

24-36 LANGSTON PLACE, EPPING

Overshadowing and Solar Impact Assessment Peer Review

Prepared for:

Langston R&J Pty Ltd
Level 4, 398-402 Sussex Street
HAYMARKET NSW 2000

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Langston R&J Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.17098-R05-v1.0	29 August 2018	James Cleary	Neihad Al-Khalidy	Neihad Al-Khalidy

EXECUTIVE SUMMARY

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Langston R&J Pty Ltd (Langston R&J) to conduct a detailed solar access analysis for the site and surrounds of the proposed 24-36 Langston Place, Epping development. Specific attention is focused around the proposed site and surrounds impact upon the neighbouring CBUS development at 12-22 Langston Place.

The State Environmental Planning Policy (SEPP) 65, supported by the Apartment Design Guide - Part 04 is relevant to the assessment of the daylight access into residential component of the proposed development. The above regulation states that:

- Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid-winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas.
- In all other areas, living rooms and private open spaces of at least 70% of the apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid-winter.
- A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter.

The ADG also outlines the following design guidance:

- To maximise the benefit to residents of direct sunlight within living rooms and private open spaces, a minimum of $1m^2$ of direct sunlight, measured at 1m above floor level is achieved for at least 15 minutes.

Impact on CBUS Development at 12-22 Langston Place

From the model provided SLR has calculated the below summarised ADG assessed direct sunlight to residential apartment results for June 21, between the hours of 9.00 am and 3.00 pm, accounting for multiple relevant surrounding schemes:

- Assessing solar access solely to the 12-22 Langston Place development with no other future proposed surrounds, SLR found that 68.0% (315 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the current proposed DA design 24-36 Langston Place, SLR found that 56.2% (260 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
 - The proposed current DA for 24-36 Langston Place will reduce solar access to 12-22 Langston Place by 11.8%.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place, SLR found that 58.8% (272 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
 - The ADG compliant massing for 24-36 Langston Place will reduce solar access to 12-22 Langston Place by 9.2%.

EXECUTIVE SUMMARY

- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place plus the future proposed northern development, SLR found that 55.5% (257 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
 - The ADG compliant massing for 24-36 Langston Place plus the future proposed northern development will reduce solar access to 12-22 Langston Place by 12.5%.

From the model provided SLR has also conducted an assessment of direct sunlight to residential apartments for June 21, between the hours of 8.00 am and 4.00 pm, finding the below:

- Assessing solar access solely to the 12-22 Langston Place development with no other future proposed surrounds, SLR found that 77.5% (359 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the current proposed DA design 24-36 Langston Place, SLR found that 68.9% (319 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place, SLR found that 70.4% (326 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place plus the future proposed northern development, SLR found that 67.1% (311 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.

Impact on CBUS Development Communal Open Space and Landscaped Area

In assessing solar access to the landscaped podium of Tower 1 and 2 for the CBUS development SLR noted the following:

- Considering existing surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 74% of open area for 2 hrs.
- Considering the proposed DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 35% of open area for 2 hrs.
- Considering the ADG compliant DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 36% of open area for 2 hrs.

Solar Access to Proposed DA for 24-36 Langston Place

With respect to solar access to 24-36 Langston Place when considering future surrounds SLR found the development will meet solar access requirements across June 21, between 9.00 am and 3.00 pm, with:

- 70.30% (71 of 101) of apartments achieving 2 hours solar access across June 21, between 9.00 am and 3.00 pm.
- 9.90% (10 of 101) of apartments achieving no solar access across June 21, between 9.00 am and 3.00 pm.

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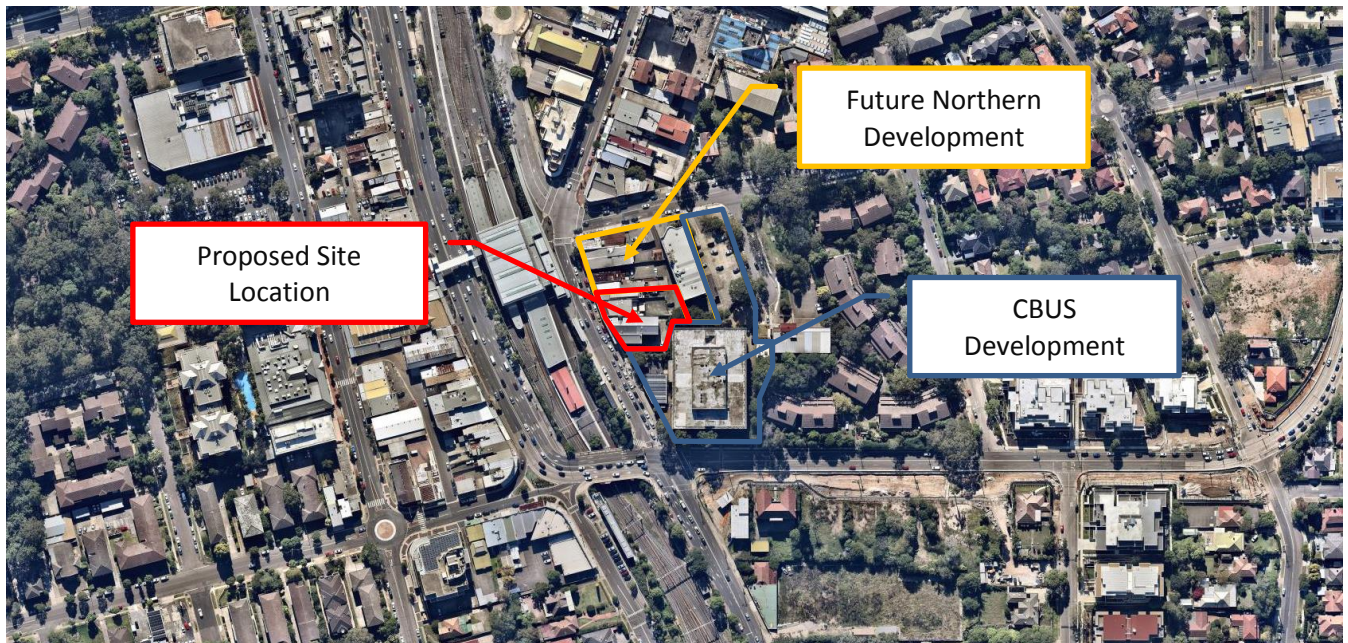
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Appendix B	Survey Data
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Appendix N	Sun Eye Views DA Scheme + Future Northern Development
Appendix O	Solar Access to Private Living Space Calculation 24-36 Langston Place

1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Langston R&J Pty Ltd (Langston R&J) to conduct a detailed solar access analysis for the surrounds of the proposed 24-36 Langston Place, Epping development. Specific attention is focused around the proposed sites impact upon the neighbouring CBUS development at 12-22 Langston Place.

Figure 1 Site Location



1.1 Proposed Development Description

The proposed development will include:

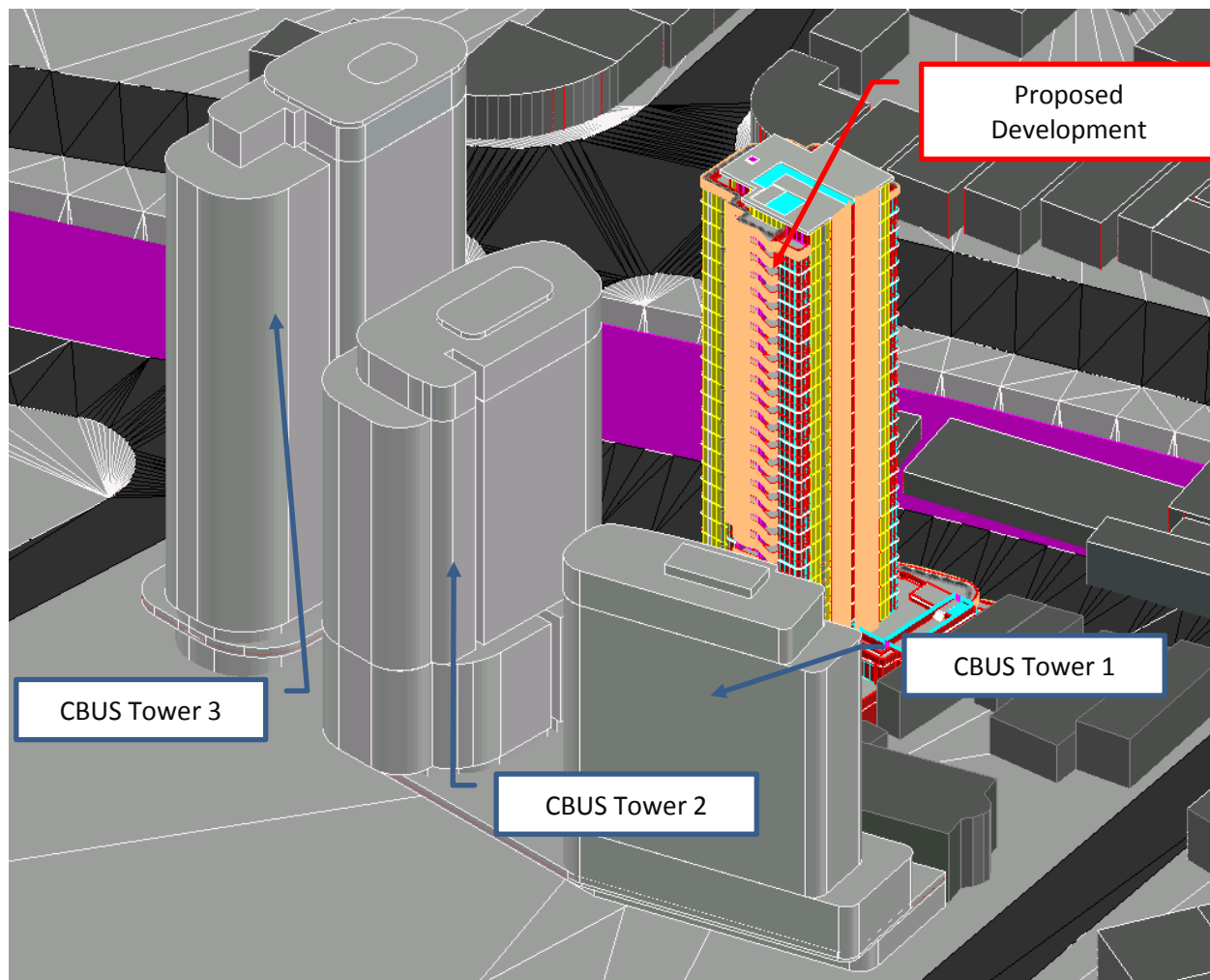
- 5 levels of basement car parking.
- Residential Entry Lobby on Ground Floor.
- Retail and Commercial tenancies on Ground Floor and Level 1, including a large, landscaped terrace on the eastern half of the site at Level 1 connected to a BBQ-terrace area.
- Residential units on Level 2 to Level 26.

1.2 CBUS Development Description

The neighbouring CBUS development will include:

- 4 levels of basement car parking.
- Retail Tenancies and Residential Entry Lobby's on Ground Floor.
- Residential apartments and communal open areas on Level 1 (Podium).
- Tower 1 with residential apartments from Level 1 to Level 18, 91 apartments in total.
- Tower 2 with residential apartments from Level 1 to Level 23, 179 apartments in total.
- Tower 3 with residential apartments from Level 1 to Level 28, 193 apartments in total.
- 463 residential apartments total across the site.

Figure 2 Perspective View of Proposed Site



2 Modelling

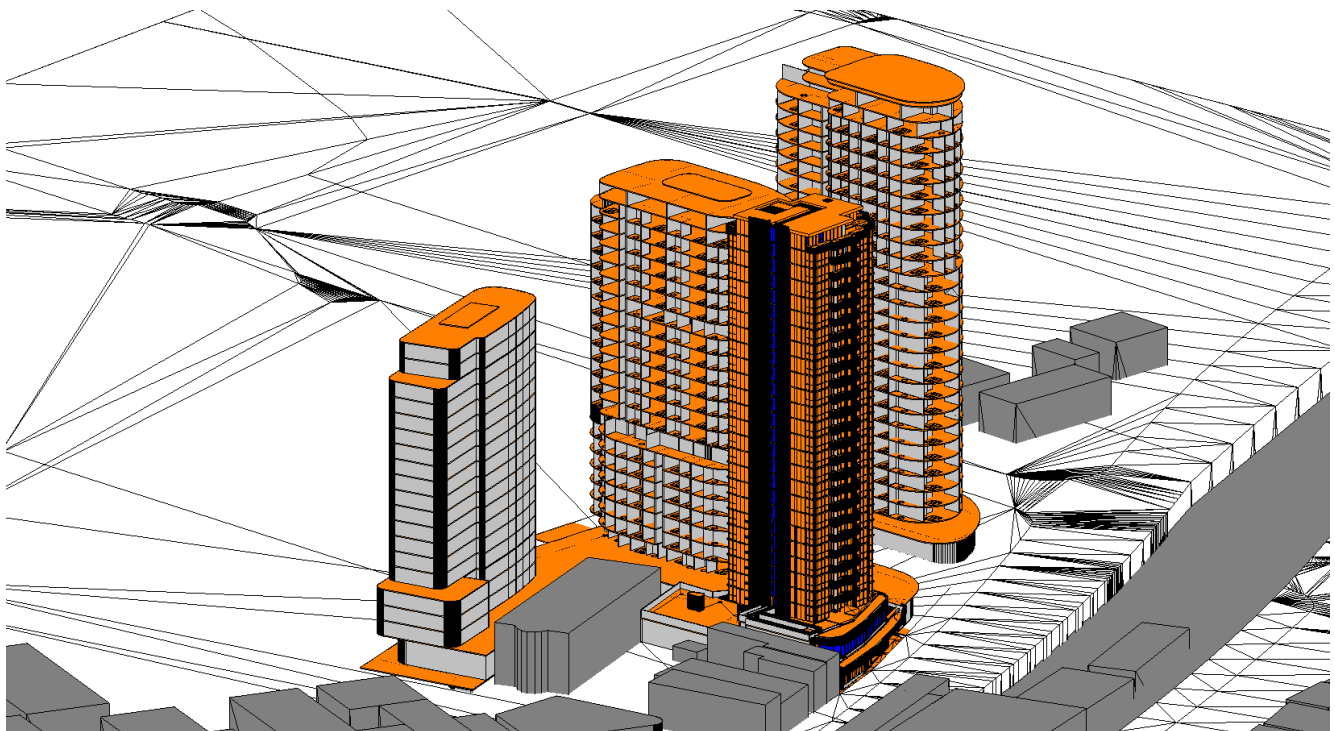
The 3D CAD files, listed below, provided by PTW Architects (PTW) were utilised to conduct the solar analysis (Refer **Figure 3**). CAD files used in assessment:

- PA014879_Langston_AA_FA_DA_C4R - 3D View.dwg, received Thursday 26 July 2018.
- 3DView.dwg, received Monday 30 July 2018.
- 3DView-CBUS.dwg, received Monday 30 July 2018.
- 3DView_ADG compliant_Future North.dwg, received Thursday 2 August 2018.
- 3DView_DA building.dwg, received Wednesday 22 August 2018.

SLR used DA architectural plans DA1005 to DA1024 along with elevations DA2000 to DA2007, attached in **Appendix A**, prepared by Architectus Sydney and provided by PTW, to review the layouts of the 12-22 Langston Place development.

SLR used the amended DA architectural plans DA-1003 to DA-1004 along with elevations DA-2001 to DA-2003, dated 30 July 2018, prepared by PTW, to review the layouts of the 24-36 Langston Place development.

Figure 3 3D Model in ECOTECH



2.1 Site Orientation

SLR used the True North direction shown in the site survey (REF: 7217, dated 04/11/2016), attached **Appendix B**, prepared by SDG Land Development Solutions for Langston R&J. This was found to be in line with the True North of the model provided by PTW.

3 Solar Access

3.1 Daylighting Considerations

The State Environmental Planning Policy (SEPP) 65, supported by the Apartment Design Guide - Part 04 is relevant to the assessment of the daylight access into residential component of the proposed development. The above regulation states that:

- Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid-winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas.
- In all other areas, living rooms and private open spaces of at least 70% of the apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid-winter.
- A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter.

The ADG also outlines the following design guidance:

- To maximise the benefit to residents of direct sunlight within living rooms and private open spaces, a minimum of $1m^2$ of direct sunlight, measured at 1m above floor level is achieved for at least 15 minutes.

SLR has been instructed to assess against the ADG requirements. Specific interest therefore lies in the solar access through living area windows and to balconies of residential apartments during the winter solstice, June 21, between the hours of 9.00 am and 3.00 pm.

3.2 Scope of Assessment

In line with assessments that have been carried out to date, SLR has been requested to assess solar access to the 12-22 Langston Place development accounting for multiple schemes for the proposed 24-36 Langston Place development and surrounds, these will include:

- Current DA scheme for 24-36 Langston Place.
- ADG Compliant Scheme for 24-36 Langston Place.
- ADG Compliant Scheme for 24-36 Langston Place + Future Northern Development.
- No Development to either of 24-36 Langston Place and the Future Northern Site (Current Surrounds).

In addition SLR will also assess solar access to the Tower 1 and 2 landscaped area of the CBUS development for:

- No Development to either of 24-36 Langston Place and the Future Northern Site (Current Surrounds).
- Current DA Scheme for 24-36 Langston Place + Future Northern Development
- ADG Compliant Scheme for 24-36 Langston Place + Future Northern Development.

Furthermore SLR will assess solar access to apartments within the 24-36 Langston Place for the proposed DA scheme, accounting for future proposed surrounds. SLR will assess solar access for the above across June 21, between 9.00 am and 3.00 pm.

4 Results

4.1 Overshadowing Impact on CBUS Development Apartment Solar Access

SLR imported the AutoCAD 3D model into ECOTECT and sun's eye view diagrams were generated for each 15 minute interval between 8.00 am and 4.00 pm on the Winter Solstice (21 June). These can be seen in attached appendices listed below:

- **Appendix C** – Sun Eye Views DA Scheme
- **Appendix D** – Sun Eye Views ADG Massing
- **Appendix E** – Sun Eye Views ADG Massing + Future Northern Development
- **Appendix F** – Sun Eye Views CBUS Development with no other Proposed Development

Results to solar access to living rooms and private open spaces of apartments in the assessed CBUS buildings on June 21 (winter solstice) between the hours of 9.00 am and 3.00 pm inclusive are summarised in the table below, detailed results can be found in **Appendices G – J**.

Table 1 Solar Access Summary to Residential Apartments between 9.00 am and 3.00 pm on June 21

Assessed Surrounds	Number of Apartments	No. of Apartment living areas with at least 2hr of direct sunlight	Percentage of Apartments living areas with 2hr of direct sunlight
No other Future Building	463	315	68.0%
DA Scheme	463	260	56.2%
ADG Massing	463	272	58.8%
ADG + Future North	463	257	55.5%

Based off **Table 1**, SLR has concluded that no proposed scheme for the surrounds of the CBUS development would see the building achieve the required 70% solar access to living rooms and balconies.

In addition to the above, solar access to apartments has also been assessed between the hours of 8.00 am and 4.00 pm, with results summarised in the table below.

Table 2 Solar Access Summary to Residential Apartments between 8.00 am and 4.00 pm on June 21

Assessed Surrounds	Number of Apartments	No. of Apartment living areas with at least 2hr of direct sunlight	Percentage of Apartments living areas with 2hr of direct sunlight
No other Future Building	463	359	77.5%
DA Scheme	463	319	68.9%
ADG Massing	463	326	70.4%
ADG + Future North	463	311	67.1%

Based off **Table 2**, a noticeably significant improvement in solar access results can be observed between 8.00 am and 4.00 pm, with all schemes achieving close to 70%.

4.2 Overshadowing Impact on CBUS Development Communal Open Space

Through the ECOTECT model shadow diagrams were generated for each 15 minute interval between 9.00 am and 3.00 pm on the Winter Solstice (21 June). Based off council's assessment the "The open space of Tower 3 is already substantially overshadowed by the tower immediately above it" SLR has limited the assessed area to the landscaped area between towers 1 and 2. The referenced shadow diagrams are included in the following Appendices:

- **Appendix K** – Shadow Diagrams Existing surrounds to Tower 1 and 2
- **Appendix L** – Shadow Diagrams DA + Future Northern Development surrounds to Tower 1 and 2
- **Appendix M** – Shadow Diagrams ADG + Future Northern Development surrounds to Tower 1 and 2

Solar access to the landscaped area shared by towers 1 and 2 has been calculated and compared in **Table 3**. The 2 hour window that yielded the highest percentage of solar access is highlighted in each scenario.

Table 3 Solar Access to Tower 1 and 2 Landscaped Area

Time	Solar Access with Existing surrounds (%)	Solar Access with DA + Future Northern Development surrounds (%)	Solar Access with ADG + Future Northern Development surrounds (%)
0900	17.01%	17.01%	17.01%
0915	16.01%	16.01%	16.01%
0930	15.27%	15.27%	15.27%
0945	14.08%	13.74%	13.74%
1000	15.42%	12.93%	12.93%
1015	19.01%	12.96%	12.29%
1030	24.08%	16.62%	17.06%
1045	33.02%	24.05%	24.35%
1100	41.26%	29.70%	30.54%
1115	42.88%	29.91%	30.02%
1130	45.95%	31.09%	30.85%
1145	47.19%	31.12%	29.21%
1200	50.47%	32.59%	29.74%
1215	56.53%	33.87%	31.96%
1230	63.77%	34.20%	34.78%
1245	69.70%	35.14%	36.72%
1300	75.09%	39.34%	39.72%
1315	78.22%	41.98%	43.10%
1330	83.87%	46.35%	47.13%
1345	86.68%	47.65%	48.09%
1400	86.05%	45.86%	46.80%
1415	85.73%	44.09%	44.56%
1430	82.90%	40.88%	42.86%

Time	Solar Access with Existing surrounds (%)	Solar Access with DA + Future Northern Development surrounds (%)	Solar Access with ADG + Future Northern Development surrounds (%)
1445	80.42%	36.21%	37.33%
1500	74.37%	28.35%	29.49%

From **Table 3** the following conclusions can be drawn:

- Considering existing surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 74% of open area for 2 hrs.
- Considering the proposed DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 35% of open area for 2 hrs.
- Considering the ADG compliant DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 36% of open area for 2 hrs.

4.3 Solar Access to Proposed DA for 24-36 Langston Place

SLR has produced a further set of sun eye views from ECOTECT generated for each 15 minute interval between 9.00 am and 3.00 pm on the Winter Solstice (21 June), taking into account the CBUS and Future Northern development along with the proposed DA design to 24-36 Langston Place; these can be found in **Appendix N**.

Results for solar access to living rooms and private open spaces of apartments in the 24-36 Langston Place development on June 21 (winter solstice) between the hours of 9.00 am and 3.00 pm inclusive, were generated are summarised in the table below, detailed results can be found in **Appendices O**.

Table 4 Solar Access Summary for 24-36 Langston Place DA Scheme between 9.00 am and 3.00 pm on June 21

Number of Apartments	Percentage of Apartment living areas with at least 2hr of direct sunlight	Percentage of Apartment living areas with no direct sunlight
101	70.30% (71 of 101)	9.90% (10 of 101)

Based off **Table 4**, it is shown that the proposed development for 24-36 Langston Place will meet solar access requirements across June 21, between 9.00 am and 3.00 pm.

5 Discussion

5.1 Overshadowing Impact on CBUS Development Apartment Solar Access

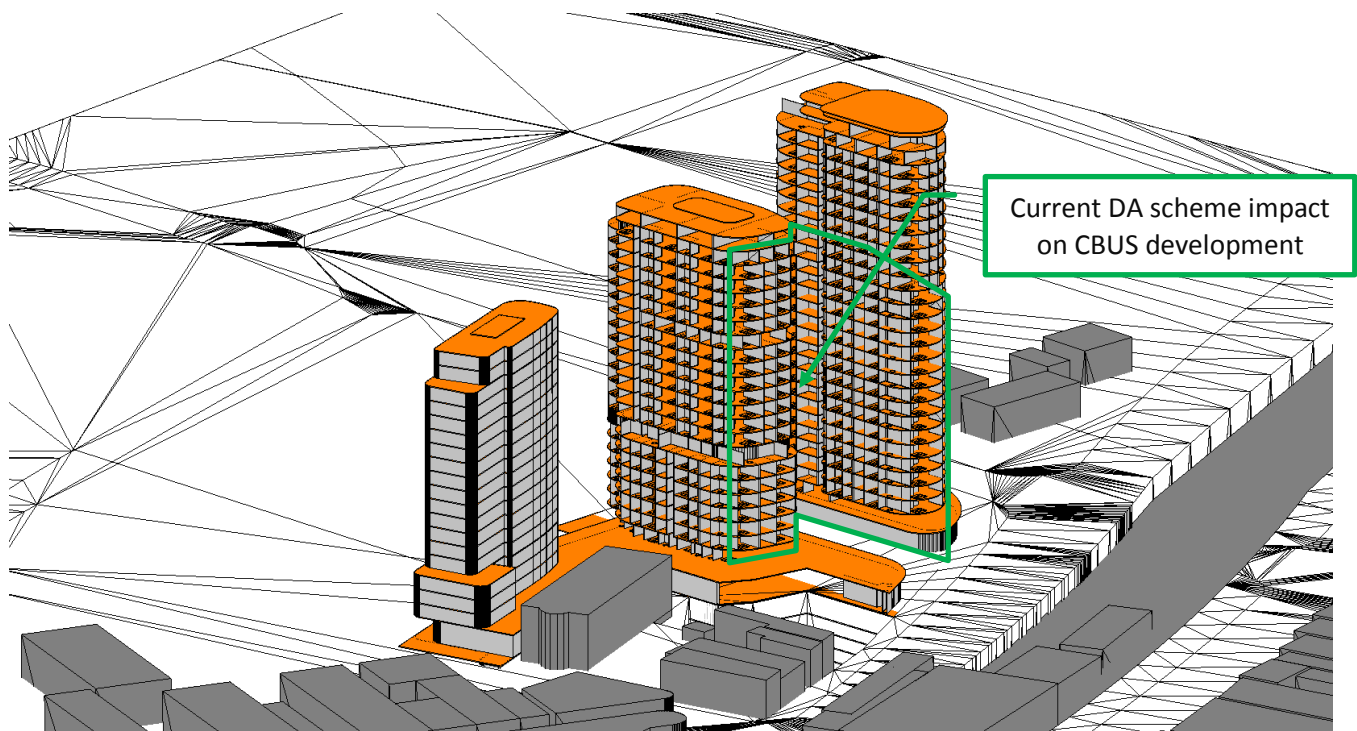
Based on the outlined results the following can be observed for the surrounding schemes assessed.

5.1.1 Current DA Scheme

The current DA scheme will impact the Tower 2 and Tower 3 of the 12-22 Langston Place development, with shadows cast up to the 23rd floor, mainly to the western side of the development.

- The impact will result in a reduction of 54 apartments achieving the ADG 2hrs solar access criterion, which equates to an 11.8% reduction in solar Access to the CBUS site between 9.00 am and 3.00 pm.

Figure 4 Impact of Proposed DA 24-36 Langston Place

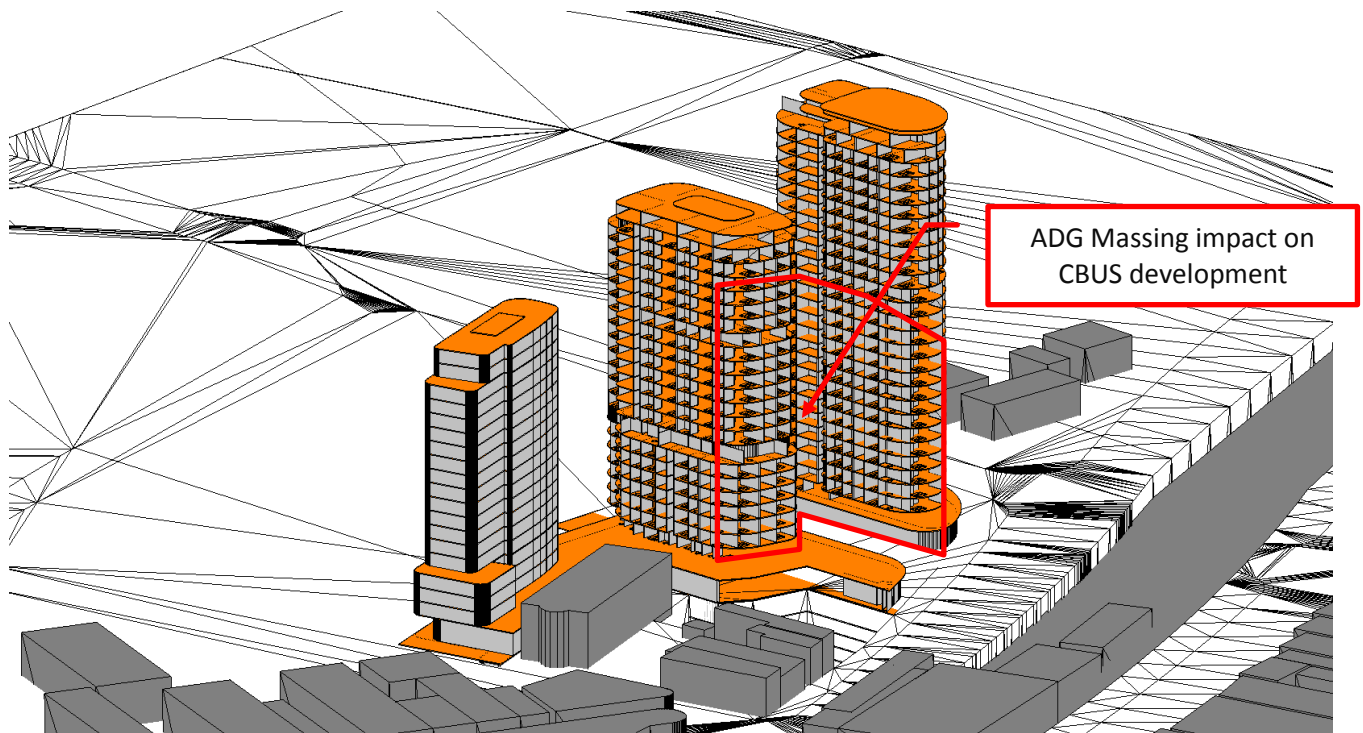


5.1.2 ADG Massing

The ADG compliant massing will impact the Tower 2 and Tower 3 of the 12-22 Langston Place development, with shadows cast up to the 19th floor, mainly to the western side of the development.

- The impact will result in a reduction of 43 apartments achieving the ADG 2hrs solar access criterion, which equates to a 9.2% reduction in solar Access to the CBUS site between 9.00 am and 3.00 pm.

Figure 5 Impact of ADG Compliant Massing 24-36 Langston Place

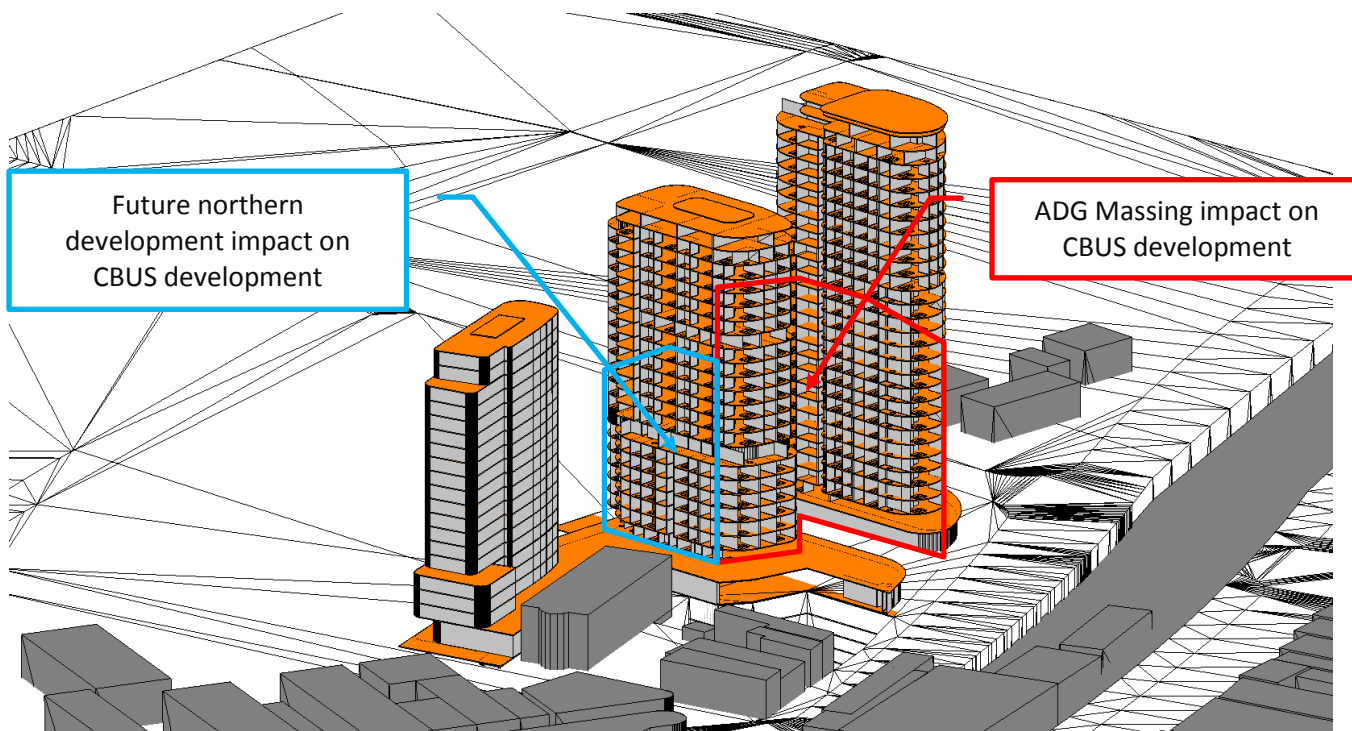


5.1.3 ADG Massing + Future Northern Development

In addition to the ADG compliant massing, the proposed future northern development will impact the Tower 2 of the 12-22 Langston Place development, with shadows cast up to the 19th floor, mainly to the western side of the development.

- The impact will result in a reduction of 58 apartments achieving the ADG 2hrs solar access criterion, which equates to a 12.5% reduction in solar Access to the CBUS site between 9.00 am and 3.00 pm.

Figure 6 Impact of ADG Compliant Massing 24-36 Langston Place + Future Northern Development



5.2 Overshadowing Impact on CBUS Development Communal Open Space

Based off the solar access assessment to the landscaped areas of the Tower 1 and 2, there was a significant reduction in direct sunlight to the space when accounting for future surrounds. However it would be unreasonable to assume the entirety of the space be proposed as communal open space, given this when assessing the shadow diagrams SLR noted the locations that were best suited across all scenarios. These can be seen in **Figure 7**.

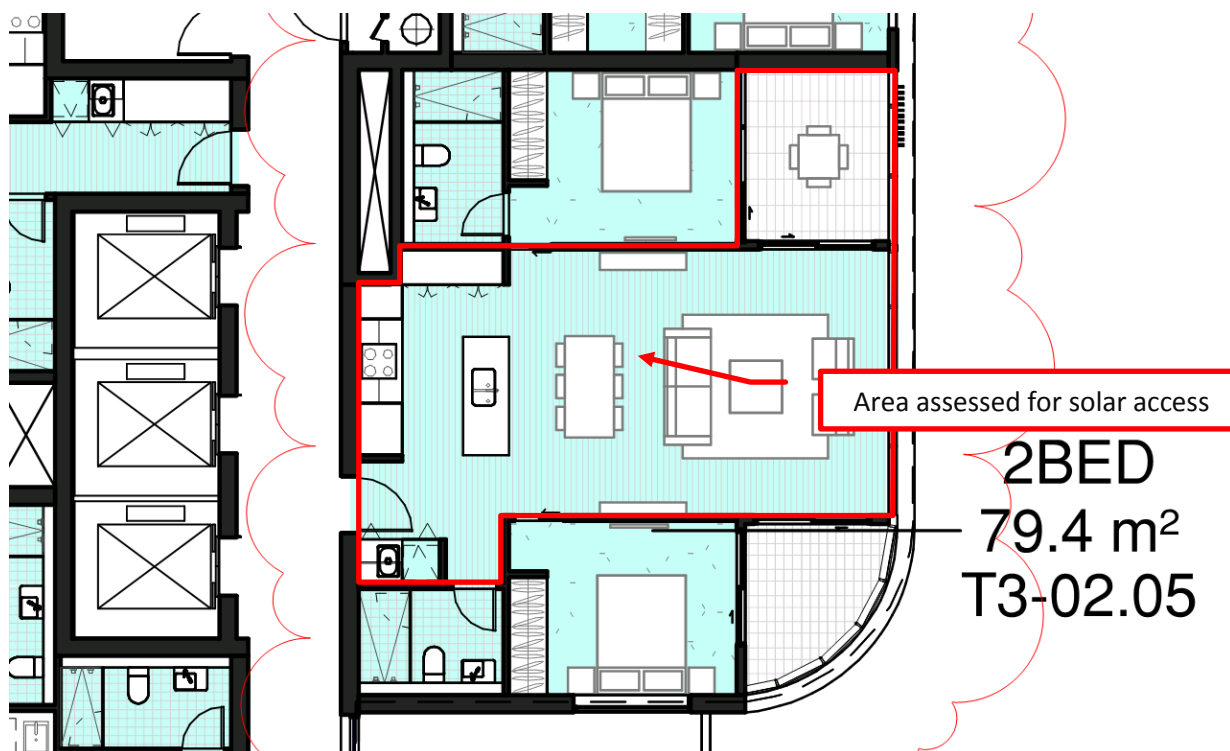
Figure 7 CBUS Tower 1 and 2 Communal Open Space



5.3 Solar Access to CBUS Development Apartment T3-02-05 and Similar

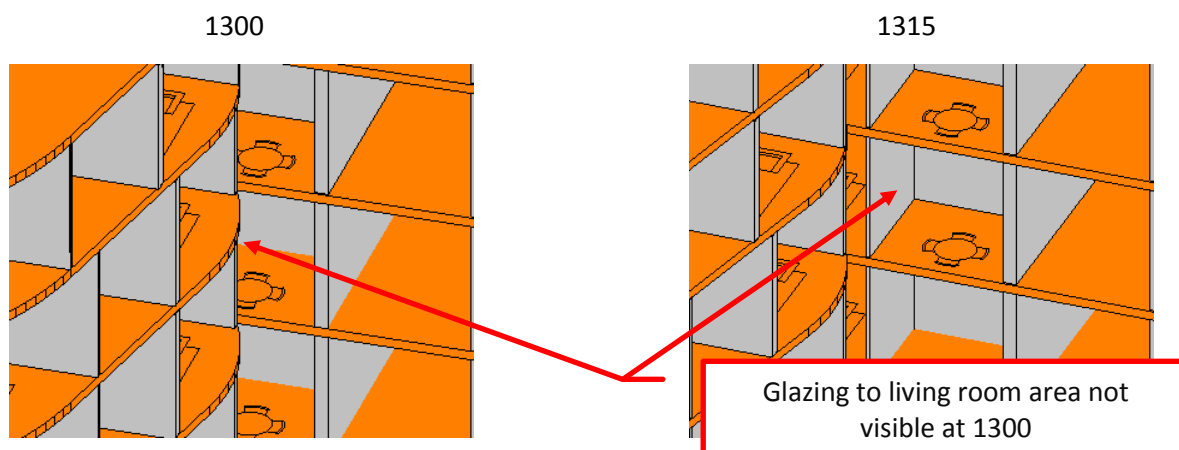
In assessing solar access to CBUS apartment T3-02-05 and similar, SLR has elected to assess solar access to one of the balconies along with the living room, rather than subjecting both balconies to the 2 hours solar access criterion.

Figure 8 Area Assessed for Solar Access to T3-02-05



In assessing solar access along the above guidelines the results for the relevant apartments have improved, however SLR has noted that apartments below level 19 are still impacted by the Tower 2 (T2) CBUS development building. Specifically the living room to the outlined apartments is obstructed from 9.00 am until after 1.00 pm, resulting in the apartment living room not achieving the required 2 hours solar access.

Figure 9 Solar Access to Apartment T3-15-05 at 1300 and 1315



5.4 Solar Access to 24-36 Langston Place 804 and Similar

Sun eye views for the solar access to 24-36 Langston Place have been included in **Appendix N**, however for clarity regarding solar access to apartment 804 and similar, additional enhanced images have been outlined in **Figure 10** and **Figure 11**.

Figure 10 Solar Access to 24-36 Langston Place at 1300

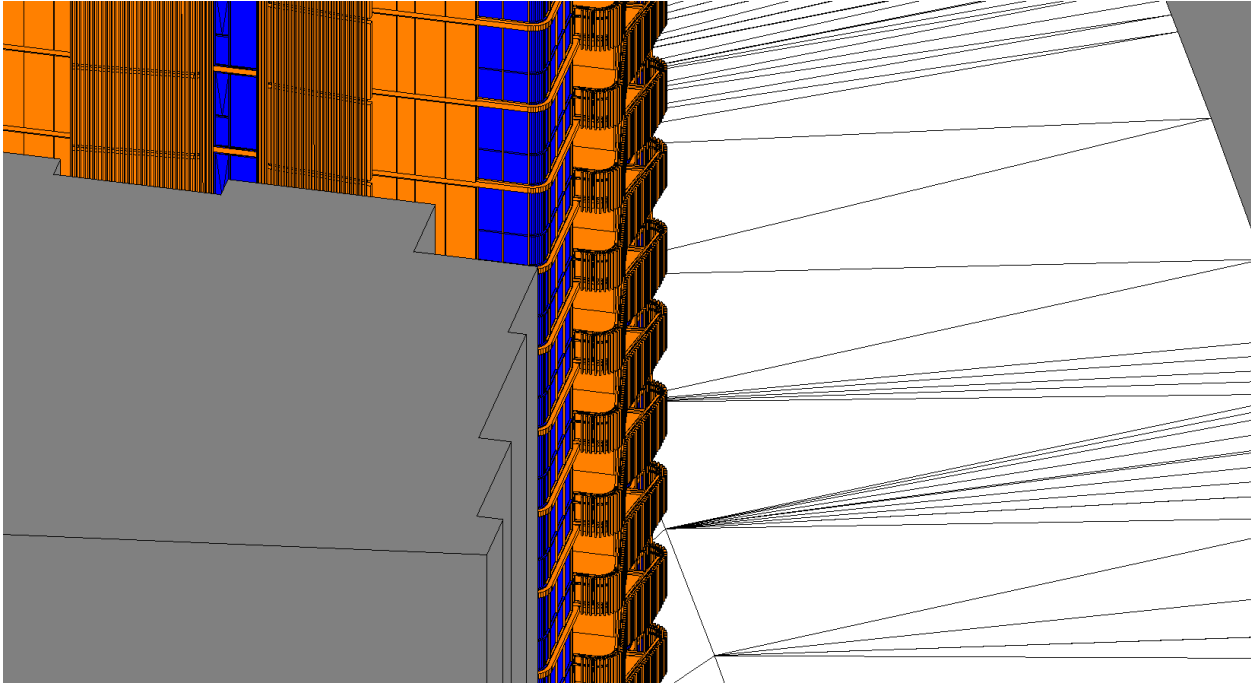
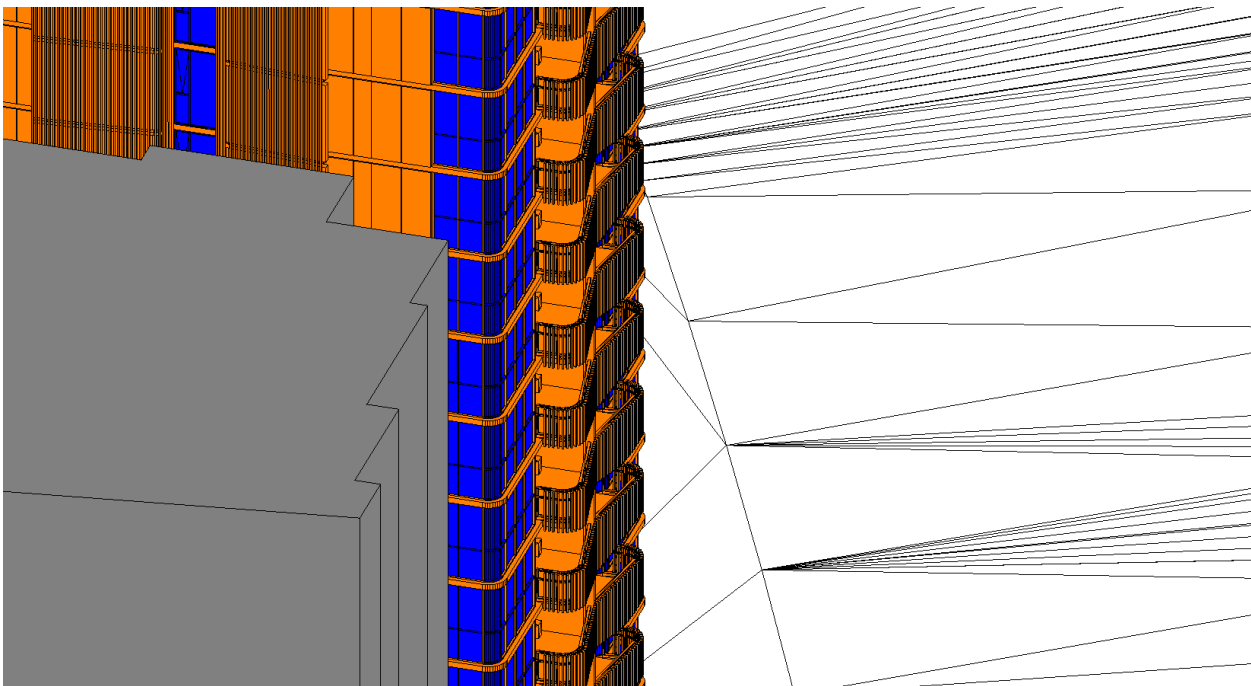


Figure 11 Solar Access to 24-36 Langston Place at 1315



6 Conclusion

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- In all other areas, living rooms and private open spaces of at least 70% of the apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid-winter.
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The ADG also outlines the following design guidance:

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From the model provided SLR has calculated the below summarised ADG assessed direct sunlight to residential apartment results for June 21, between the hours of 9.00 am and 3.00 pm, accounting for multiple relevant surrounding schemes:

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 - The proposed current DA for 24-36 Langston Place will reduce solar access to 12-22 Langston Place by 11.8%.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place, SLR found that 58.8% (272 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
 - The ADG compliant massing for 24-36 Langston Place will reduce solar access to 12-22 Langston Place by 9.2%.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place plus the future proposed northern development, SLR found that 55.5% (257 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.

