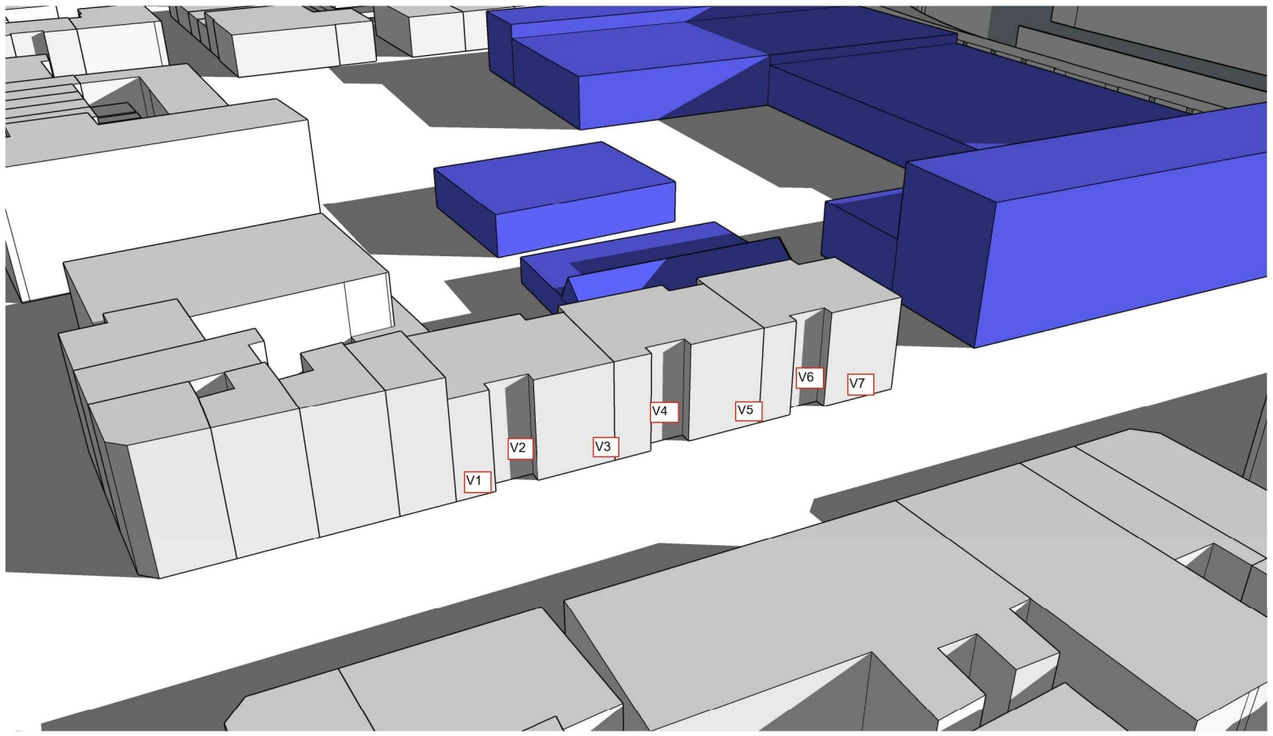
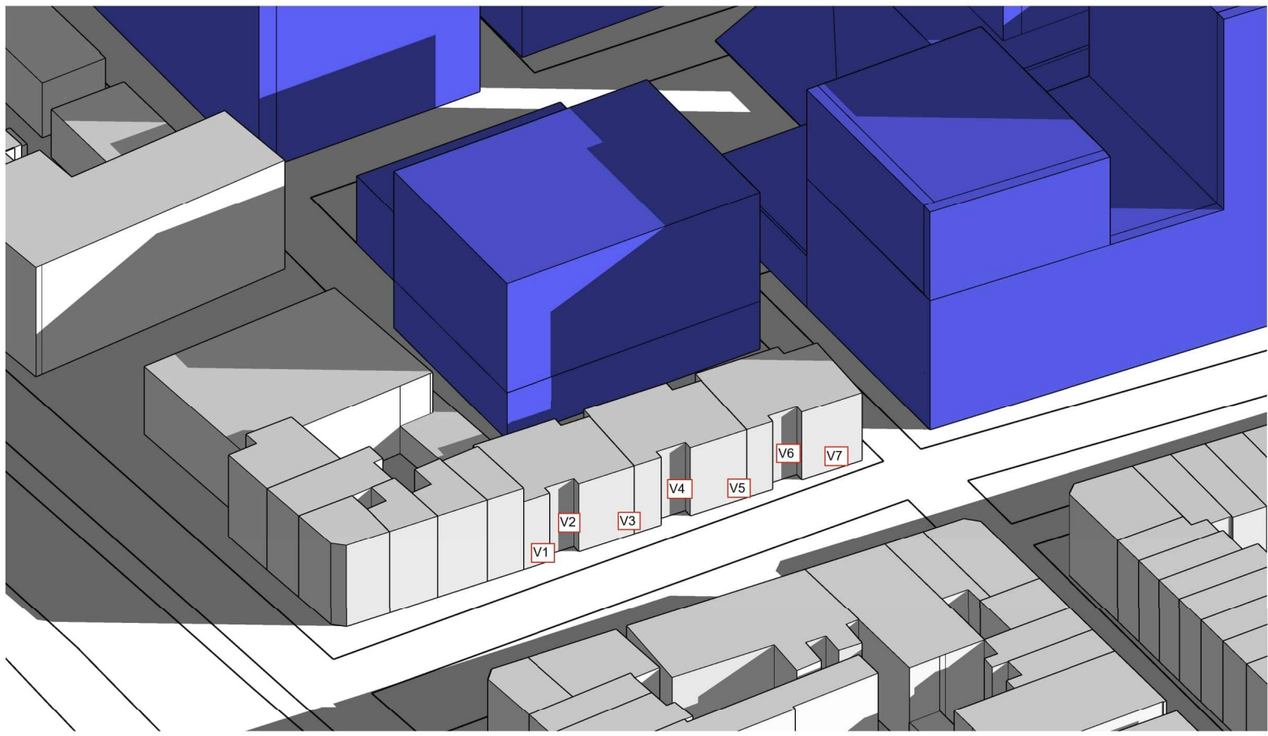
21 september
16.30





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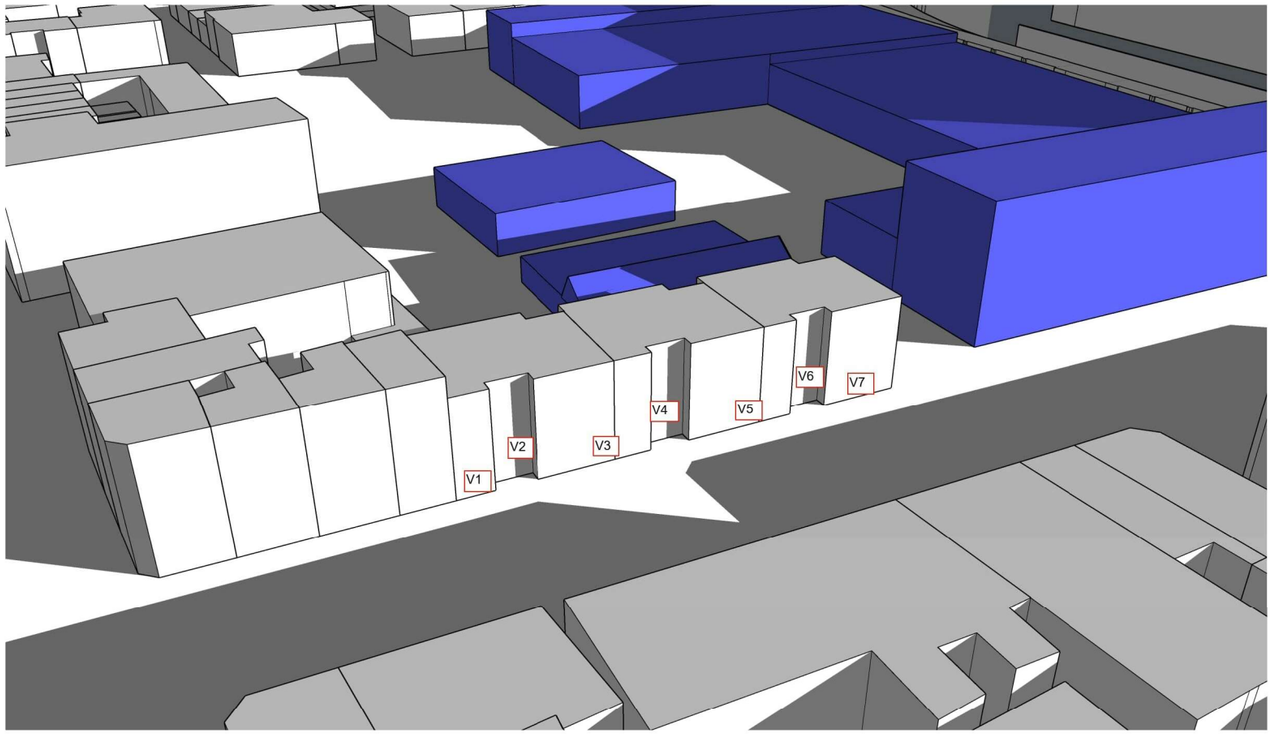

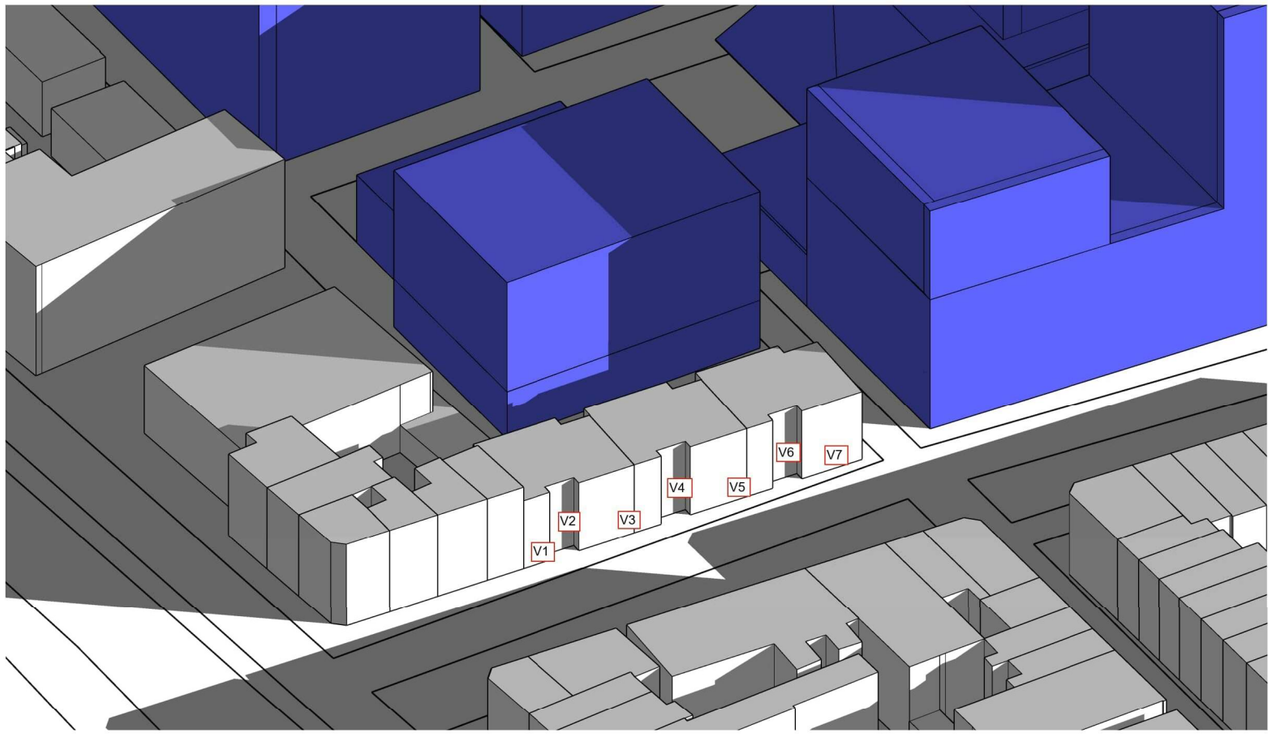

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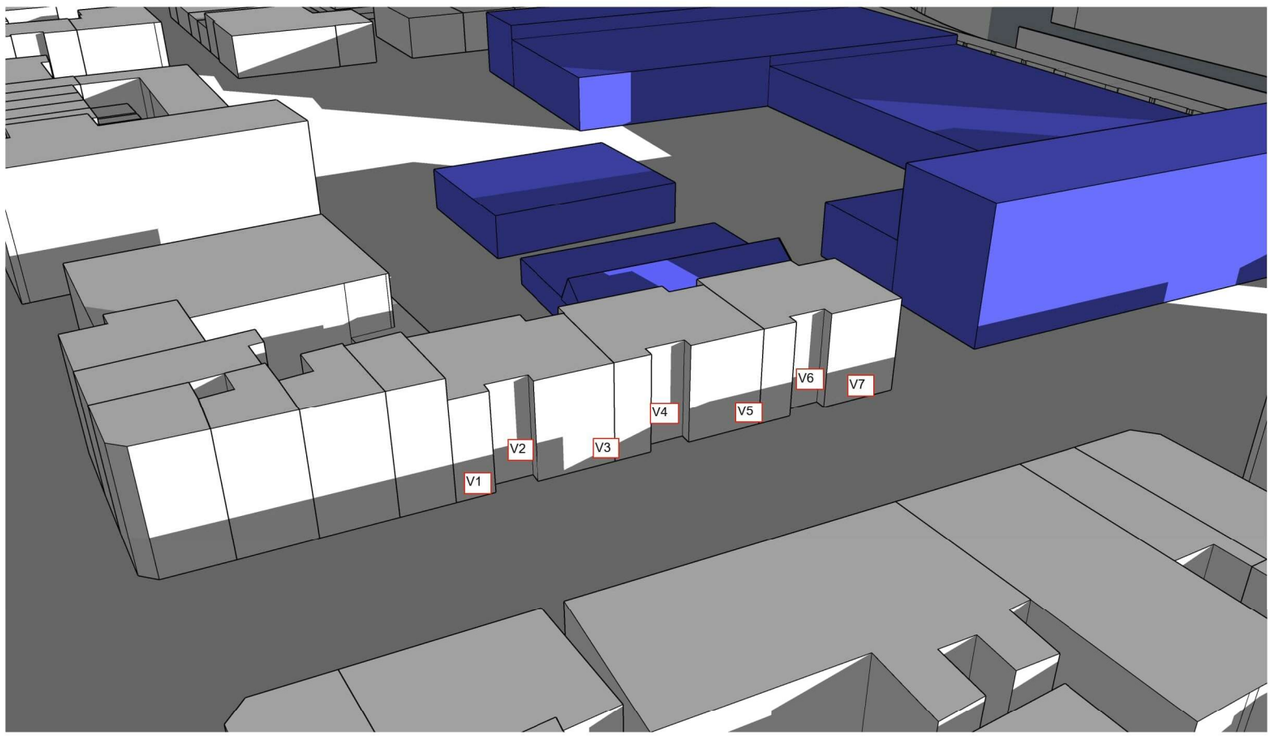

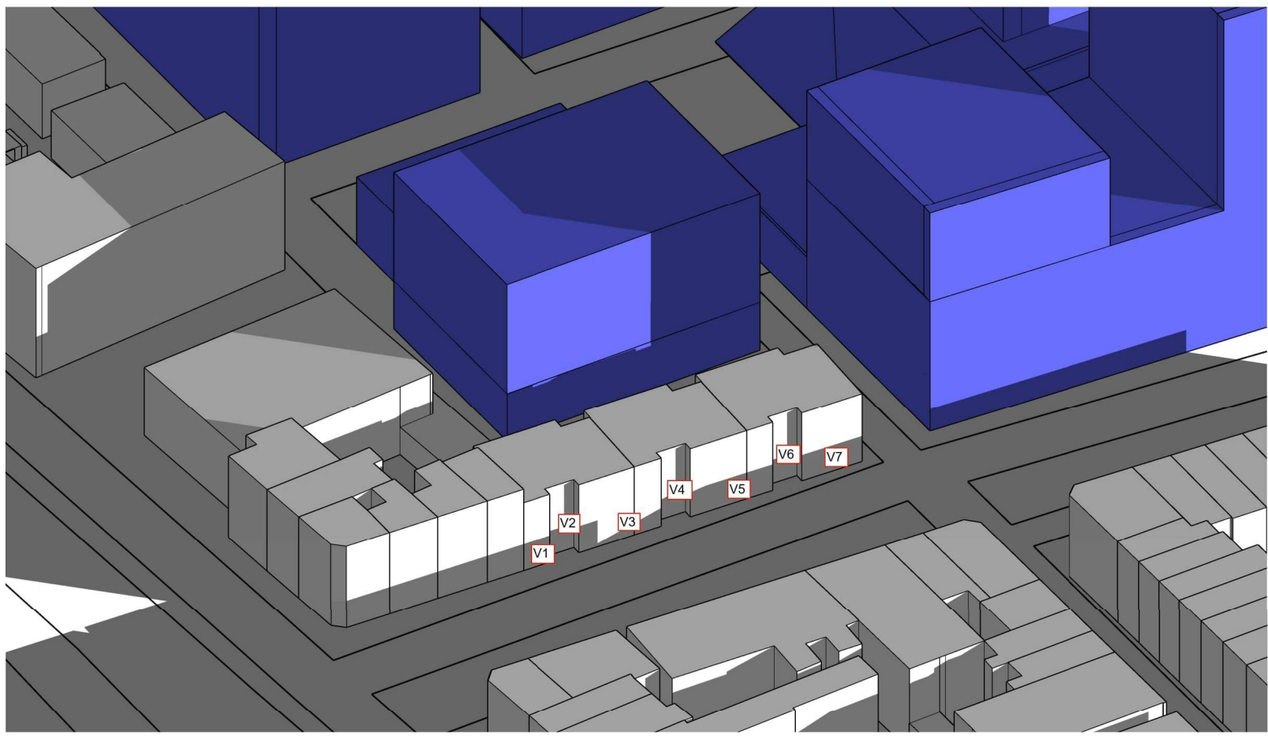

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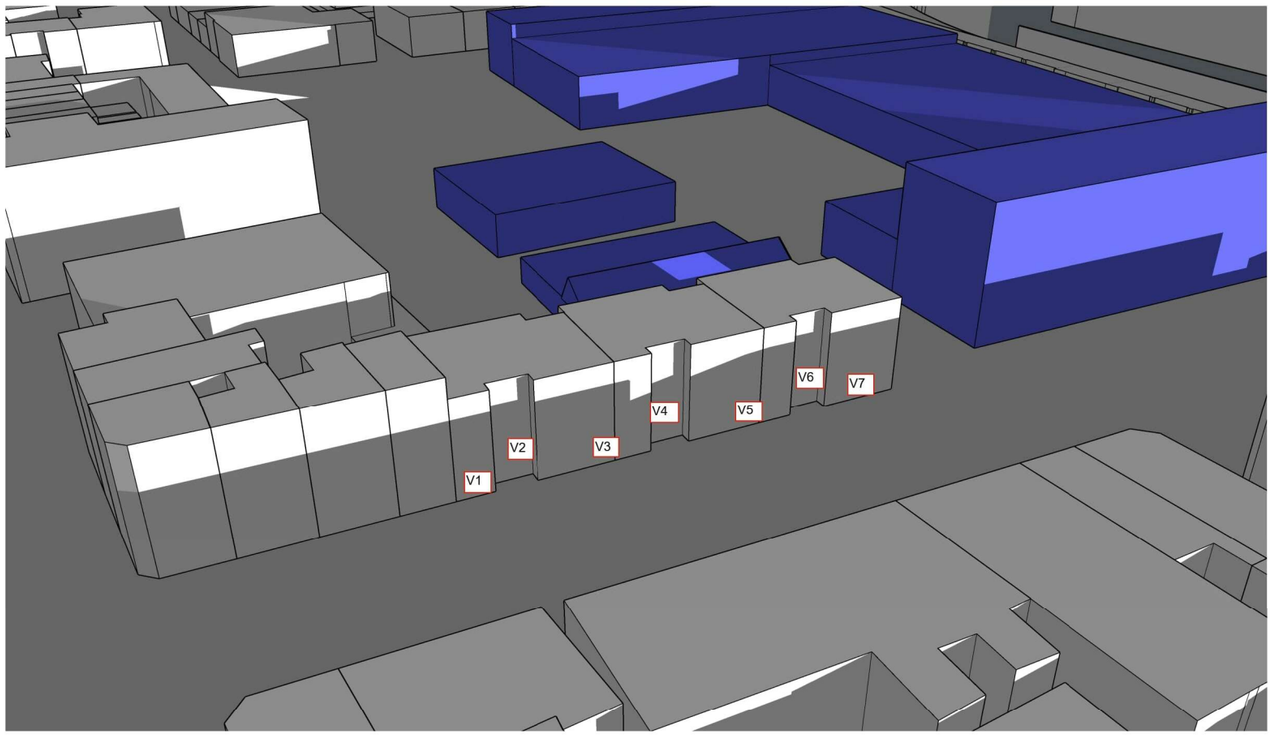

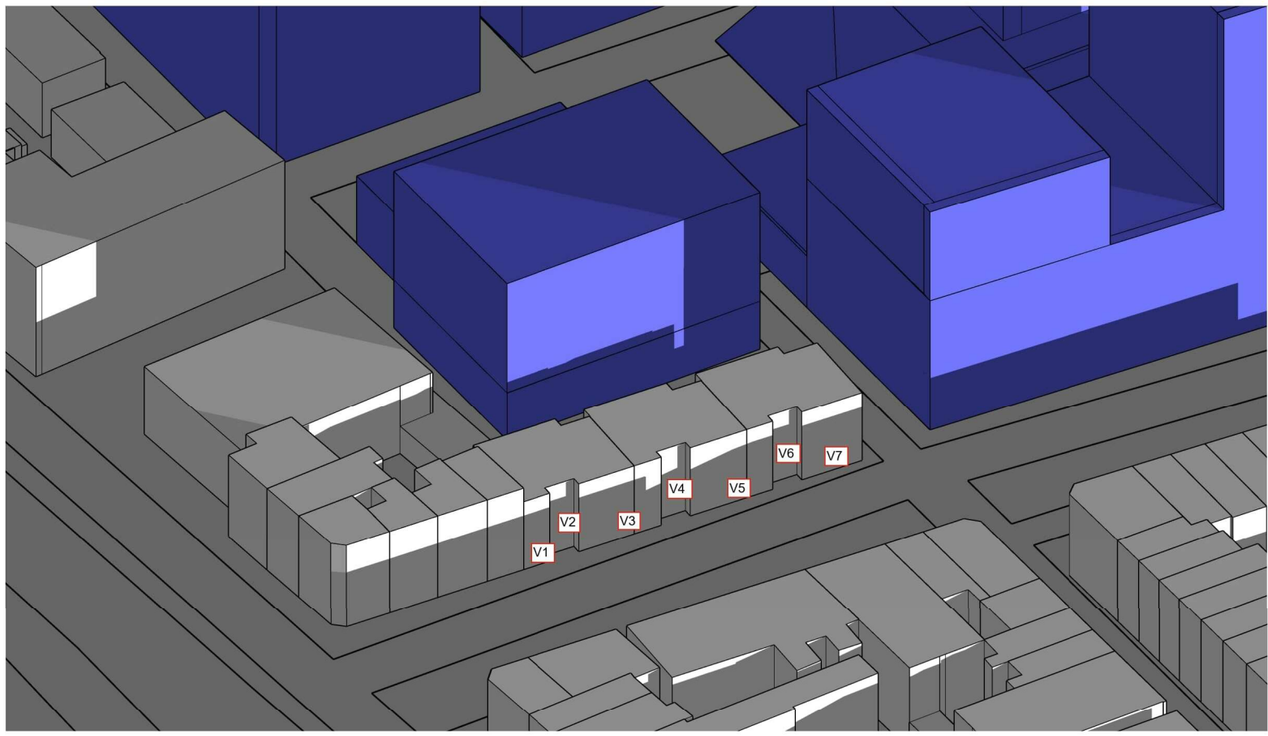

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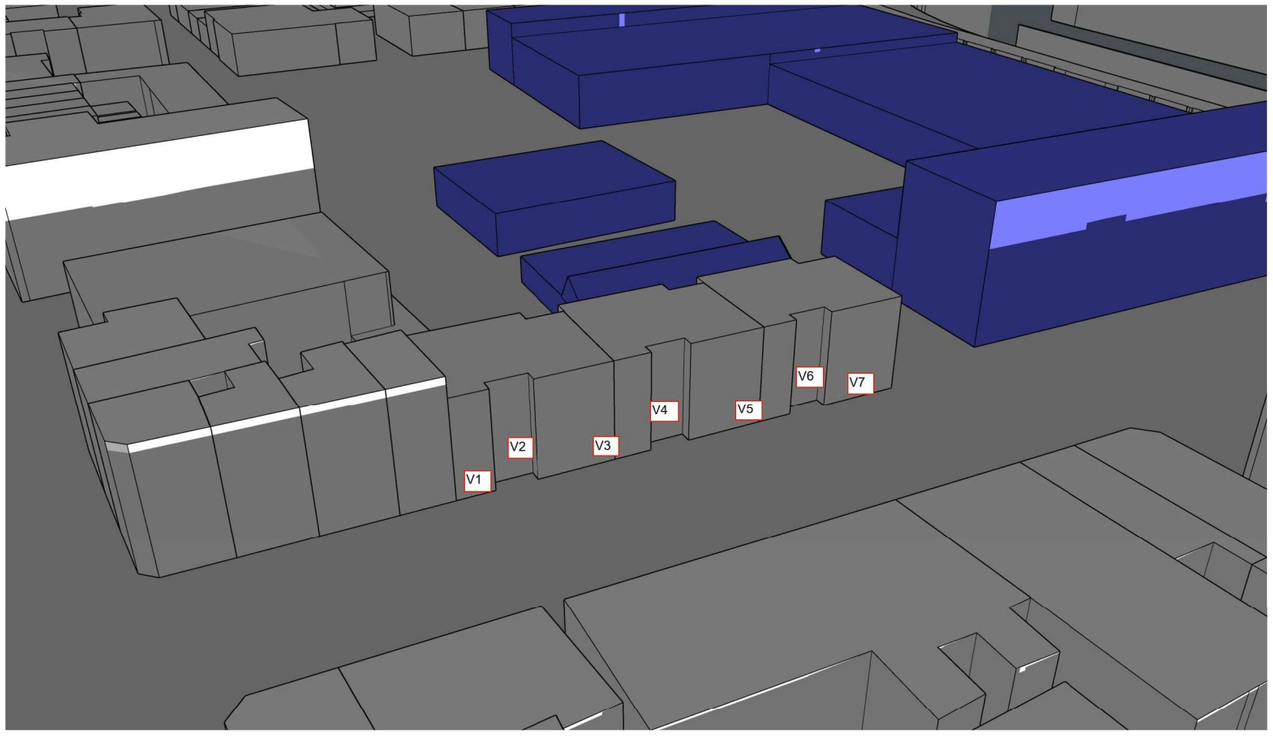

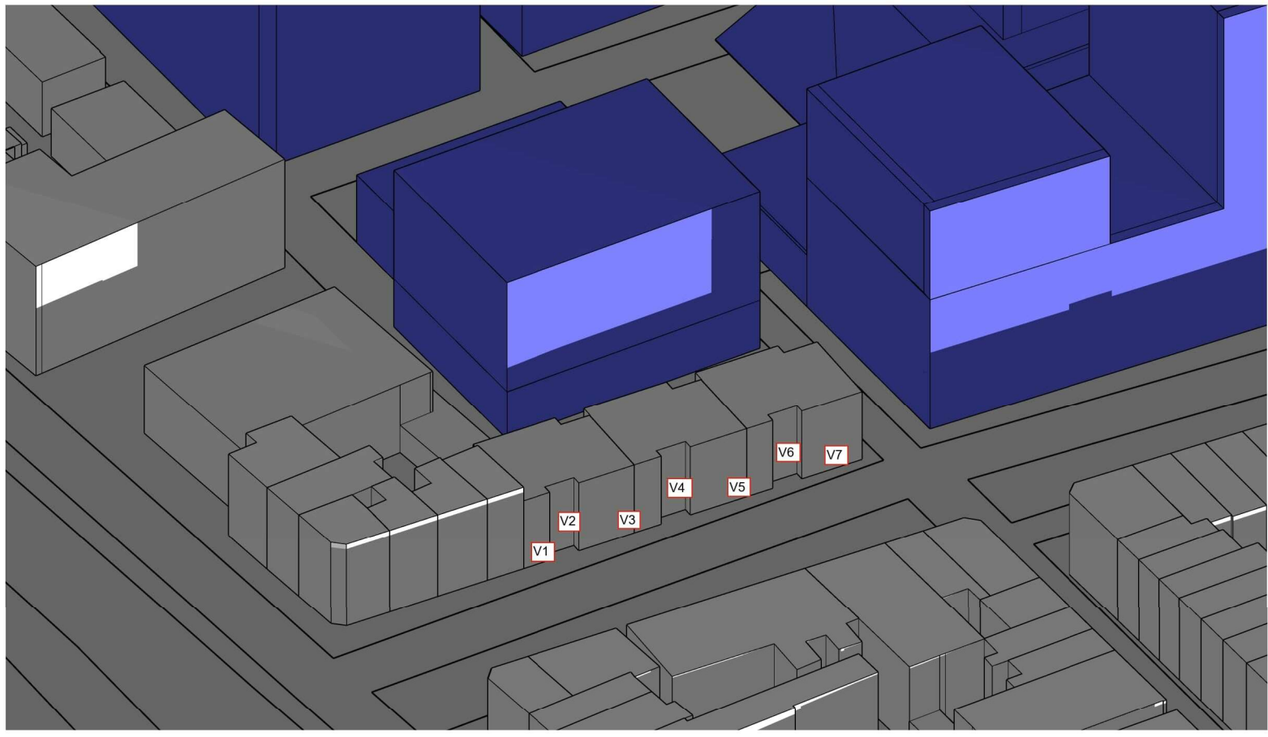

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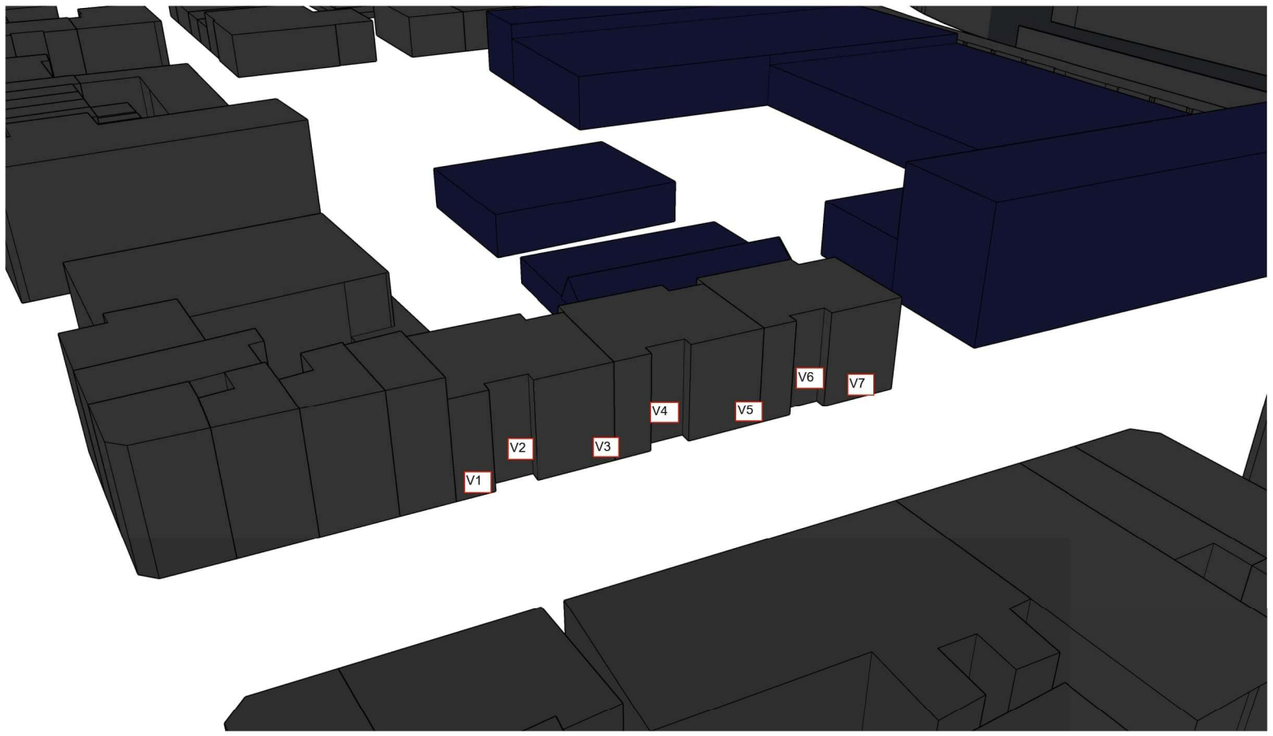
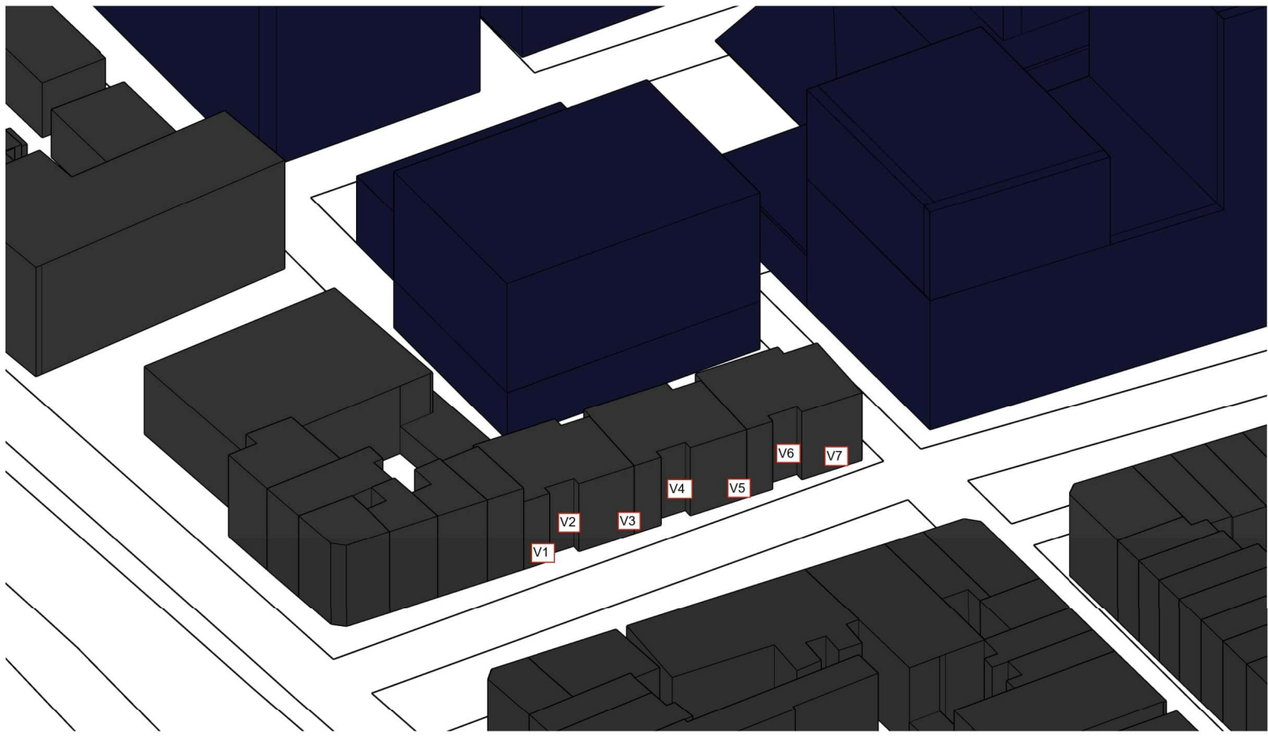
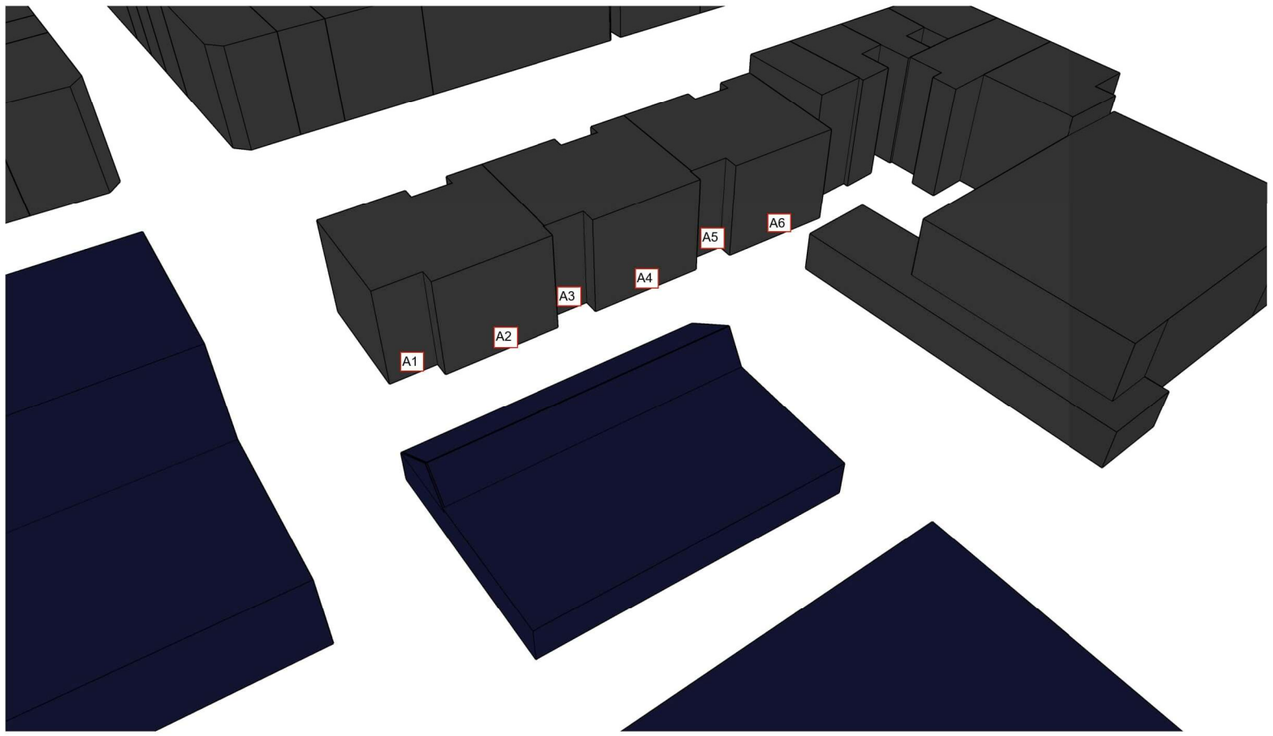
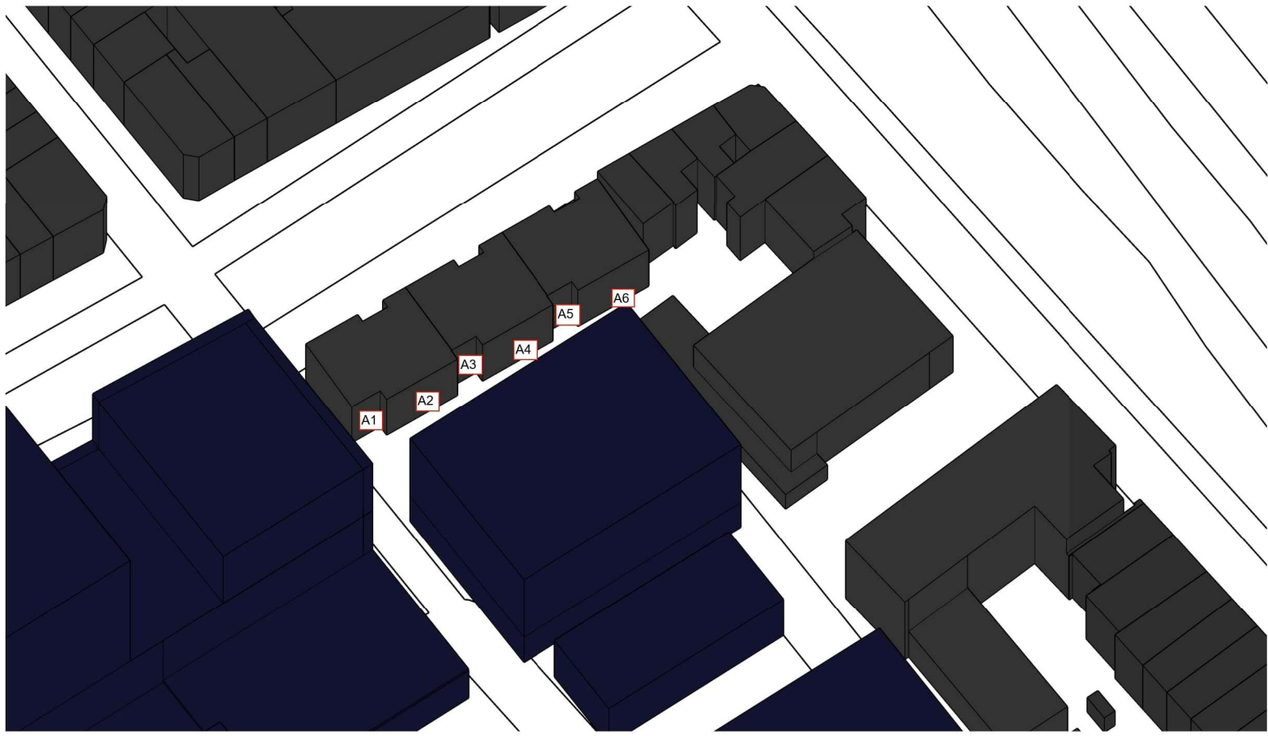




bijlage 13b. resultaten 21 september Teilingerstraat Zuid (achtergevels) huidig vs. nieuw

Teilingerstraat Zuidzijde achtergevel
21 september
06.00





Teilingerstraat Zuidzijde achtergevel
21 september
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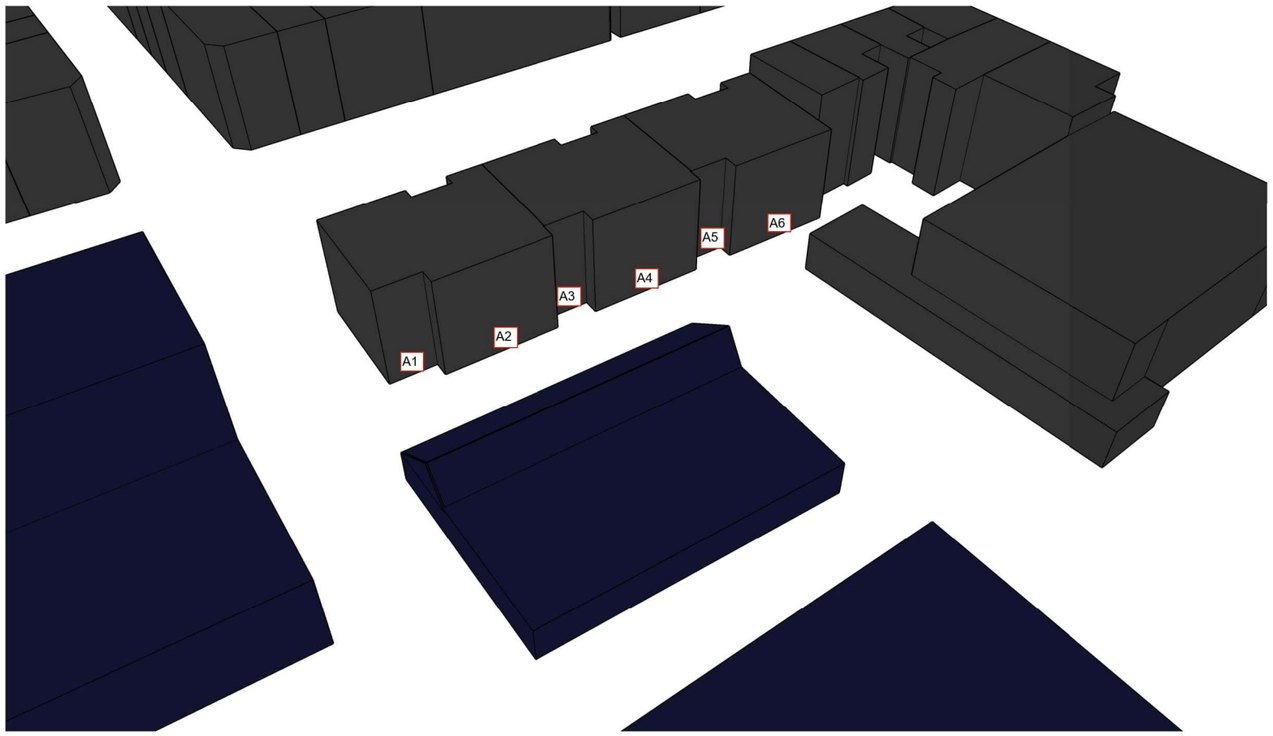
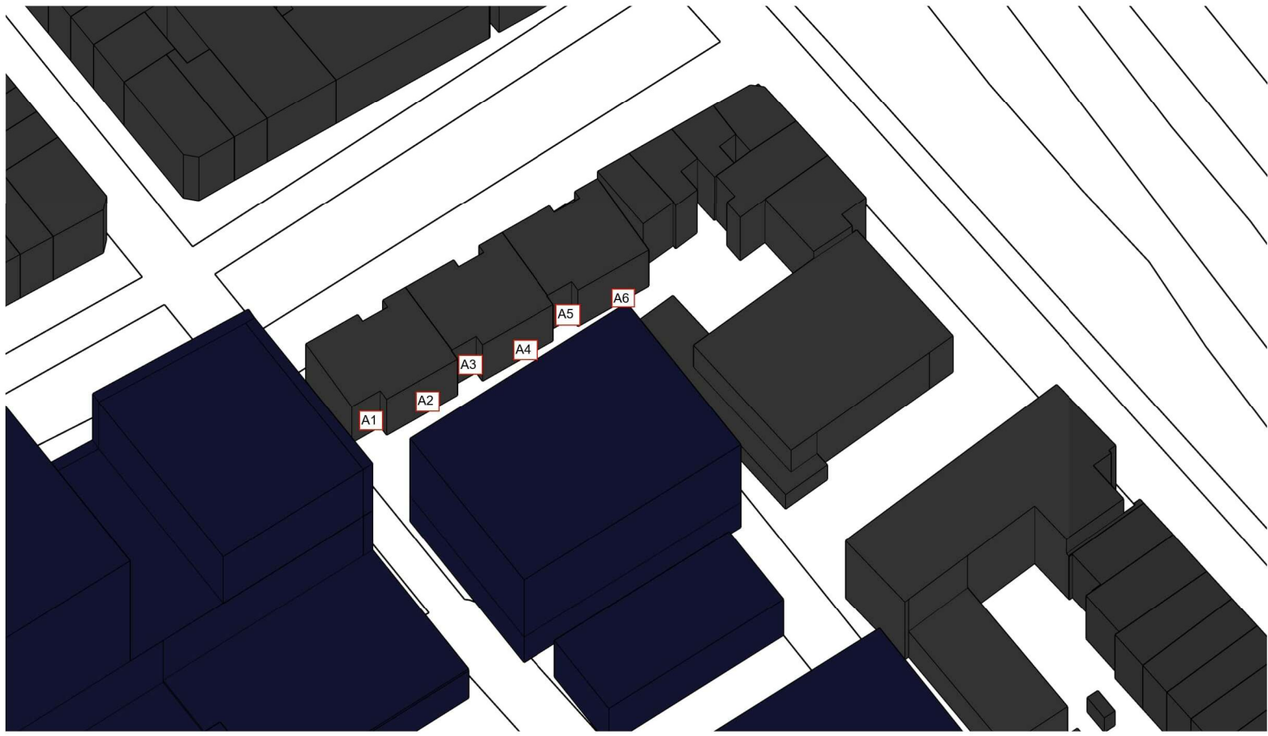
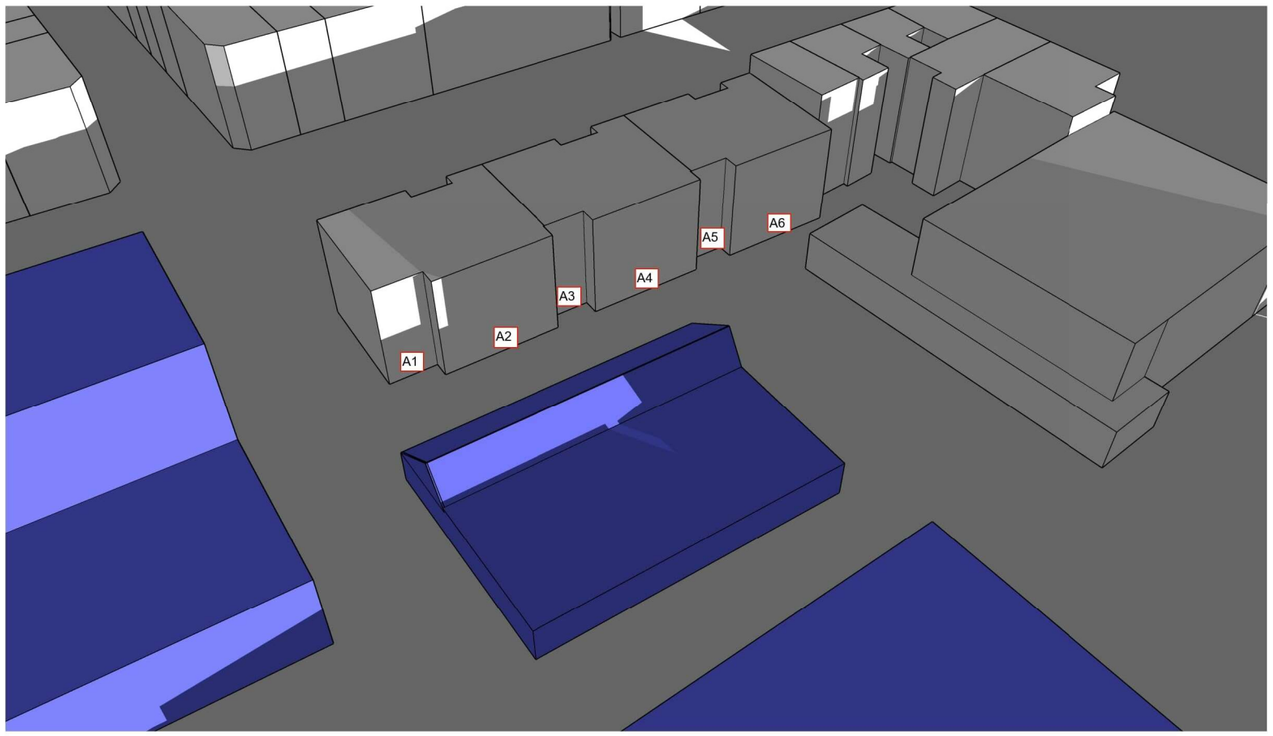
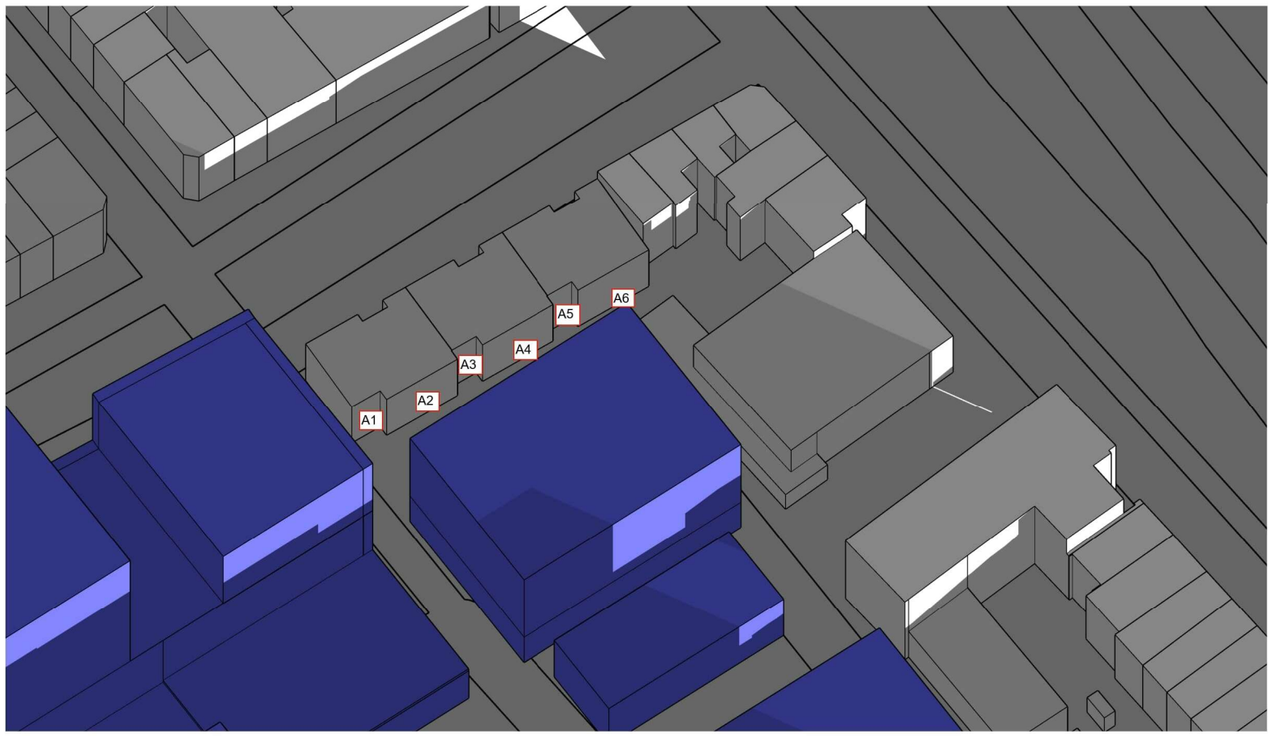




Teilingerstraat Zuidzijde achtergevel
21 september
07.00





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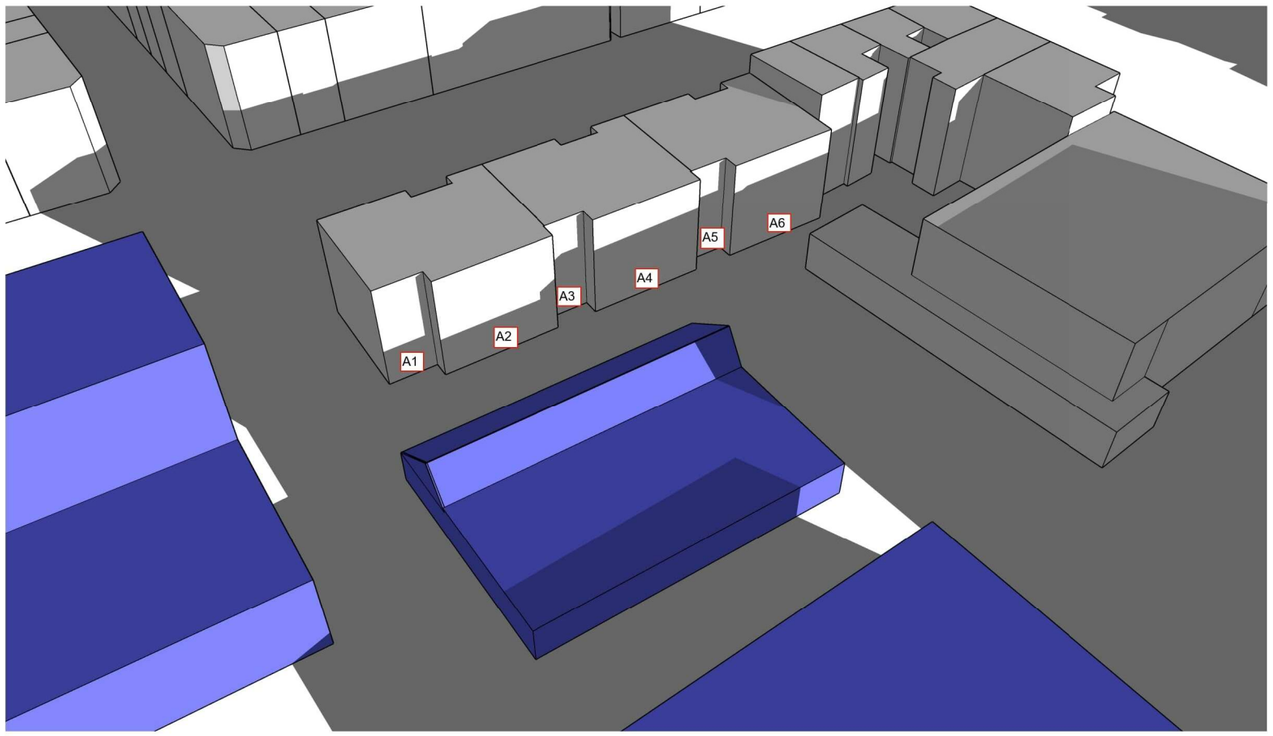

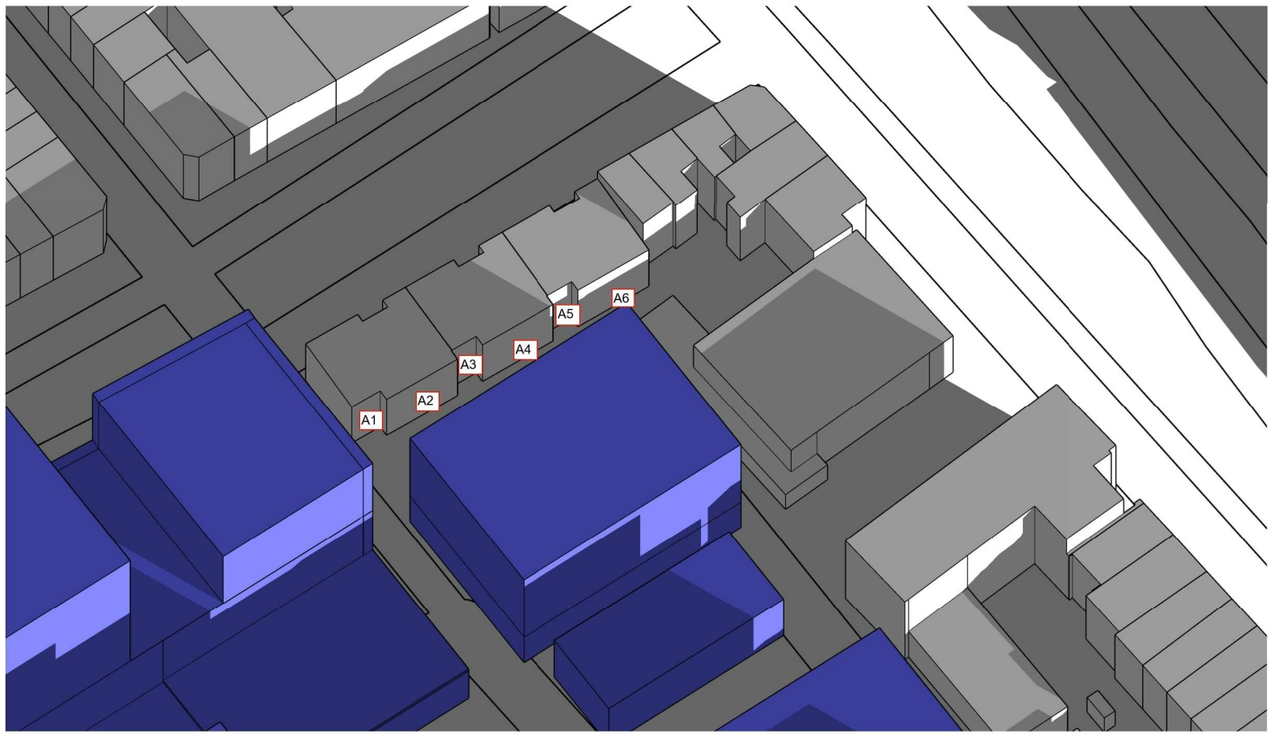

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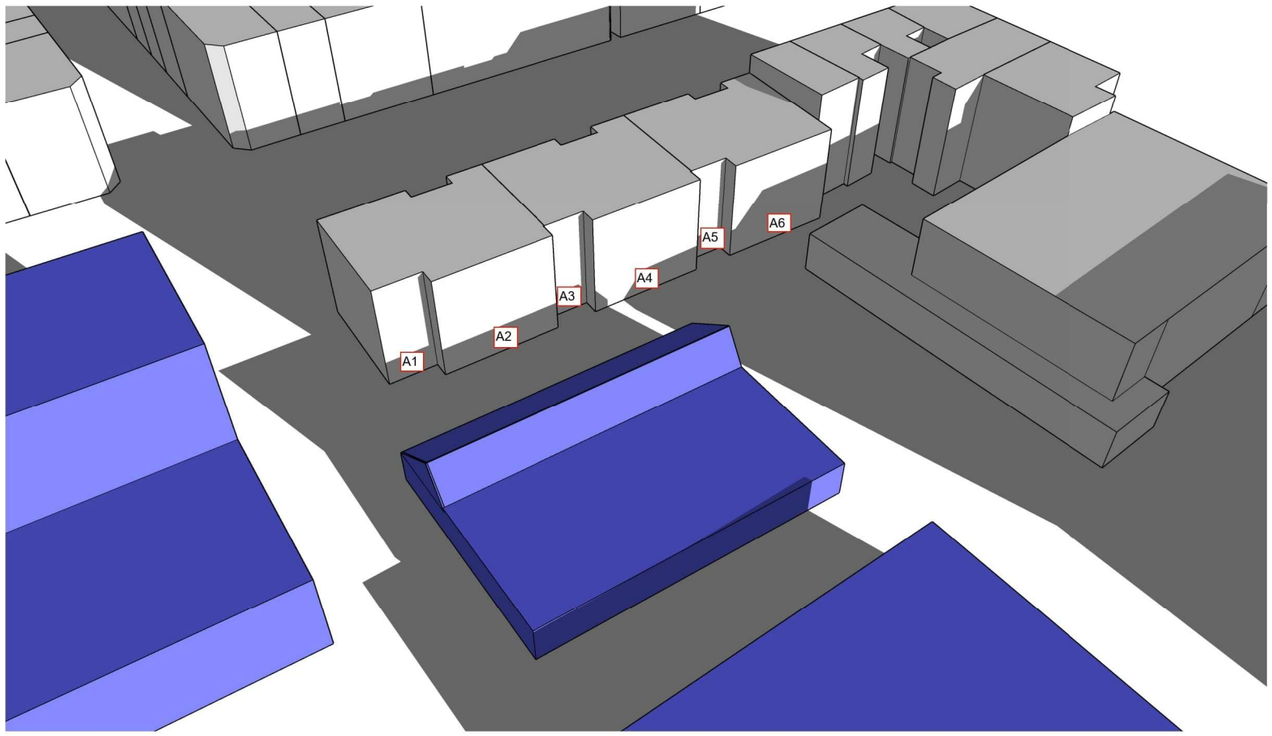