- The ADG compliant massing for 24-36 Langston Place plus the future proposed northern development will reduce solar access to 12-22 Langston Place by 12.5%.

From the model provided SLR has also conducted an assessment of direct sunlight to residential apartments for June 21, between the hours of 8.00 am and 4.00 pm, finding the below:

- Assessing solar access solely to the 12-22 Langston Place development with no other future proposed surrounds, SLR found that 77.5% (359 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the current proposed DA design 24-36 Langston Place, SLR found that 68.9% (319 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place, SLR found that 70.4% (326 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.
- Assessing solar access against surrounds for the ADG compliant massing to 24-36 Langston Place plus the future proposed northern development, SLR found that 67.1% (311 of 463) of apartments within the 12-22 Langston Place development would achieve 2hrs direct solar access.

In assessing solar access to the landscaped podium of Tower 1 and 2 for the CBUS development SLR noted the following:

- Considering existing surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 74% of open area for 2 hrs.
- Considering the proposed DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 35% of open area for 2 hrs.
- Considering the ADG compliant DA + Future Northern Development surrounds the Tower 1 and 2 landscaped area of the CBUS development will achieve solar access to greater than 36% of open area for 2 hrs.

With respect to solar access to 24-36 Langston Place when considering future surrounds SLR found the development will meet solar access requirements across June 21, between 9.00 am and 3.00 pm, with:

- 70.30% (71 of 101) of apartments achieving 2 hours solar access across June 21, between 9.00 am and 3.00 pm.
- 9.90% (10 of 101) of apartments achieving no solar access across June 21, between 9.00 am and 3.00 pm.

APPENDIX A

Provided Drawings used in Assessments









AMENDED DA ISSUE

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0 1.25 5 10 12.5m
Scale 1:250 @ A1

checked	FH	scale	1 : 250@A1
drawn	AR/NR/MC/PL/HN	project no	140309.00



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issue	amendment	date
B	ISSUE FOR INFORMATION	16/10/2015
C	ISSUE FOR INFORMATION	21/10/2015
D	ISSUED FOR QS	03/11/2015
E	DRAFT DA ISSUE	22/12/2015
F	DRAFT DA ISSUE	22/01/2016
G	FINAL DRAFT DA ISSUE	04/02/2016
H	DA ISSUE	18/02/2016
I	DA SUBMISSION	11/02/2016
J	DA SUBMISSION RESPONSE AMENDMENTS	04/05/2016
K	FOR INFORMATION	24/11/2016
L	DRAFT DA ISSUE	25/11/2016
M	DRAFT DA ISSUE	03/12/2016
N	AMENDED PLAN SUBMISSION	03/02/2017
O	AMENDED DA SUBMISSION	05/06/2016



Unit Types

RL Schedule - Level 11-15	
Level	RL
Level 11	137.85
Level 12	140.90
Level 13	143.95
Level 14	147.00
Level 15	150.05

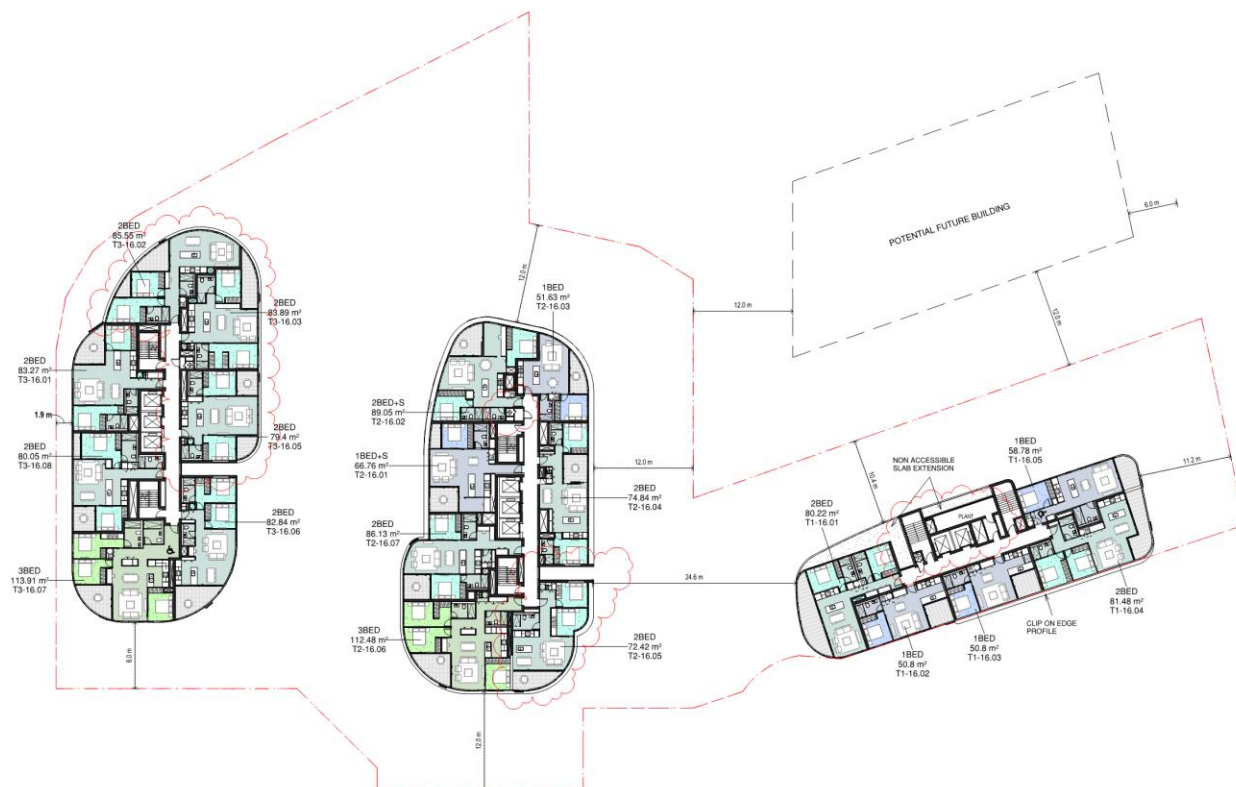
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ABN 90 131 245 684

0 1.25 5 10 12.5
Scale 1:250 @ A1

checked	FH	scale	1 : 250@A
drawn	AR/NR/MC/PL/NN	project no	140309.0

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issue	amendment	date
A	DRAFT DA ISSUE	23/12/2015
B	DRAFT DA ISSUE	22/01/2016
C	FINAL DRAFT DA ISSUE	04/02/2016
D	DA ISSUE	08/02/2016
E	DA SUBMISSION	11/02/2016
F	DA SUBMISSION RESPONSE AMENDMENTS	24/05/2016
G	FOR INFORMATION	24/11/2016
H	DRAFT DA ISSUE	25/11/2016
I	DRAFT DA ISSUE	01/12/2016
J	AMENDING PLAN SUBMISSION	03/02/2017
K	AMENDING DA SUBMISSION	05/06/2017

Unit Types

 1BED
 1BED+S
 2BED
 2BED+S
 3BED

RL Schedule - Level 16	
Level	RL
Level 16	153.10

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project
12-22 LANGSTON PLACE, EPPING

drawing
Level 16 Floor Plan

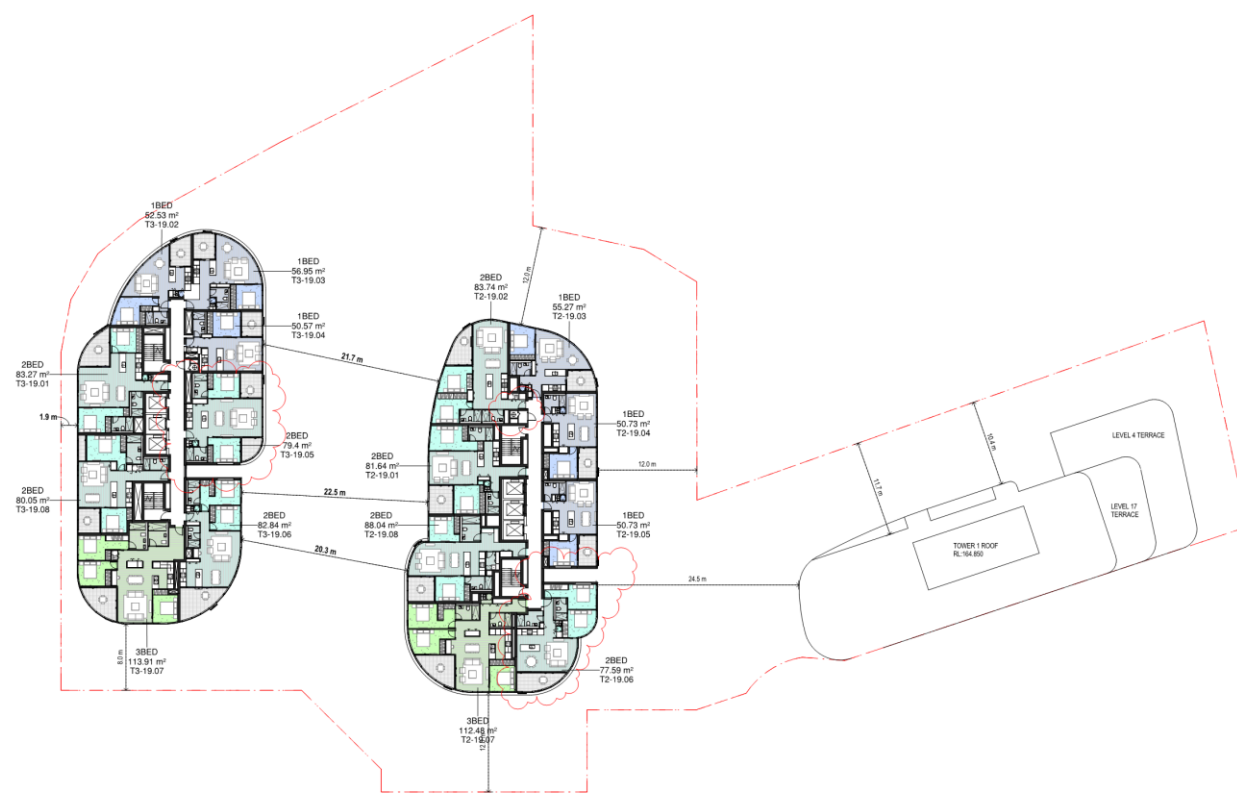
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H	DRAFT DA ISSUE	22/10/2015
I	DRAFT DA ISSUE	22/10/2015
J	DRAFT DA ISSUE	22/10/2015
K	DRAFT DA ISSUE	22/10/2015
L	DRAFT DA ISSUE	22/10/2015
M	DRAFT DA ISSUE	22/10/2015
N	DRAFT DA ISSUE	22/10/2015
O	AMENDED DA ISSUE	22/10/2015
P	AMENDED DA ISSUE	22/10/2015

Unit Types

Unit Type	RL Schedule - Level 19
1BED	Level 19
2BED	Level 19
3BED	Level 19

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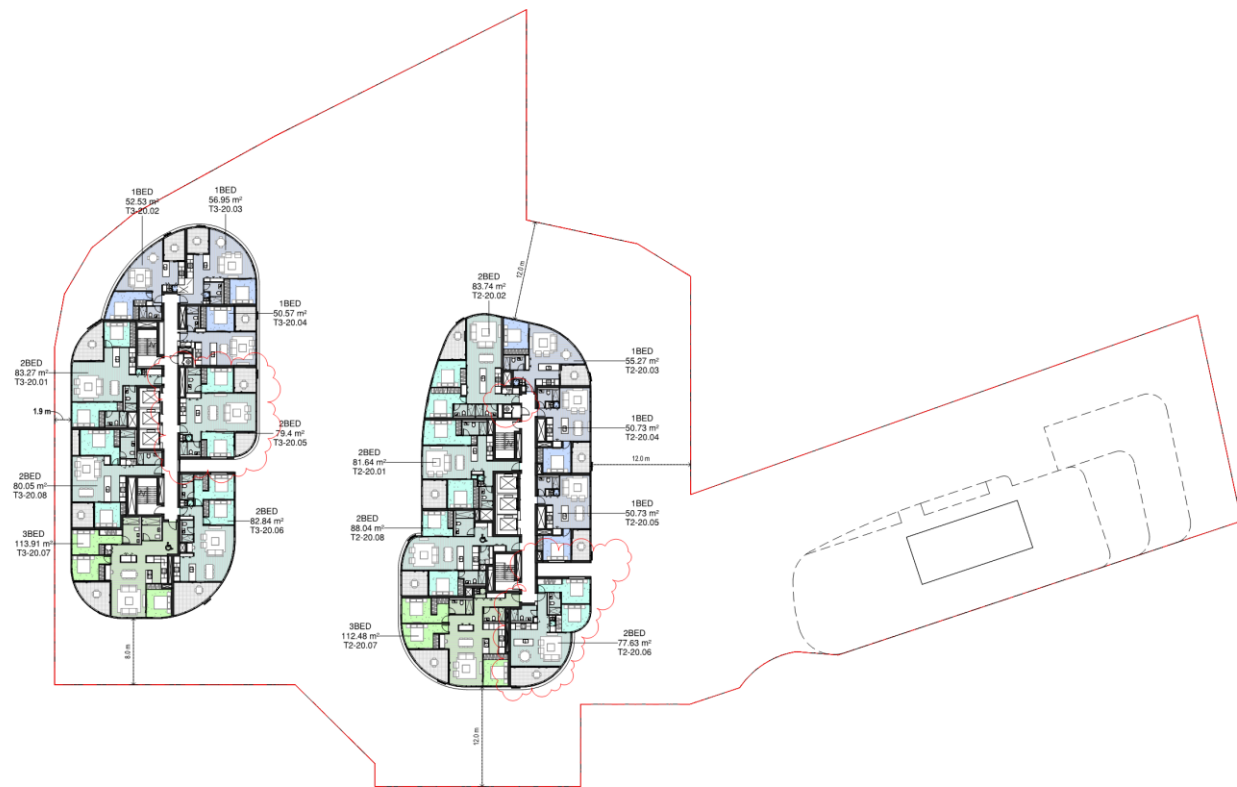
project
12-22 LANGSTON PLACE, EPPING

drawing
Levels 19 Floor Plan

drawing no
DA1016

issue
O

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Issue	amendment	date
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G	DRAFT DA ISSUE	22/10/2015
H	DRAFT DA ISSUE	22/10/2015
I	DRAFT DA ISSUE	22/10/2015
J	DRAFT DA ISSUE	22/10/2015
K	DRAFT DA ISSUE	22/10/2015
L	DRAFT DA ISSUE	22/10/2015
M	DRAFT DA ISSUE	22/10/2015
N	DRAFT DA ISSUE	22/10/2015
O	AMENDED DA SUBMISSION	05/06/2017



Unit Types

- 1BED
- 2BED
- 3BED

RL Schedule - Level 20-21	
Level	RL
Level 20	165.30
Level 21	168.35

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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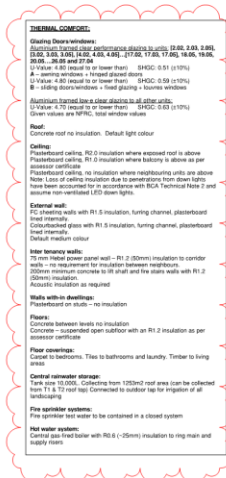
AMENDED DA ISSUE

project 12-22 LANGSTON PLACE, EPPING

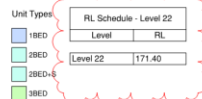
drawing Level 20-21 Floor Plan

drawing no DA1017 issue O

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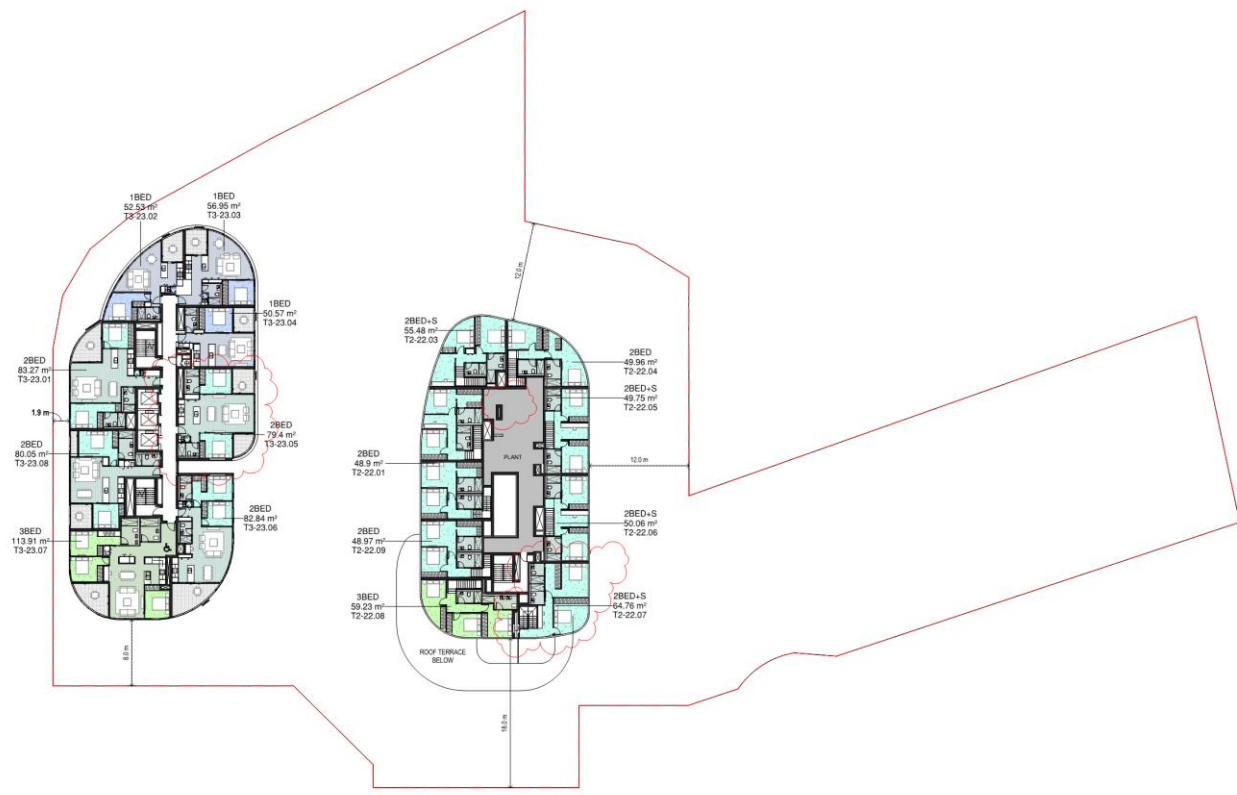


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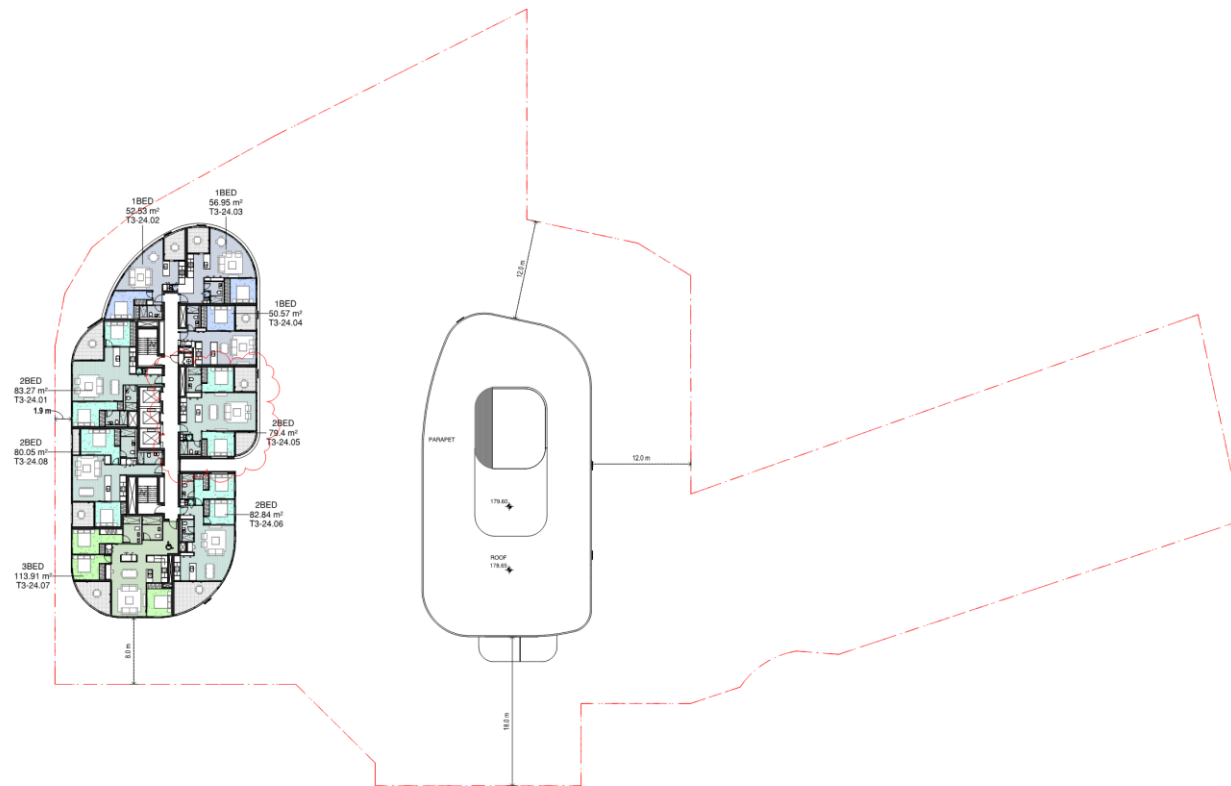
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Glazing Down windows:
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54.35, 54.38, 54.41, 54.44, 54.47, 54.



TERMINAL COMMENT:

Glazing down windows:
Australian Standard glass performance tables in units (2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00, 10.00, 11.00, 12.00 and 13.00)
U Value = 0.80 (glass) or lower than 0.80 (U) 0.91 (10%)
A-weighted sound reduction index (Rw) = 30 dB (10%)
U Value = 0.80 (glass) or lower than 0.80 (U) 0.91 (10%)
B-weighted sound reduction index (Rw) = 30 dB (10%)
Note: Loss of ceiling insulation due to penetrations from down lights have been accounted for in accordance with R10 Technical Note 2 and where not ventilated LED down lights.

Roof:
Concrete roof no insulation. Default light colour

Ceiling:
Plasterboard ceiling, R0.2 insulation where exposed roof is above
Plasterboard ceiling, R0.2 insulation where balcony is above as per assessor certificate
Plasterboard ceiling, no insulation where neighbouring units are above
Note: Loss of ceiling insulation due to penetrations from down lights have been accounted for in accordance with R10 Technical Note 2 and where not ventilated LED down lights.

External wall:
FC sheathing walls with R1.5 insulation, furring channel, plasterboard lined internally
Conventional glass with R1.5 insulation, furring channel, plasterboard lined internally
Default medium colour

Inter tenancy walls:
75 mm timber power panel wall - R1.2 (30mm) insulation to corridor walls - no requirement for insulation between wall/floor
30mm insulation complete to all walls and the stairs walls with R1.2 (30mm) insulation
Acoustic insulation as required

Walls with no dwellings:
Plasterboard on studs - no insulation

Floors:
Concrete between levels no insulation
Concrete - suspended open joist floor with an R1.2 insulation as per assessor certificate

Floor coverings:
Carpet to bedrooms. Tiles to bathrooms and laundry. Timber to living areas

Central radiator station:
Ten radiators (10 radiators) connected from 100mm roof area (can be collected from T1 & T2 roof top) Connected to outdoor tap for irrigation of all landscaping

Fire sprinkler systems:
Fire sprinkler test water to be contained in a closed system

Hot water system:
Central gas fired boiler with R0.6 (-35mm) insulation to ring main and supply lines

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Issue	amendment	date
A	ISSUE FOR INFORMATION	15/10/2015
B	ISSUE FOR INFORMATION	15/10/2015
C	ISSUE FOR INFORMATION	03/11/2015
D	DRAFT DA ISSUE	23/12/2015
E	DRAFT DA ISSUE	23/12/2015
F	FINAL DRAFT DA ISSUE	23/12/2015
G	DA ISSUE	04/01/2016
H	DA SUBMISSION	11/01/2016
I	DA SUBMISSION AMENDMENTS	20/06/2016
J	FOR INFORMATION	24/11/2016
K	DRAFT DA ISSUE	24/11/2016
L	DRAFT DA ISSUE	24/11/2016
M	AMENDED PLAN SUBMISSION	03/02/2017
N	AMENDED DA SUBMISSION	03/02/2017

Unit Types

1BED	RL Schedule - Level 24
2BED	Level 24
3BED	Level 24



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checked	PH
drawn	AR/NM/MC/PLH
project no	140309.00
1 : 250 @ A1	

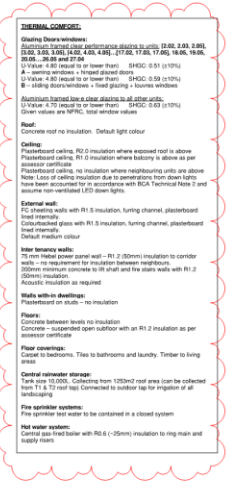
AMENDED DA ISSUE

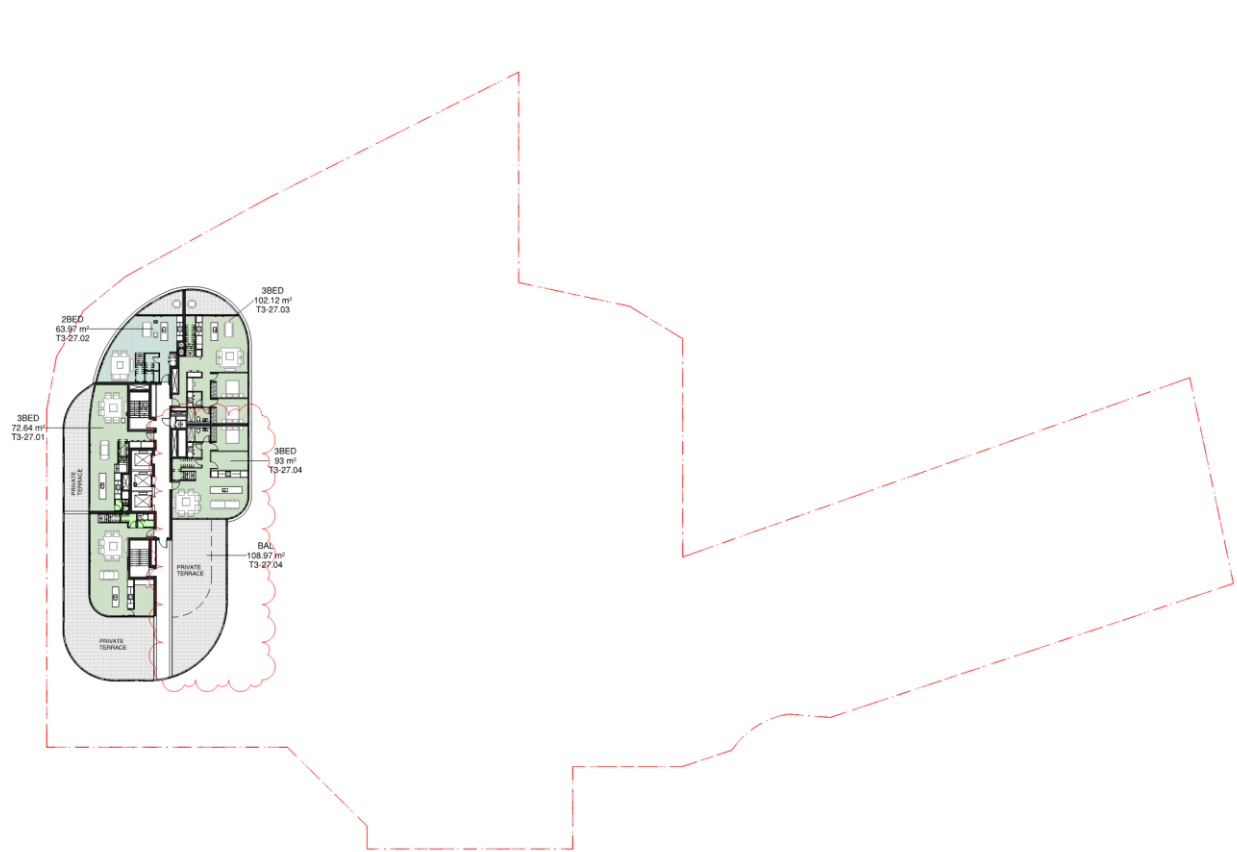
project 12-22 LANGSTON PLACE, EPPING

drawing Level 24 Floor Plan

drawing no	issue
DA1020	N

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TERMINAL CORREL:

Glazing Down windows:
Australian Standard glass performance tables in units (2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00, 10.00, 11.00, 12.00 and 13.00)
U Value < 0.5 (usual) or lower than 0.45 (0.51 (10%))
A - warmest window - thermal break down (U < 0.51 (10%))
B - cold window - thermal break down (U < 0.51 (10%))
C - sliding down windows - fixed glazing + frames windows
D - sliding down windows - fixed glazing + frames windows
E - sliding down windows - fixed glazing + frames windows
F - sliding down windows - fixed glazing + frames windows
G - sliding down windows - fixed glazing + frames windows
H - sliding down windows - fixed glazing + frames windows
I - sliding down windows - fixed glazing + frames windows
J - sliding down windows - fixed glazing + frames windows
K - sliding down windows - fixed glazing + frames windows
L - sliding down windows - fixed glazing + frames windows
M - sliding down windows - fixed glazing + frames windows
N - sliding down windows - fixed glazing + frames windows
O - sliding down windows - fixed glazing + frames windows
P - sliding down windows - fixed glazing + frames windows
Q - sliding down windows - fixed glazing + frames windows
R - sliding down windows - fixed glazing + frames windows
S - sliding down windows - fixed glazing + frames windows
T - sliding down windows - fixed glazing + frames windows
U - sliding down windows - fixed glazing + frames windows
V - sliding down windows - fixed glazing + frames windows
W - sliding down windows - fixed glazing + frames windows
X - sliding down windows - fixed glazing + frames windows
Y - sliding down windows - fixed glazing + frames windows
Z - sliding down windows - fixed glazing + frames windows

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issue	amendment	date
A	FOR INFORMATION	24/11/2016
B	DRAFT DA ISSUE	24/11/2016
C	DRAFT DA ISSUE	03/12/2016
D	AMENDED DA SUBMISSION	05/02/2017
E	AMENDED DA SUBMISSION	05/02/2017



RL Schedule - Level 27	
Level	RL
Level 27	186.65

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PROJECT NO: 140209.00
ARCHITECT: PLH/PW/SD

AMENDED DA ISSUE

project: 12-22 LANGSTON PLACE, EPPING

drawing: Level 27 Floor Plan

drawing no: DA1022
issue: E

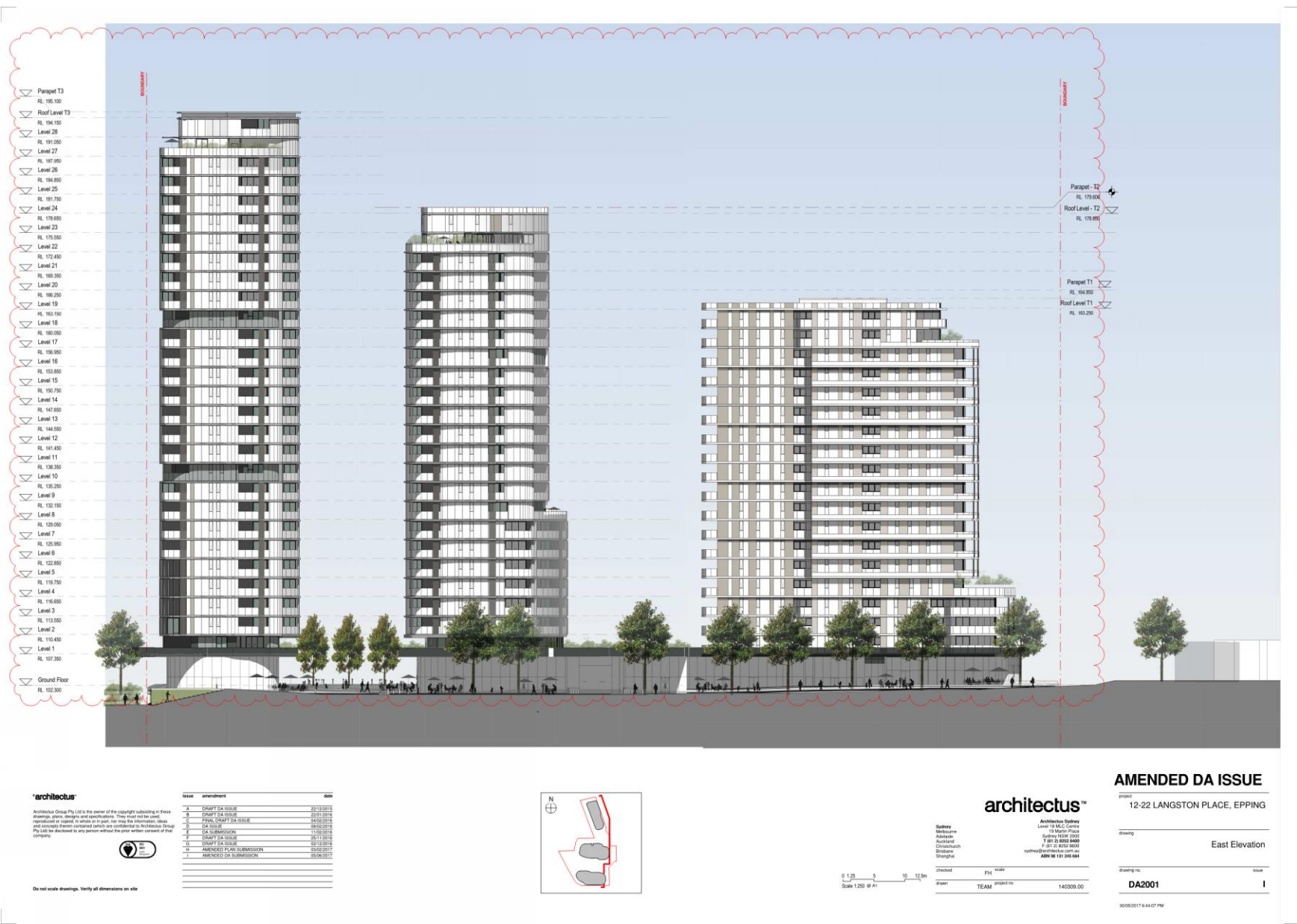
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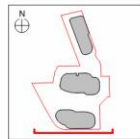
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A	DRAFT DA ISSUE	20/10/2015
B	DRAFT DA ISSUE	22/01/2016
C	FINAL DRAFT DA ISSUE	24/02/2016
D	DA ISSUE	04/03/2016
E	DA SUBMISSION	11/03/2016
F	DRAFT DA ISSUE	20/11/2016
G	DRAFT DA ISSUE	09/12/2016
H	AMENDED DA SUBMISSION	05/01/2017
I	AMENDED DA SUBMISSION	05/06/2017



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drawn: TEAM 10/06/17
scale: 1:250 @ A1
project no: 1402009.00

AMENDED DA ISSUE

12-22 LANGSTON PLACE, EPPING

South Elevation

DA2002



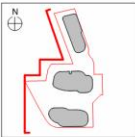
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B	DRAFT DA ISSUE	22/01/2016
C	FINAL DRAFT DA ISSUE	14/02/2016
D	DA ISSUE	04/03/2016
E	DA SUBMISSION	11/03/2016
F	DRAFT DA ISSUE	28/11/2016
G	DRAFT DA ISSUE	08/12/2016
H	AMENDED PLAN SUBMISSION	15/03/2017
I	AMENDED DA SUBMISSION	06/06/2017



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Drawn: TEAM
Project No: 1402009.00

0 1.25 2.5 5 10 12.5m
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AMENDED DA ISSUE

12-22 LANGSTON PLACE, EPPING

West Elevation

DA2003



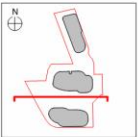
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A	DMPT DA ISSUE	22/12/2015
B	FINAL DMPT DA ISSUE	24/02/2016
C	DA ISSUE	24/02/2016
D	DA SUBMISSION	11/02/2016
E	DMPT DA ISSUE	25/11/2016
F	DMPT DA ISSUE	01/12/2016
G	AMENDED FINAL SUBMISSION	03/02/2017
H	AMENDED DA SUBMISSION	05/06/2017



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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
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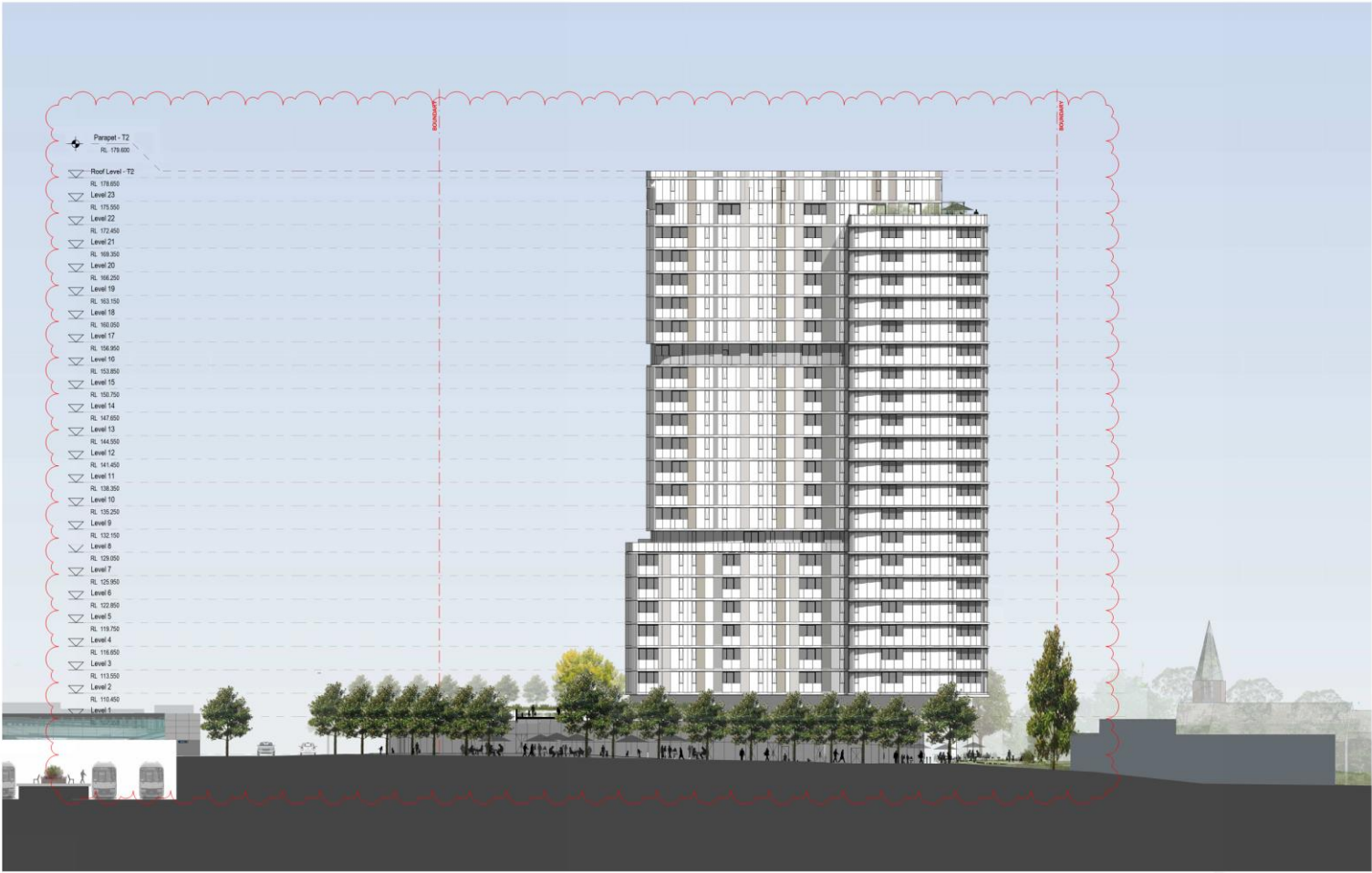
AMENDED DA ISSUE

12-22 LANGSTON PLACE, EPPING

North Link Elevation

drawing no: DA2004
scale: H

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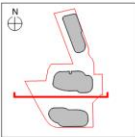
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B	FINAL DA ISSUE	24/02/2016
C	DA ISSUE	05/02/2016
D	DA SUBMISSION	11/02/2016
E	DA ISSUE	25/11/2016
F	DA ISSUE	01/12/2016
G	AMENDED FINAL SUBMISSION	01/12/2016
H	FINAL SUBMISSION	20/11/2017
I	AMENDED DA SUBMISSION	05/06/2017



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PIJ
TEAM

14/06/17
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0800 65 151 584

AMENDED DA ISSUE

12-22 LANGSTON PLACE, EPPING

South Link Elevation

DA2005

30/05/2017 6:44:12 PM





- Parapet T3
RL 195.100
- Roof Level T3
RL 194.150
- Level 28
RL 191.600
- Level 27
RL 187.600
- Level 26
RL 184.600
- Level 25
RL 181.700
- Level 24
RL 178.600
- Level 23
RL 175.500
- Level 22
RL 172.400
- Level 21
RL 169.300
- Level 20
RL 166.200
- Level 19
RL 163.100
- Level 18
RL 160.000
- Level 17
RL 156.900
- Level 16
RL 153.800
- Level 15
RL 150.700
- Level 14
RL 147.600
- Level 13
RL 144.500
- Level 12
RL 141.400
- Level 11
RL 138.300
- Level 10
RL 135.200
- Level 9
RL 132.100
- Level 8
RL 129.000
- Level 7
RL 125.900
- Level 6
RL 122.800
- Level 5
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- Level 3
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- Level 2
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- Level 1
RL 107.300
- Ground
RL 102.300

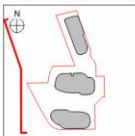
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Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	DA ISSUE	08/02/2016
B	DA SUBMISSION	11/02/2016
C	DRAFT DA ISSUE	25/11/2016
D	DRAFT DA ISSUE	05/12/2016
E	AMENDED FINAL SUBMISSION	01/12/2016
F	FINAL SUBMISSION	20/01/2017
G	AMENDED DA SUBMISSION	05/04/2017



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Scale 1:250 @ A1

Checked: P11
Drawn: TEAM
Project No: 1402009.00

AMENDED DA ISSUE

12-22 LANGSTON PLACE, EPPING

West Context Elevation

DA2007

G

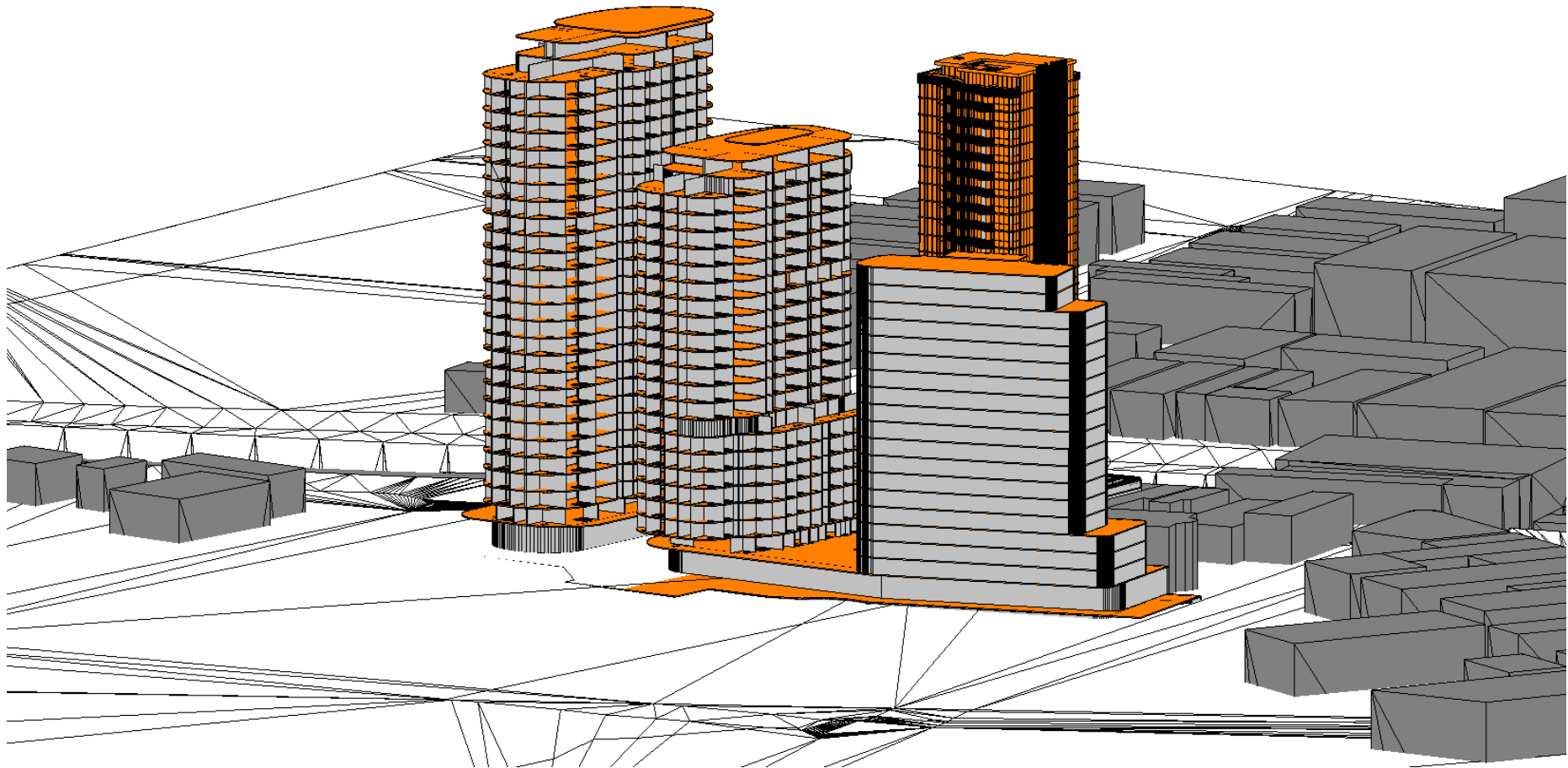
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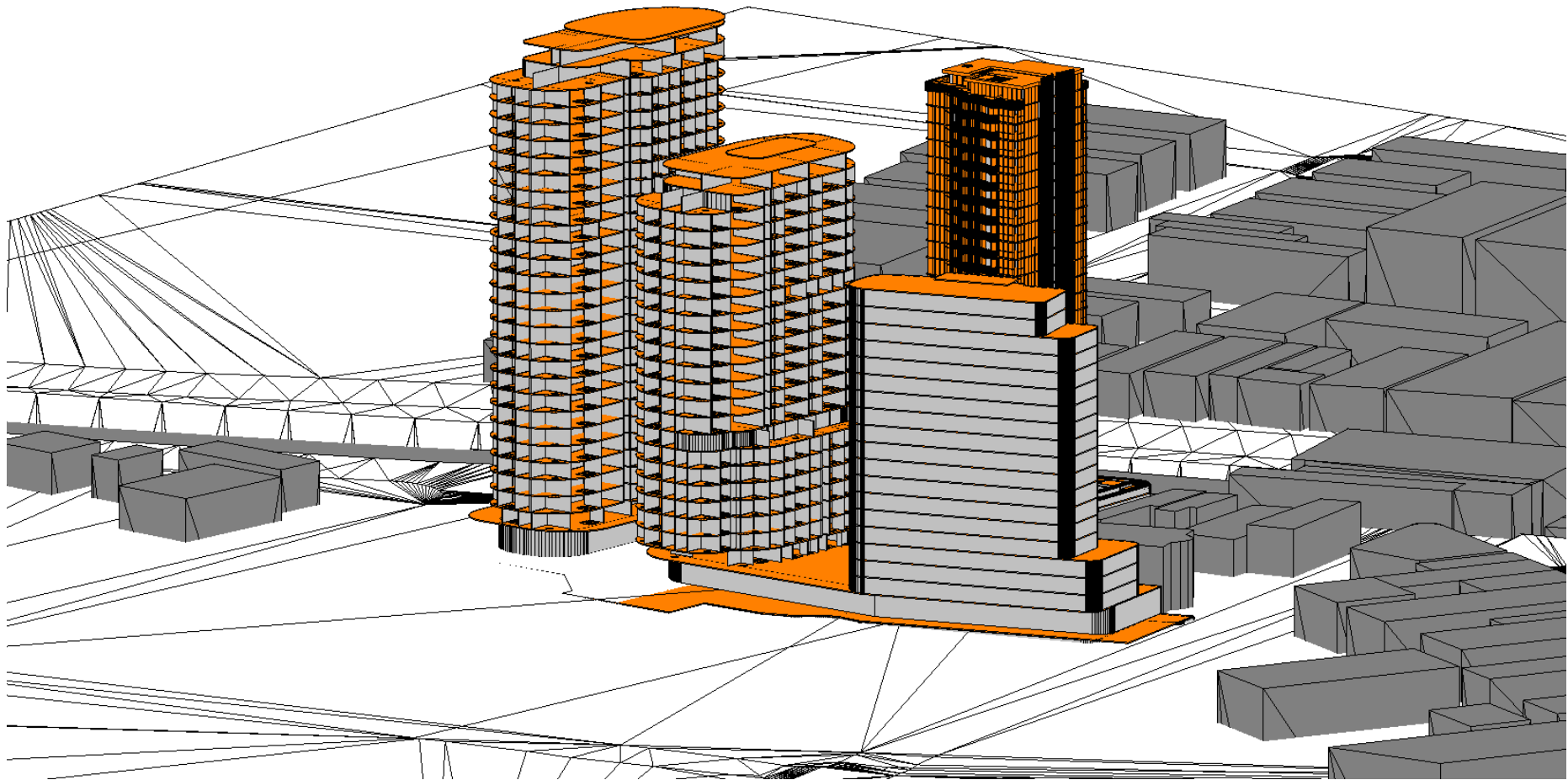
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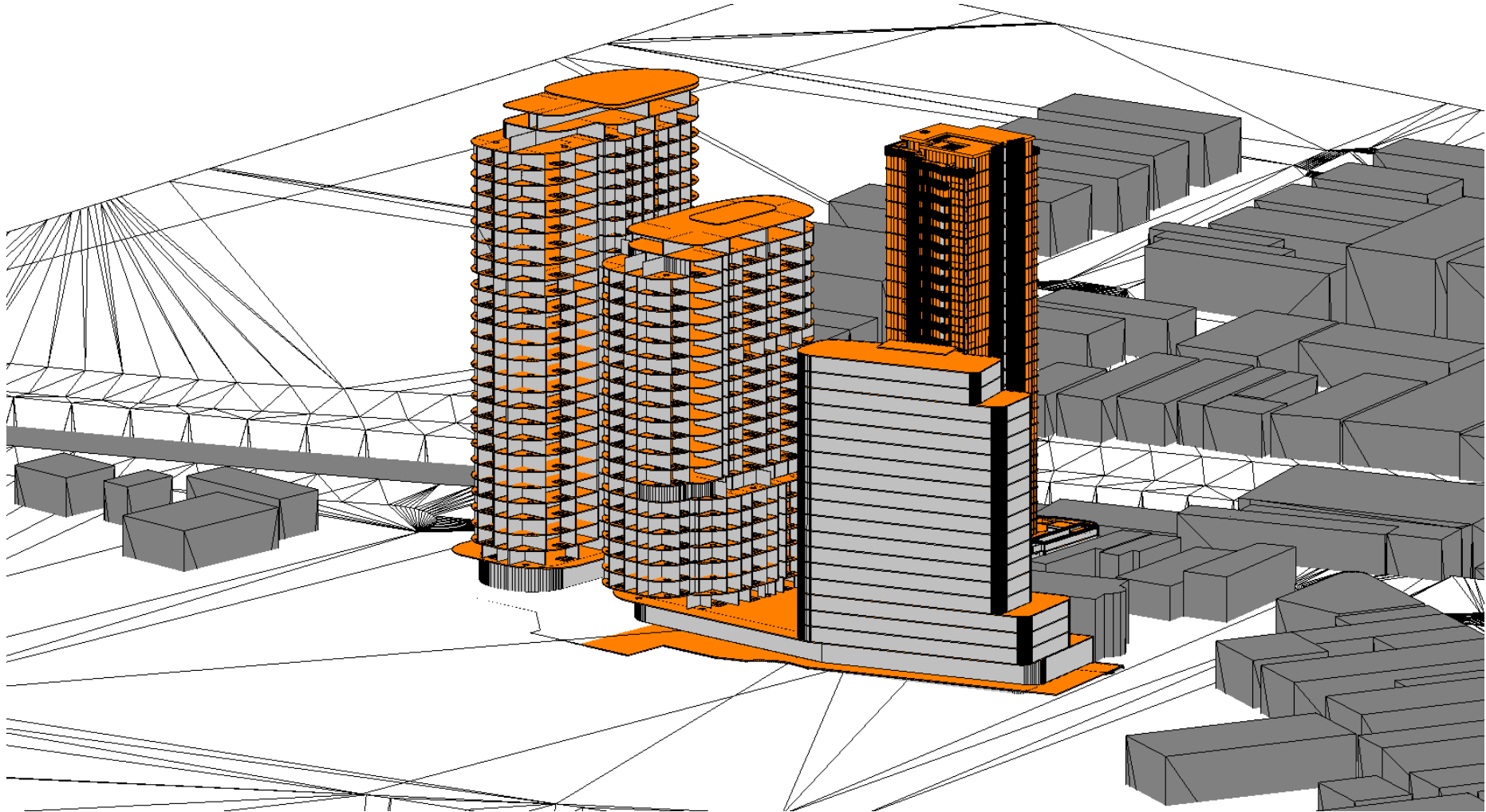
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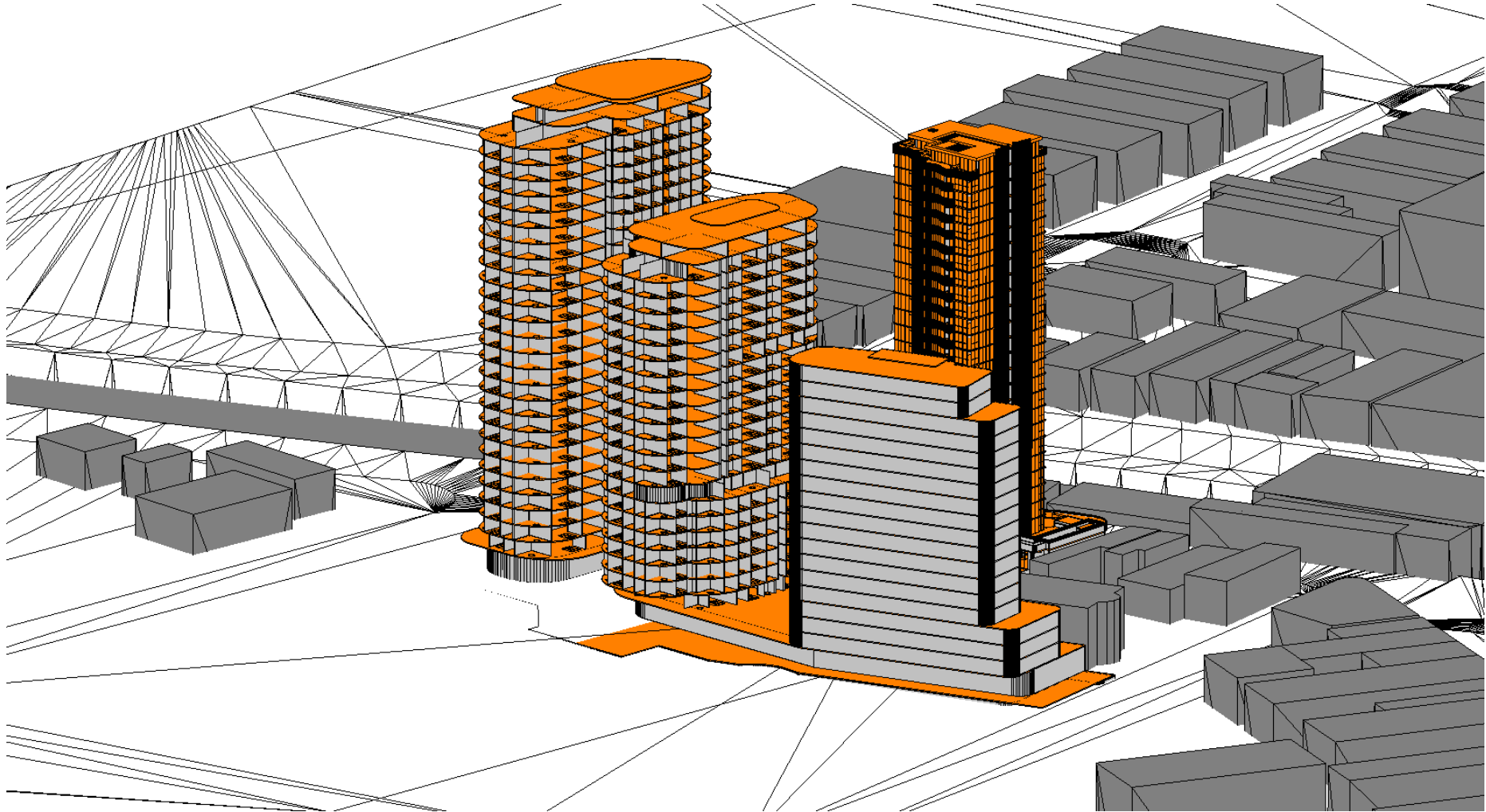
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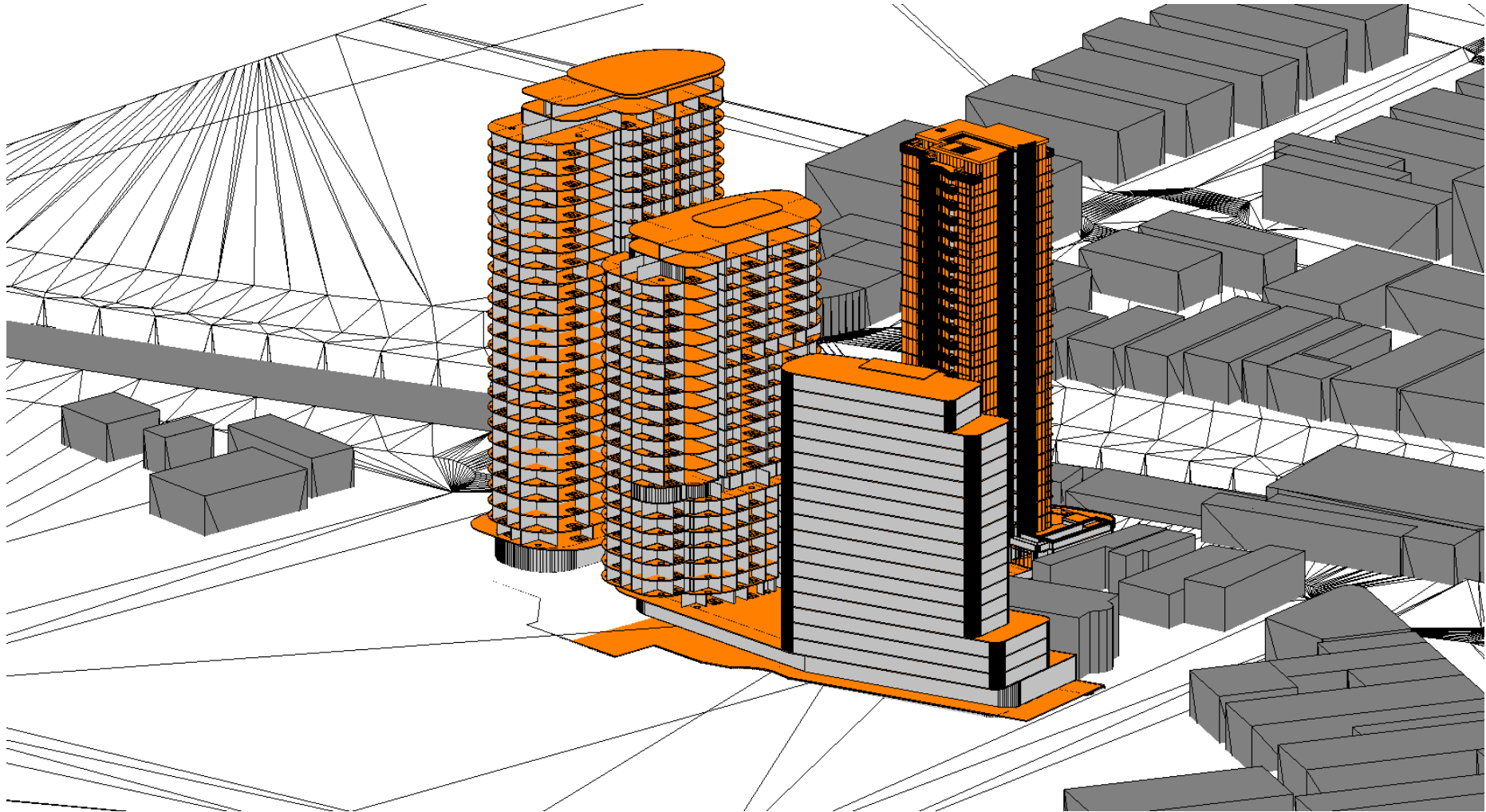
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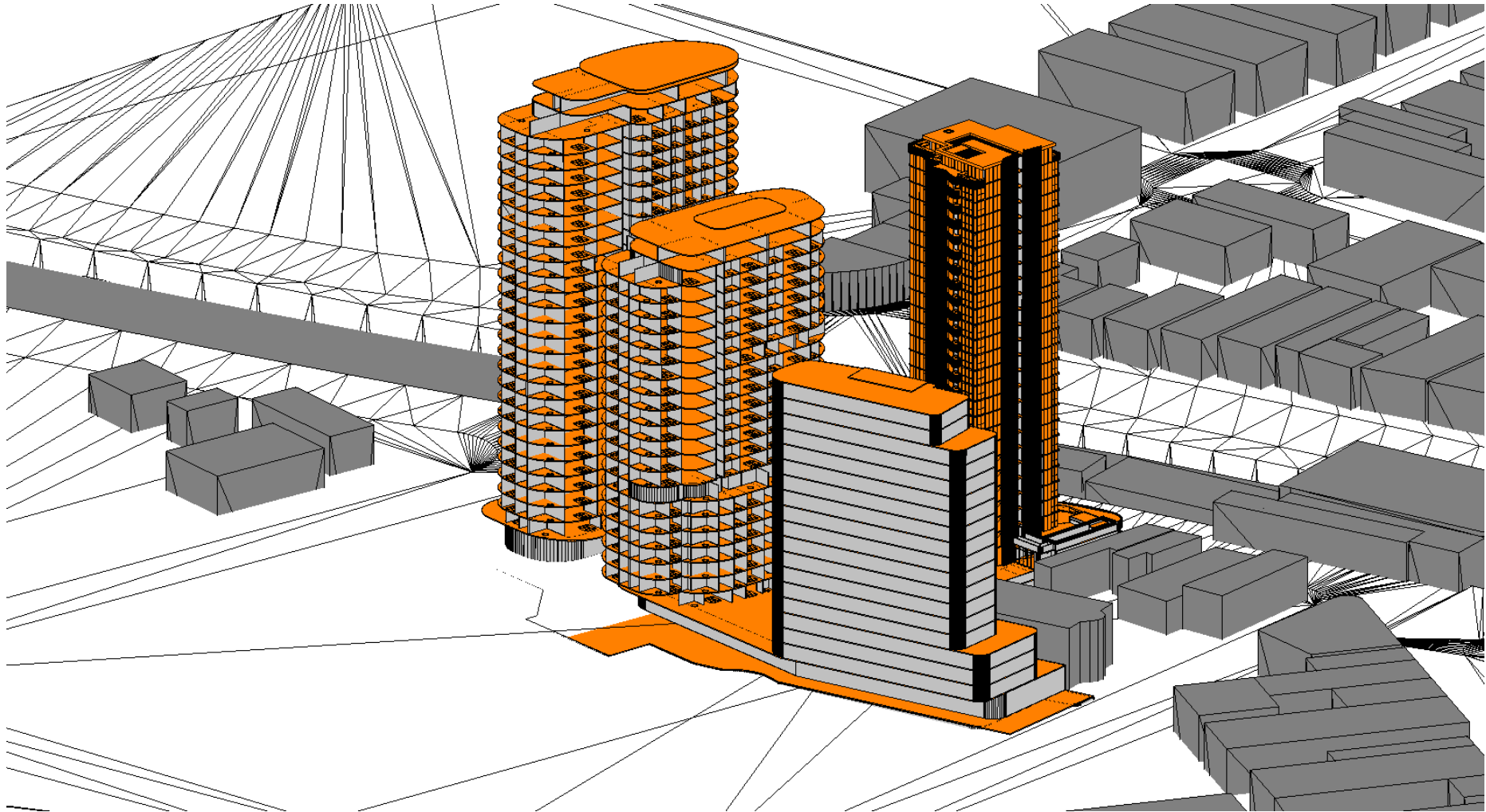