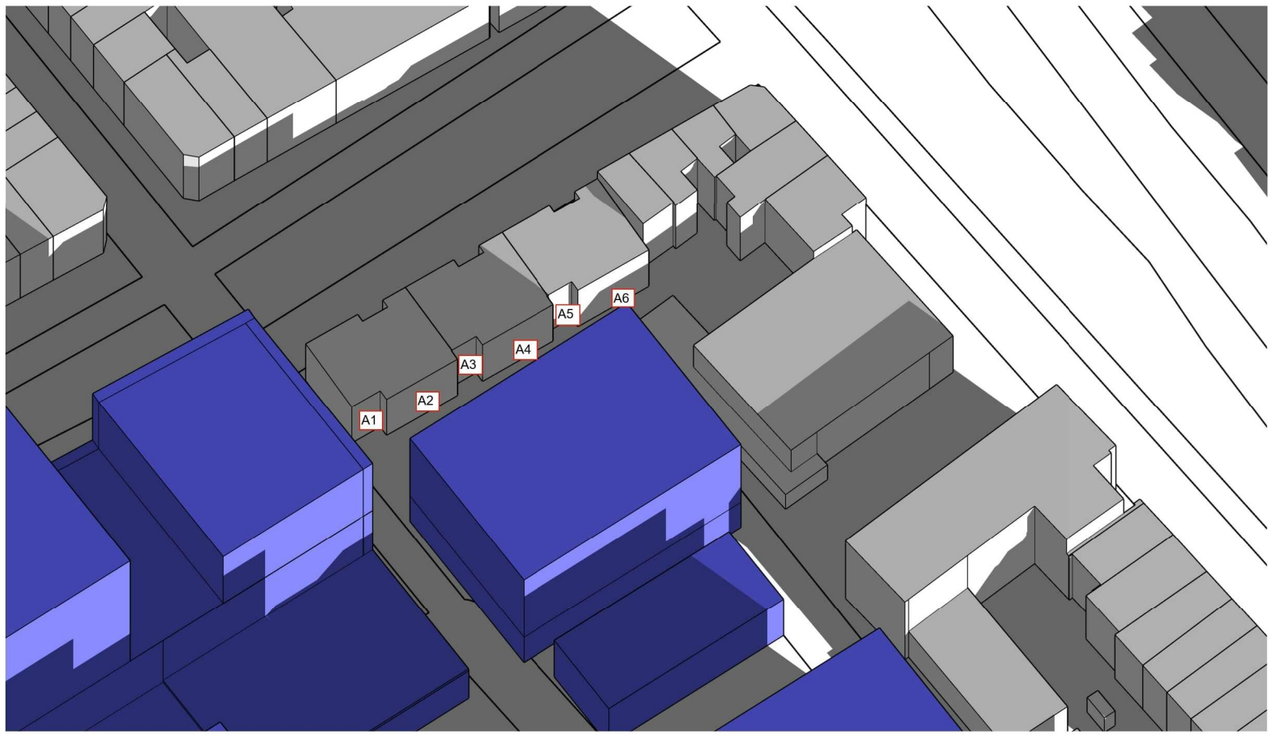

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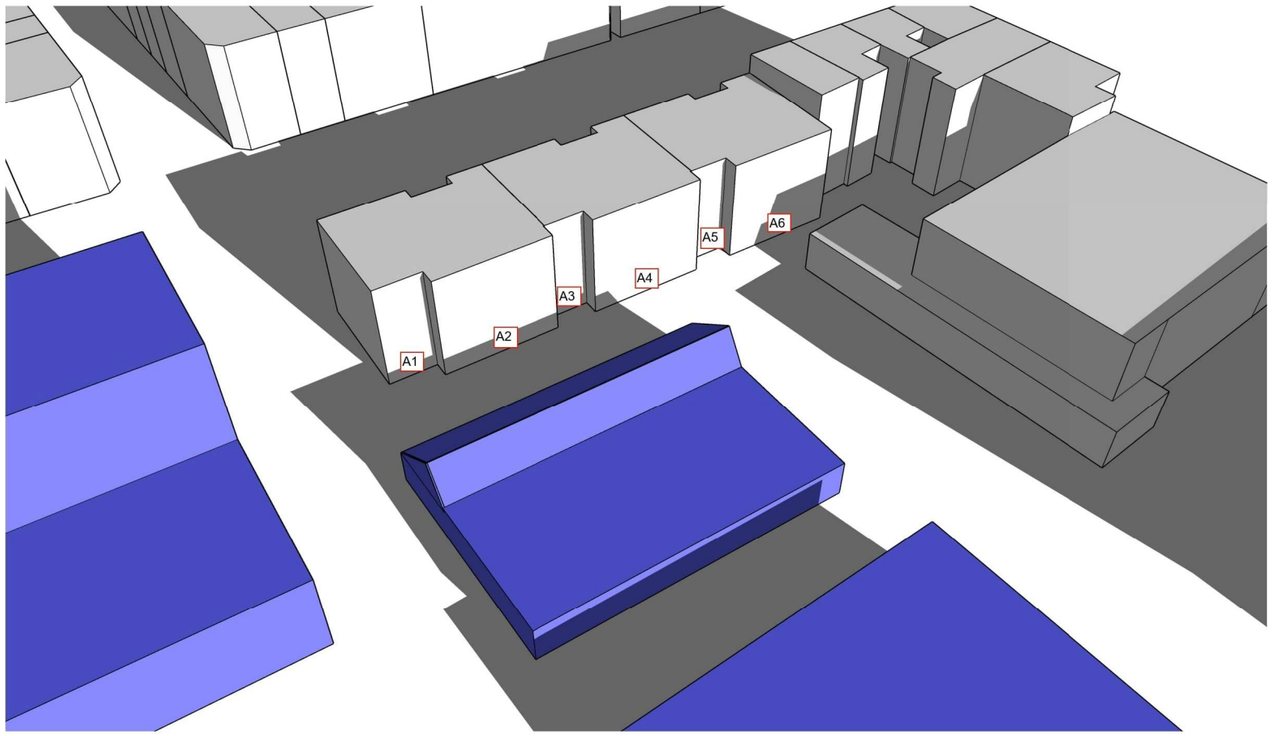

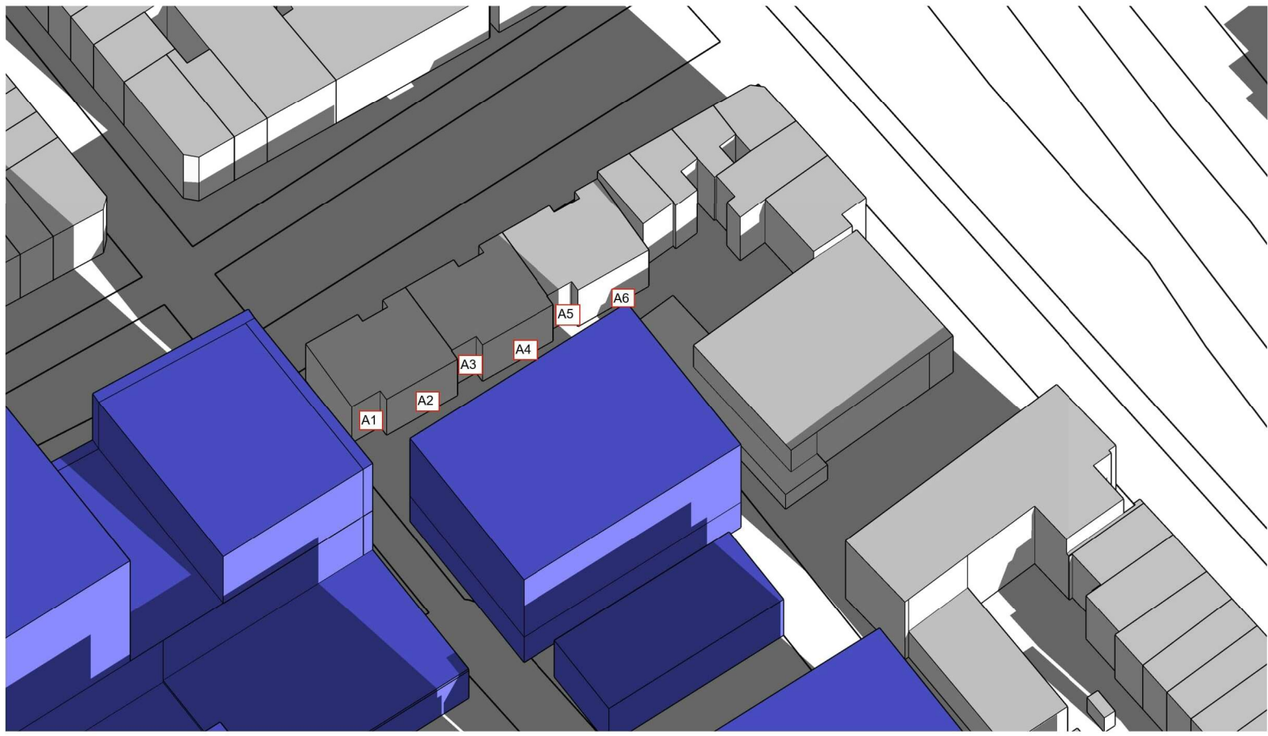

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21 september
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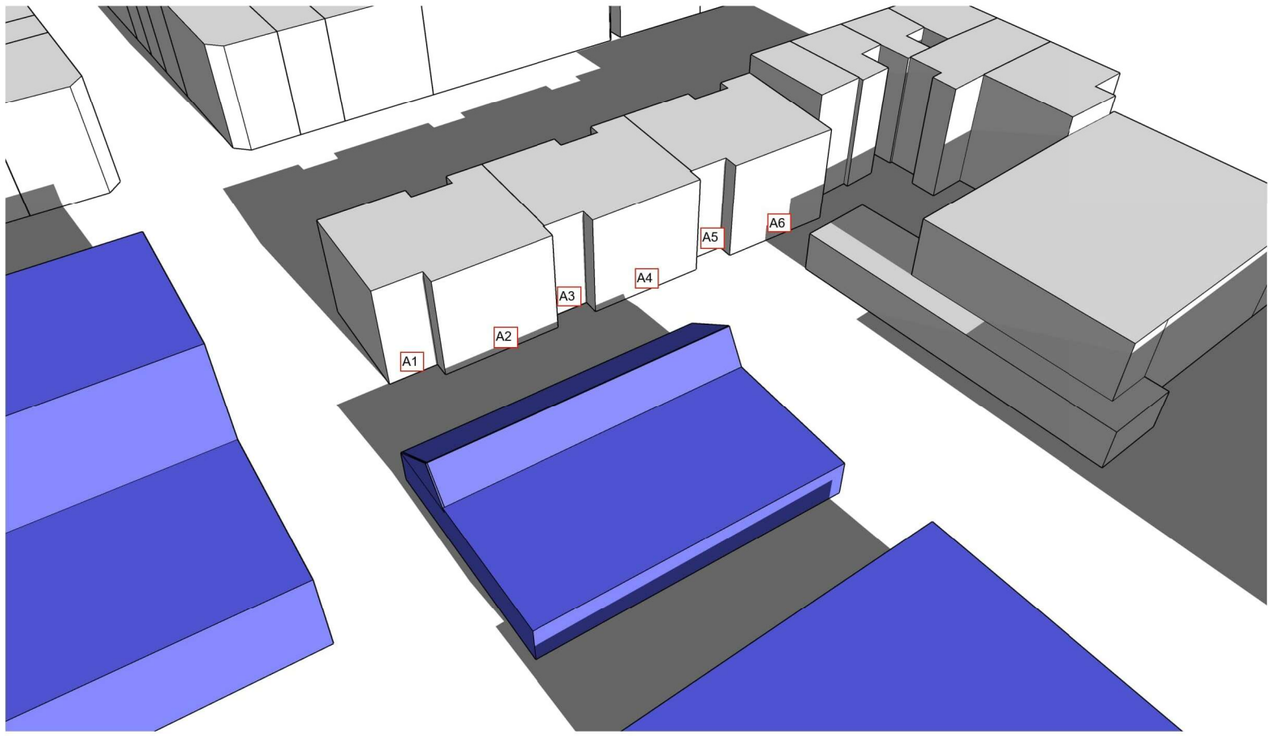

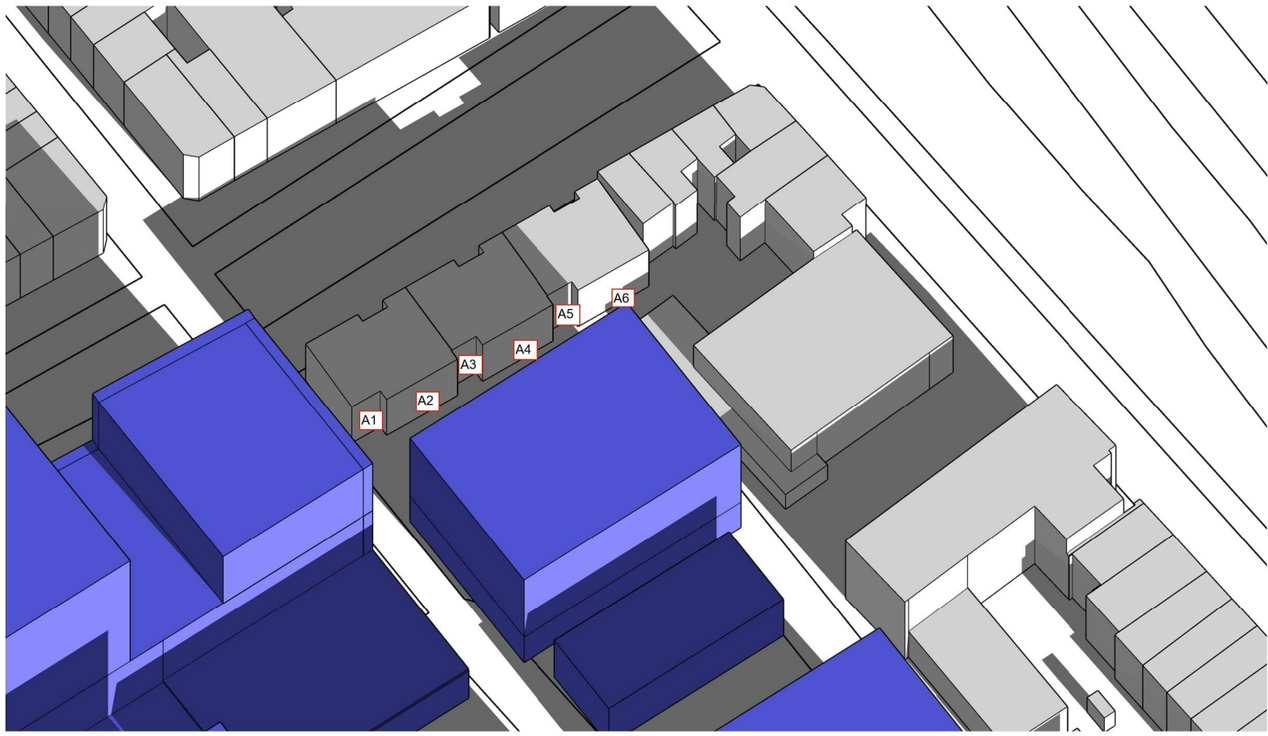

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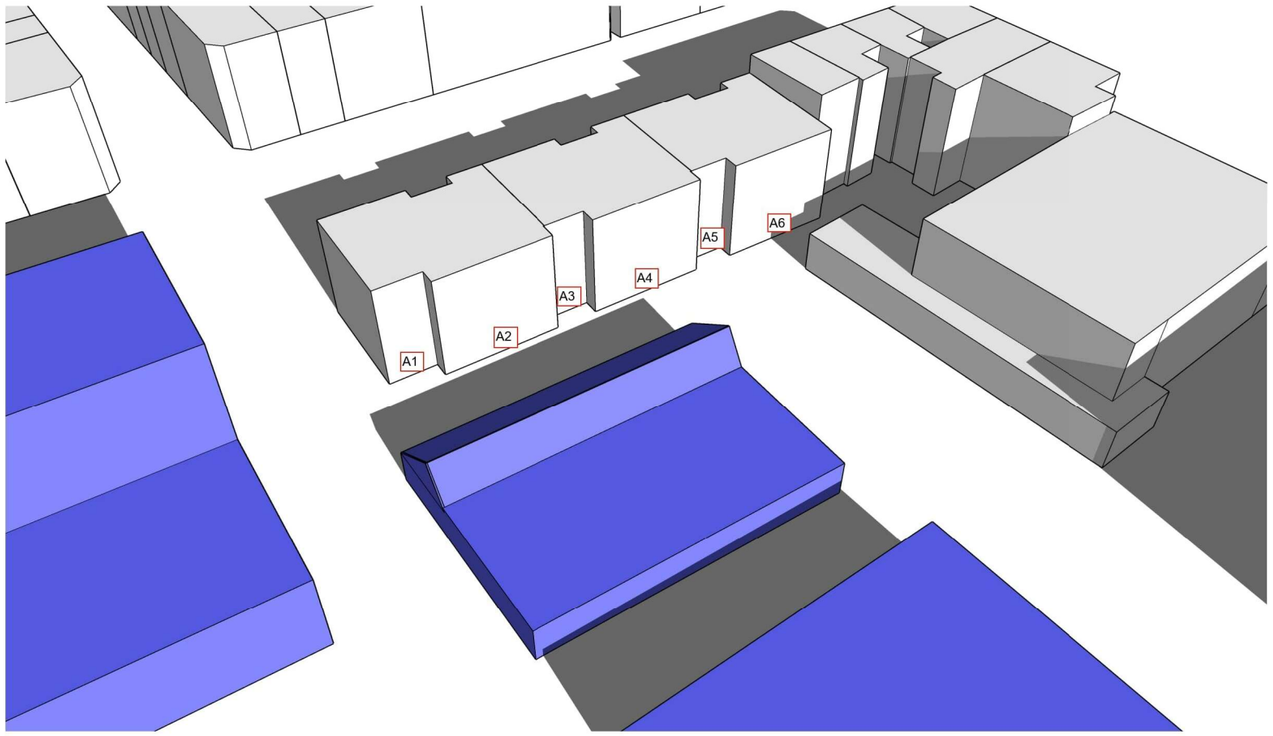
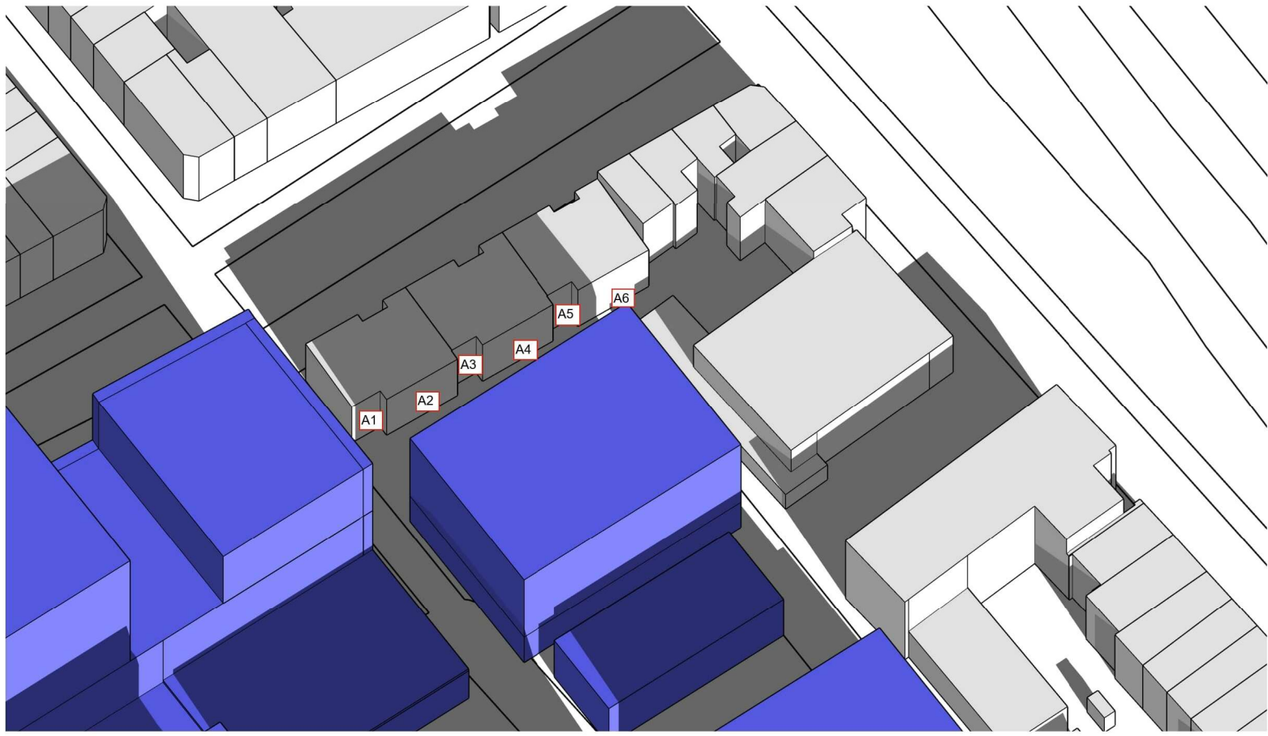
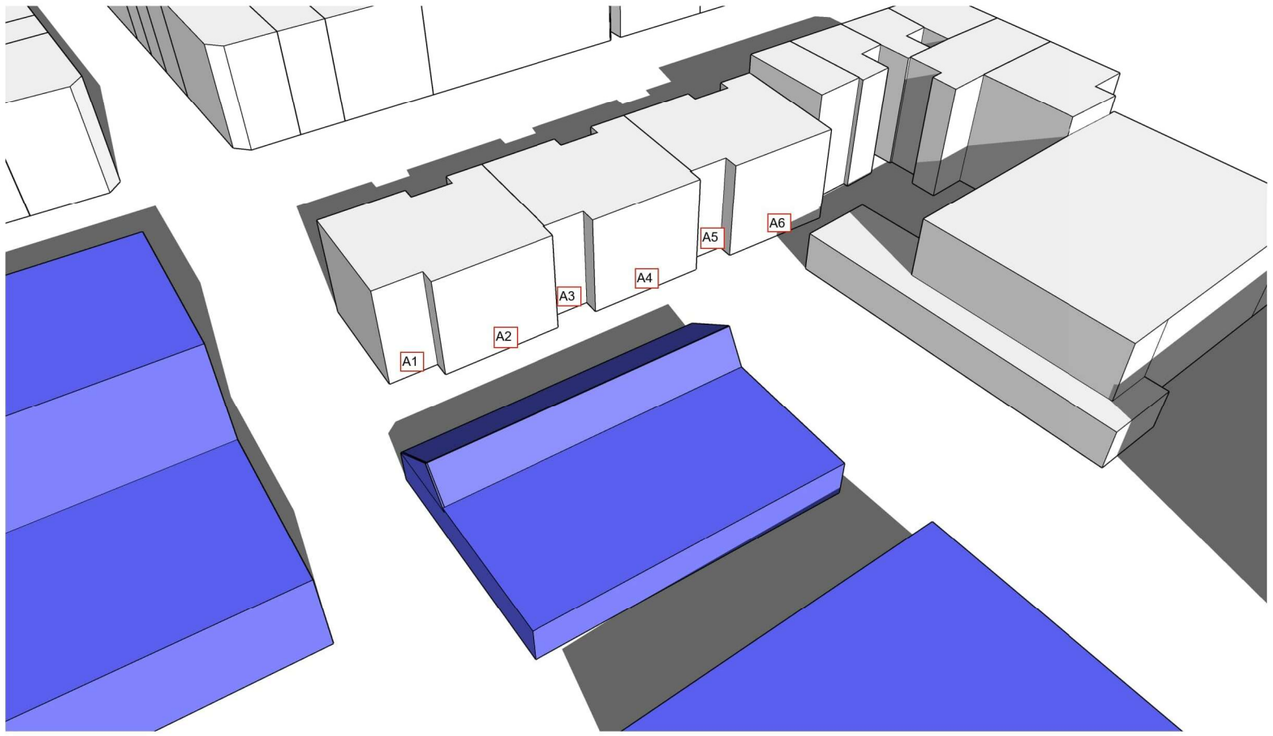
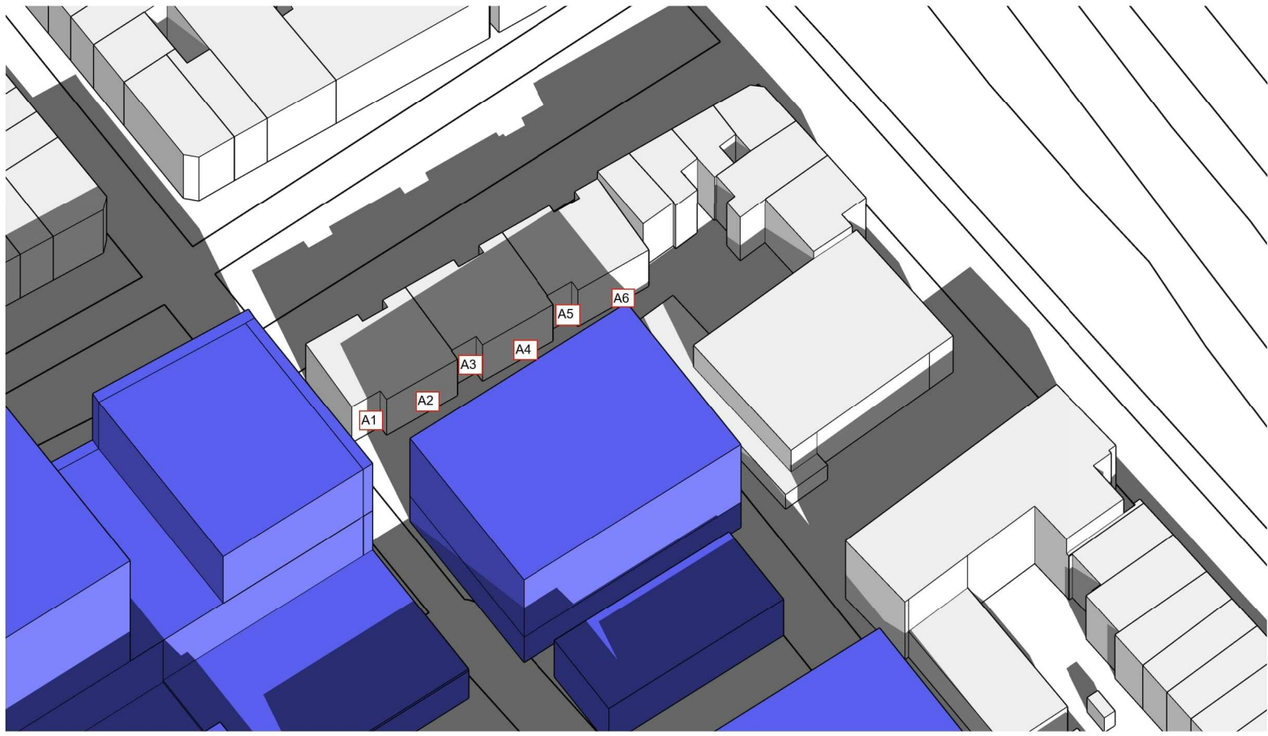
21 september
09.30





Teilingerstraat Zuidzijde achtergevel
21 september
10.00





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21 september
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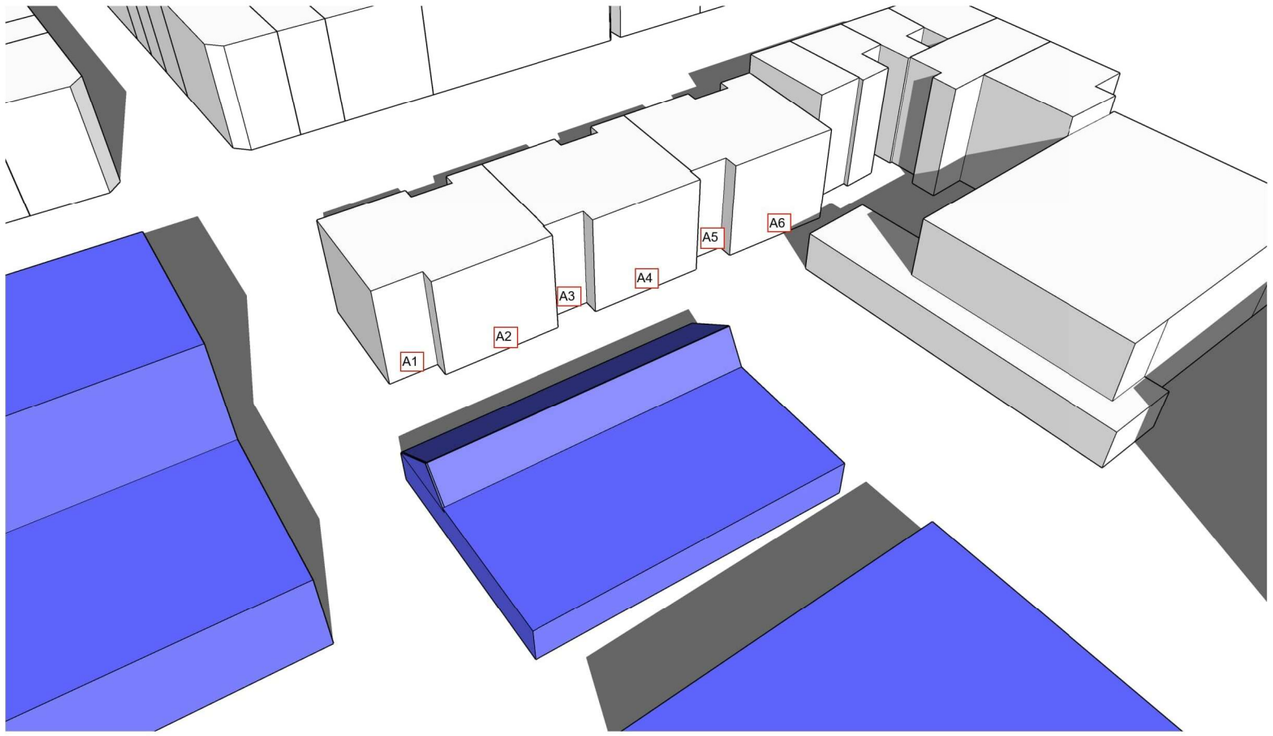

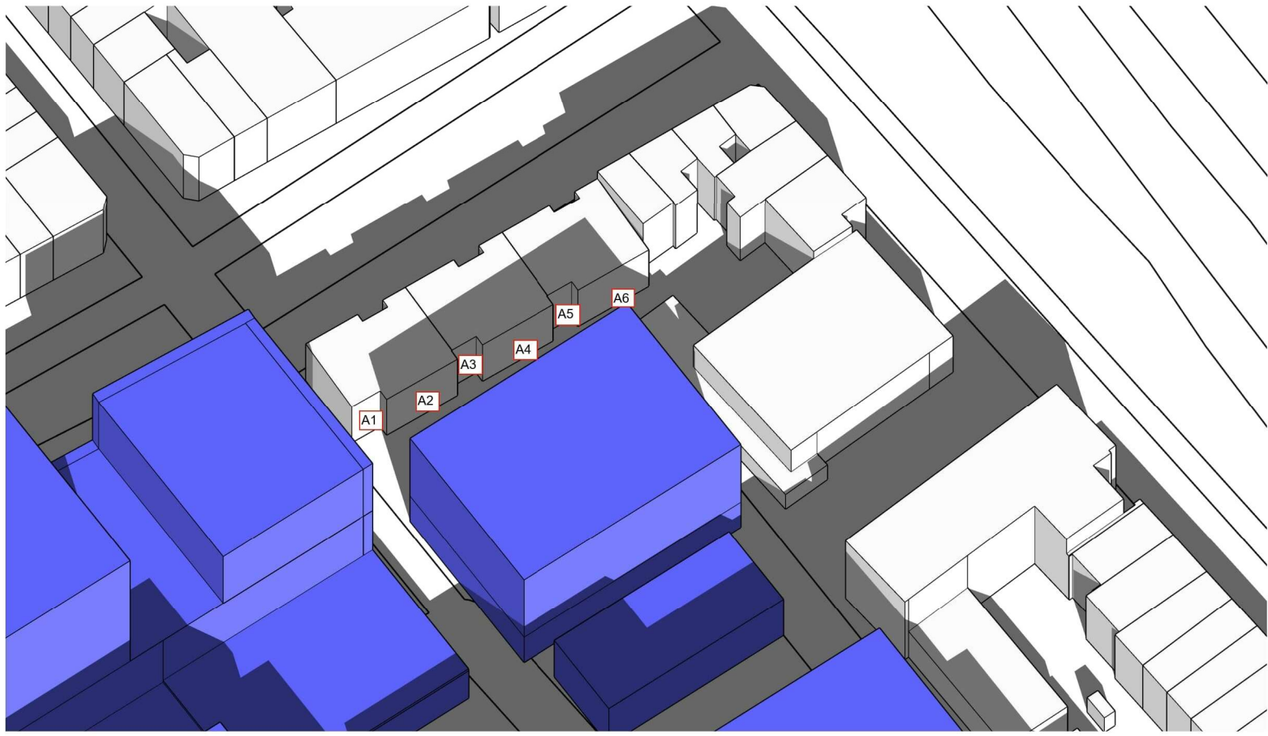

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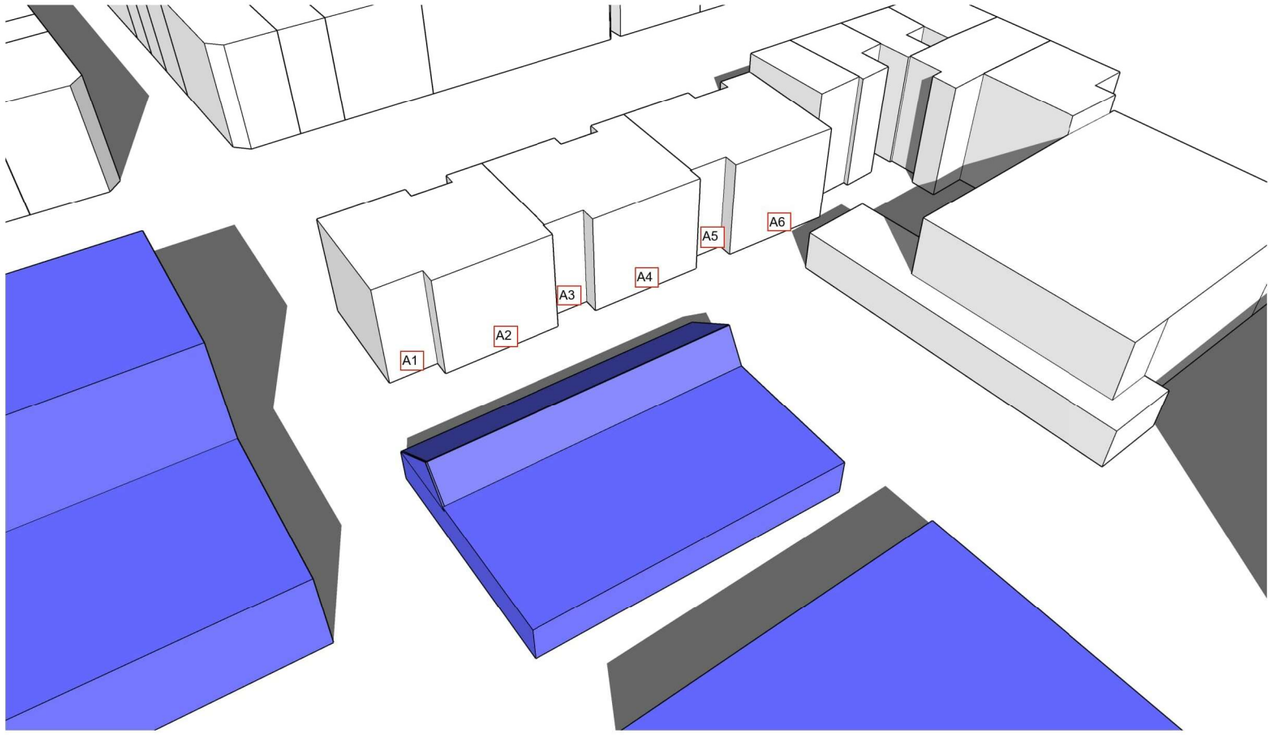
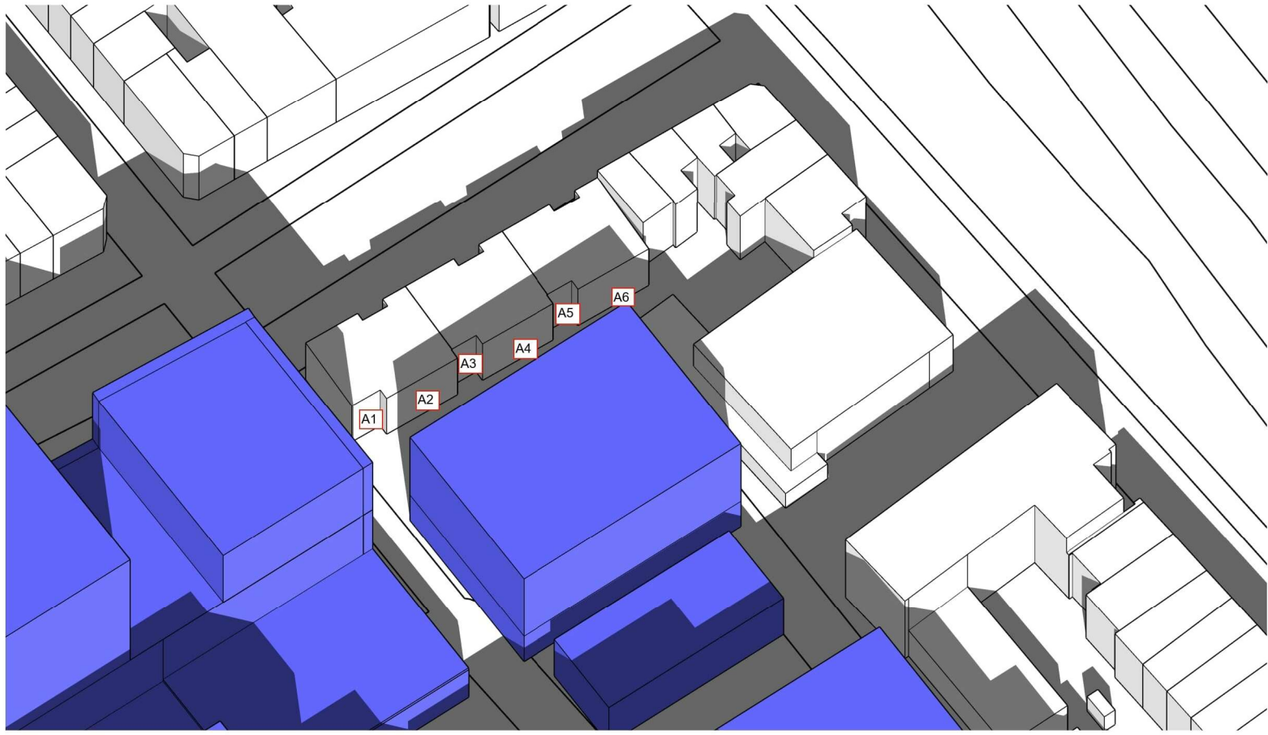
21 september
11.00





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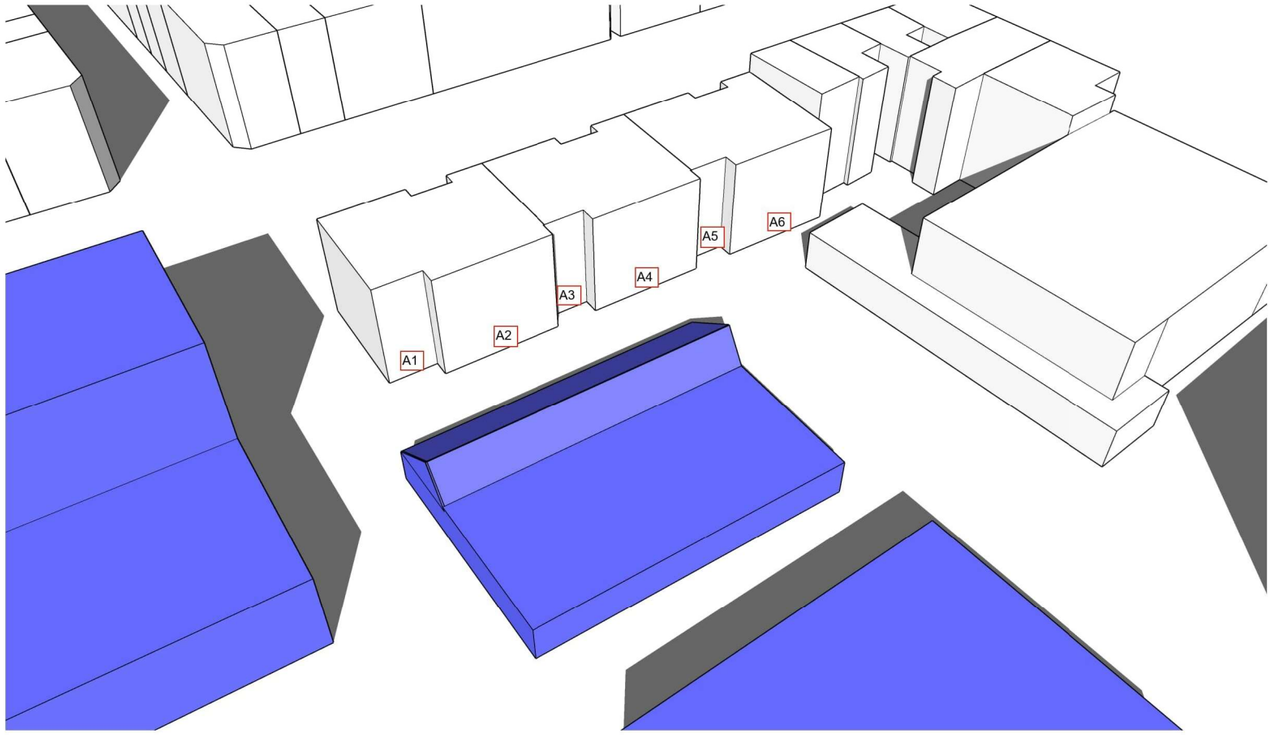

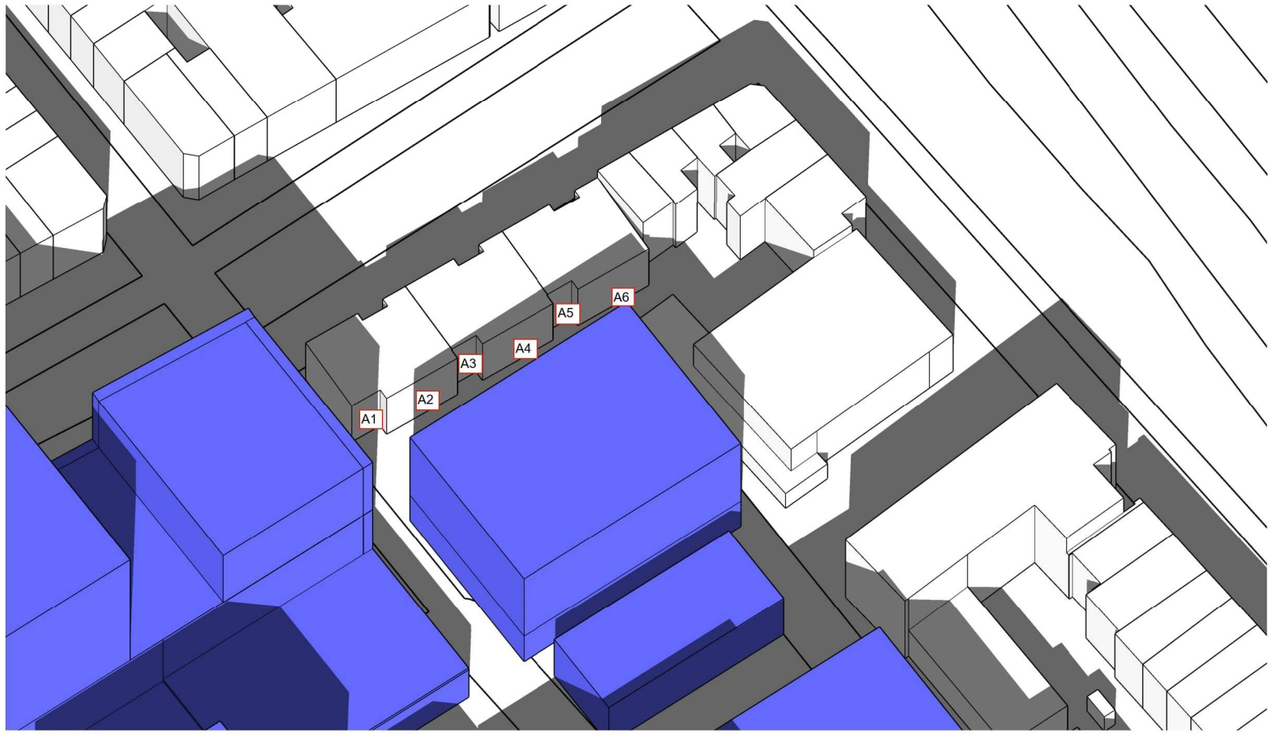

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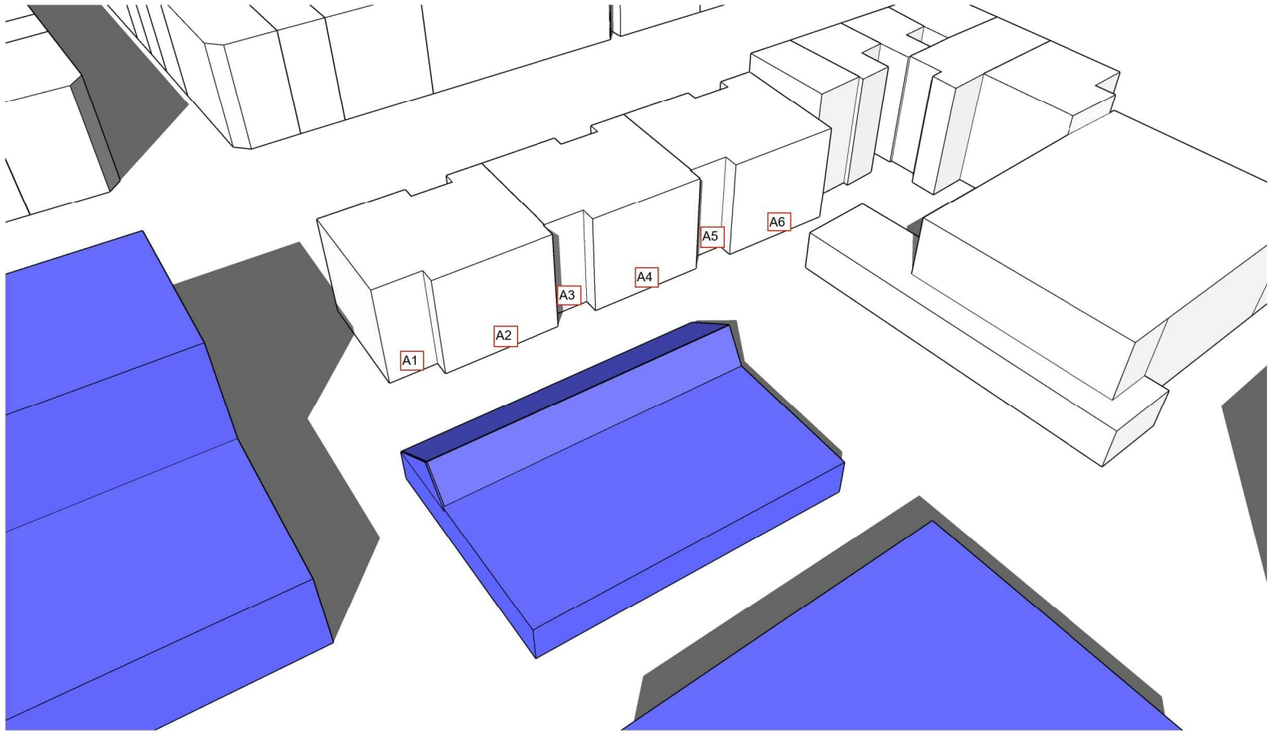
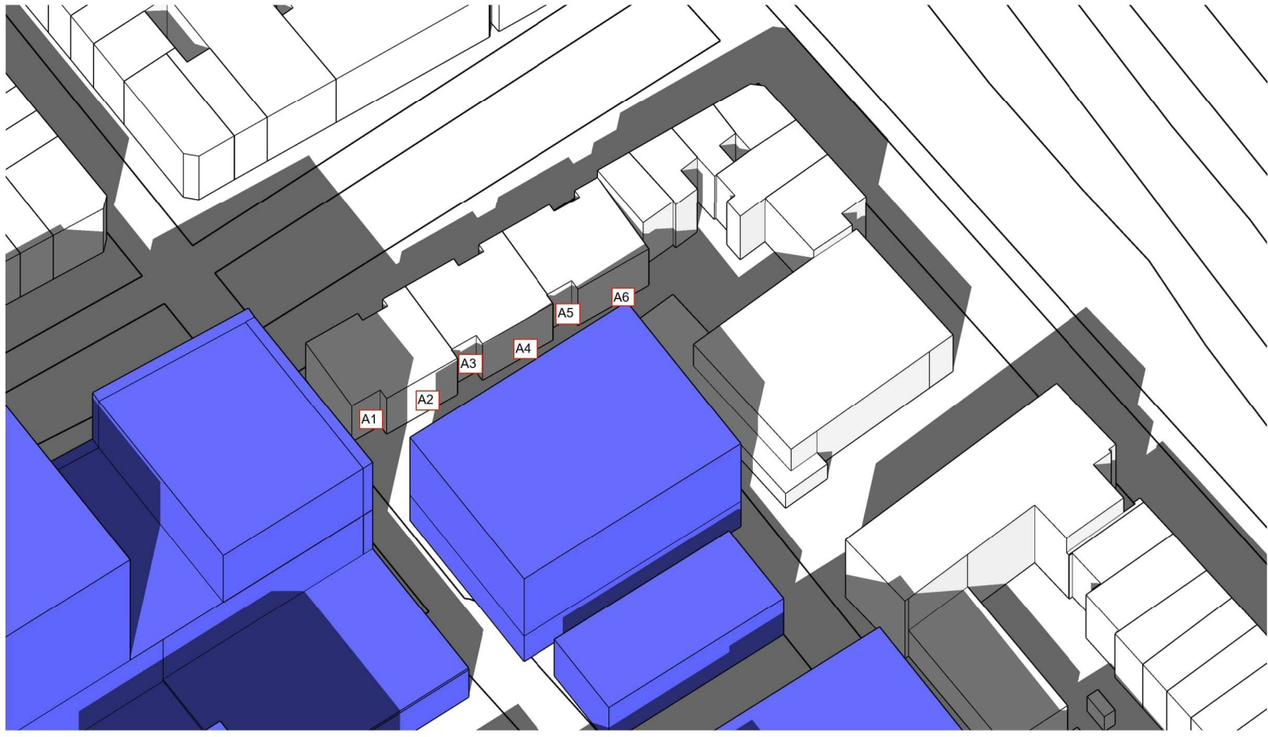
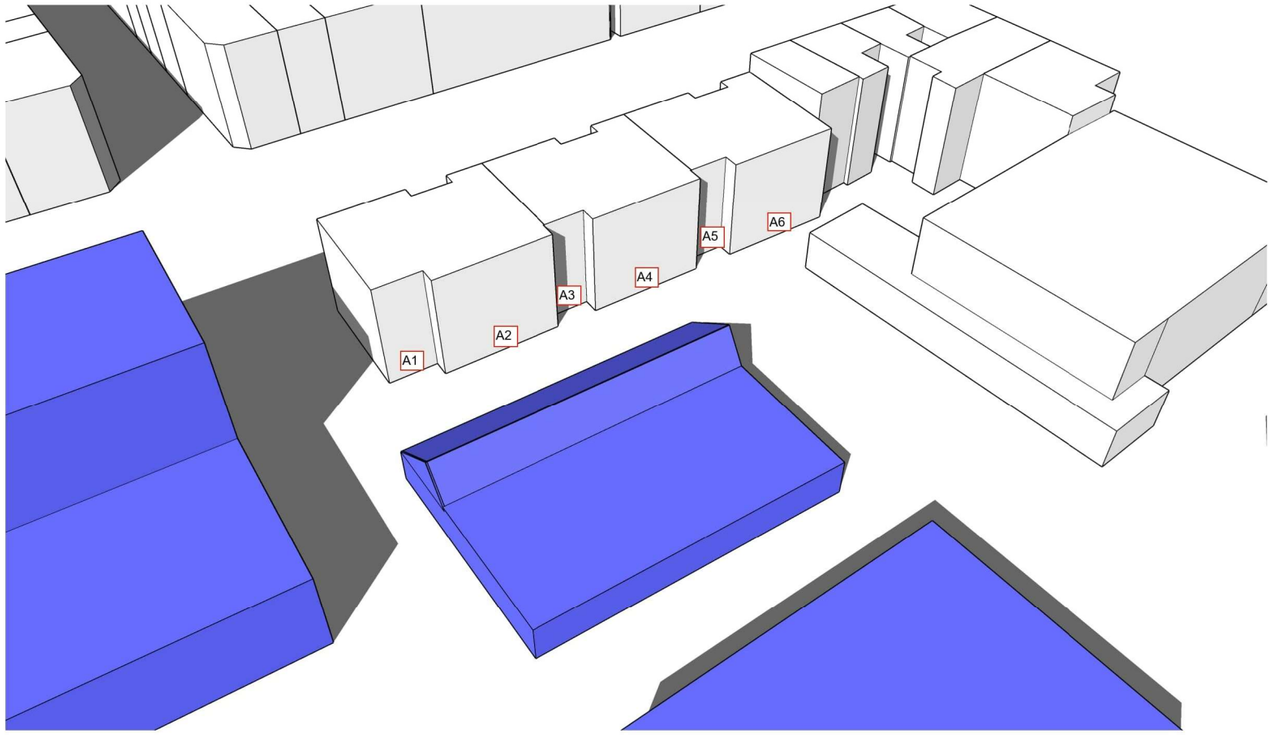
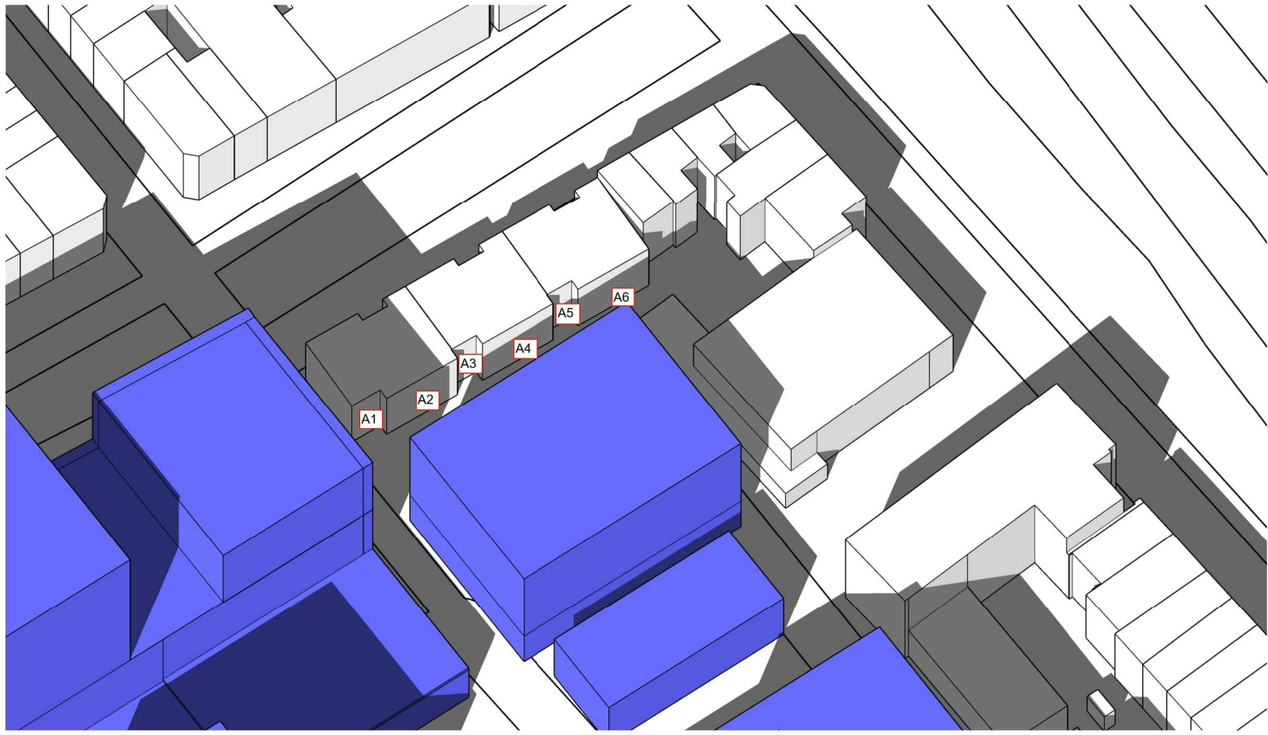
12.00



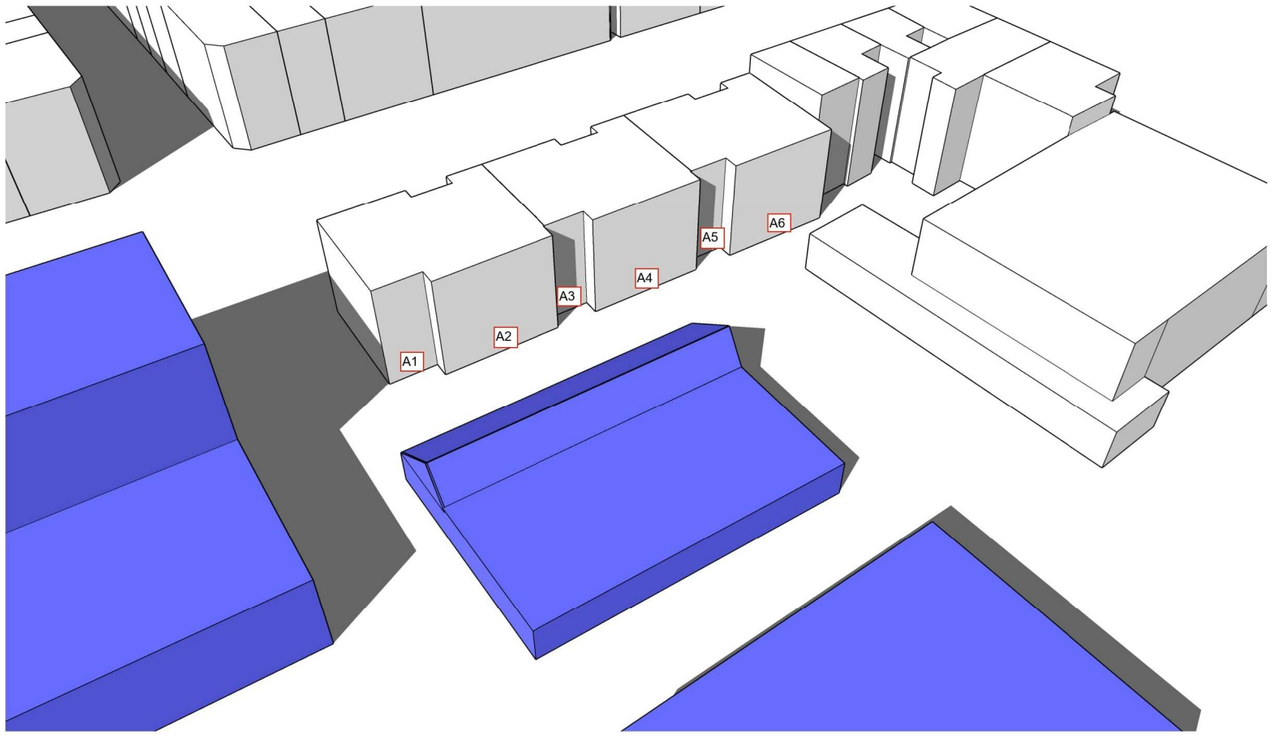


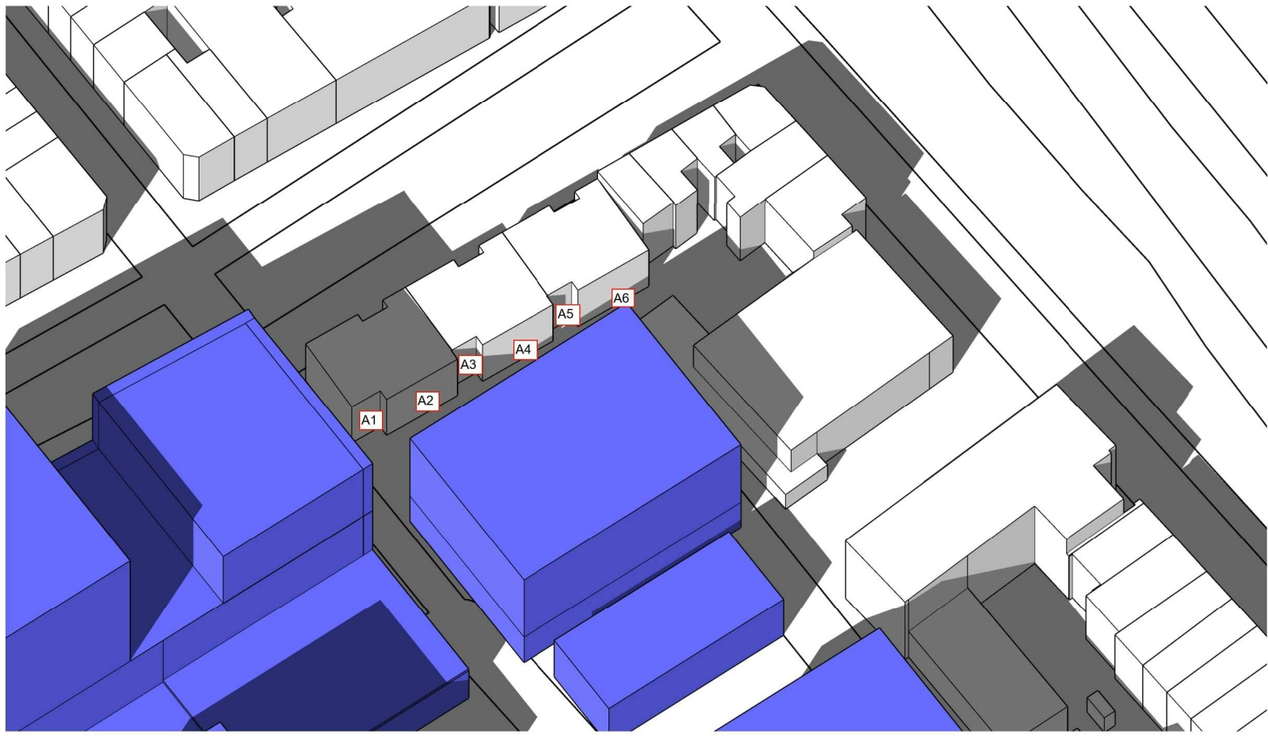
Teilingerstraat Zuidzijde achtergevel
21 september
12.30