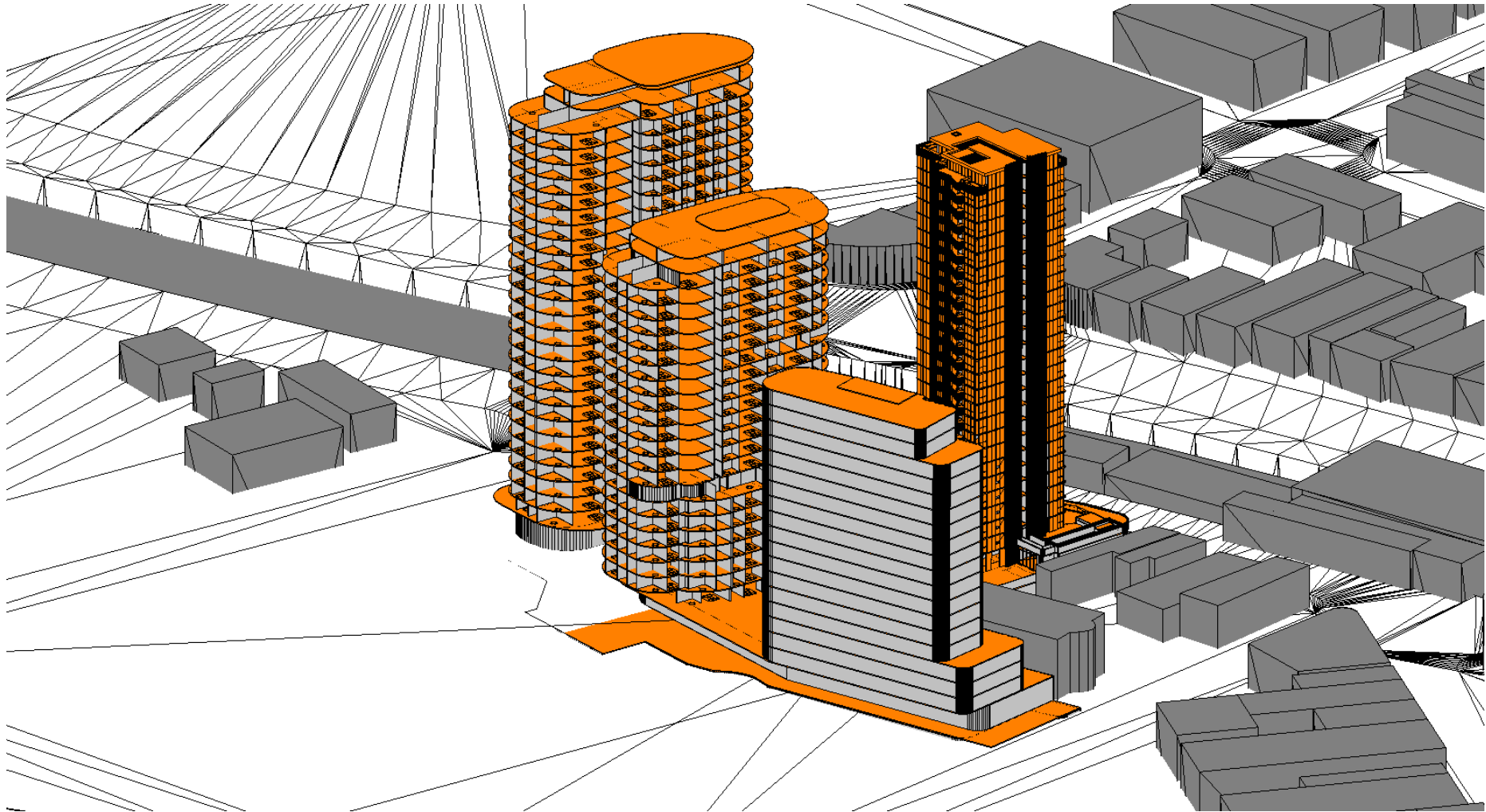


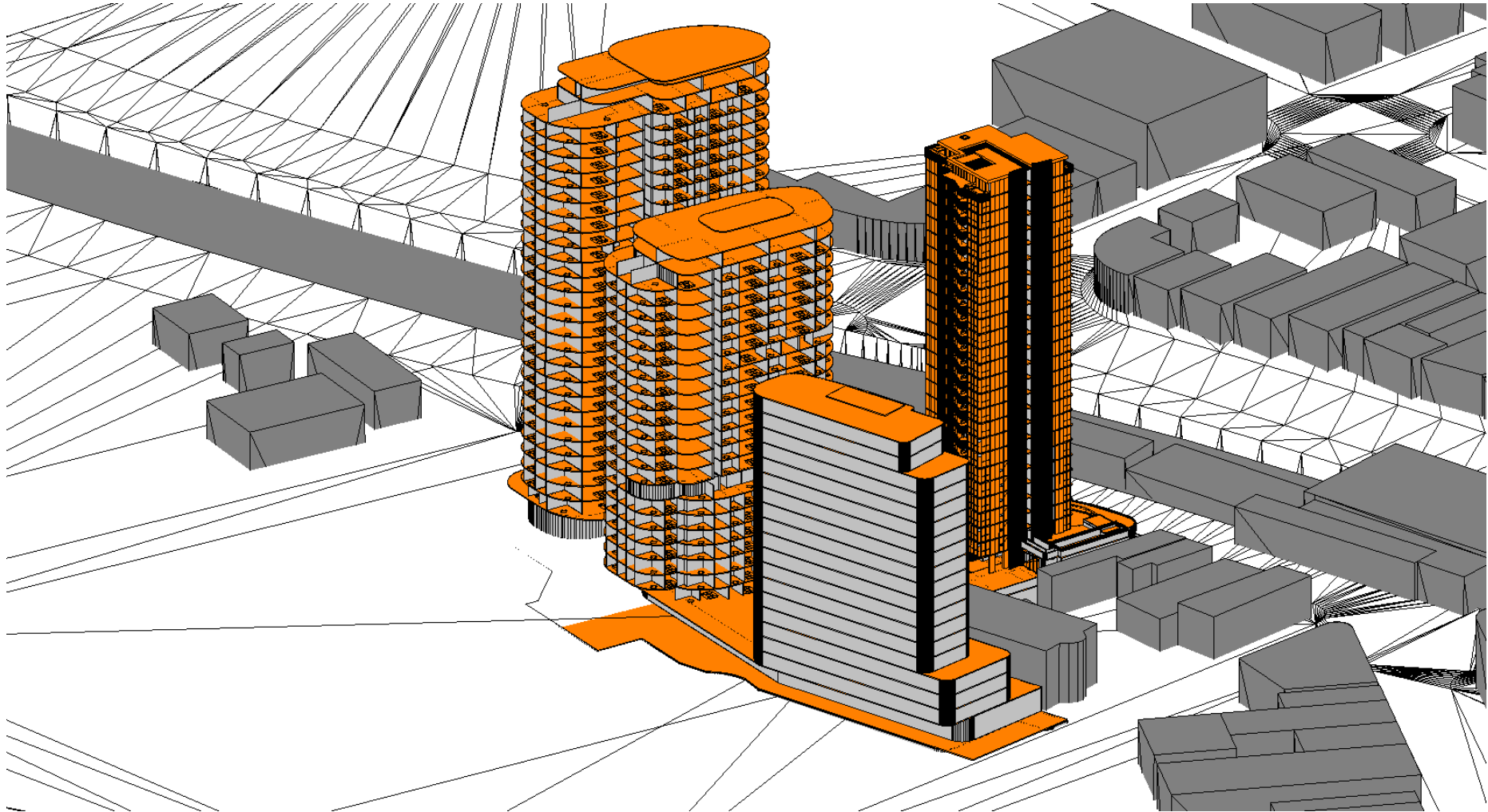




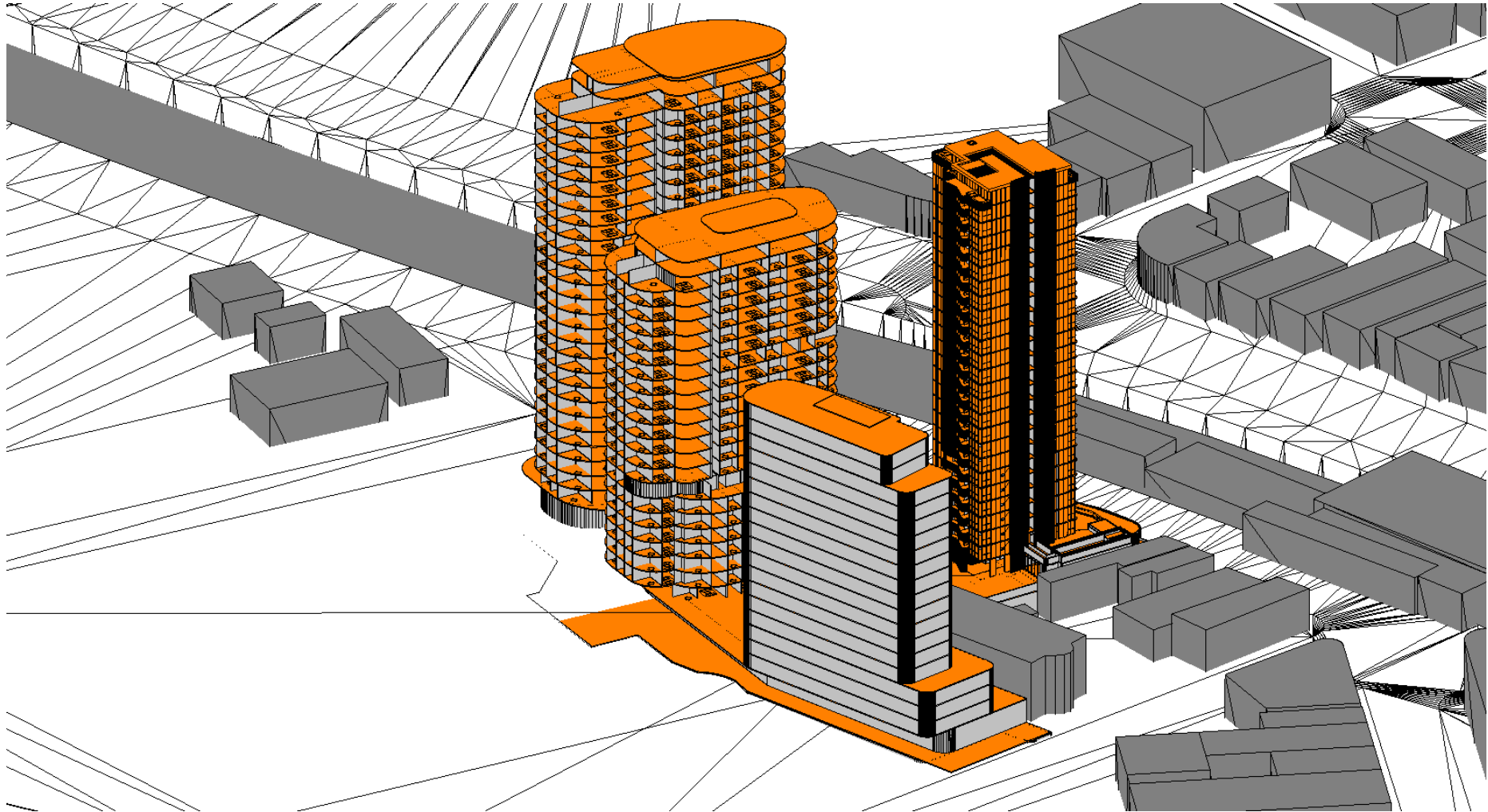


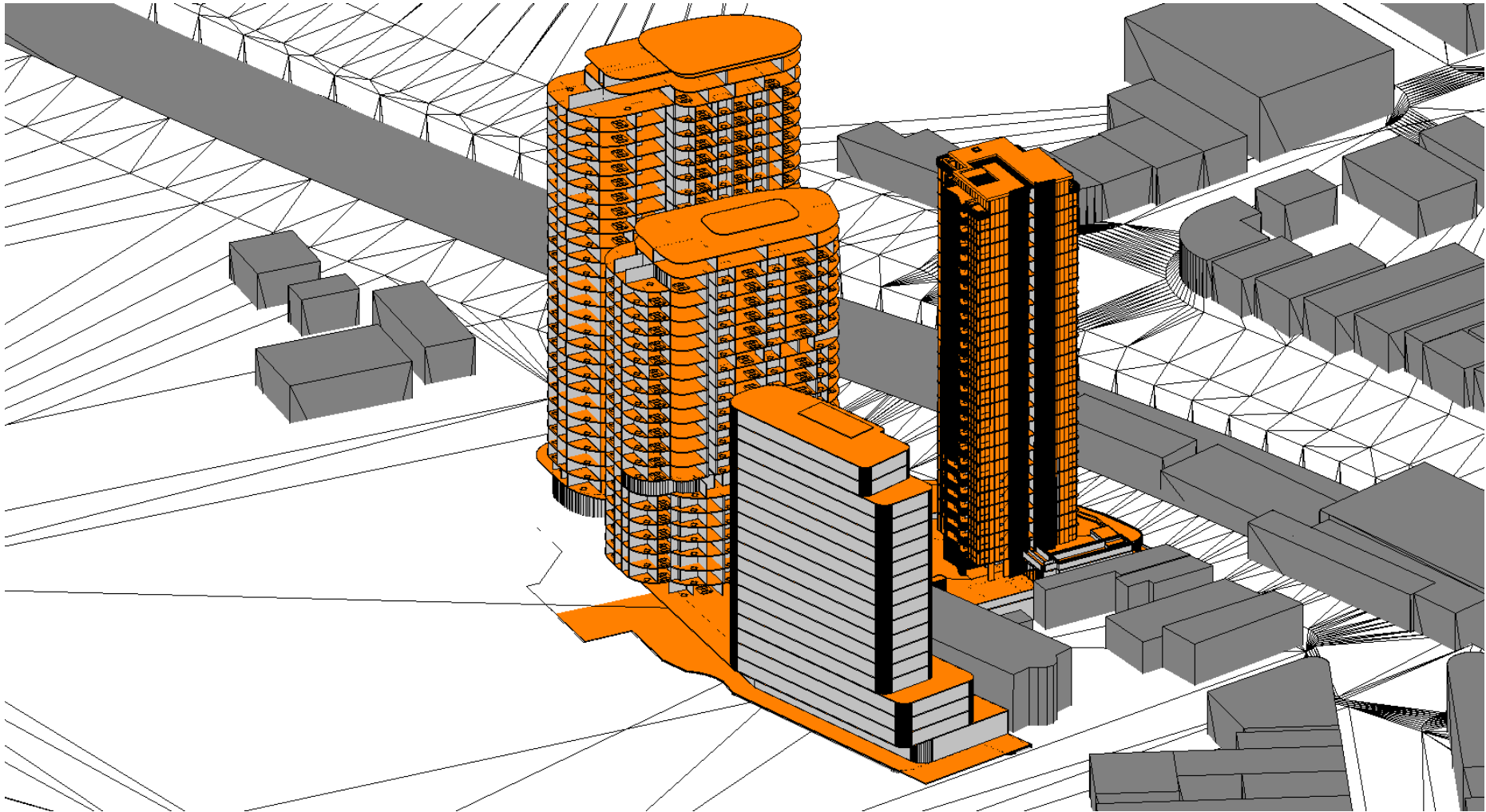


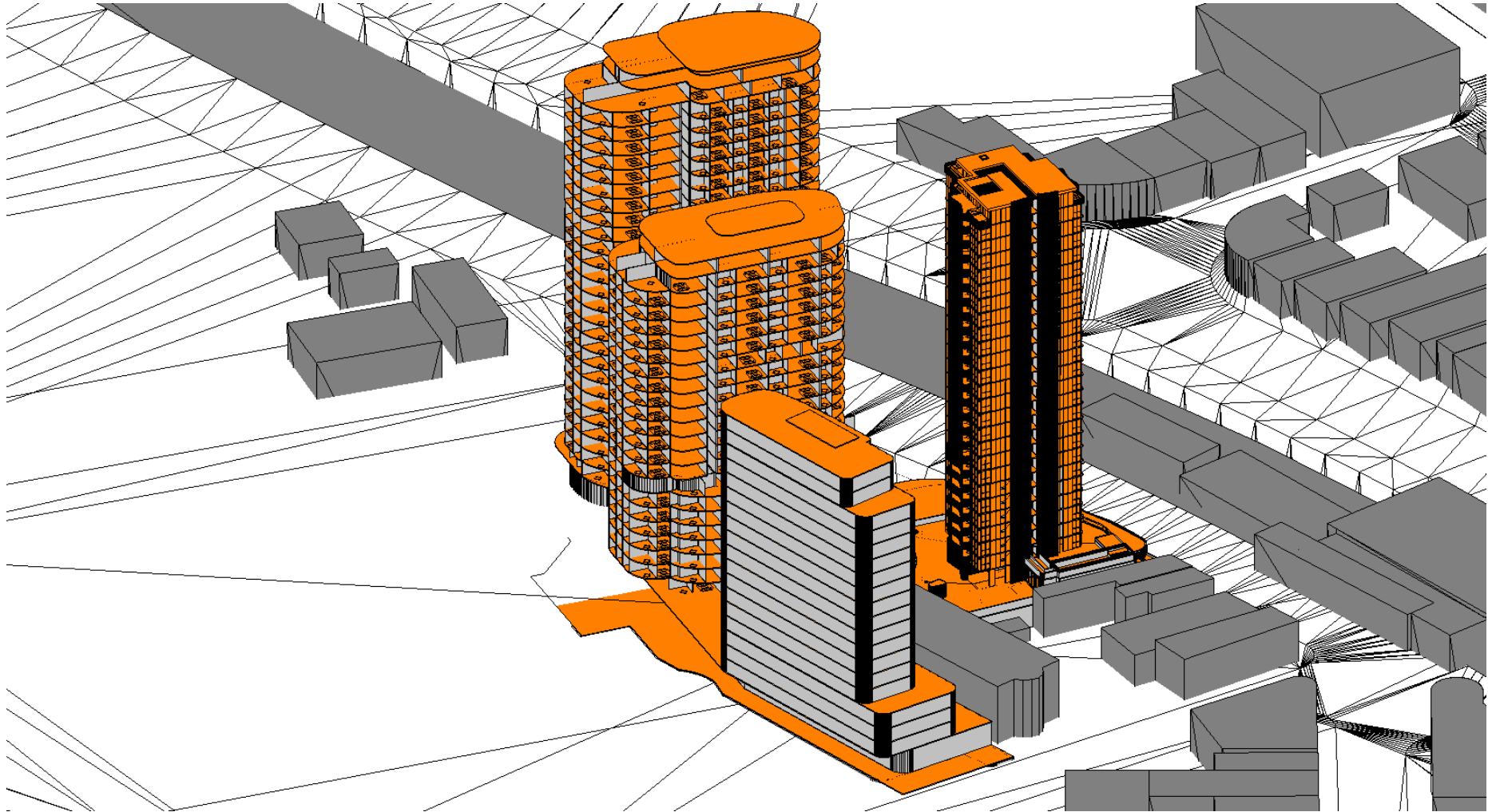


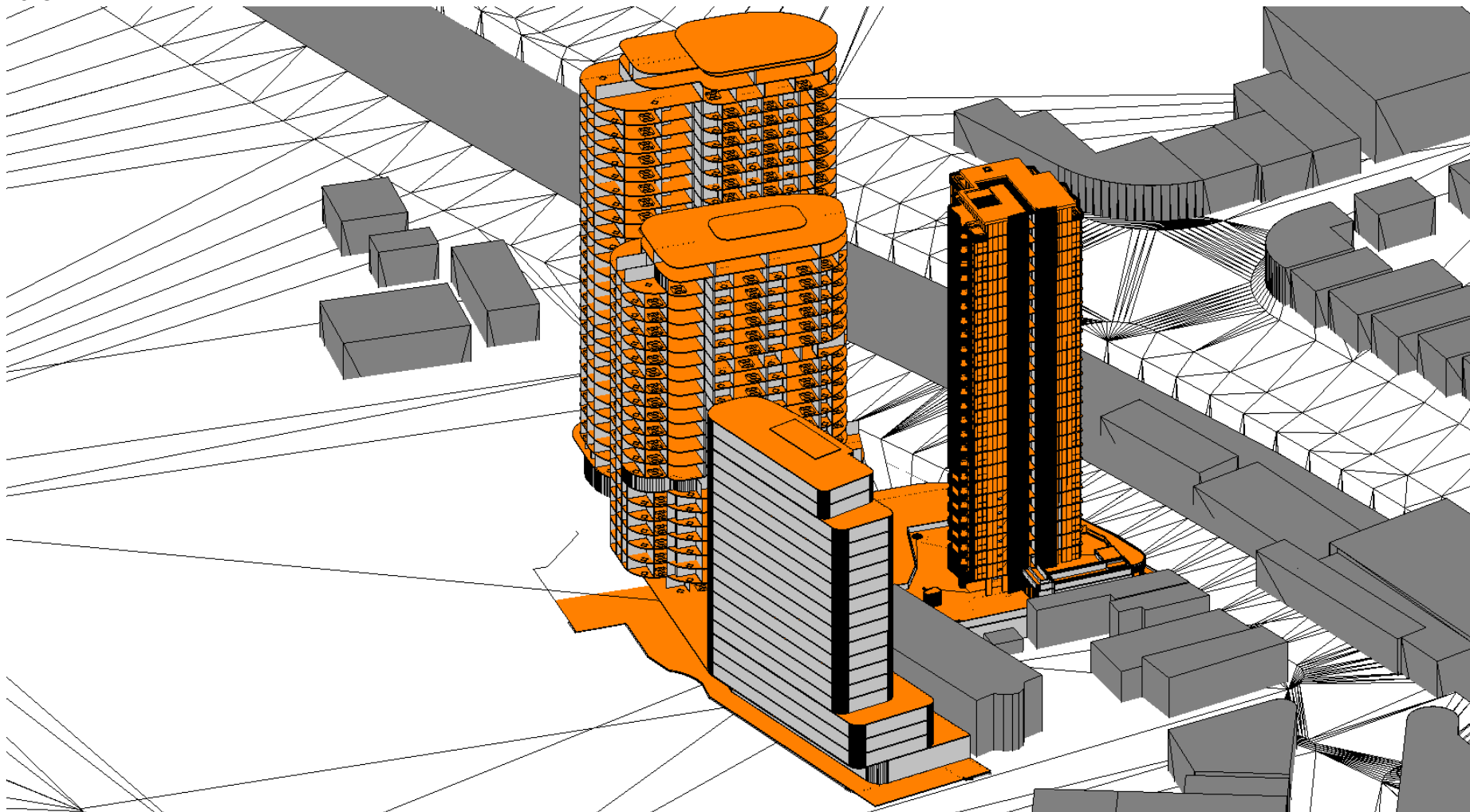


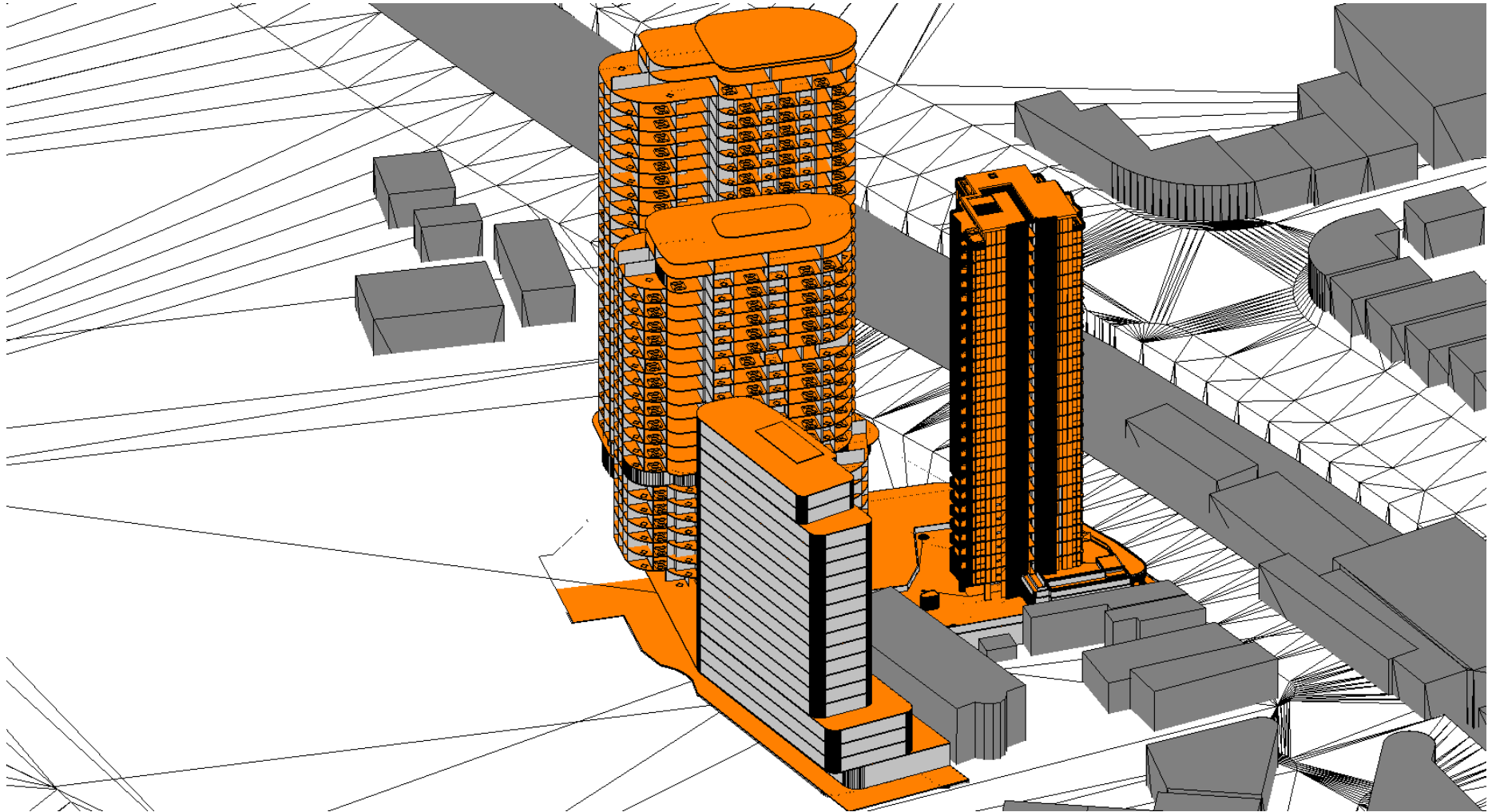
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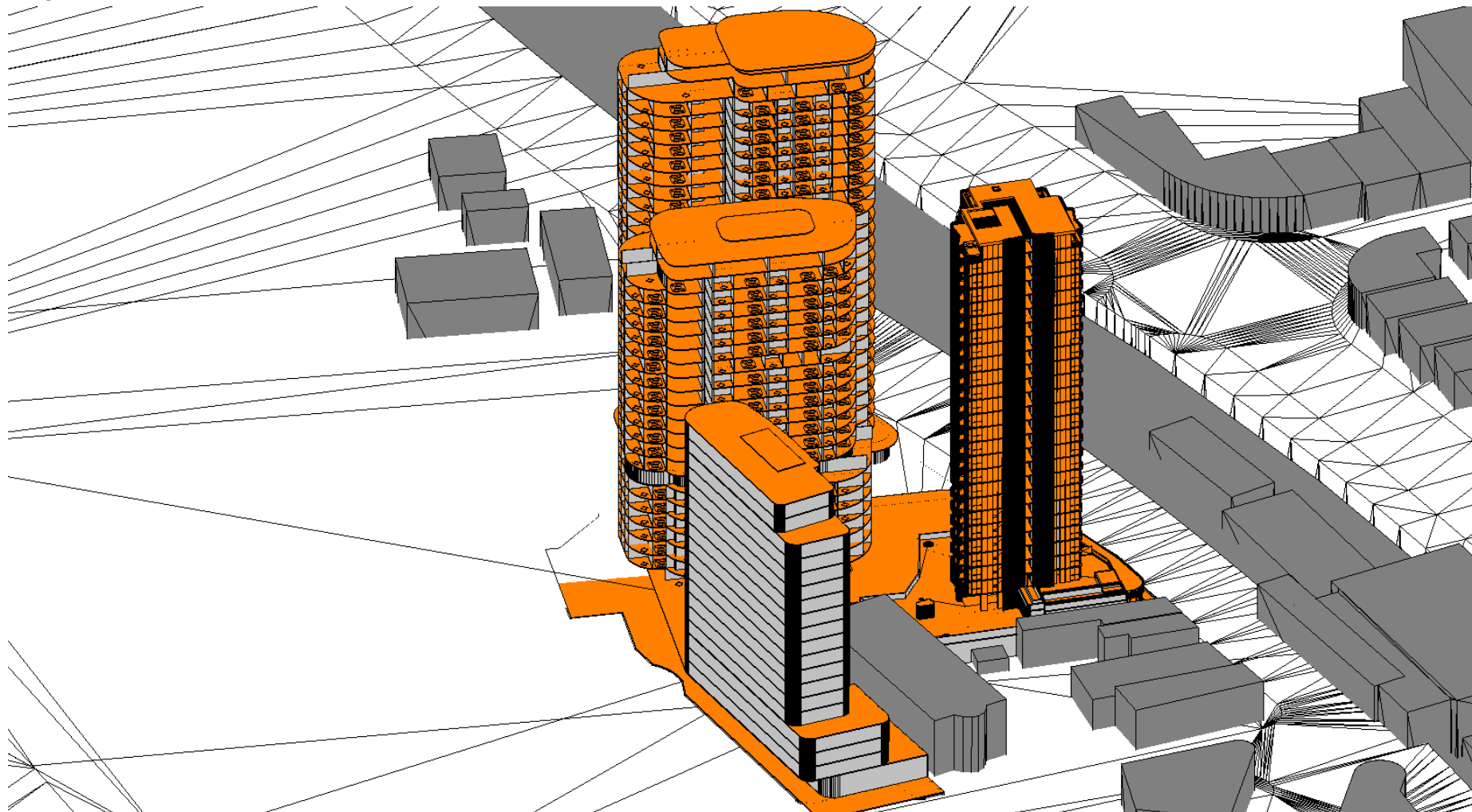