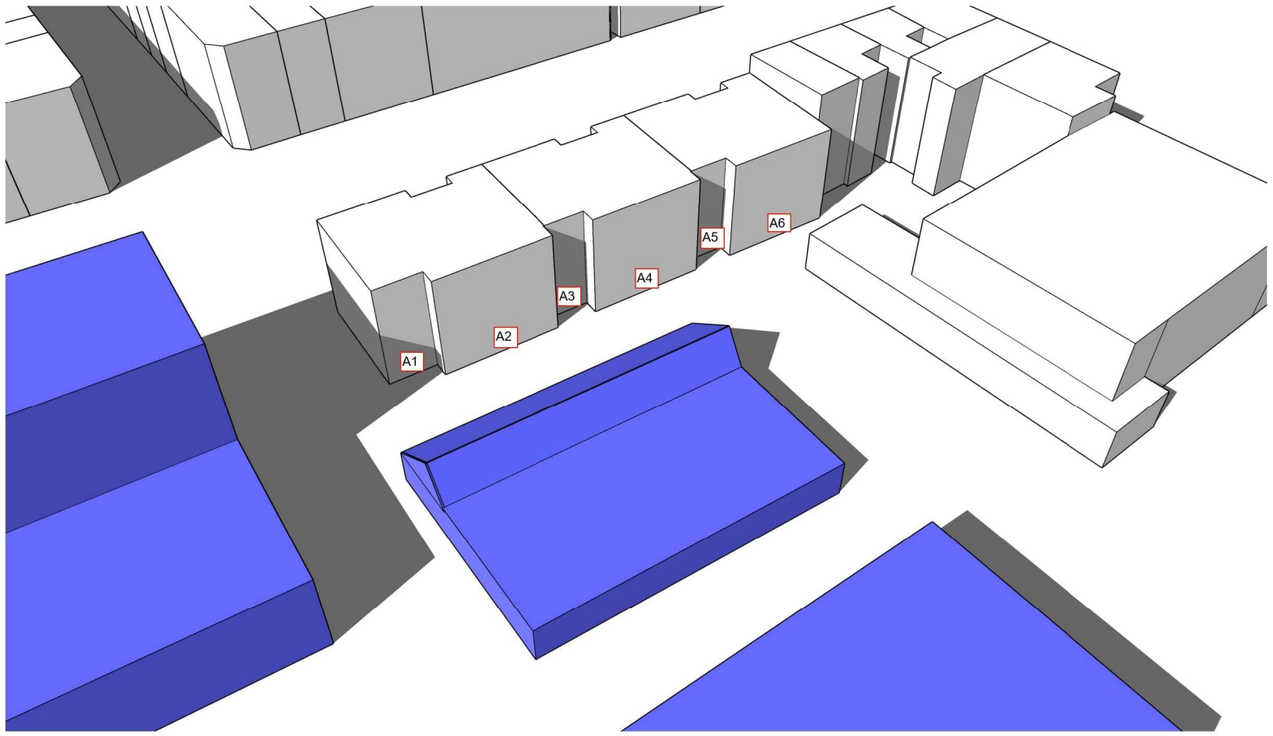


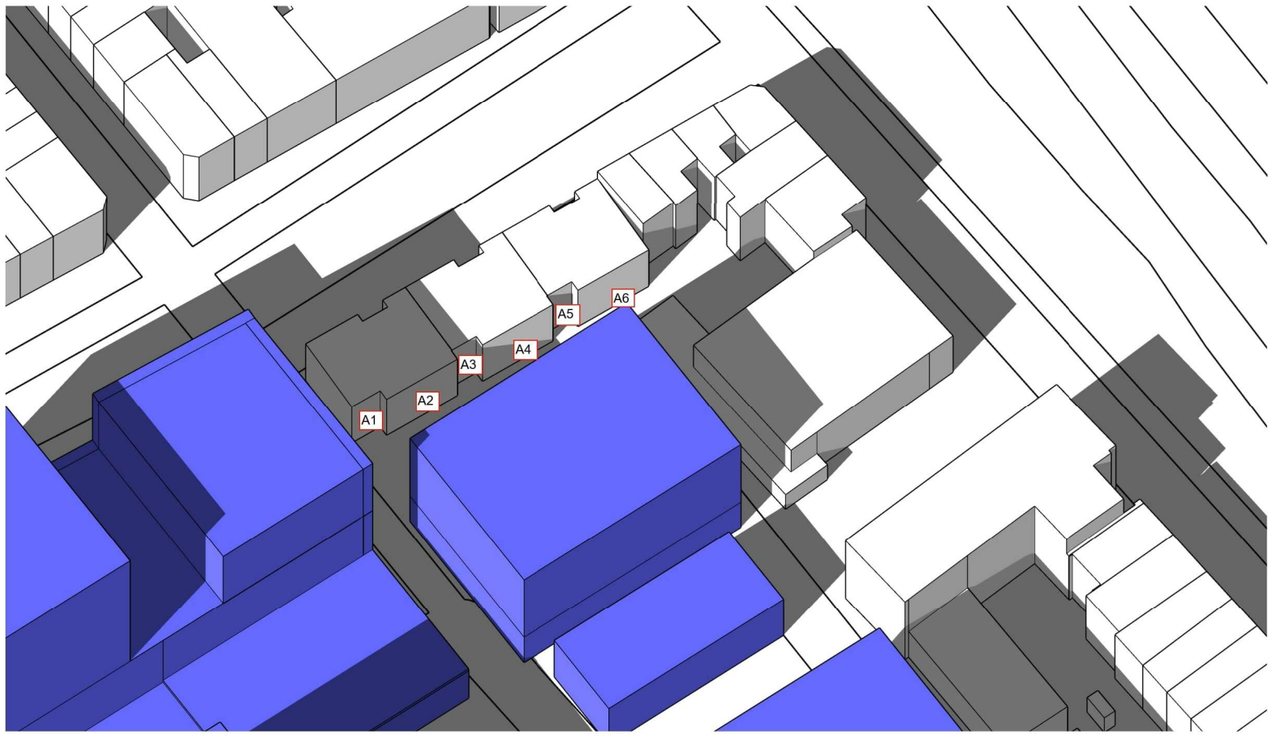
Teilingerstraat Zuidzijde achtergevel
21 september
13.00



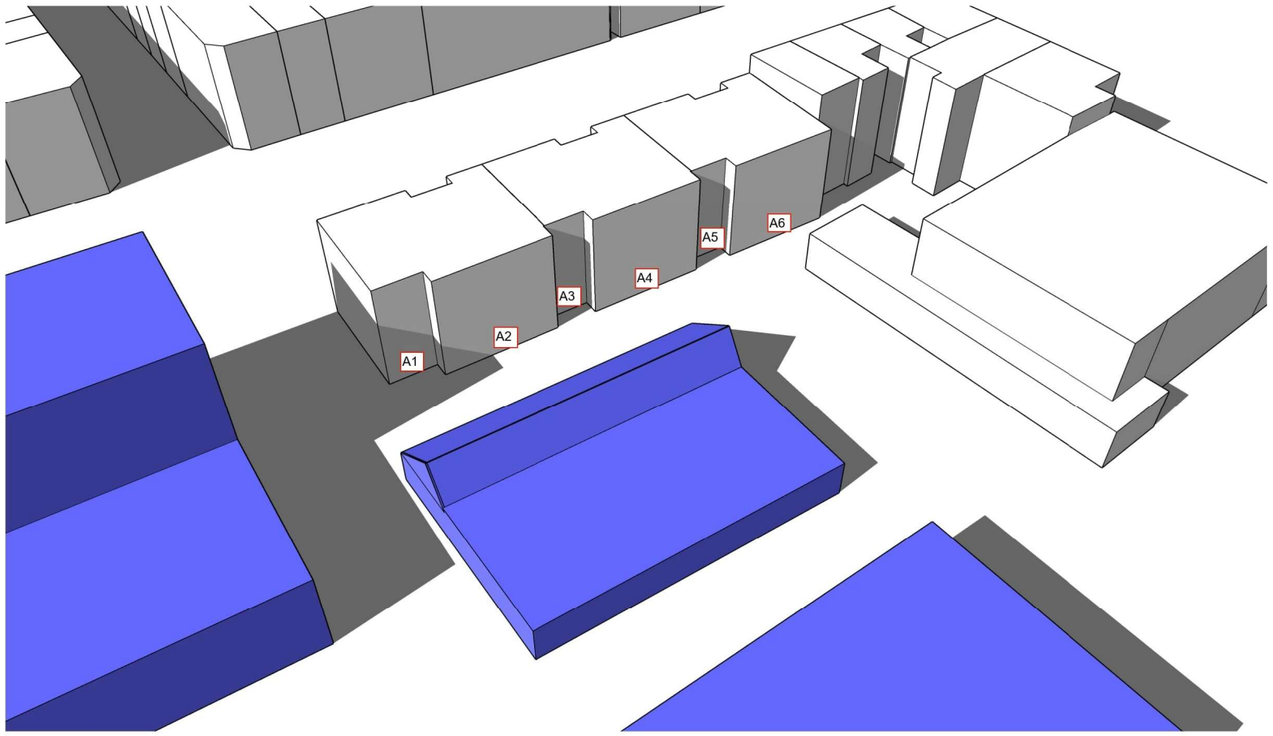


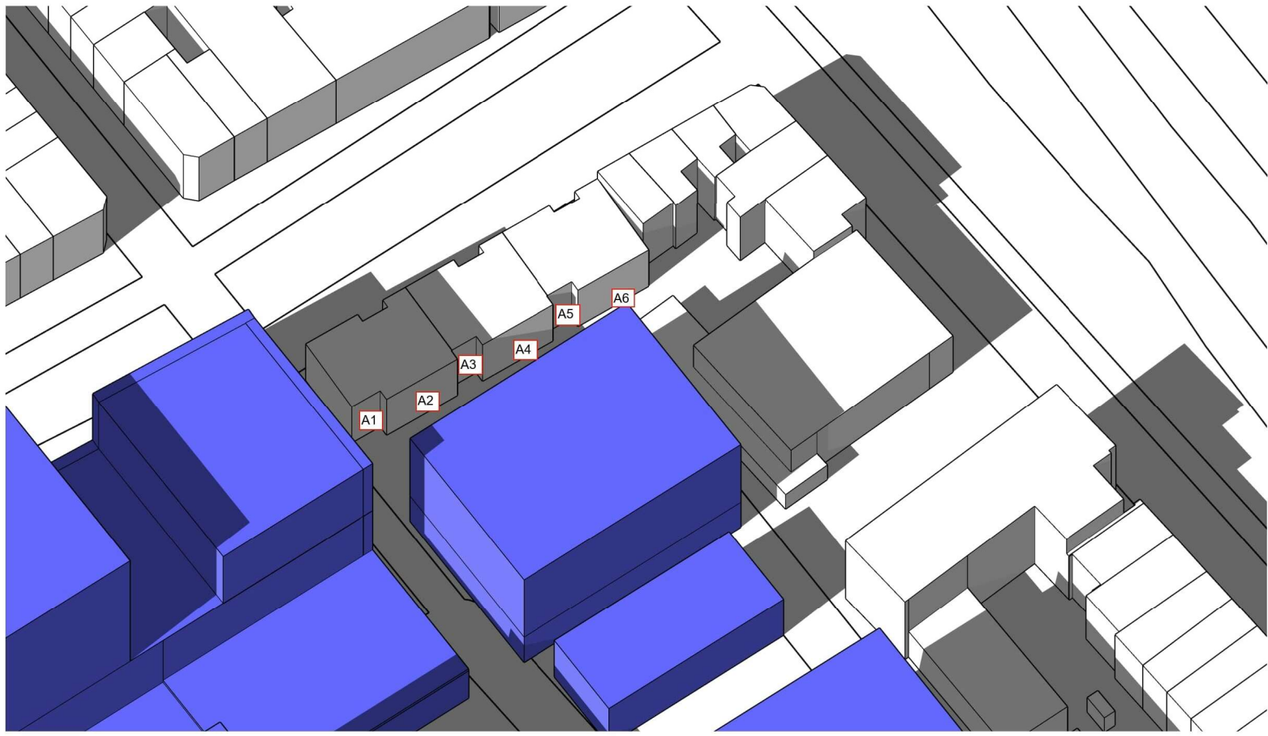
Teilingerstraat Zuidzijde achtergevel
21 september
13.30



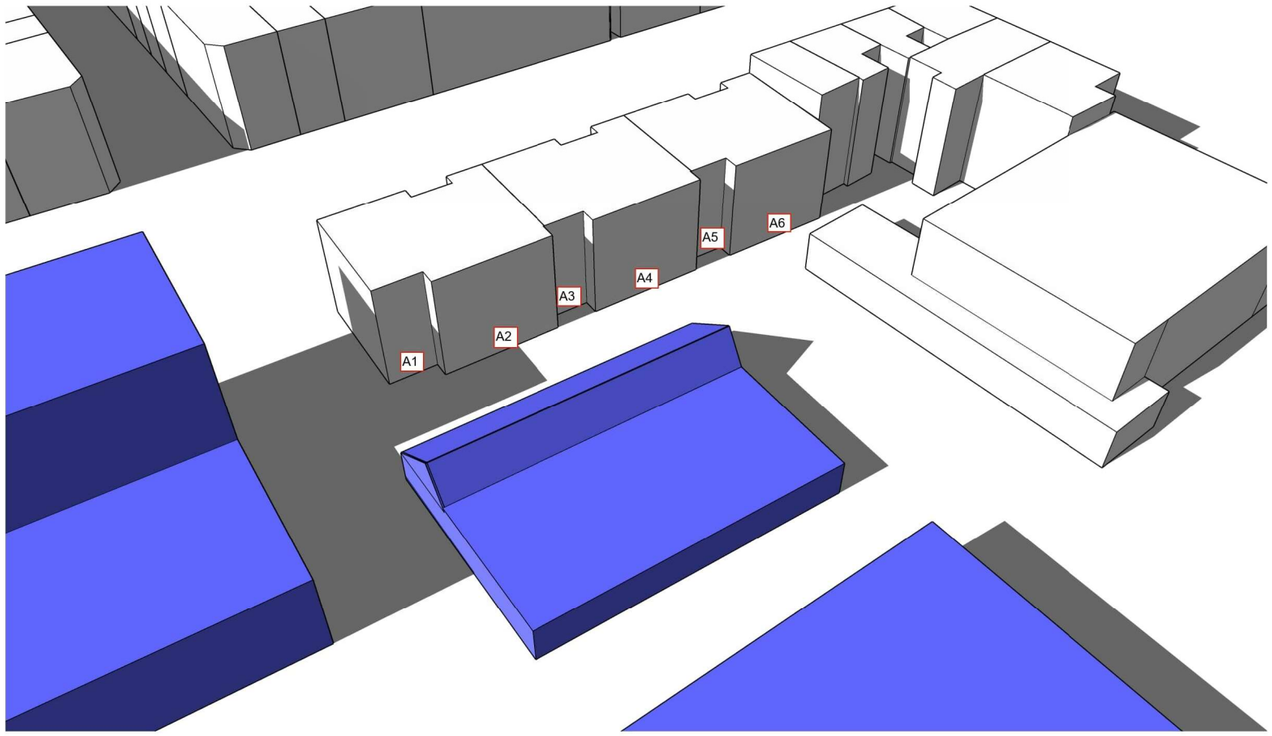


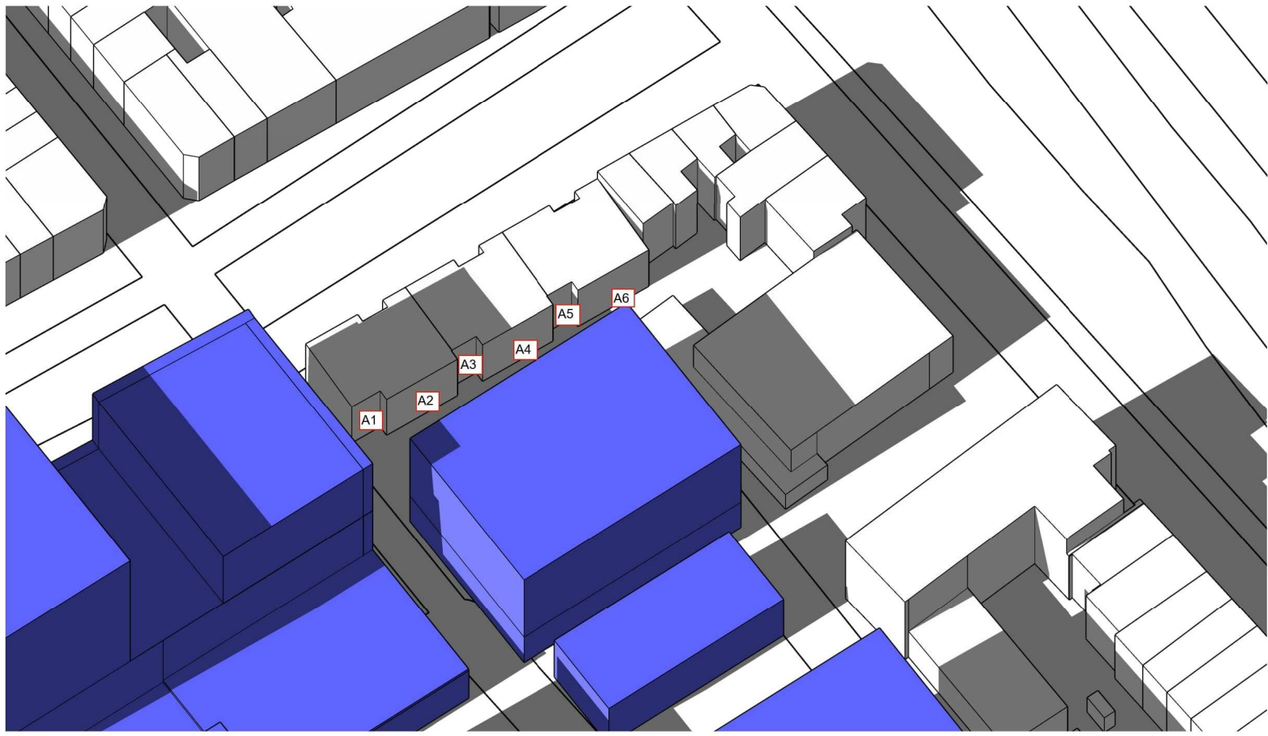
Teilingerstraat Zuidzijde achtergevel
21 september
14.00



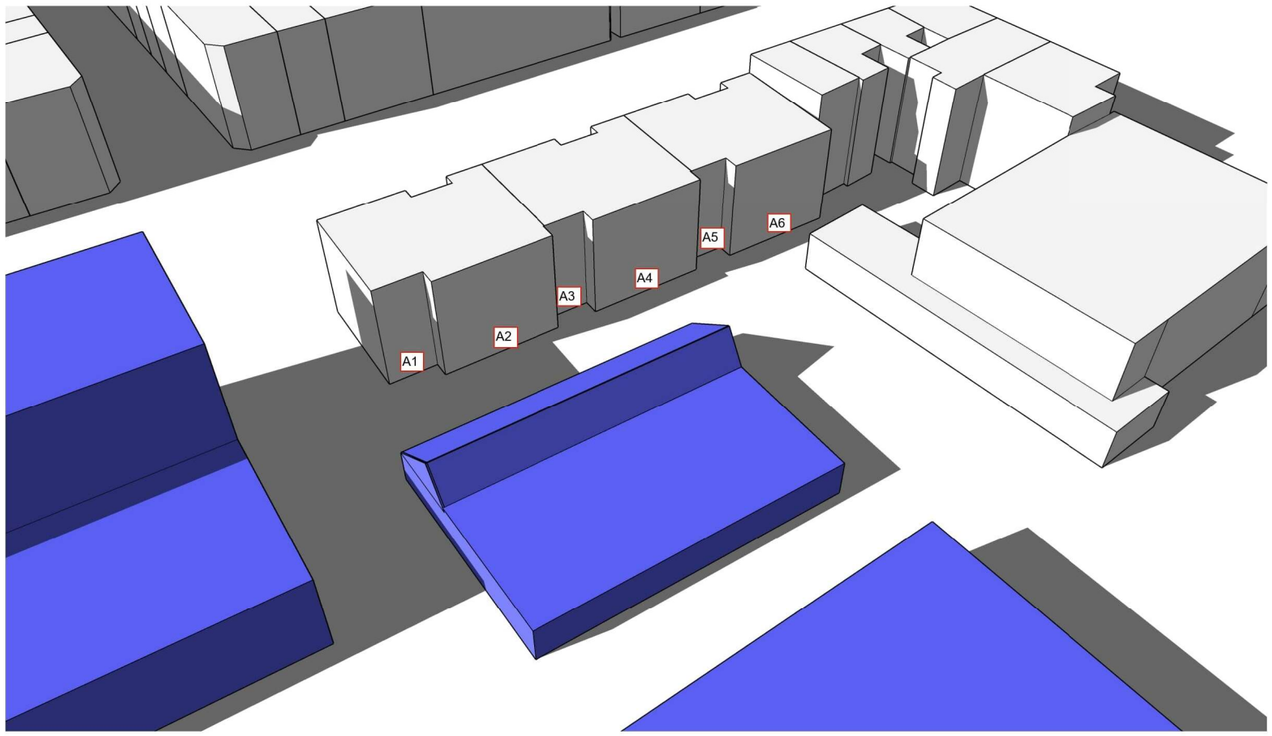


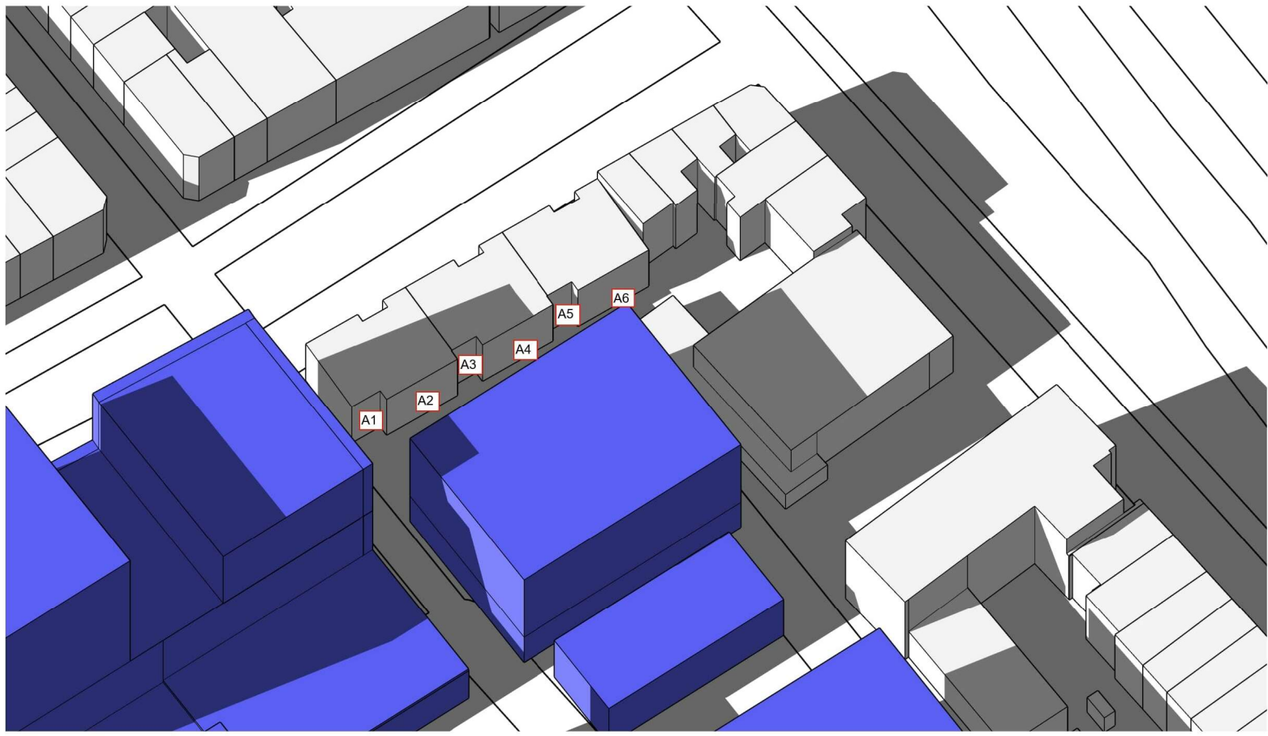
Teilingerstraat Zuidzijde achtergevel
21 september
14.30



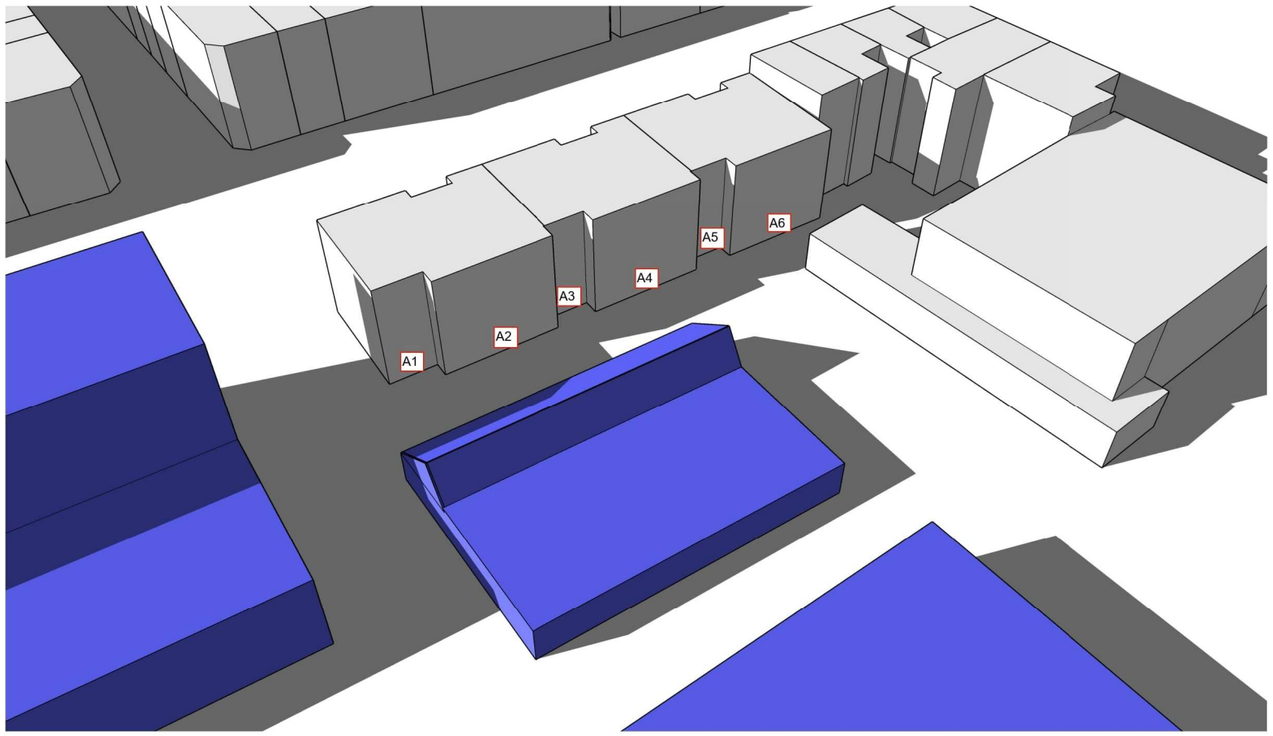


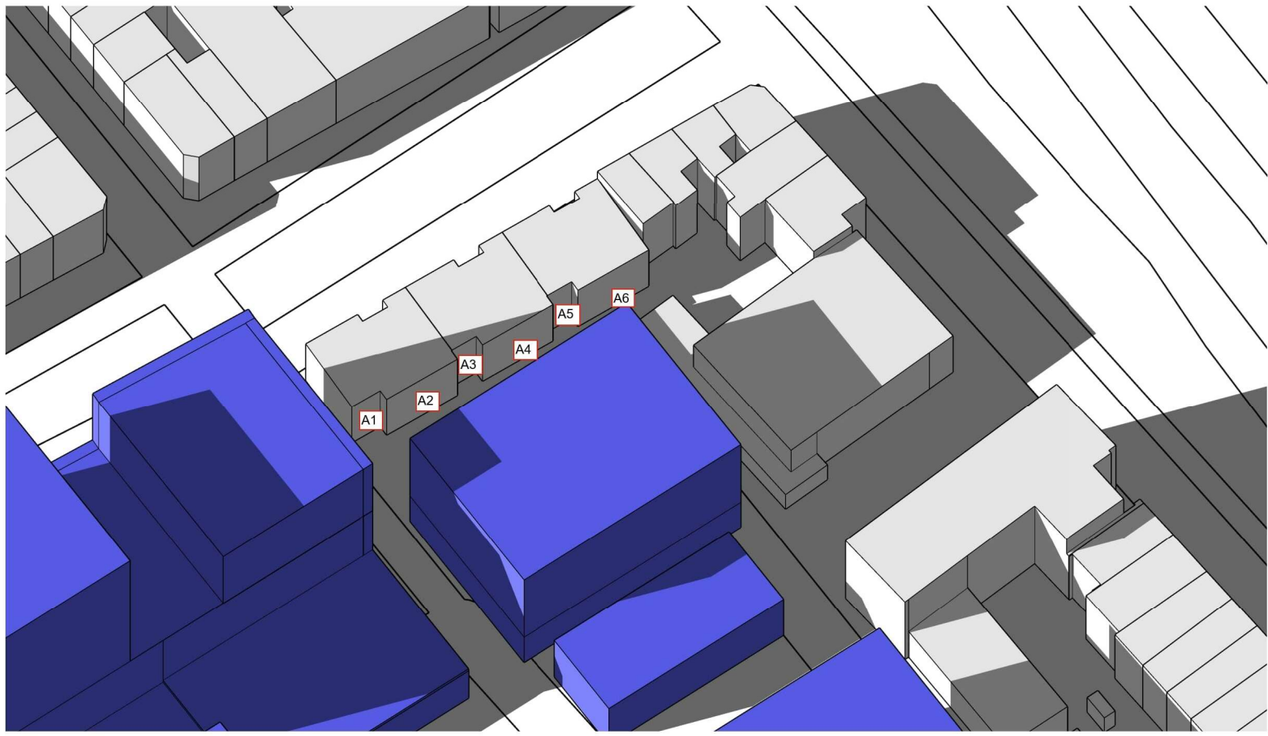
Teilingerstraat Zuidzijde achtergevel
21 september
15.00



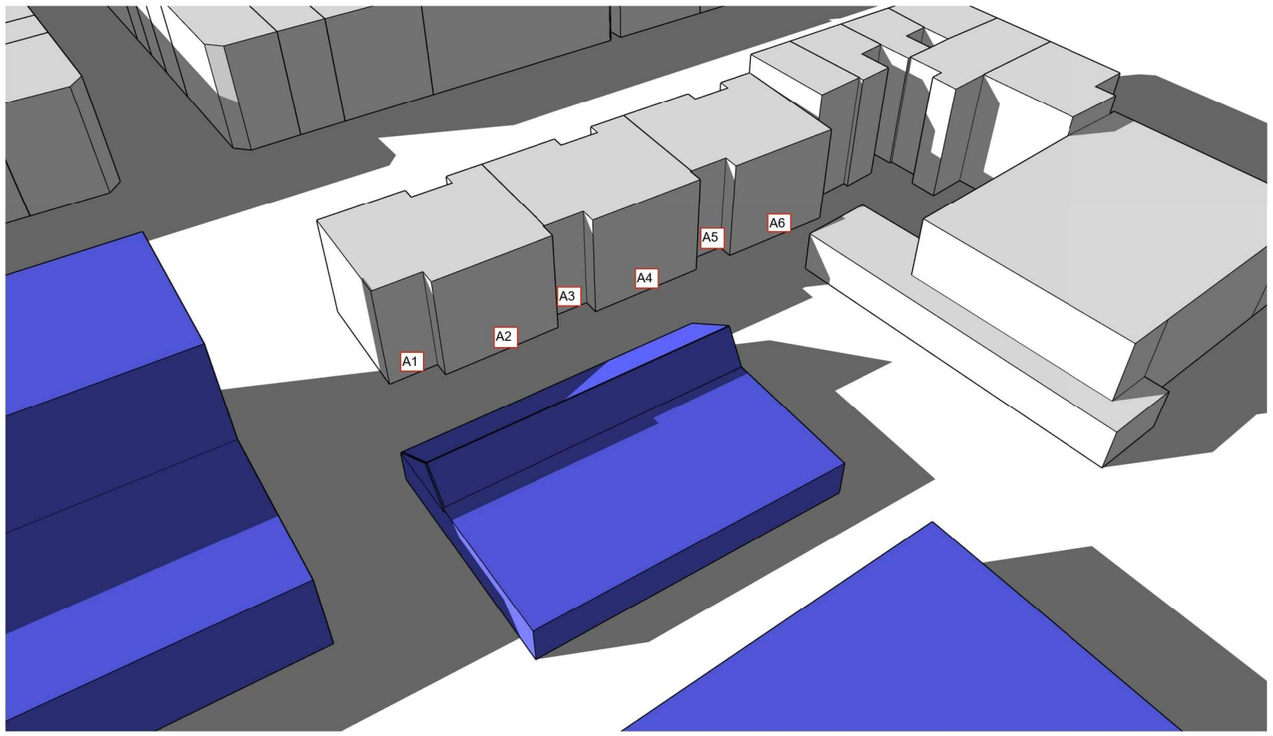


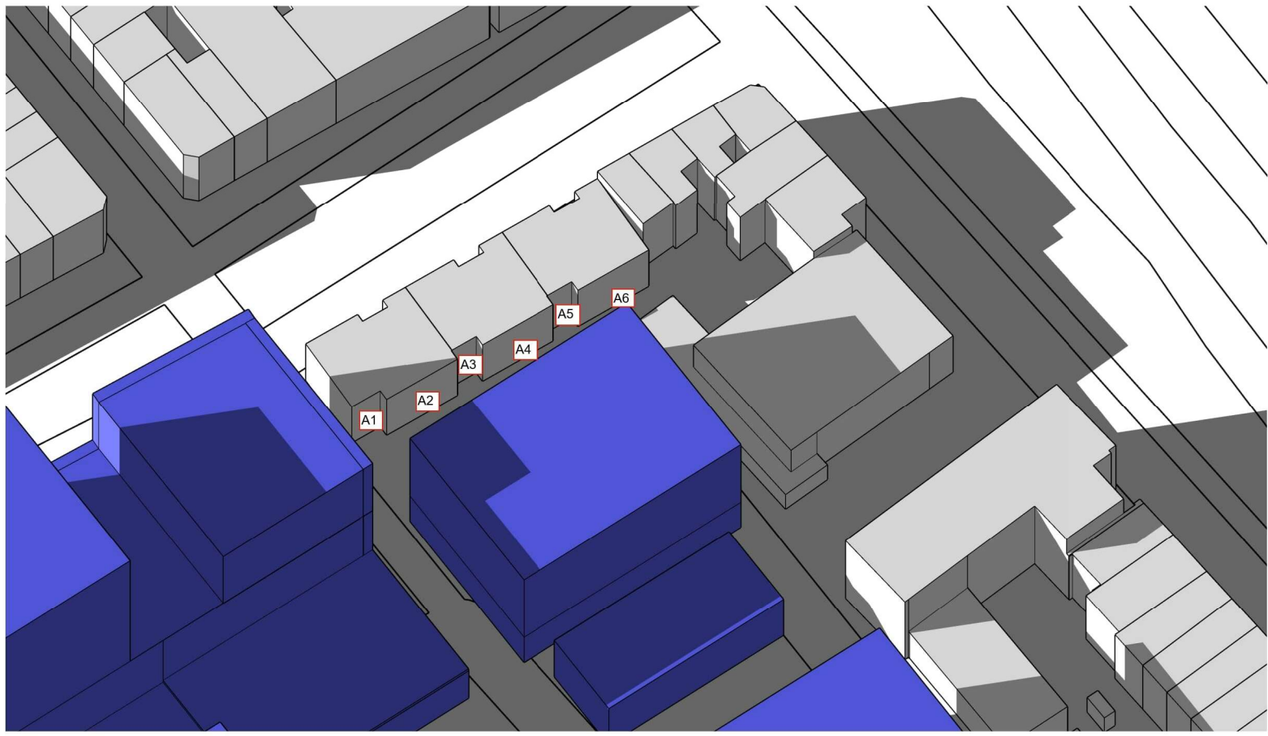
Teilingerstraat Zuidzijde achtergevel
21 september
15.30



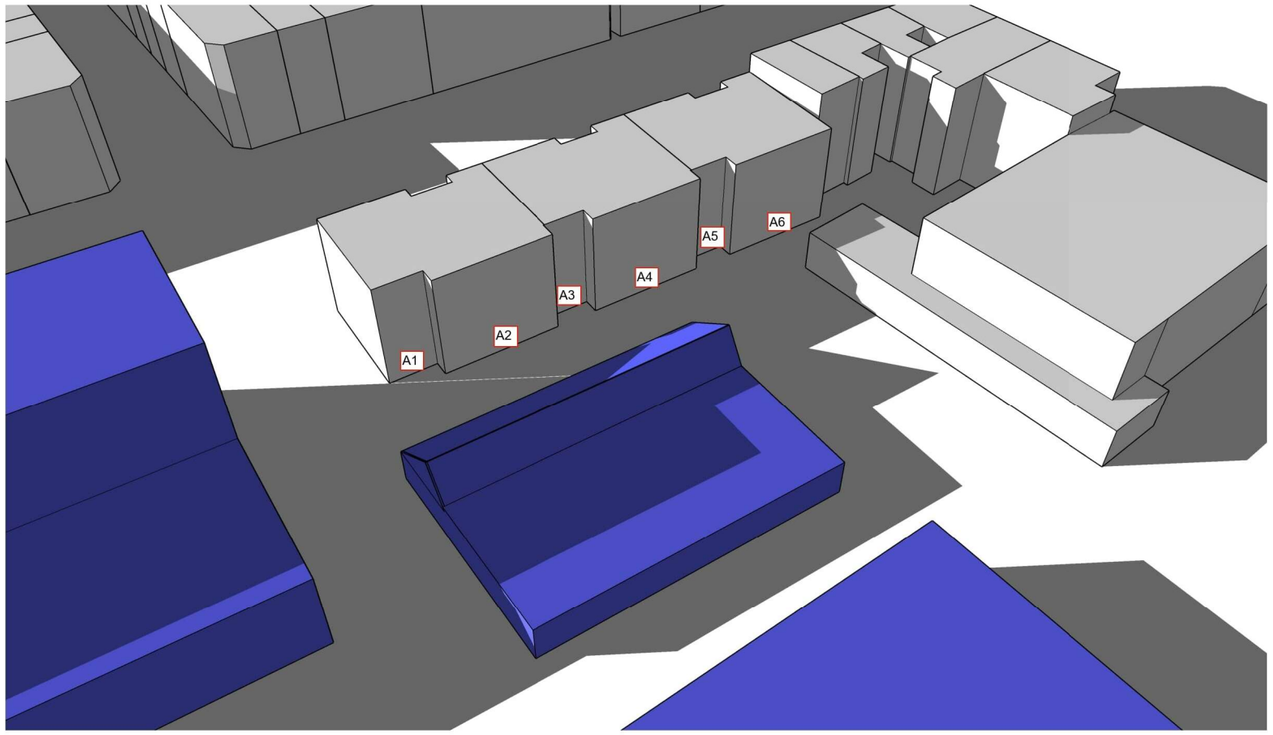


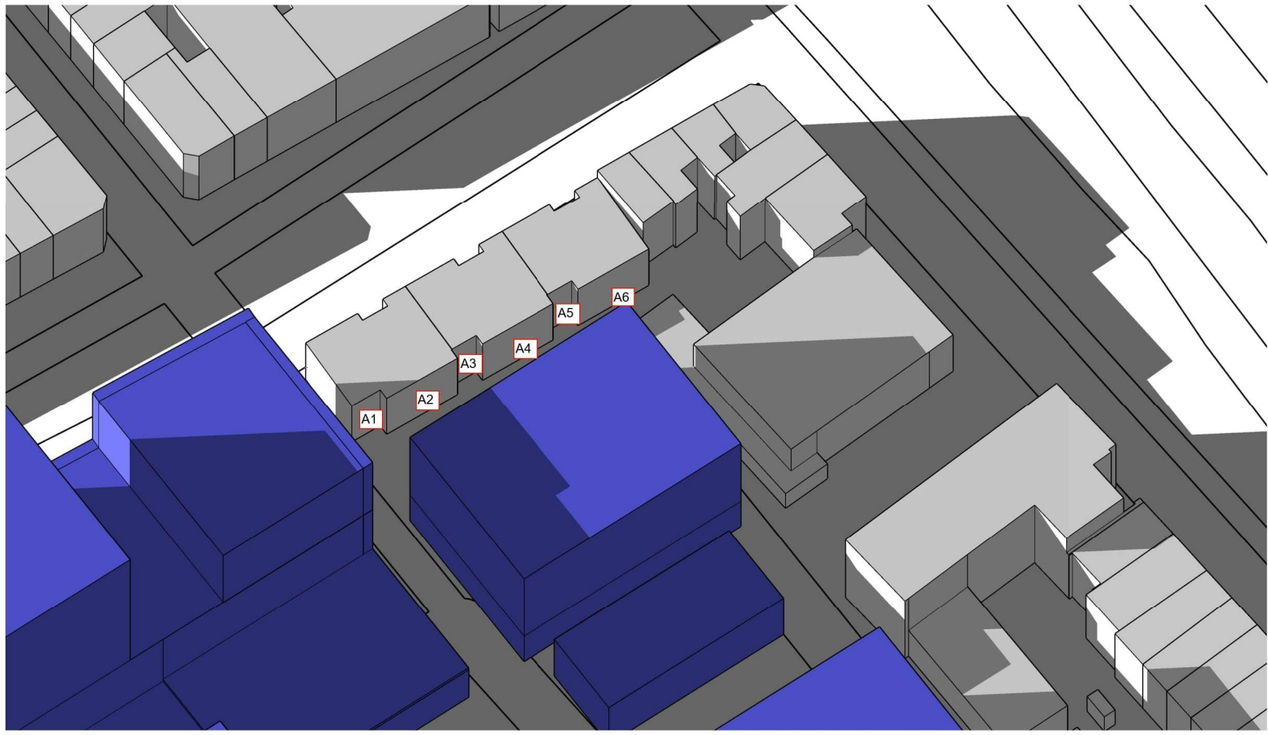
Teilingerstraat Zuidzijde achtergevel
21 september
16.00



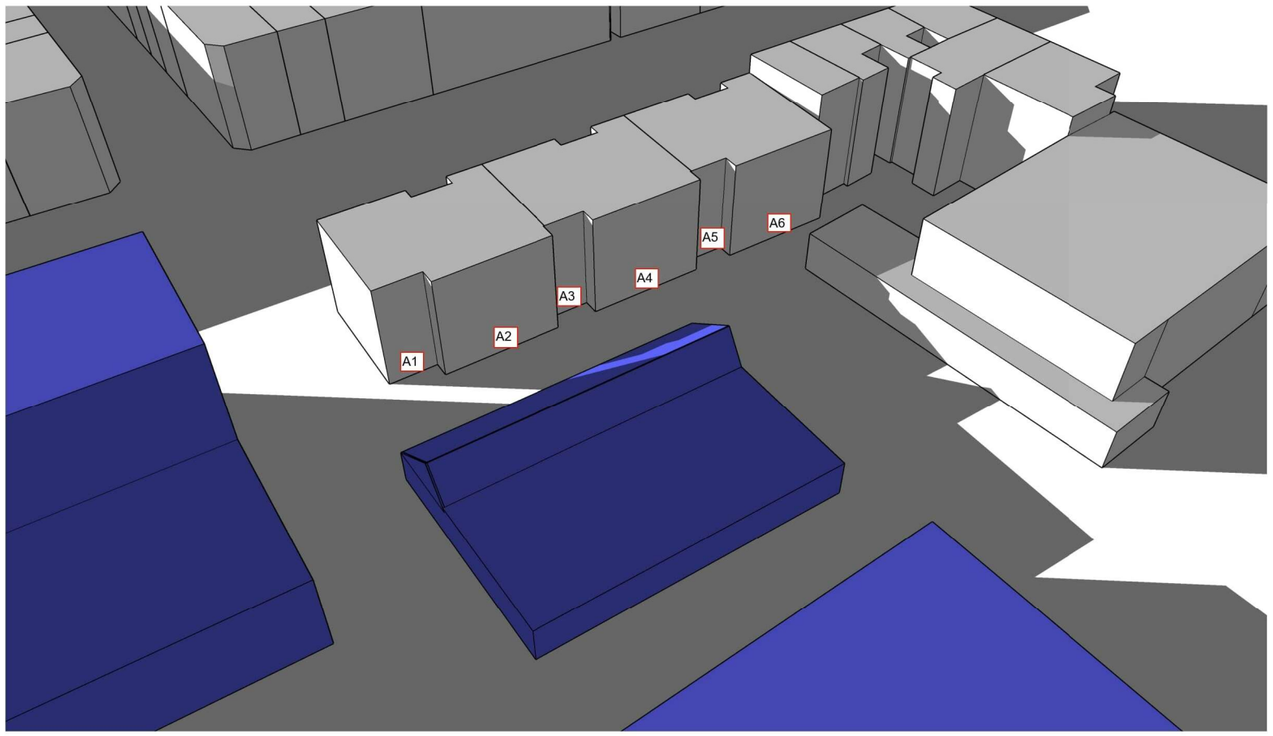


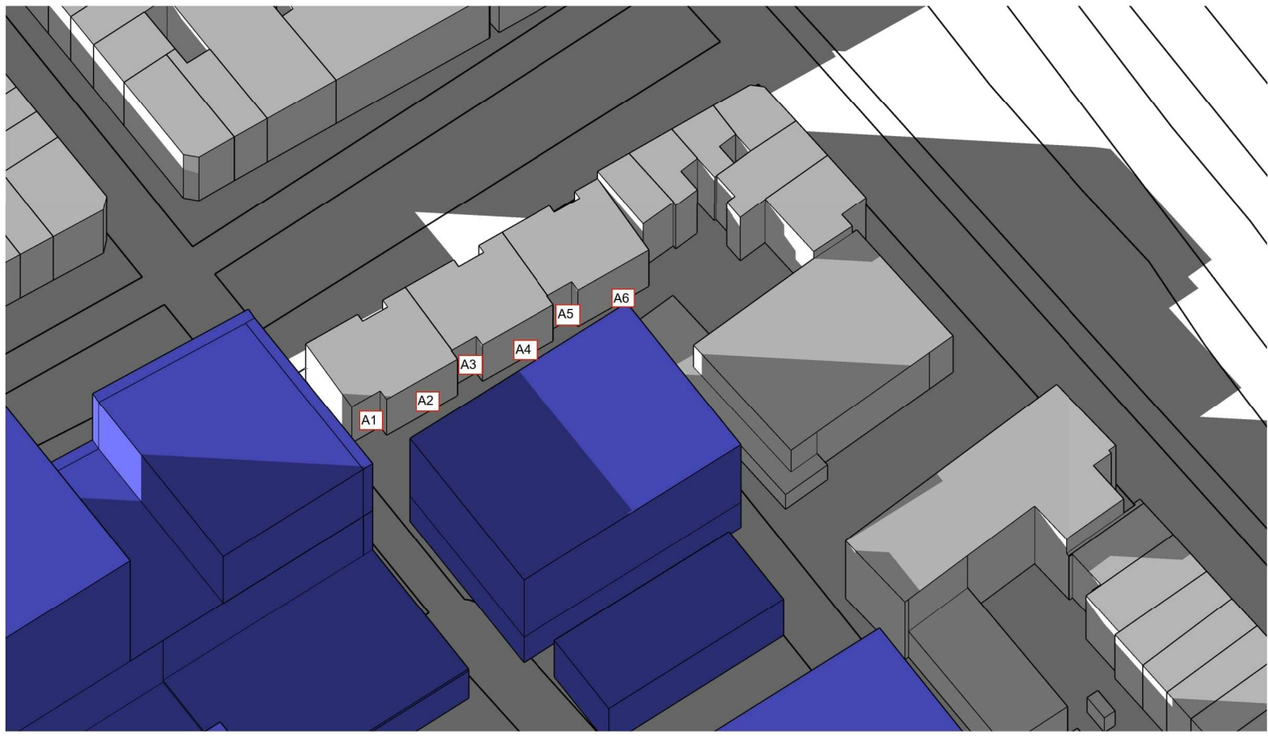
Teilingerstraat Zuidzijde achtergevel
21 september
16.30



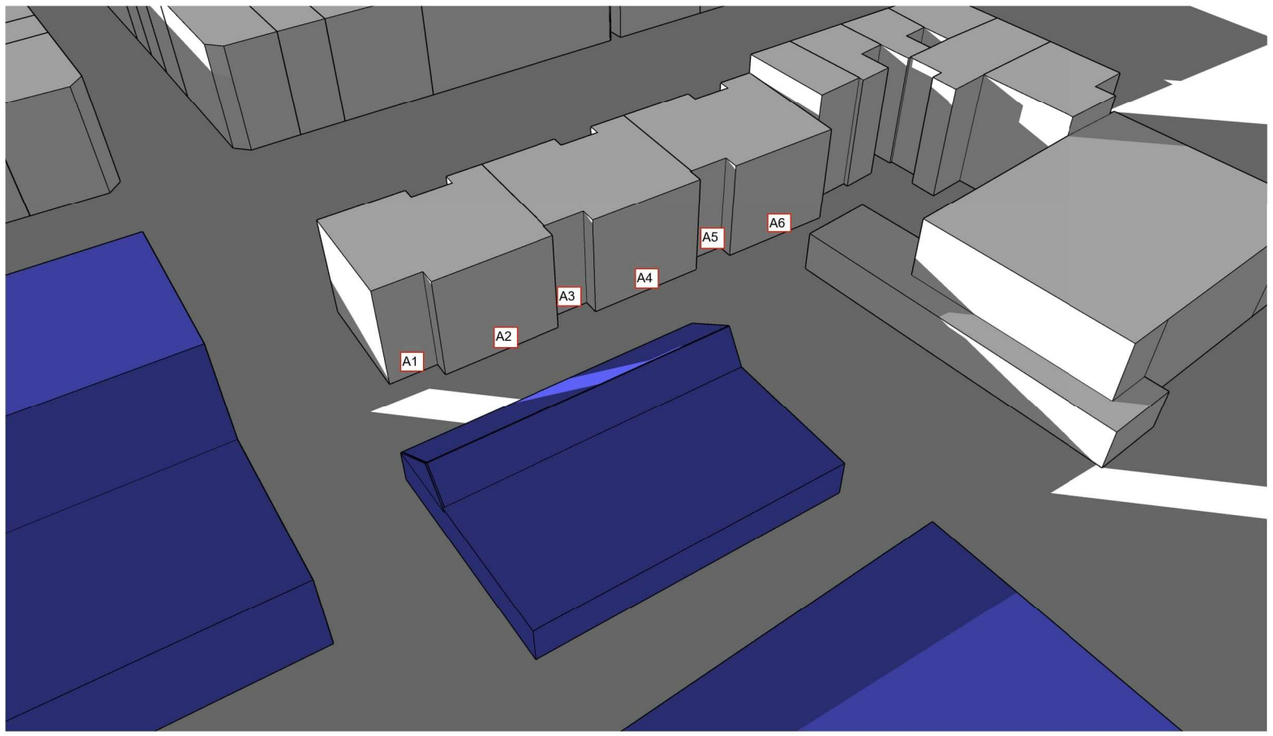


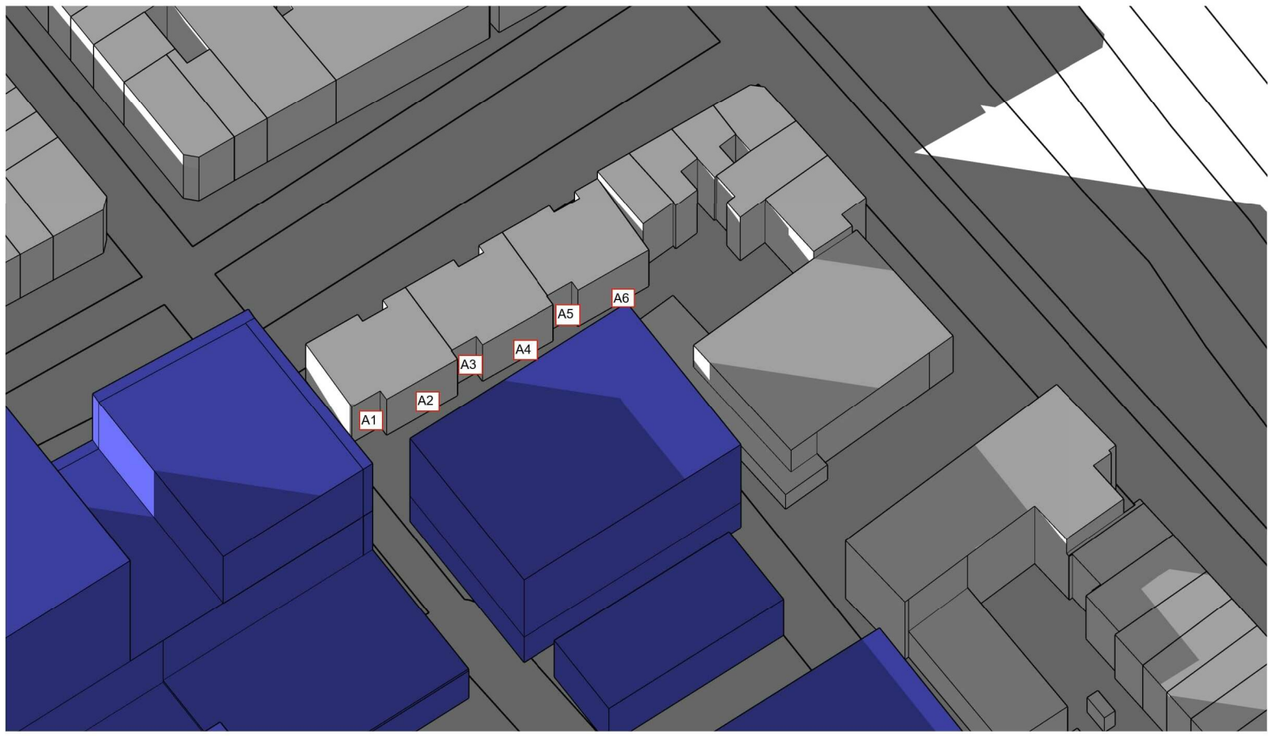
Teilingerstraat Zuidzijde achtergevel
21 september
17.00



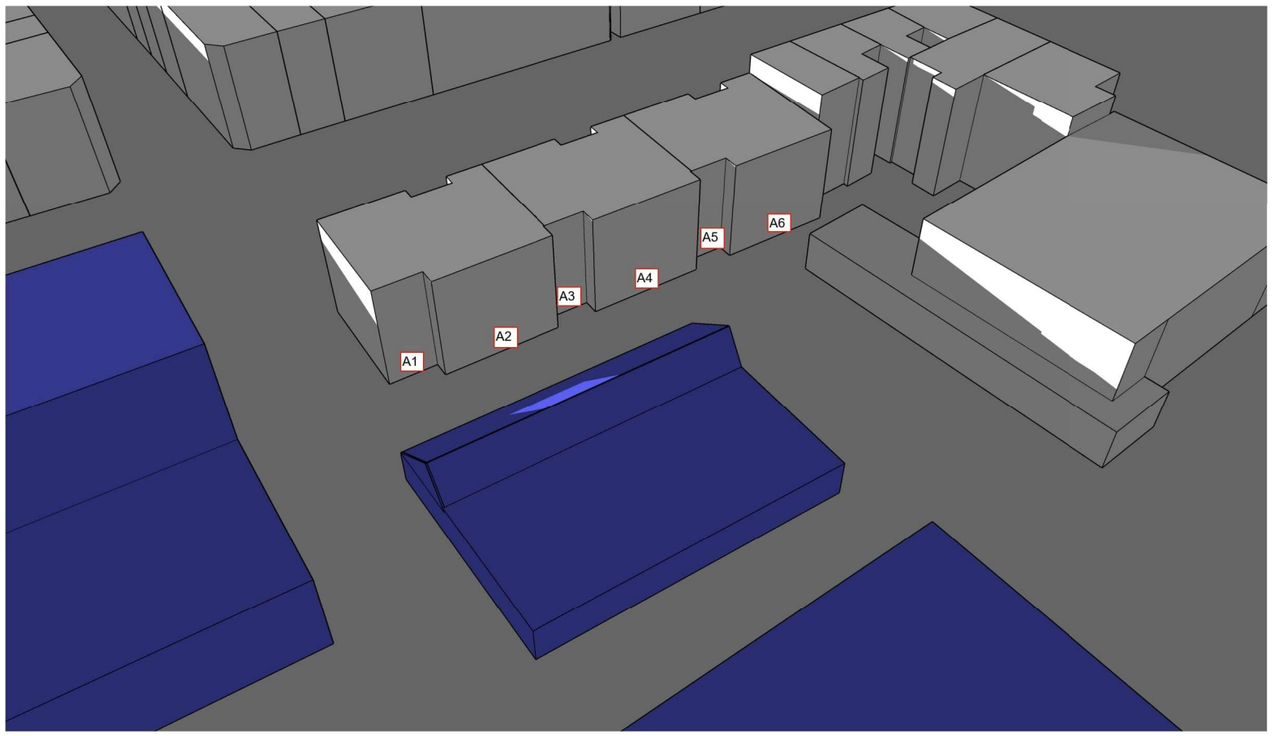


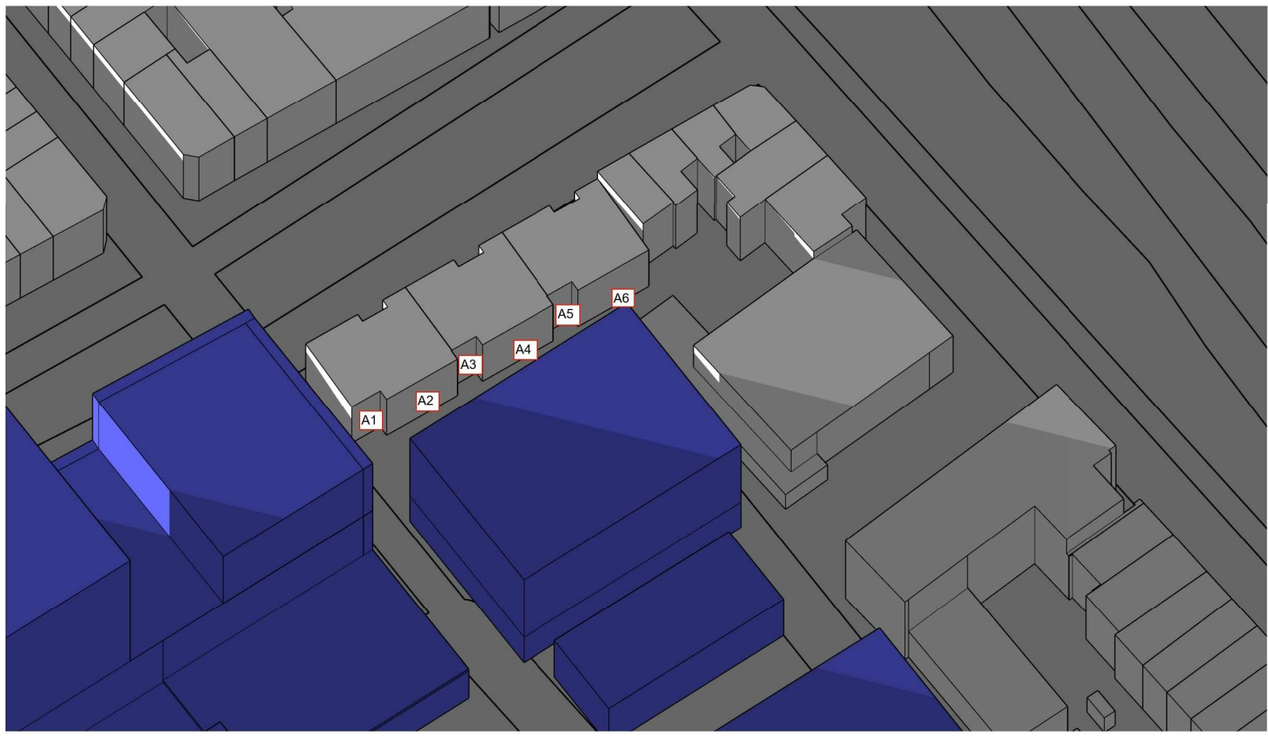
Teilingerstraat Zuidzijde achtergevel
21 september
17.30



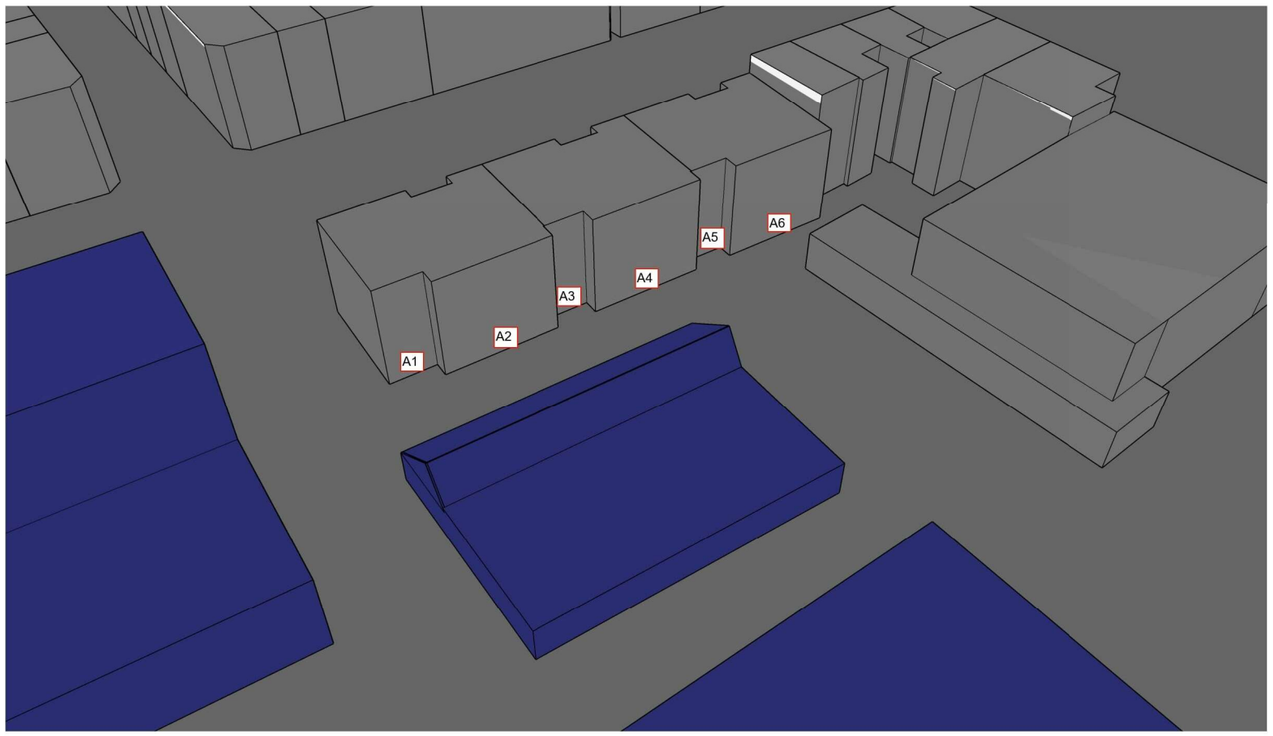


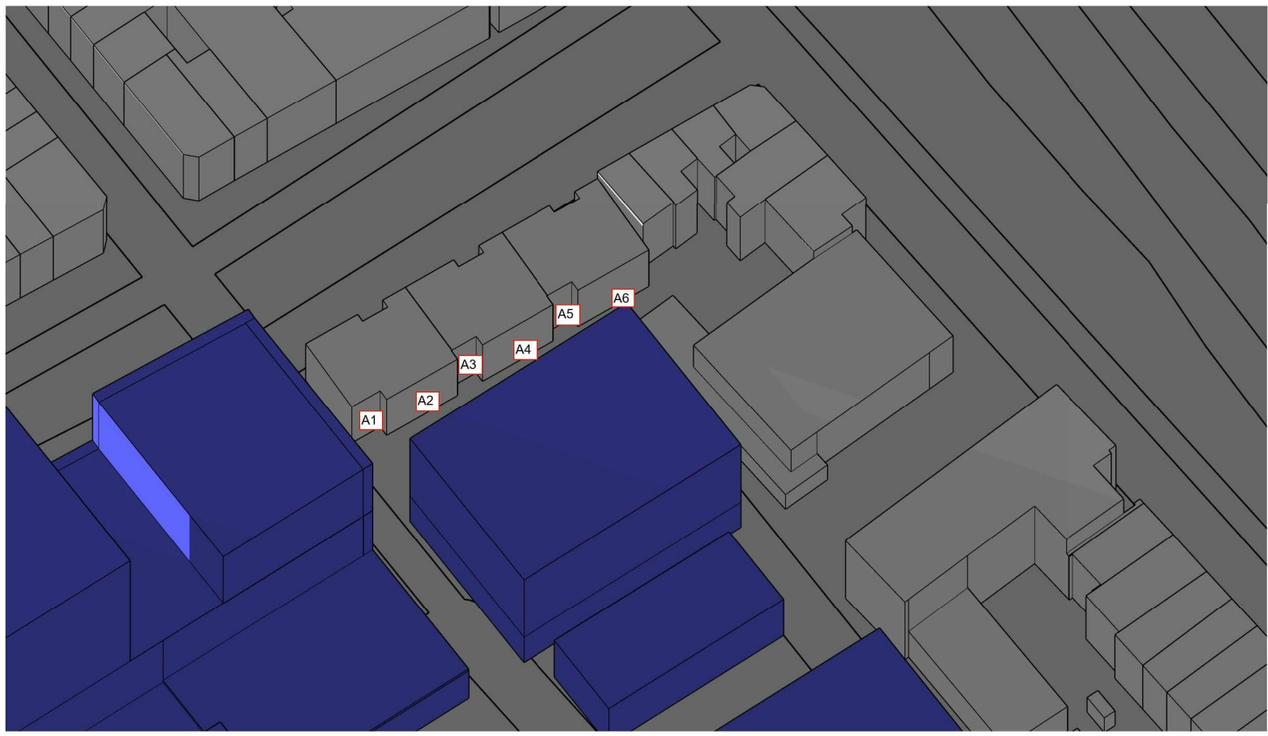
Teilingerstraat Zuidzijde achtergevel
21 september
18.00