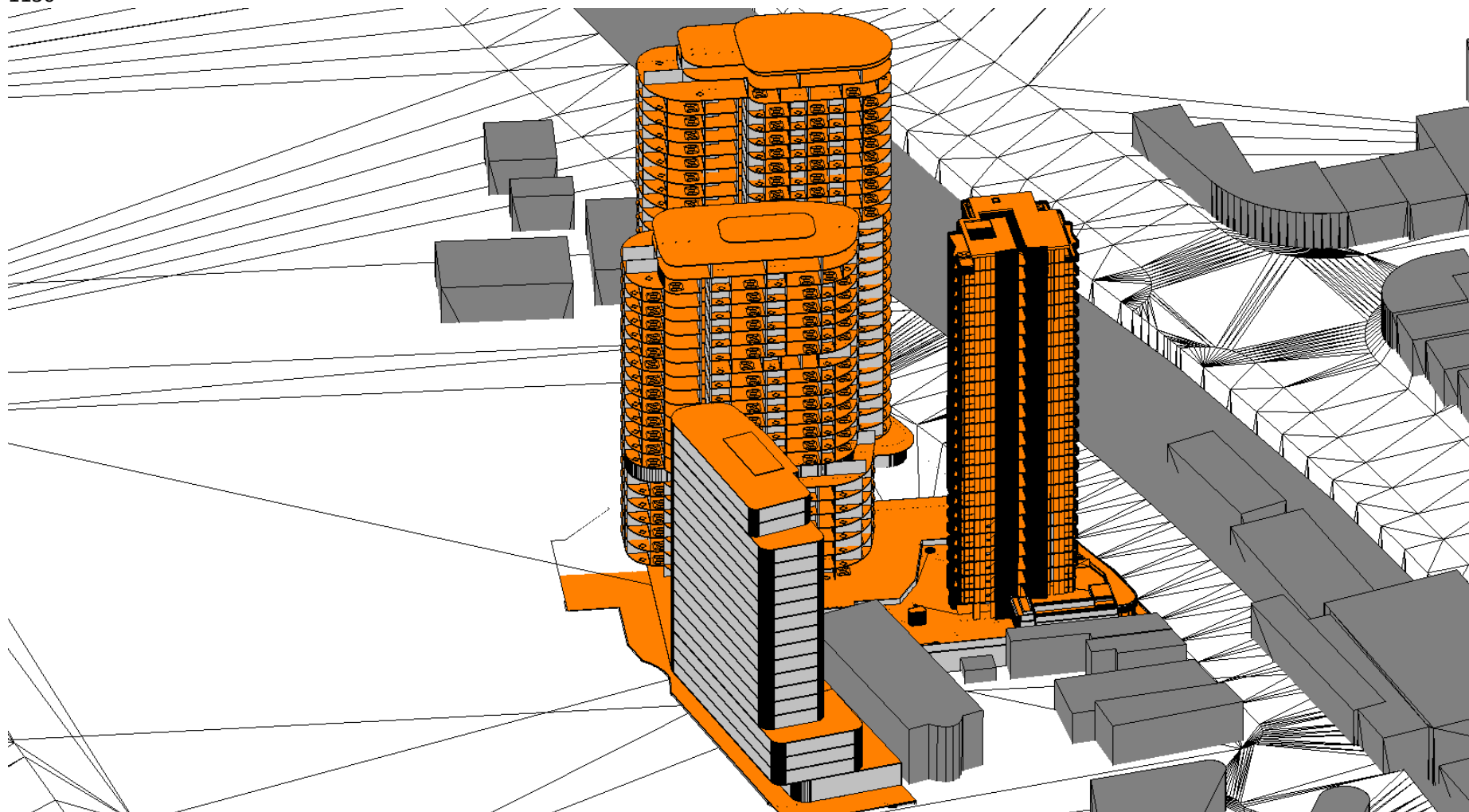


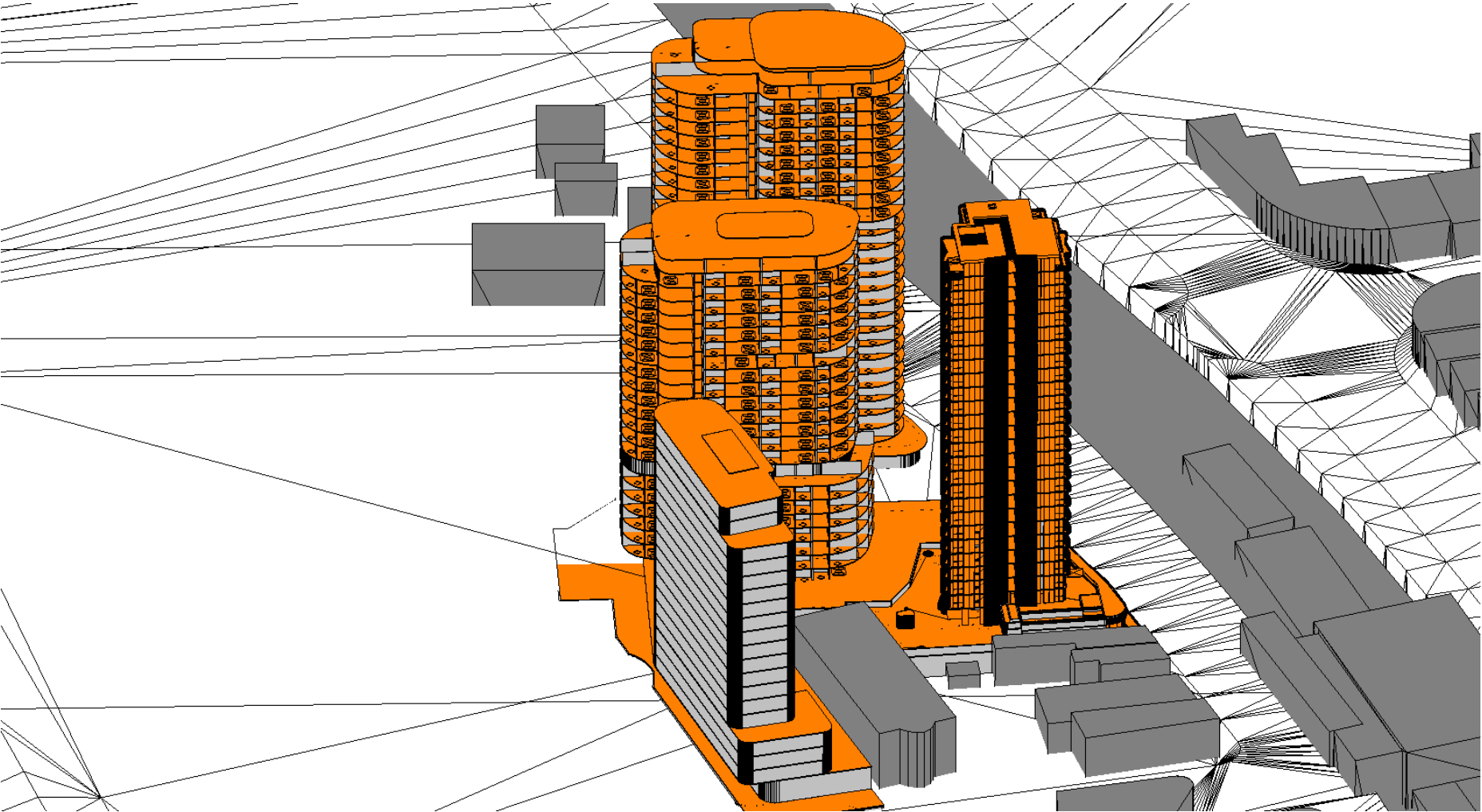


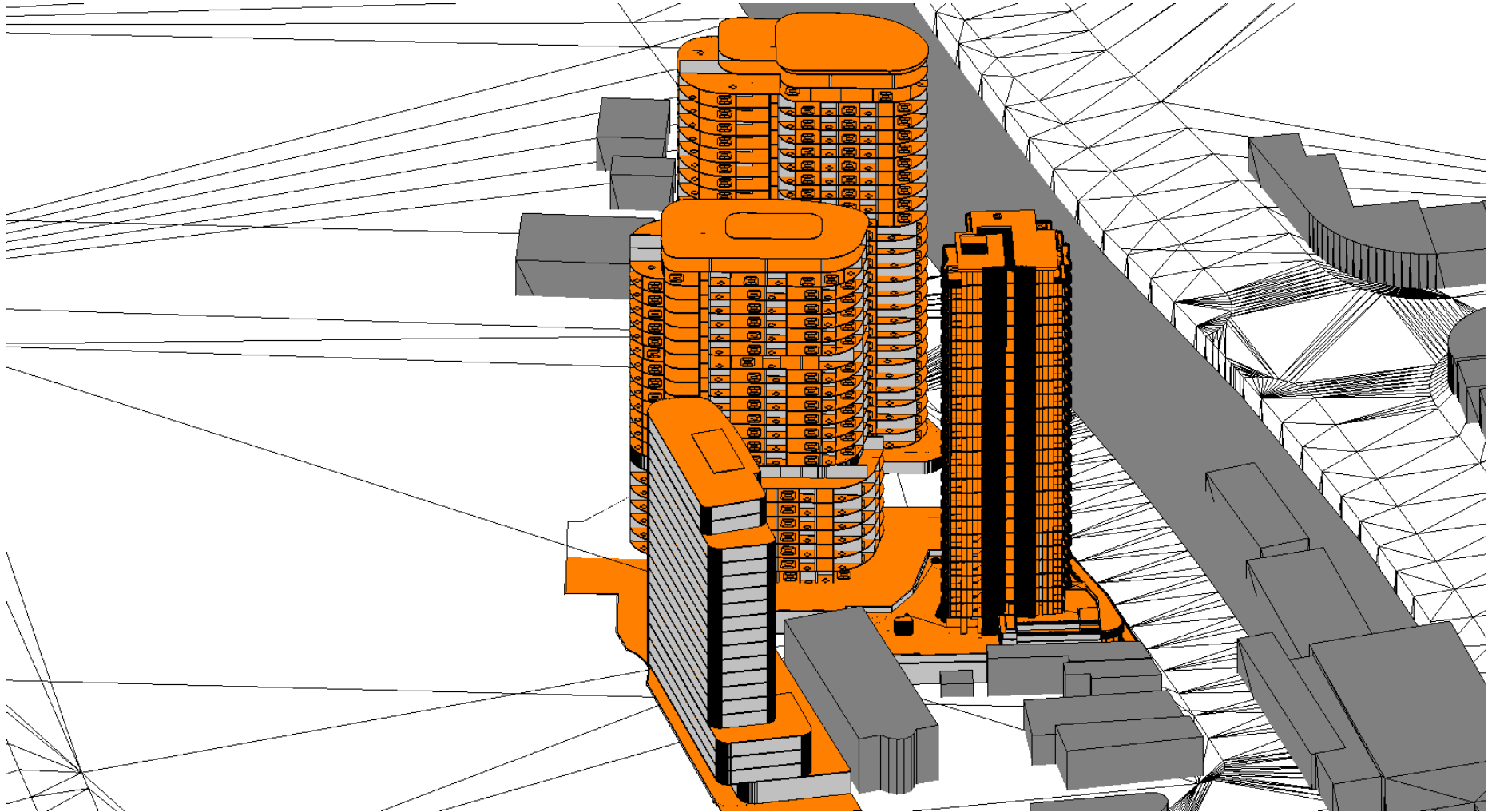


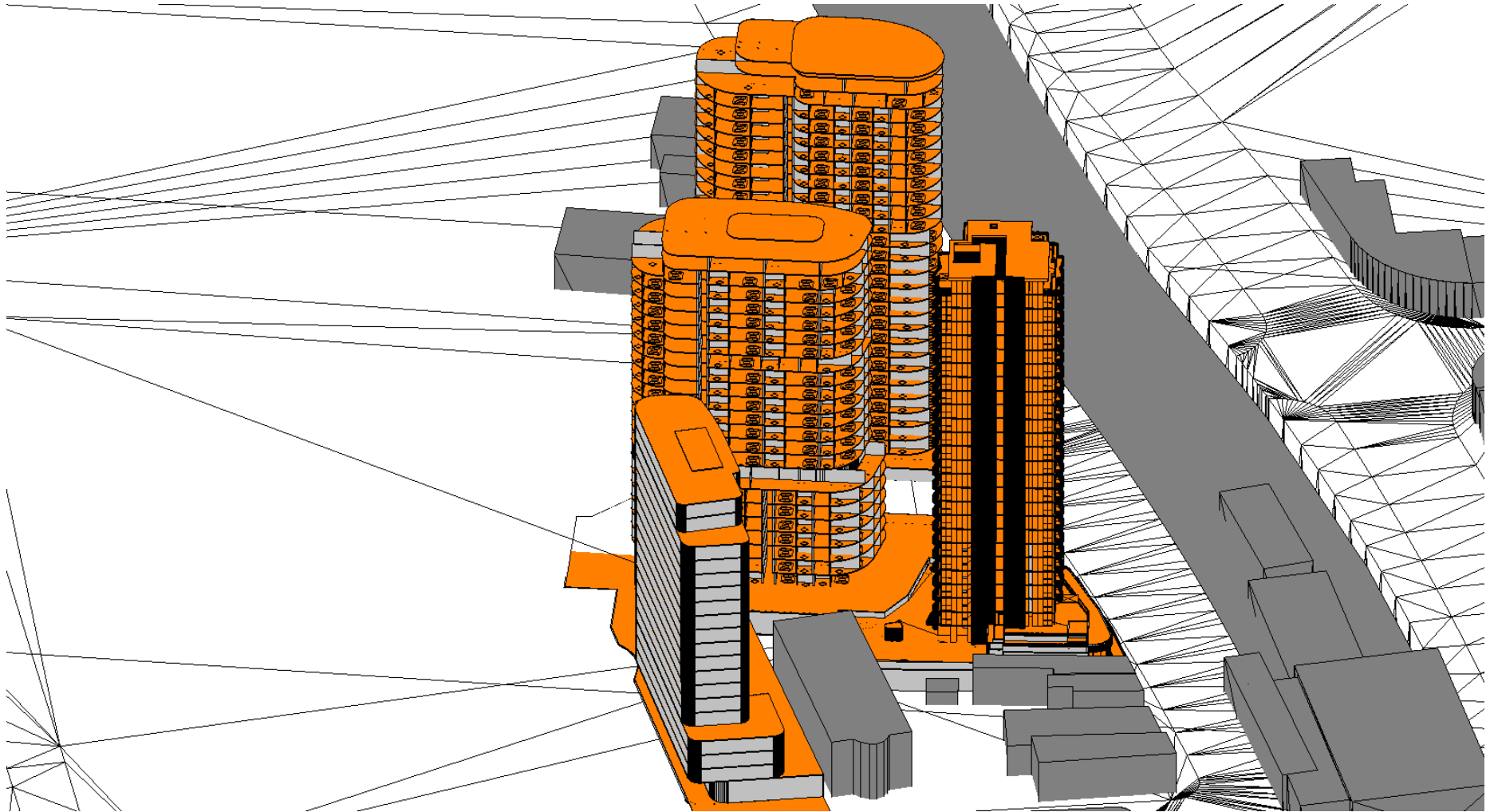


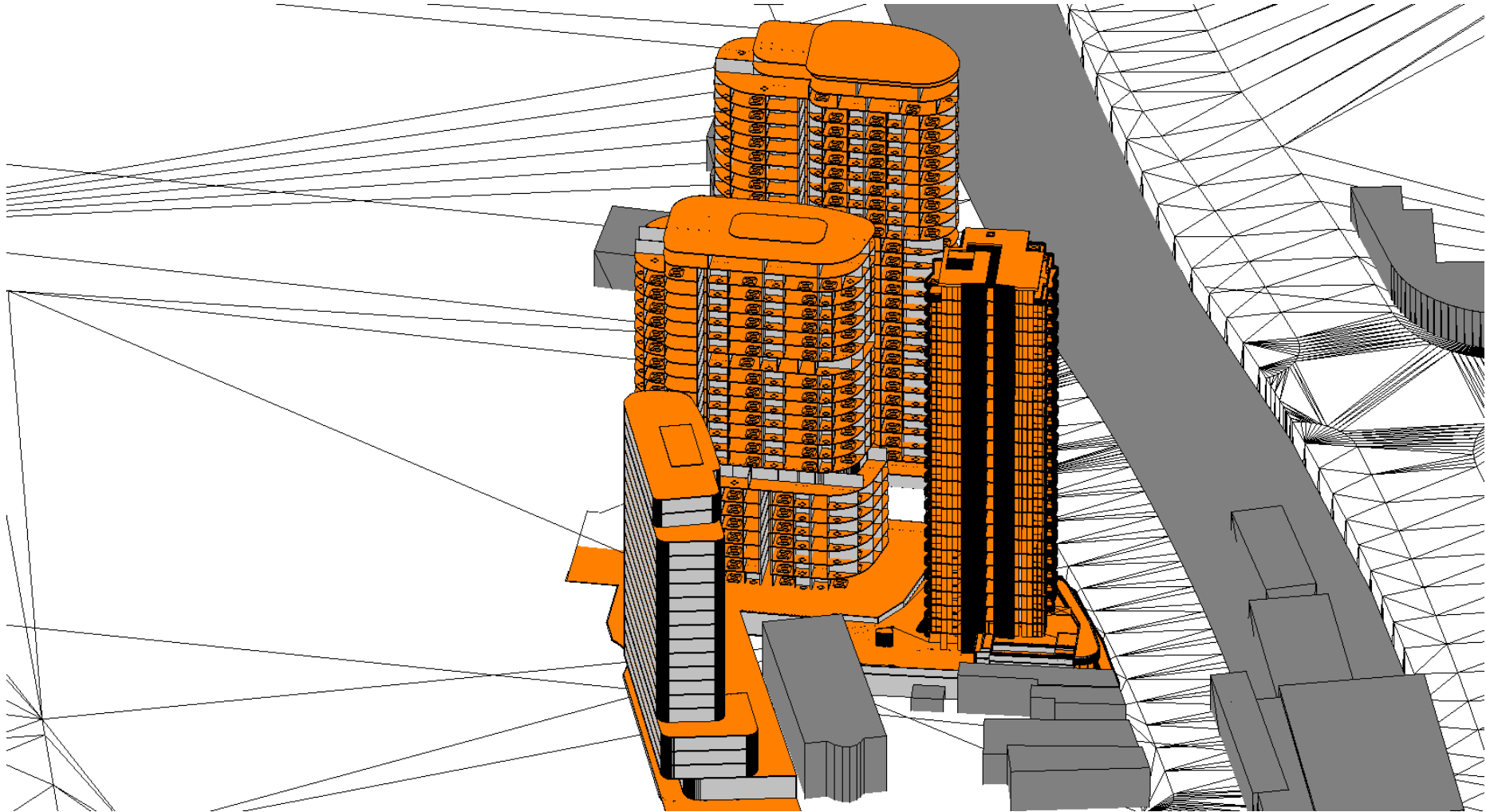


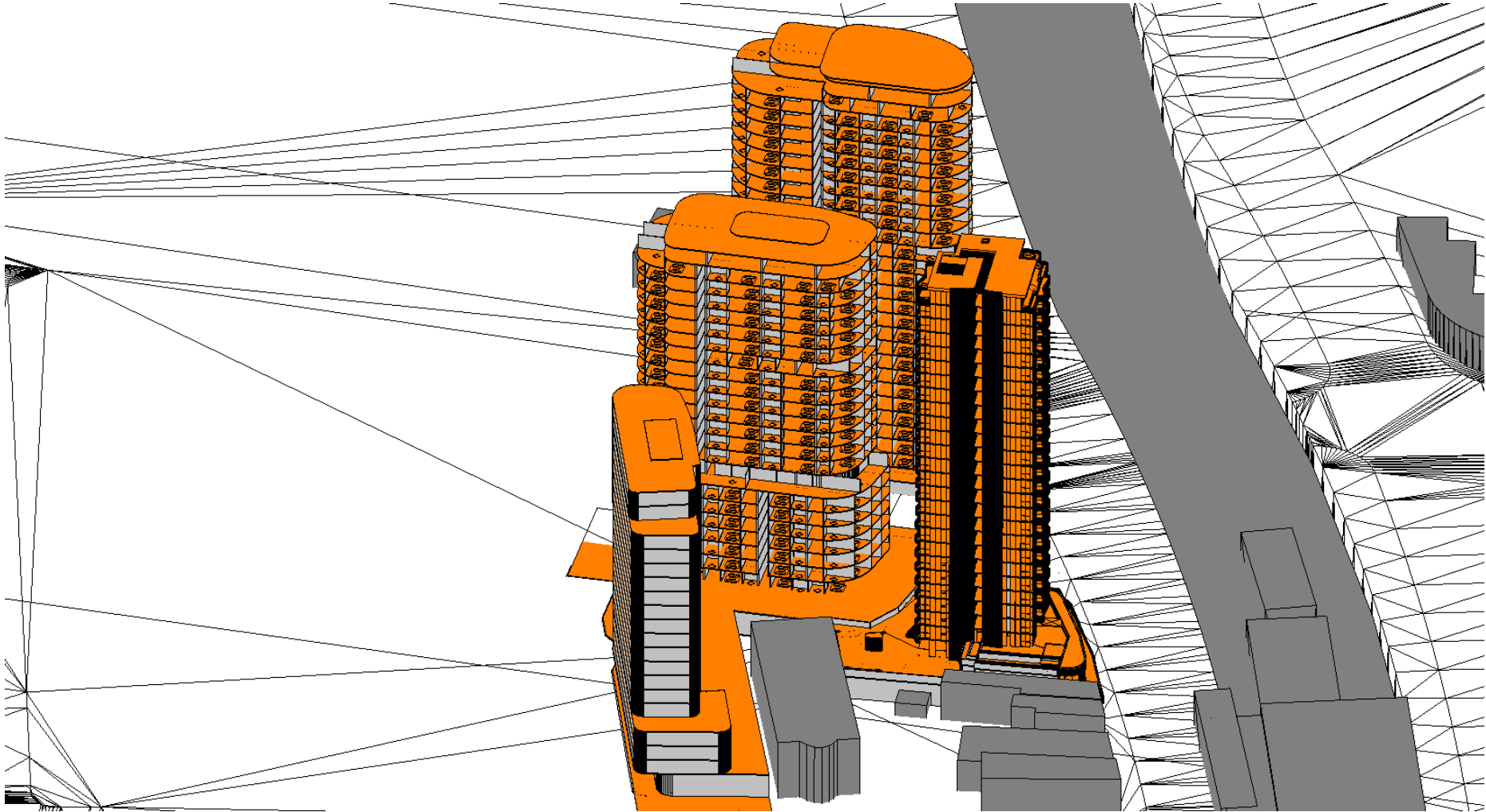


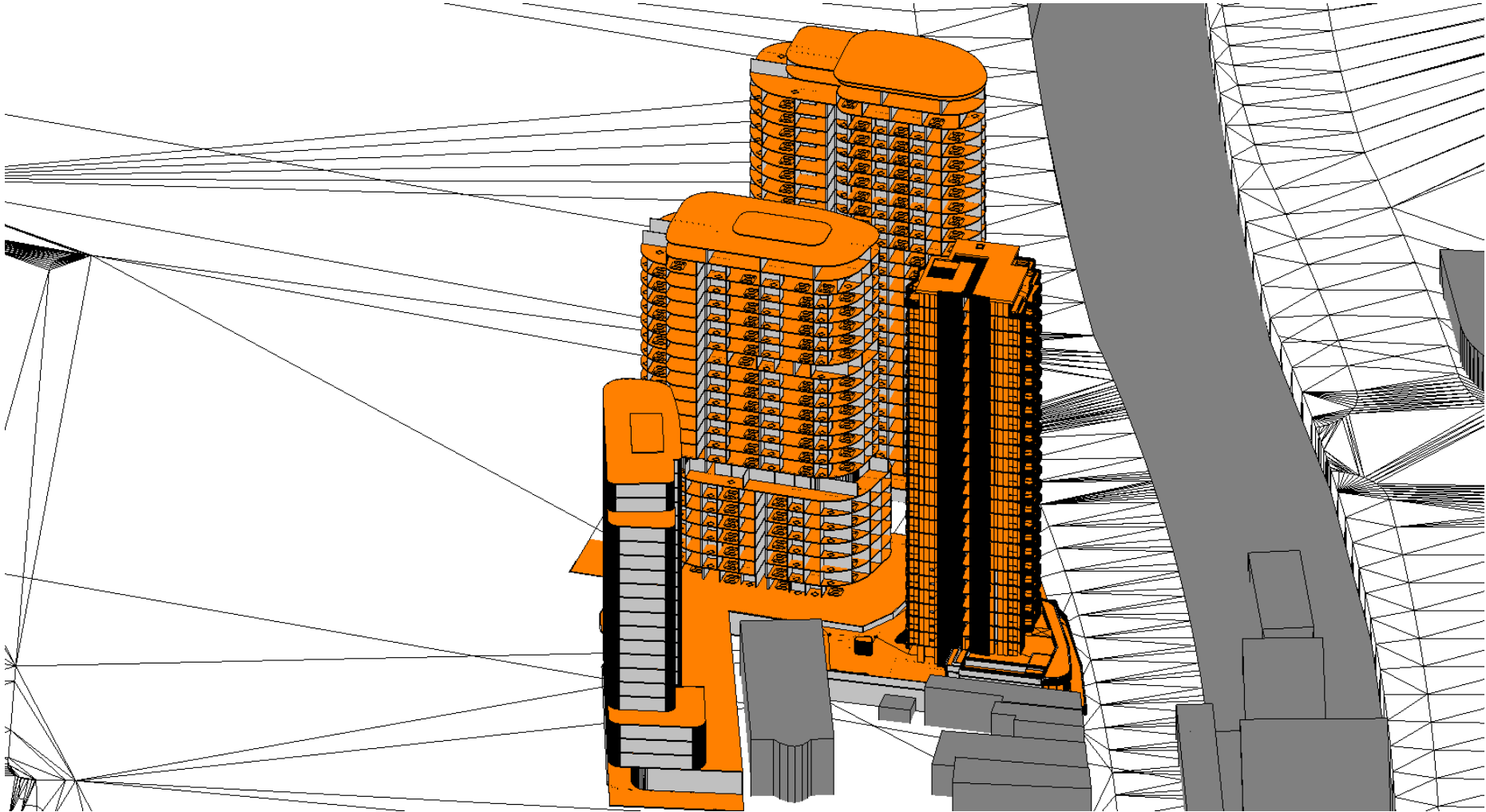


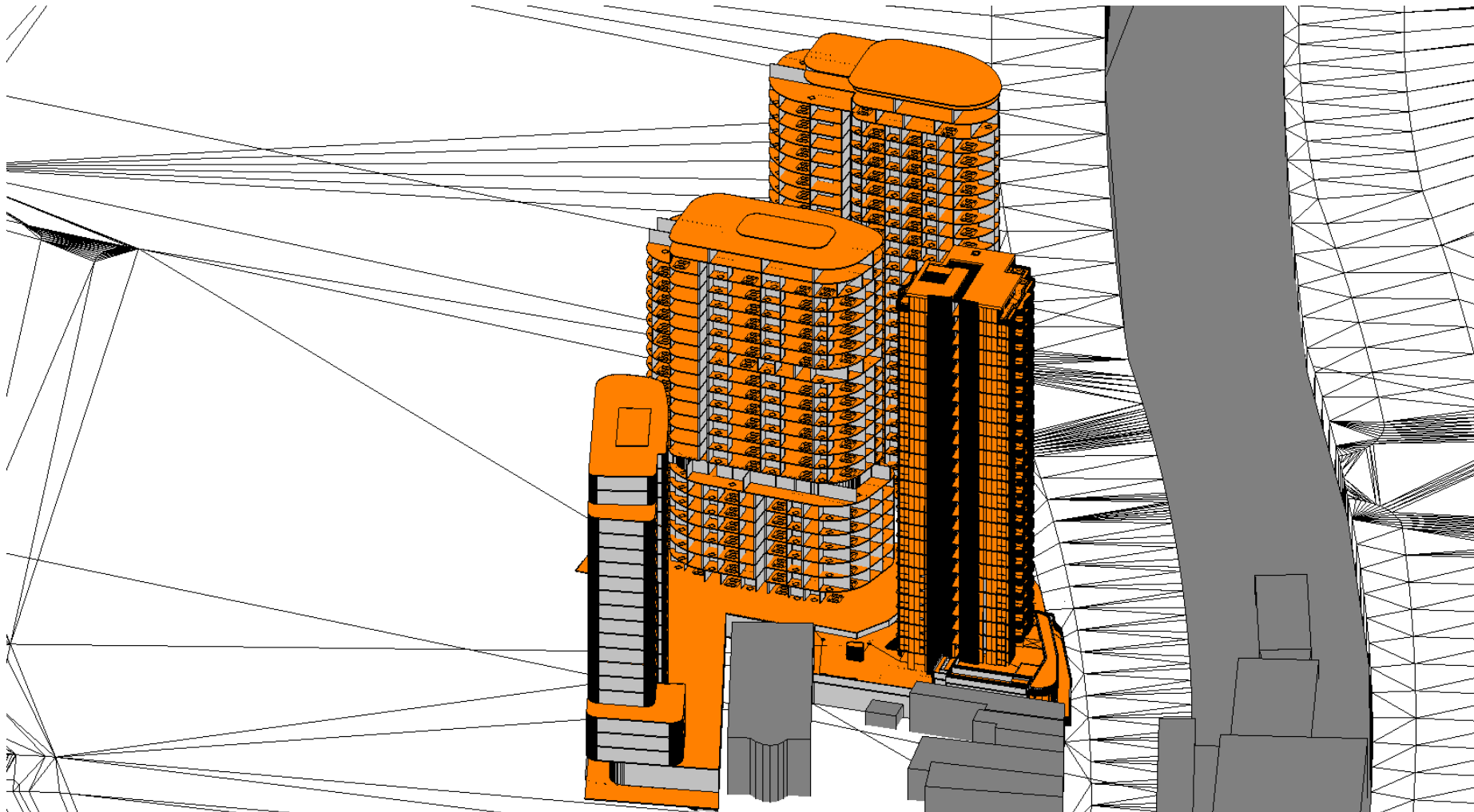


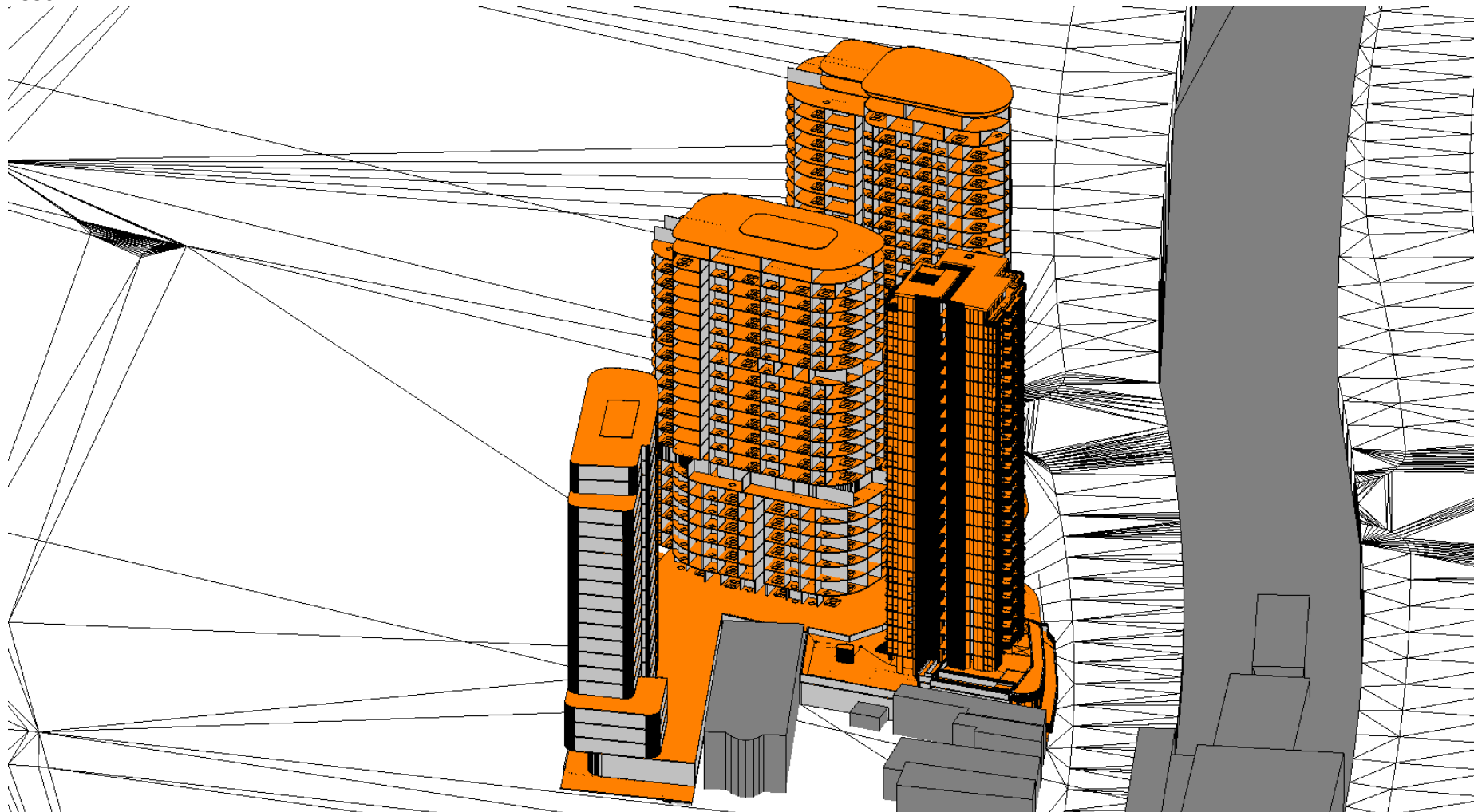


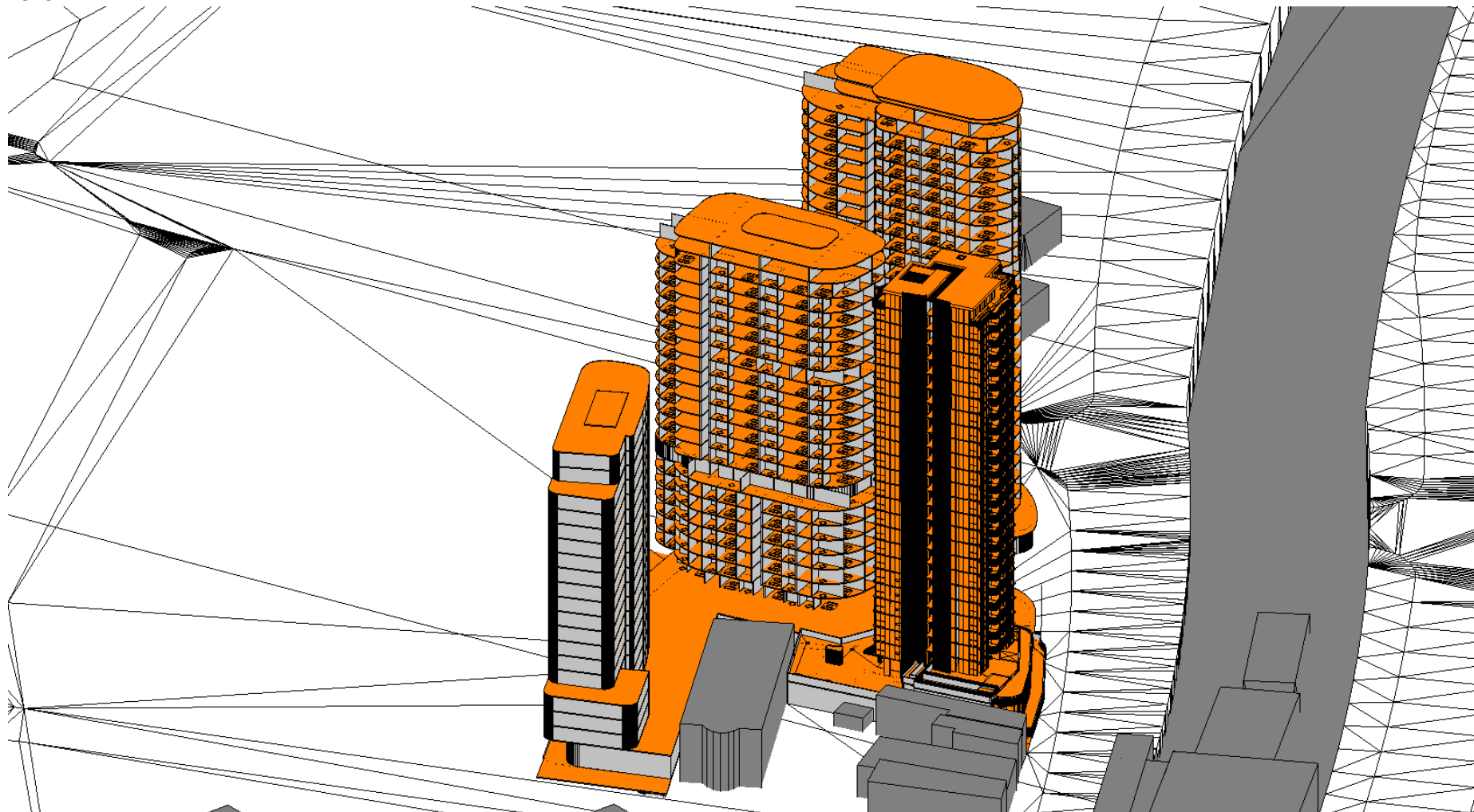


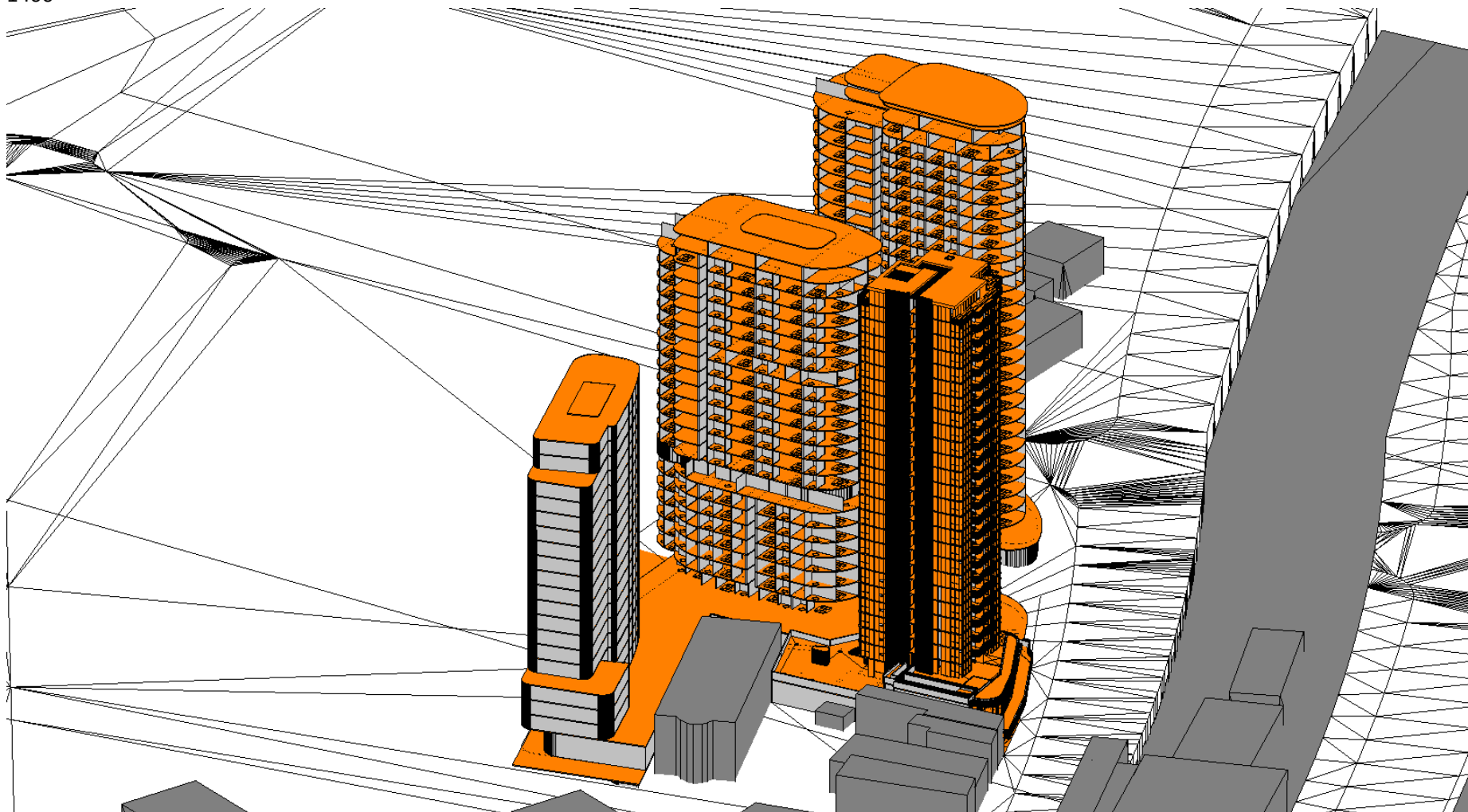


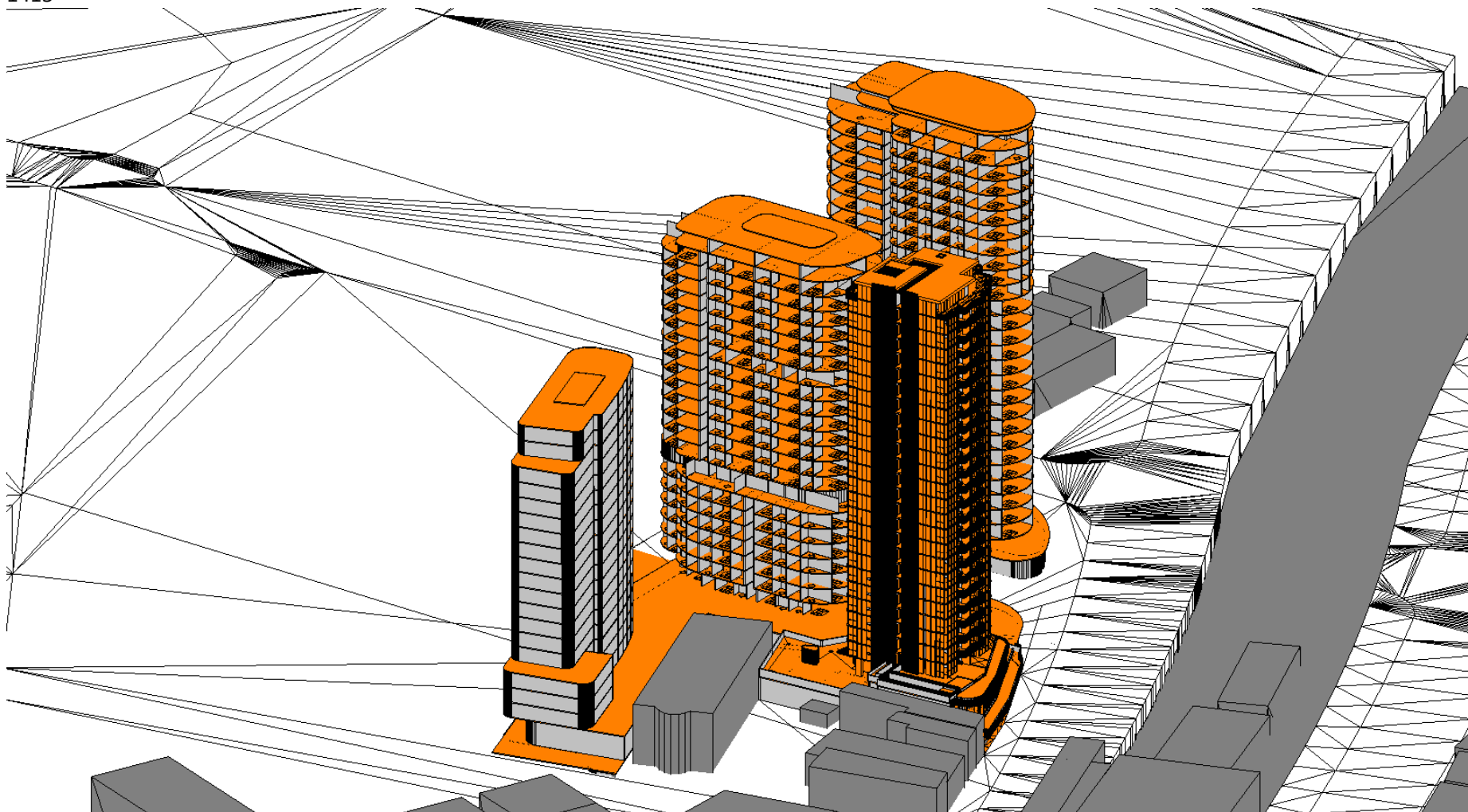


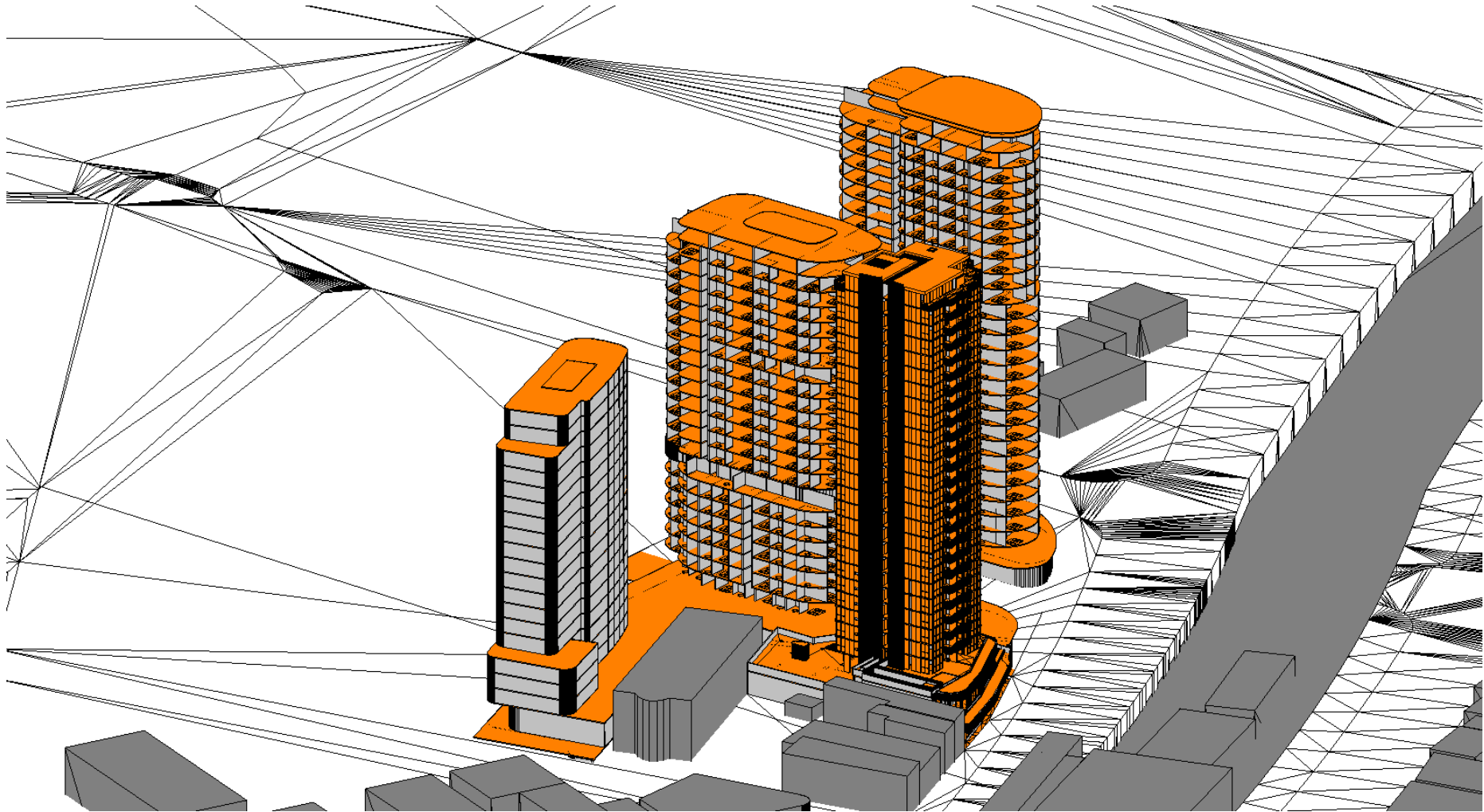


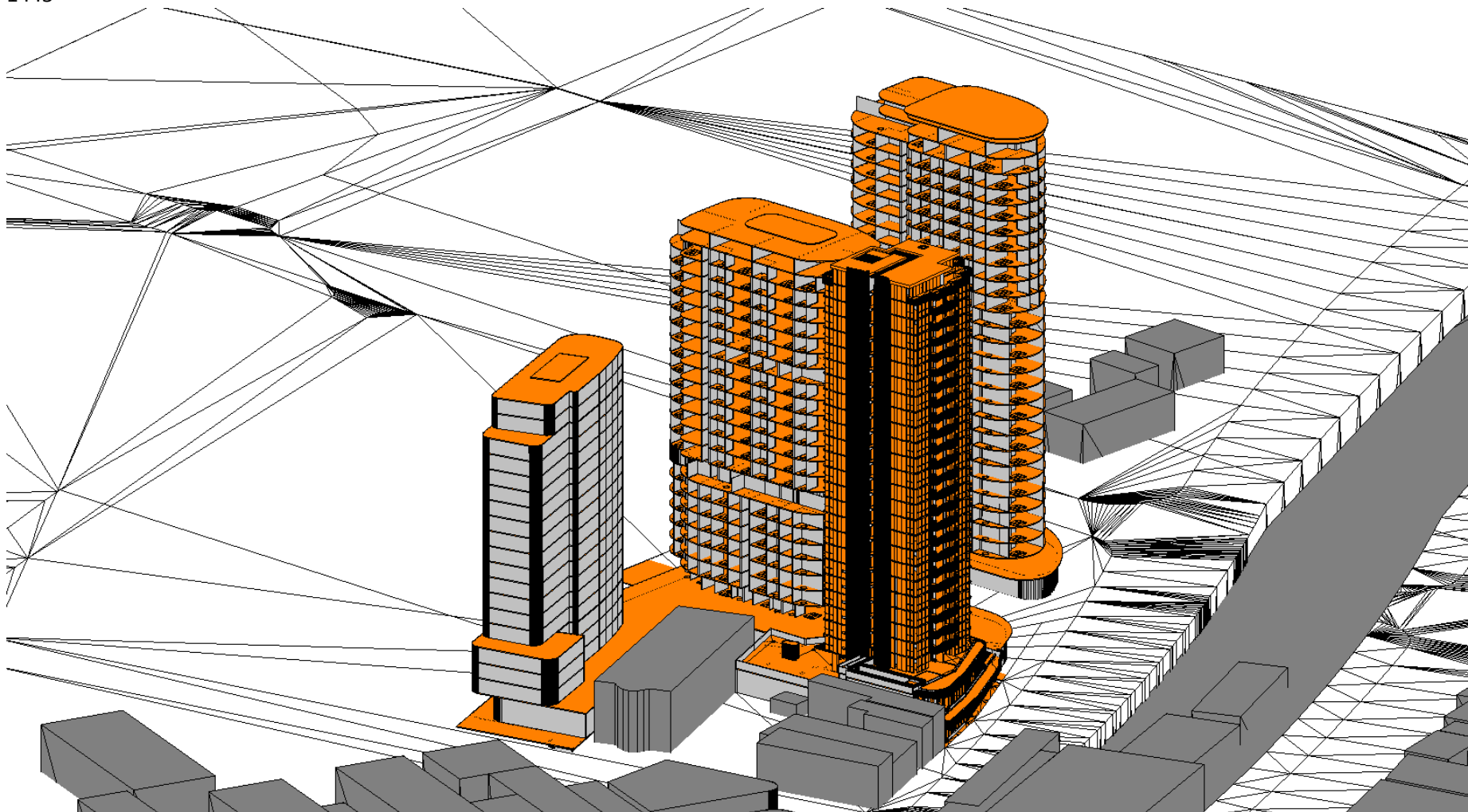


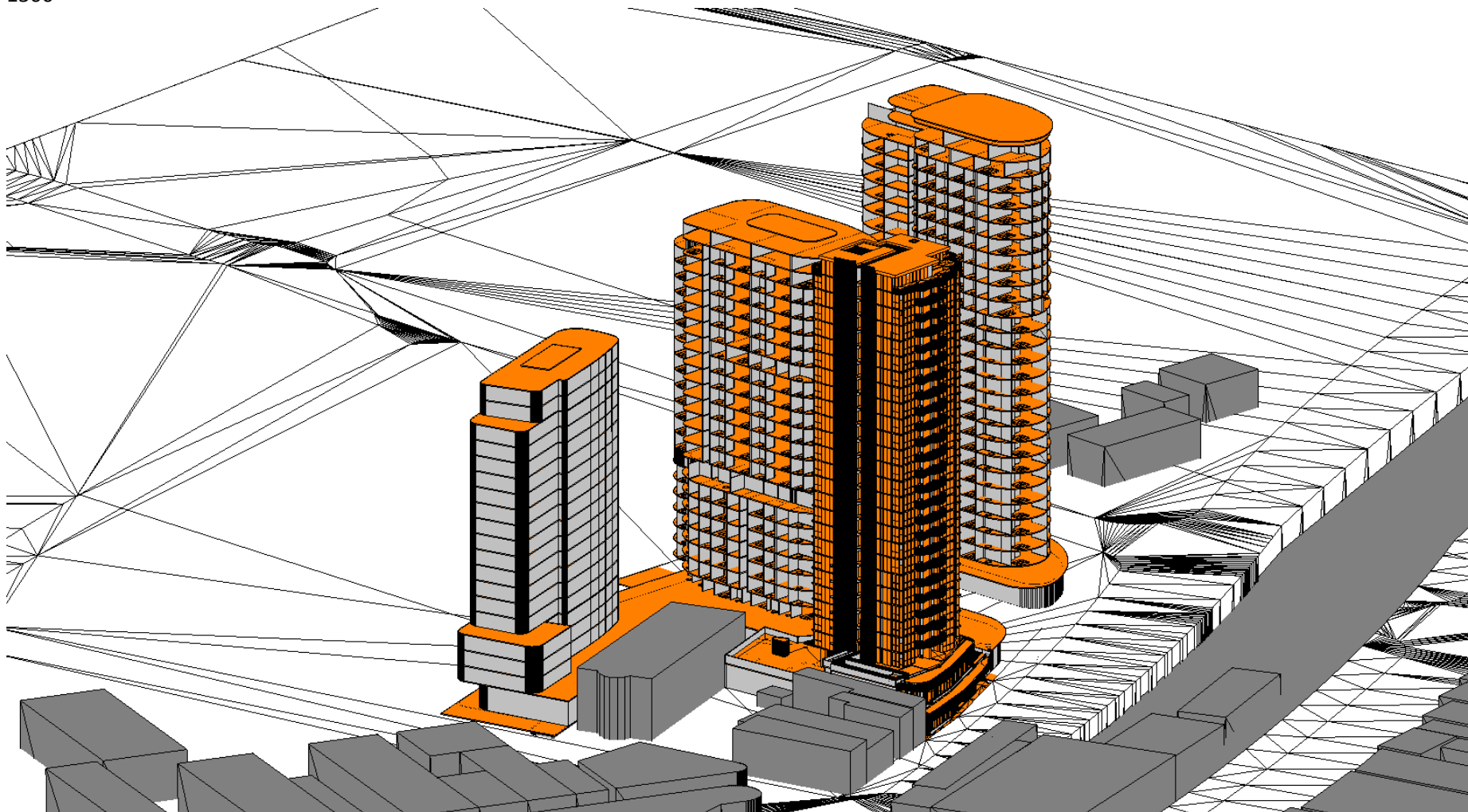


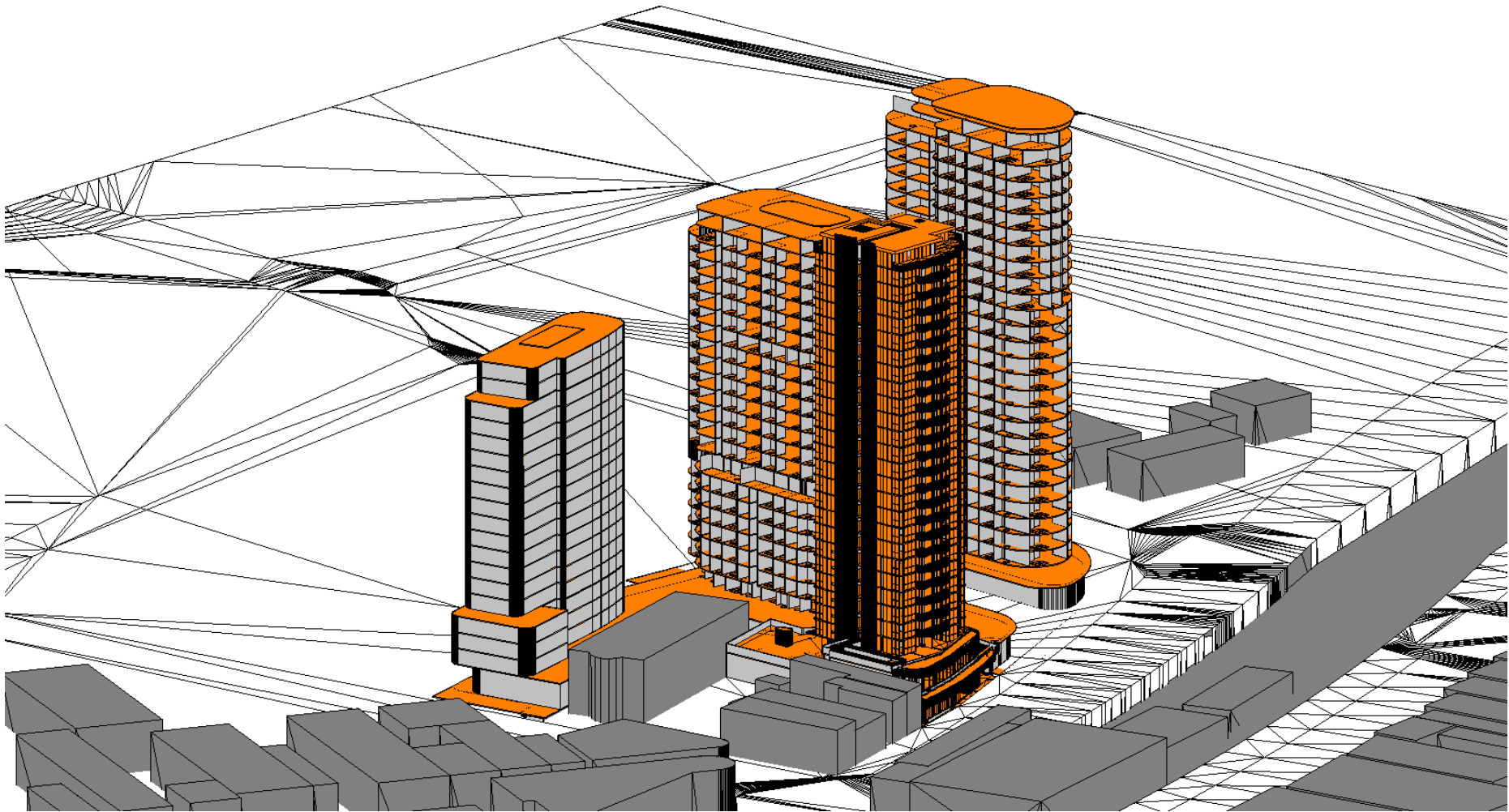


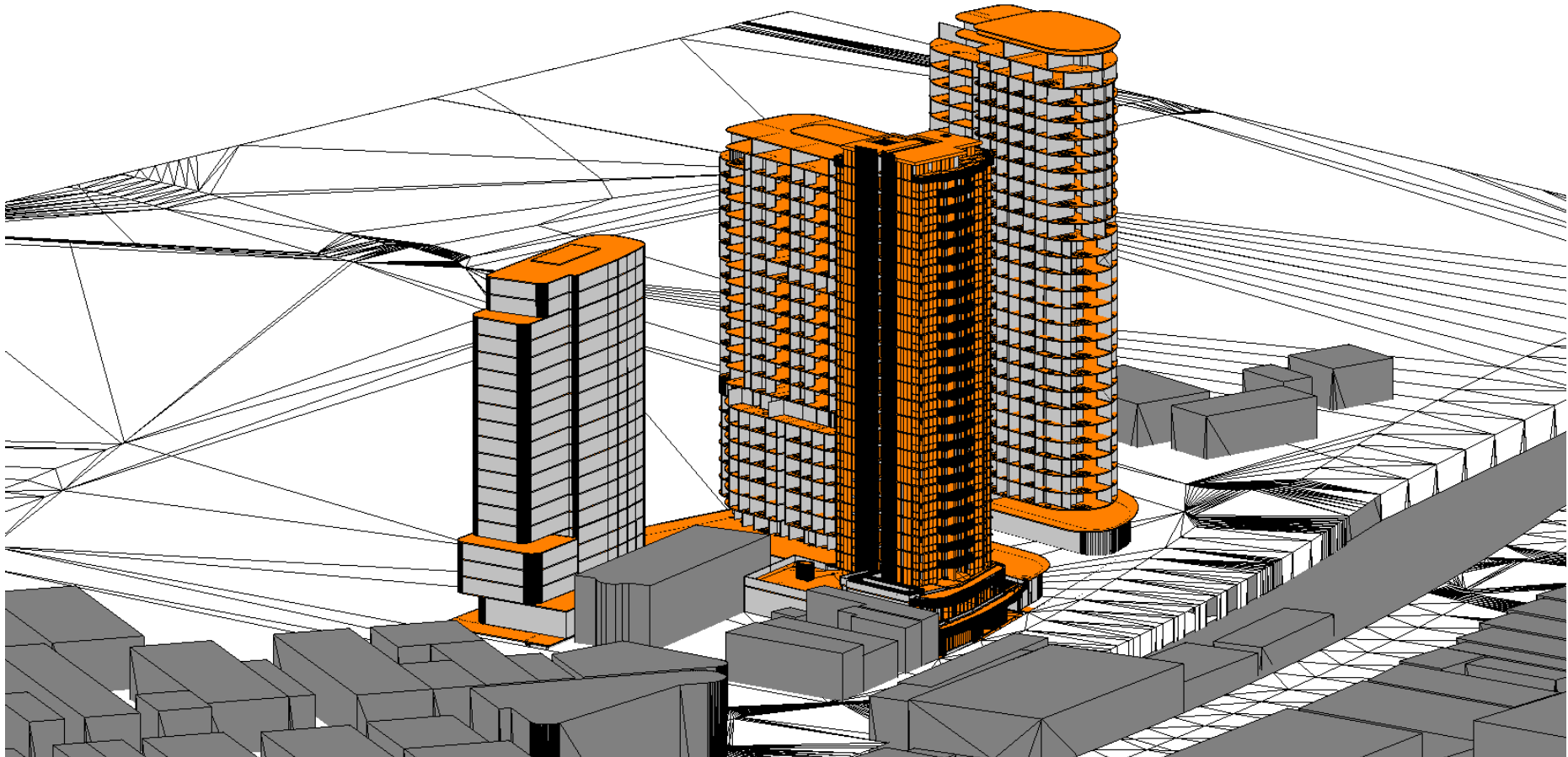


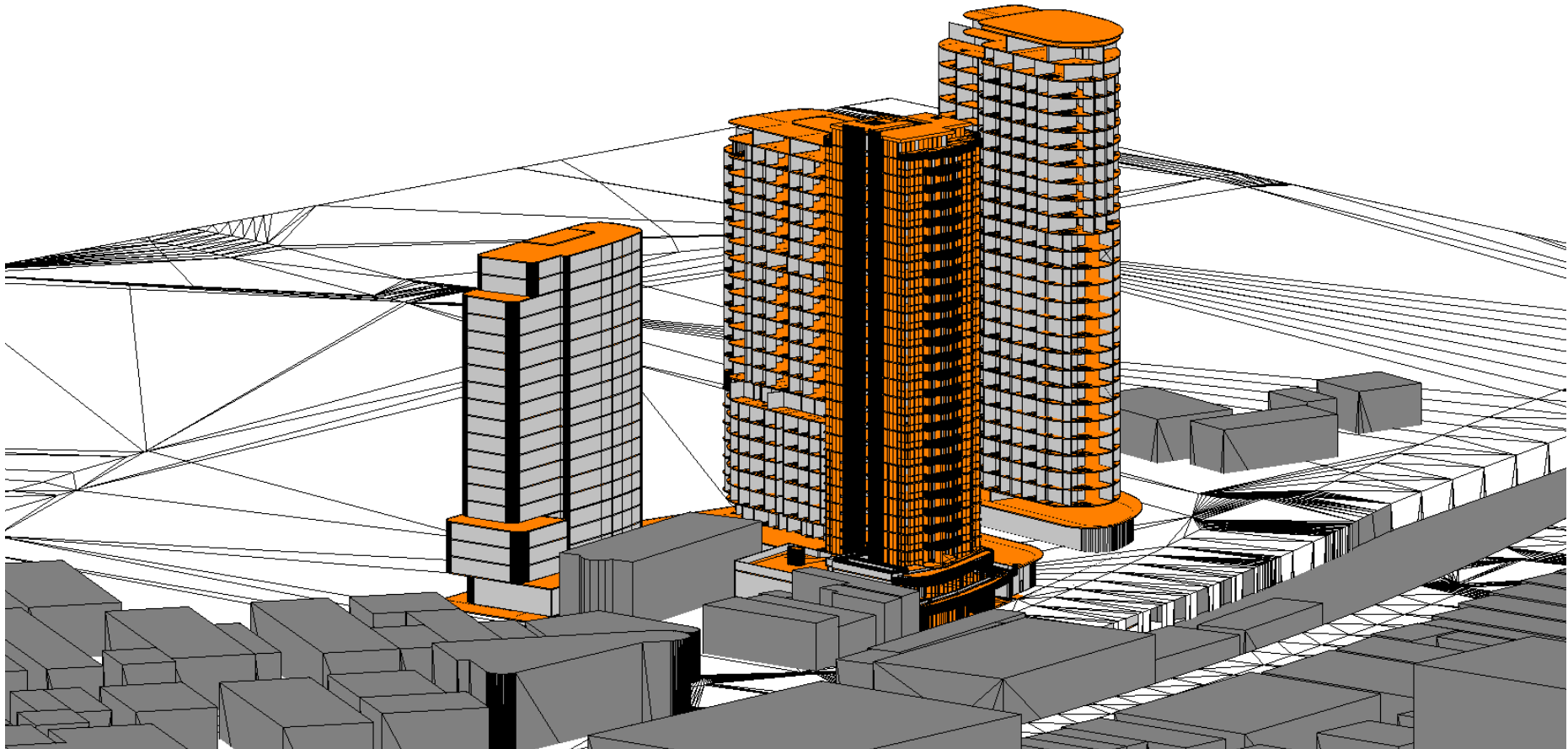


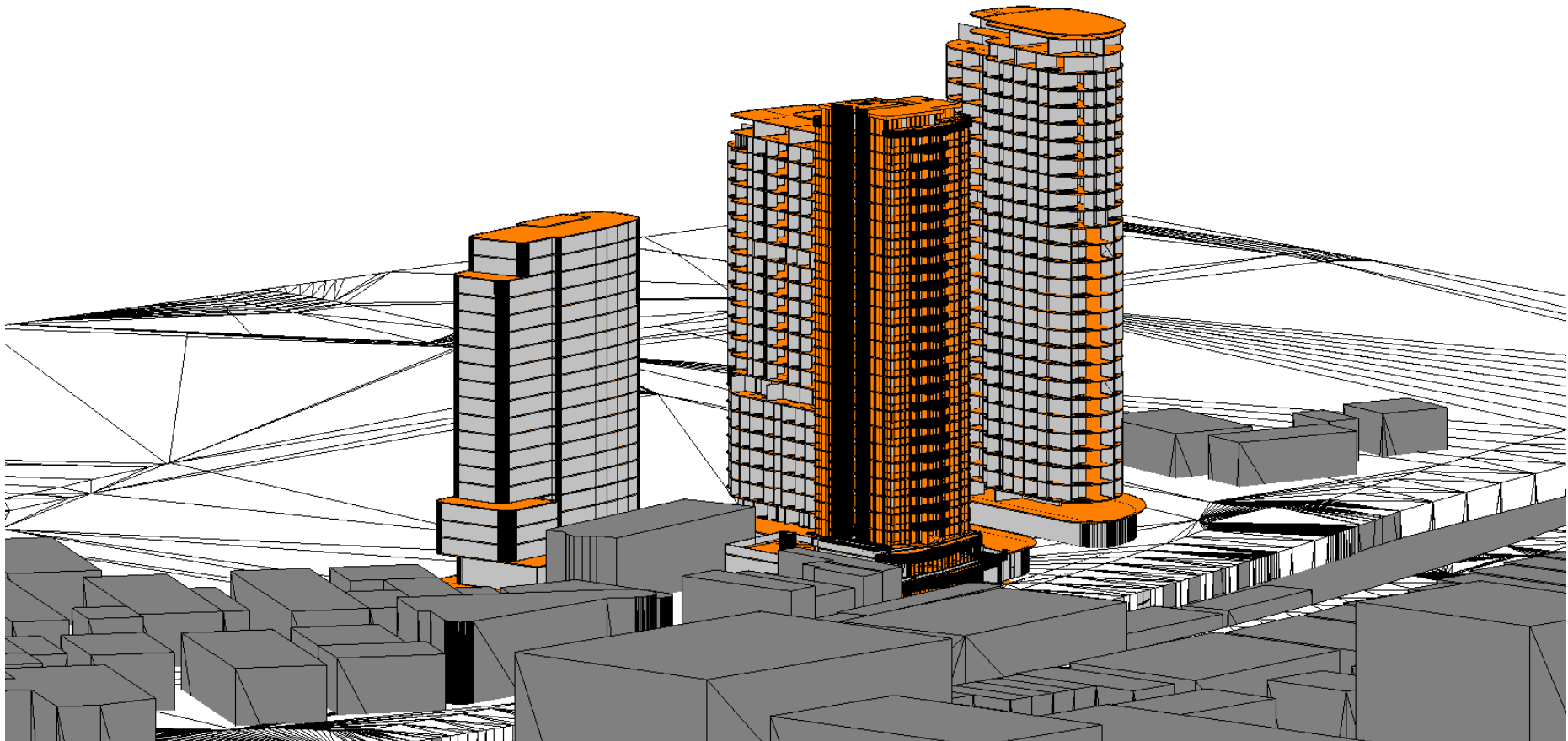








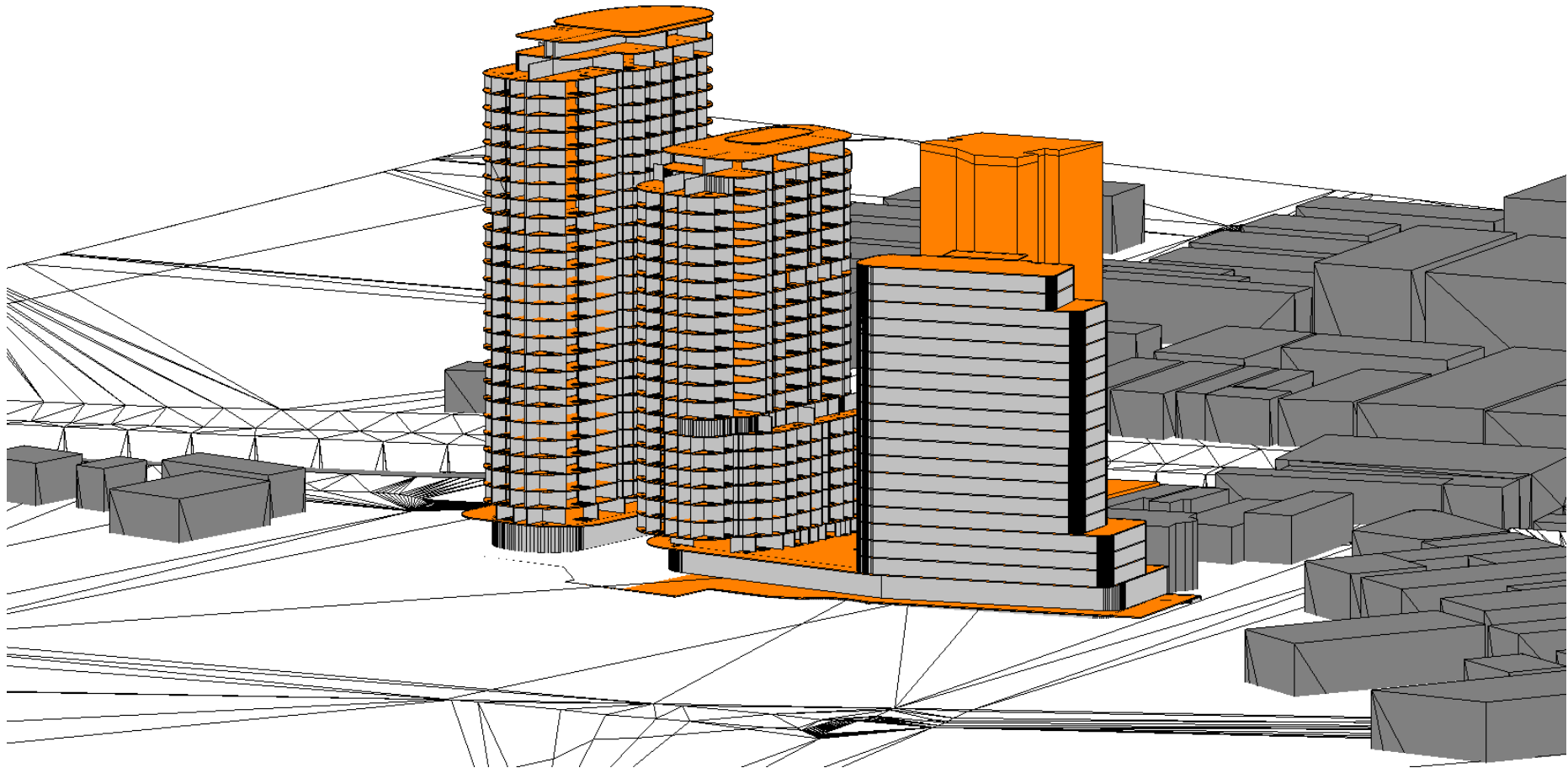


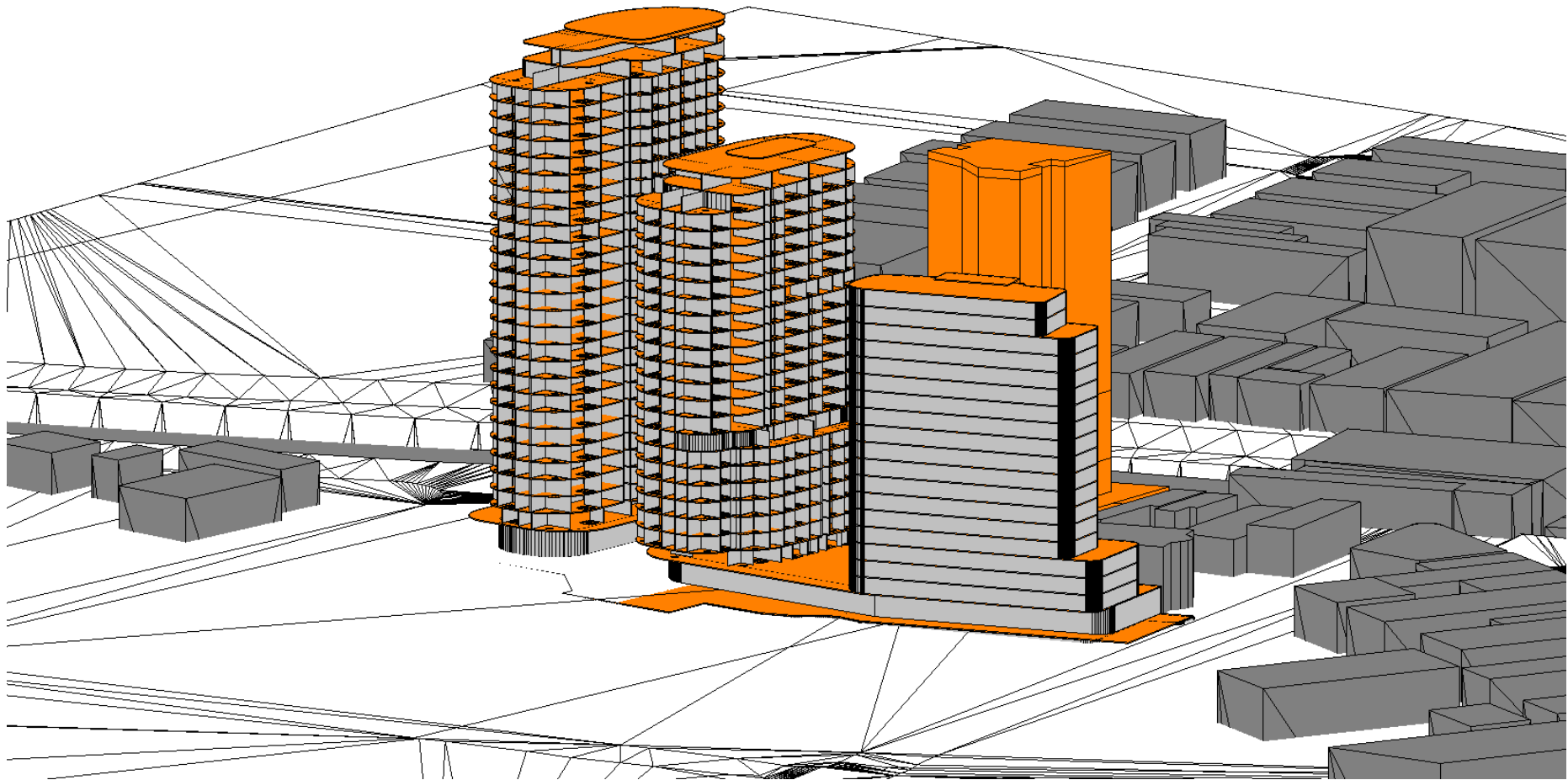


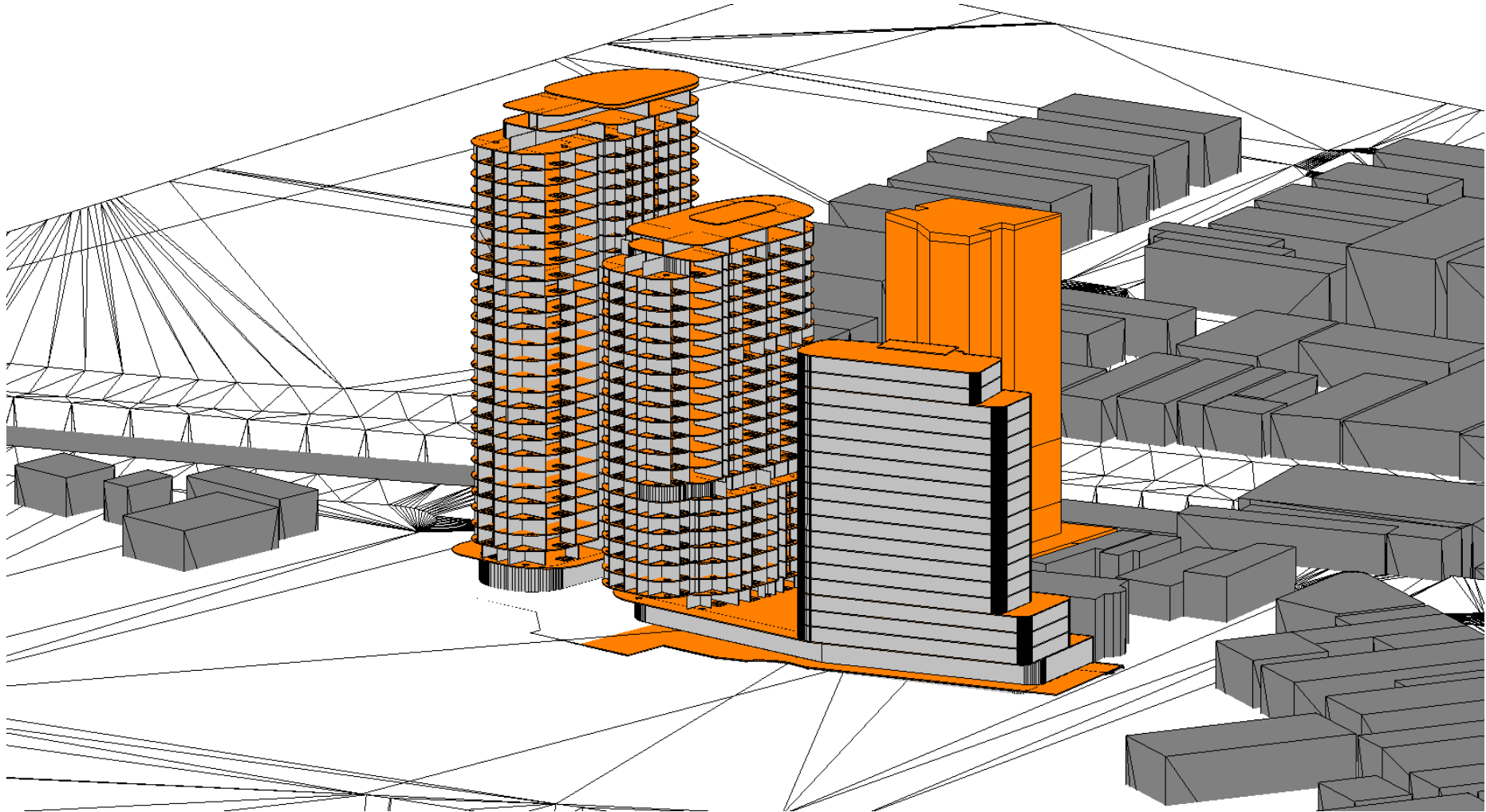
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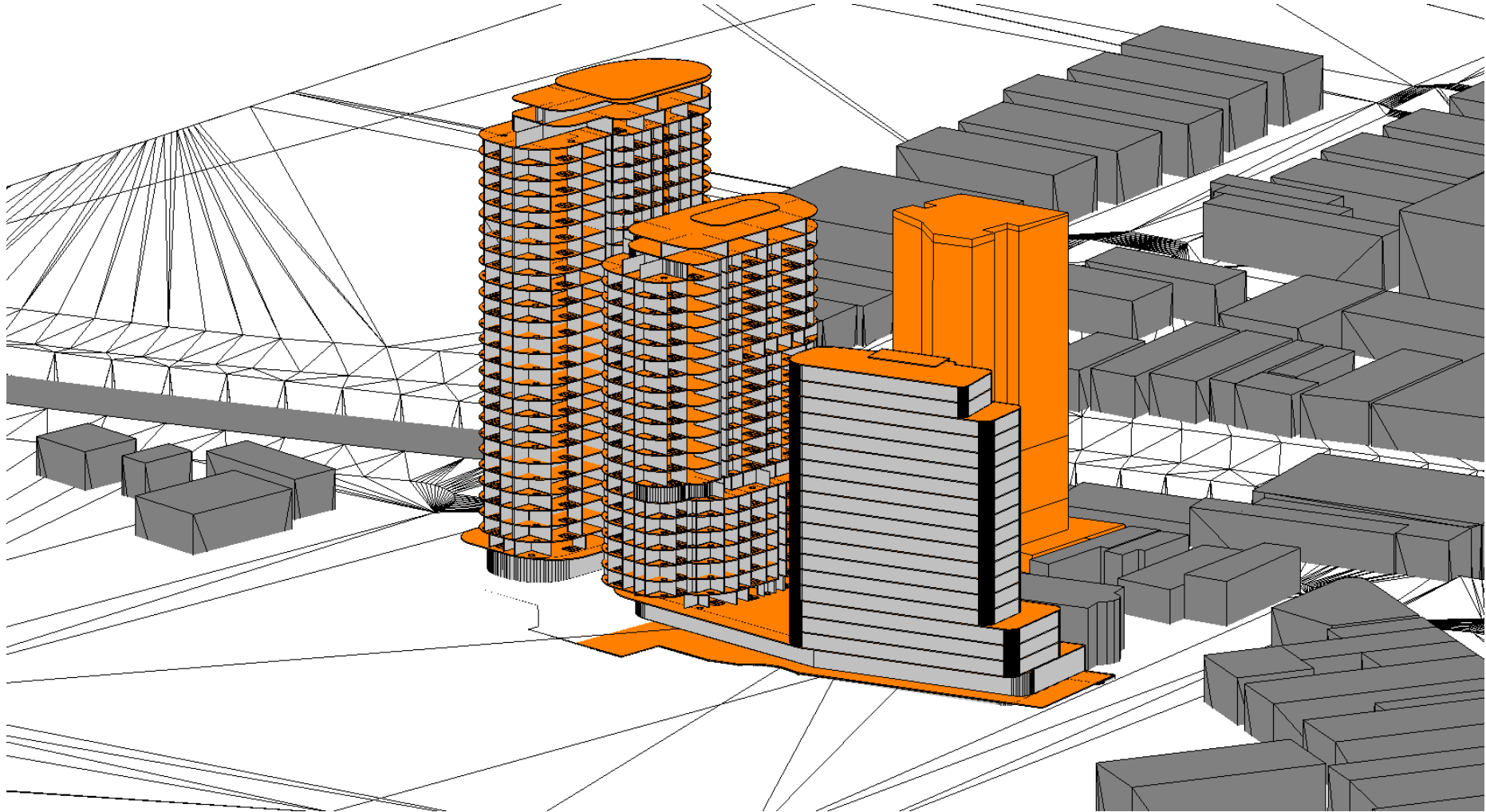
Sun Eye Views ADG Massing