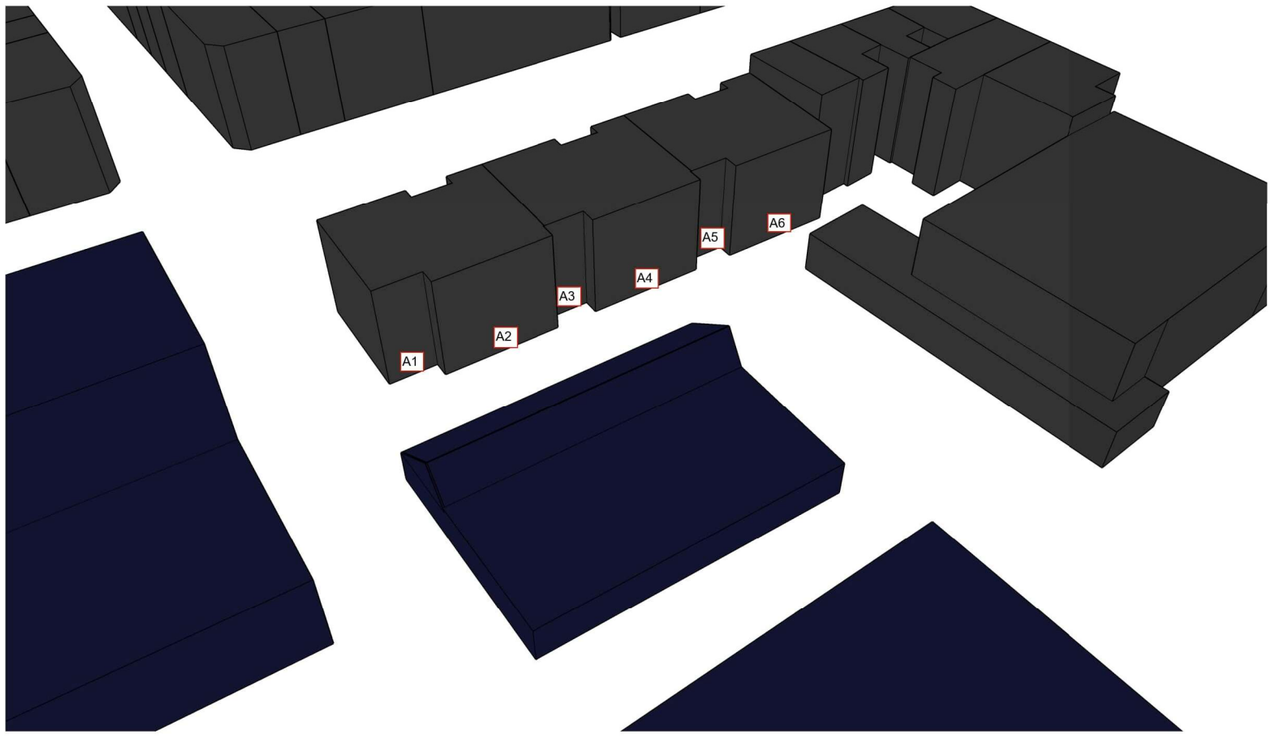


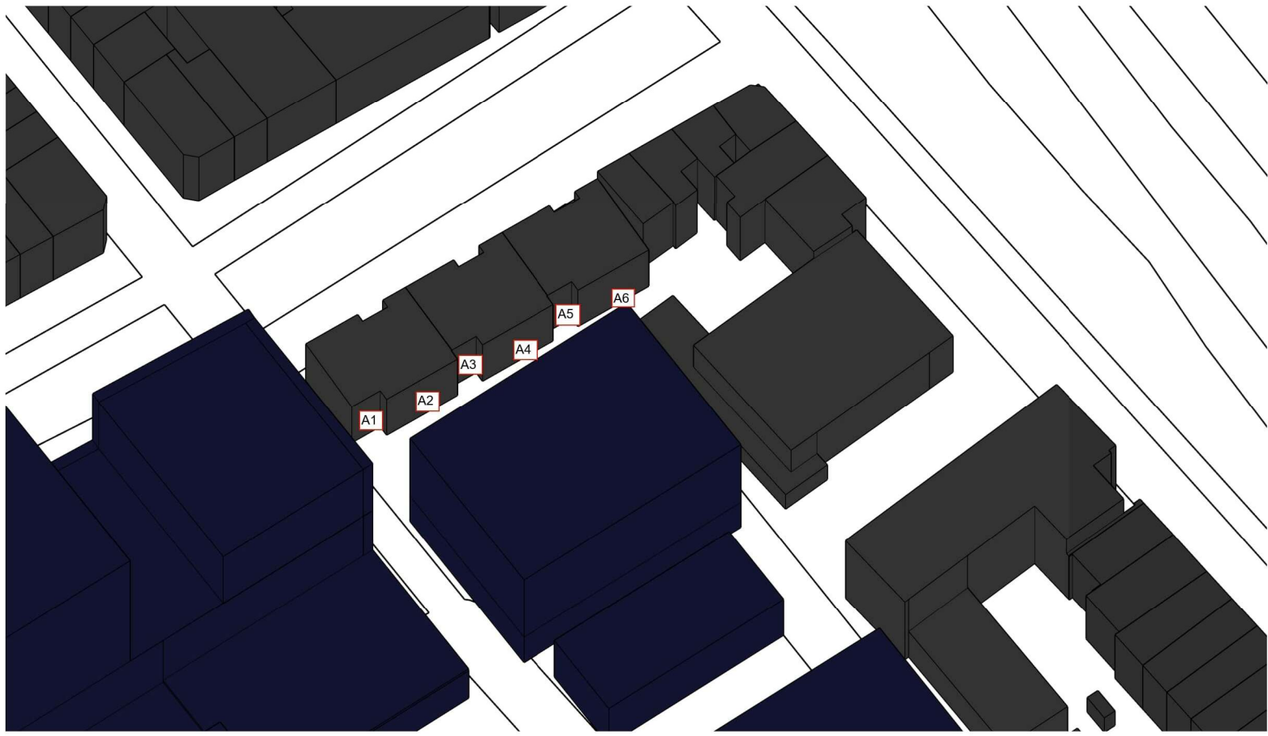
Teilingerstraat Zuidzijde achtergevel
21 september
18.30





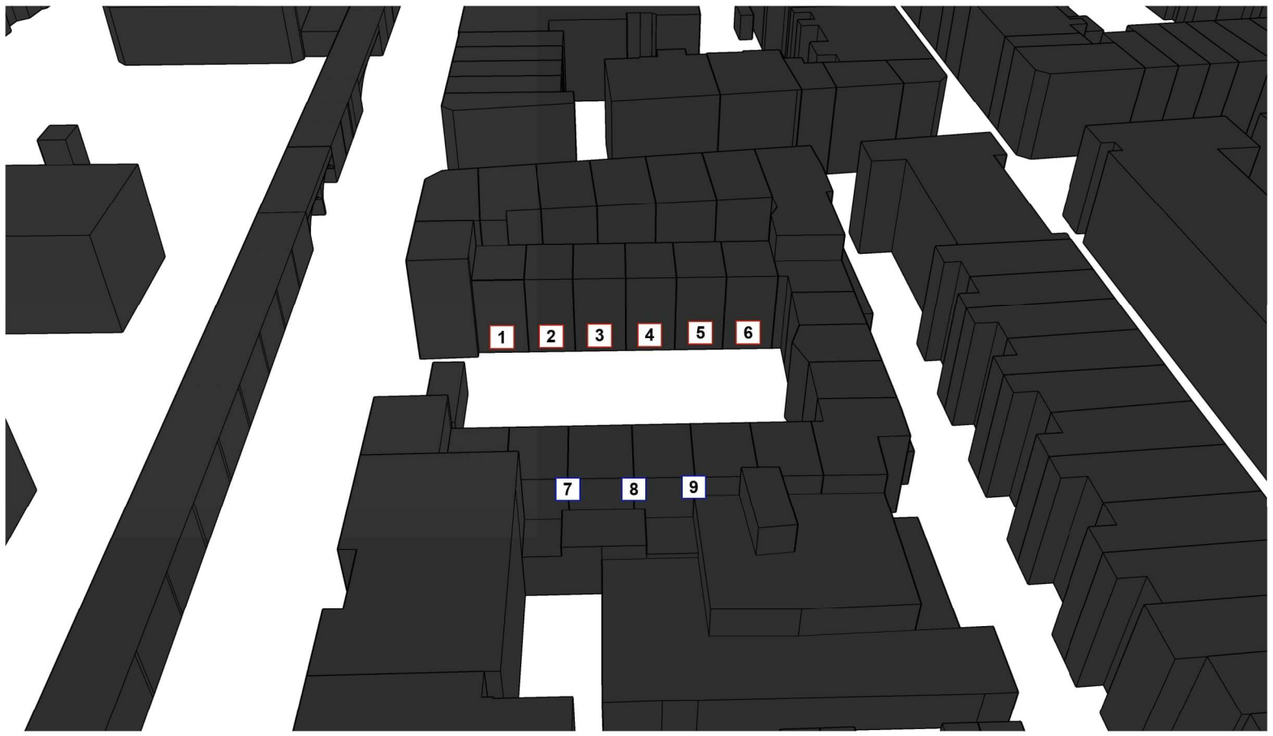
Teilingerstraat Zuidzijde achtergevel
21 september
19.00

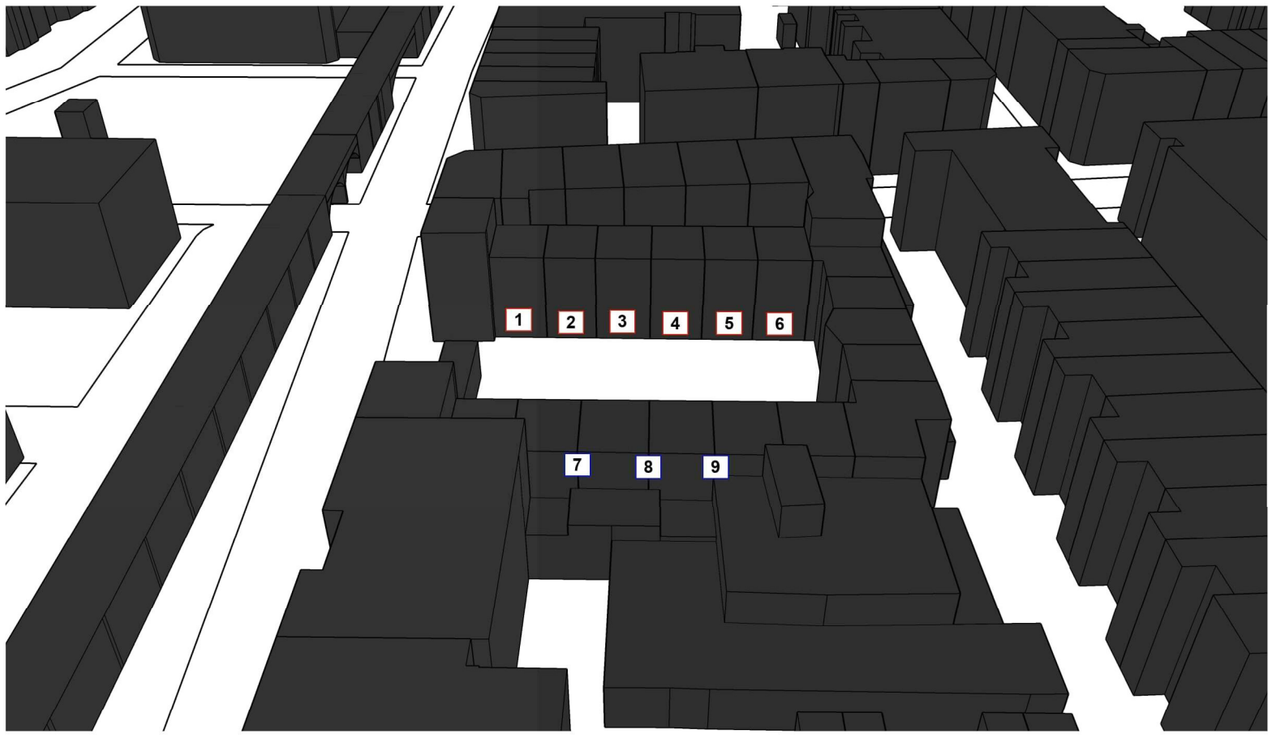




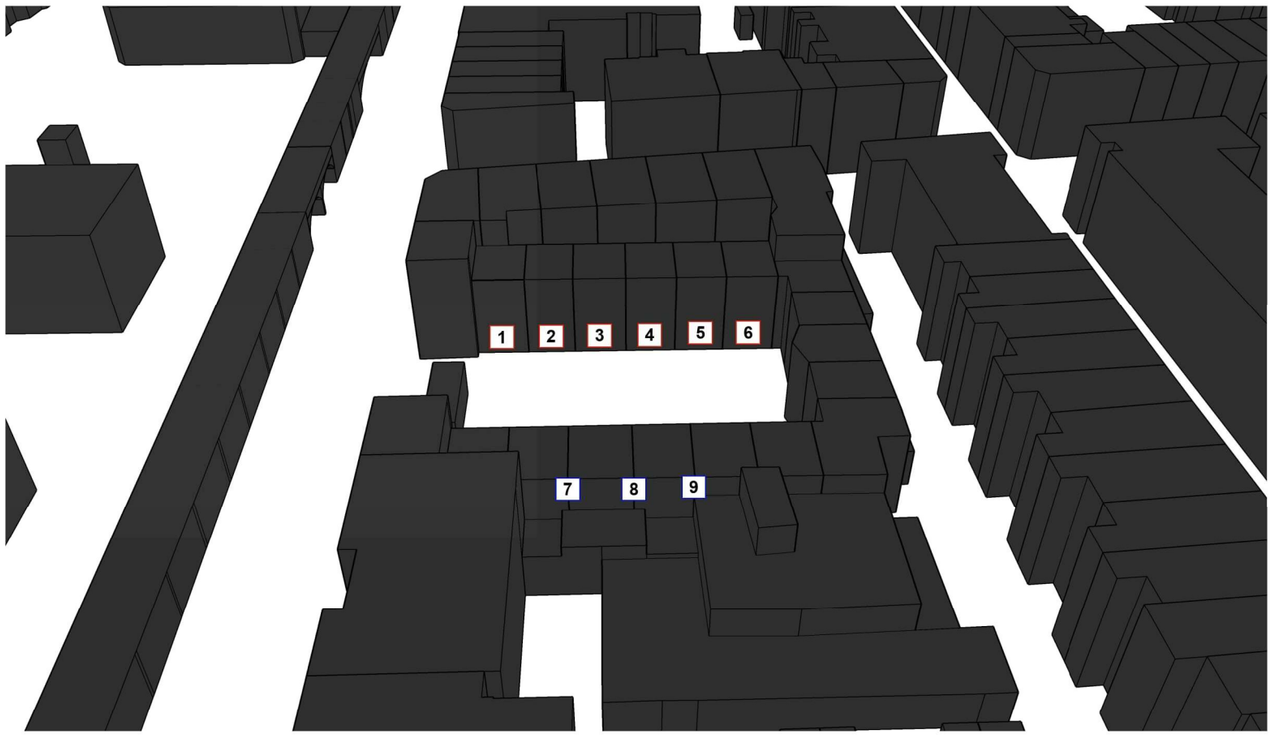
bijlage 14. resultaten 21 september Vijverhofstraat huidig vs. nieuw

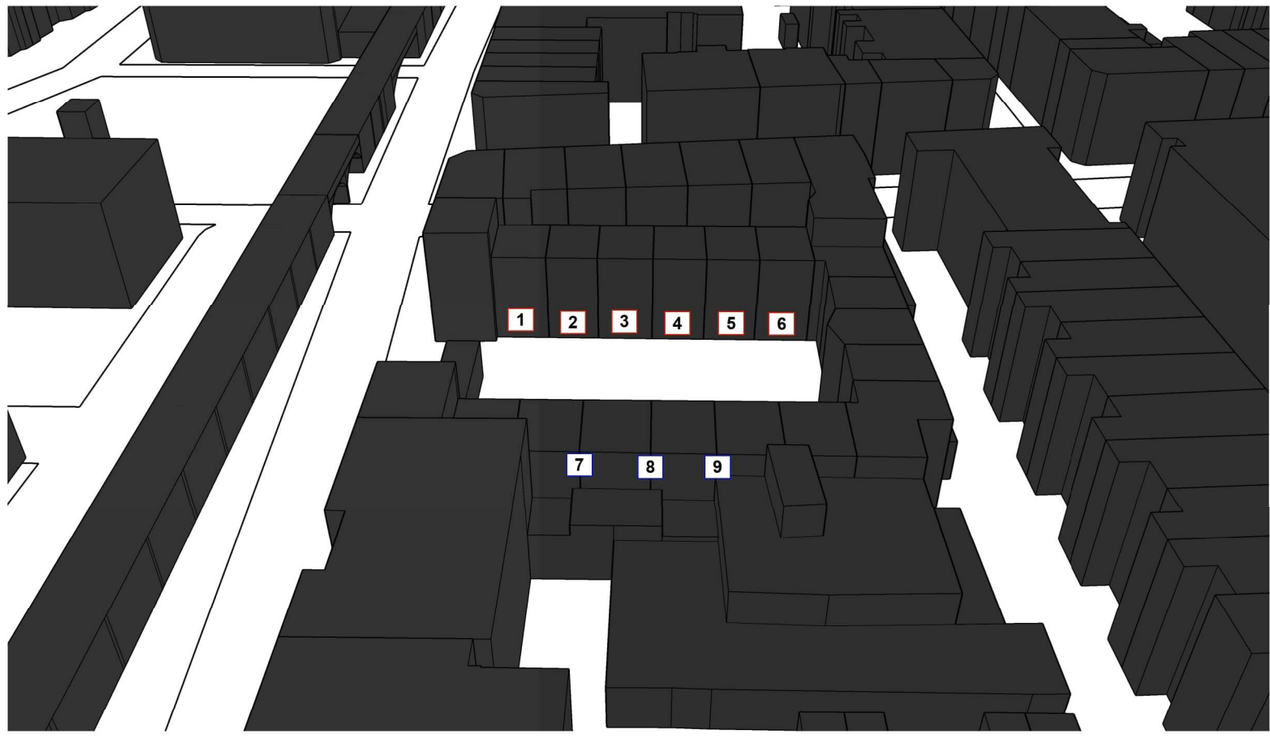
Vijverhofstraat "het hofje"
21 september
06.00



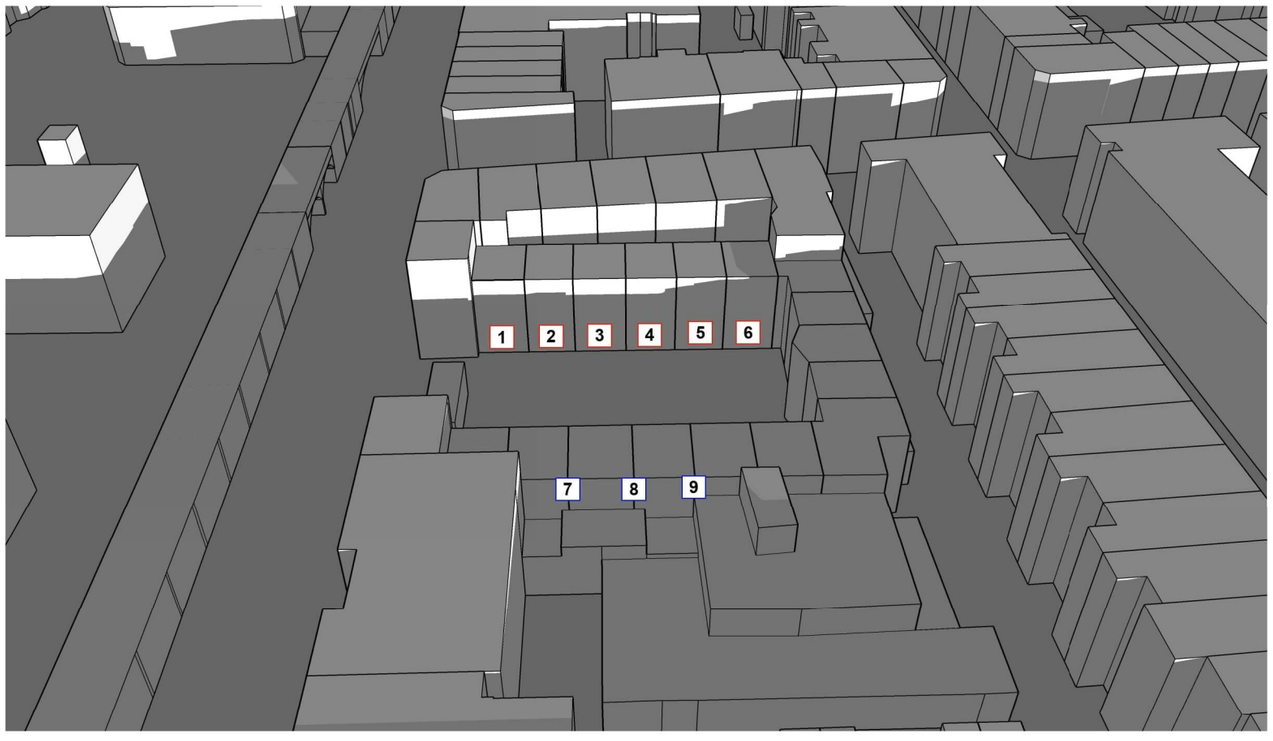


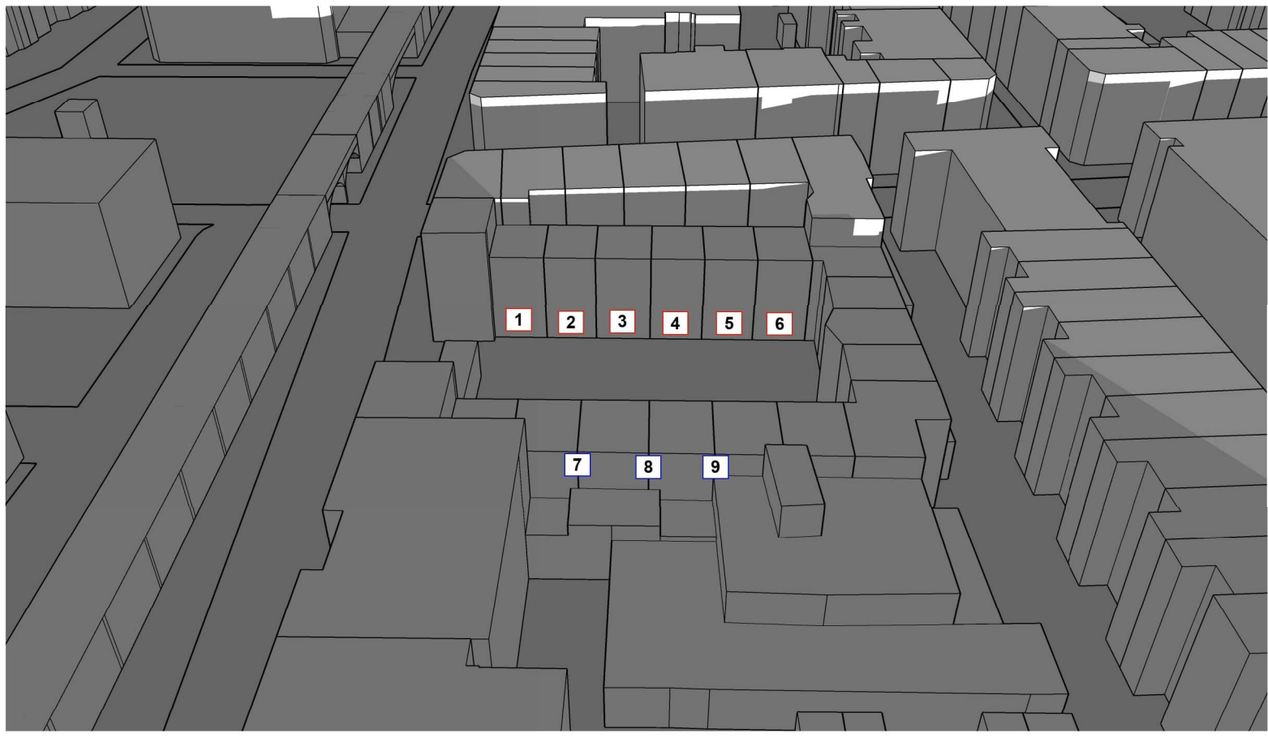
Vijverhofstraat "het hofje"
21 september
06.30



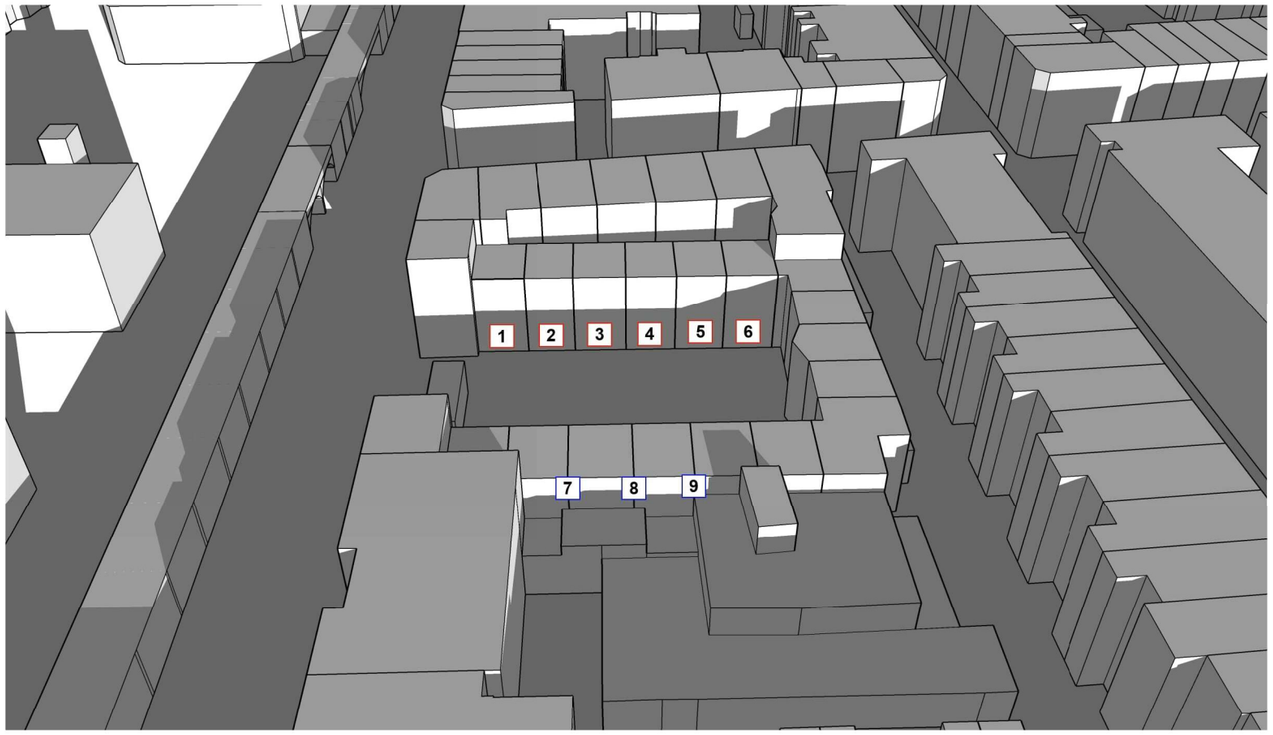


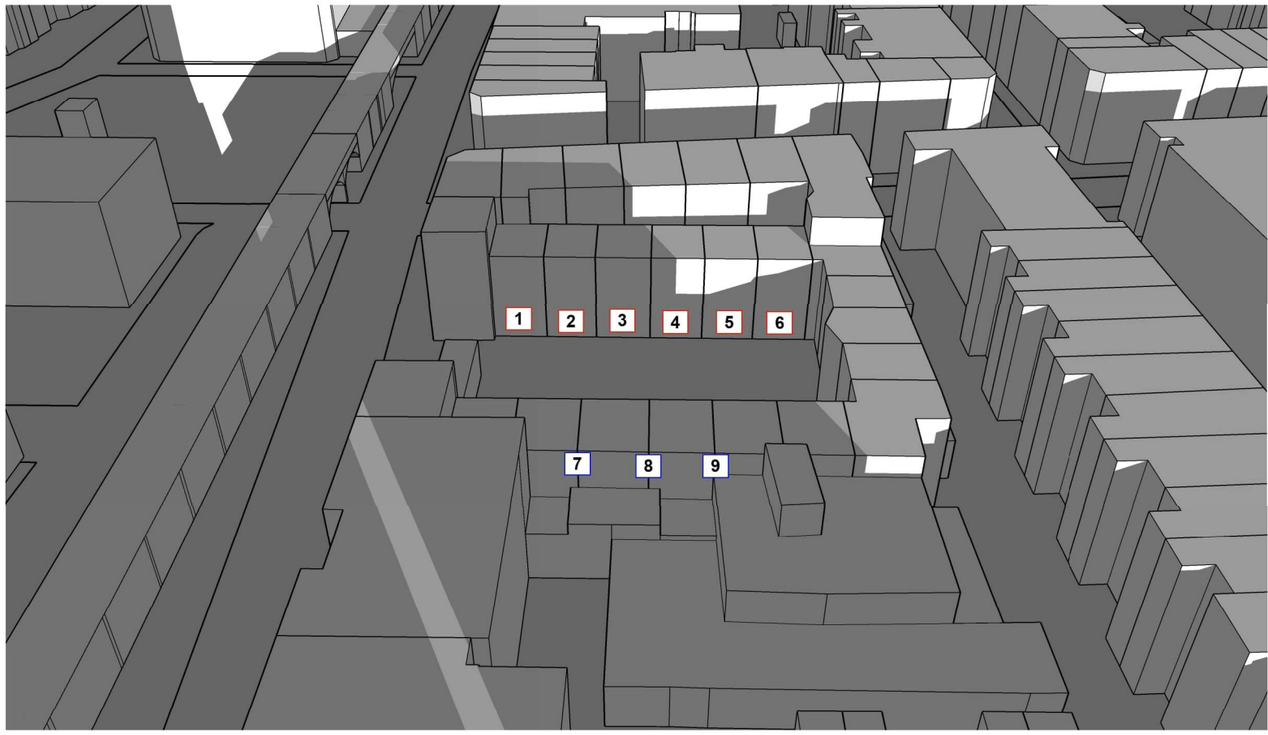
Vijverhofstraat "het hofje"
21 september
07.00



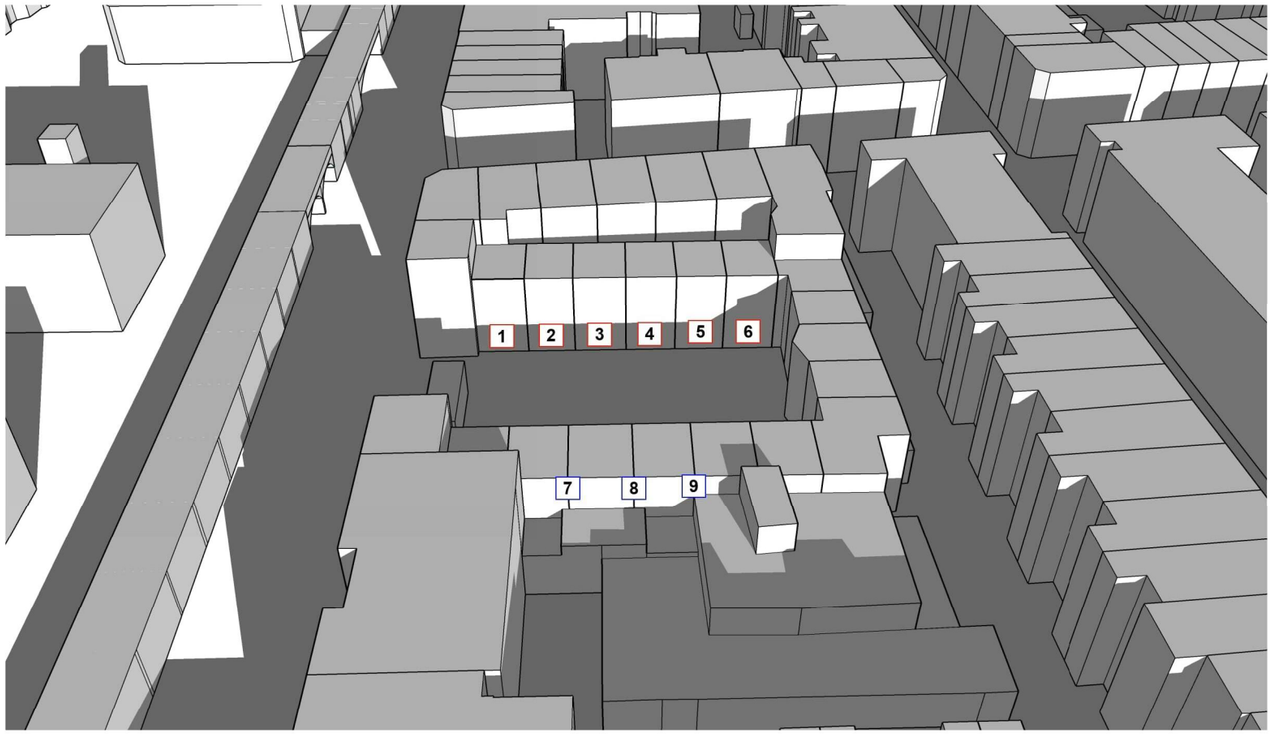


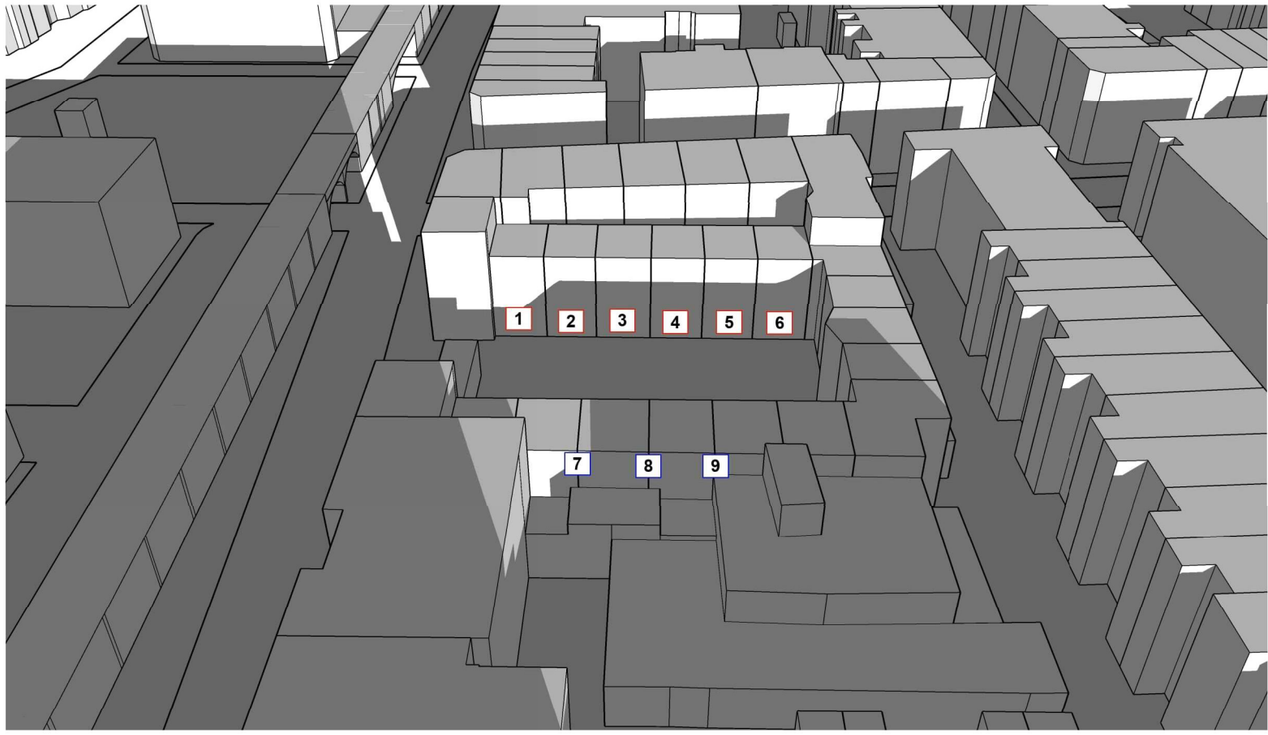
Vijverhofstraat "het hofje"
21 september
07.30



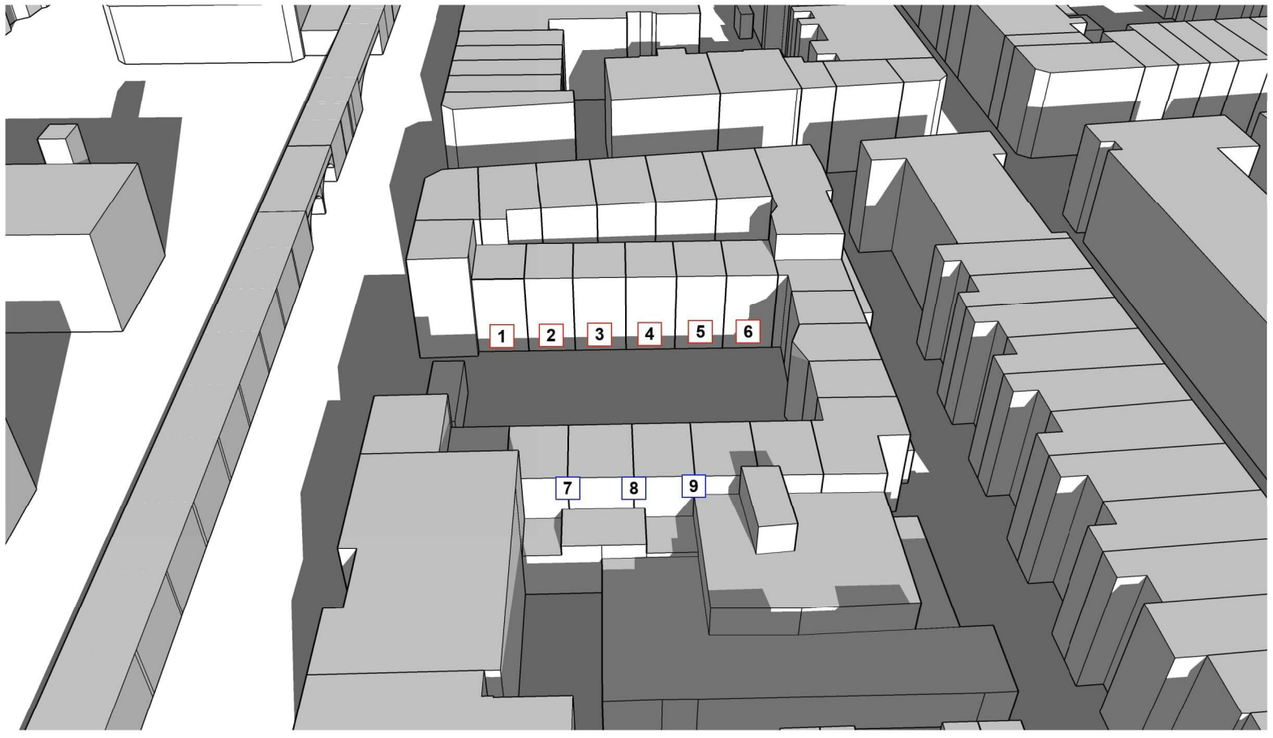


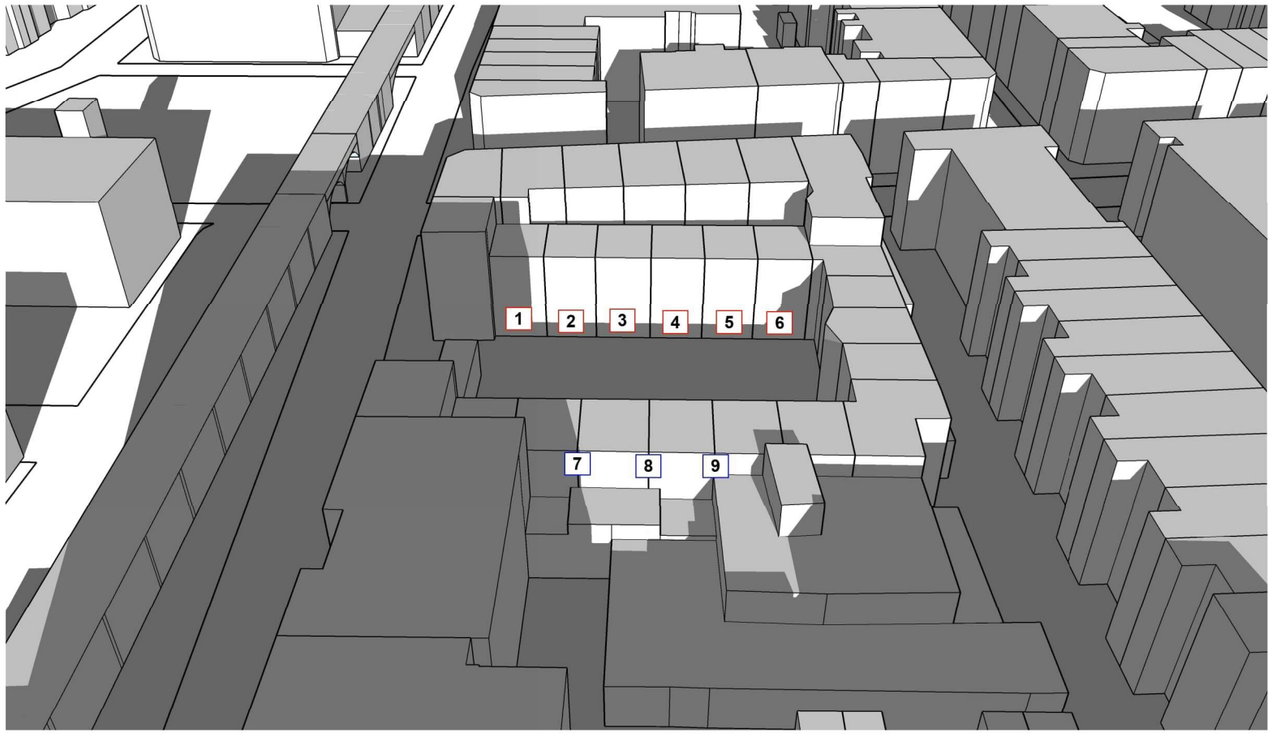
Vijverhofstraat "het hofje"
21 september
08.00



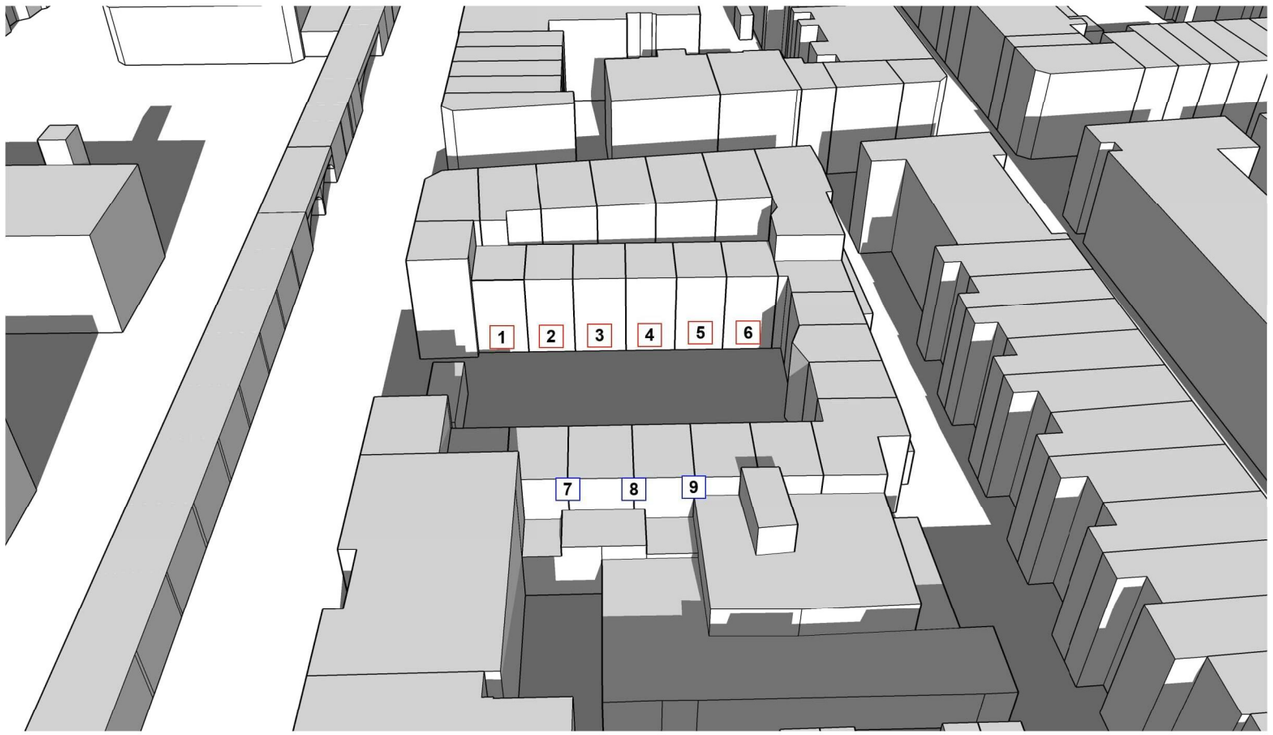


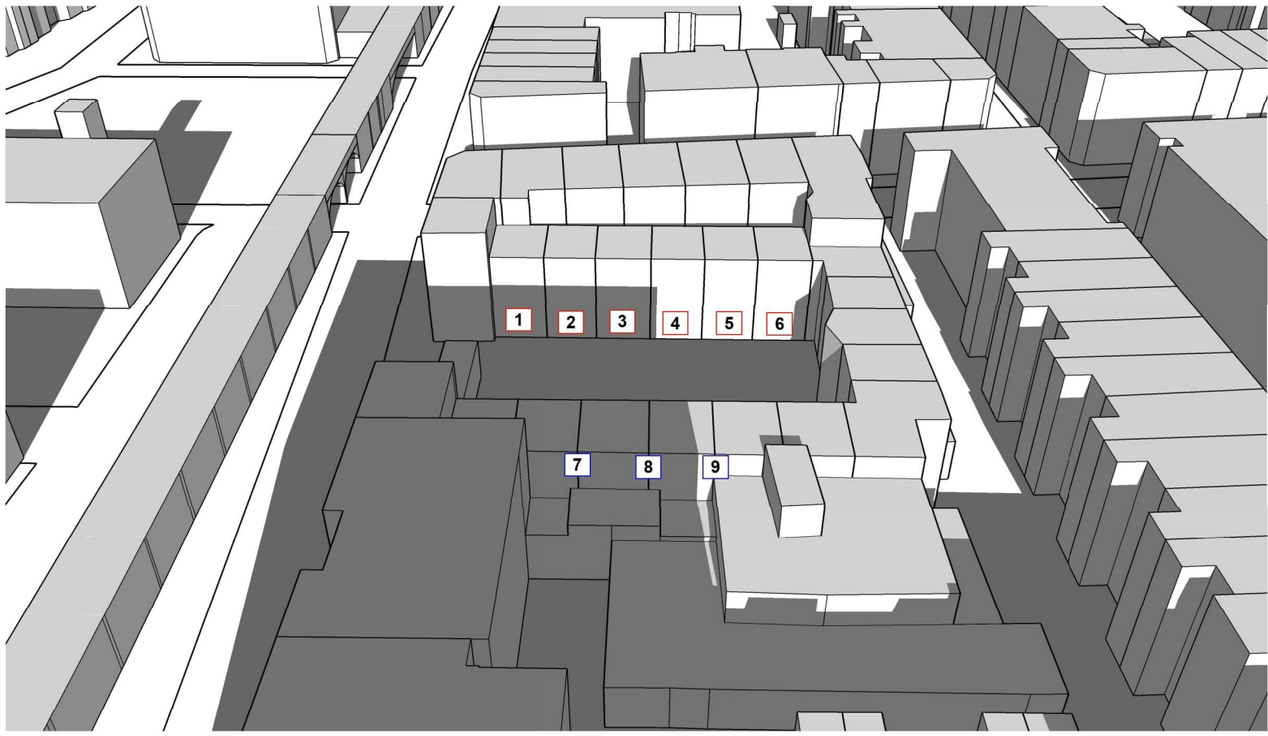
Vijverhofstraat "het hofje"
21 september
08.30



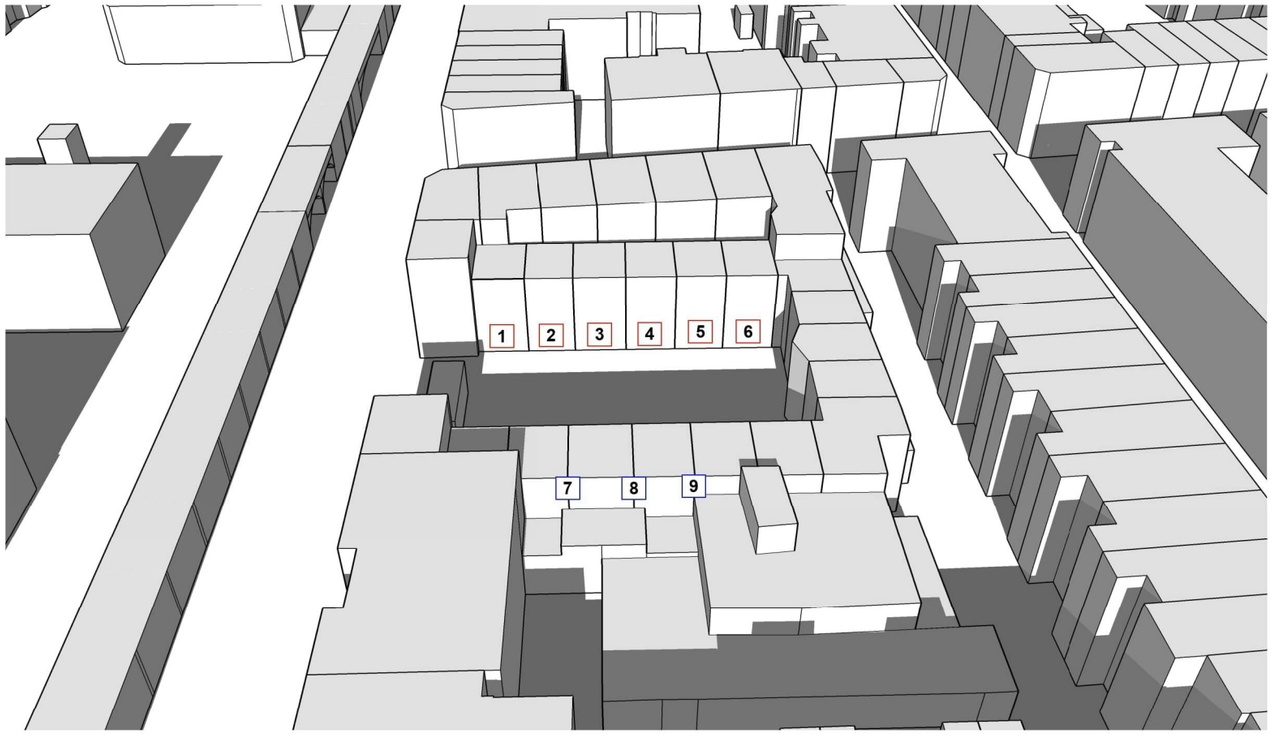


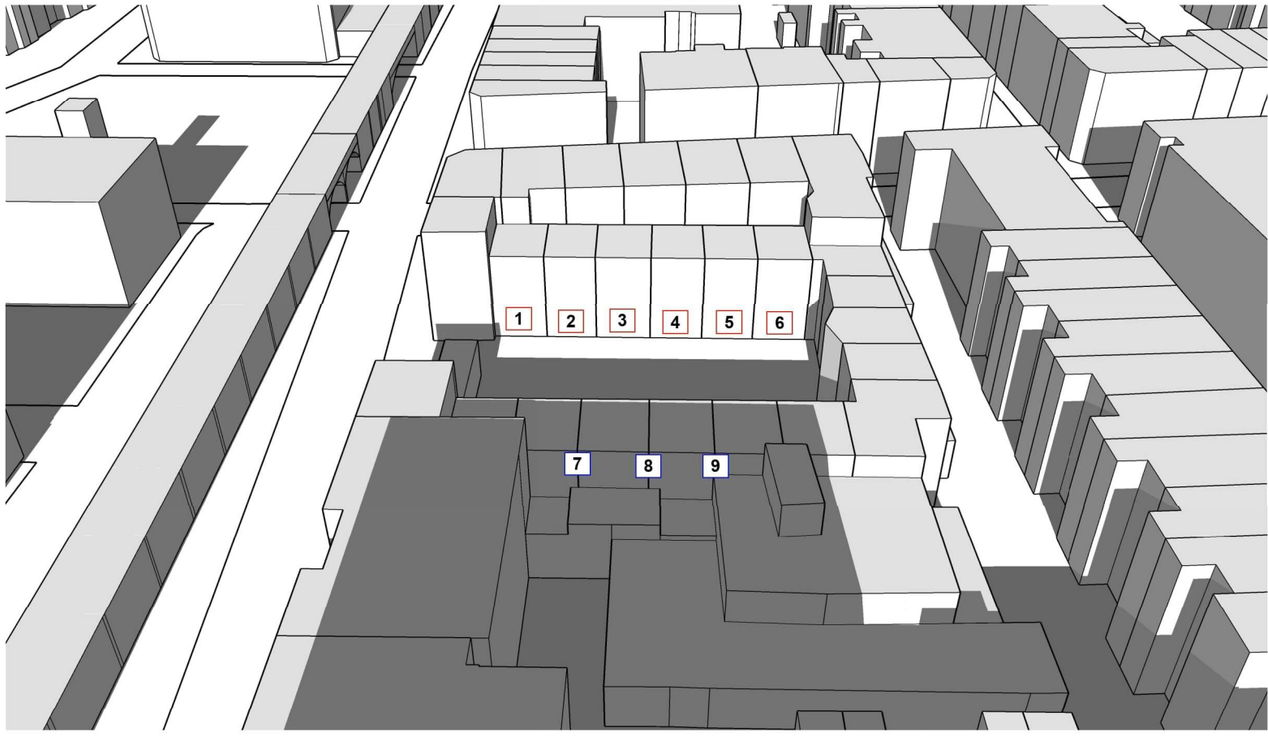
Vijverhofstraat "het hofje"
21 september
09.00



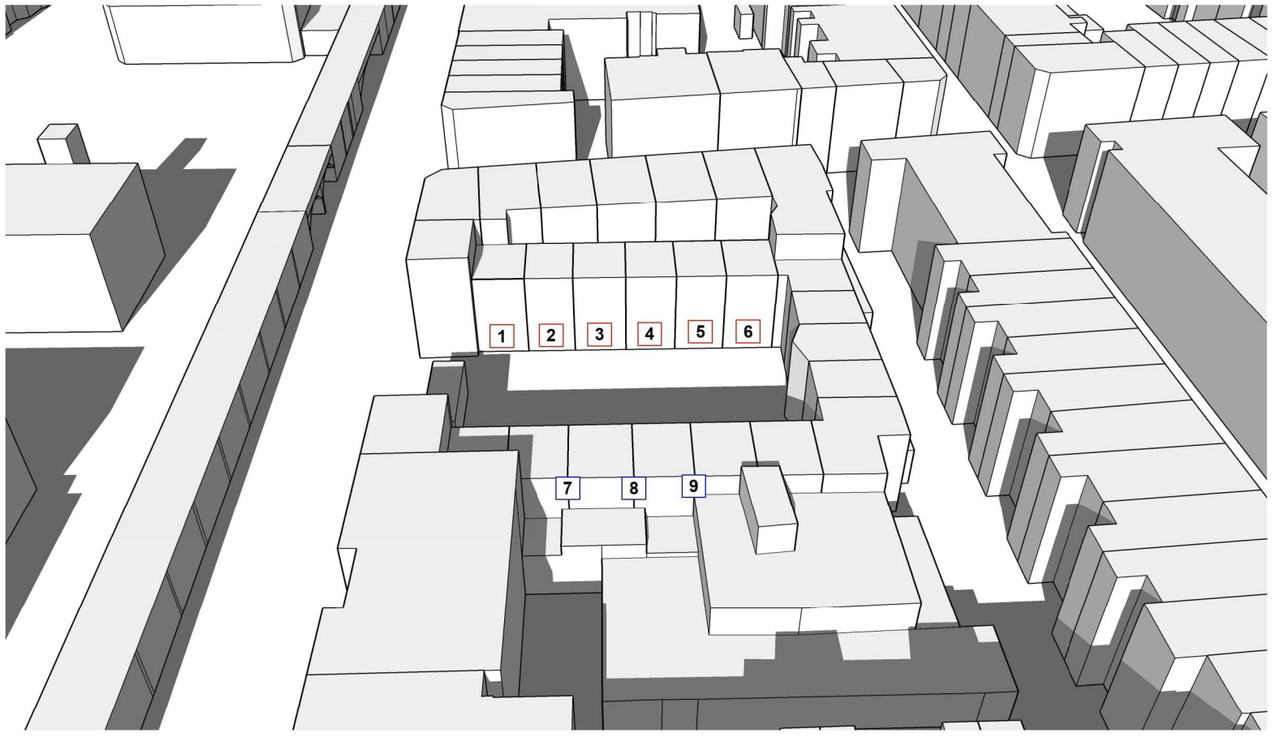


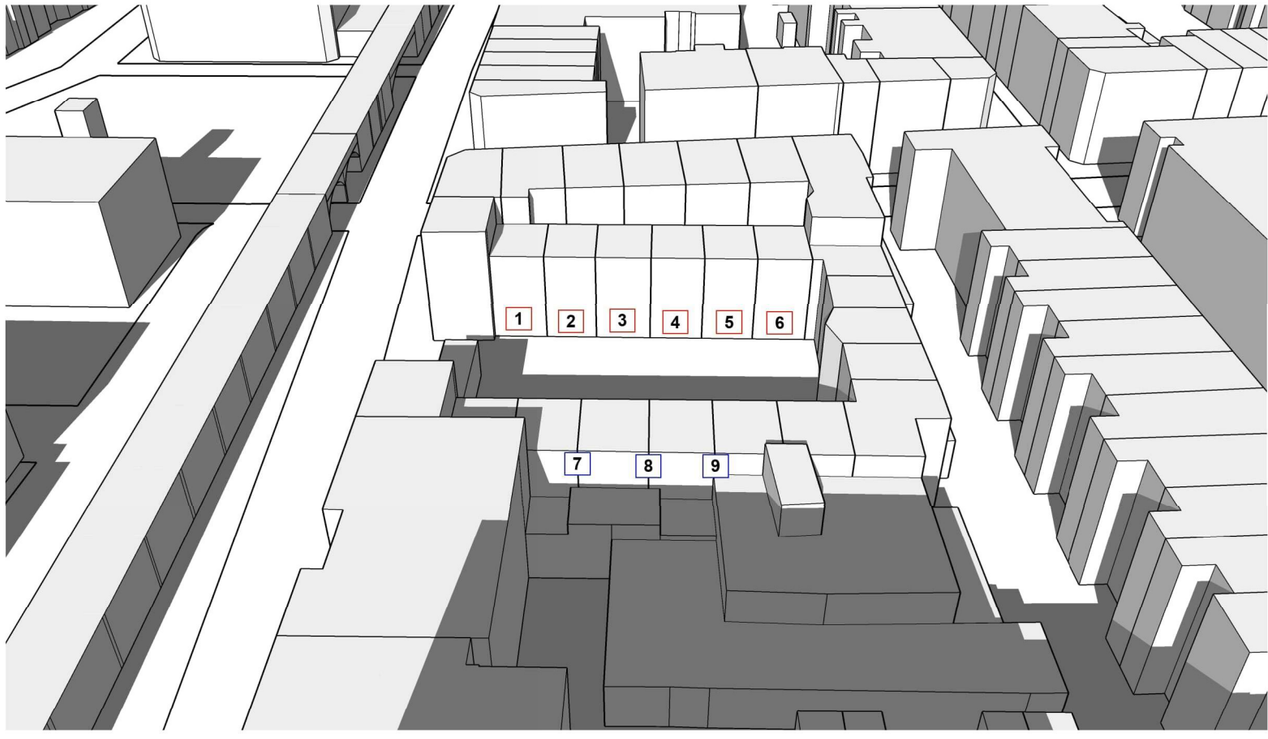
Vijverhofstraat "het hofje"
21 september
09.30



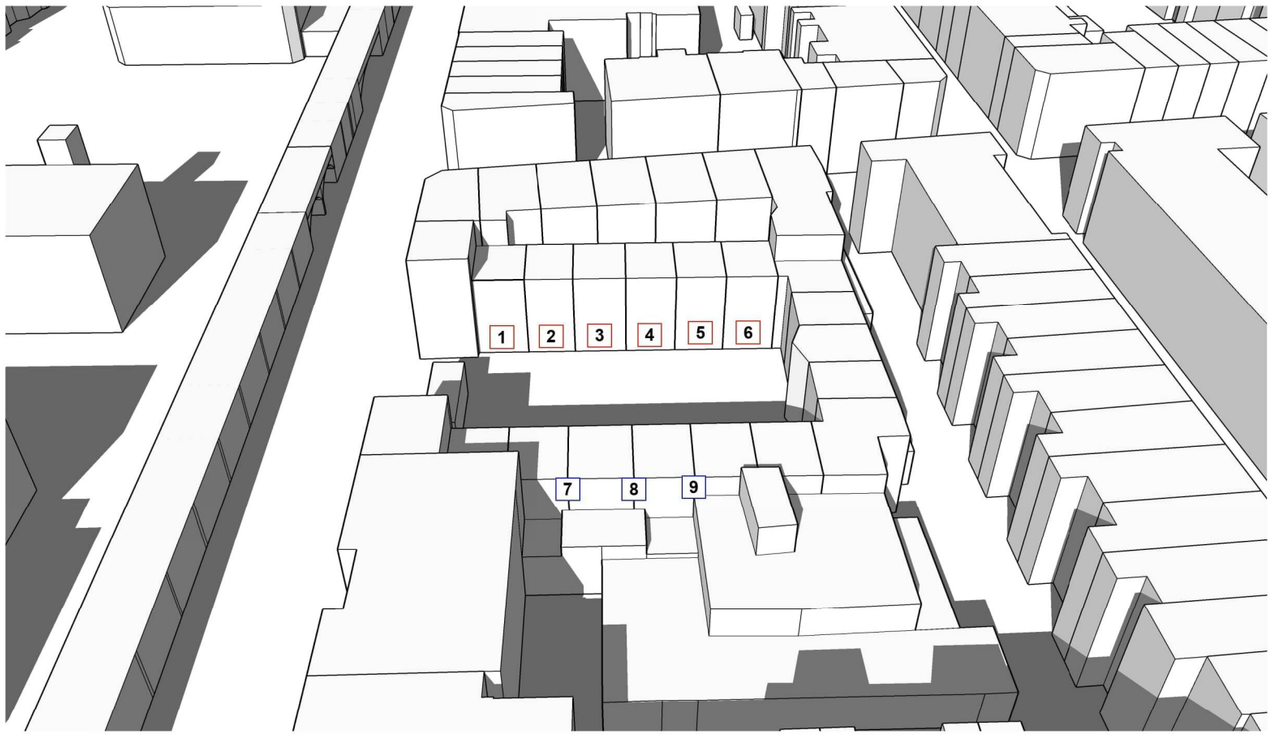


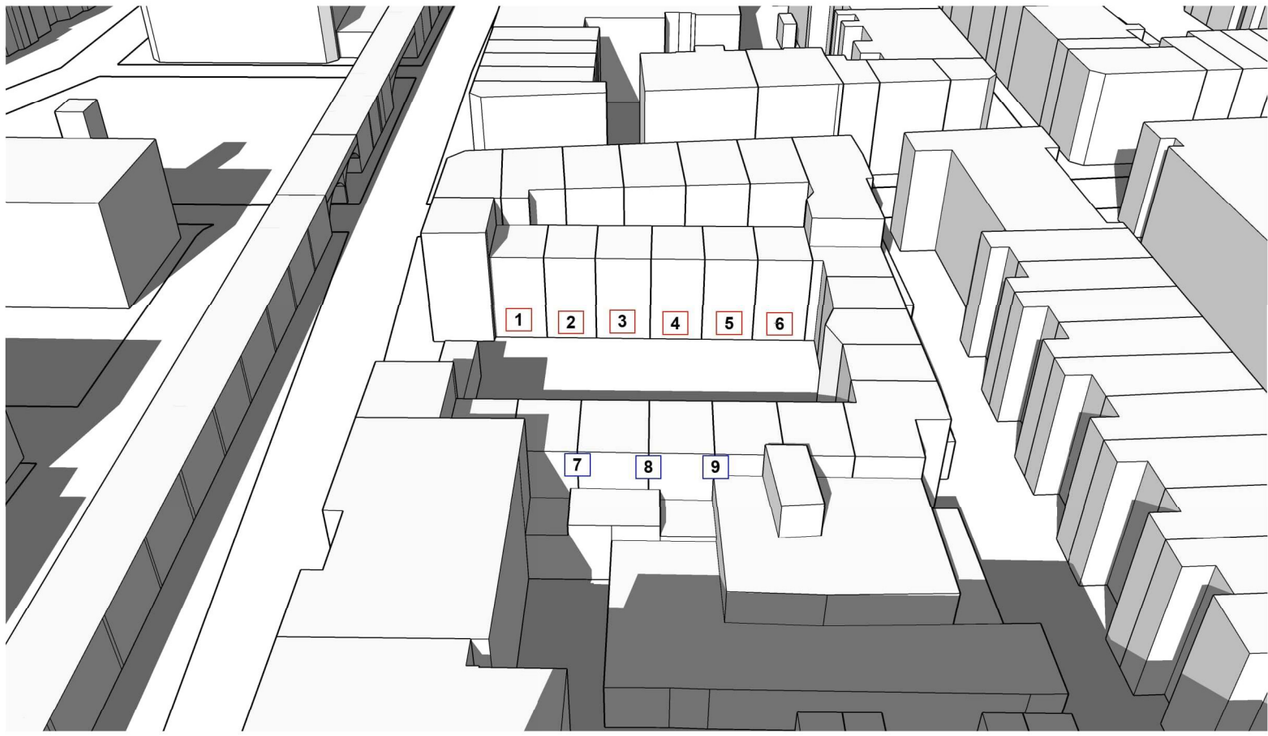
Vijverhofstraat "het hofje"
21 september
10.00



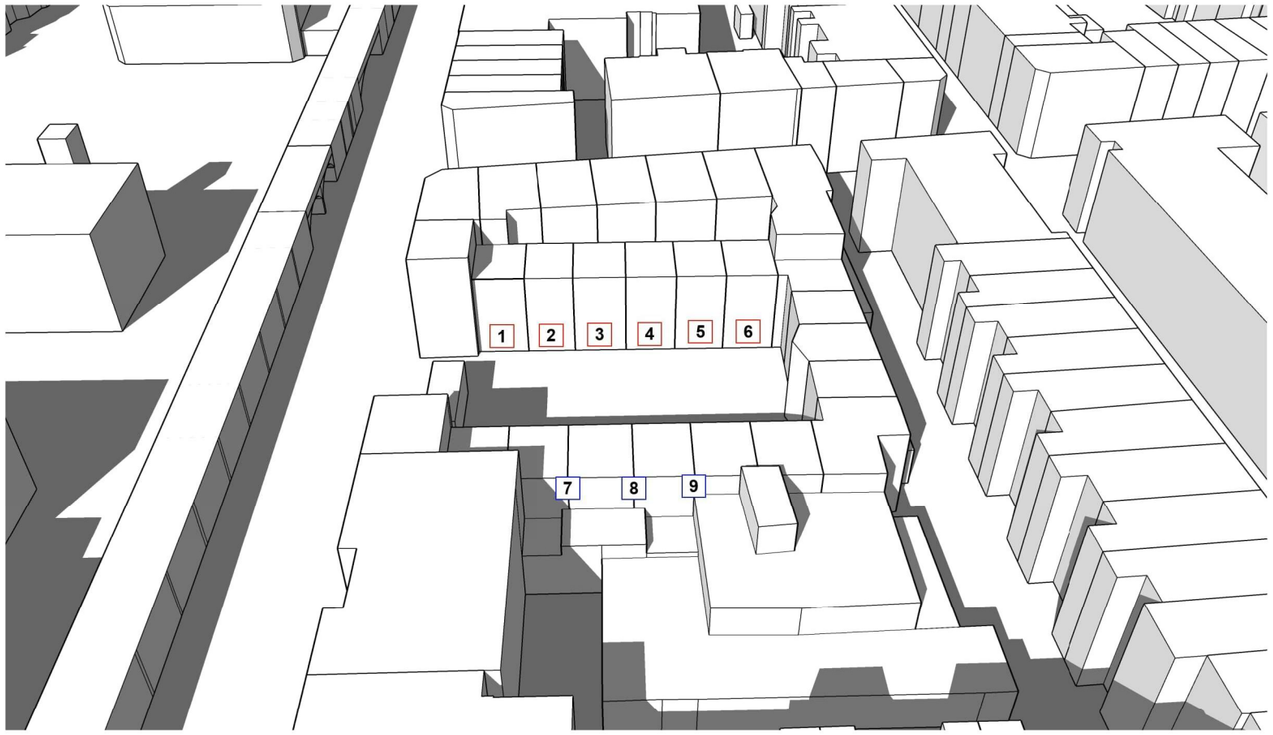


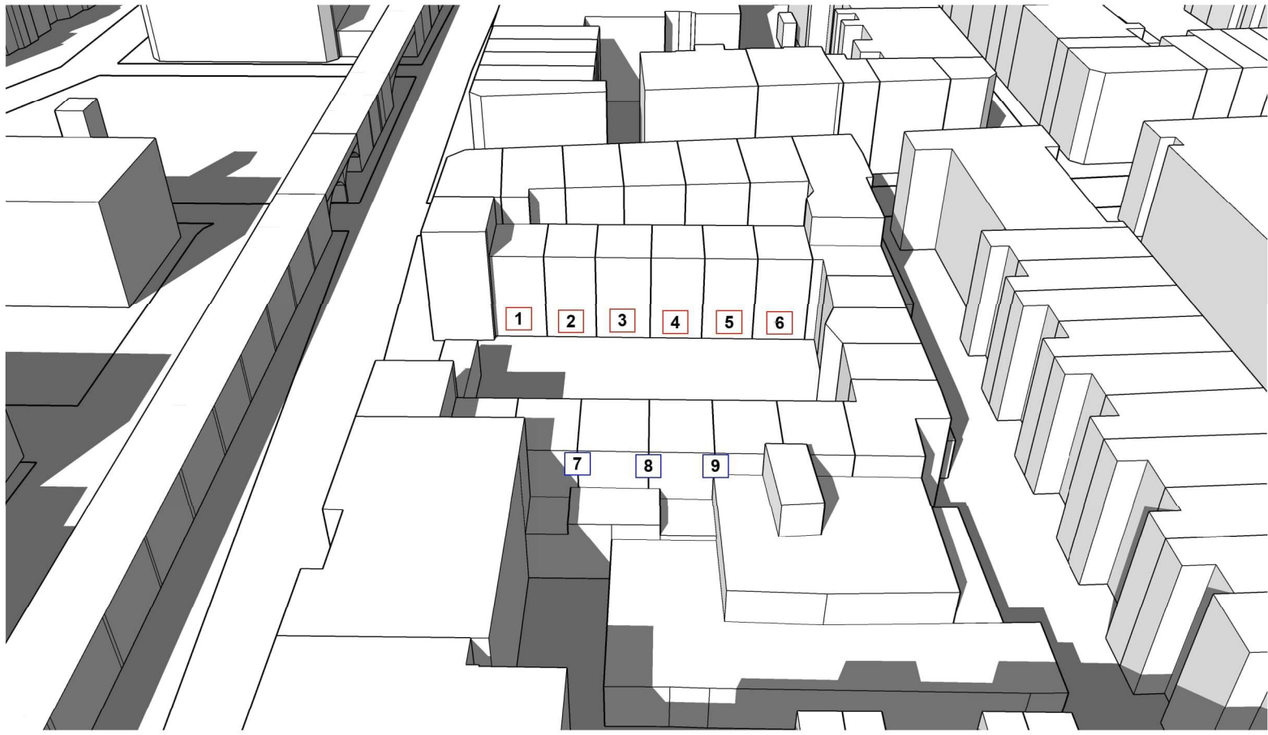
Vijverhofstraat "het hofje"
21 september
10.30



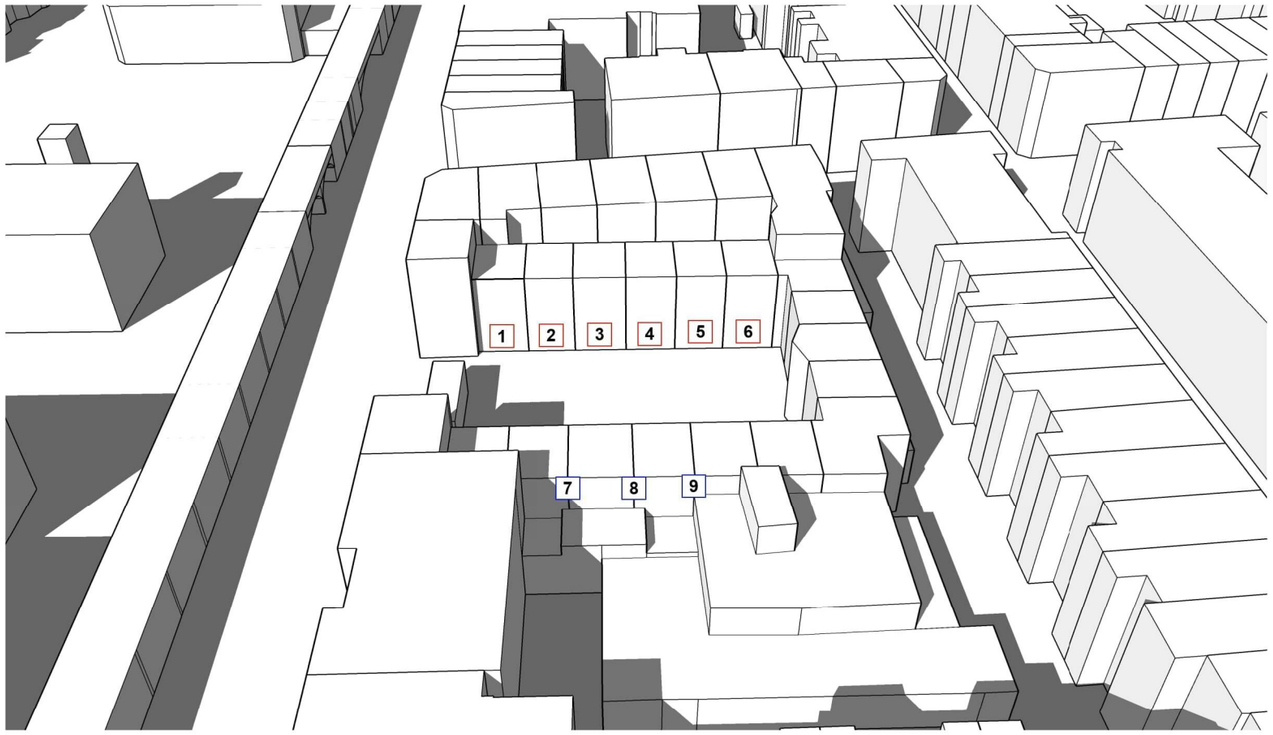


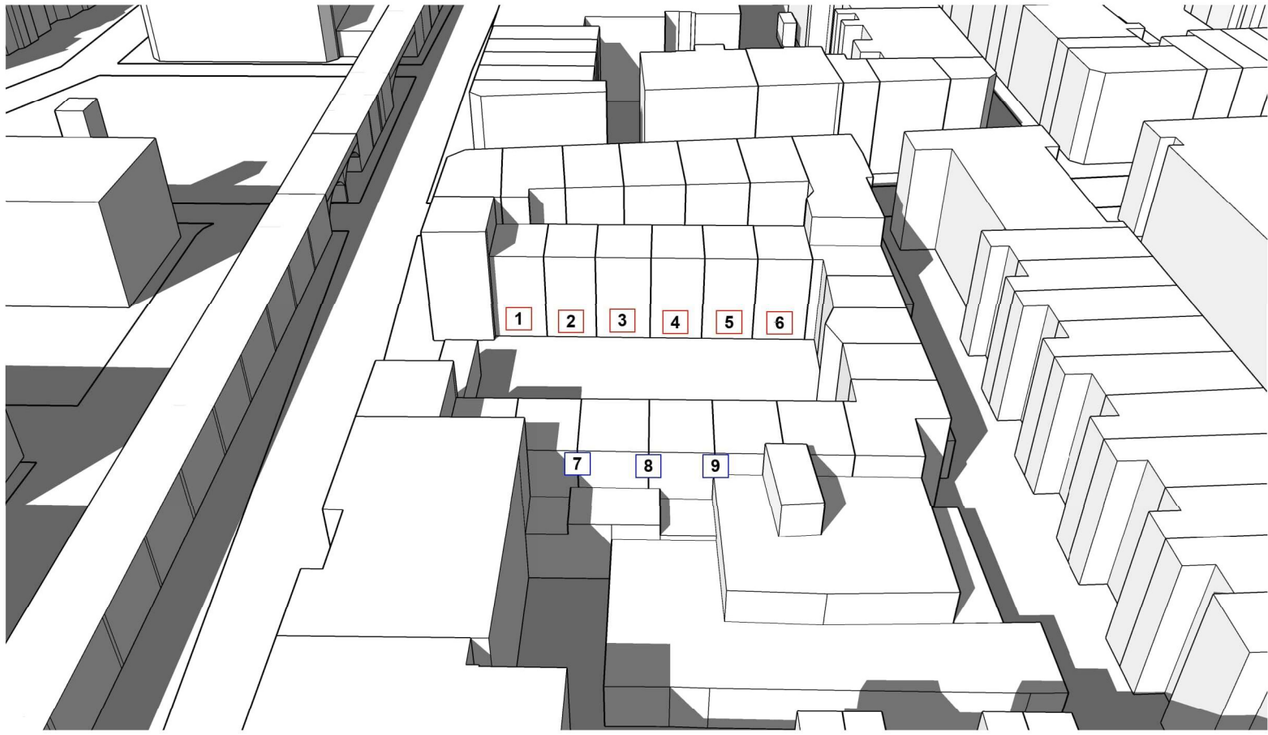
Vijverhofstraat "het hofje"
21 september
11.00



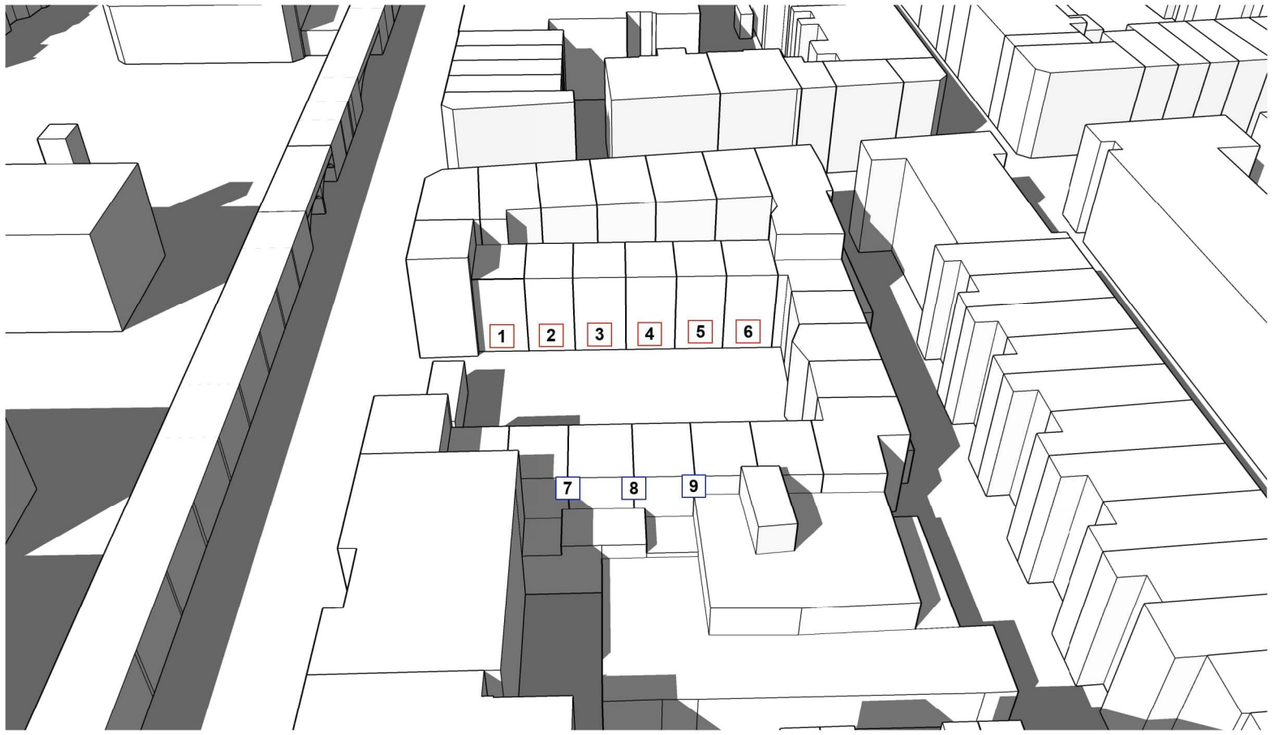


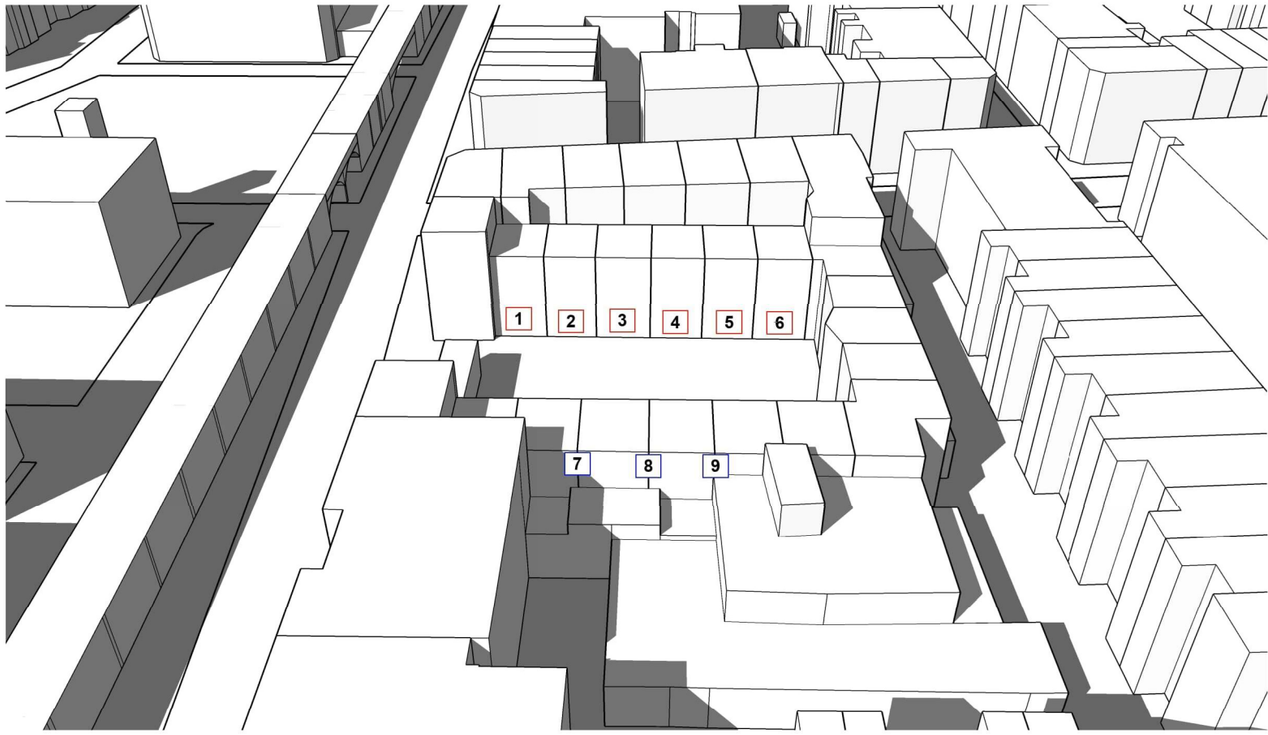
Vijverhofstraat "het hofje"
21 september
11.30



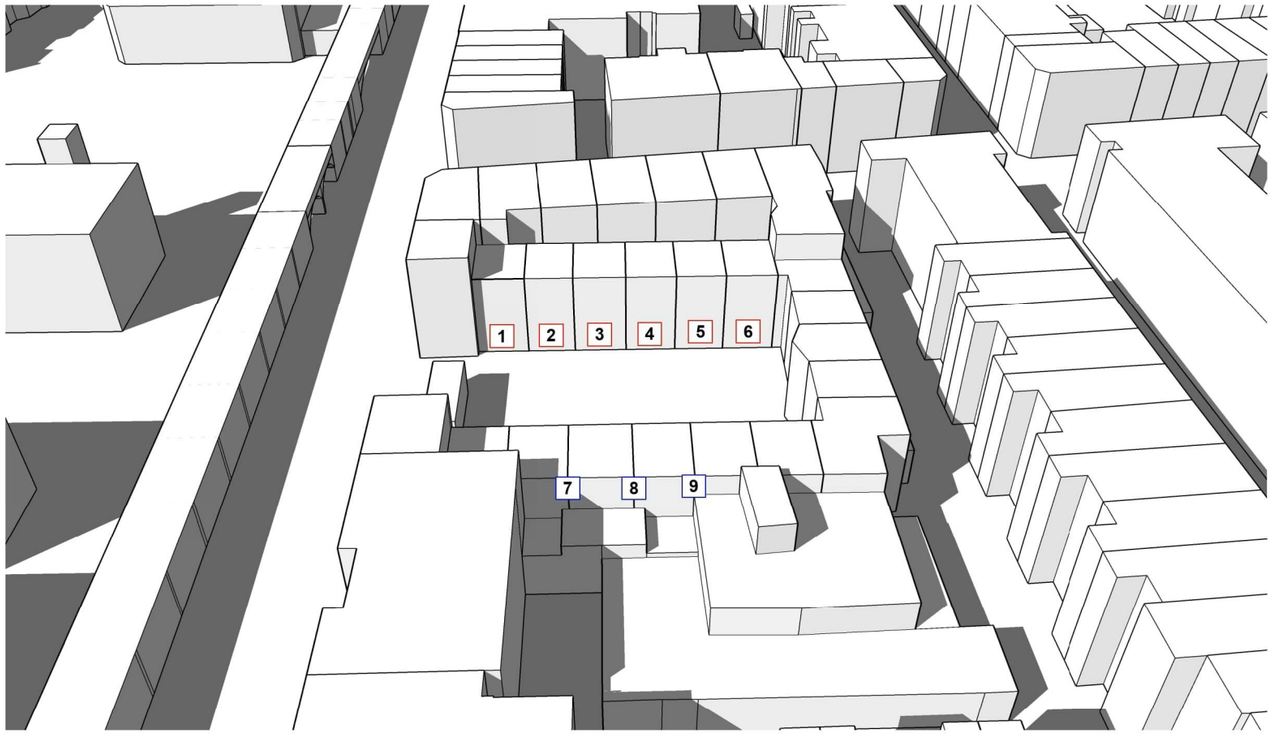


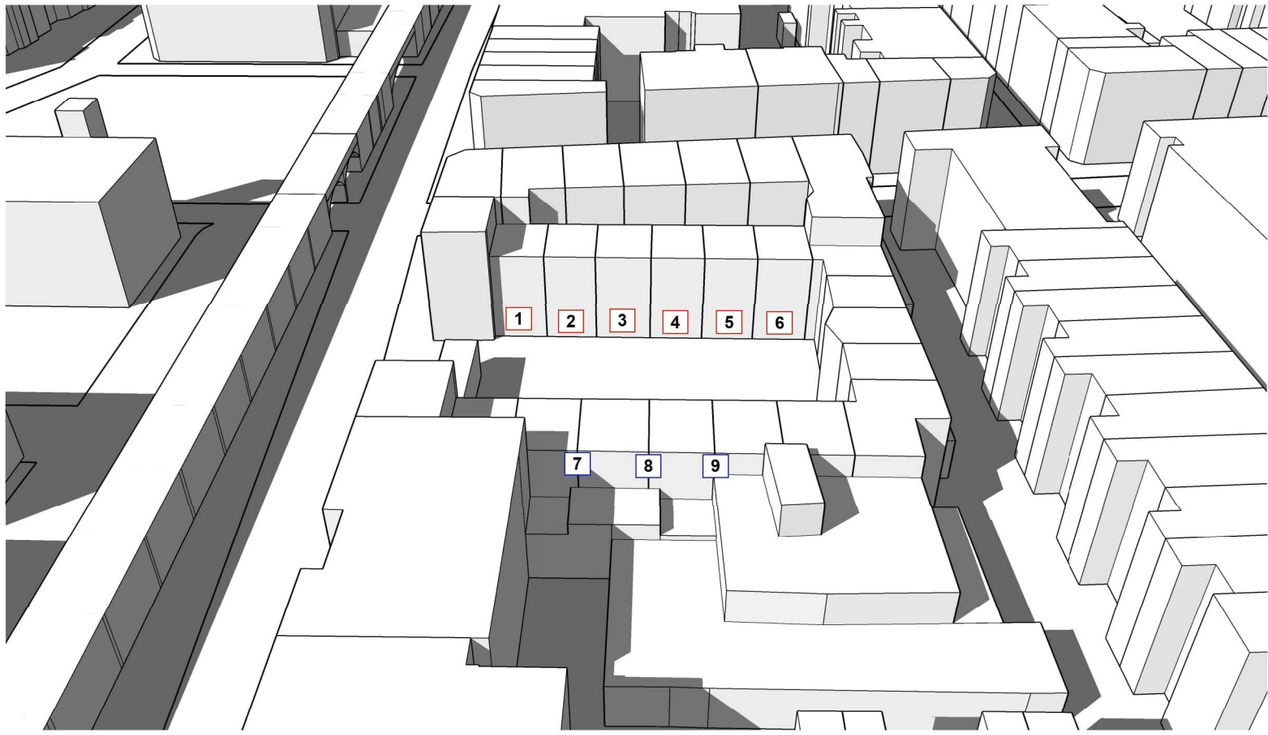
Vijverhofstraat "het hofje"
21 september
12.00





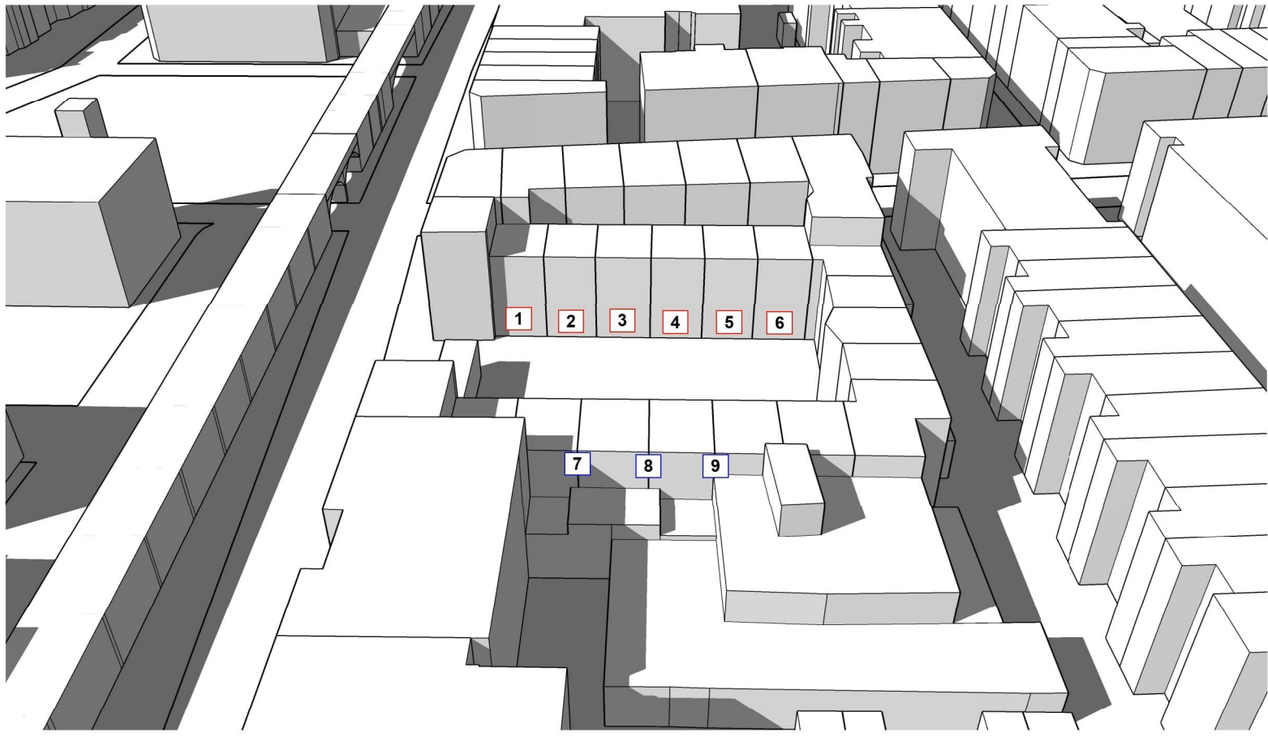
Vijverhofstraat "het hofje"
21 september
12.30



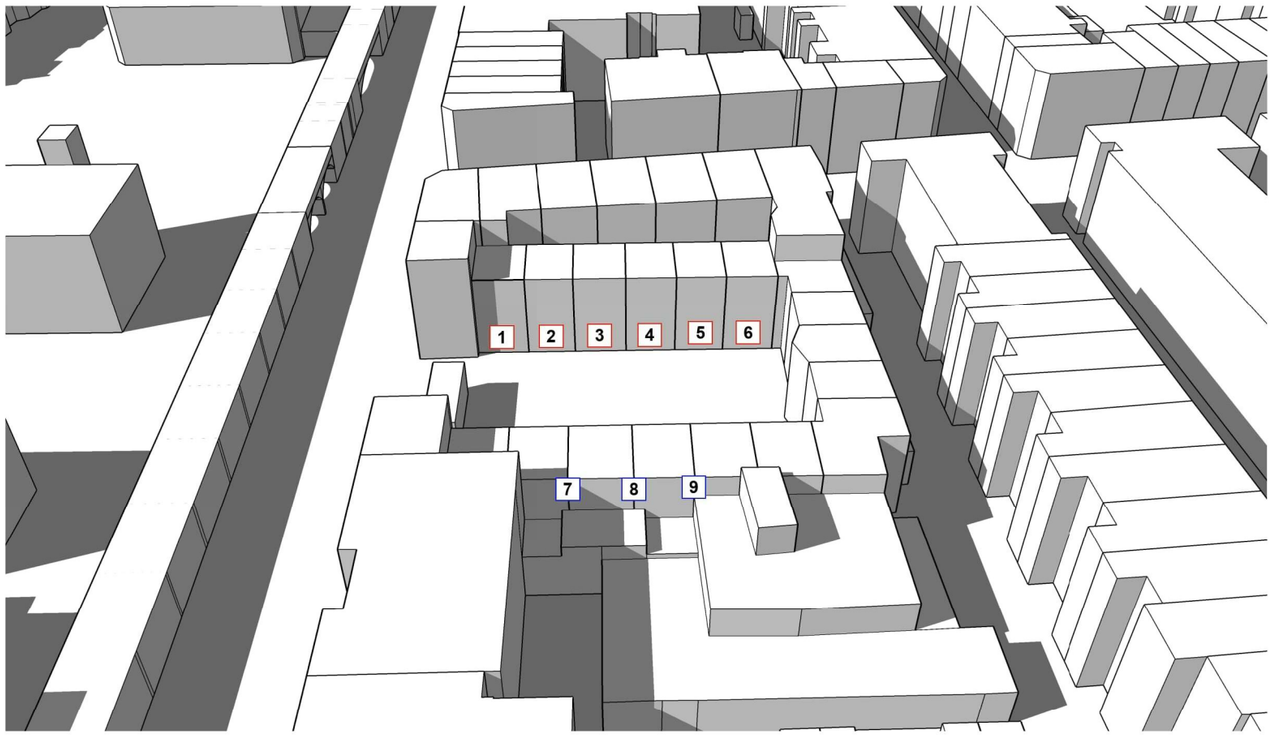


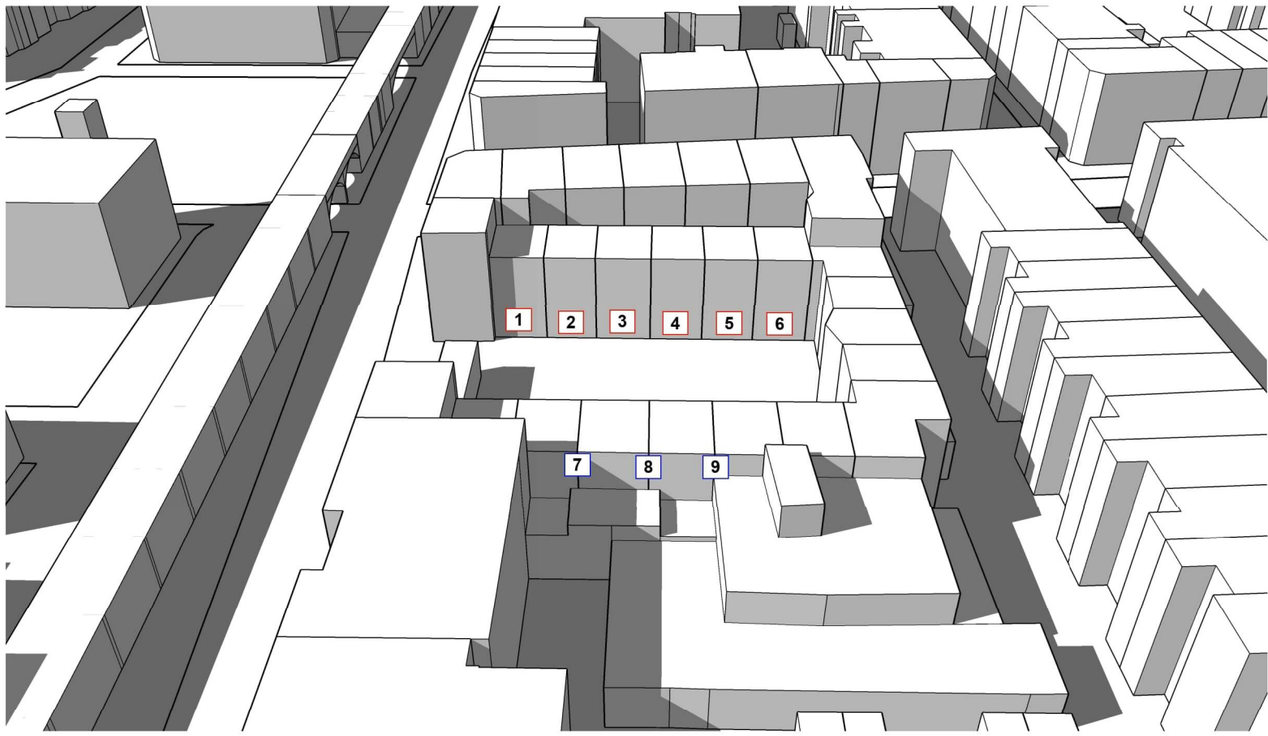
Vijverhofstraat "het hofje"
21 september
13.00



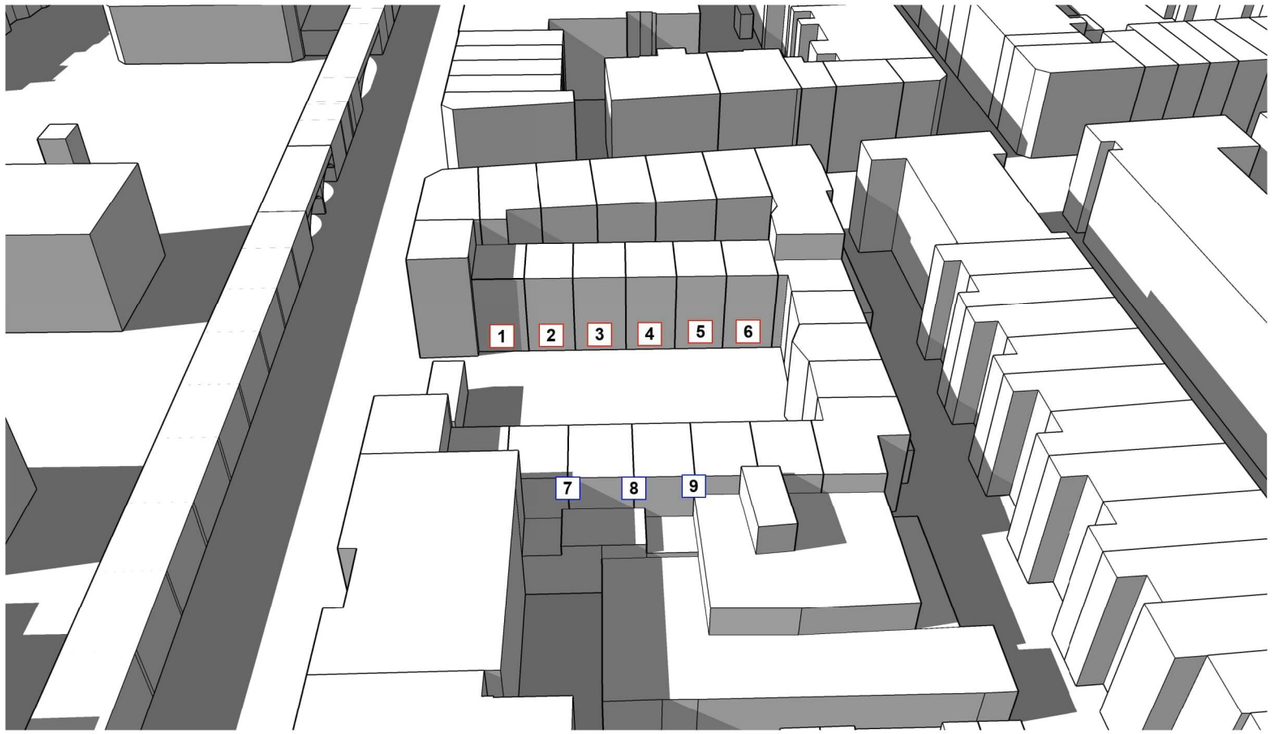


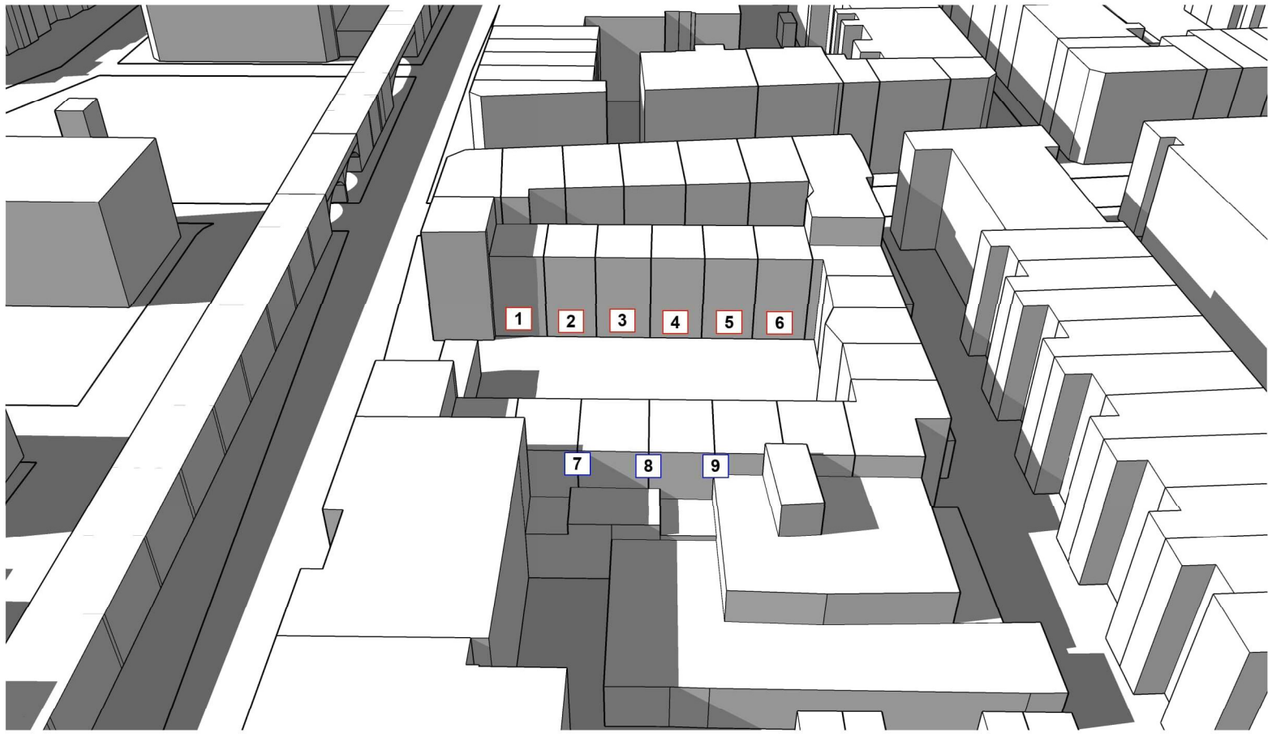
Vijverhofstraat "het hofje"
21 september
13.30



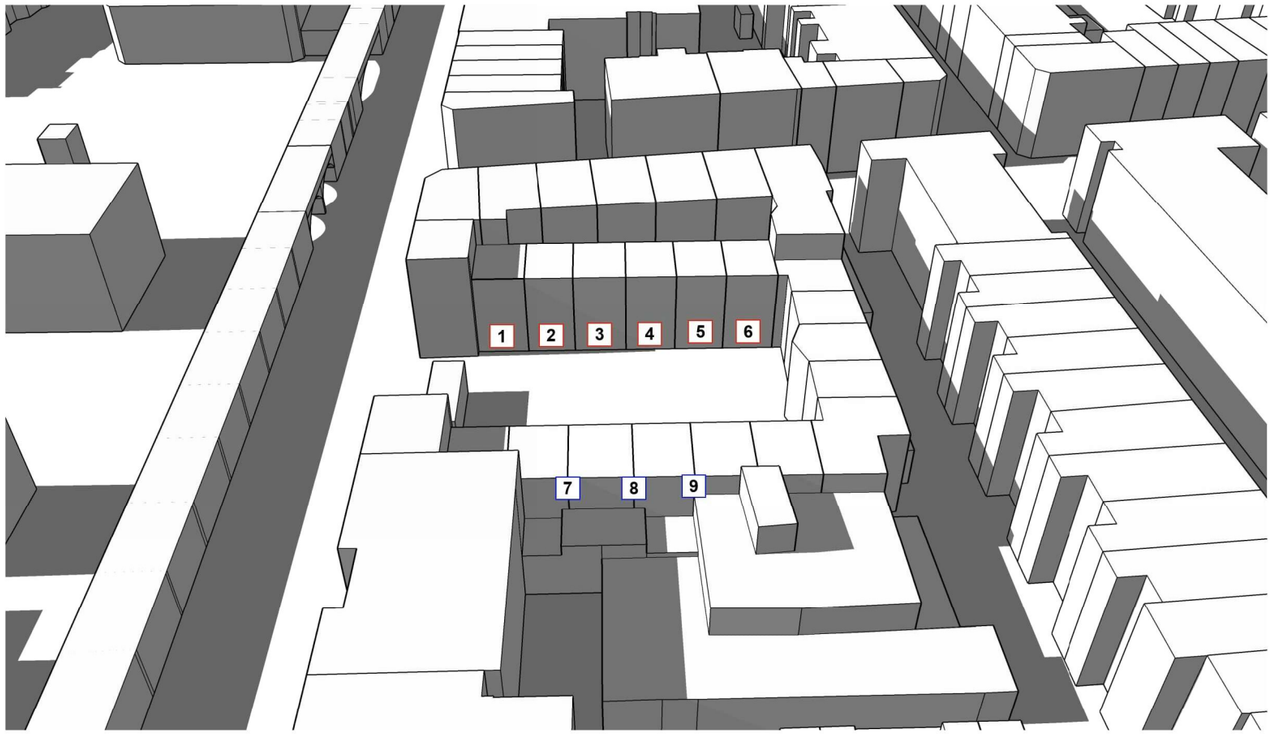


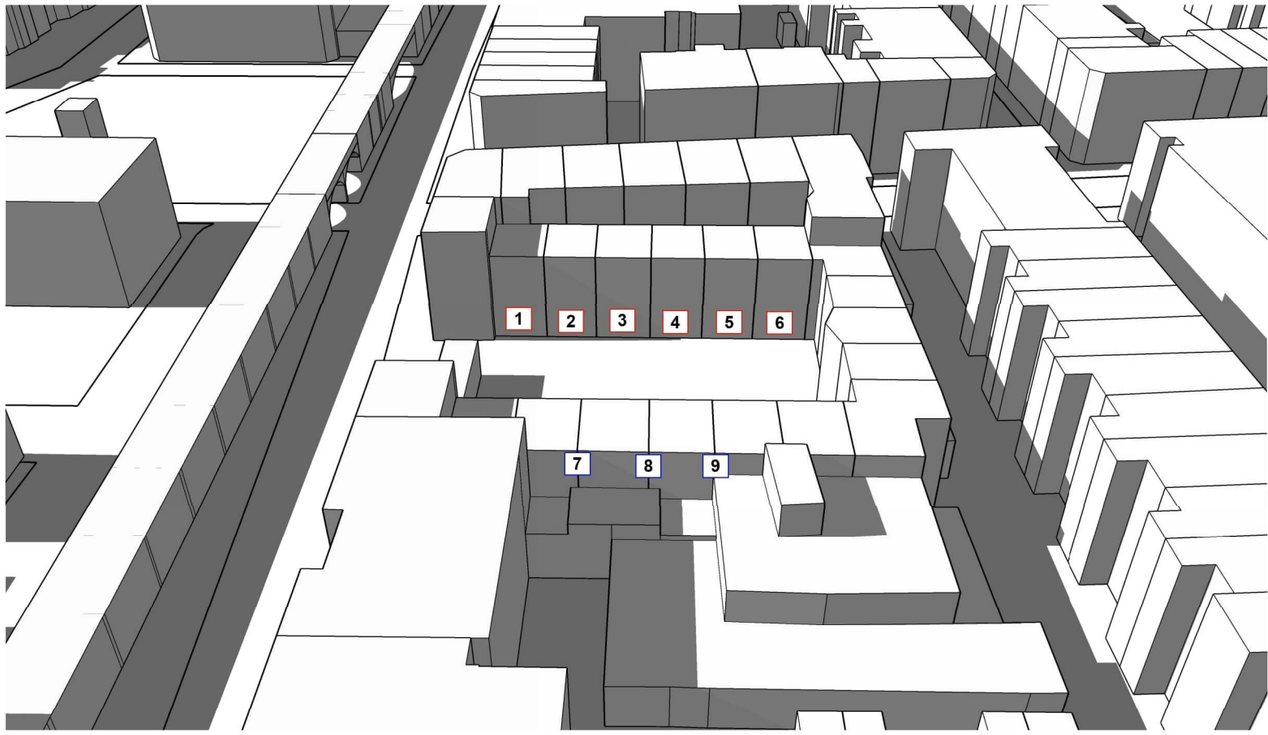
Vijverhofstraat "het hofje"
21 september
14.00



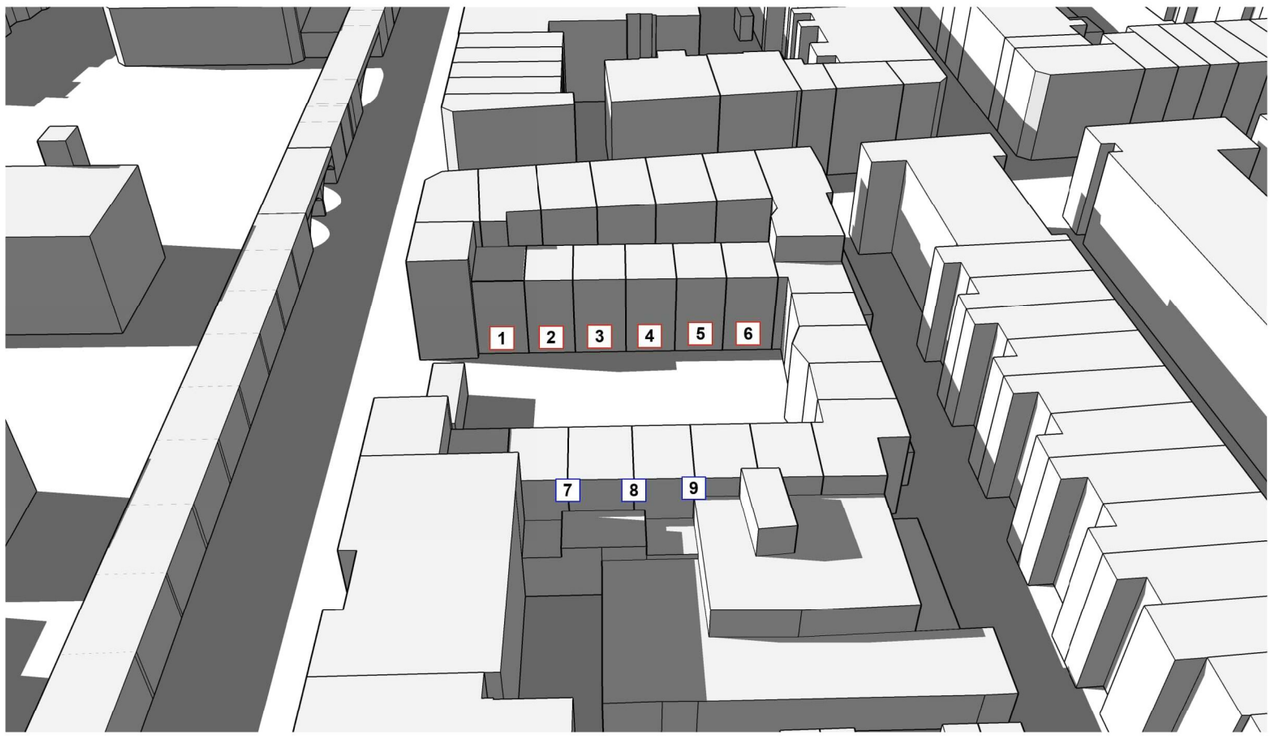


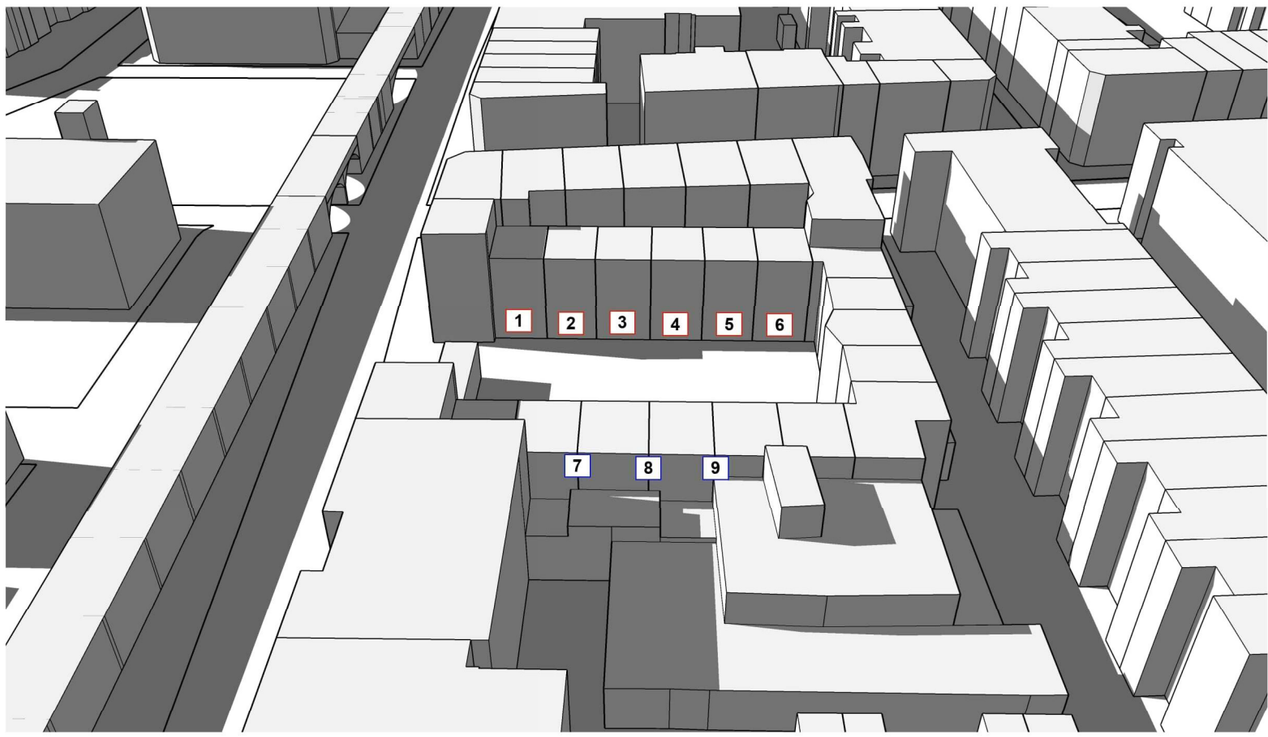
Vijverhofstraat "het hofje"
21 september
14.30



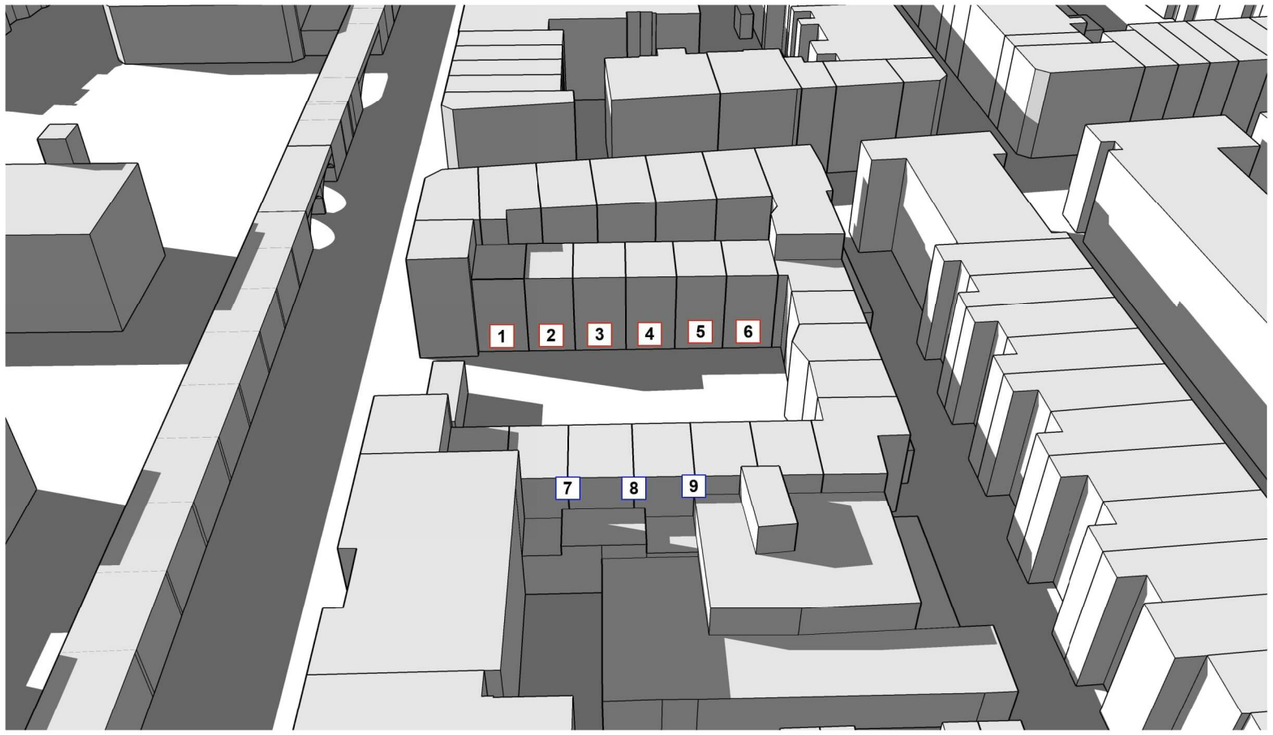


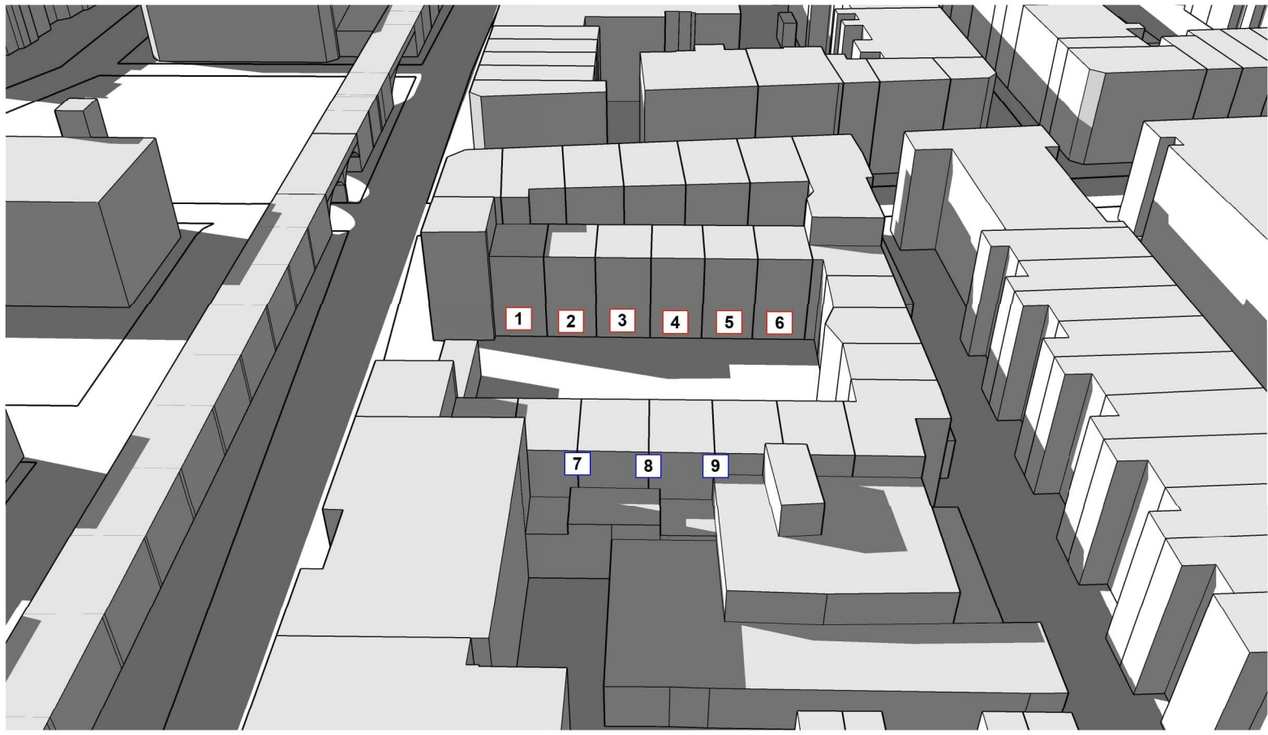
Vijverhofstraat "het hofje"
21 september
15.00



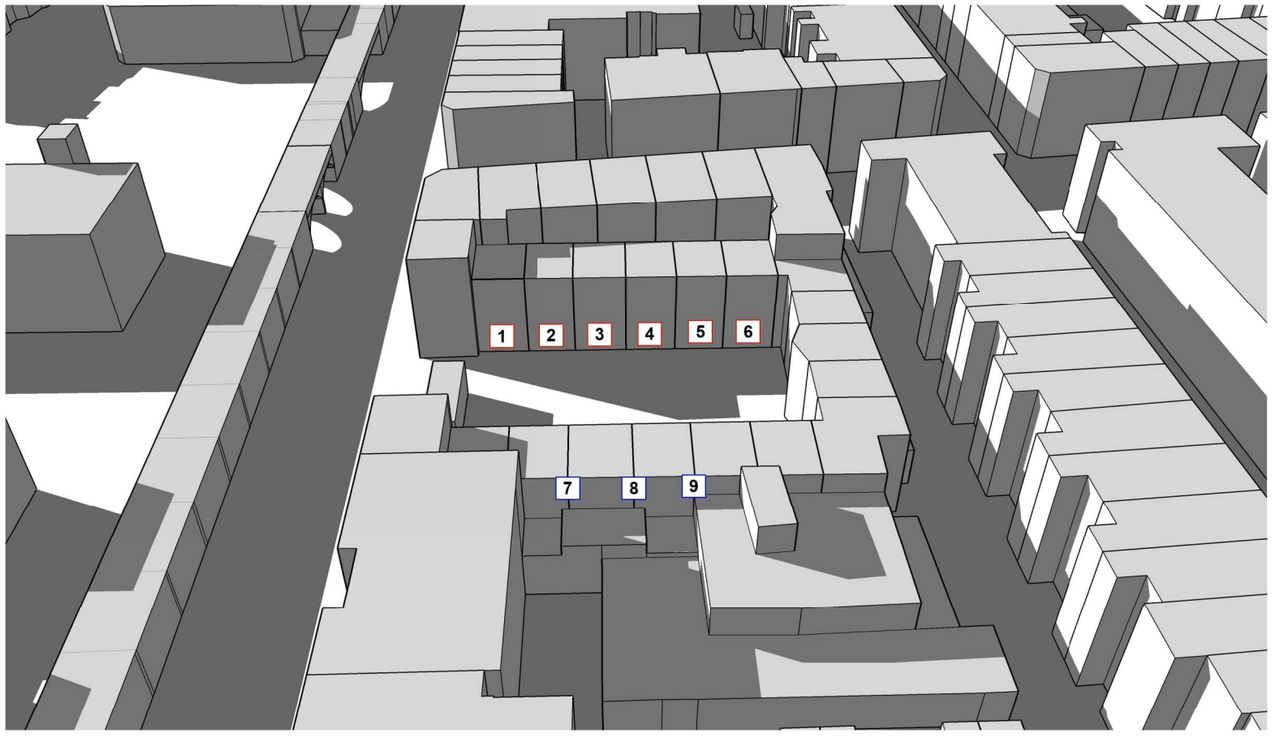


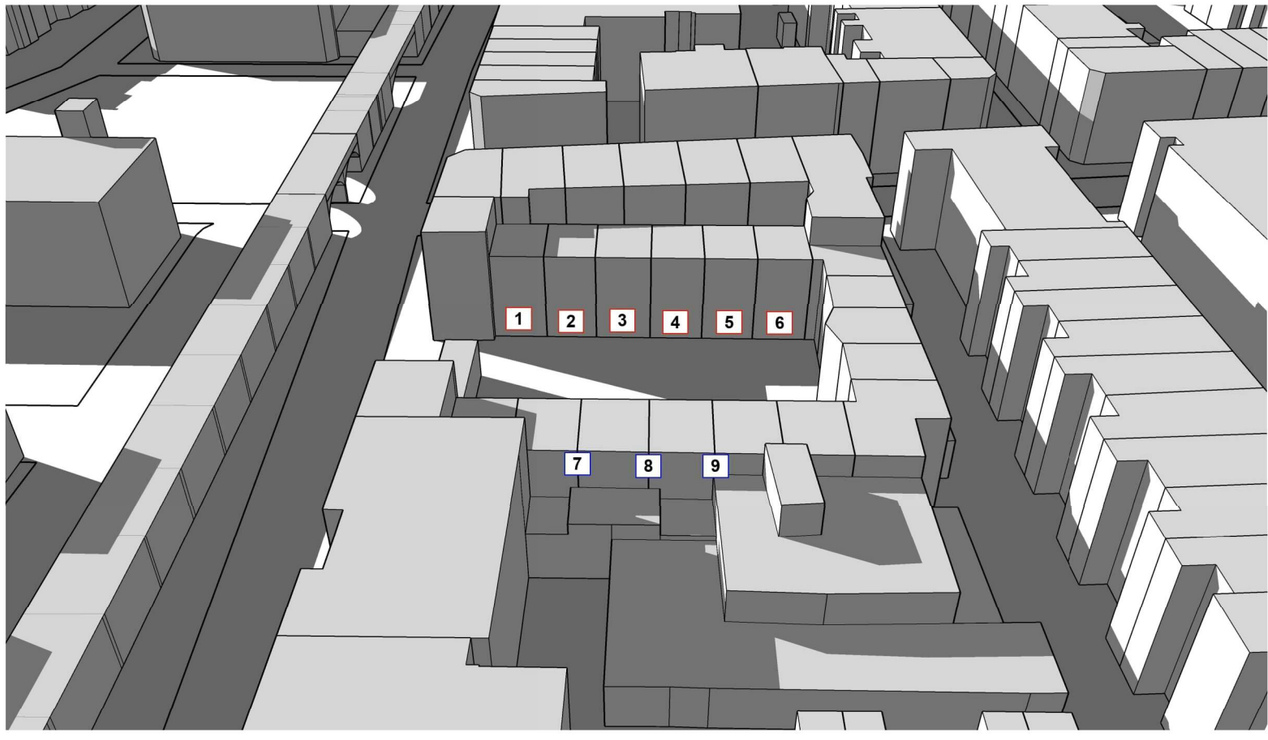
Vijverhofstraat "het hofje"
21 september
15.30