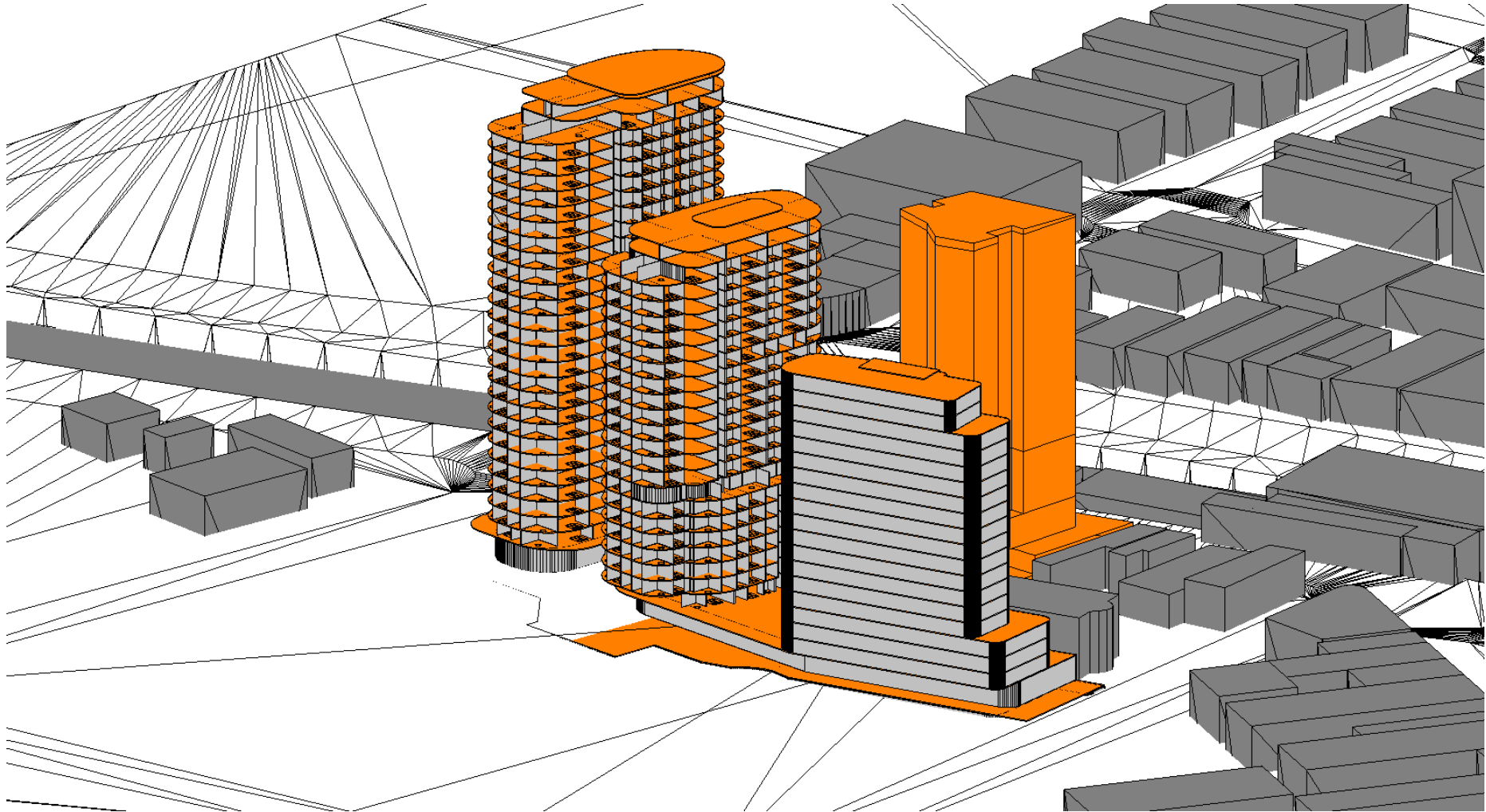
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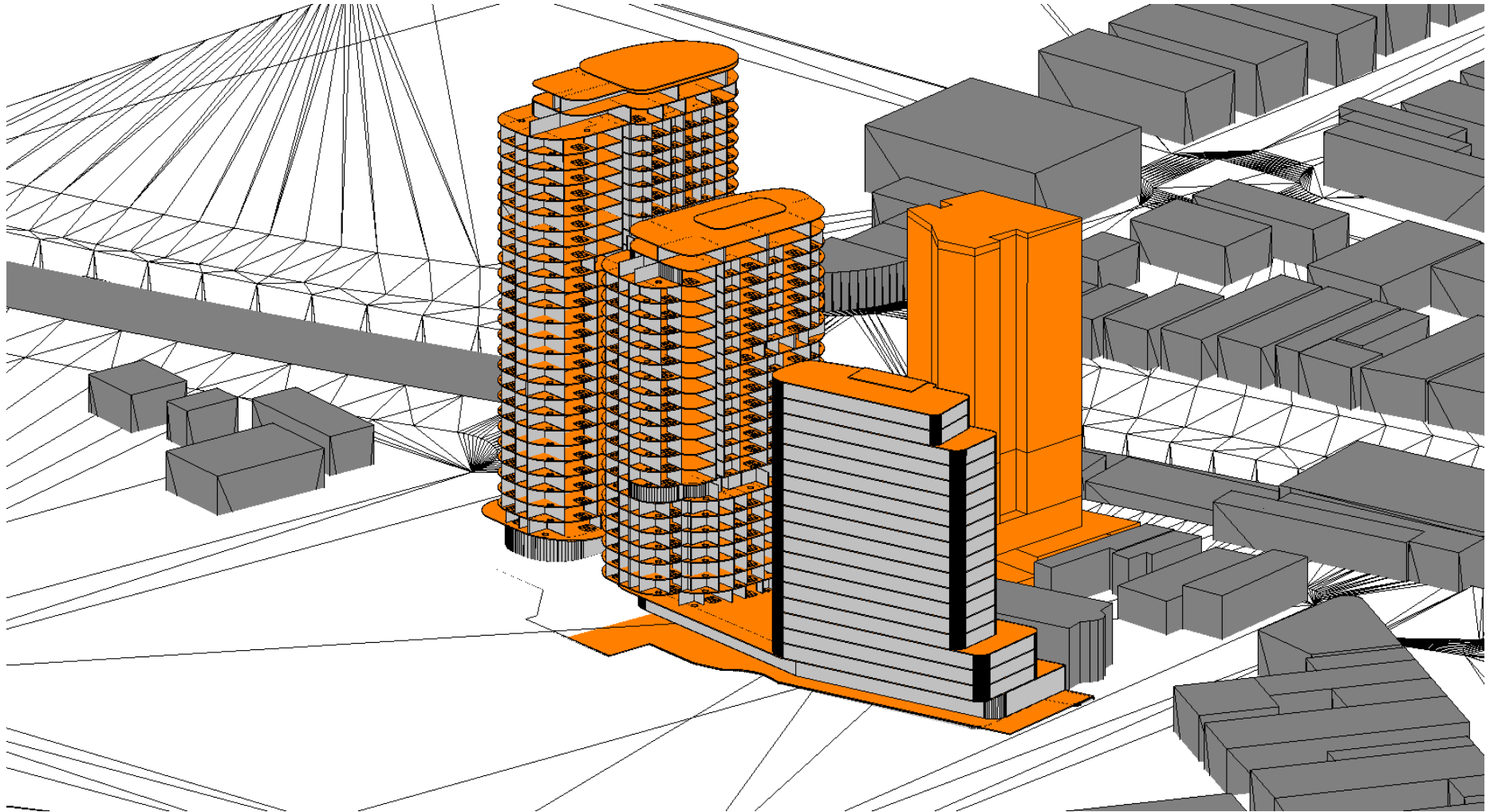


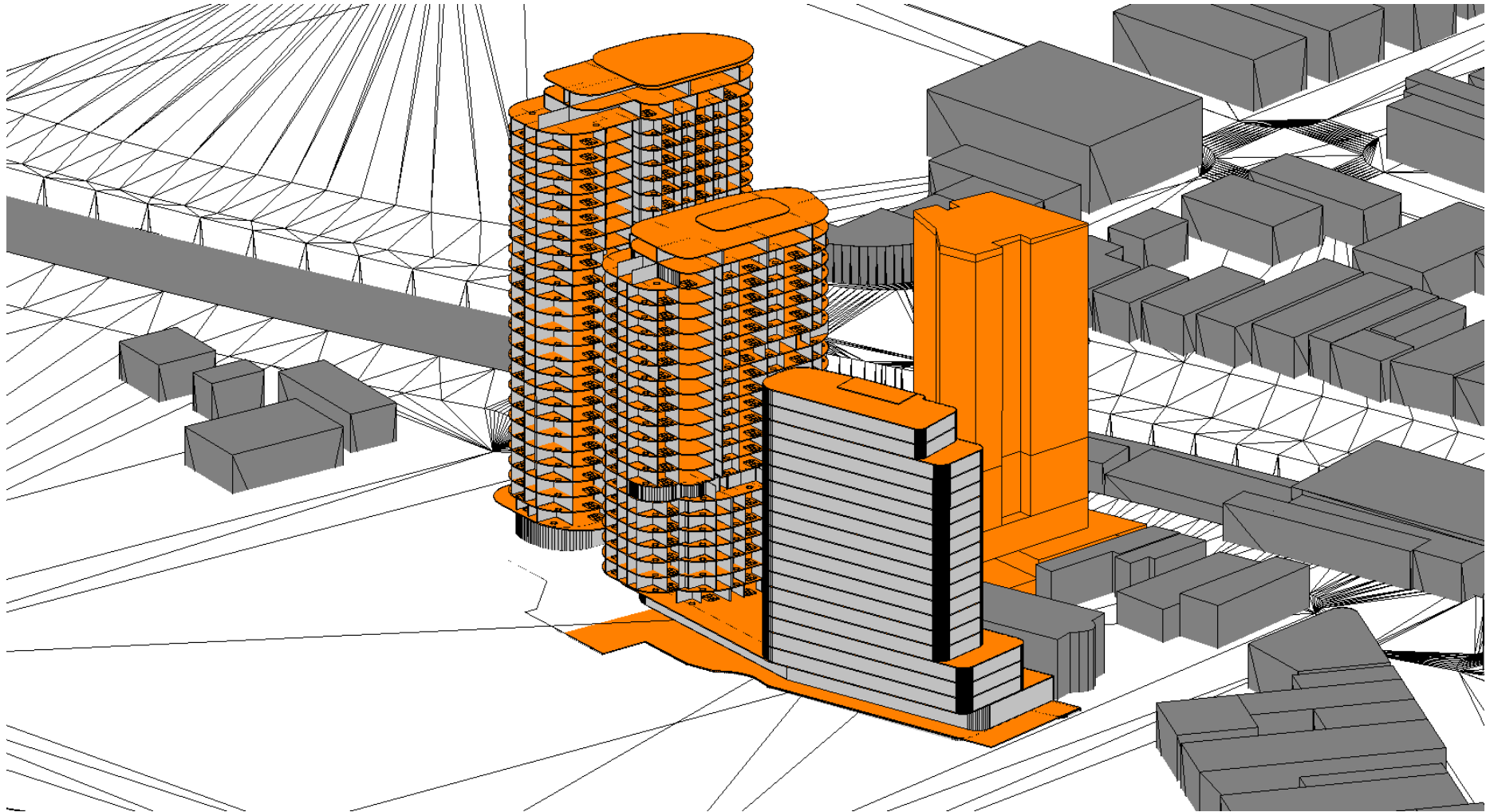


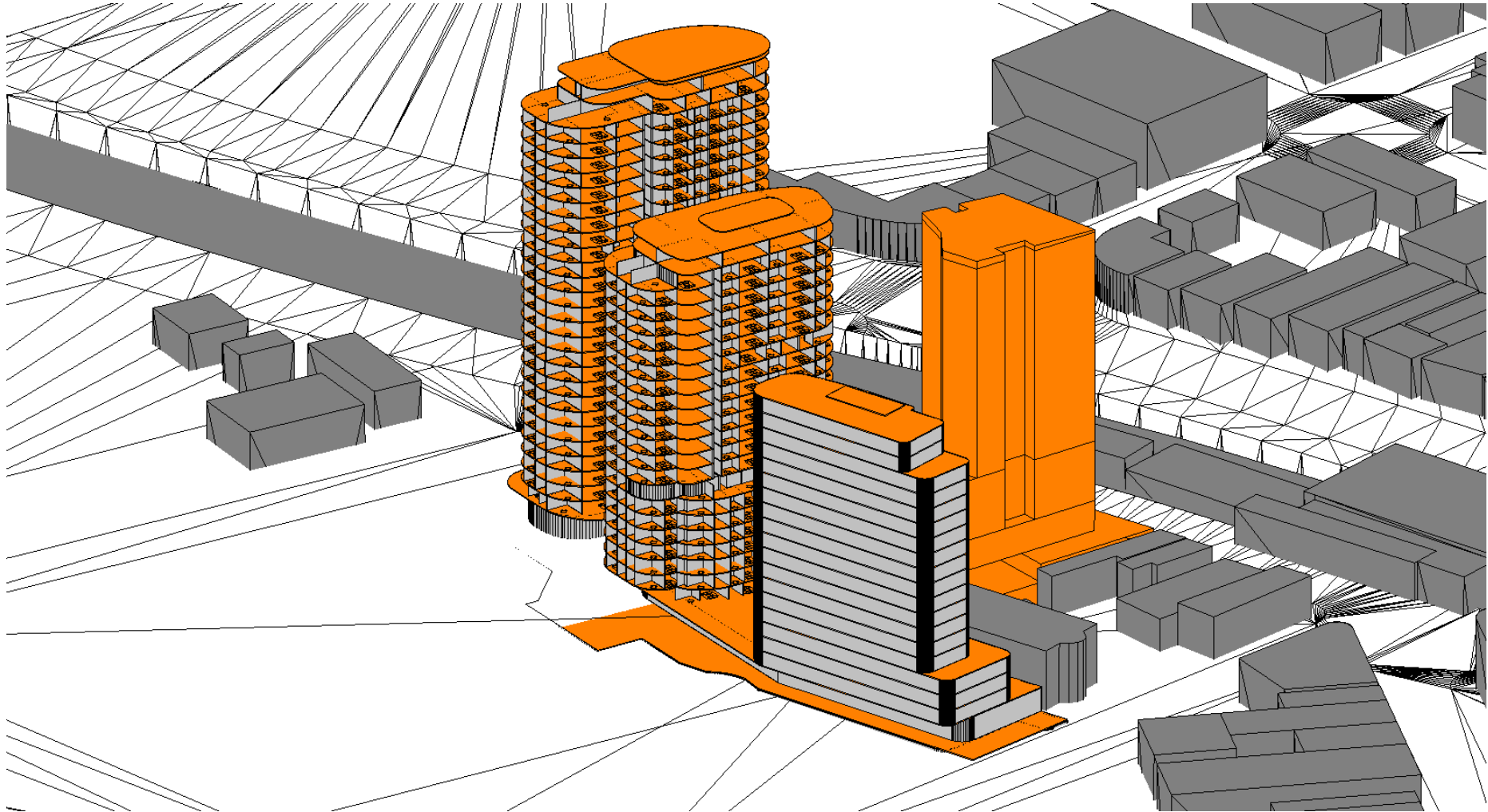




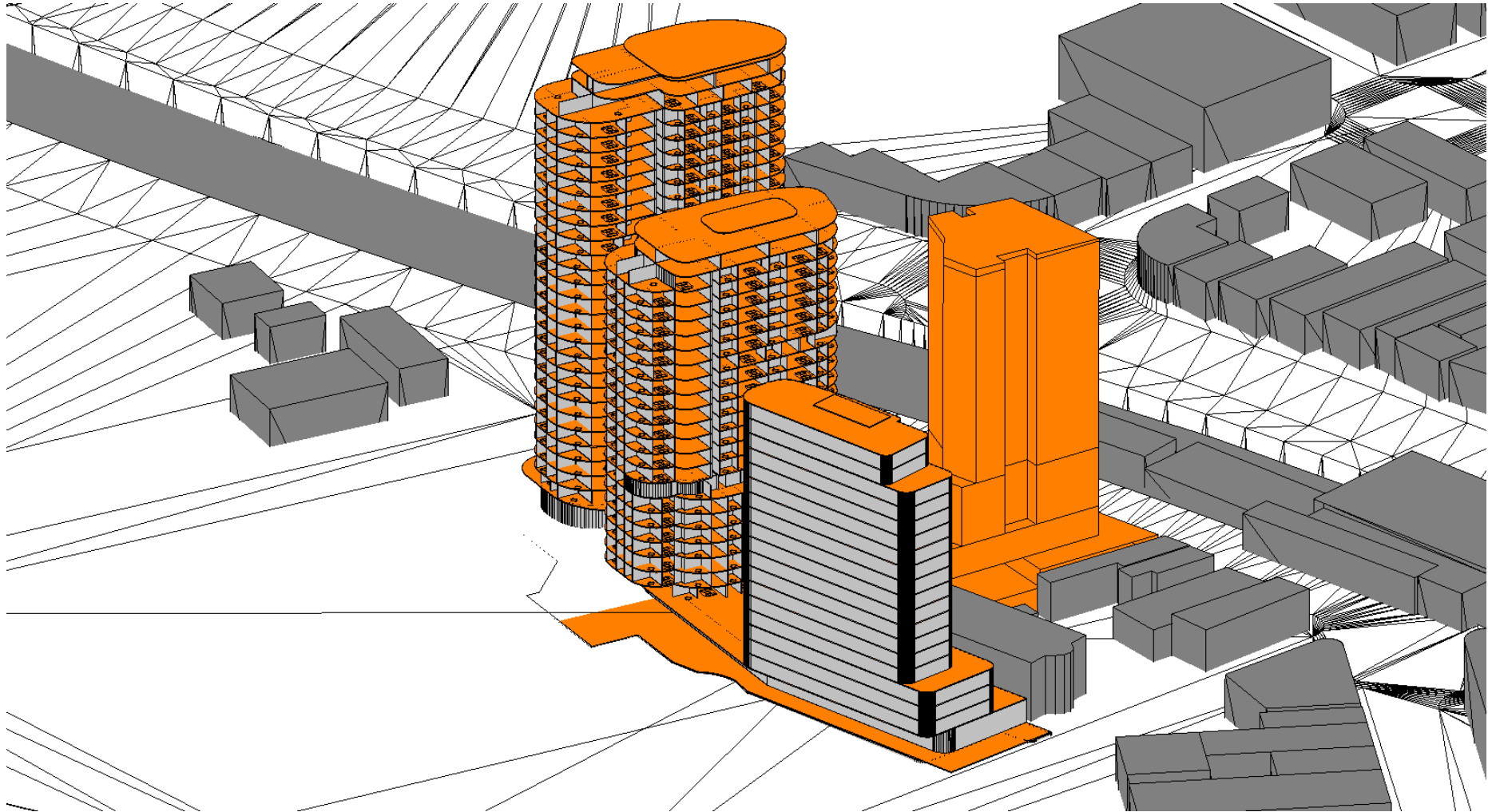


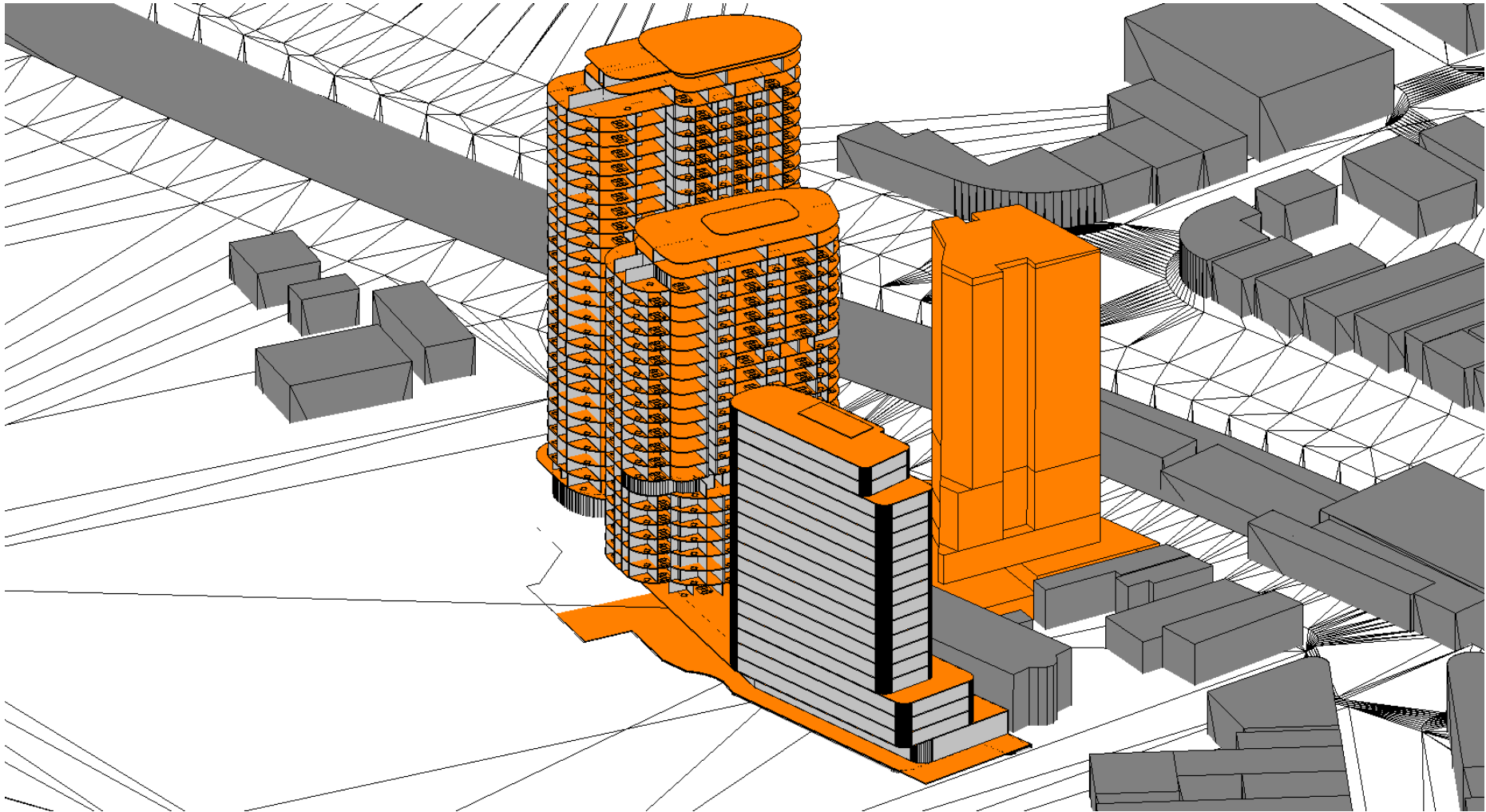


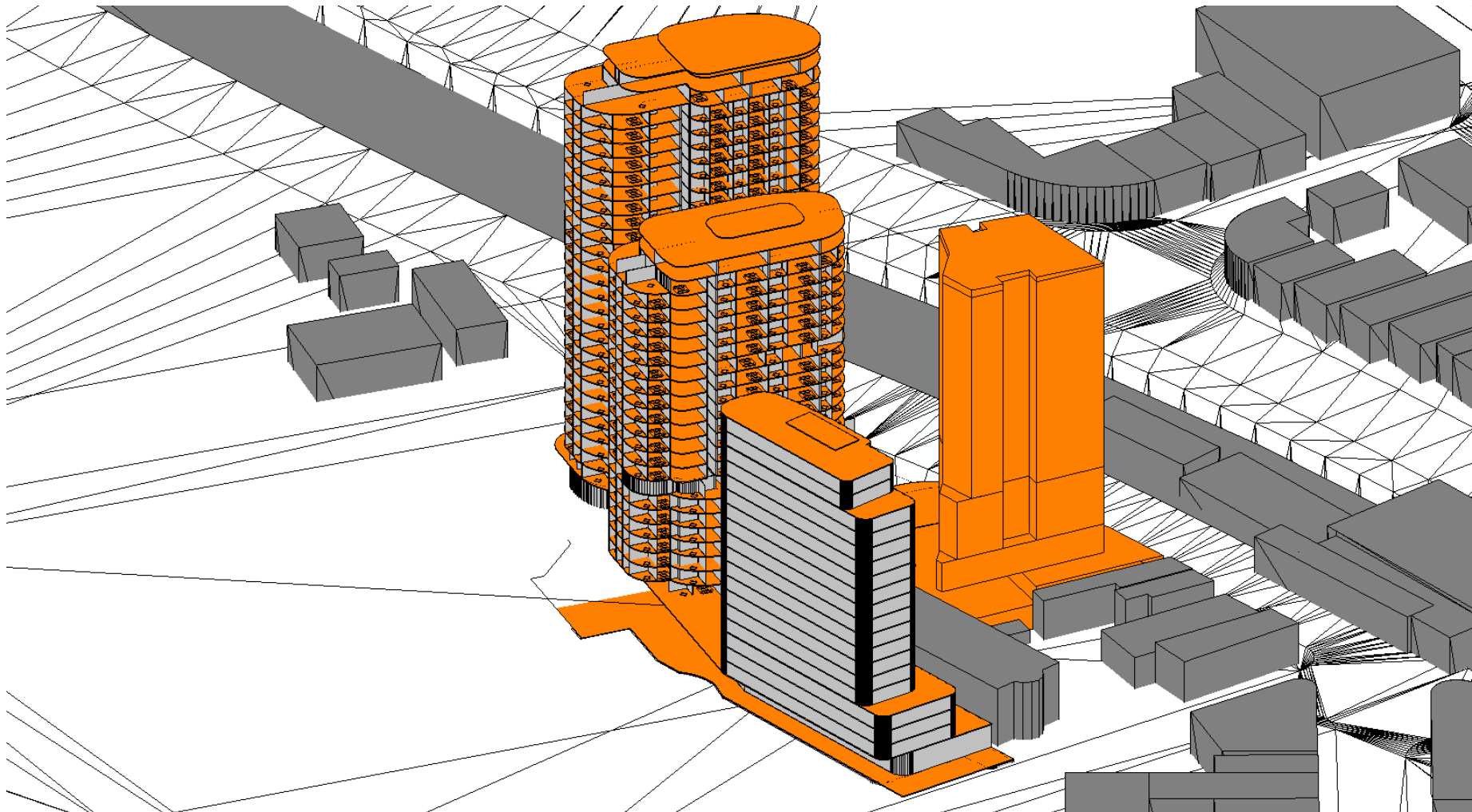


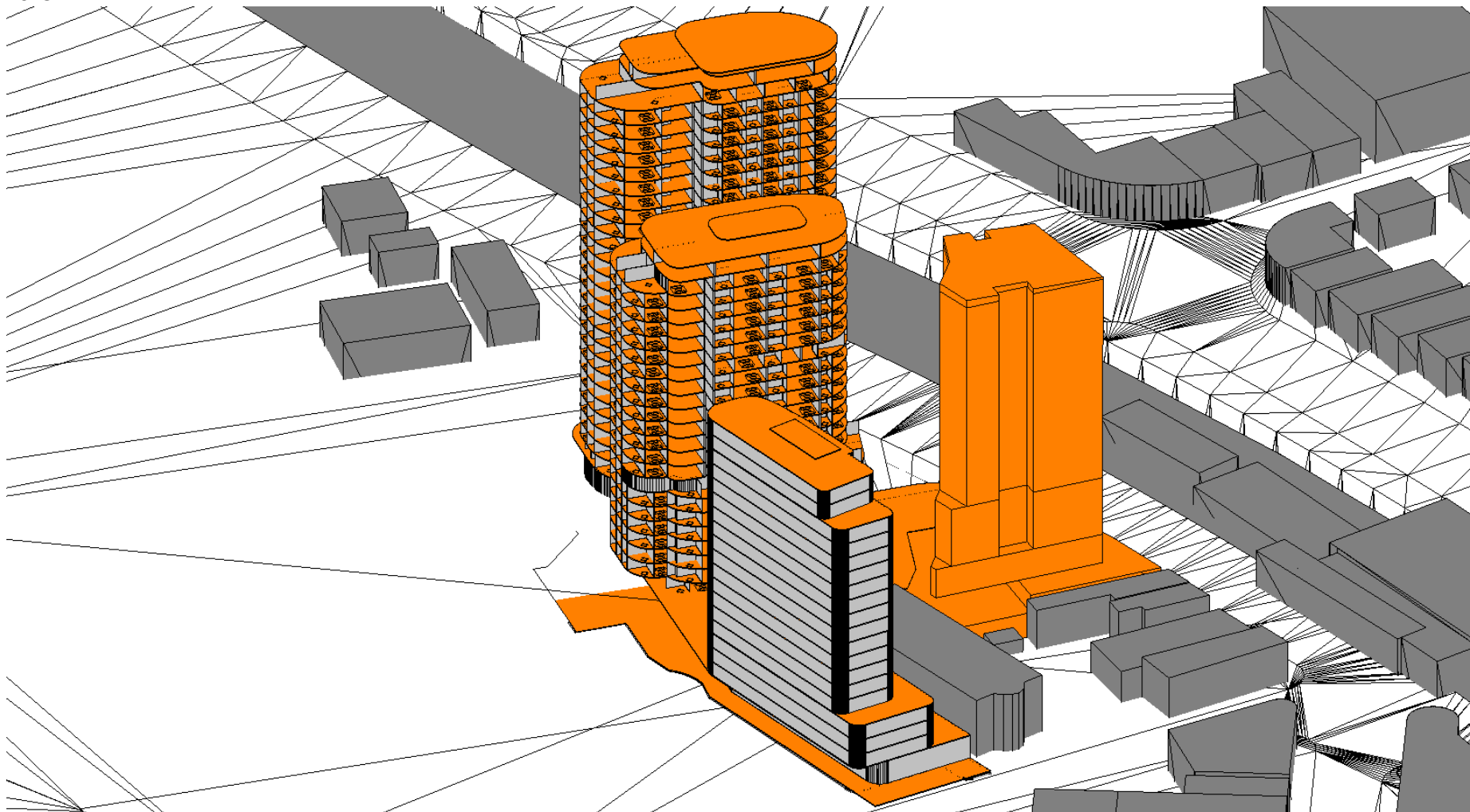


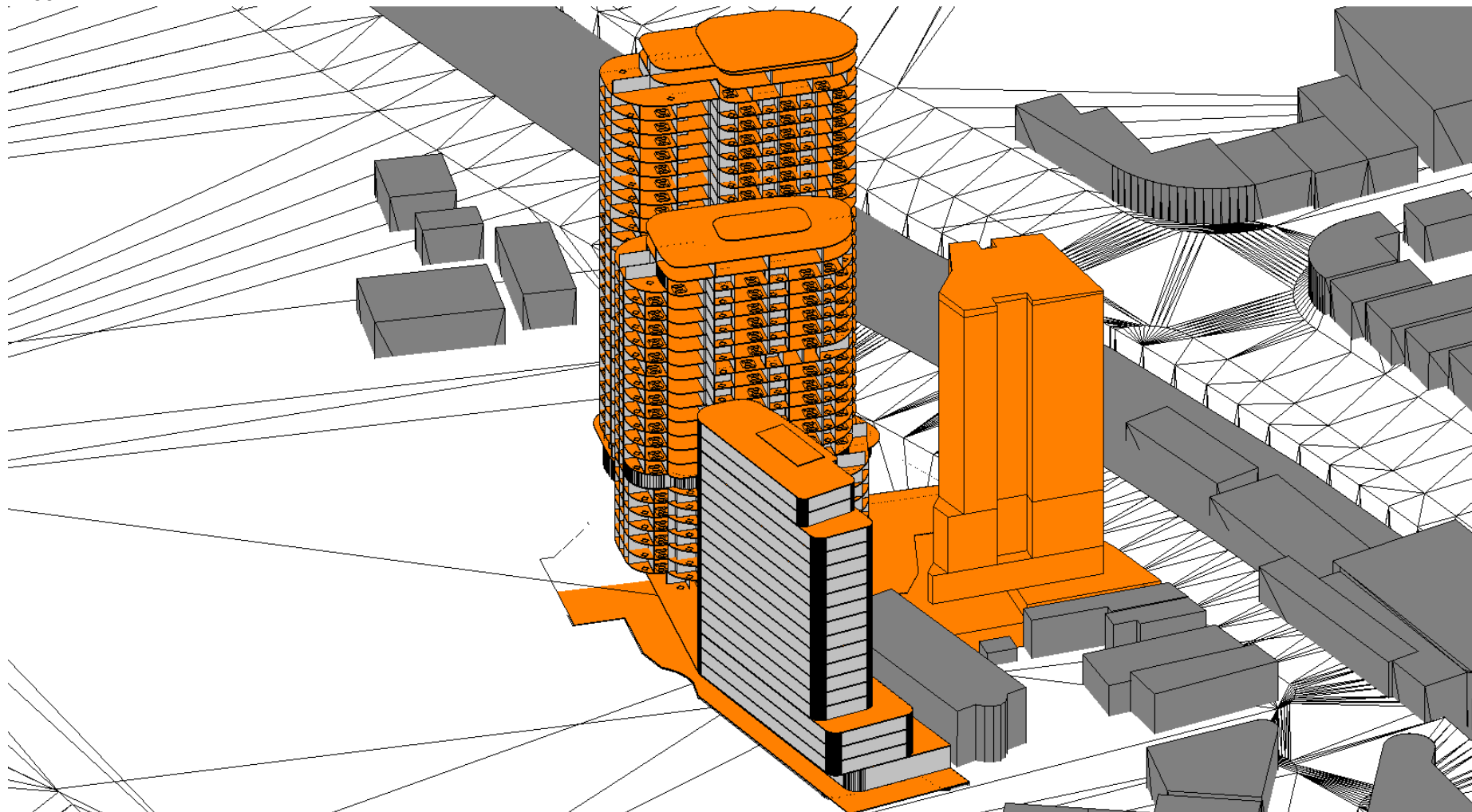
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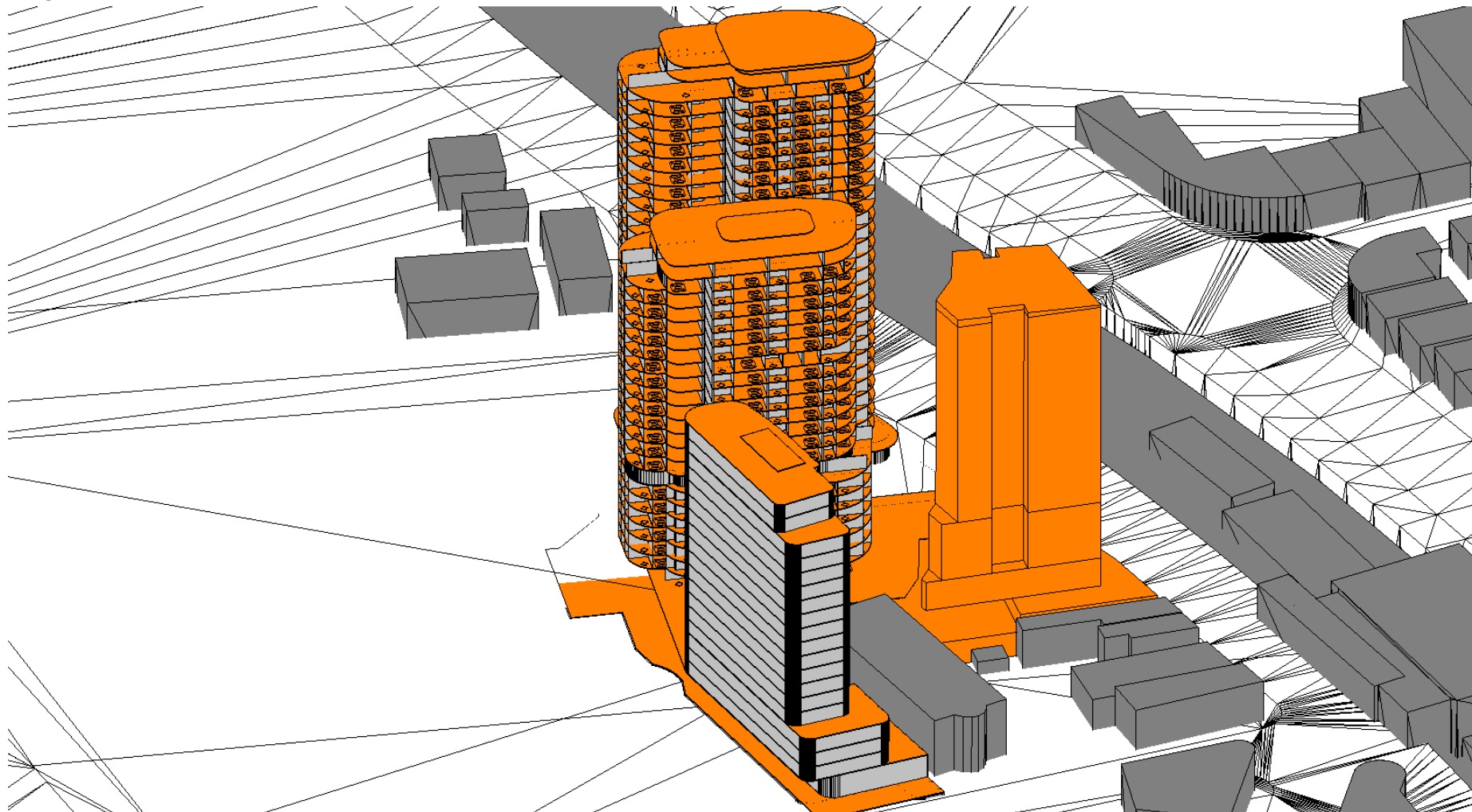