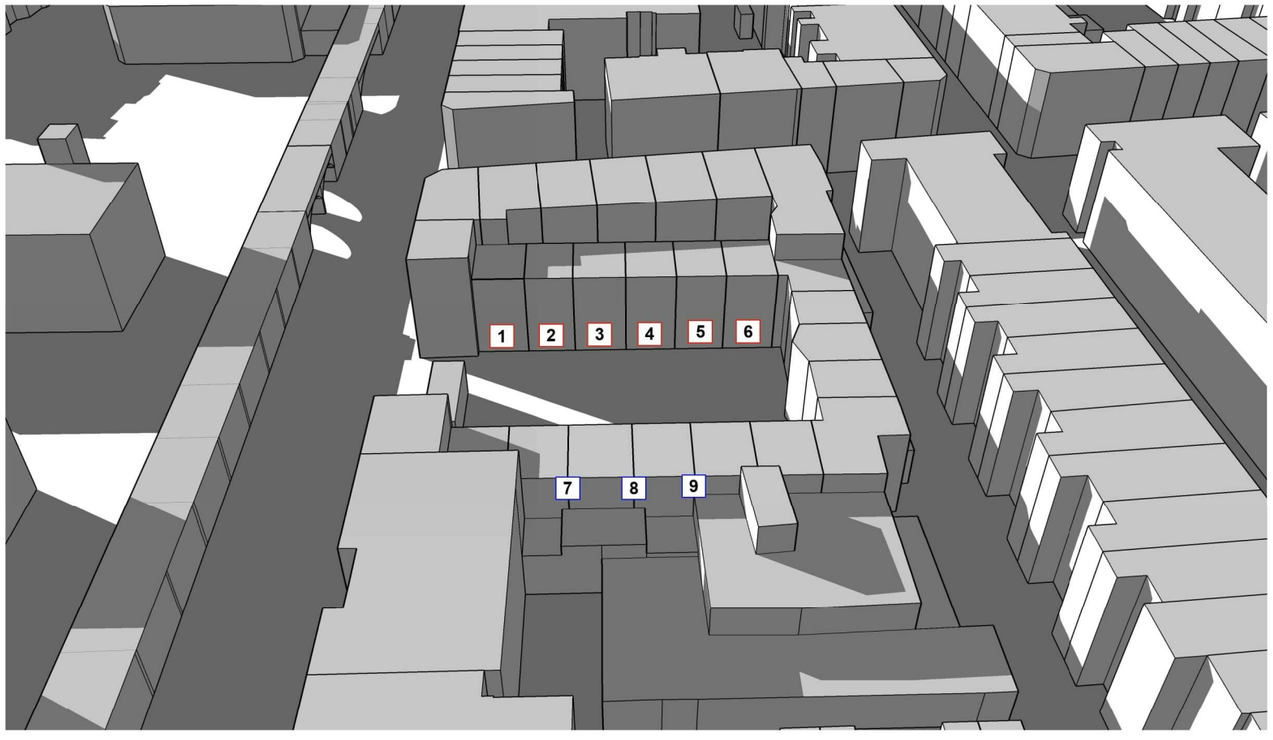


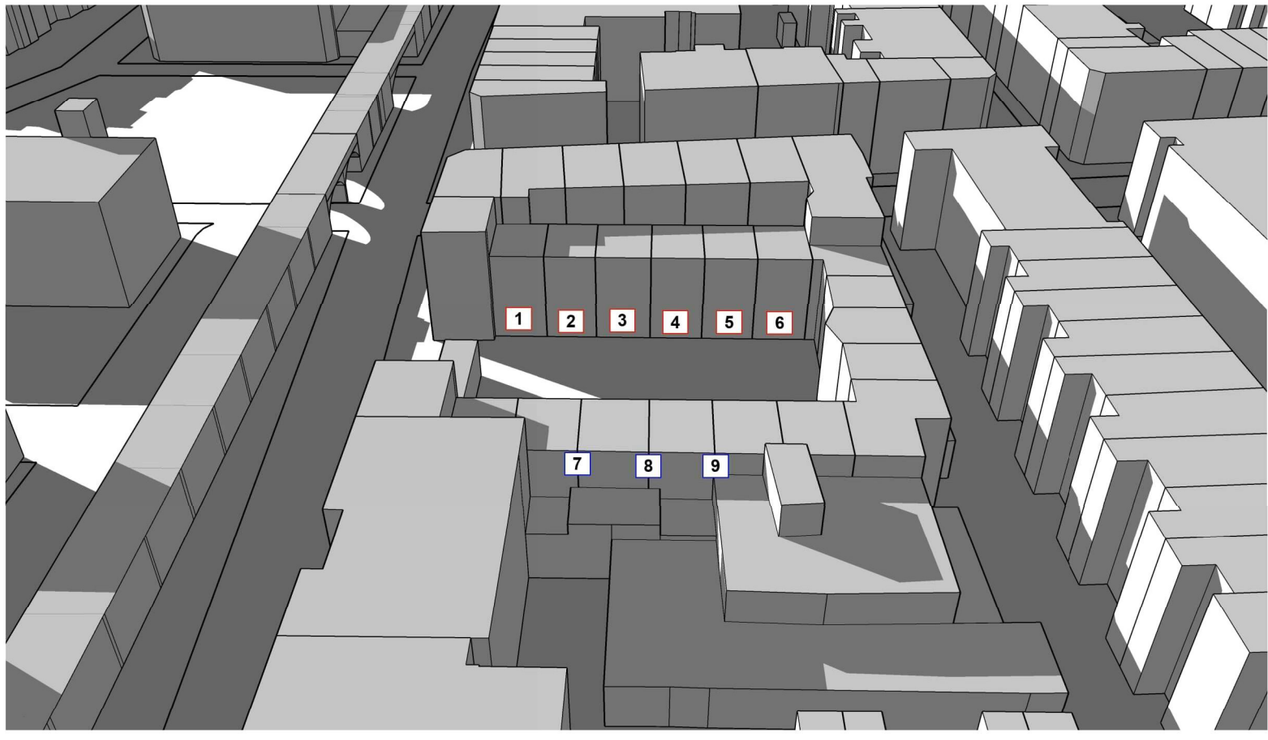
Vijverhofstraat "het hofje"
21 september
16.00



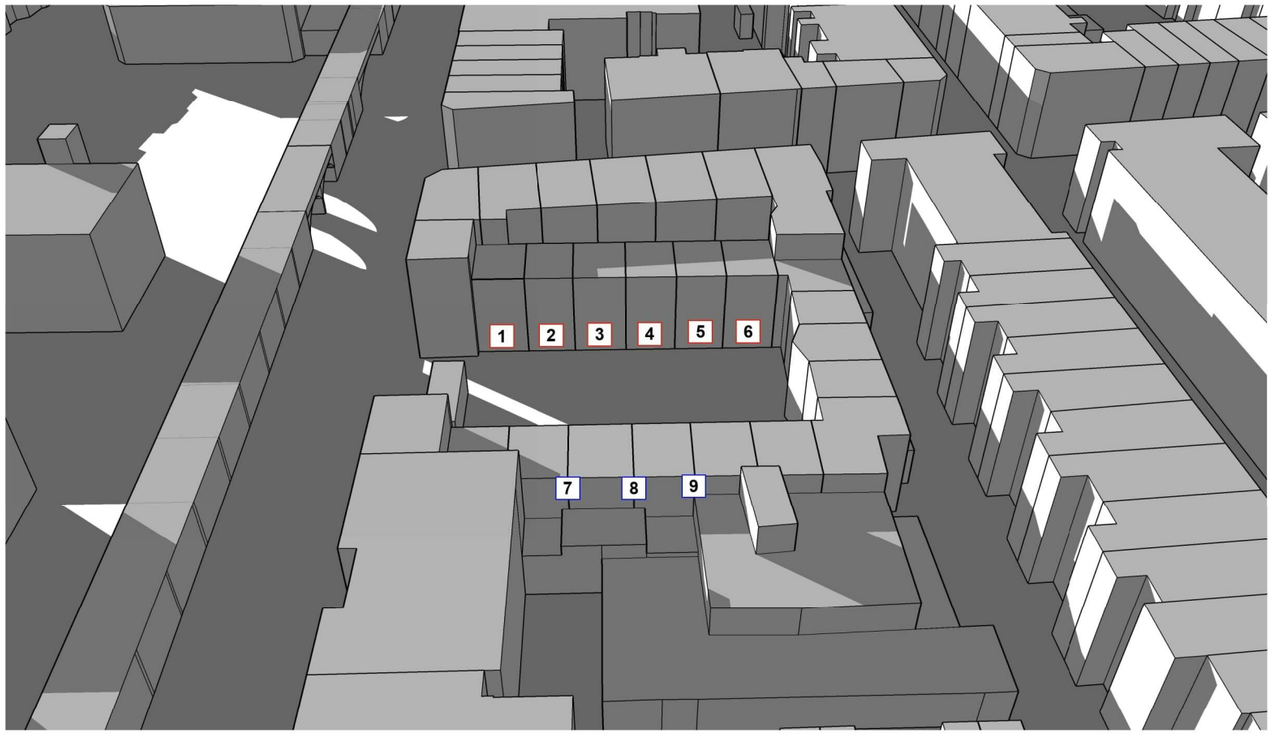


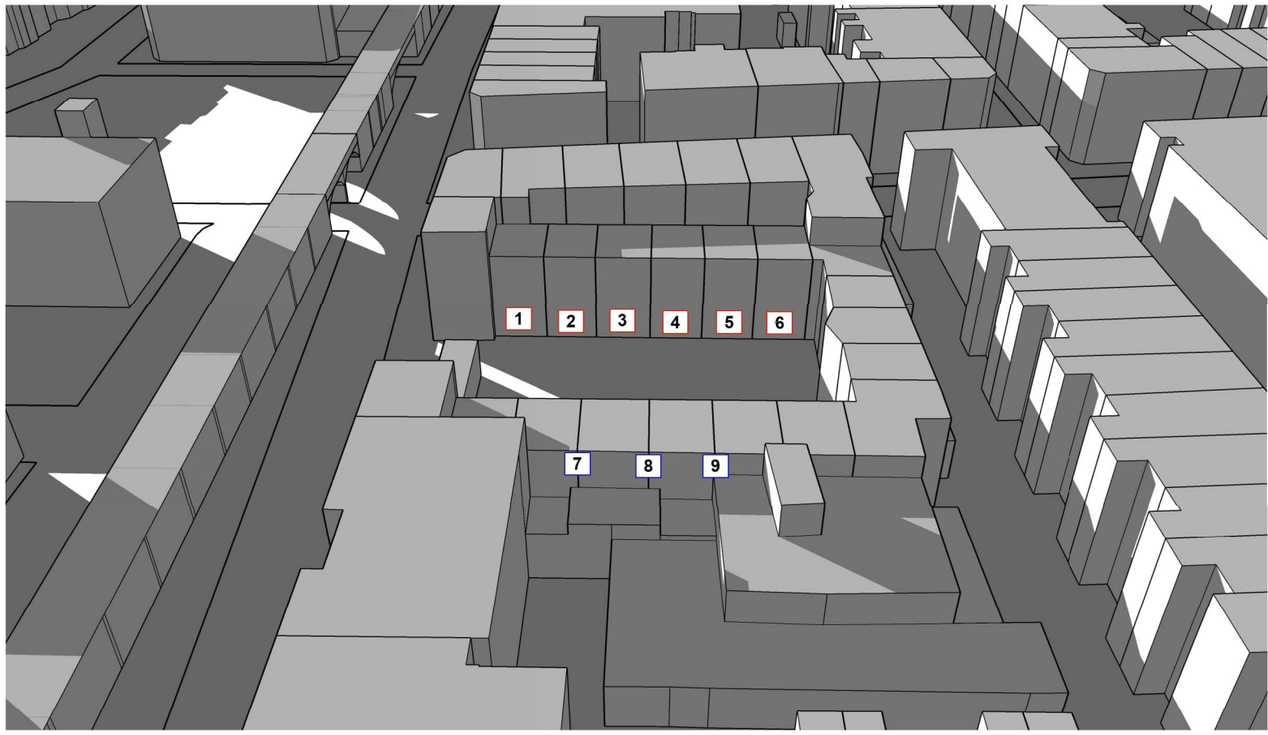
Vijverhofstraat "het hofje"
21 september
16.30



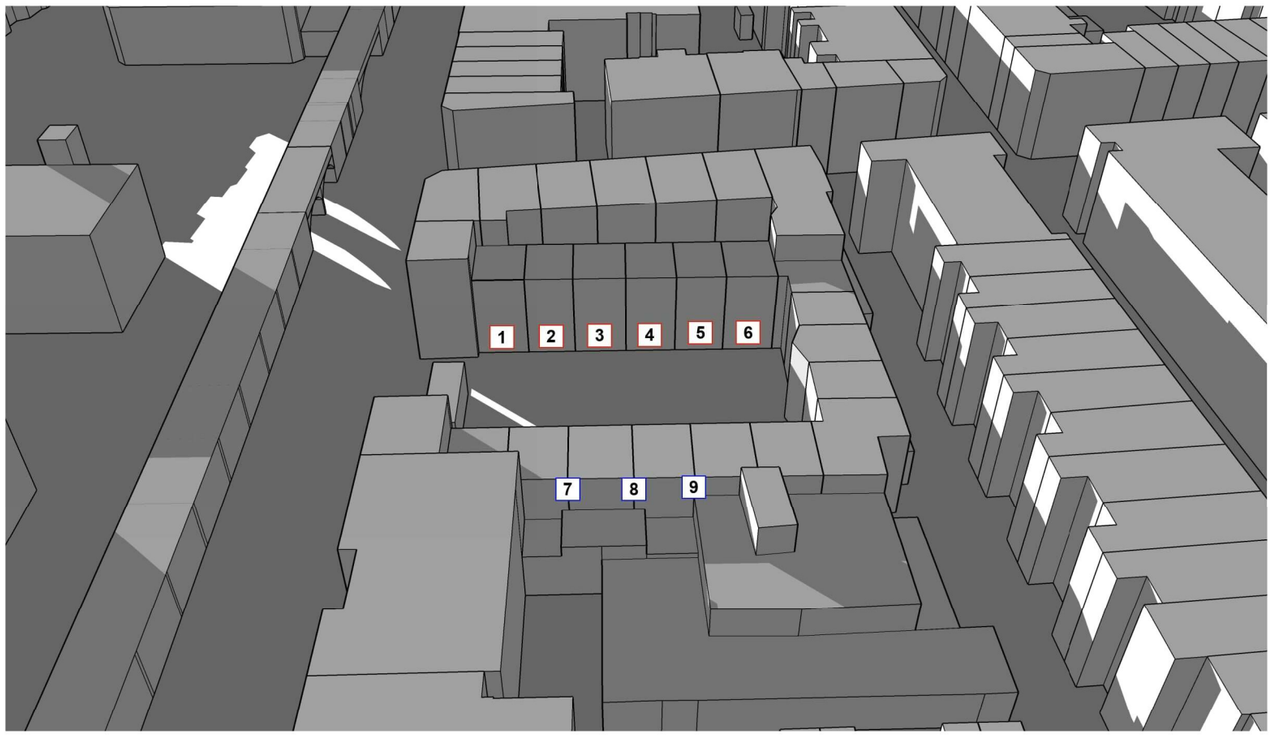


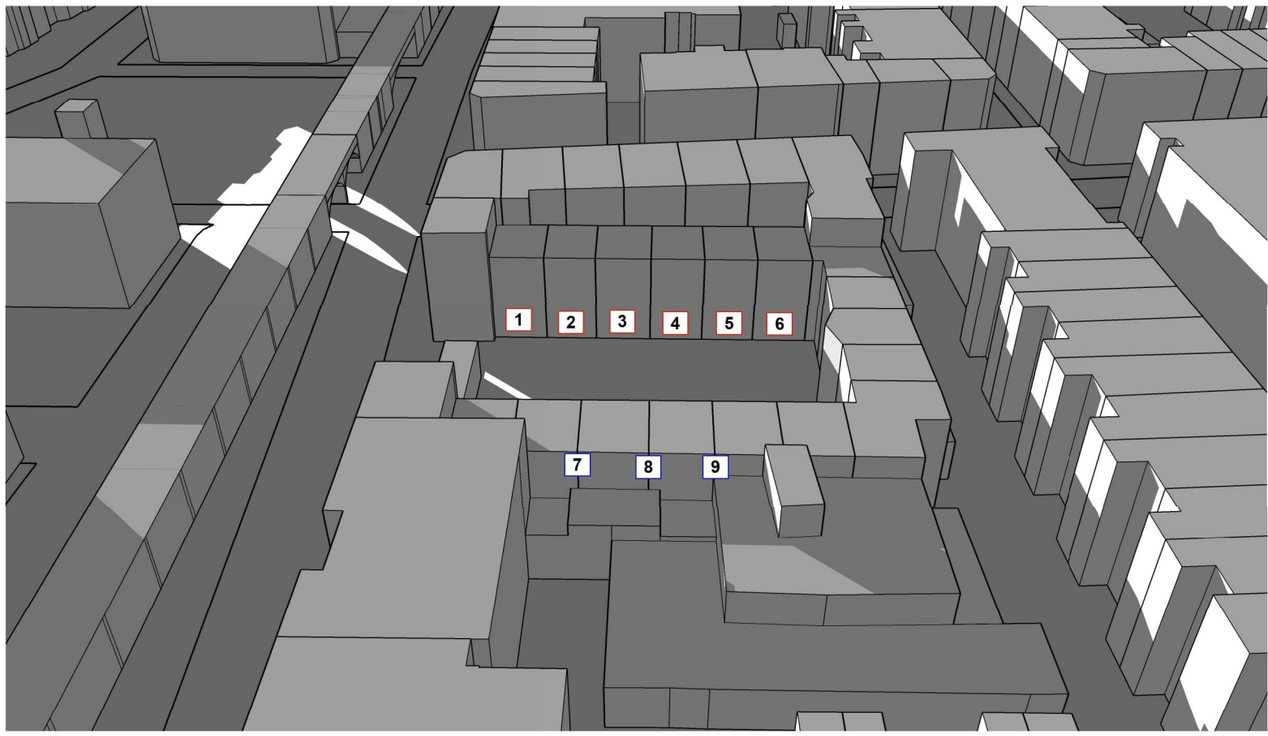
Vijverhofstraat "het hofje"
21 september
17.00



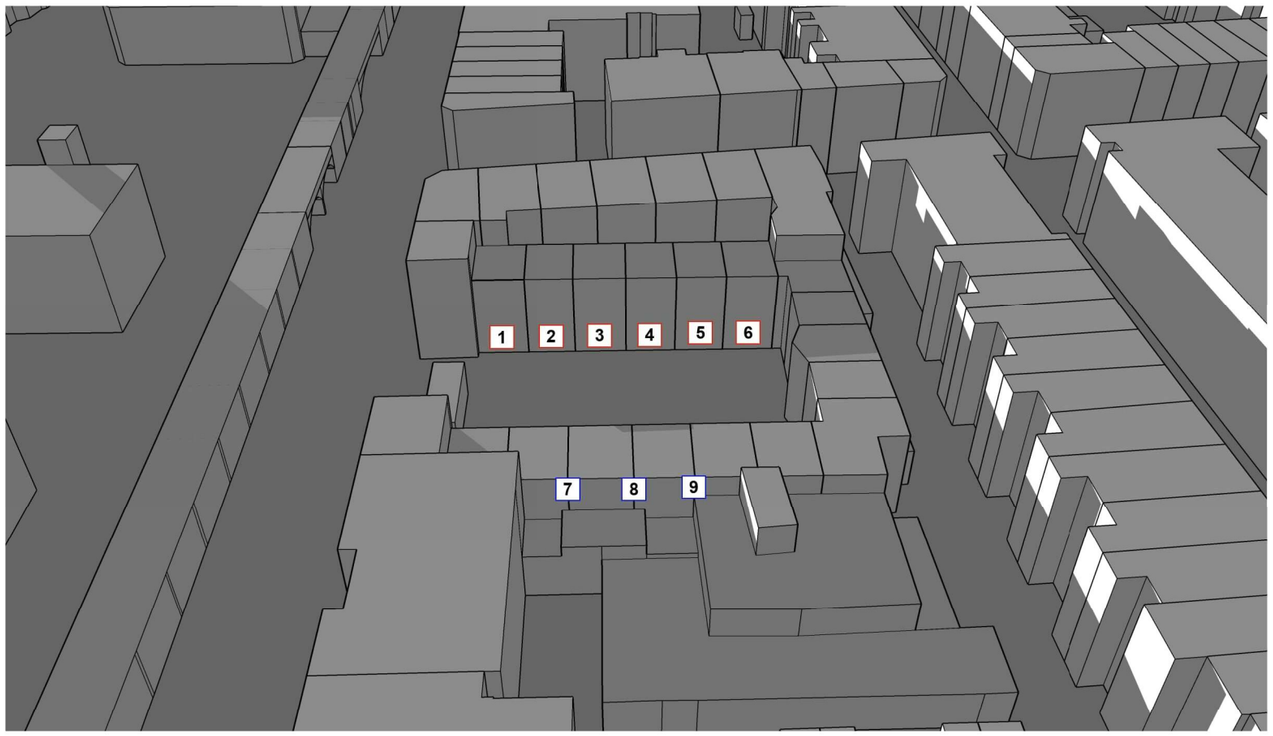


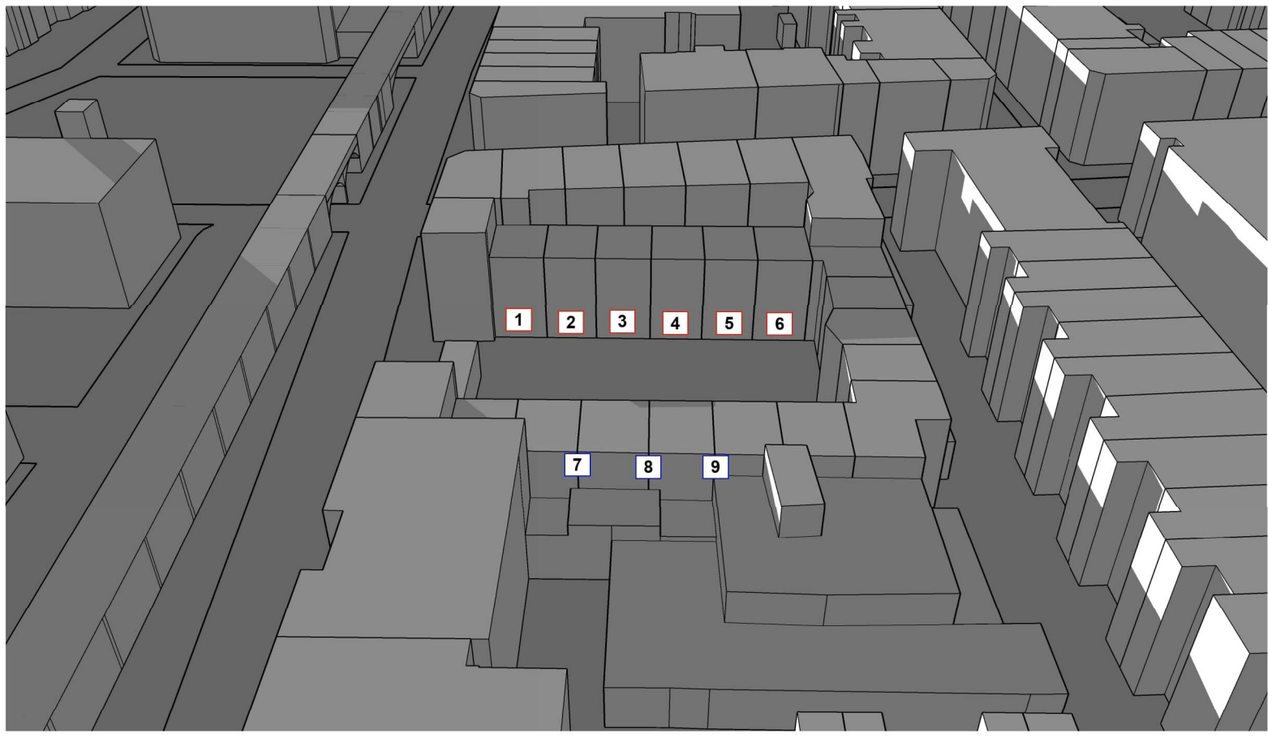
Vijverhofstraat "het hofje"
21 september
17.30



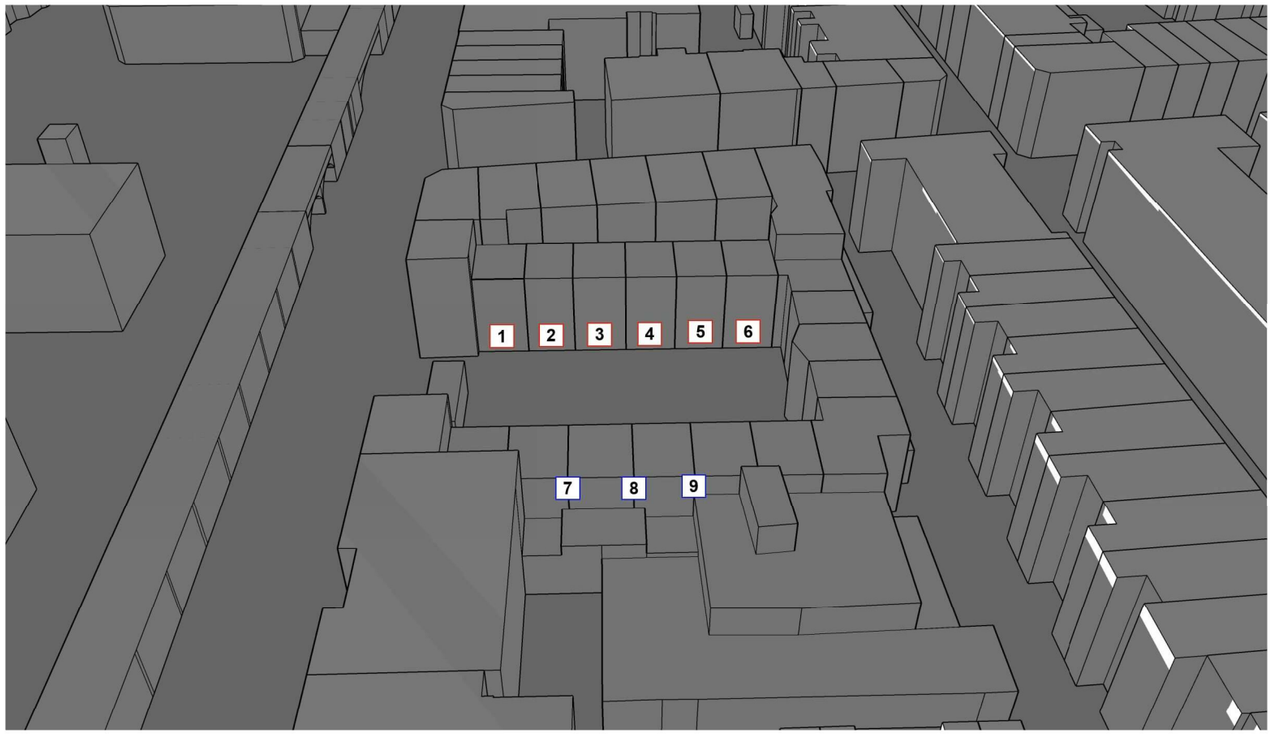


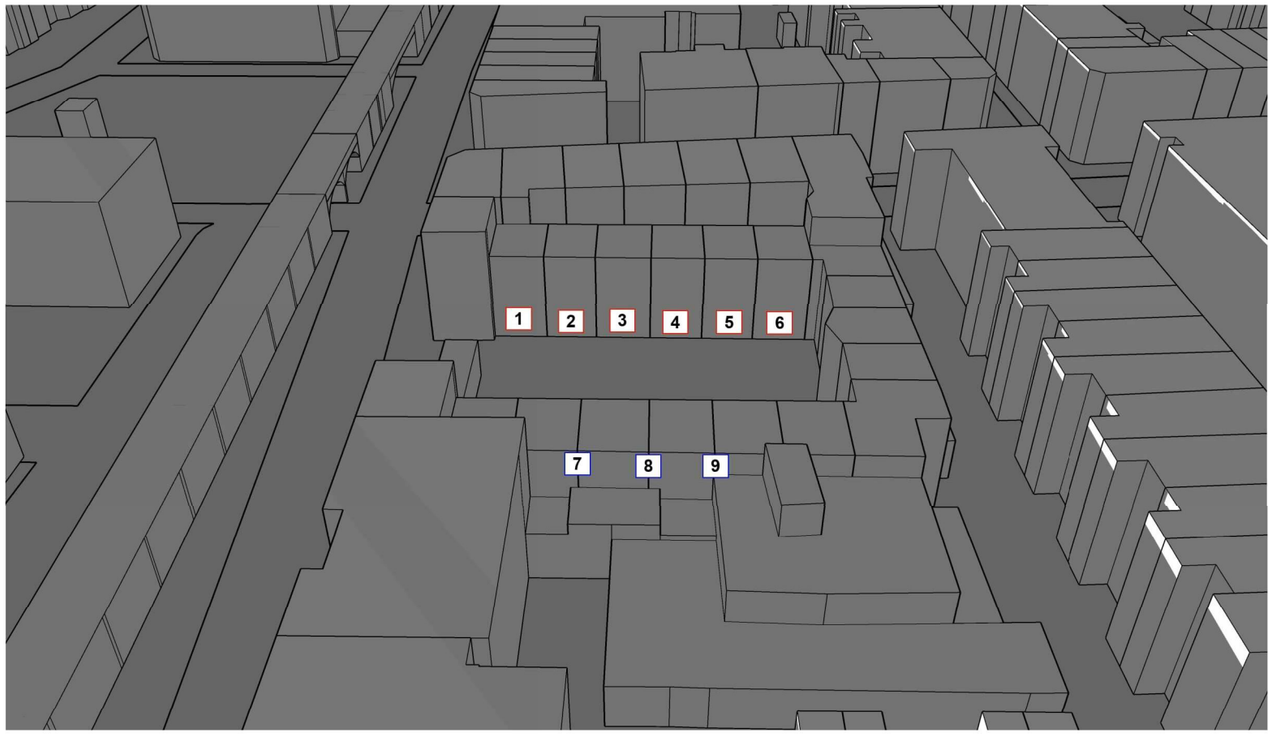
Vijverhofstraat "het hofje"
21 september
18.00



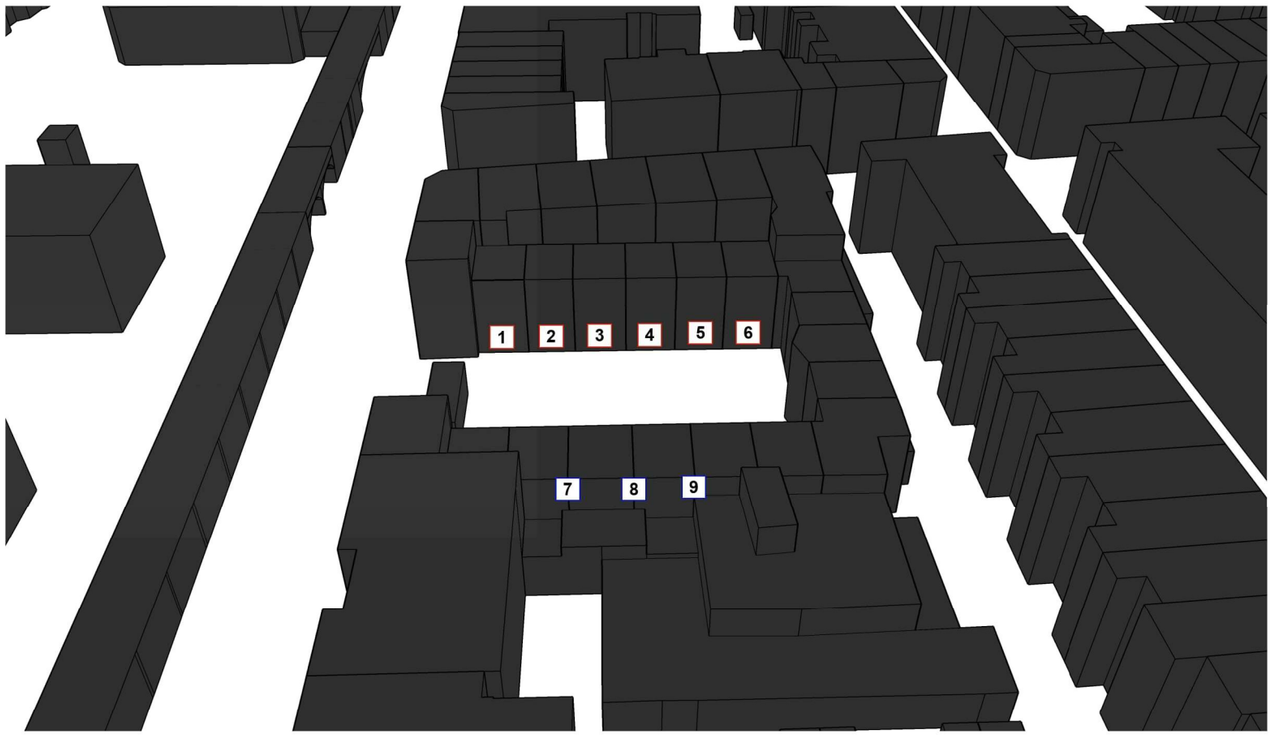


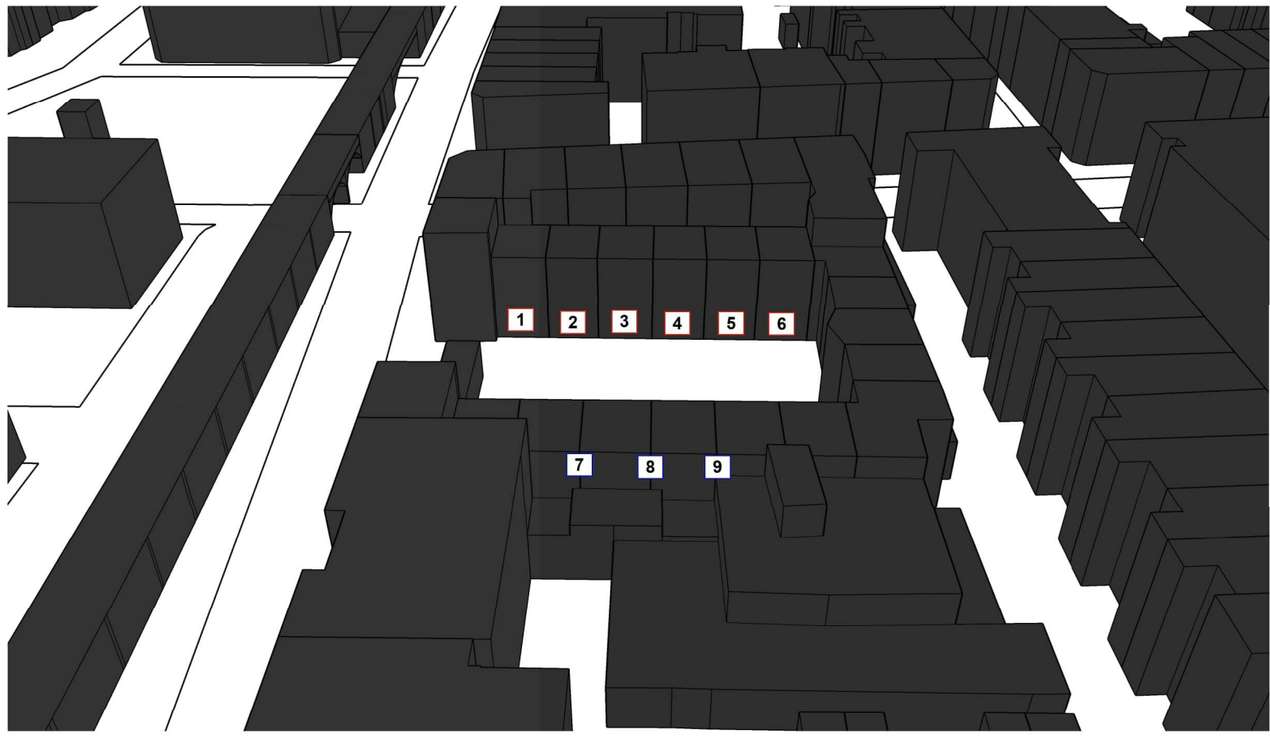
Vijverhofstraat "het hofje"
21 september
18.30





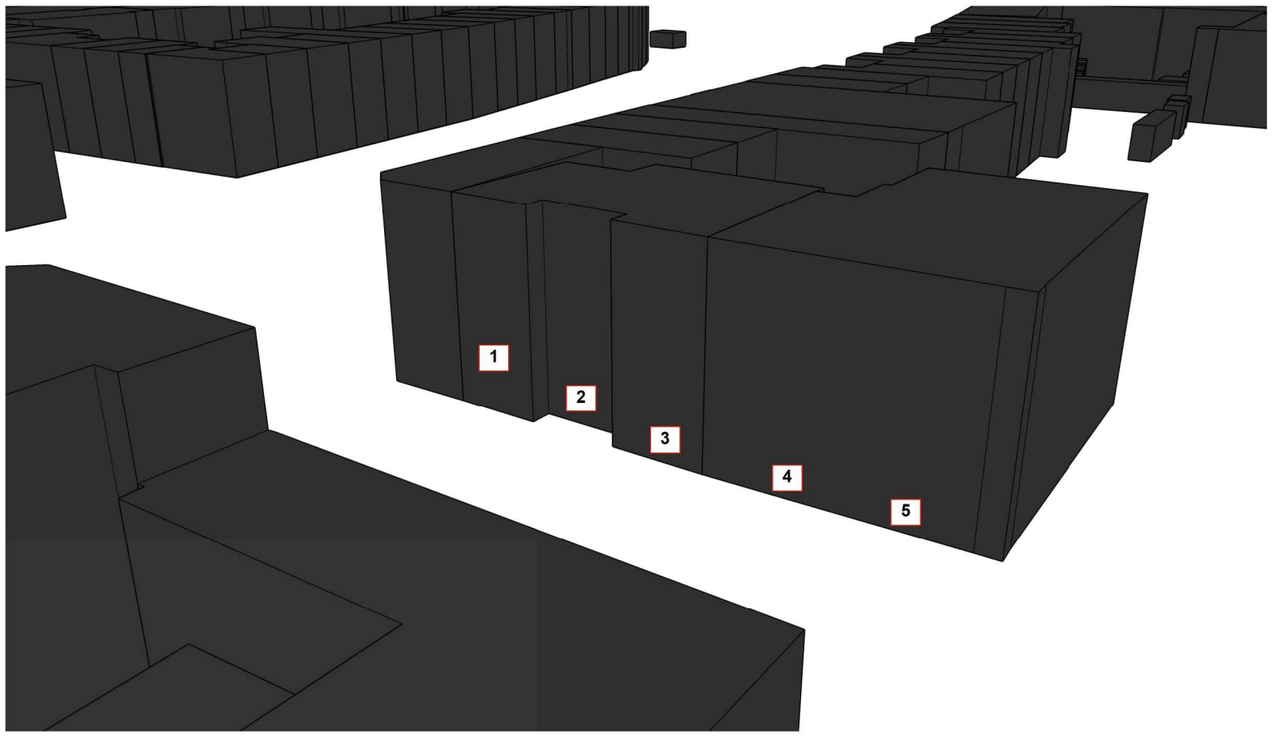
Vijverhofstraat "het hofje"
21 september
19.00

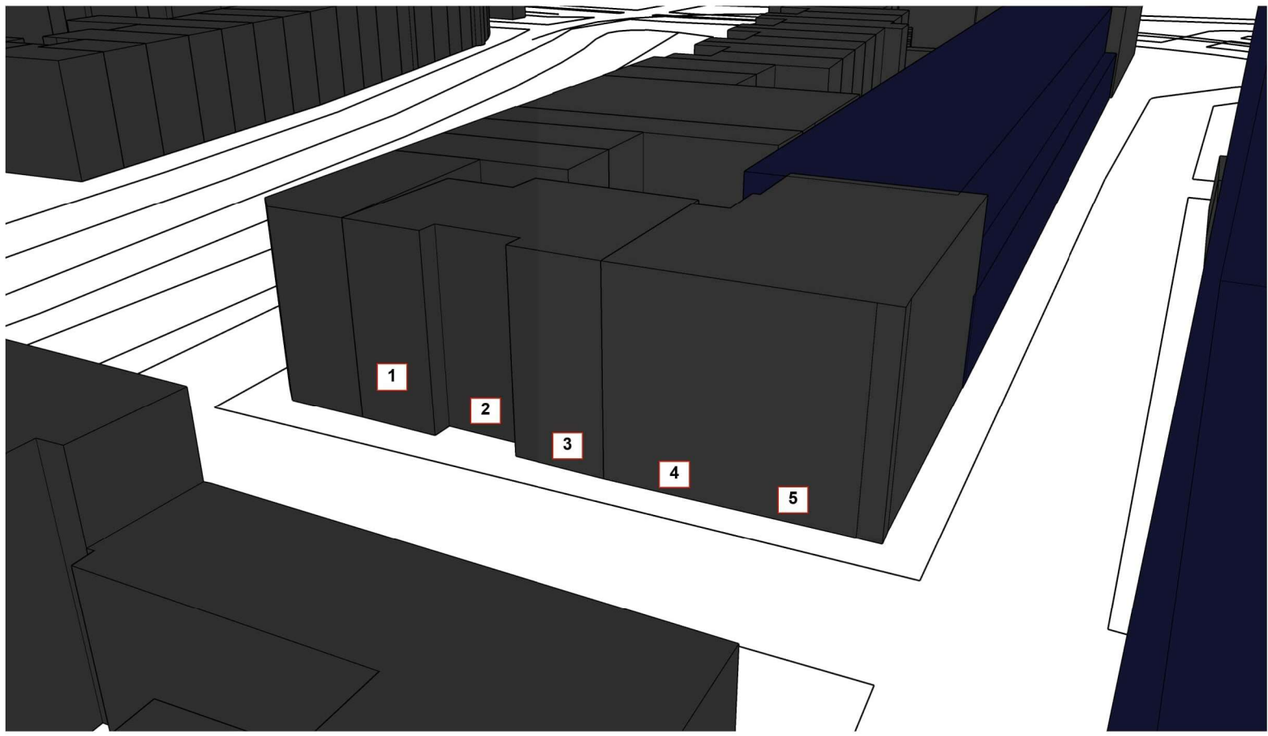




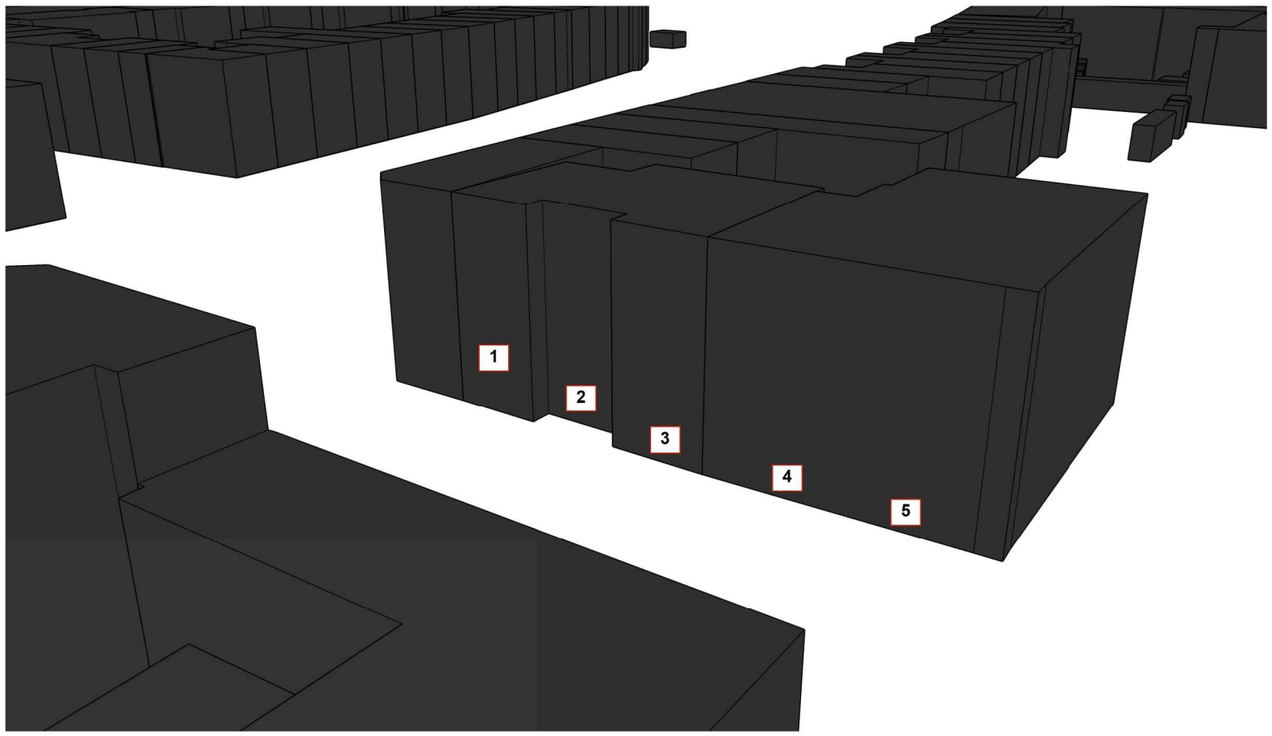
bijlage 15. resultaten 21 september Zomerhofstraat huidig vs. nieuw

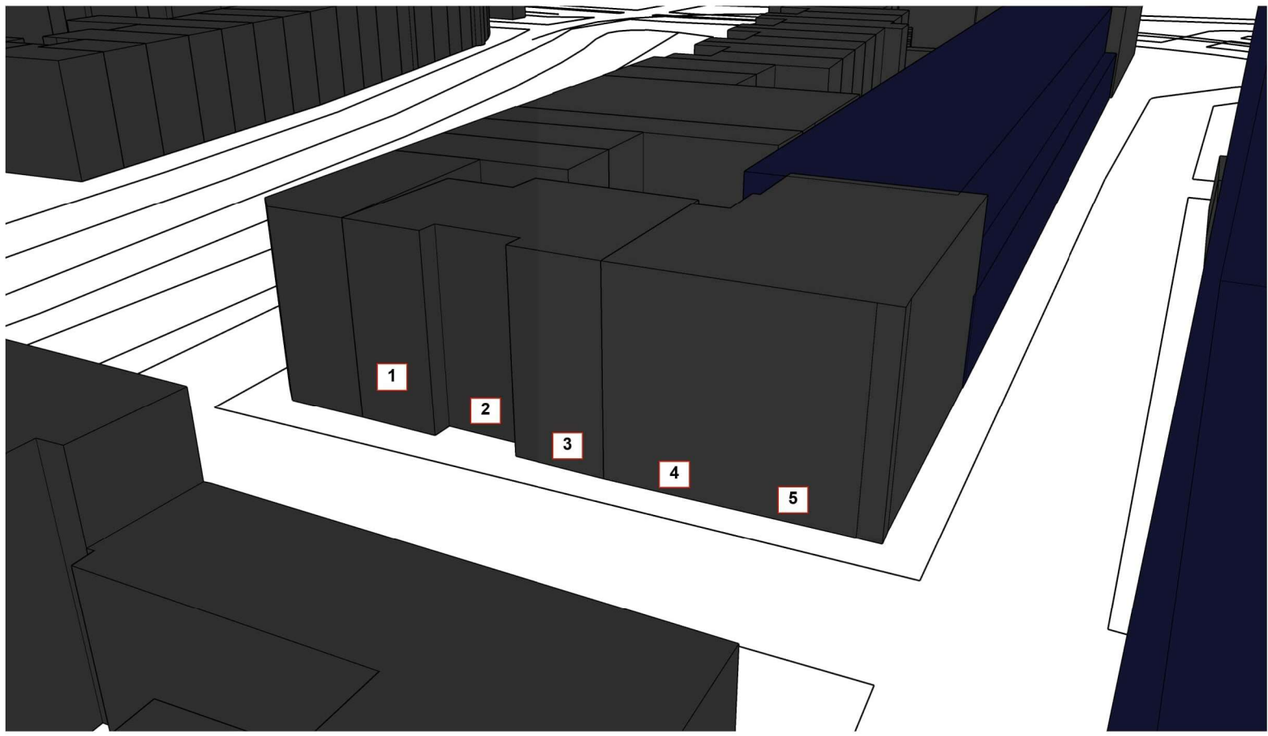
Zomerhofstraat
21 september
06.00



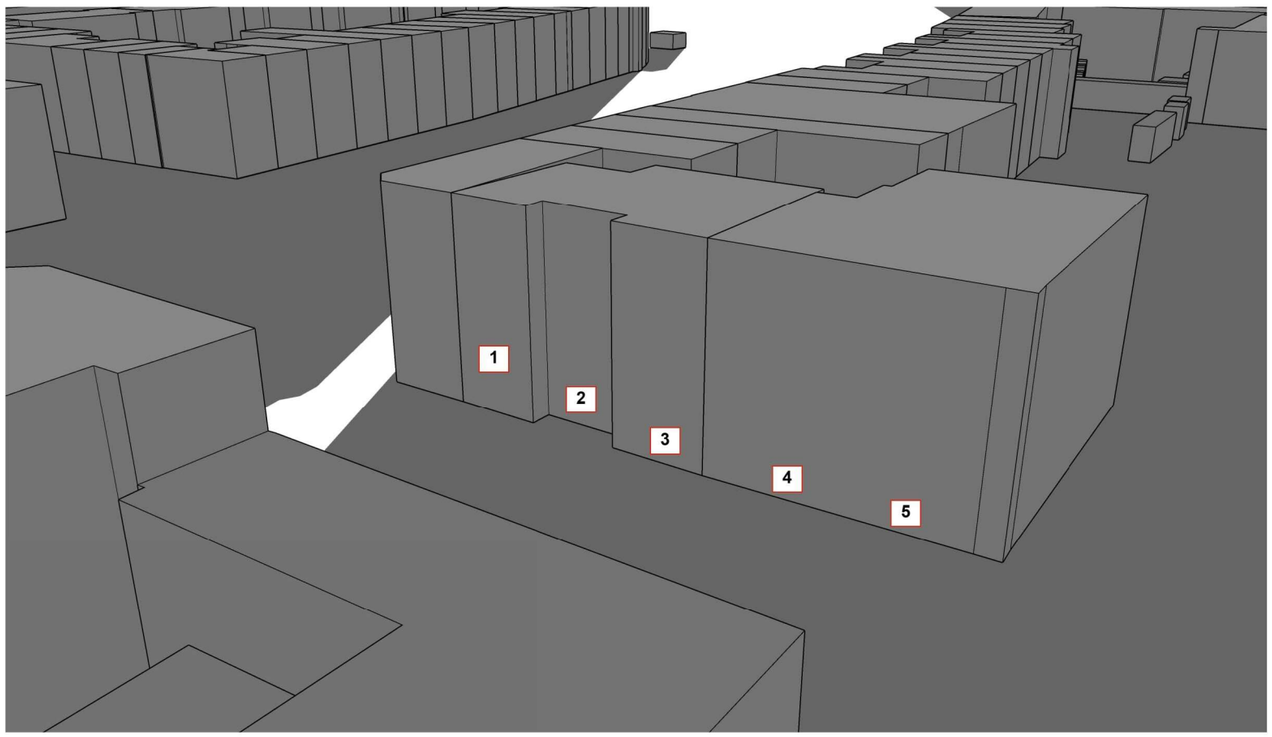


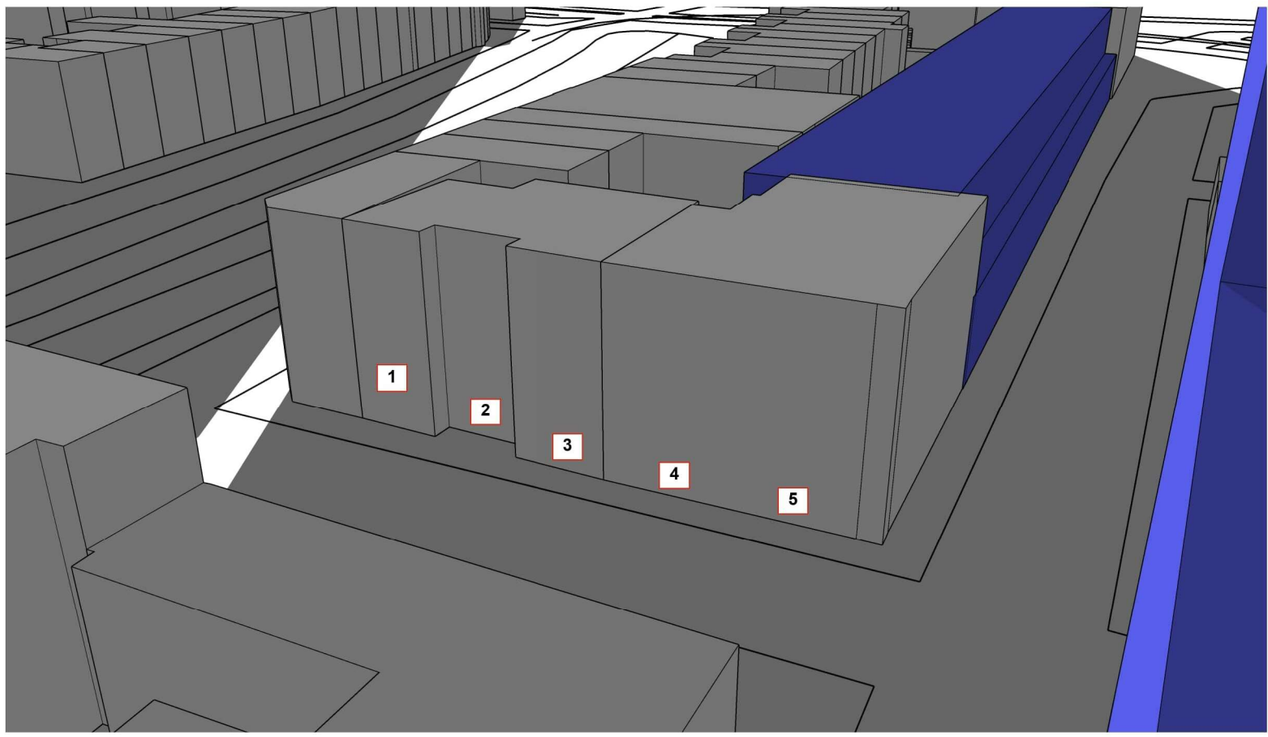
Zomerhofstraat
21 september
06.30



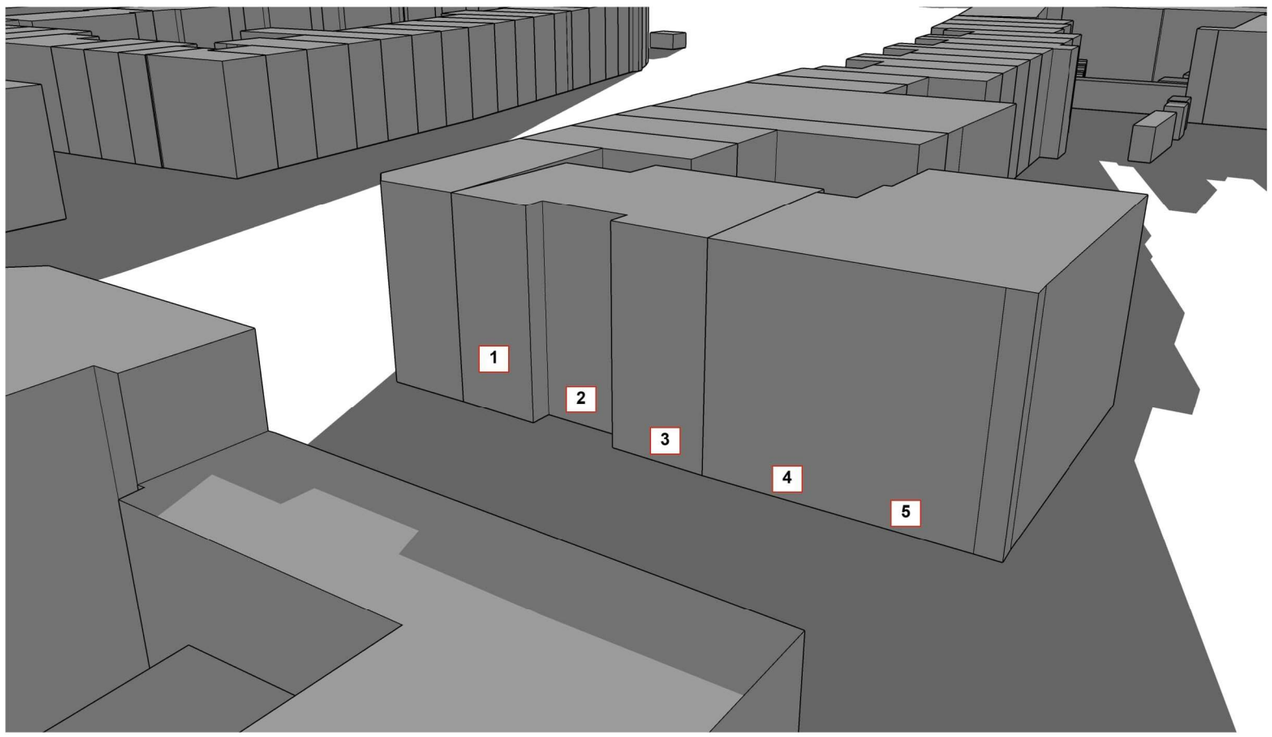


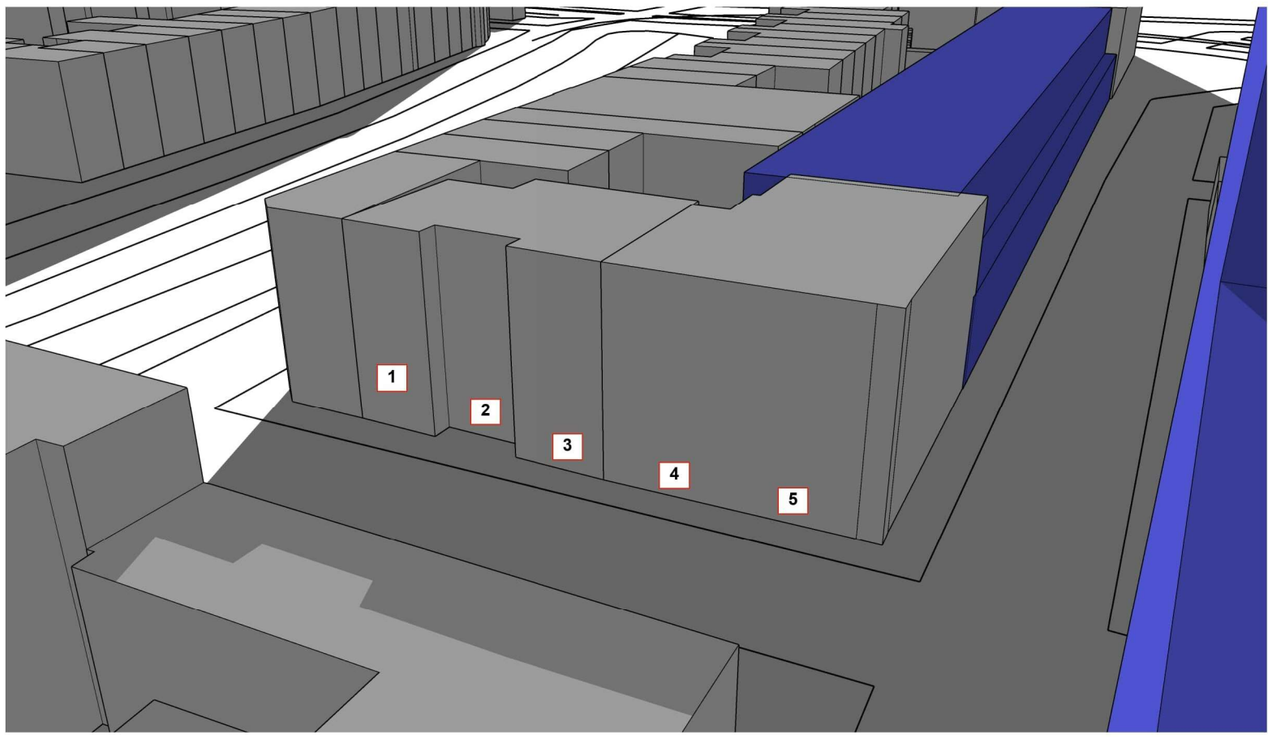
Zomerhofstraat
21 september
07.00



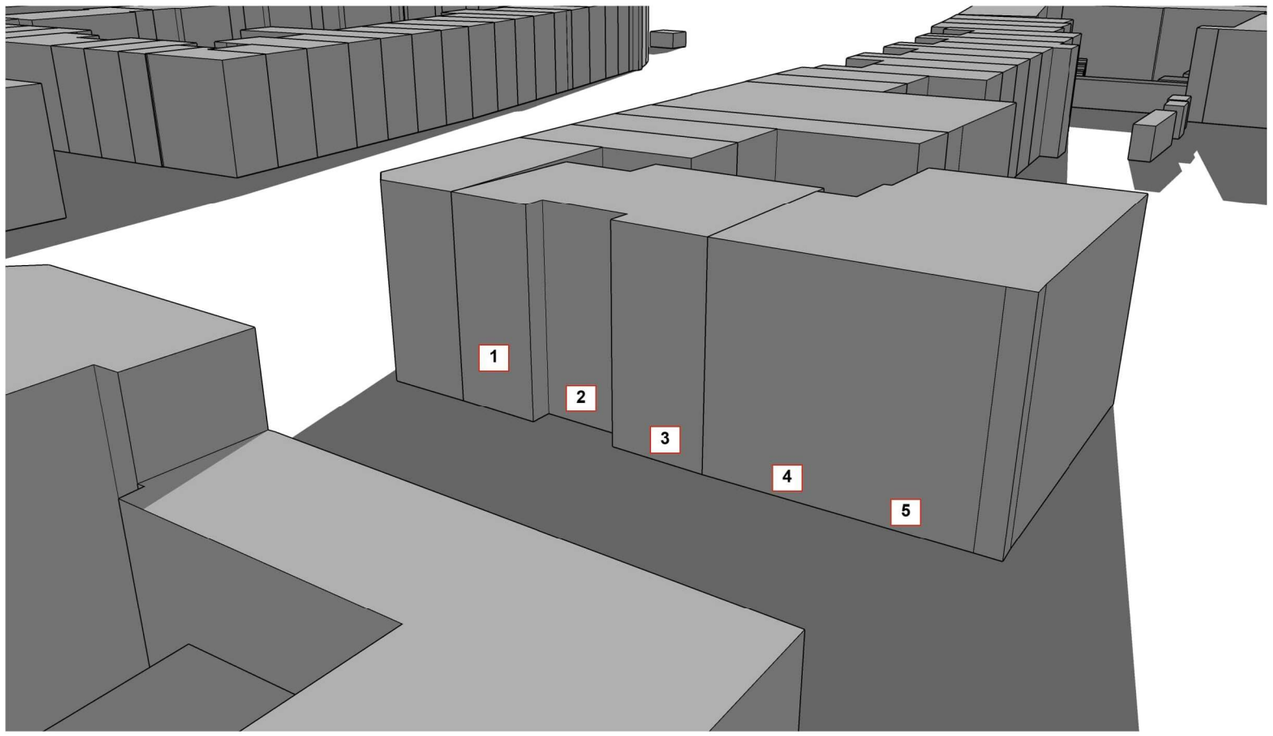


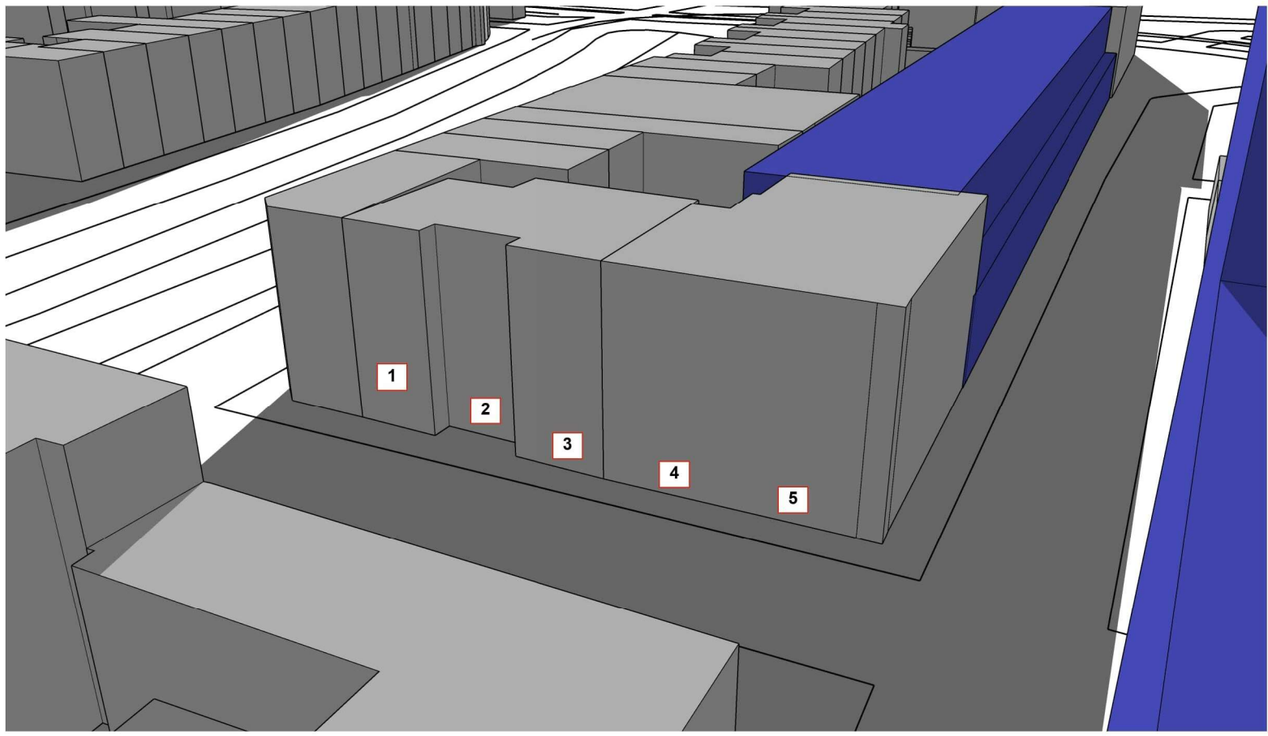
Zomerhofstraat
21 september
07.30



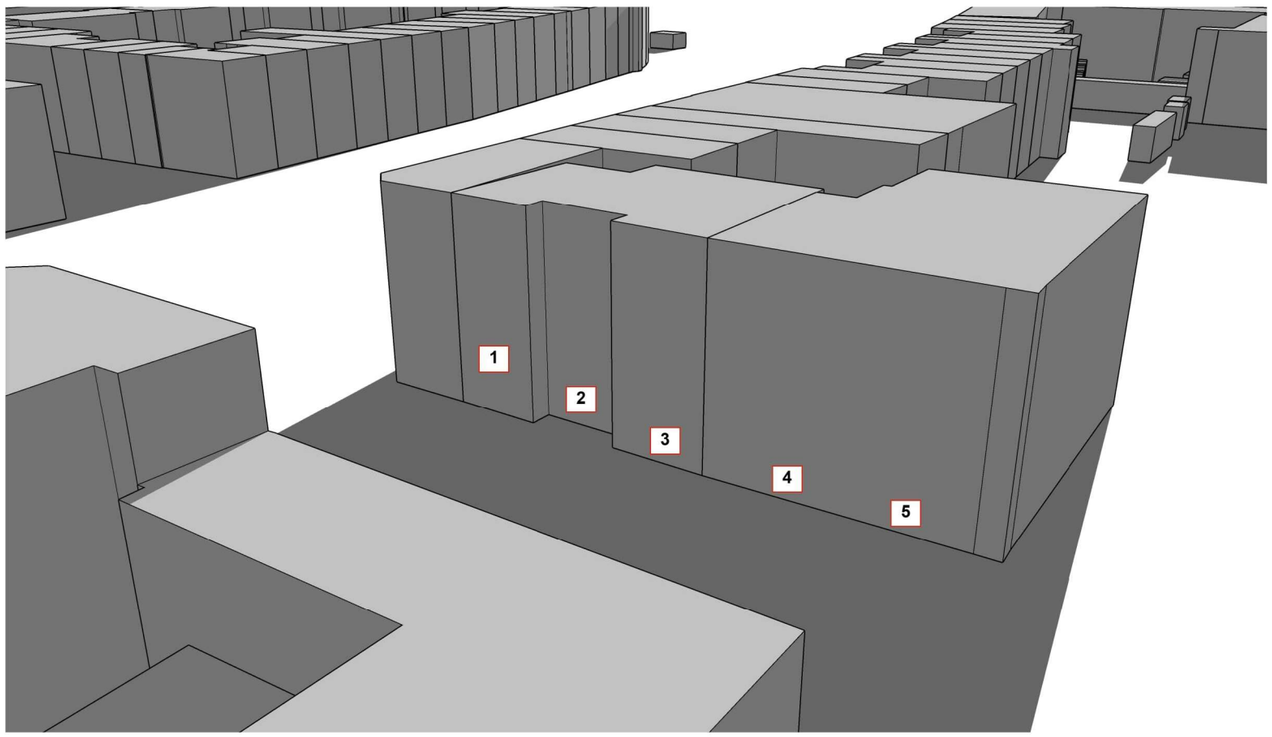


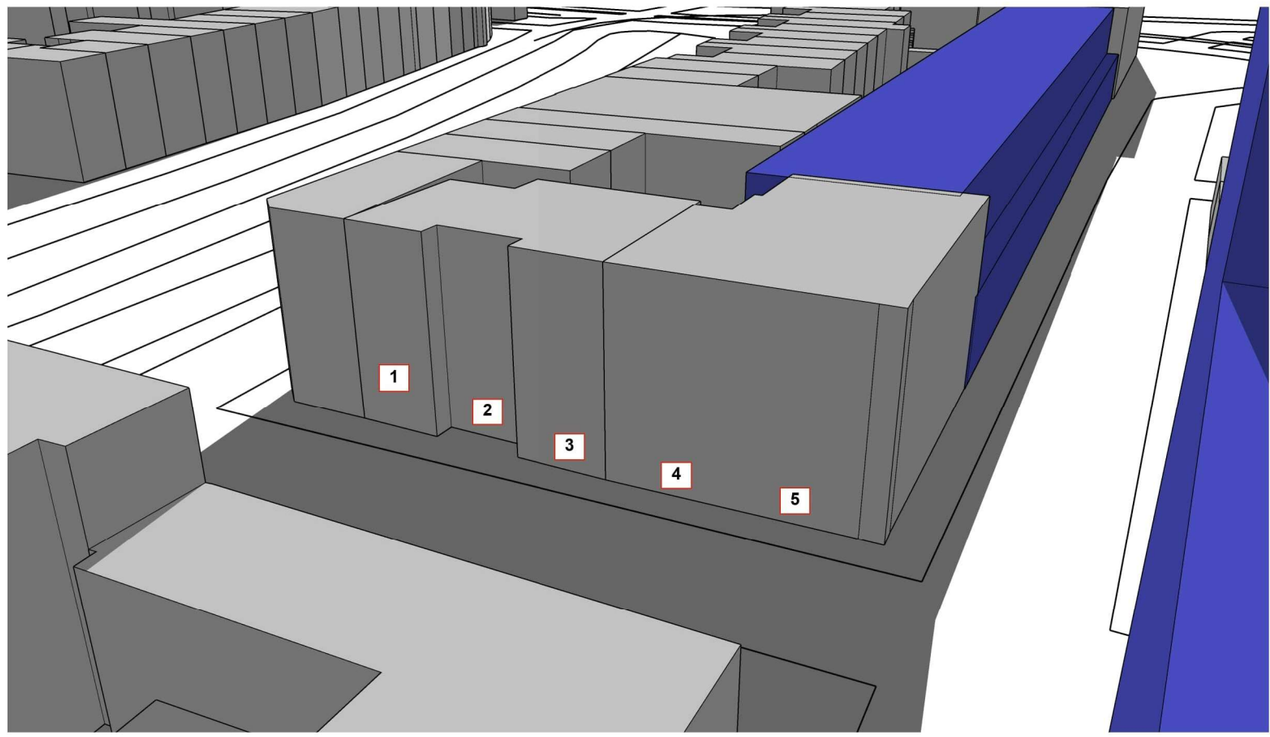
Zomerhofstraat
21 september
08.00



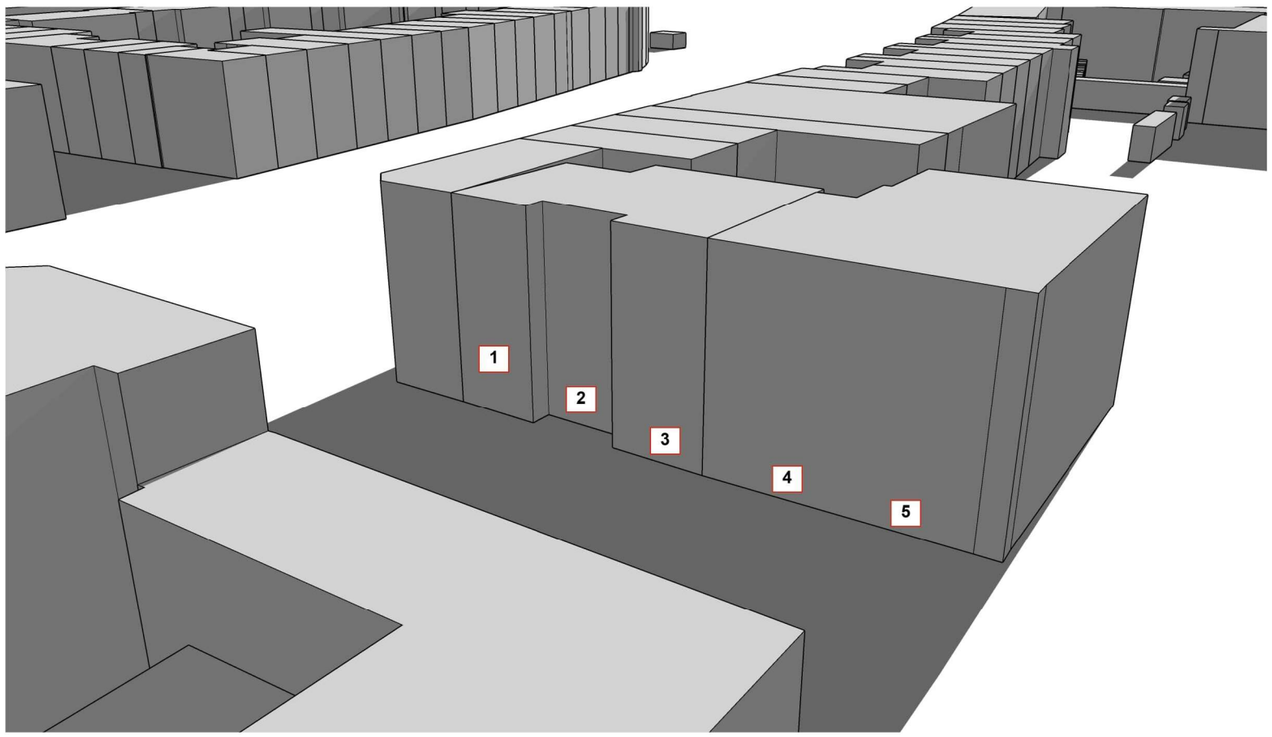


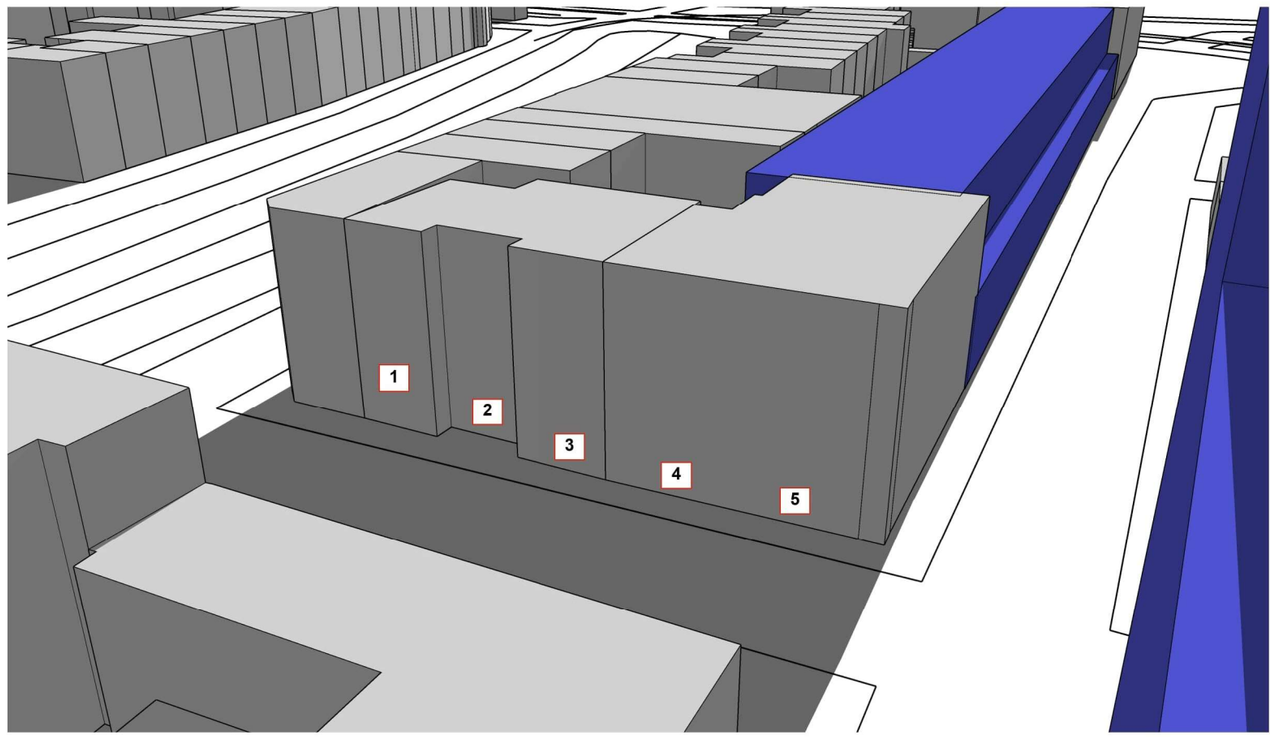
Zomerhofstraat
21 september
08.30



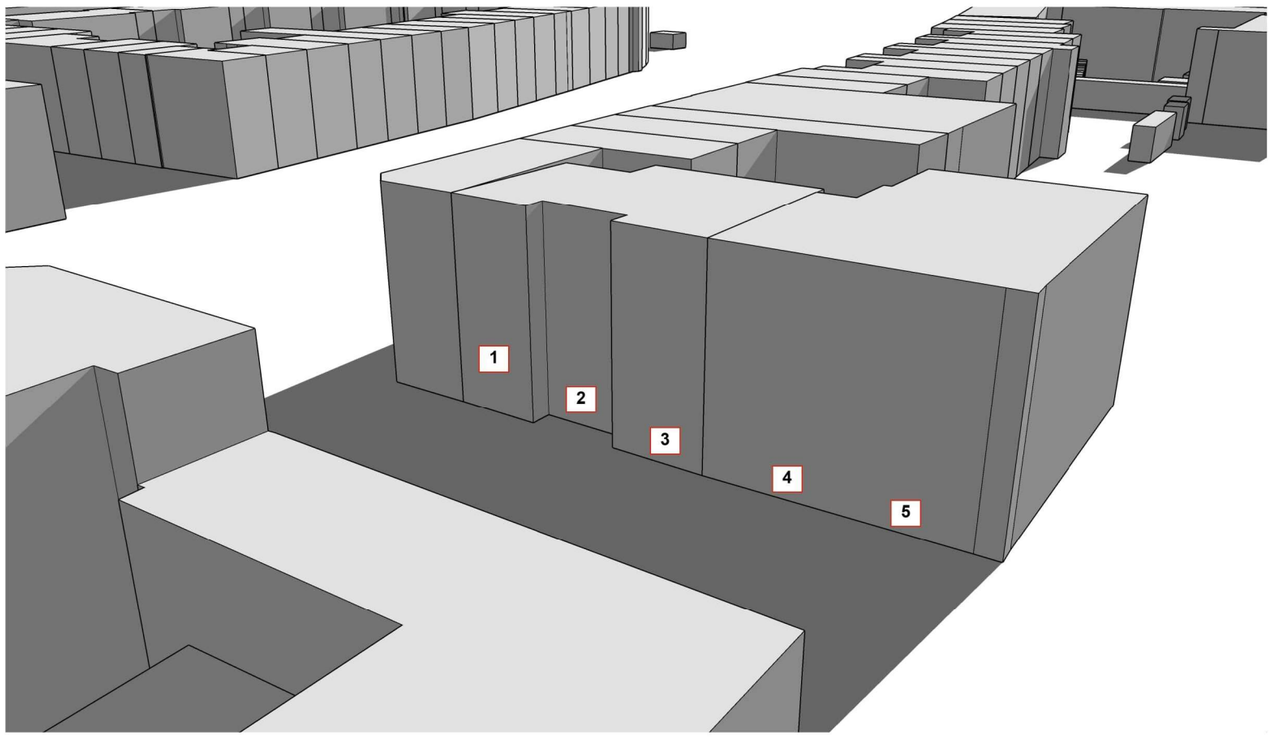


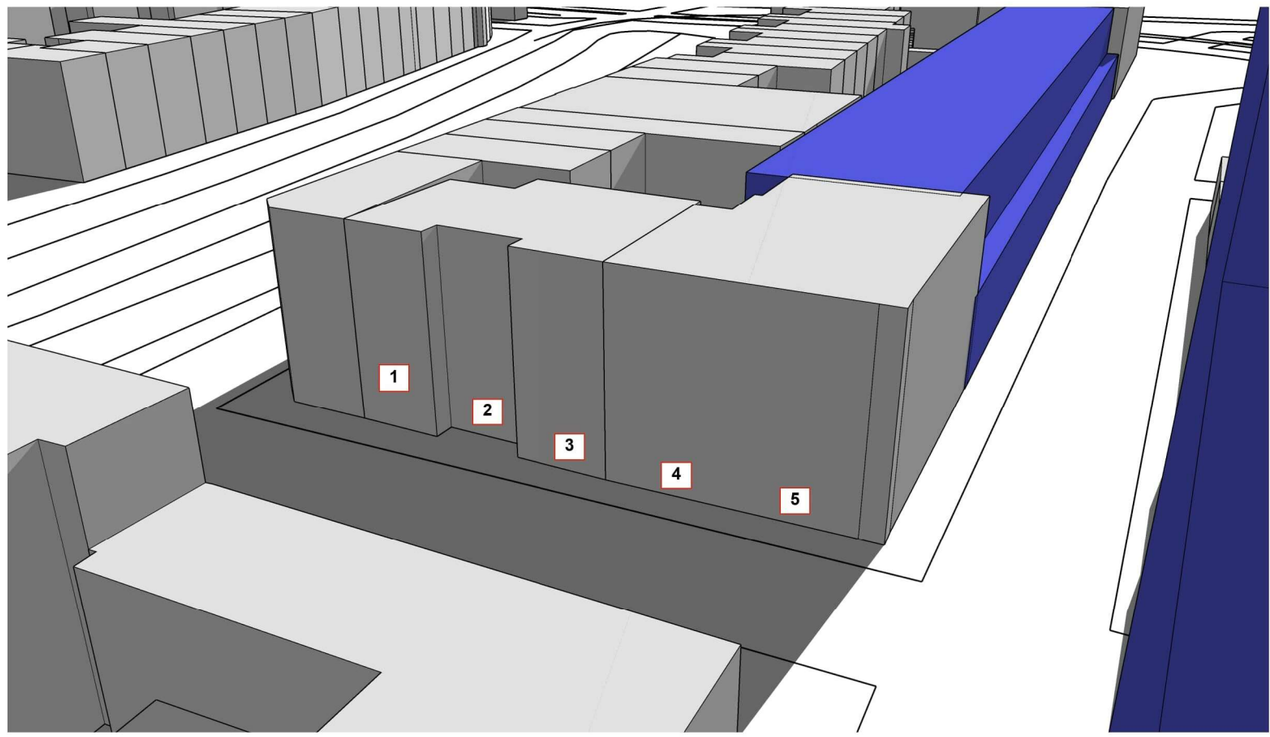
Zomerhofstraat
21 september
09.00



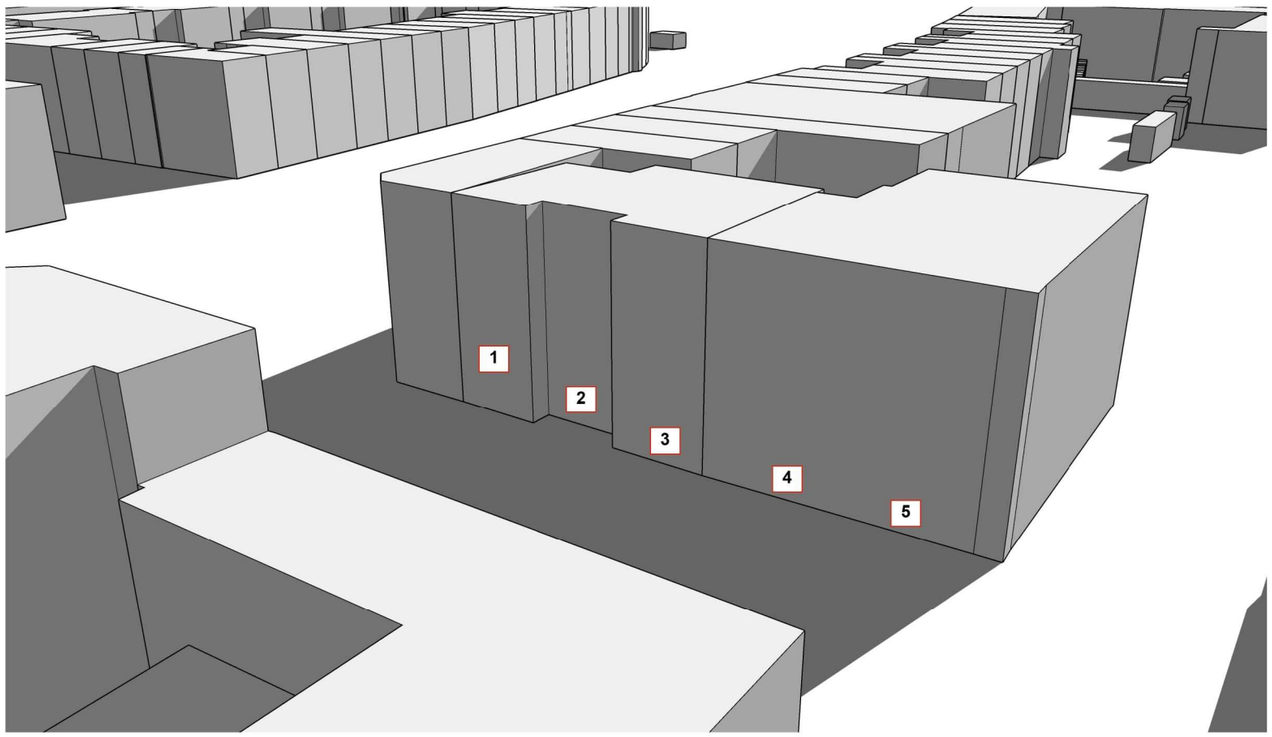


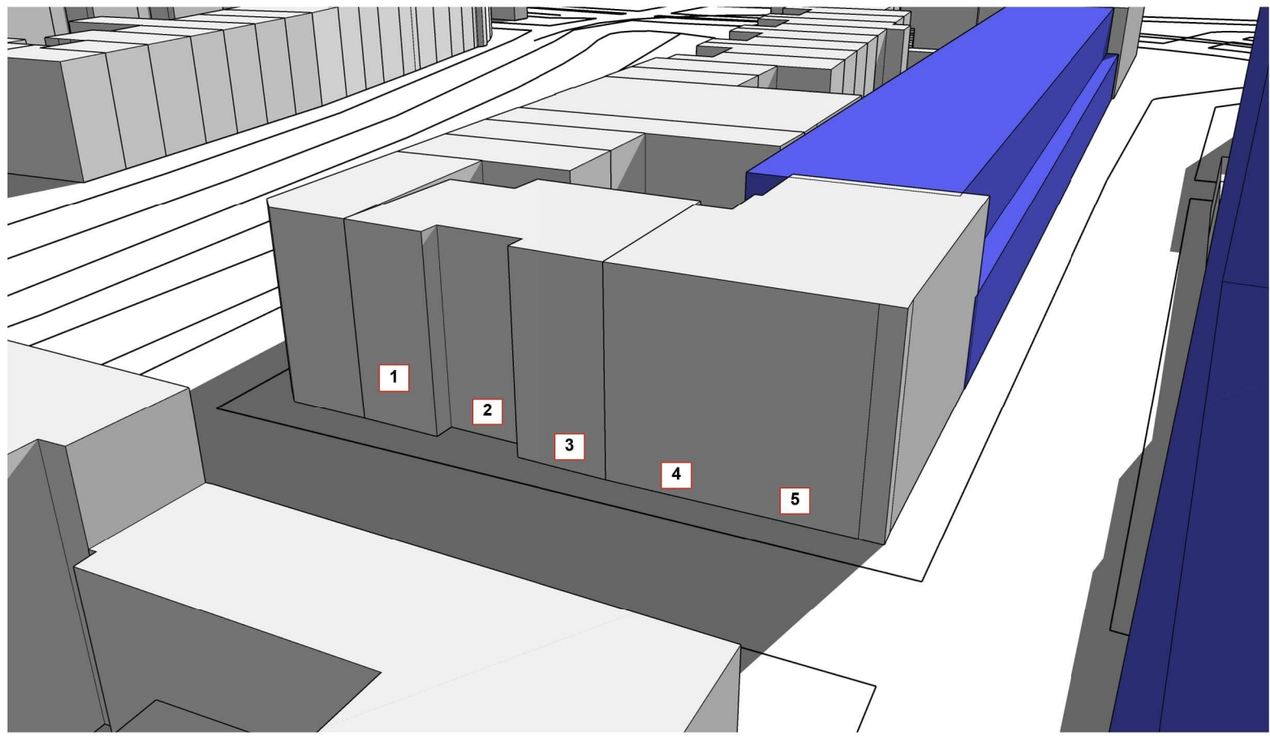
Zomerhofstraat
21 september
09.30



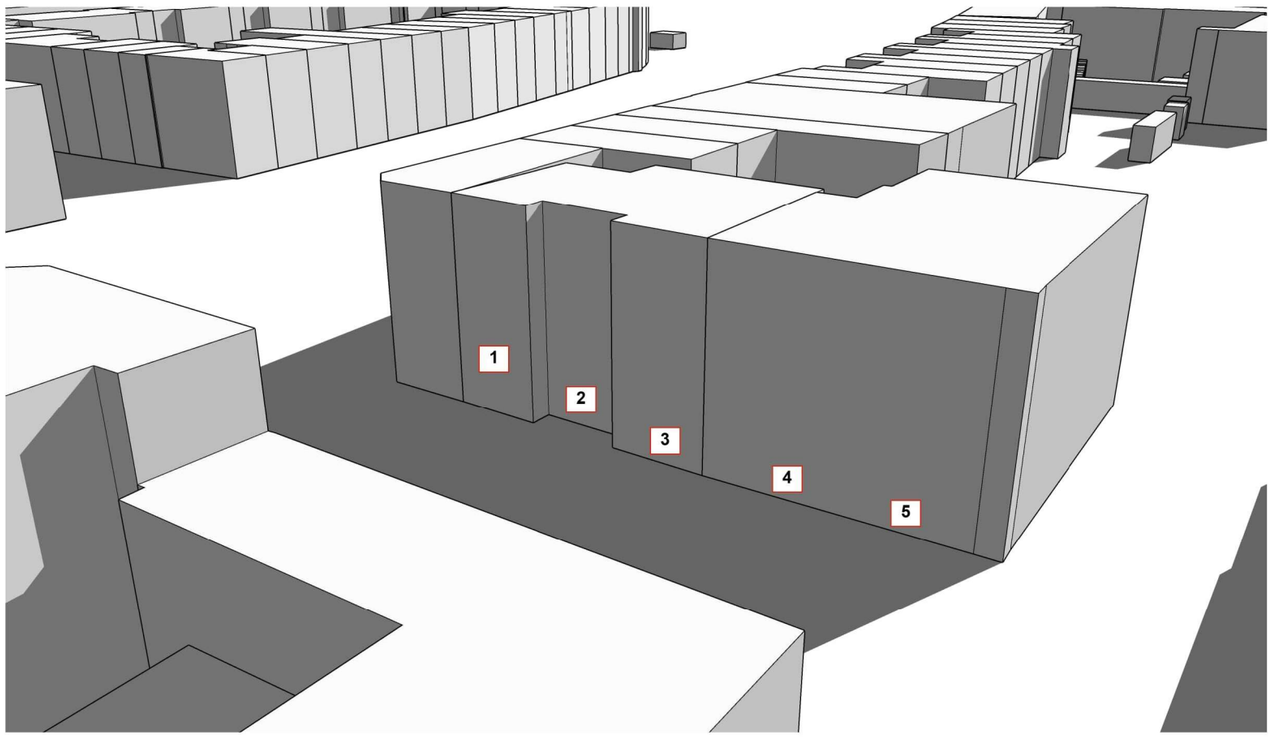


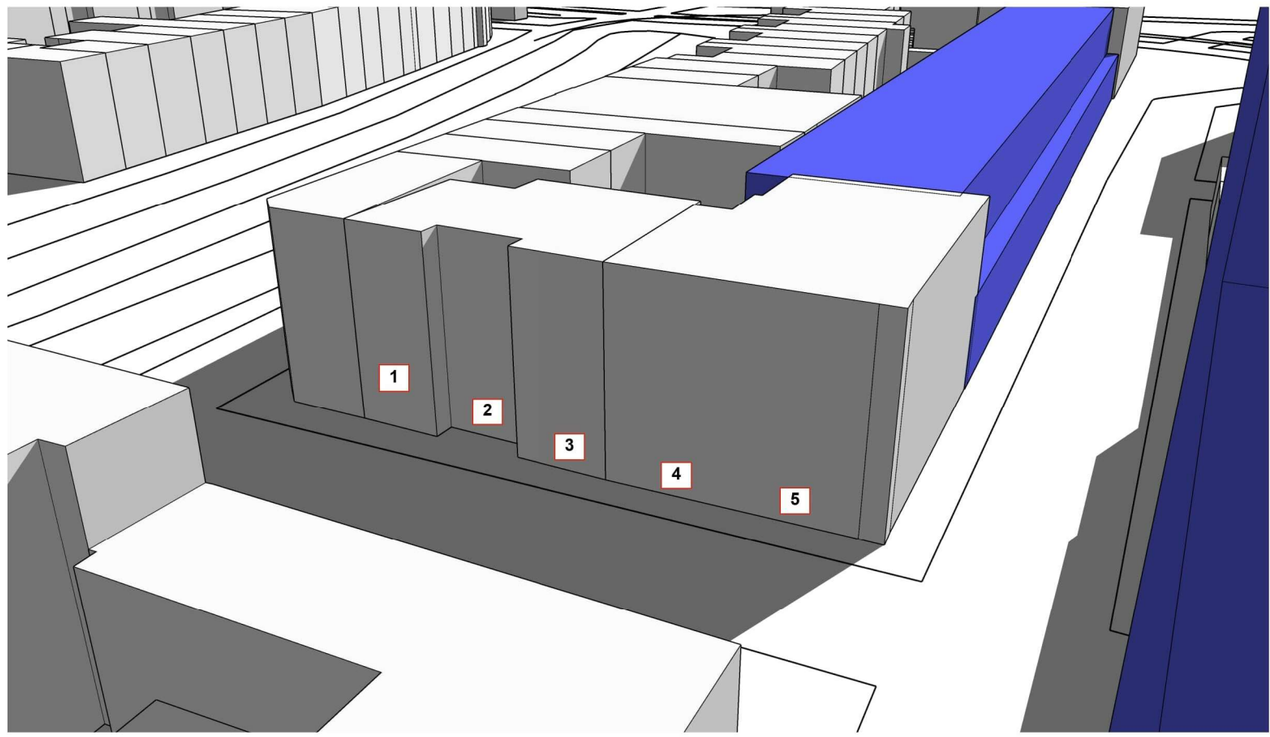
Zomerhofstraat
21 september
10.00



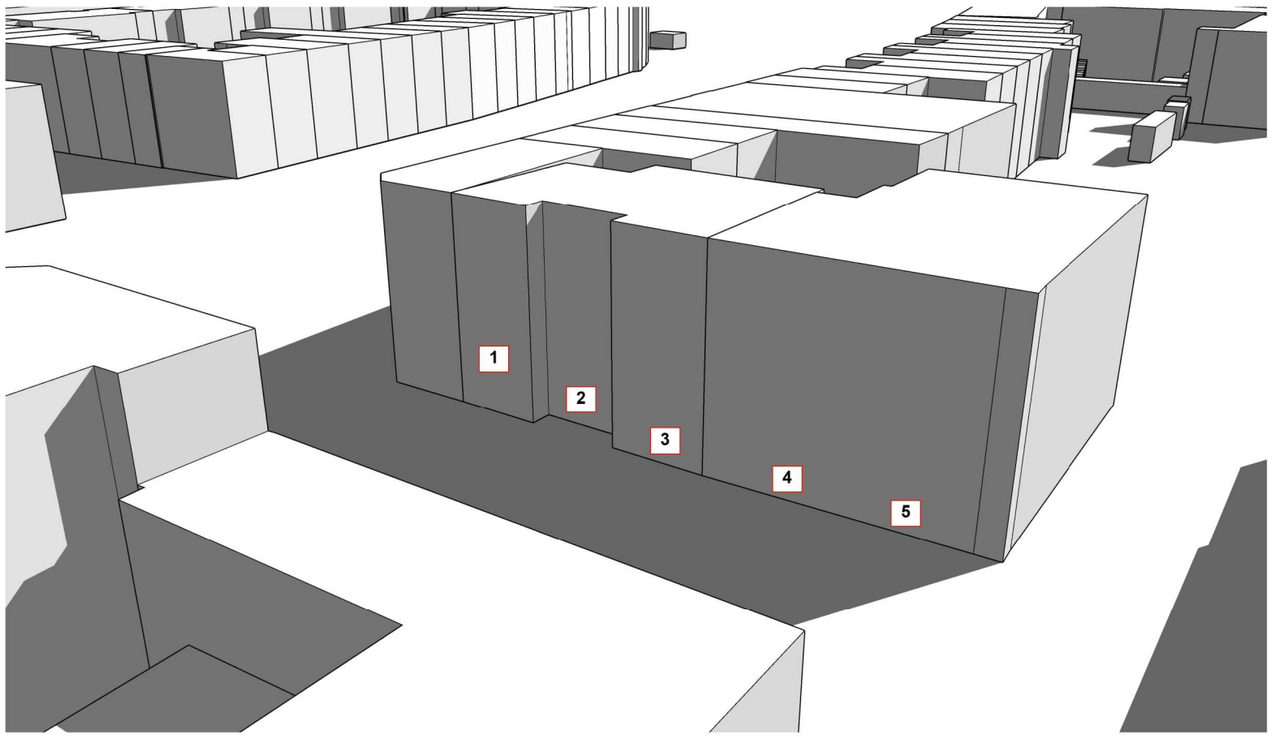


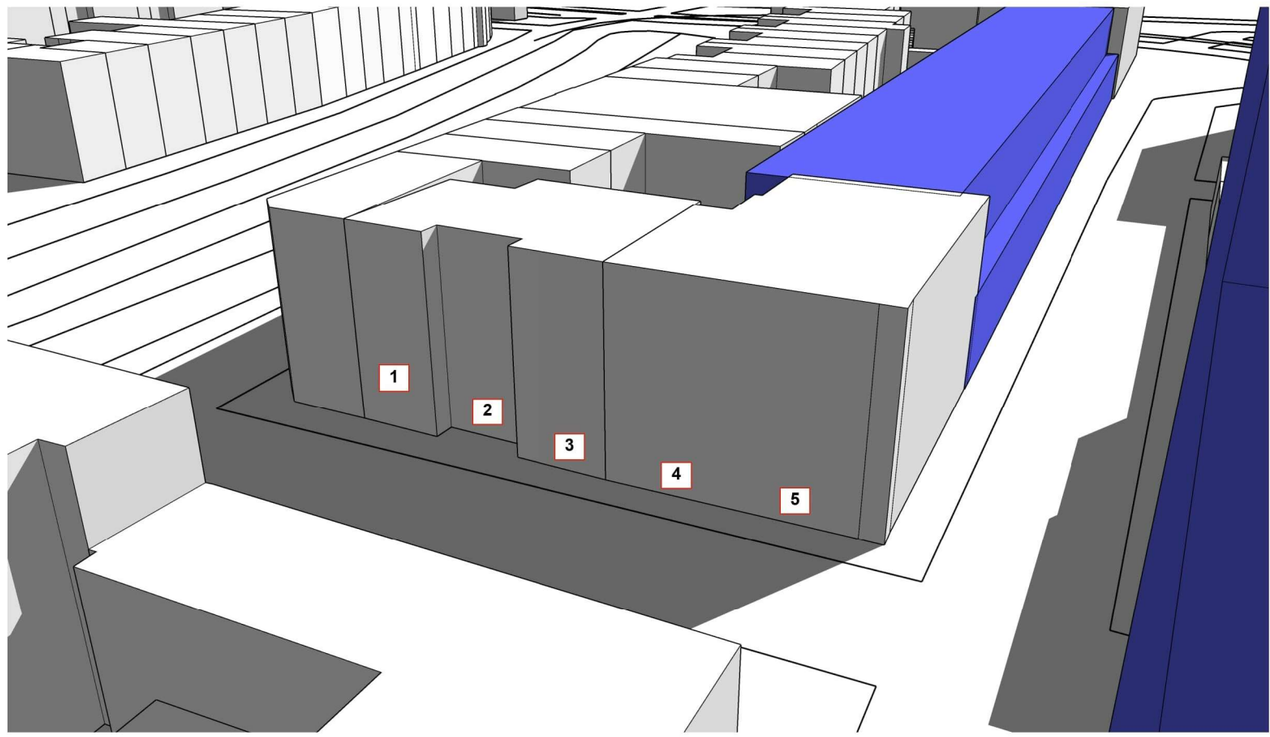
Zomerhofstraat
21 september
10.30



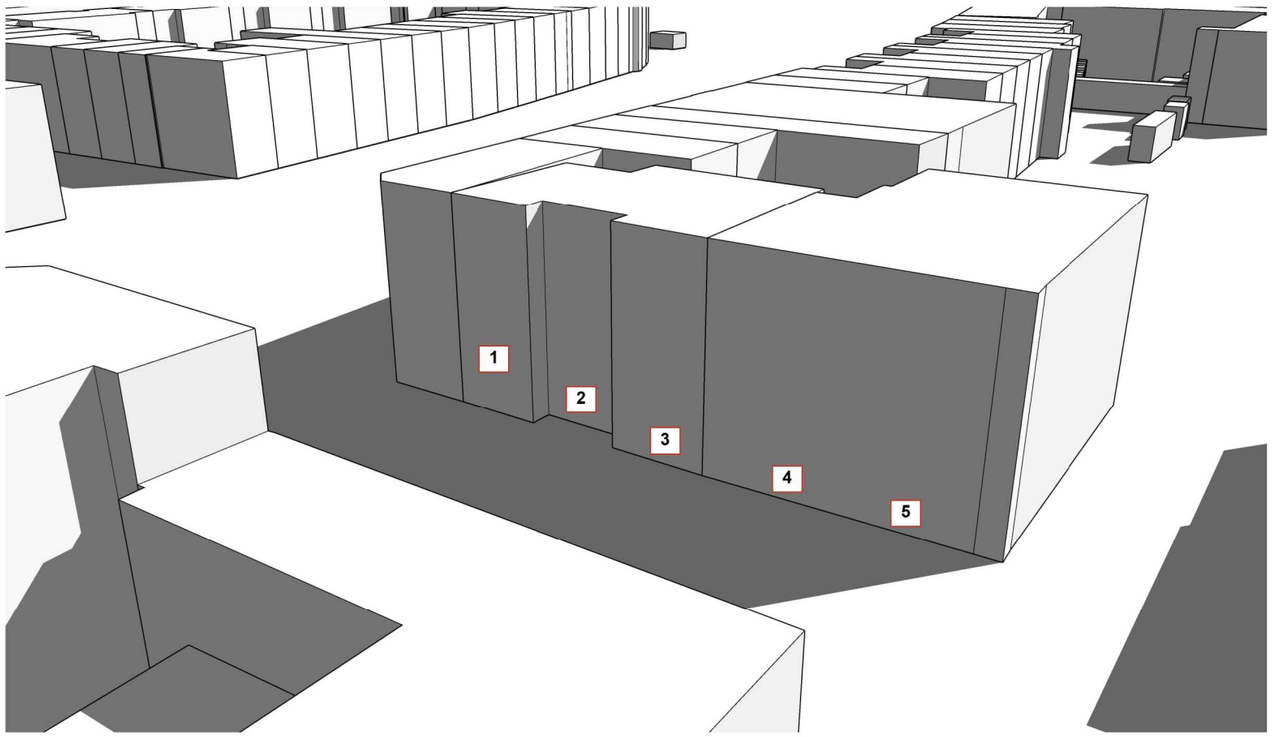


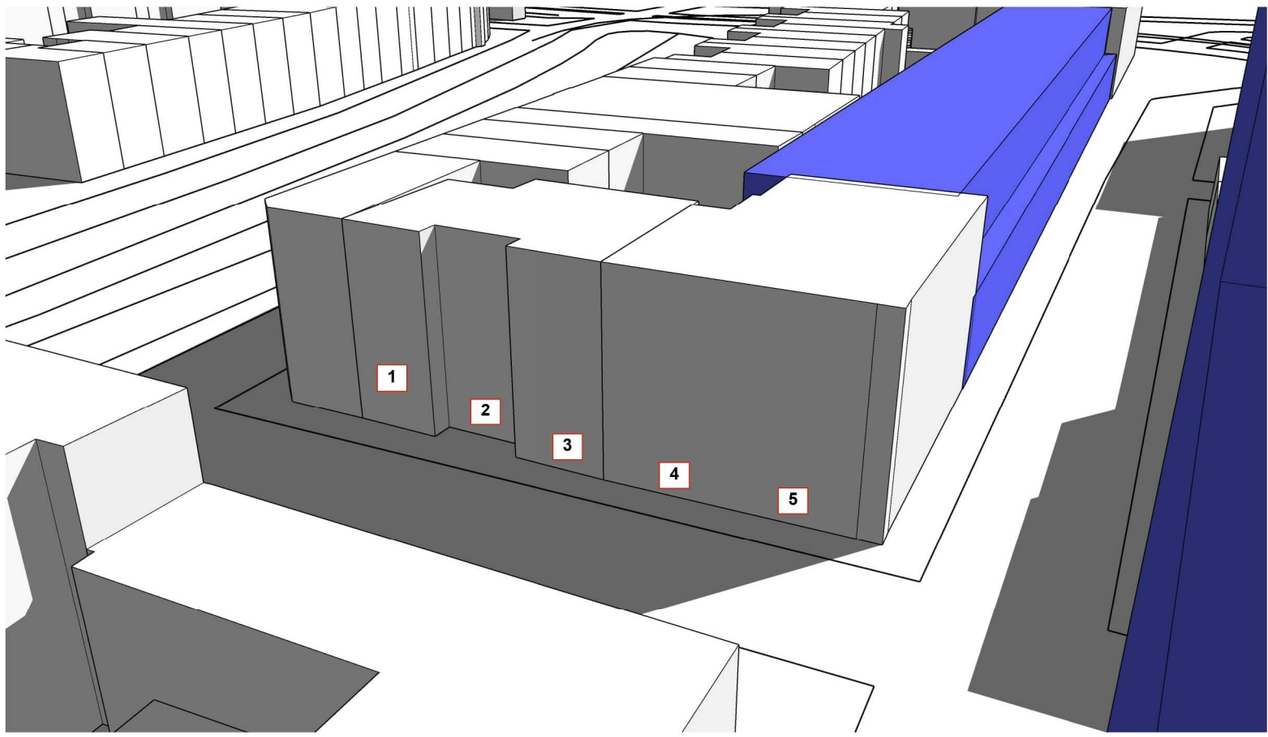
Zomerhofstraat
21 september
11.00



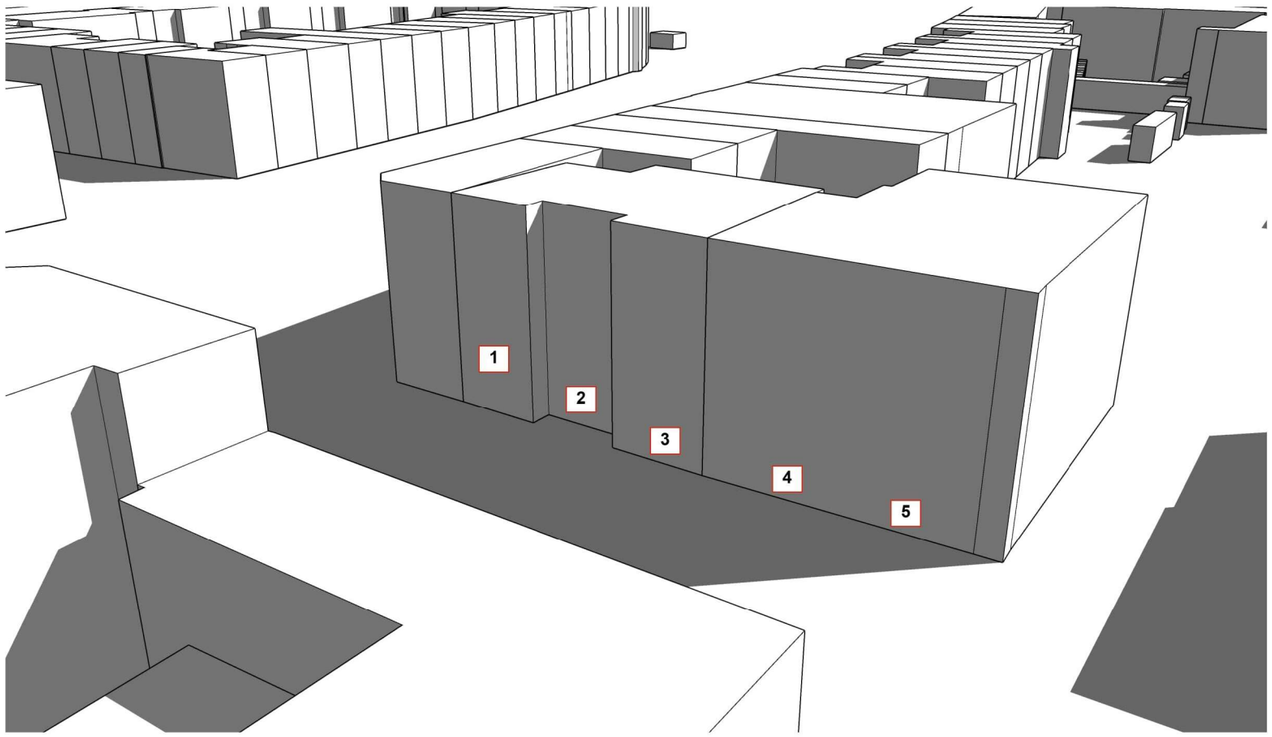


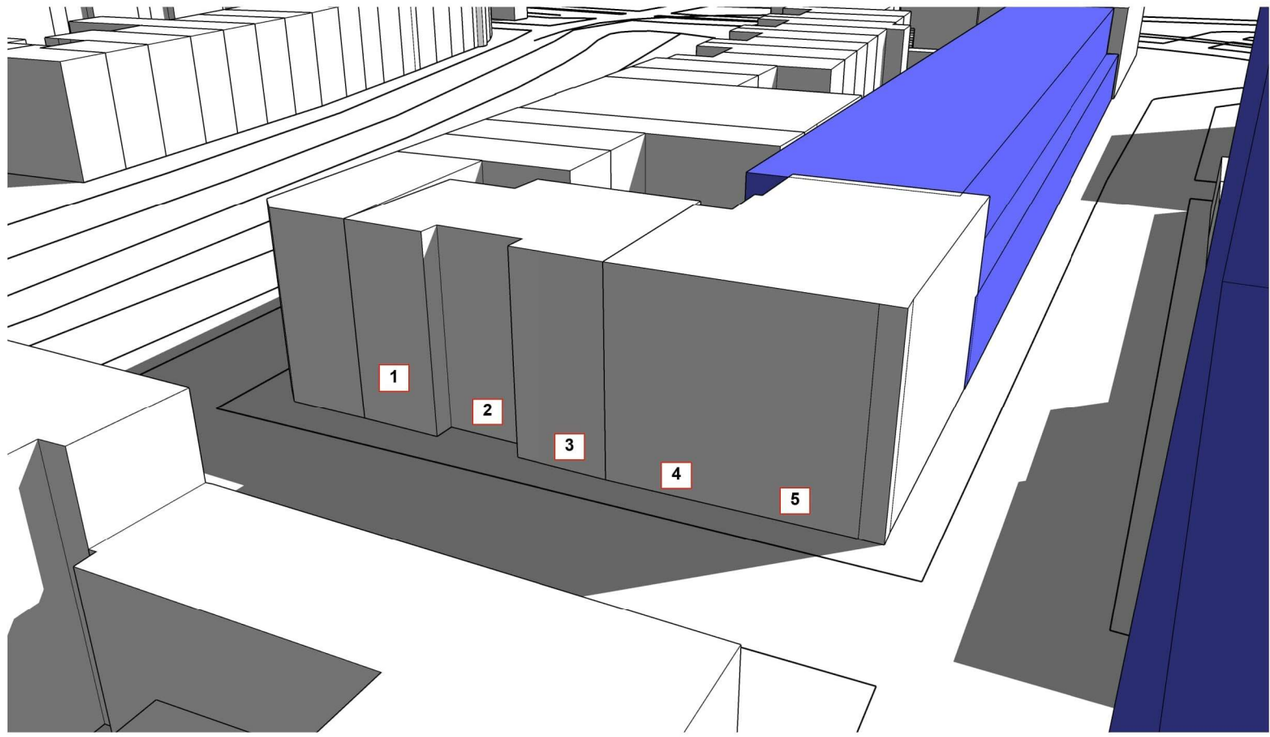
Zomerhofstraat
21 september
11.30



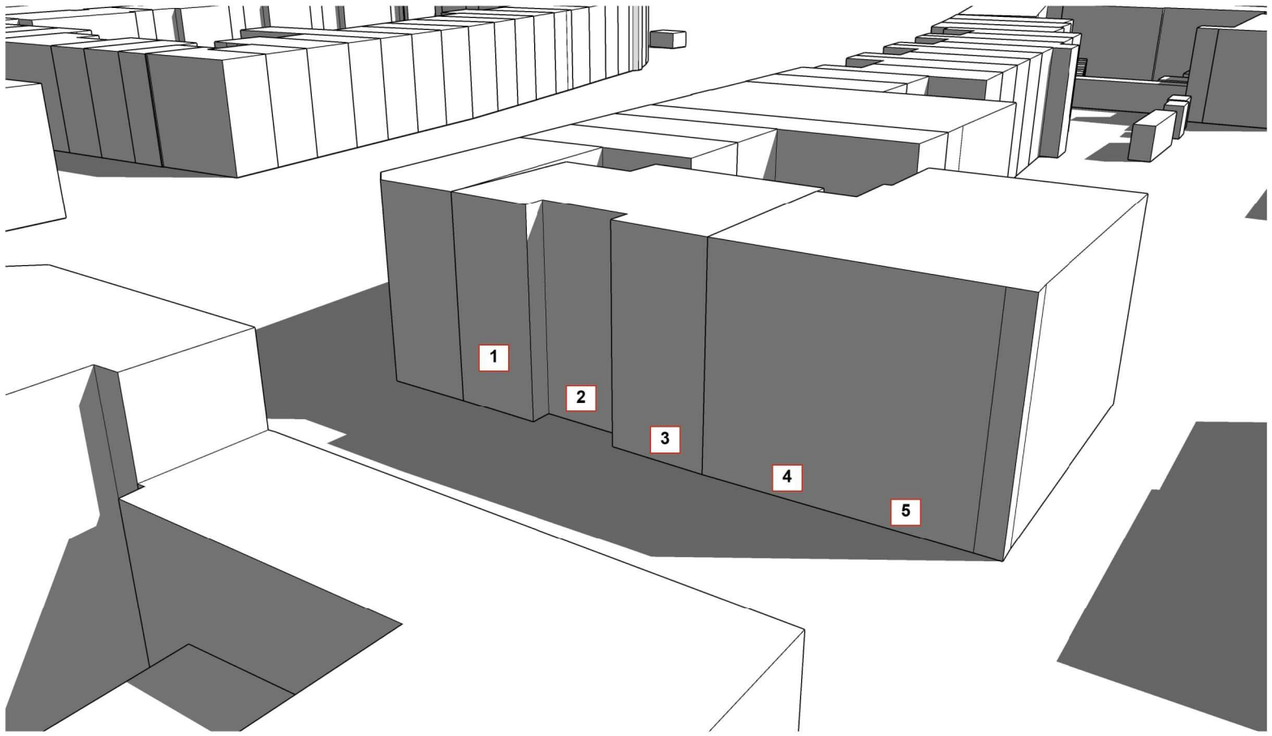


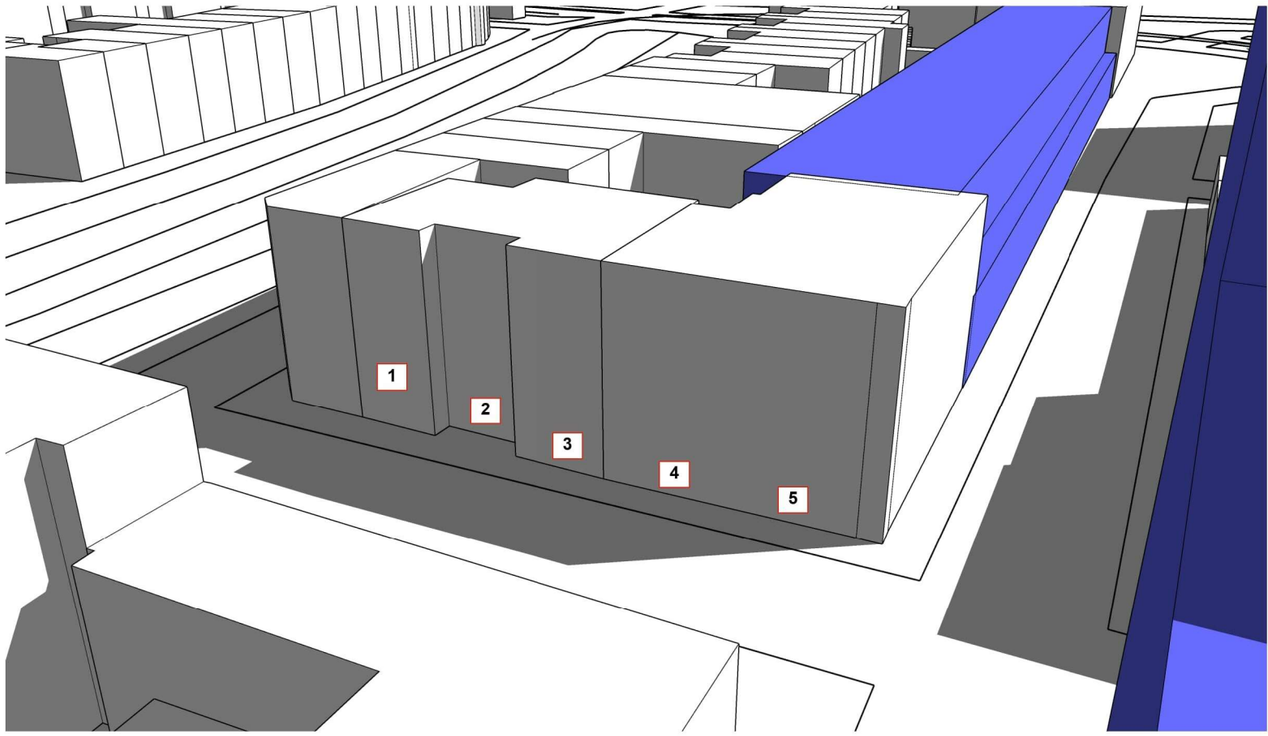
Zomerhofstraat
21 september
12.00



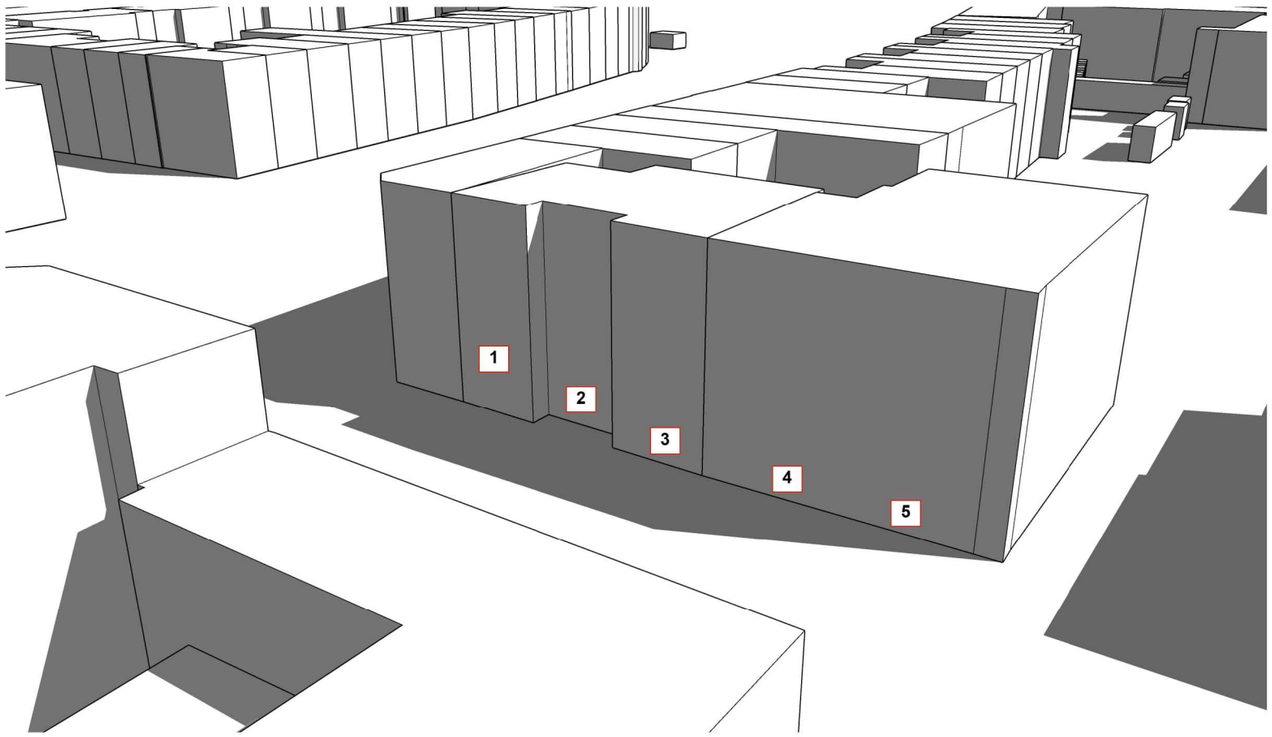


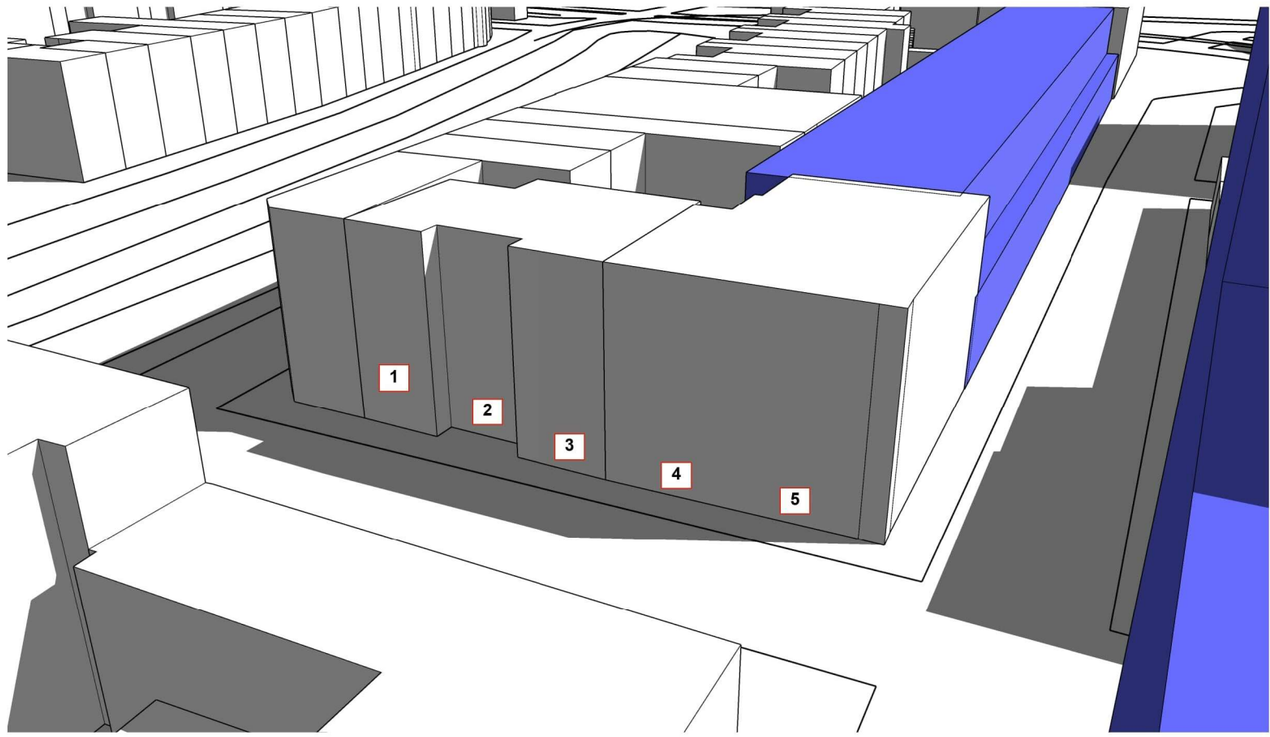