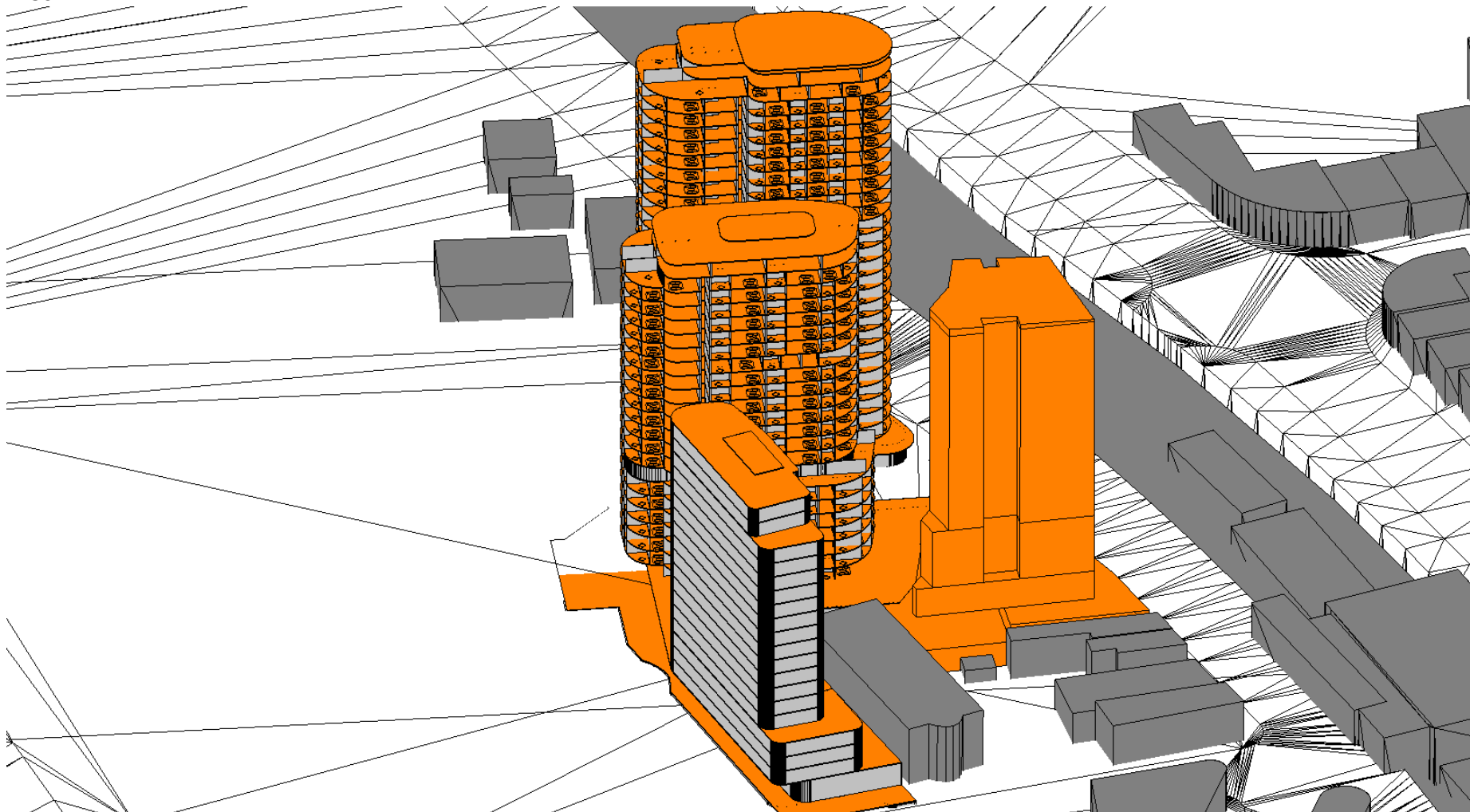


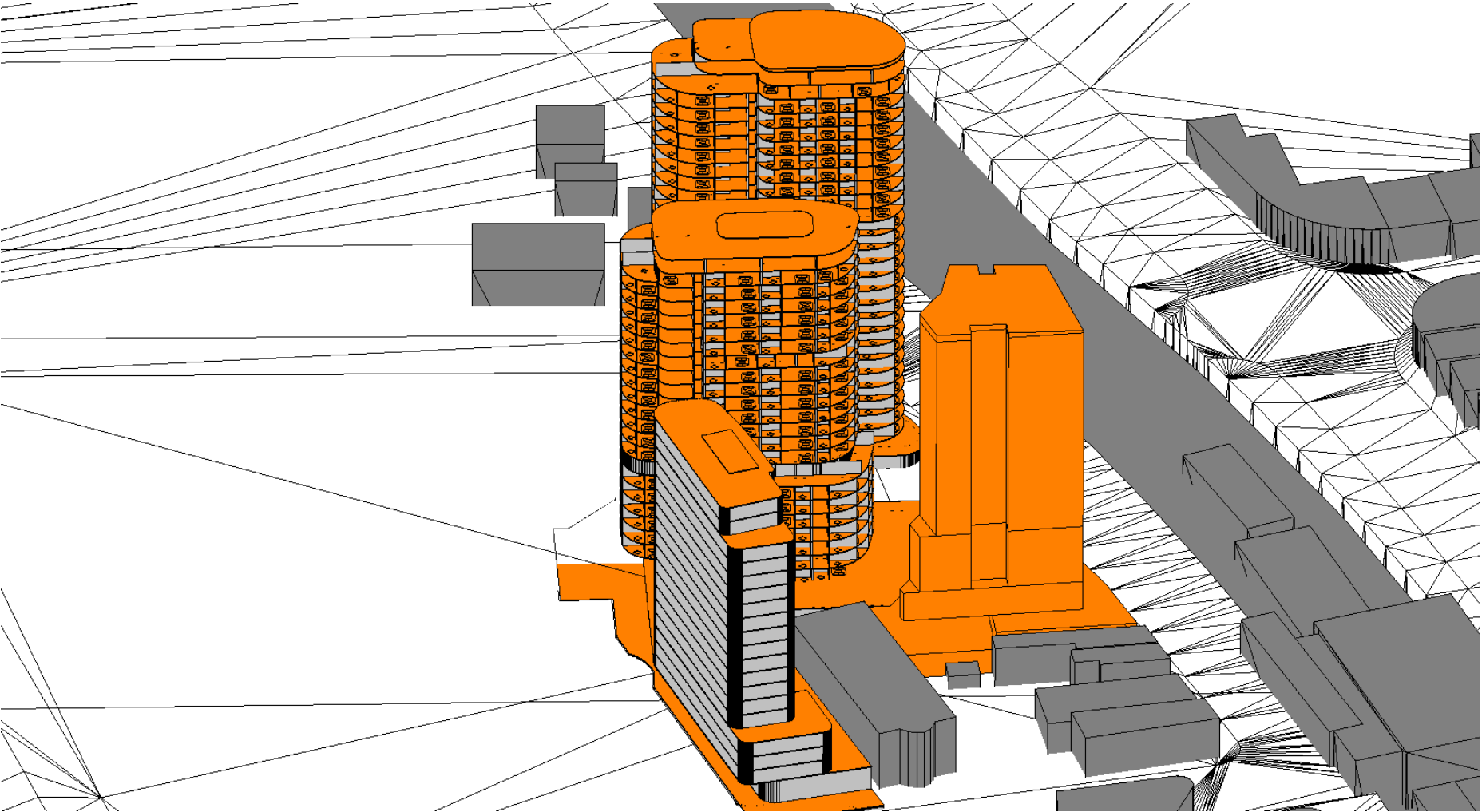


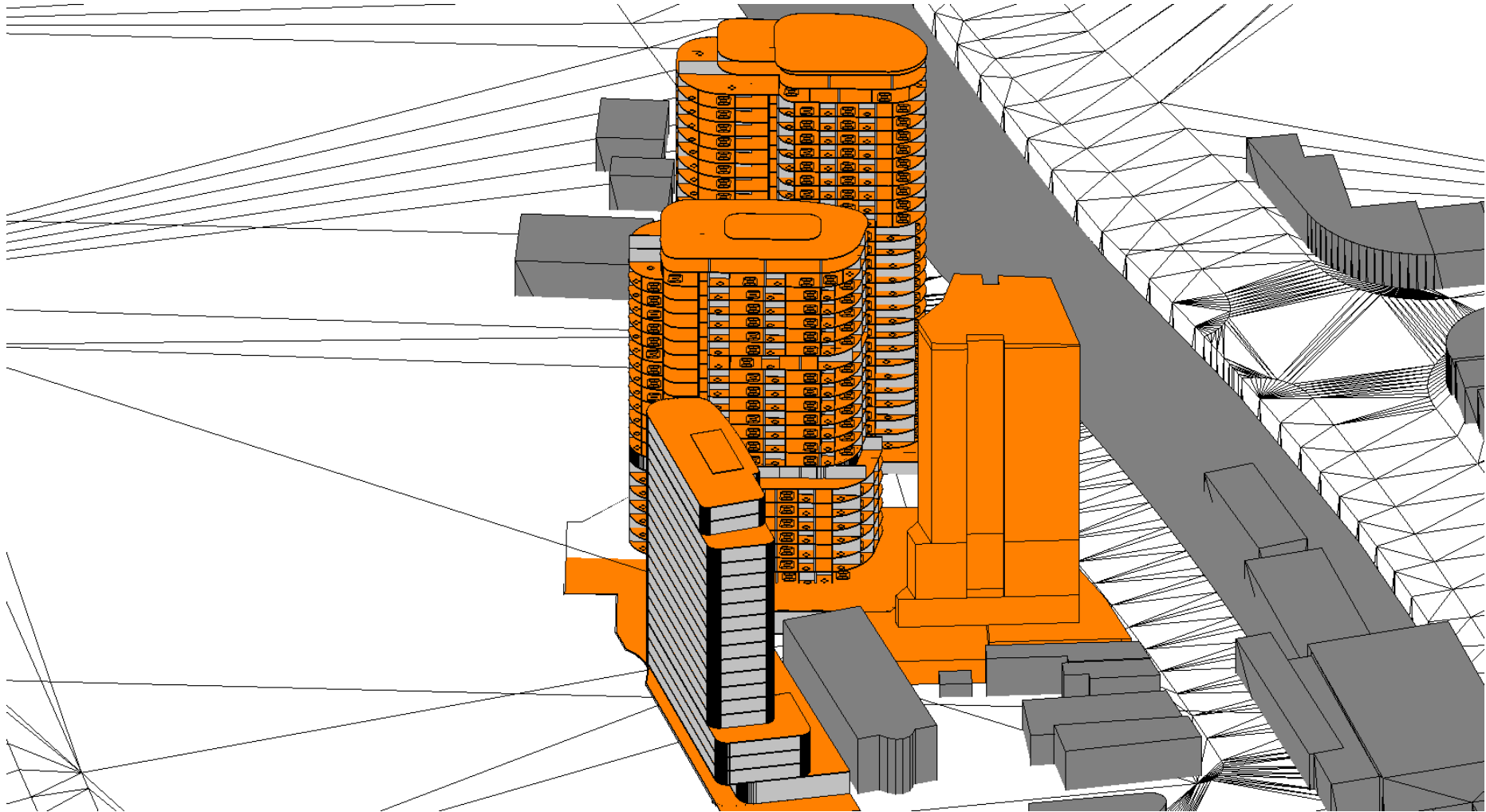


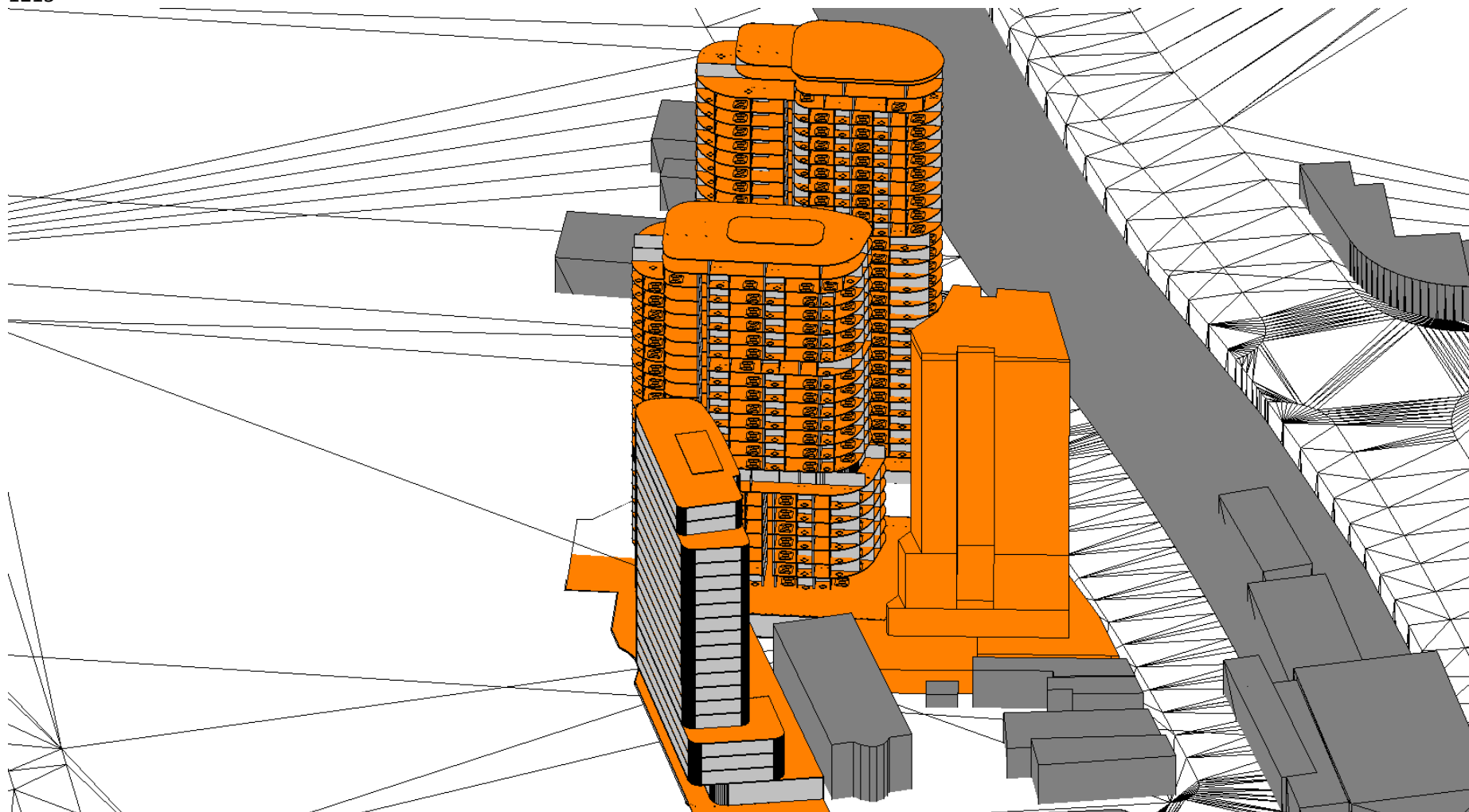


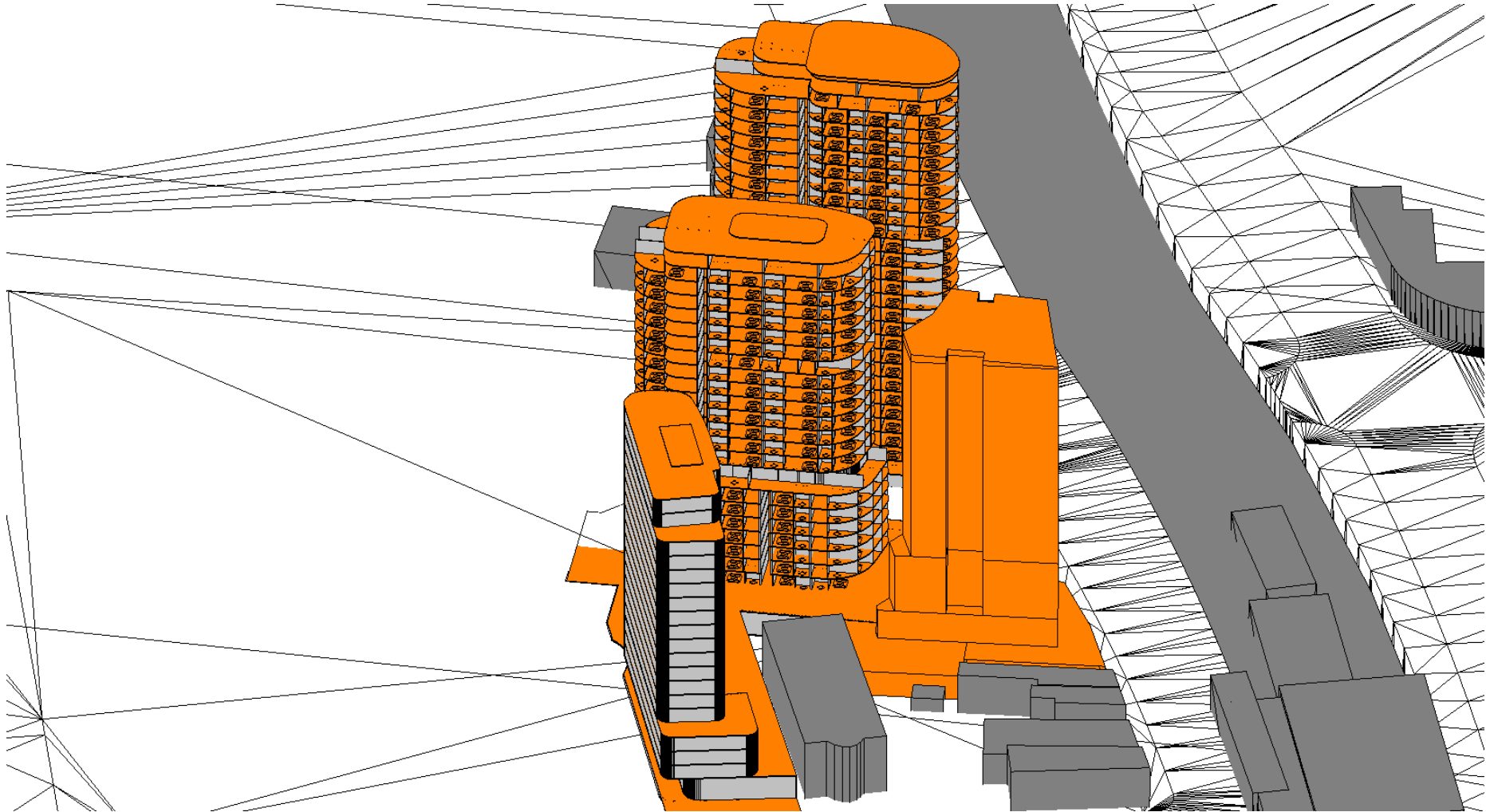


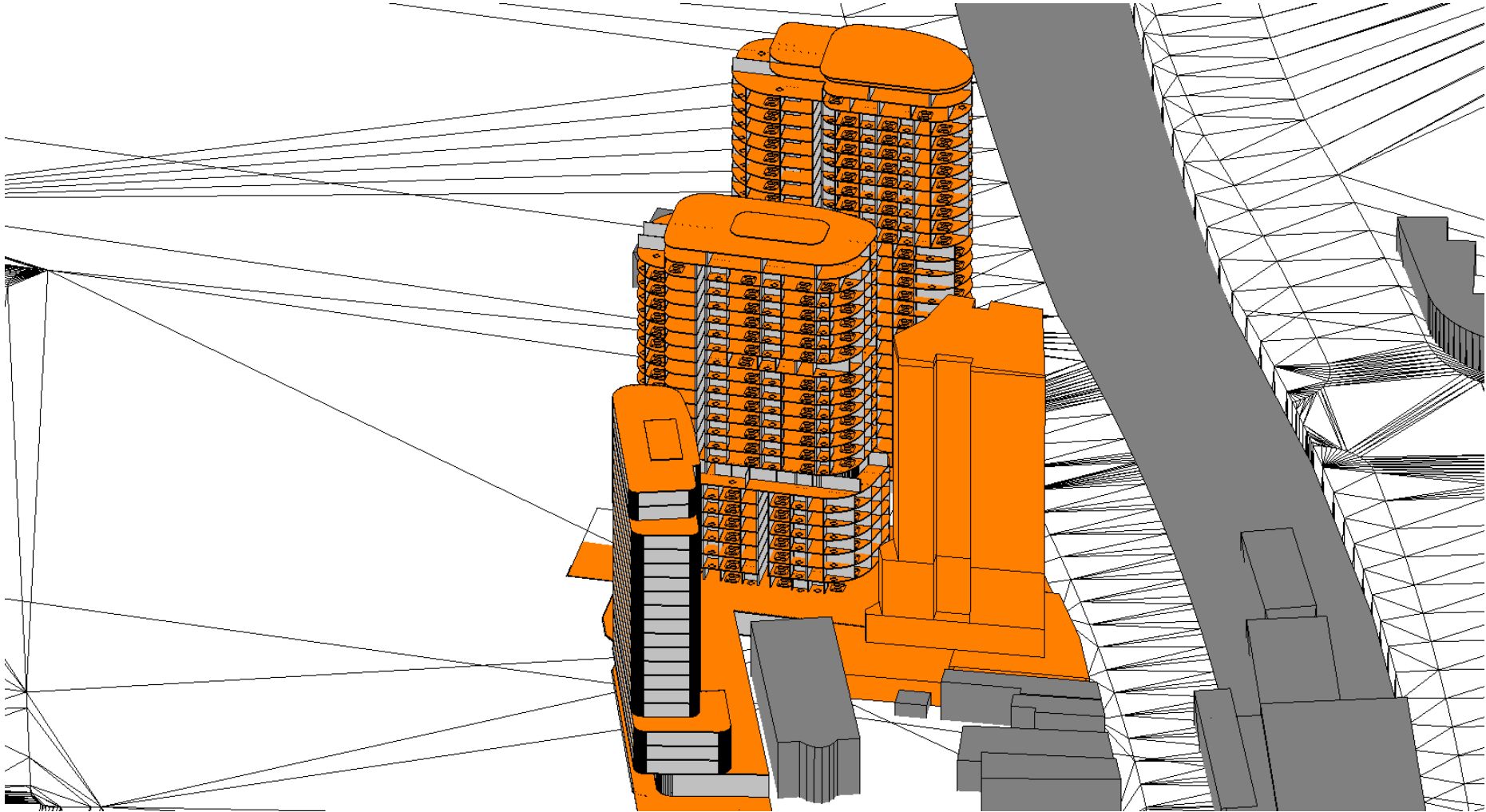


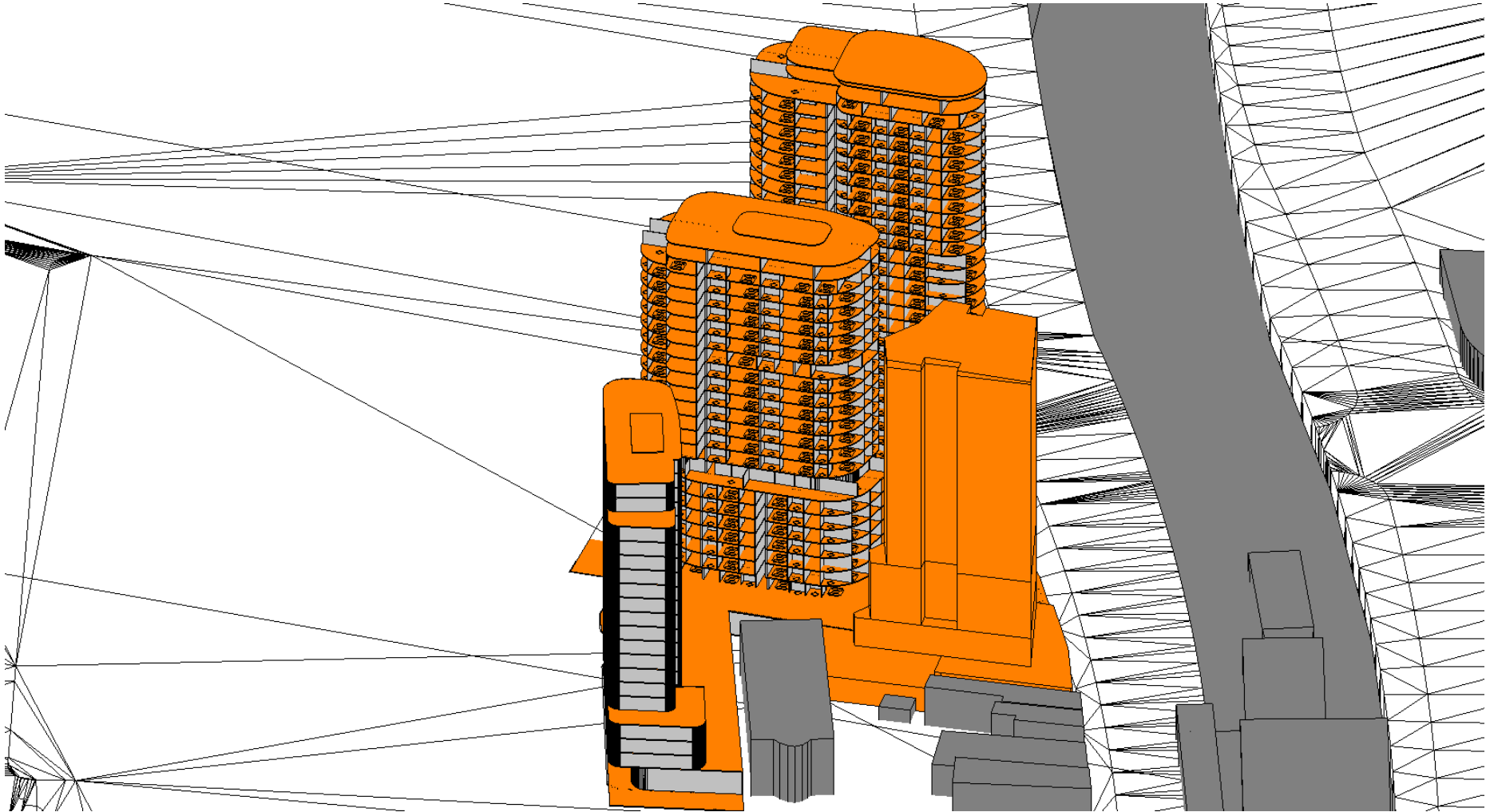


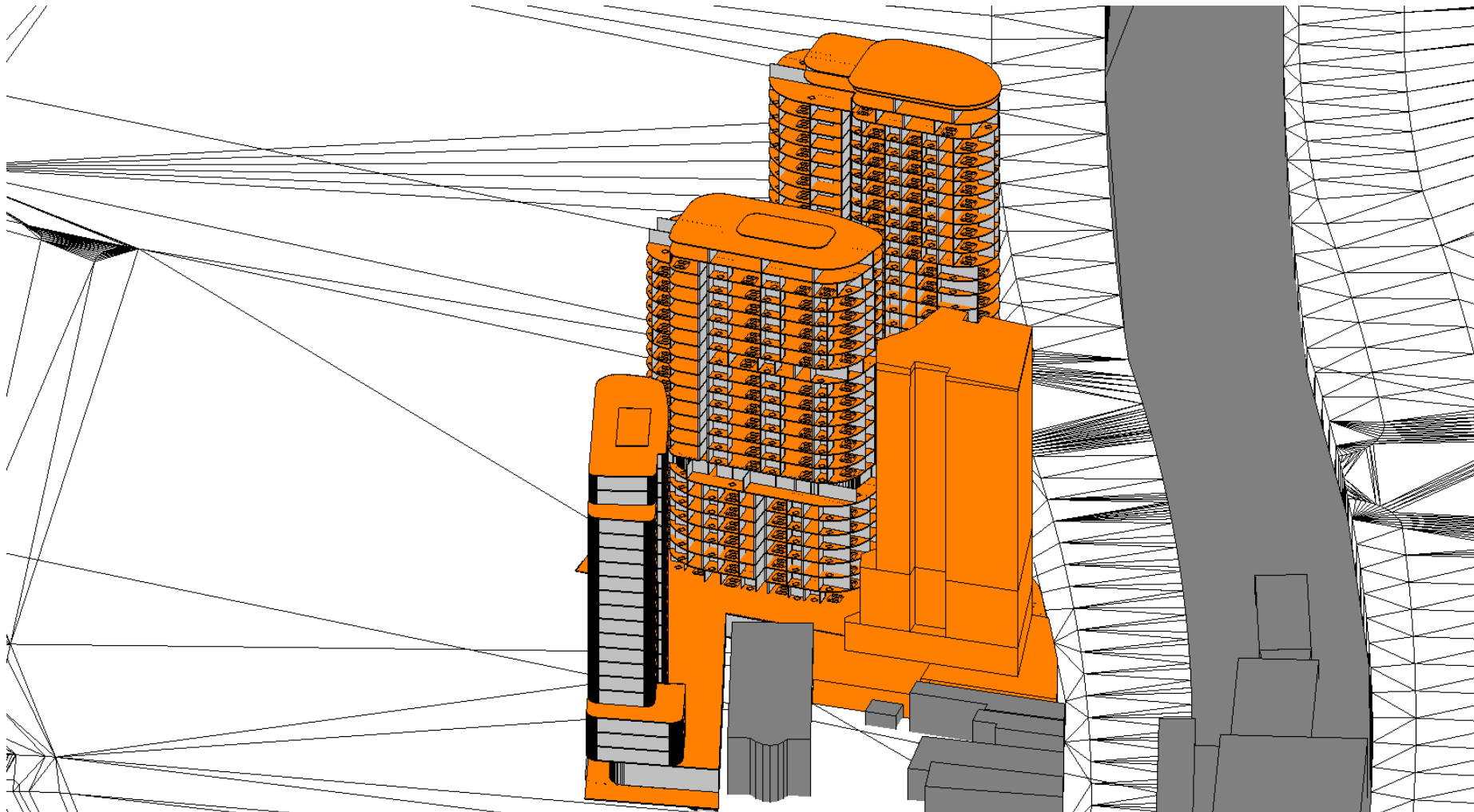


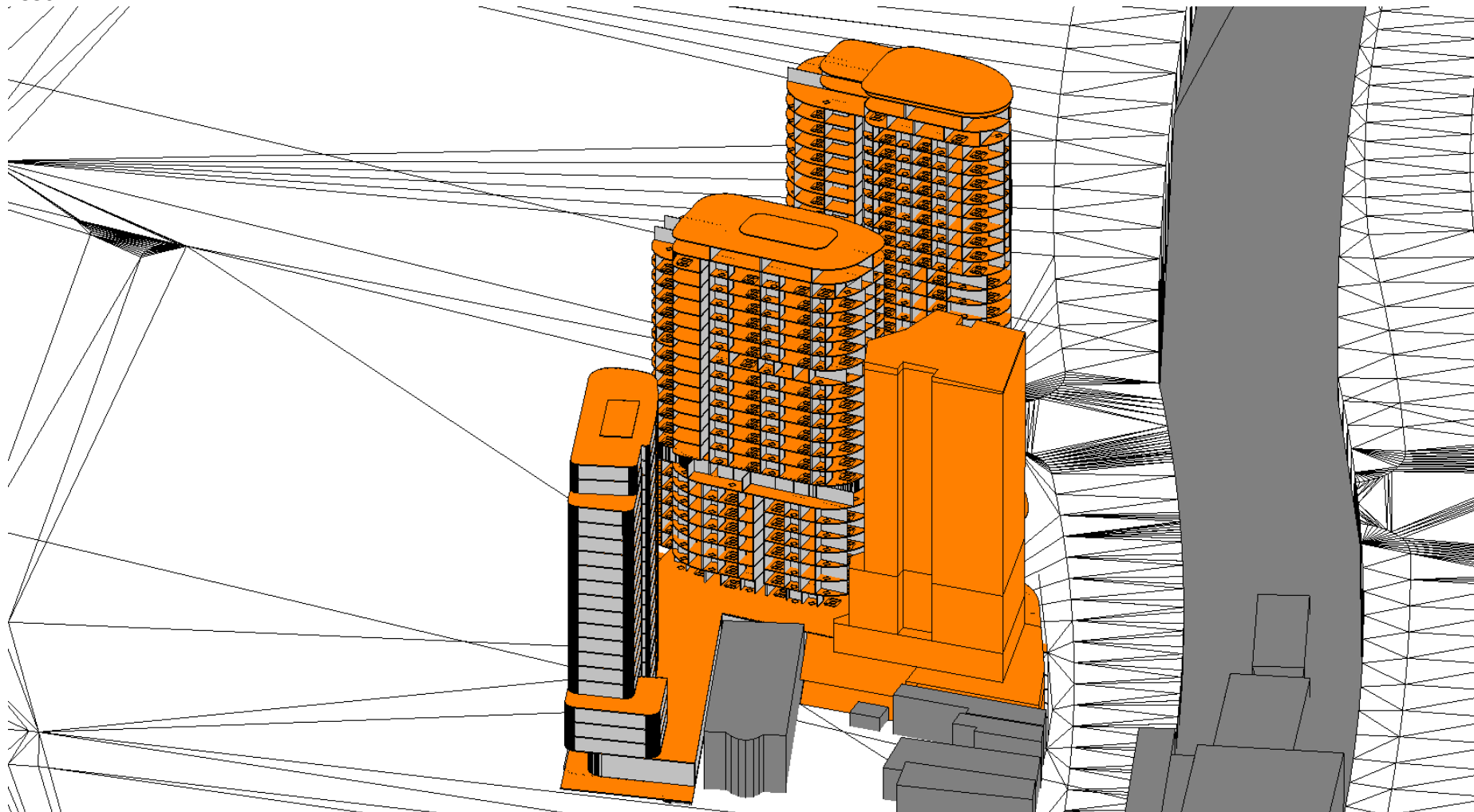


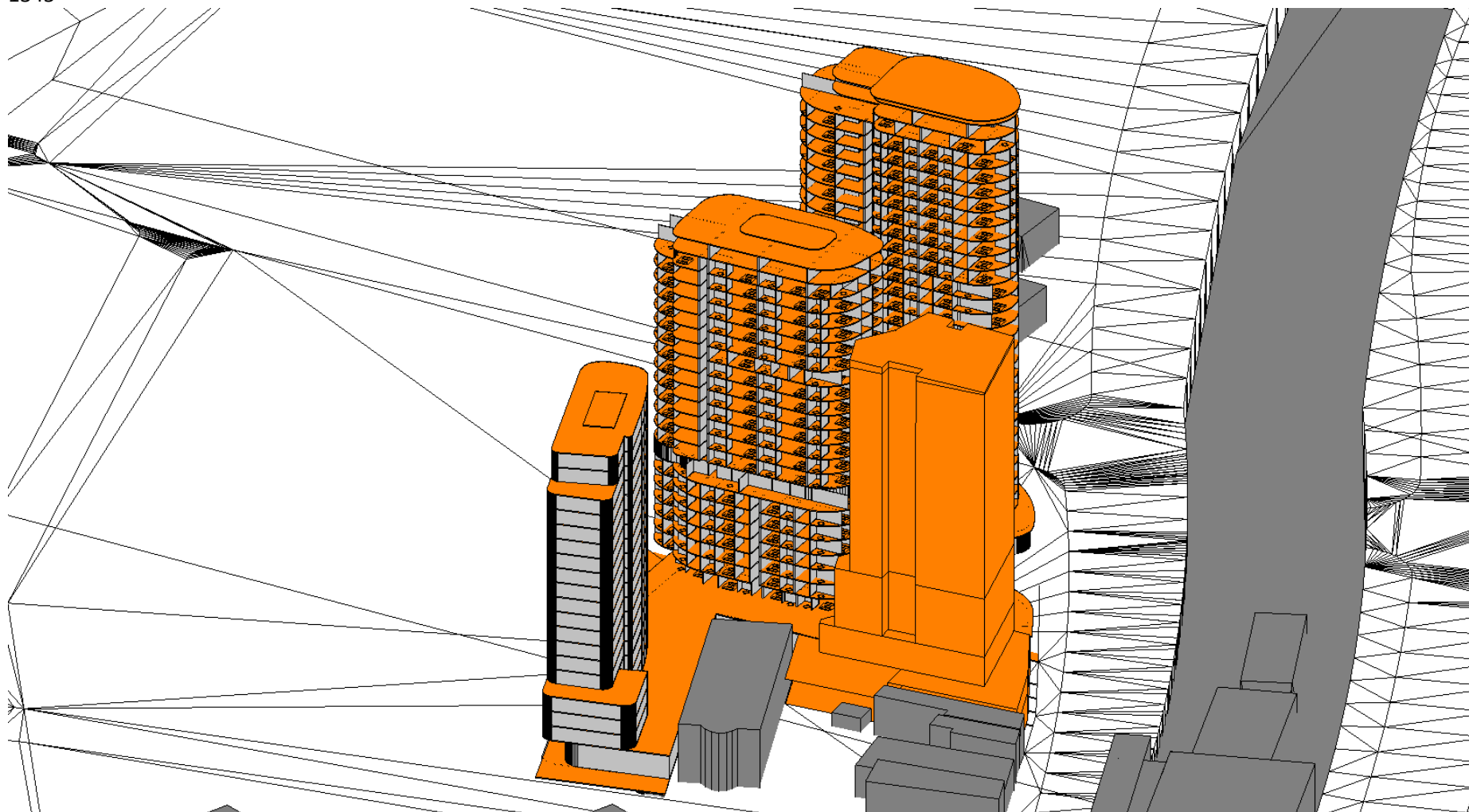


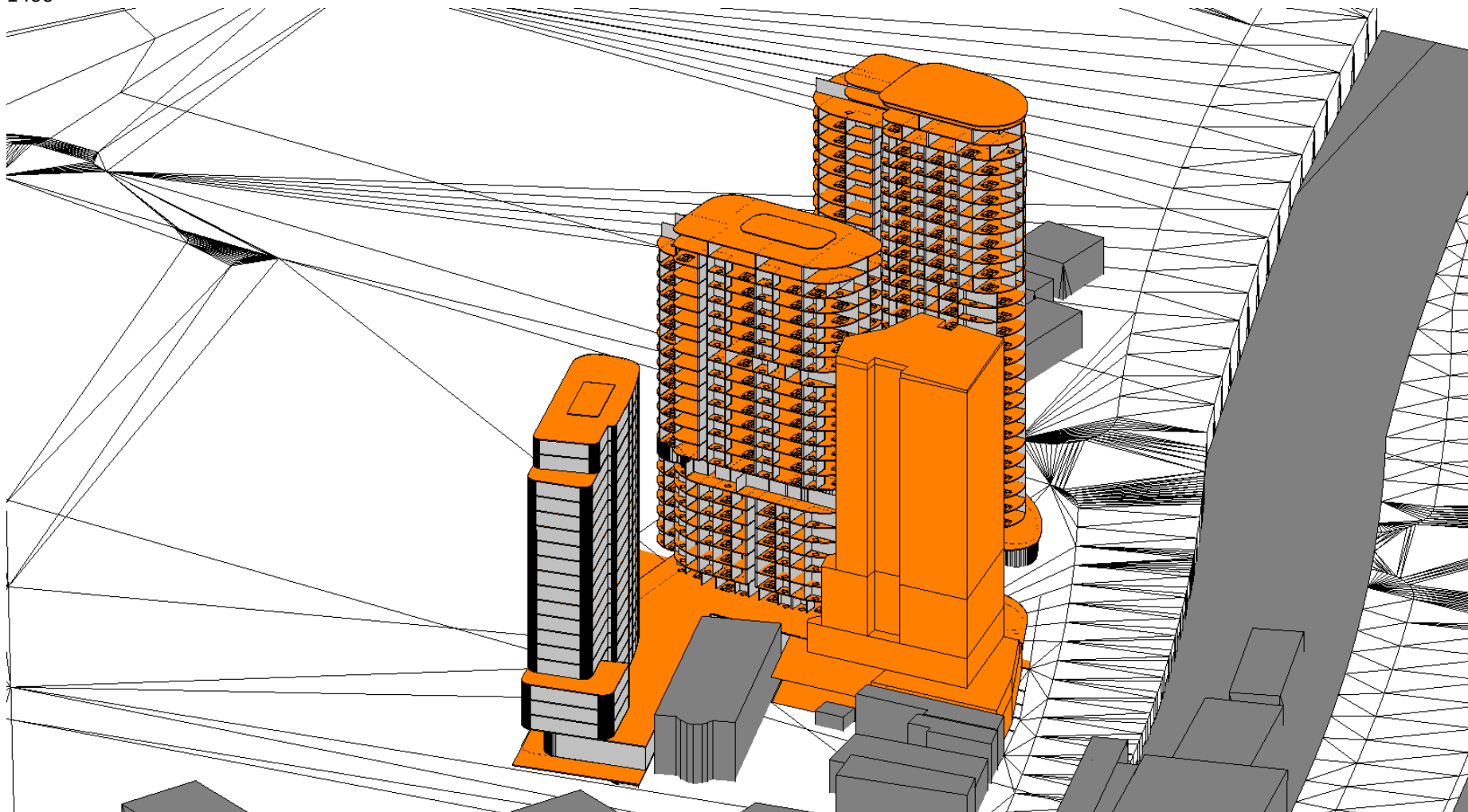


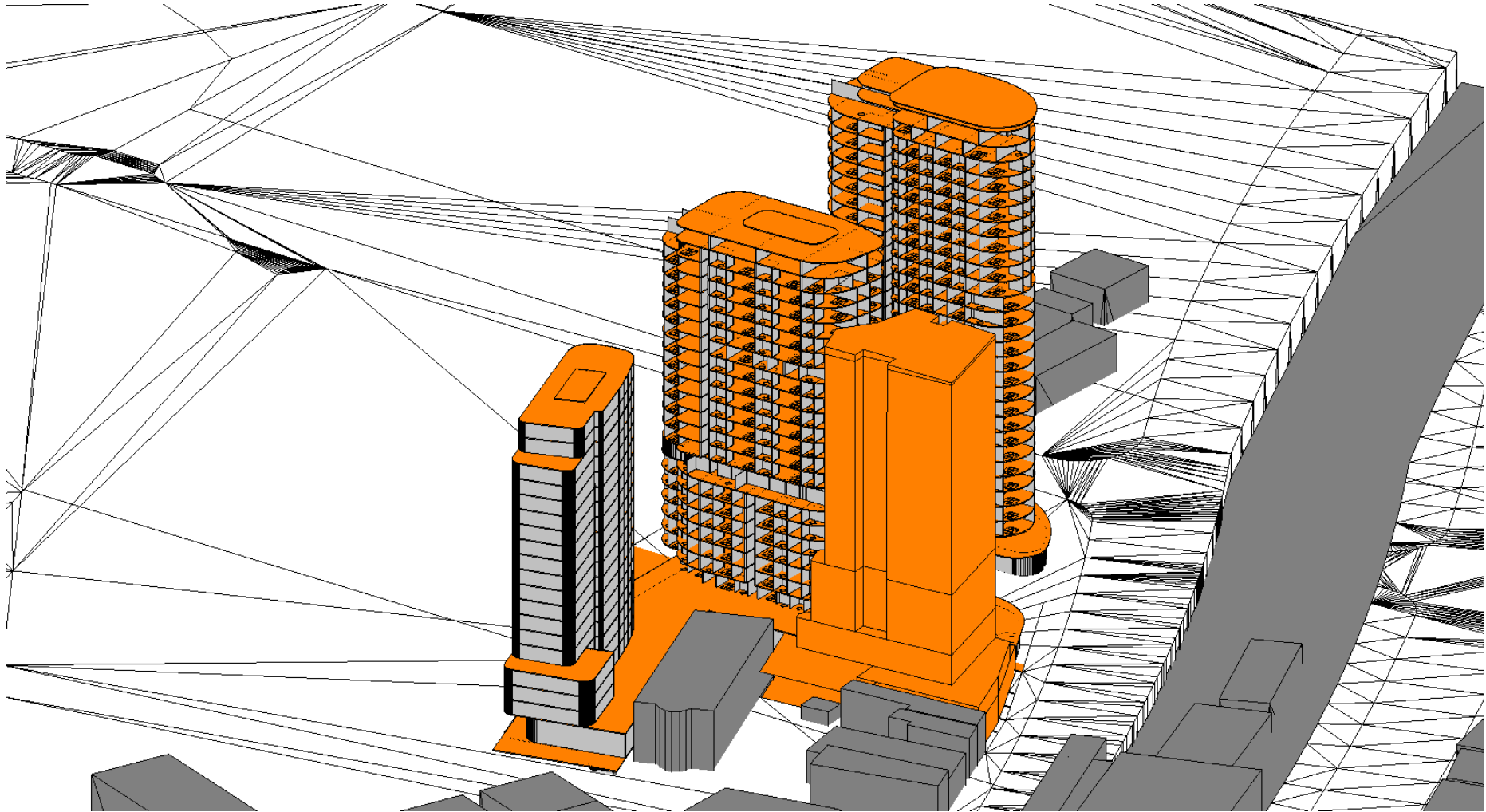


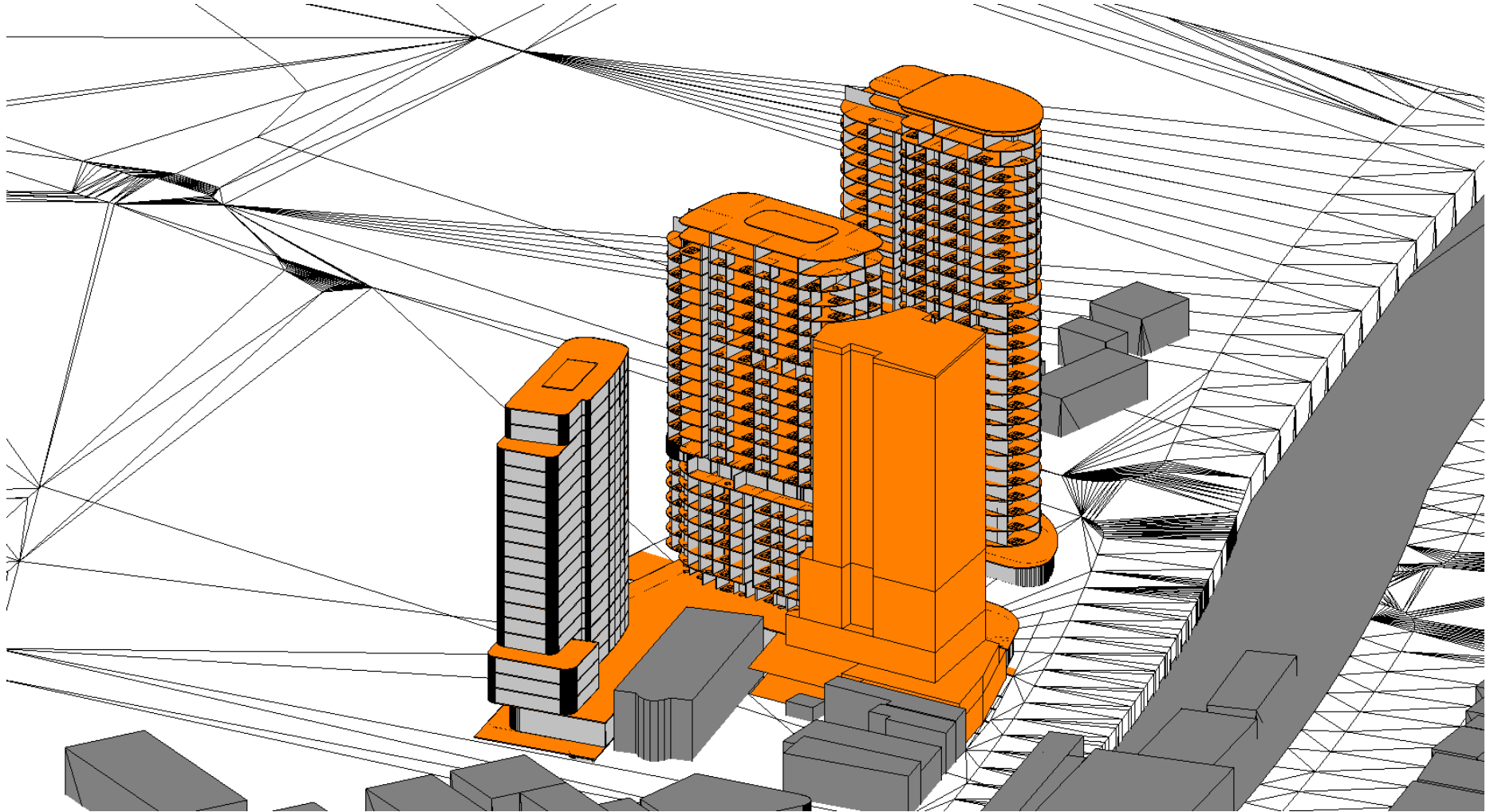


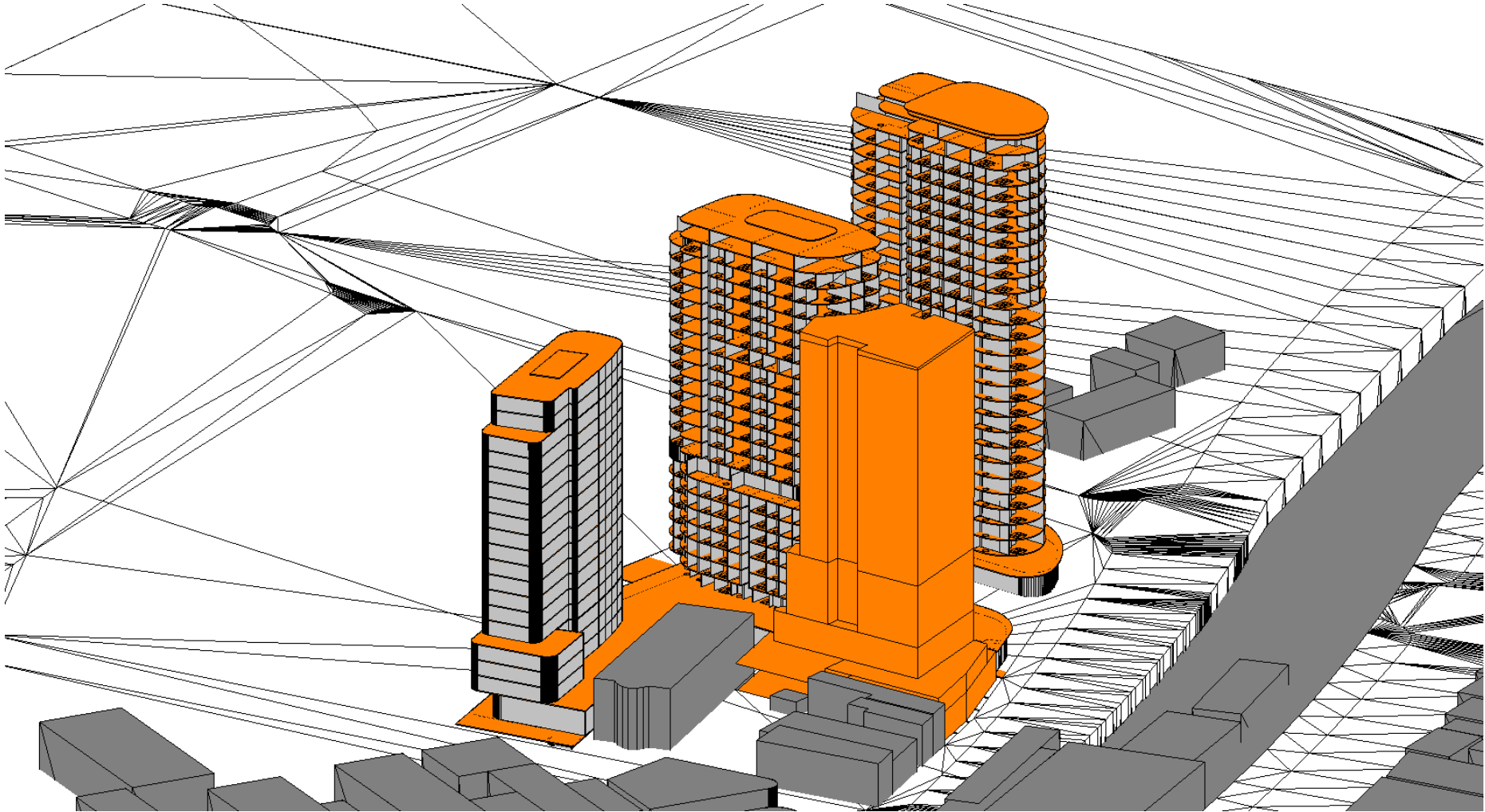