Zomerhofstraat
21 september
12.30



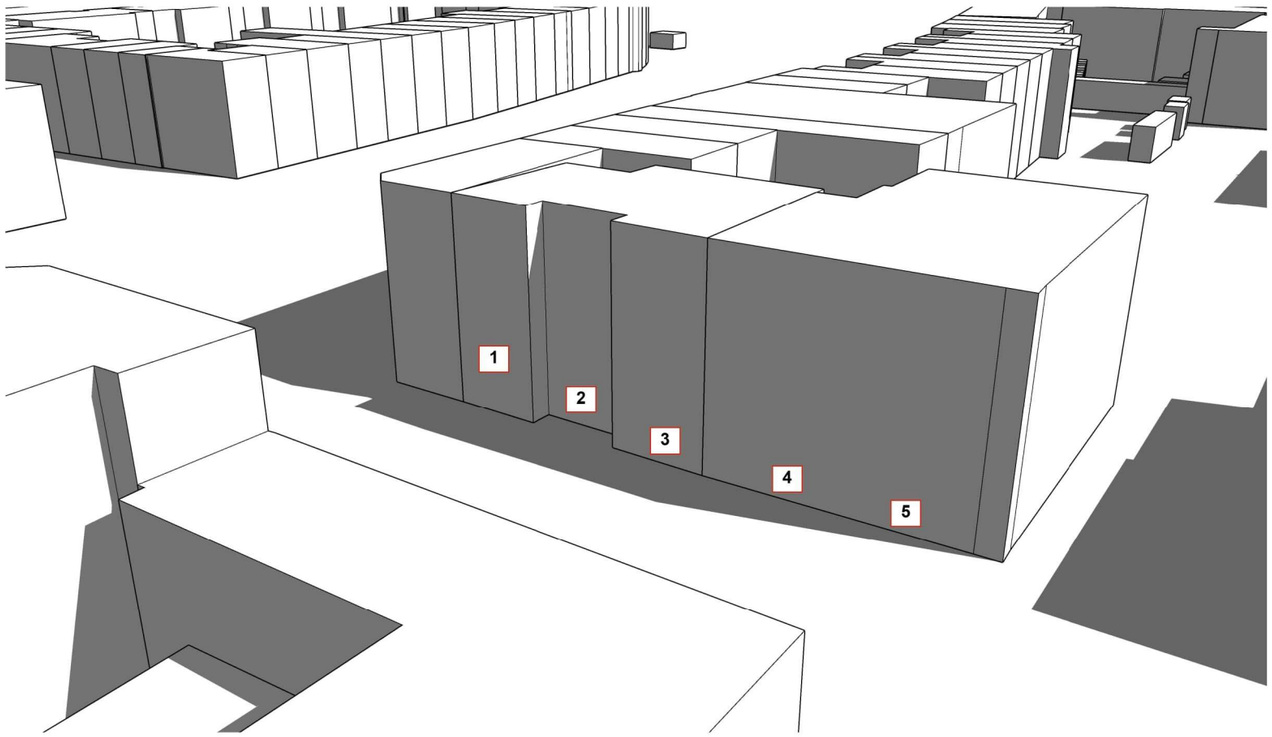


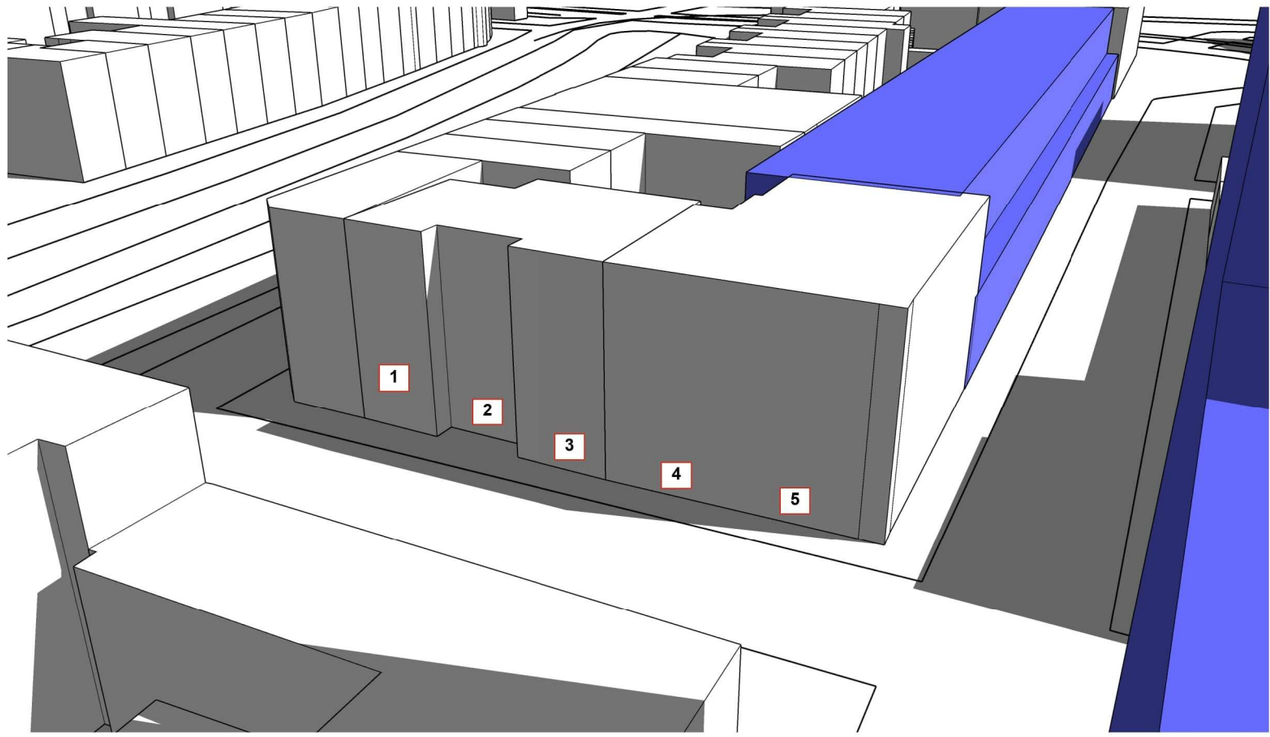
Zomerhofstraat
21 september
13.00



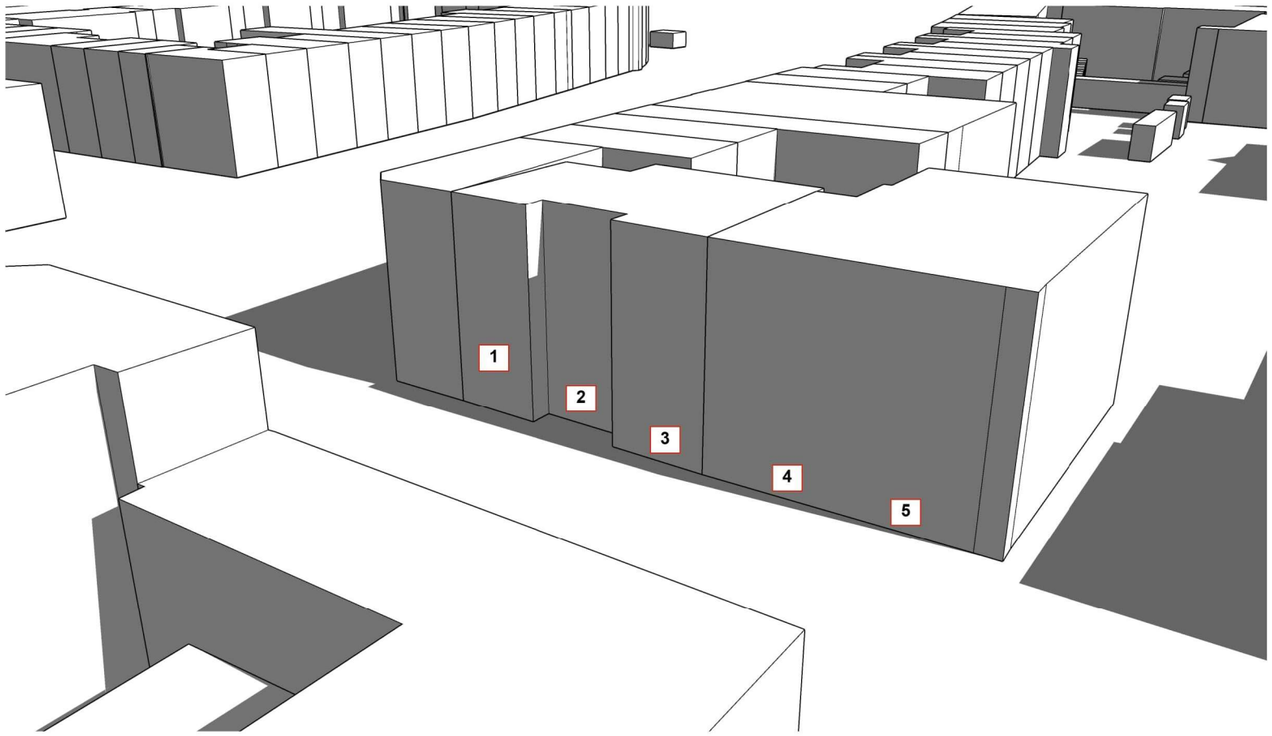


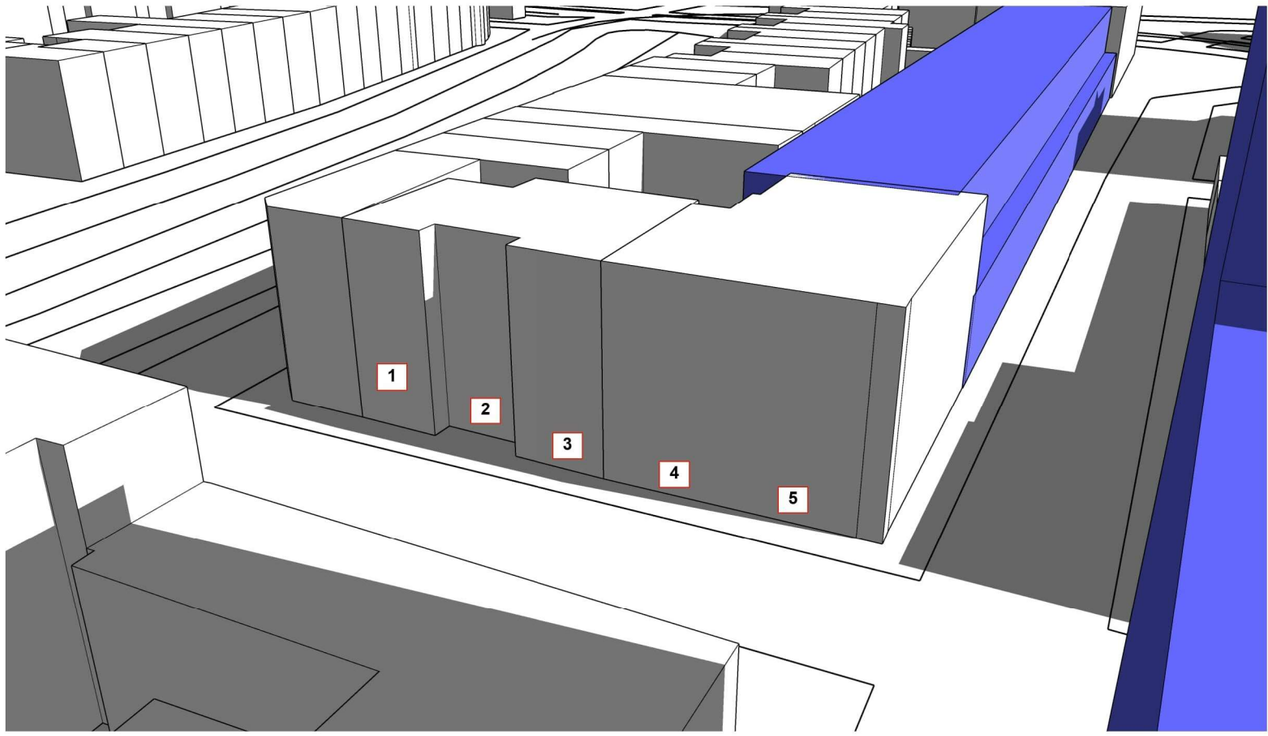
Zomerhofstraat
21 september
13.30



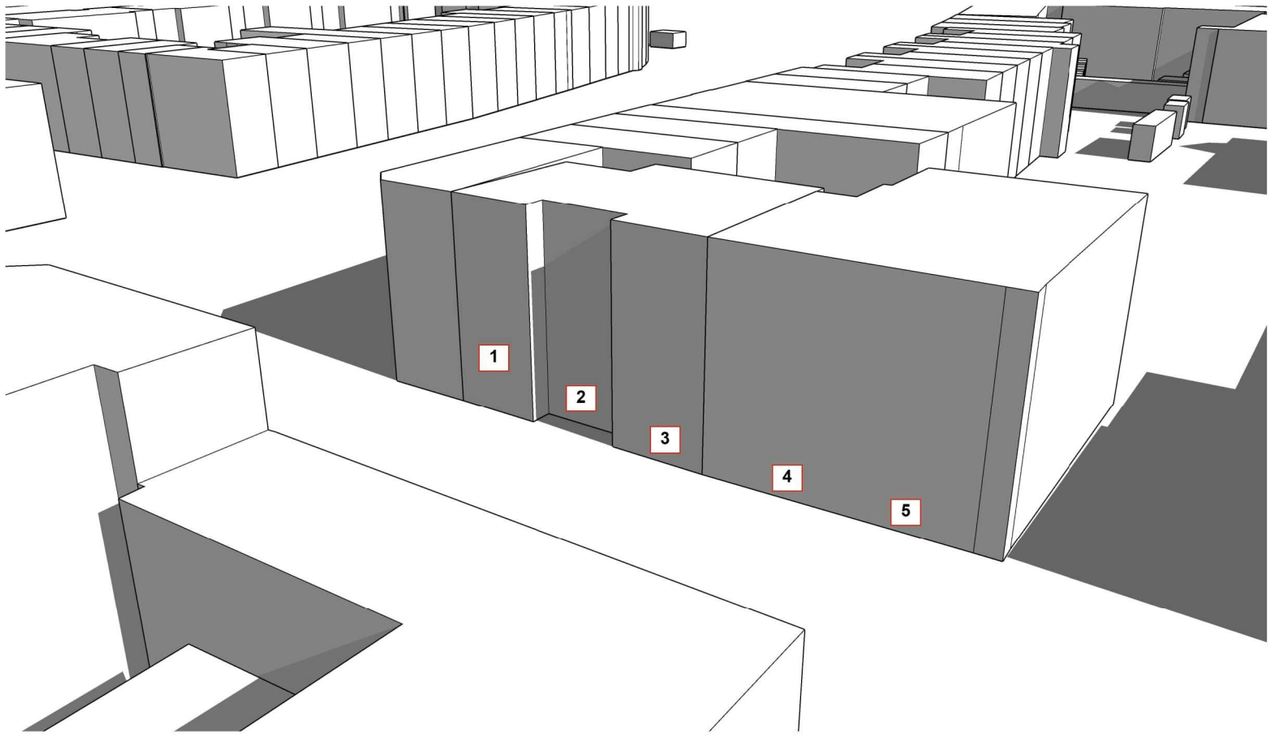


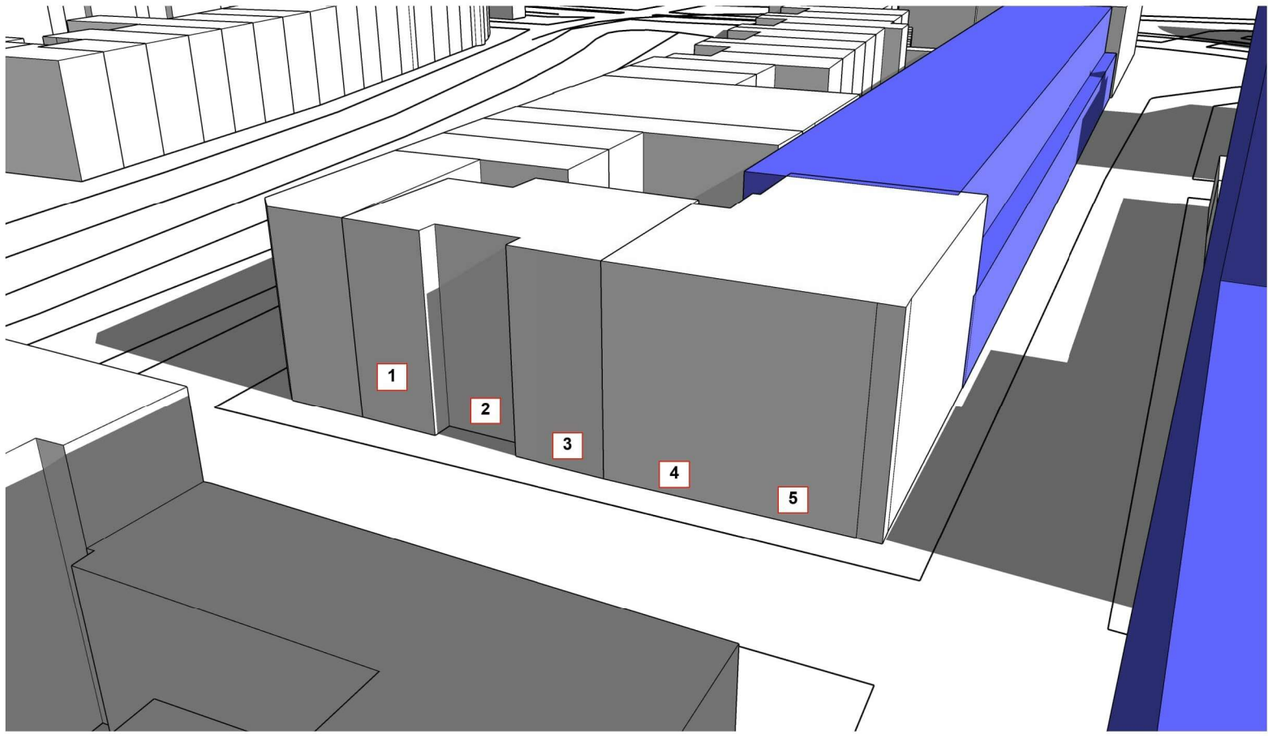
Zomerhofstraat
21 september
14.00



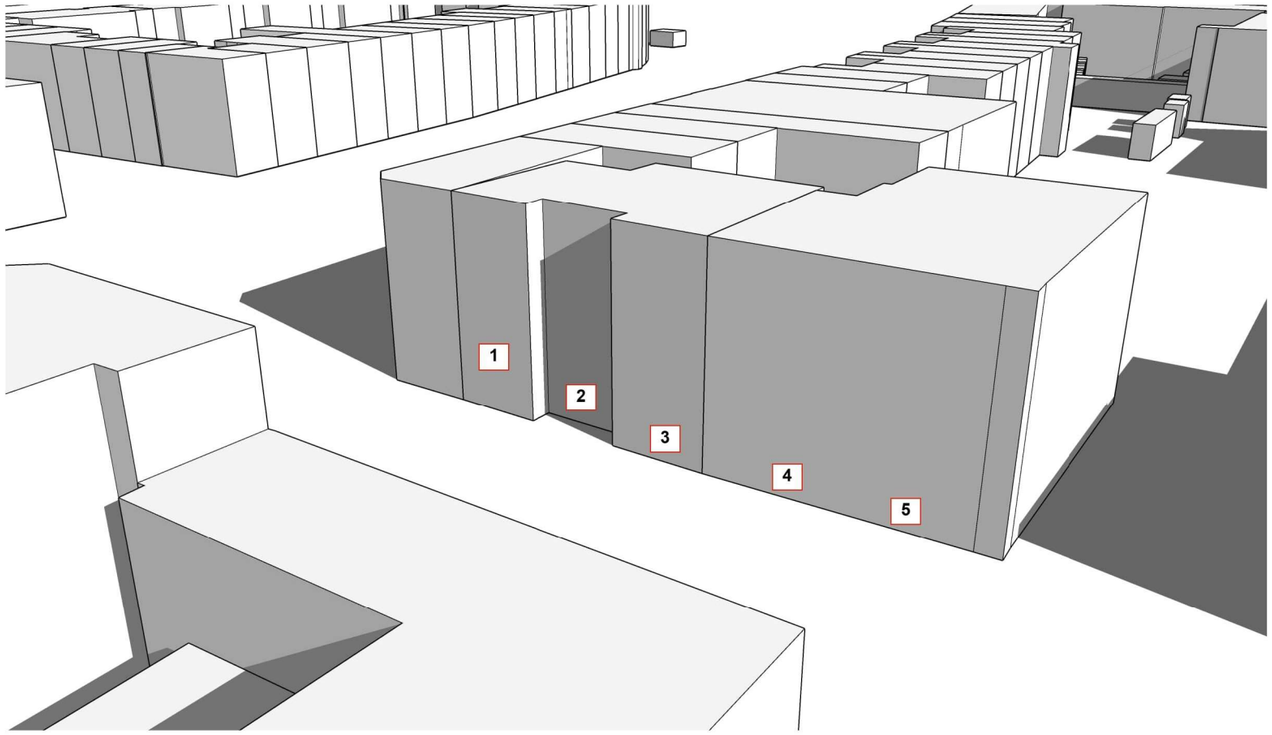


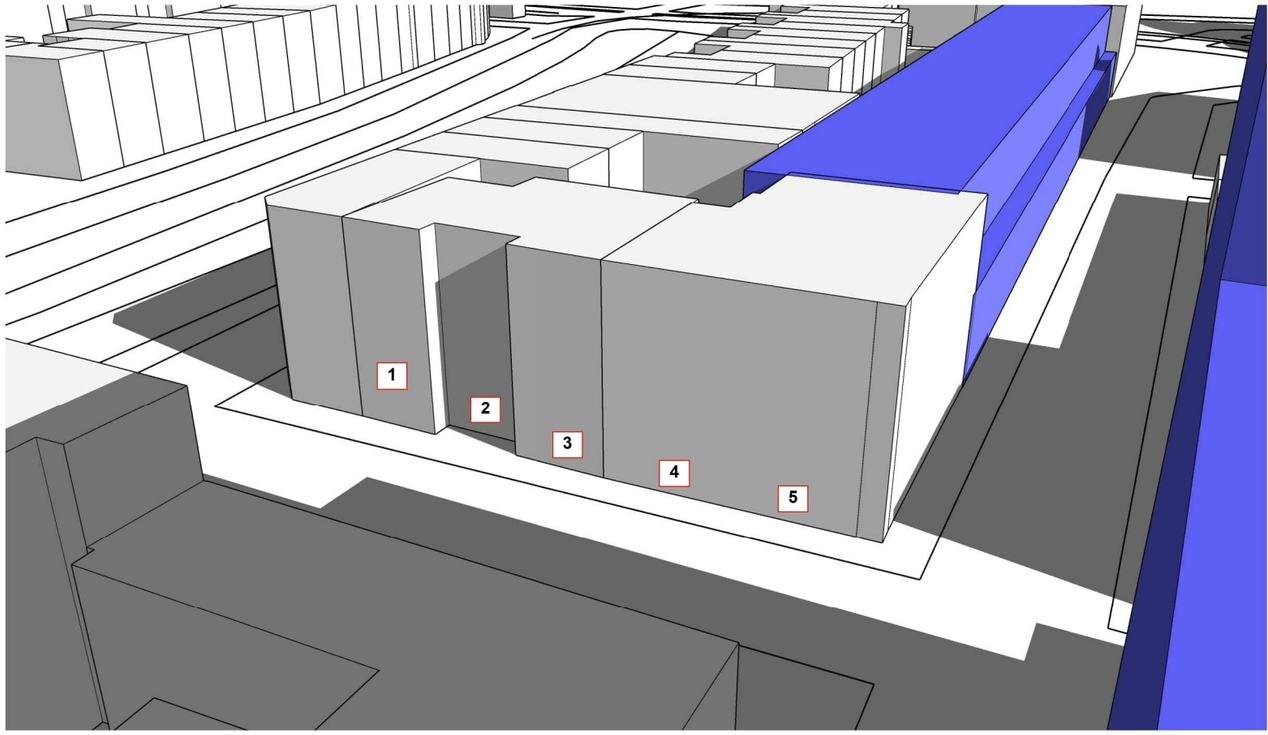
Zomerhofstraat
21 september
14.30





Zomerhofstraat
21 september
15.00





Zomerhofstraat
21 september
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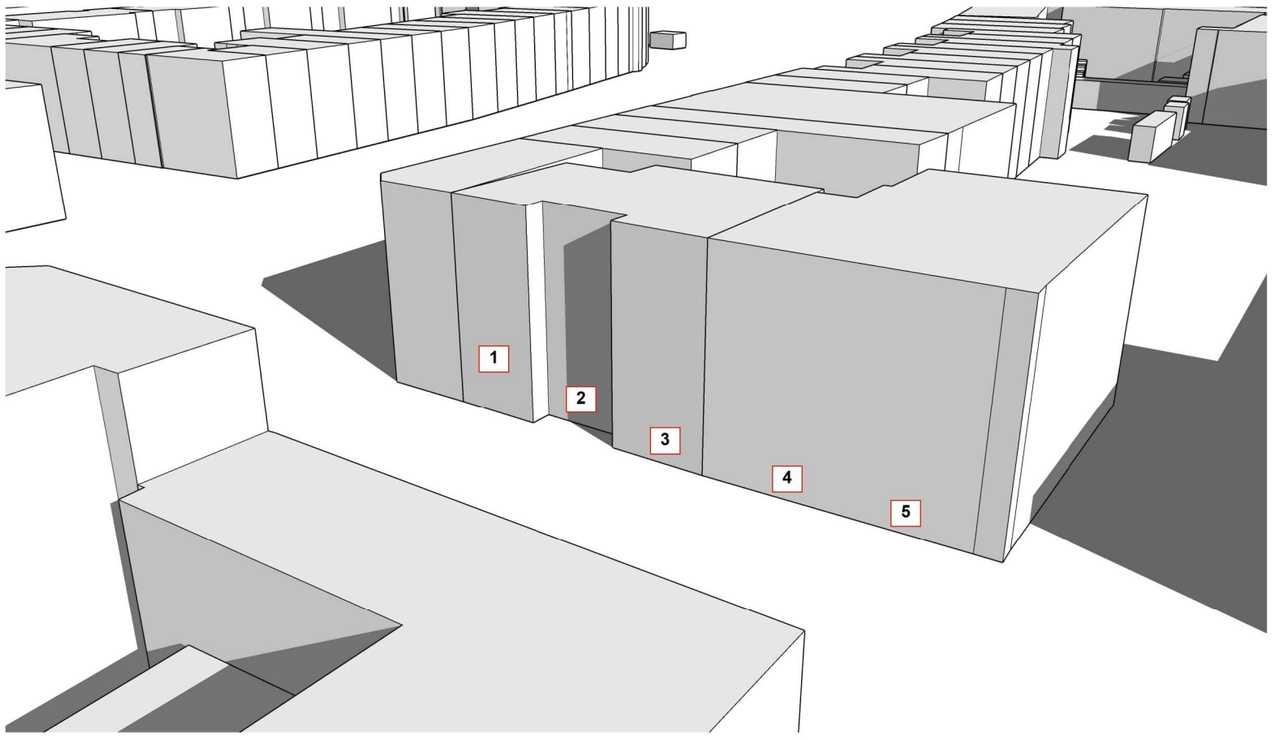

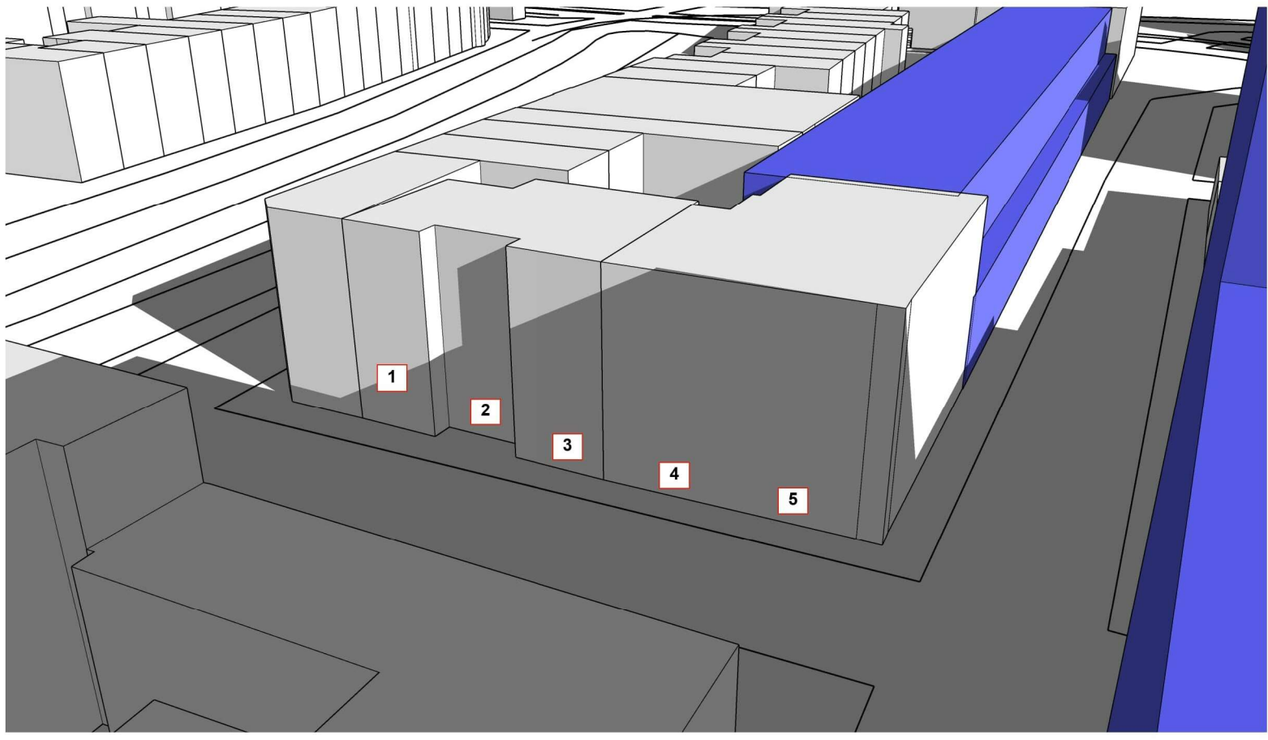

Zomerhofstraat
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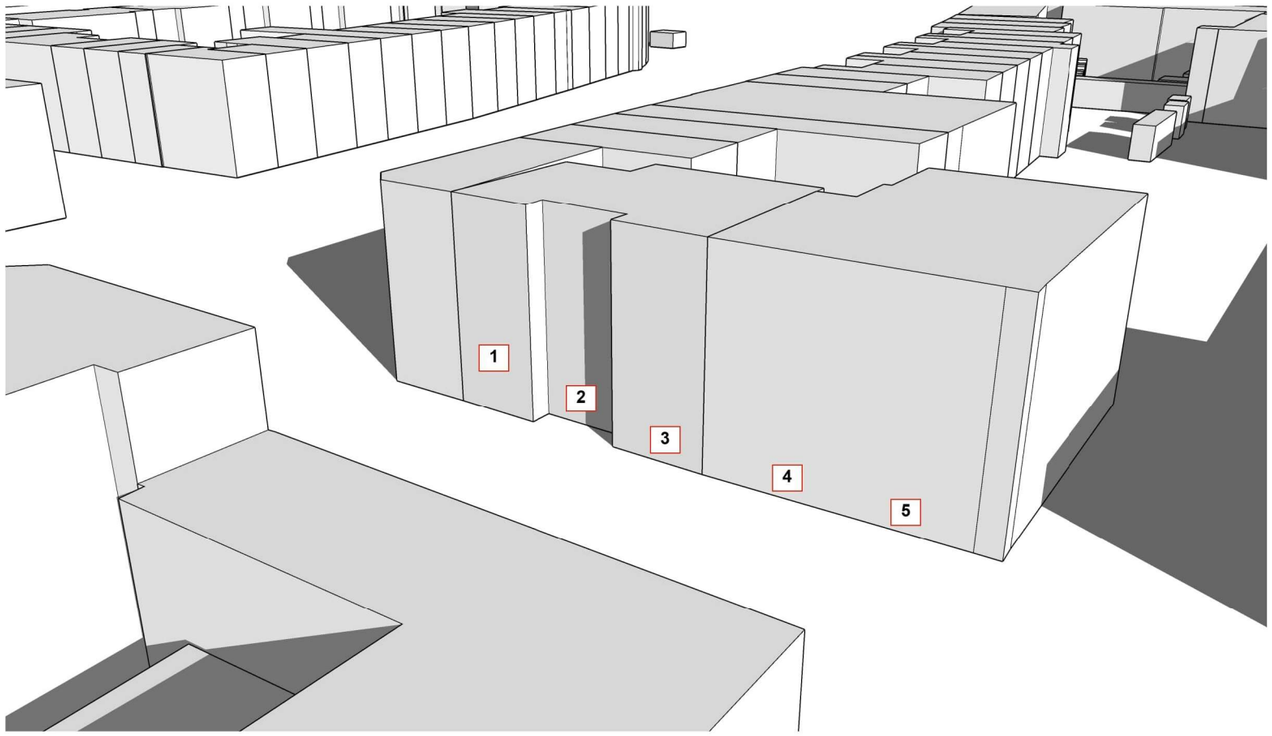
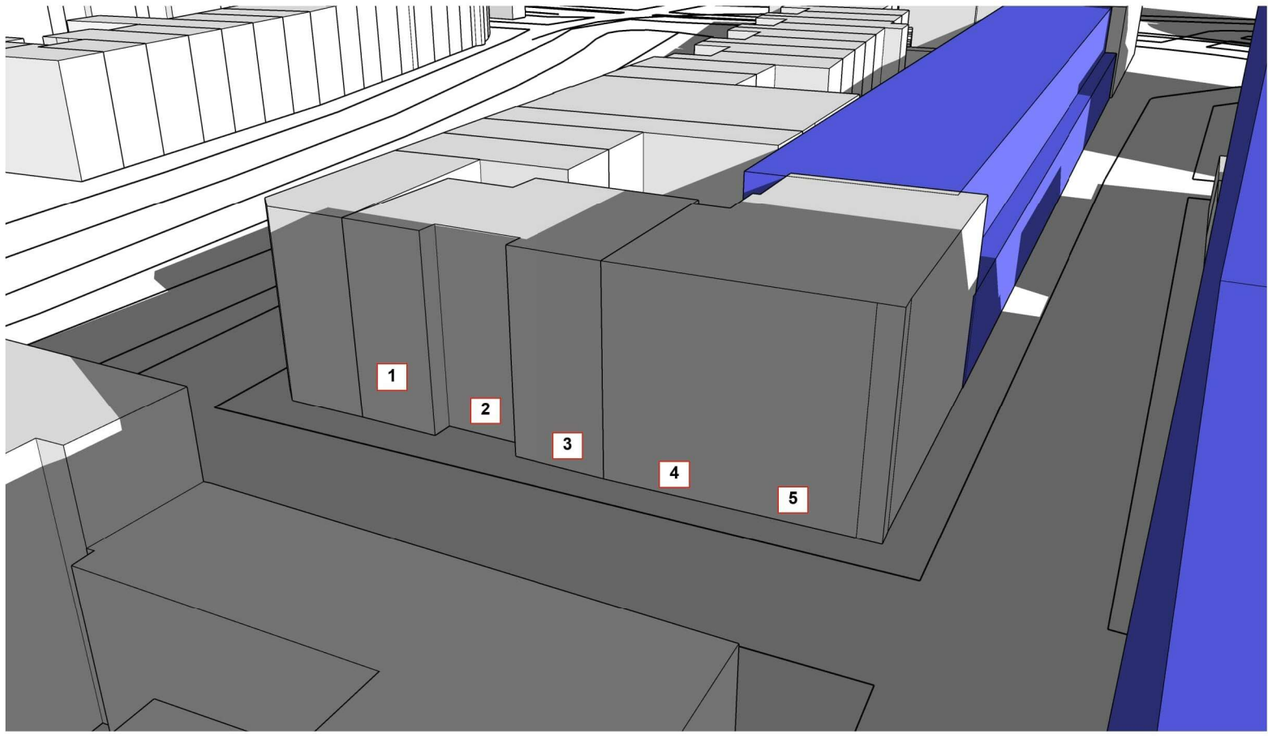
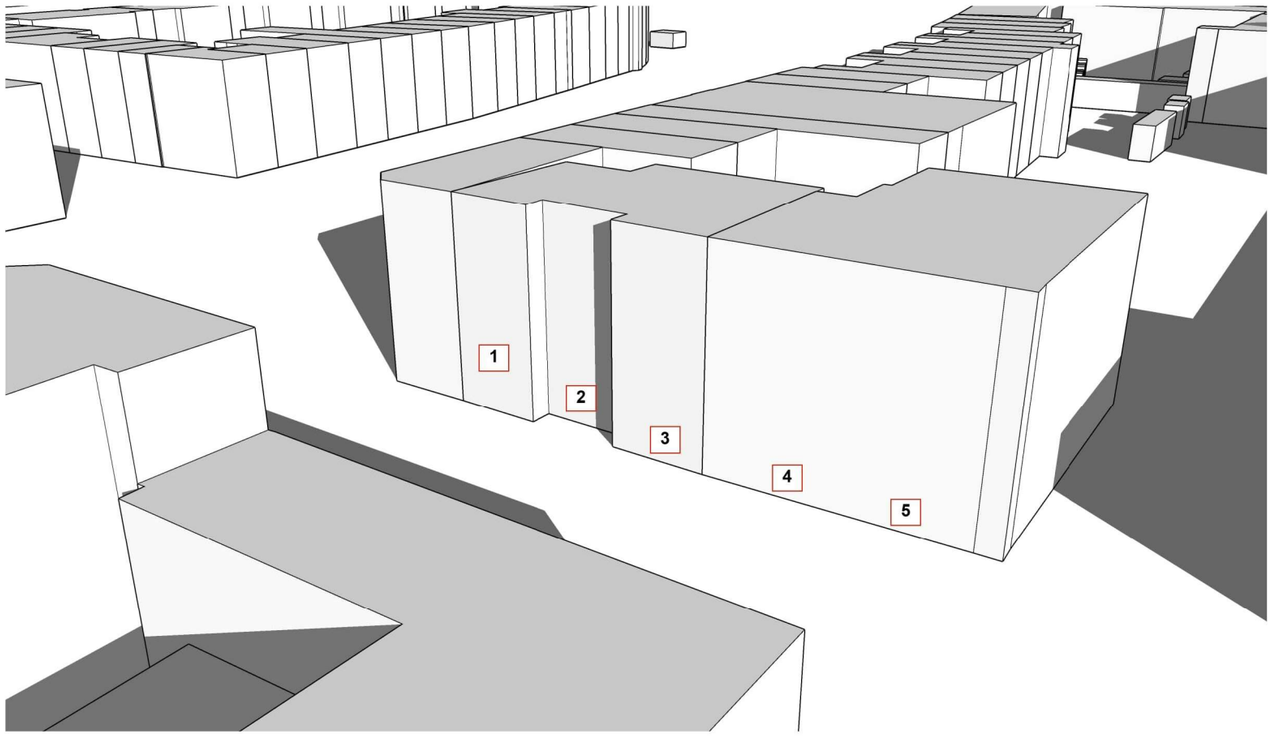
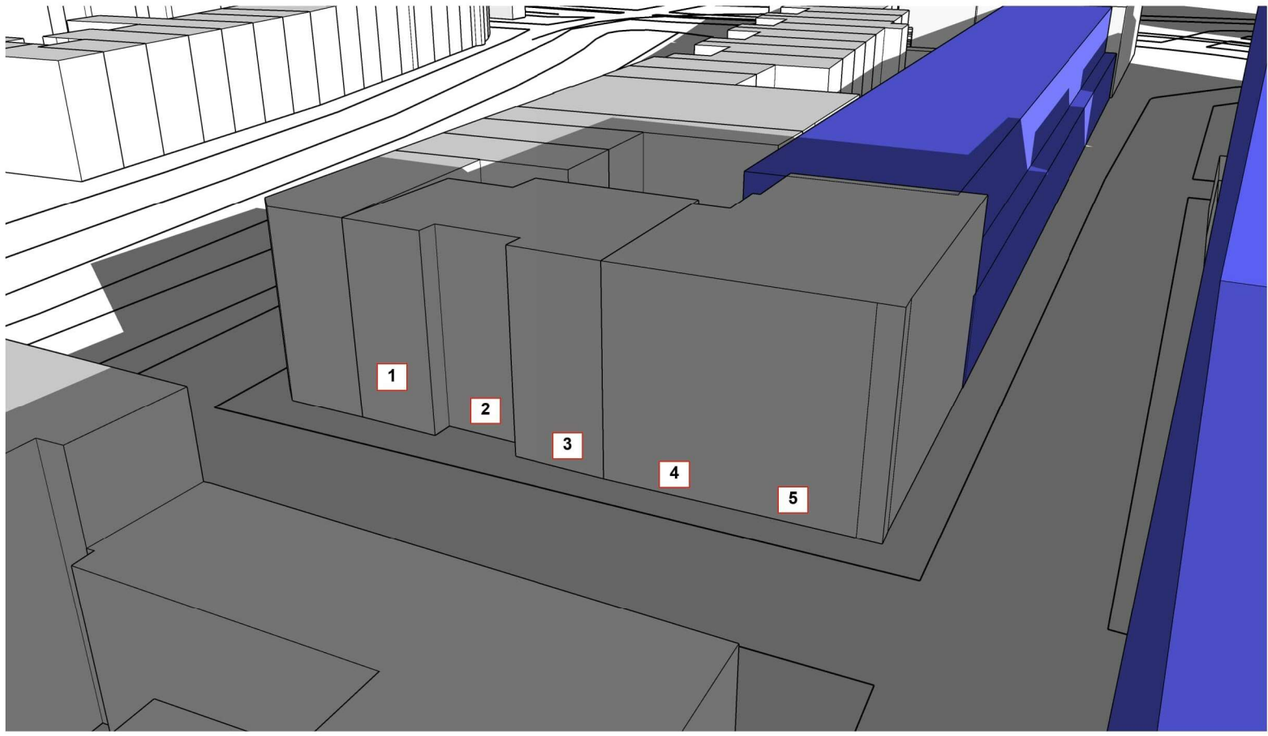
16.00



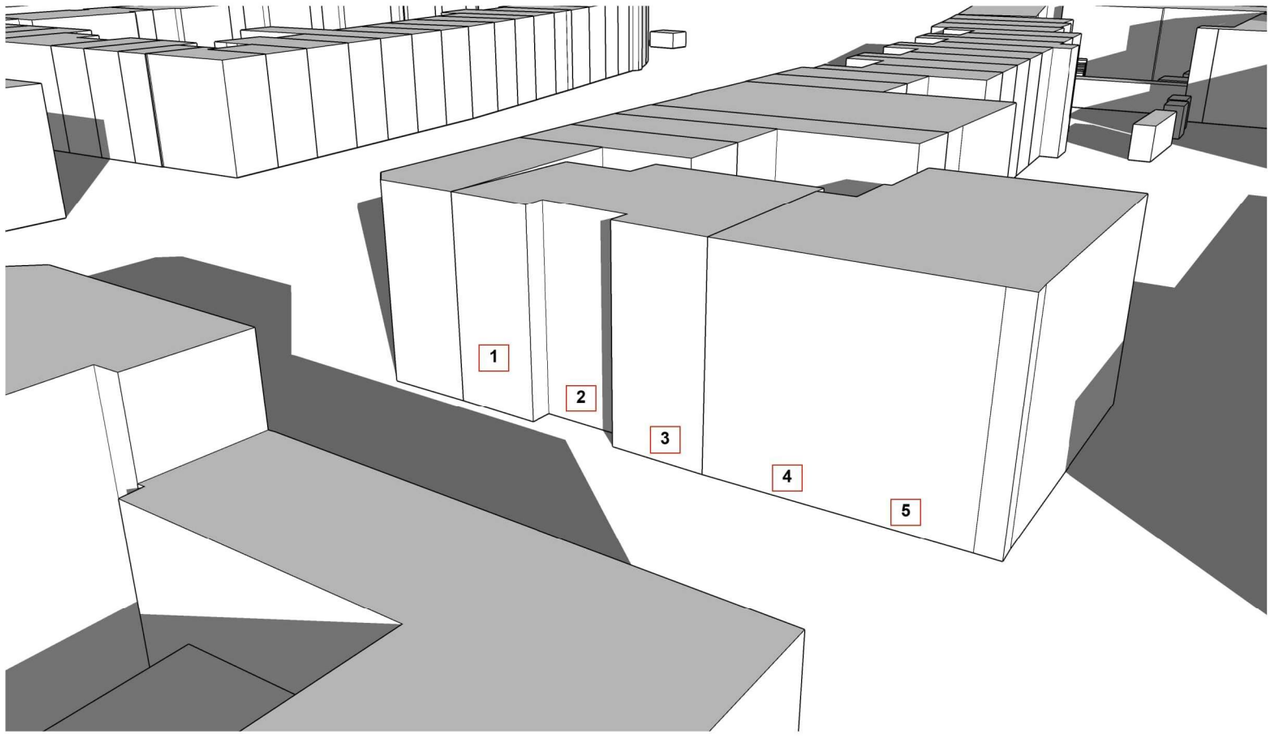


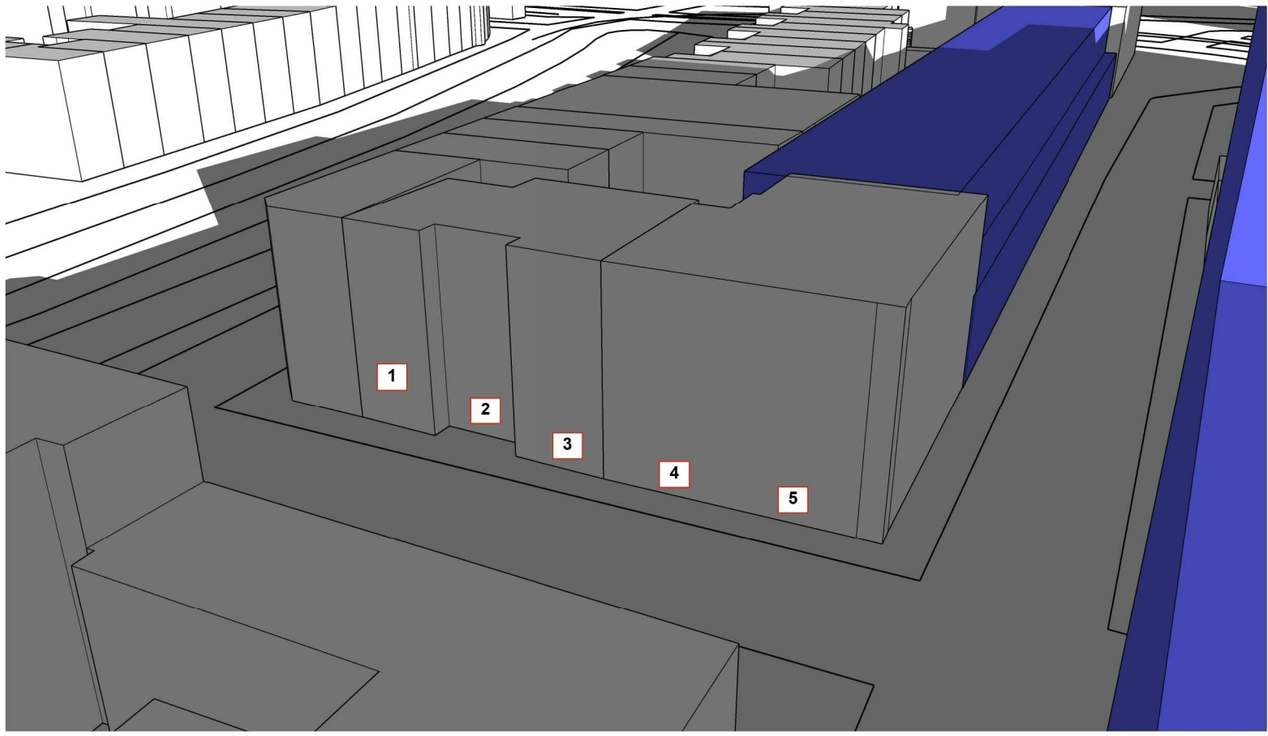
Zomerhofstraat
21 september
16.30



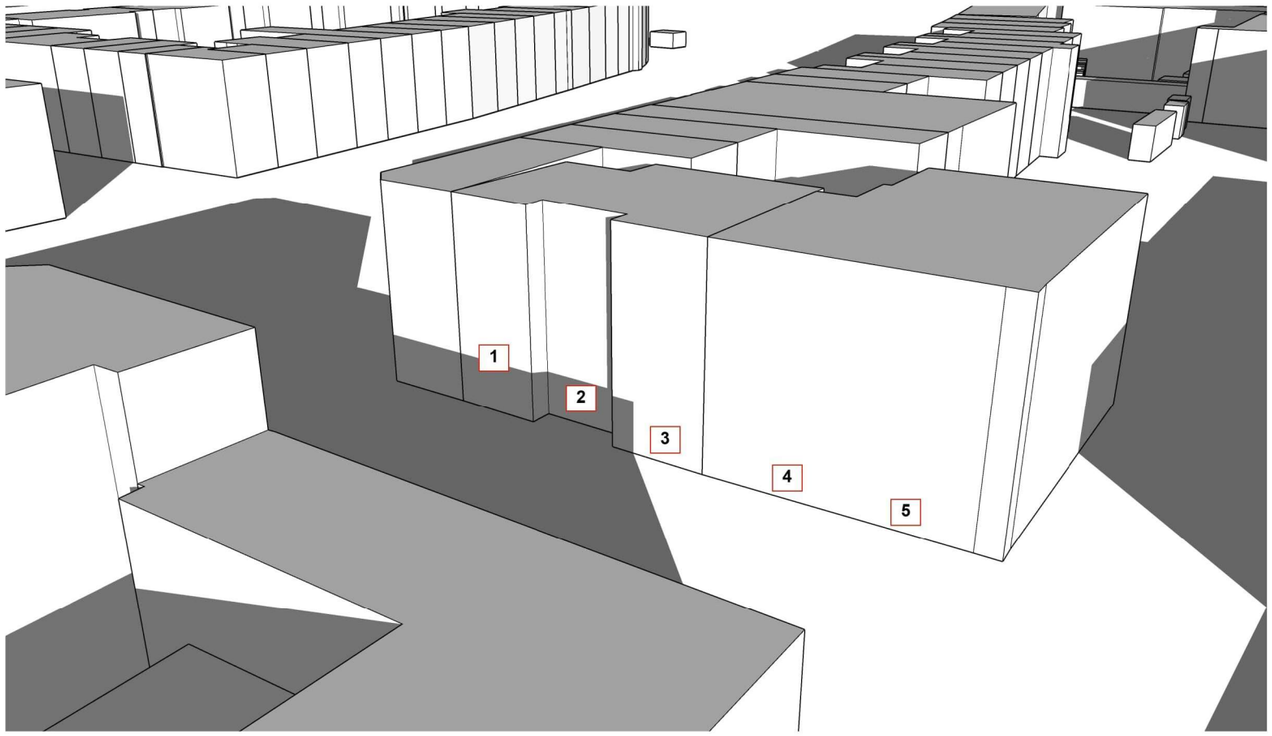


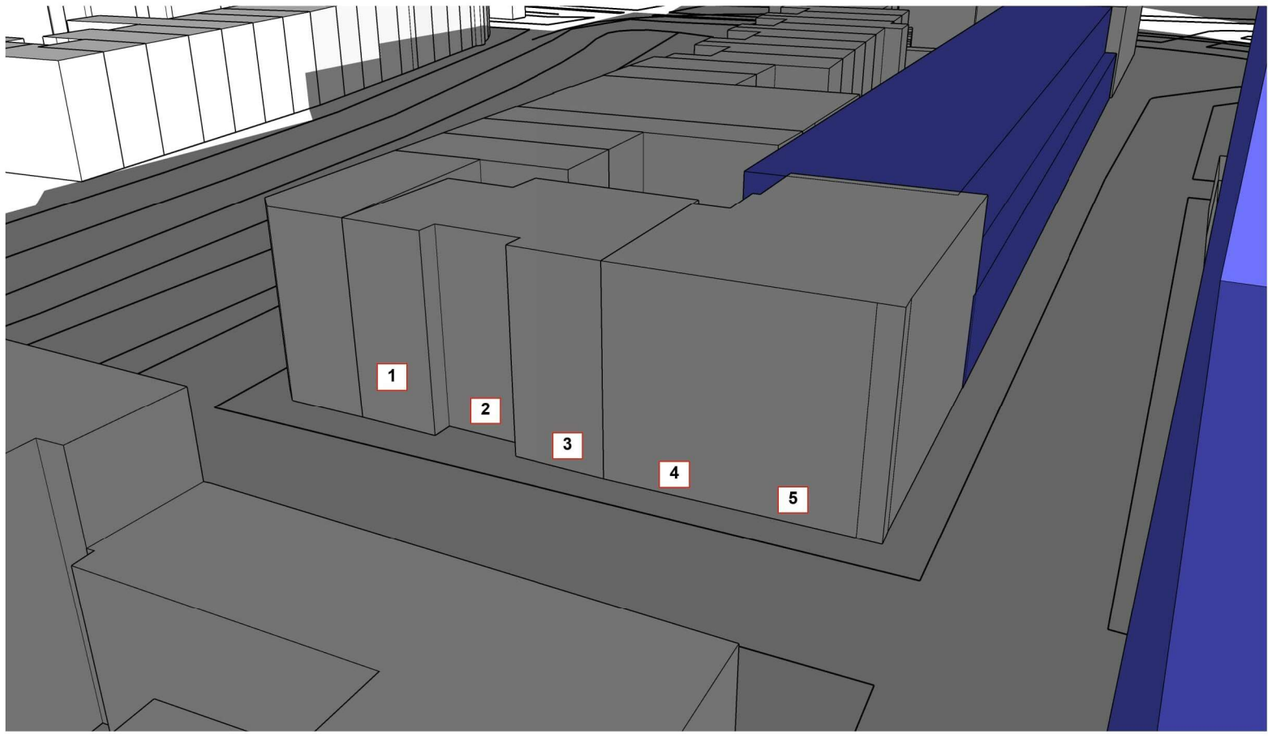
Zomerhofstraat
21 september
17.00





Zomerhofstraat
21 september
17.30





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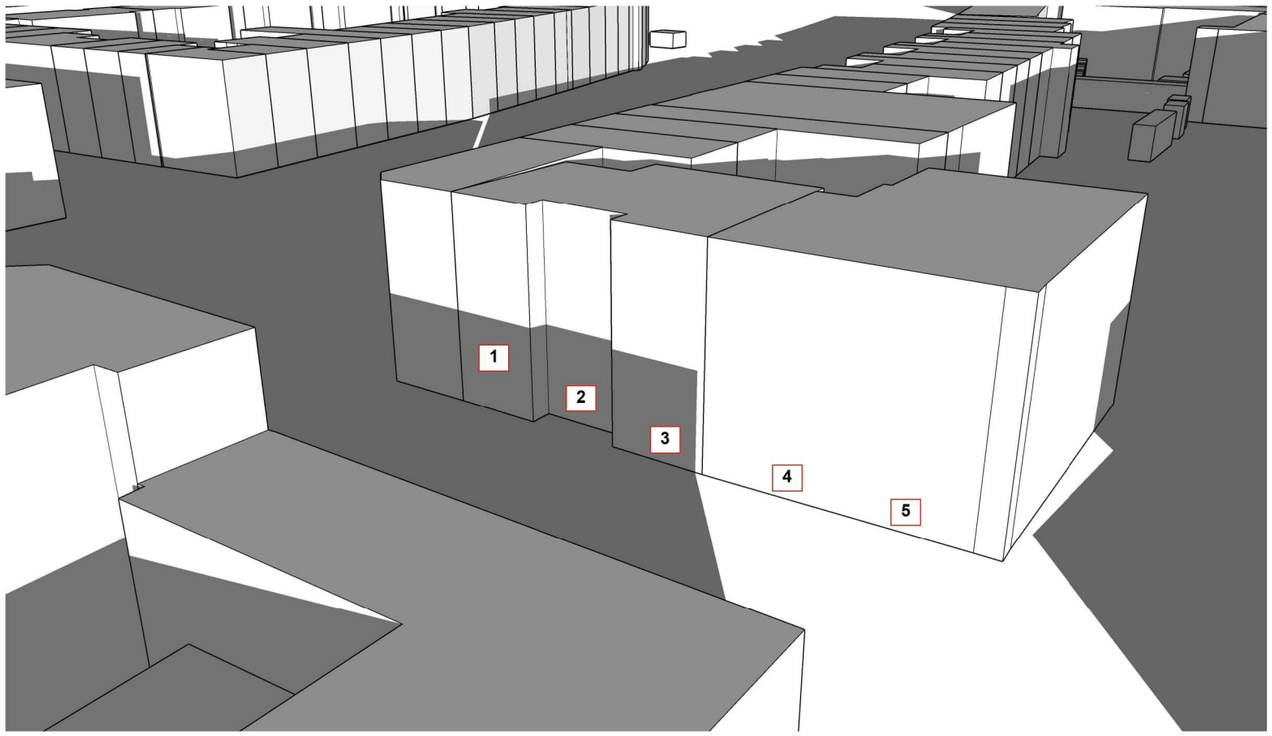
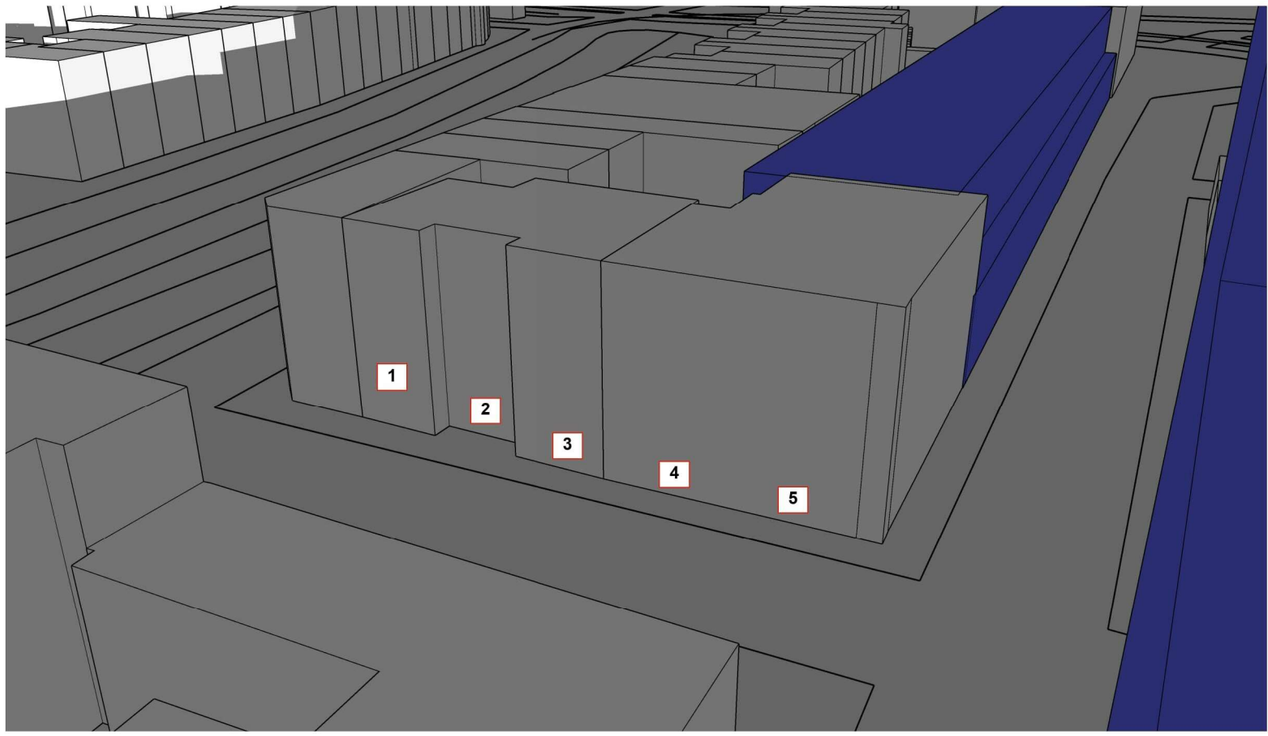
21 september
18.00





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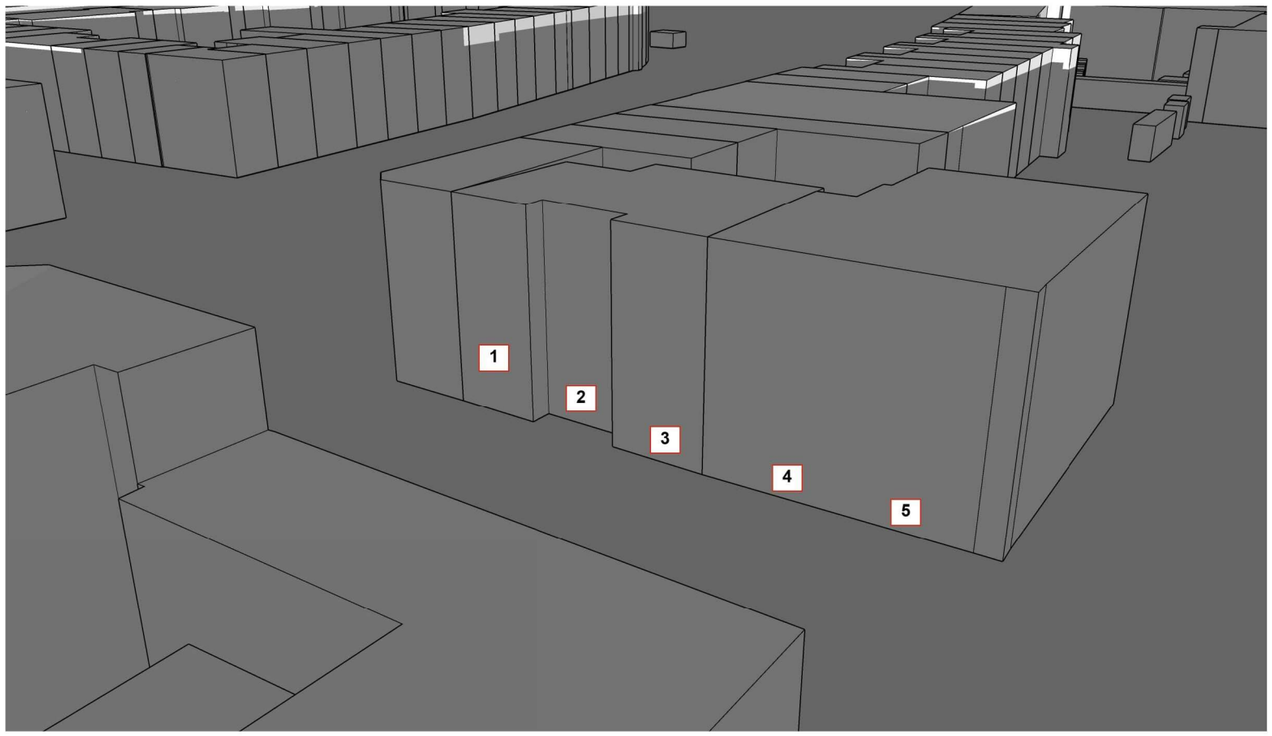

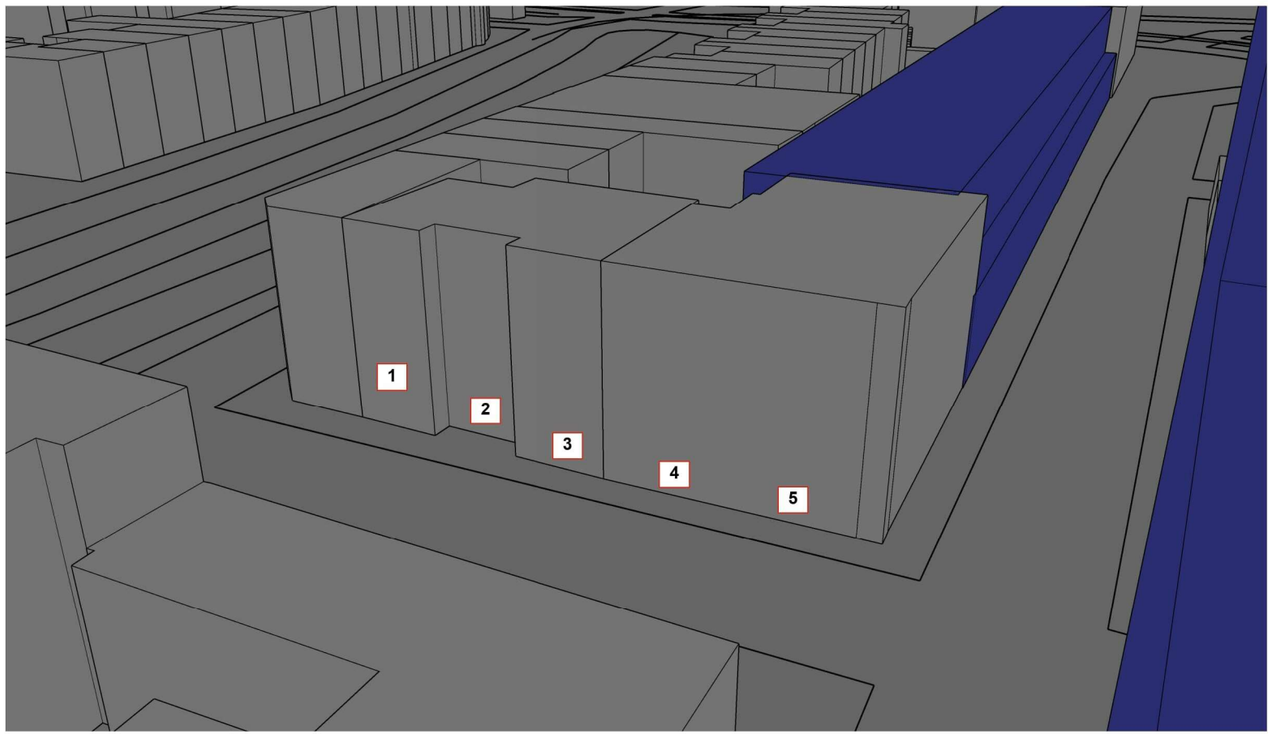

Zomerhofstraat
21 september
19.00