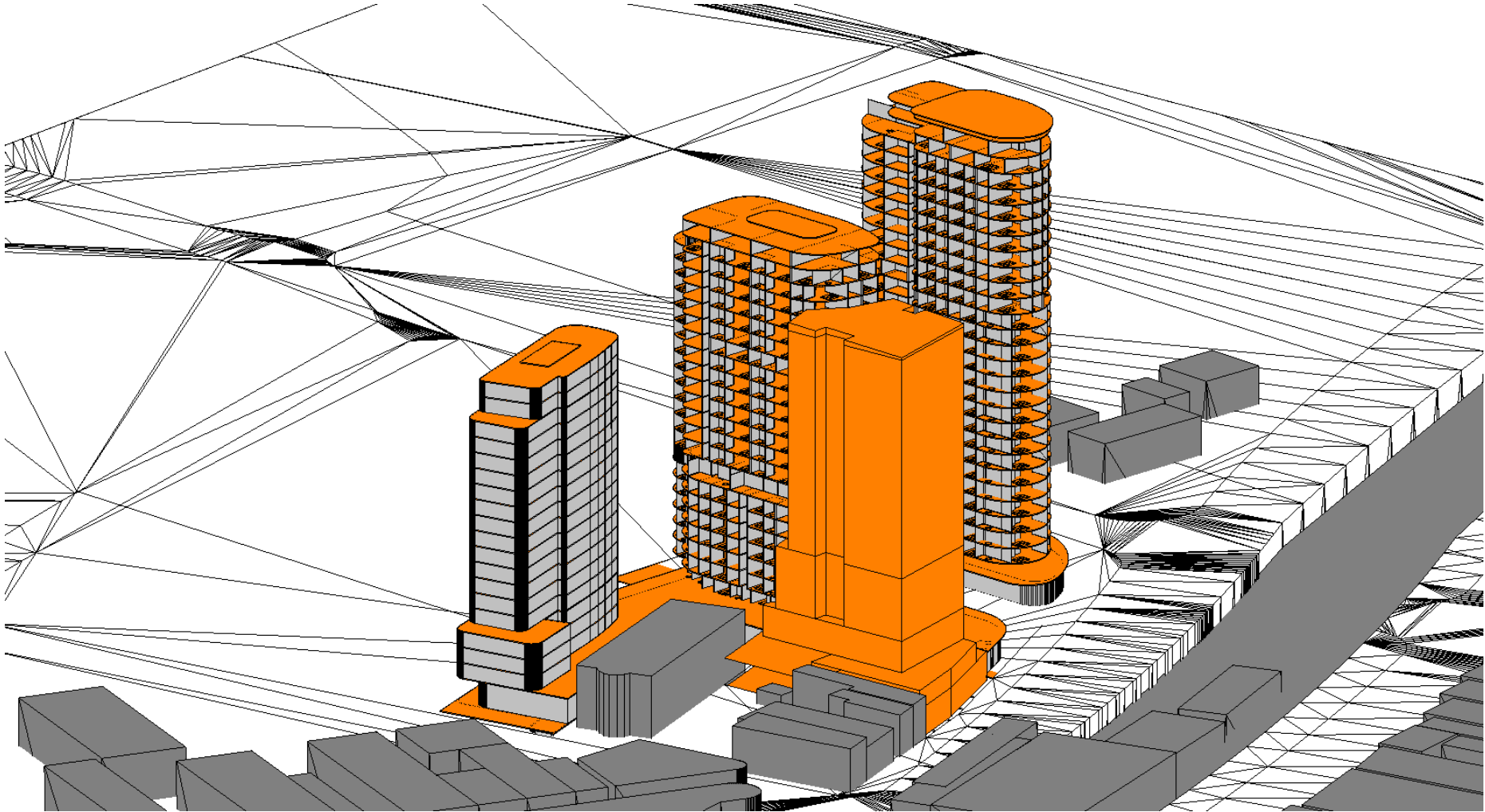


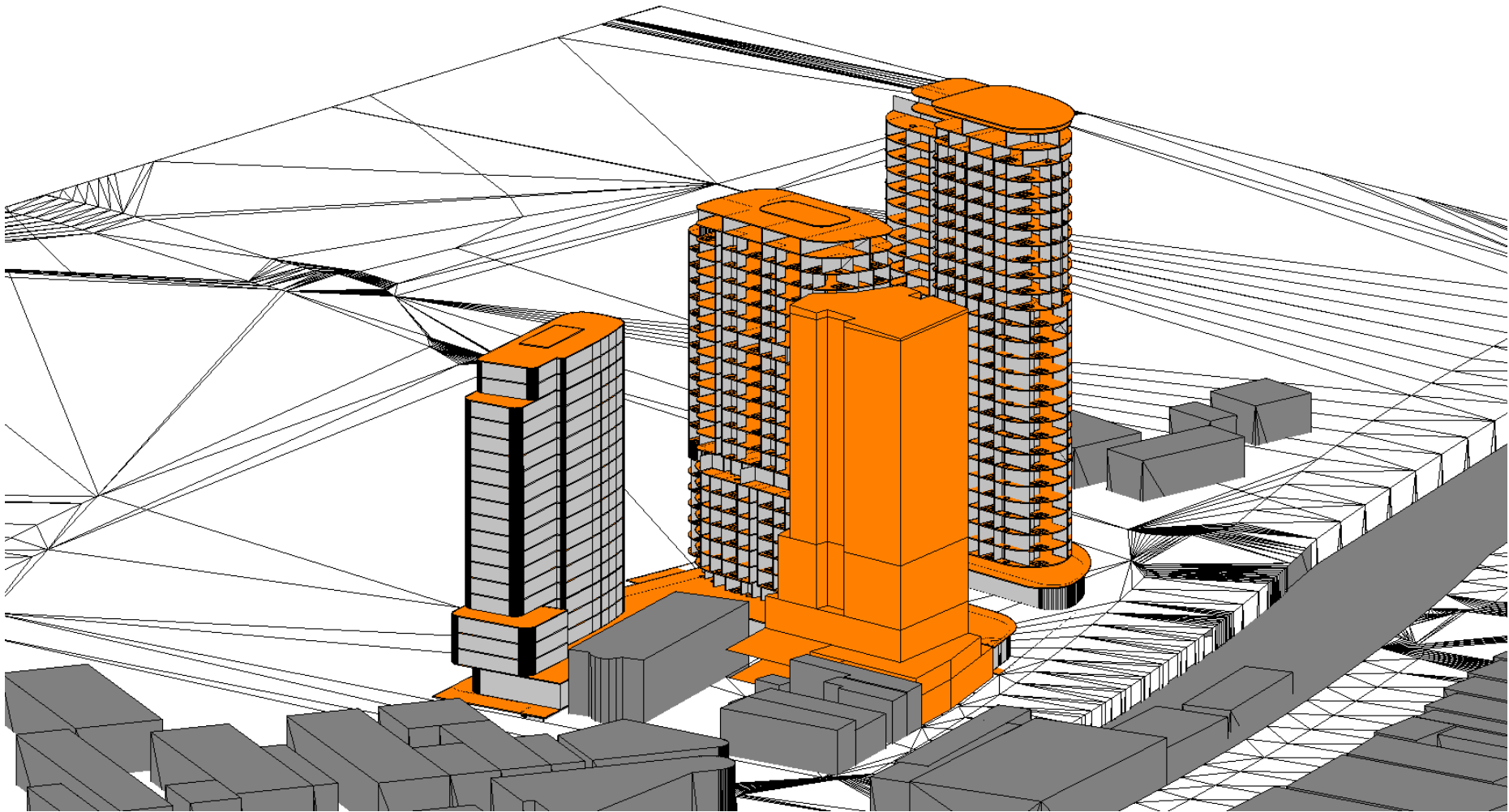


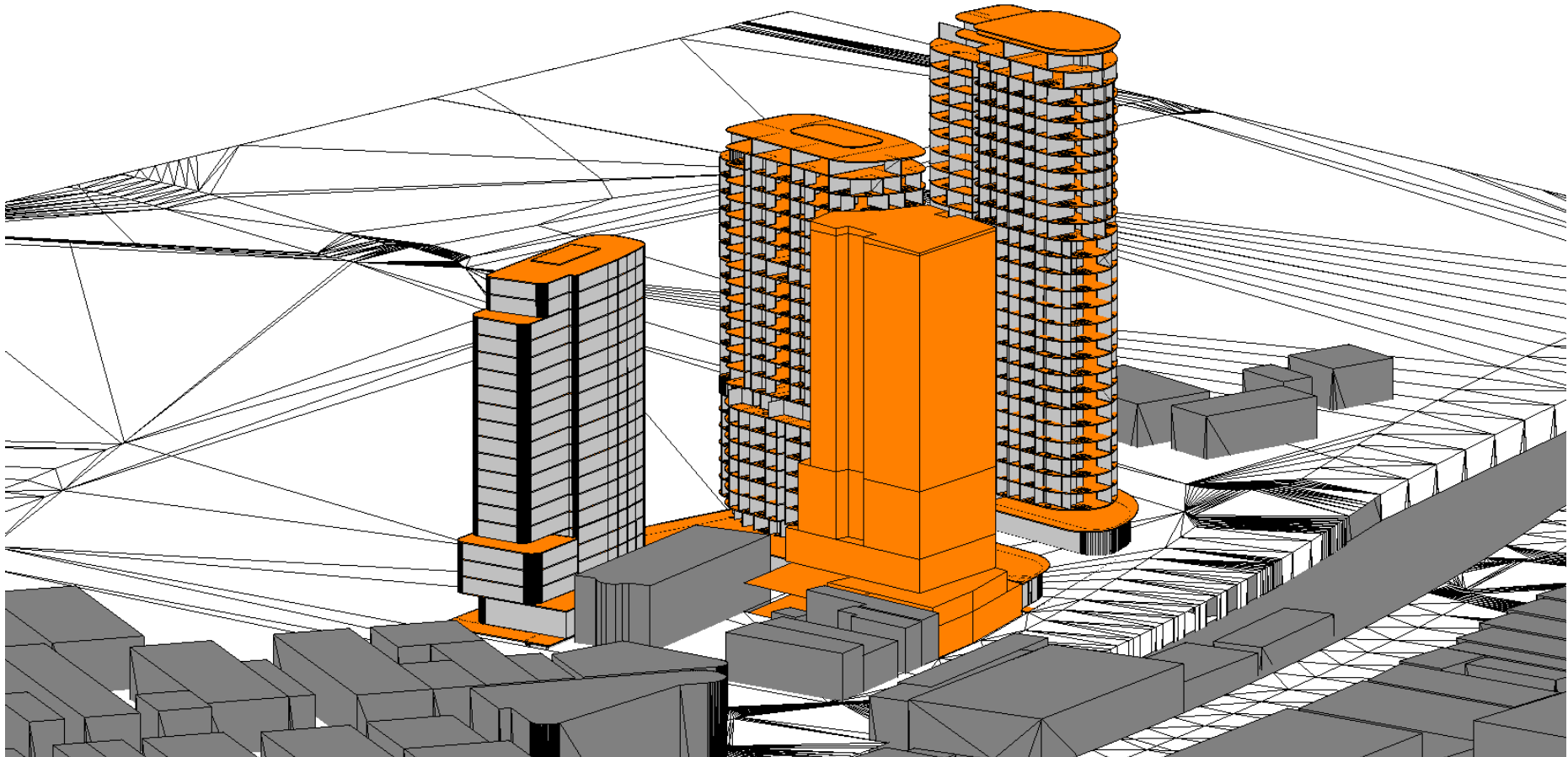


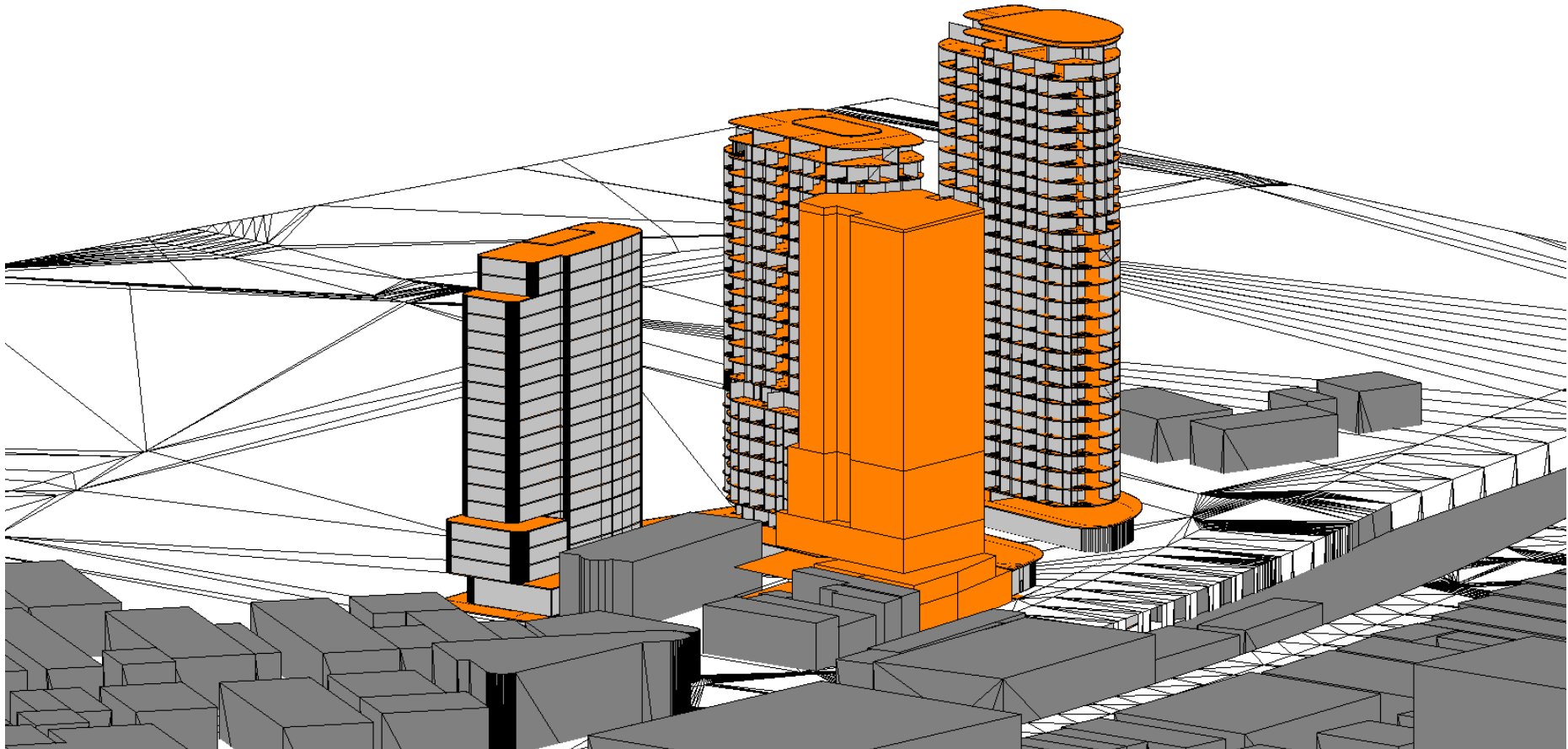


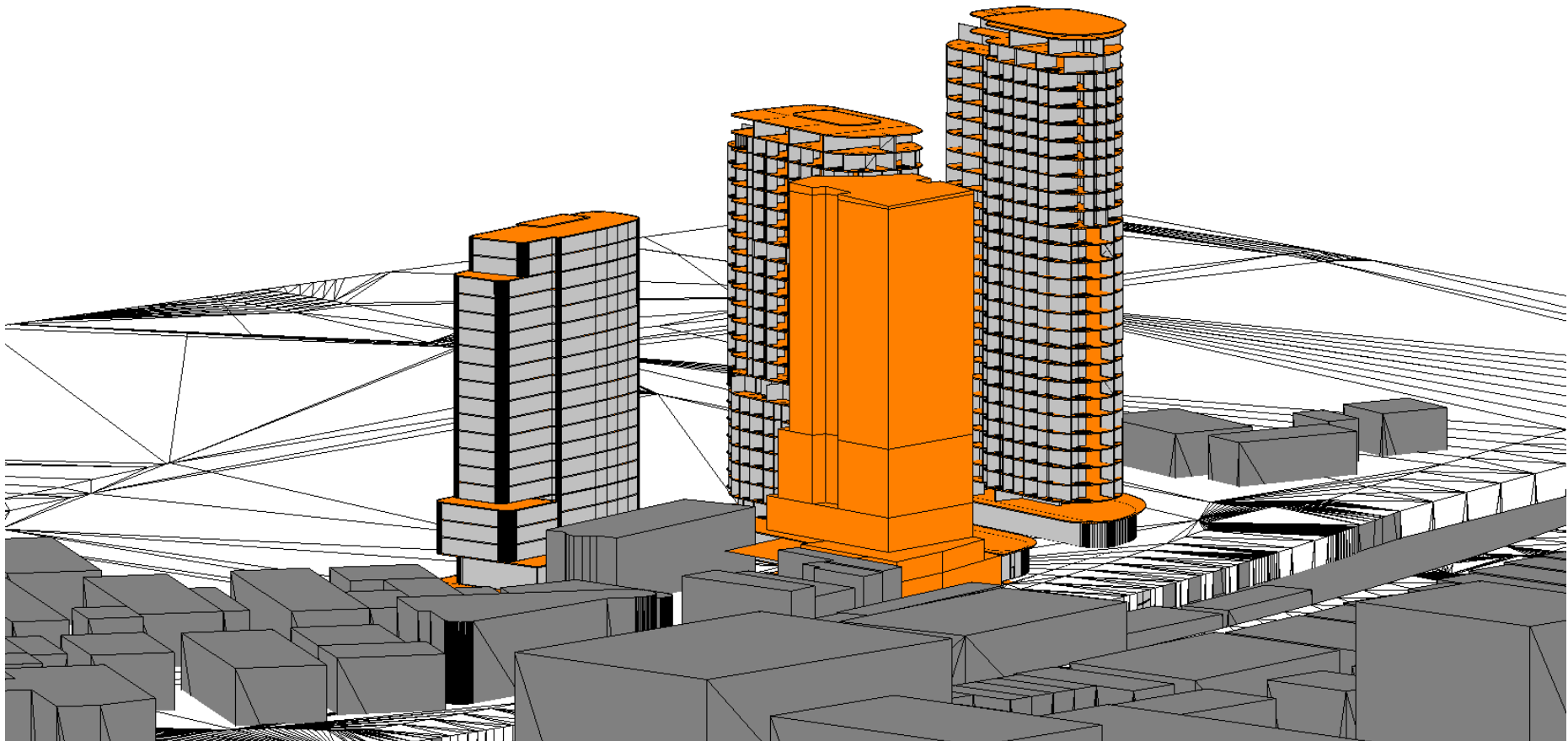








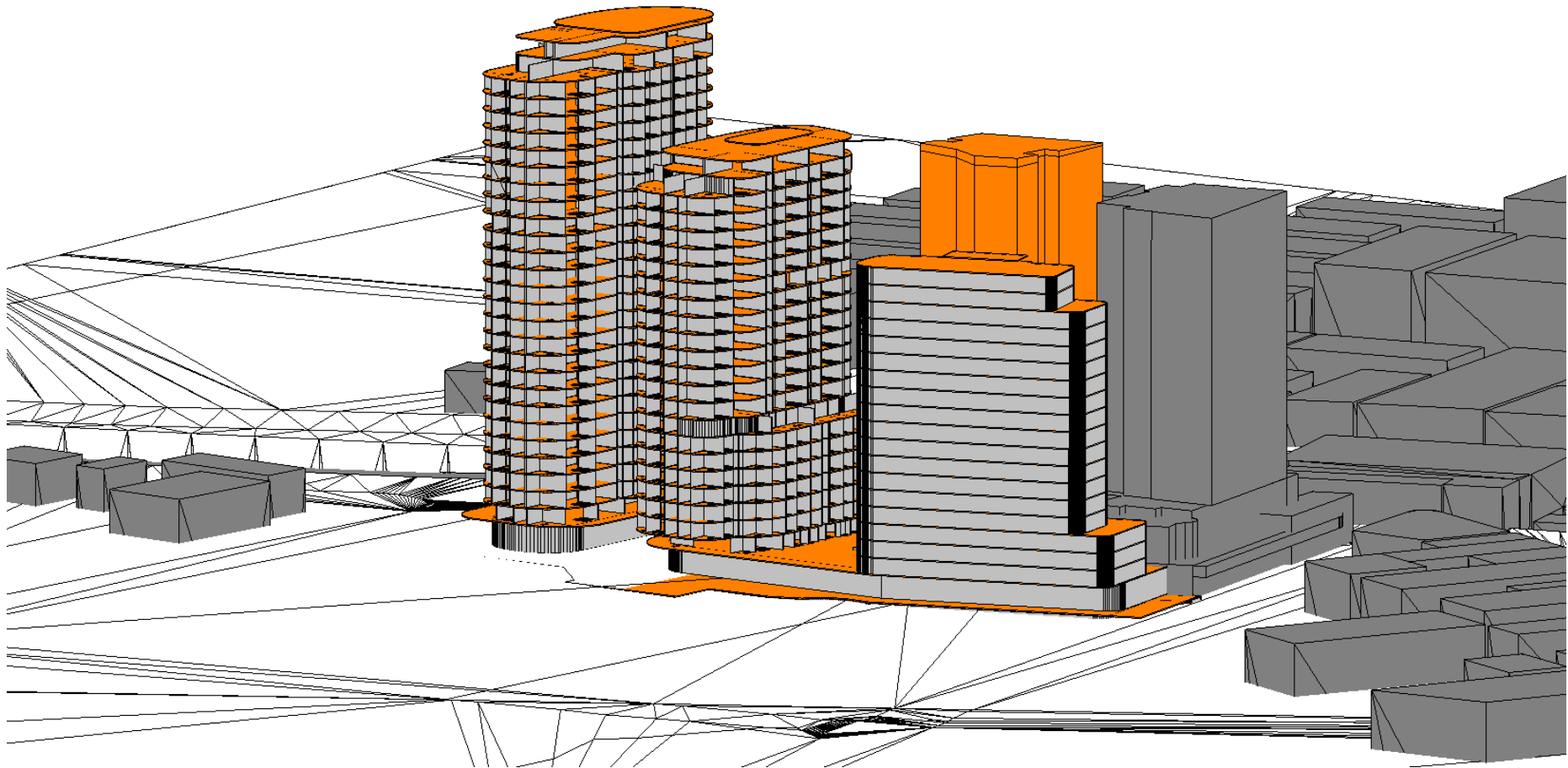


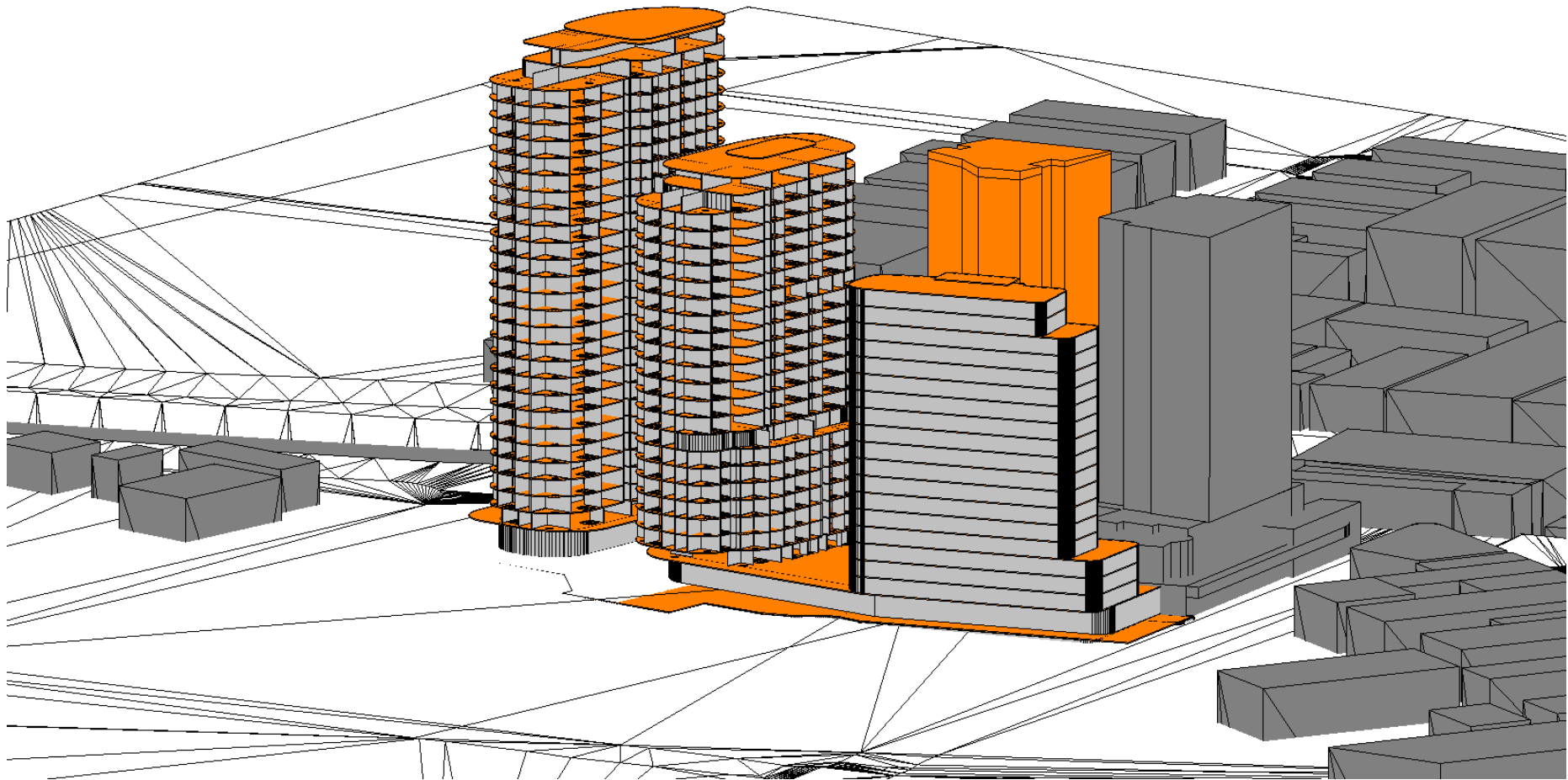


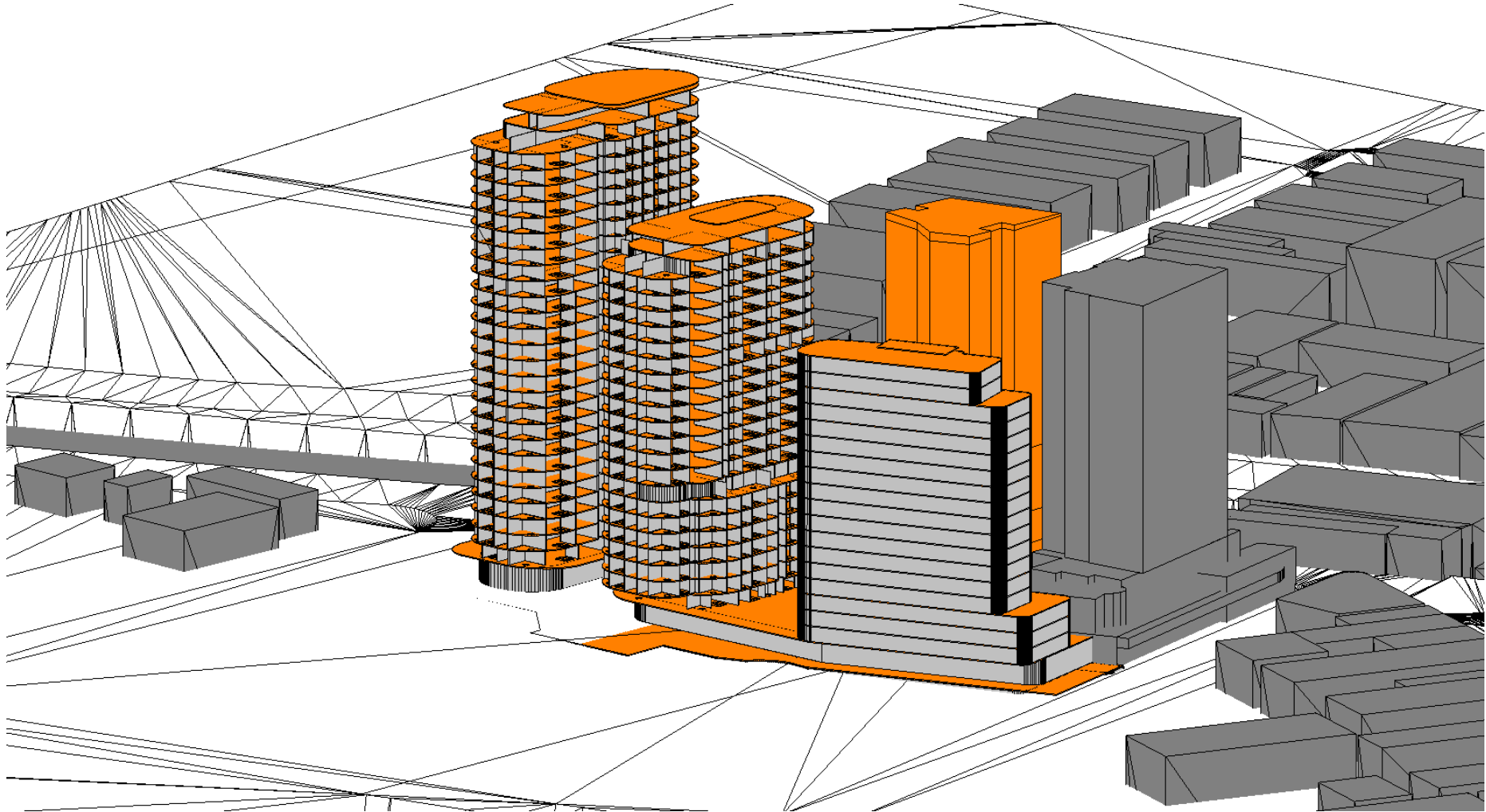
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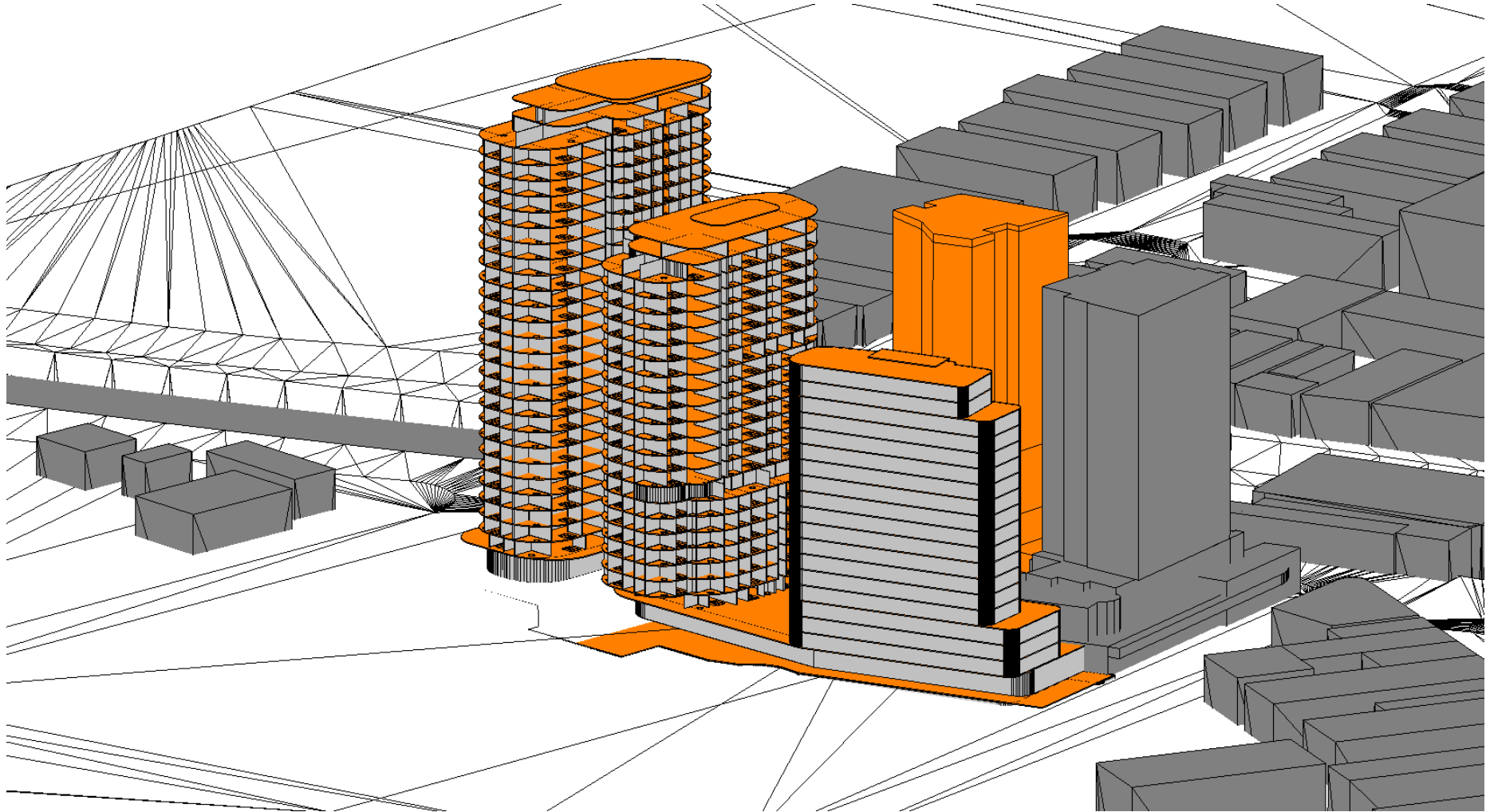
Sun Eye Views ADG Massing + Future Northern Development

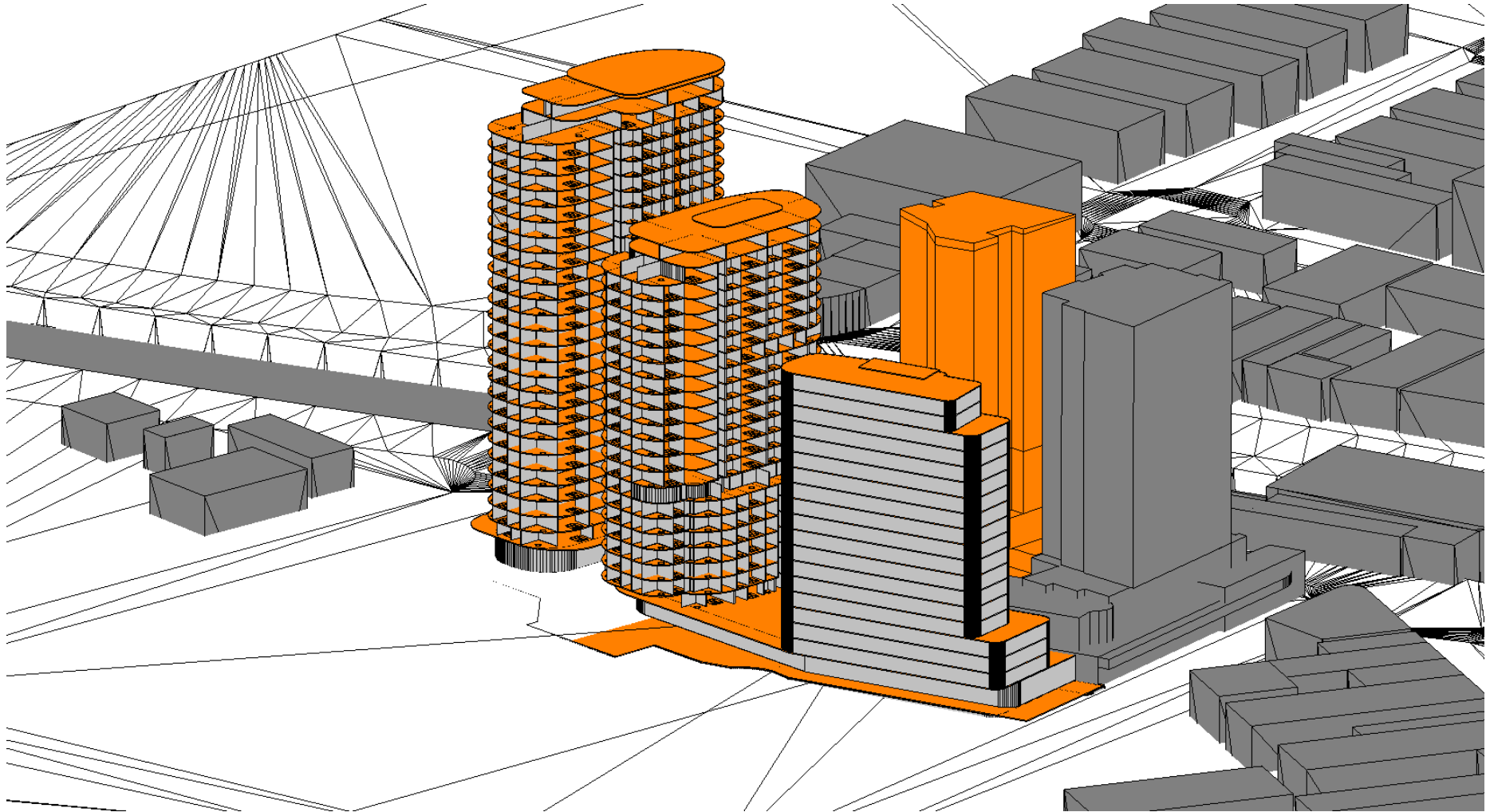
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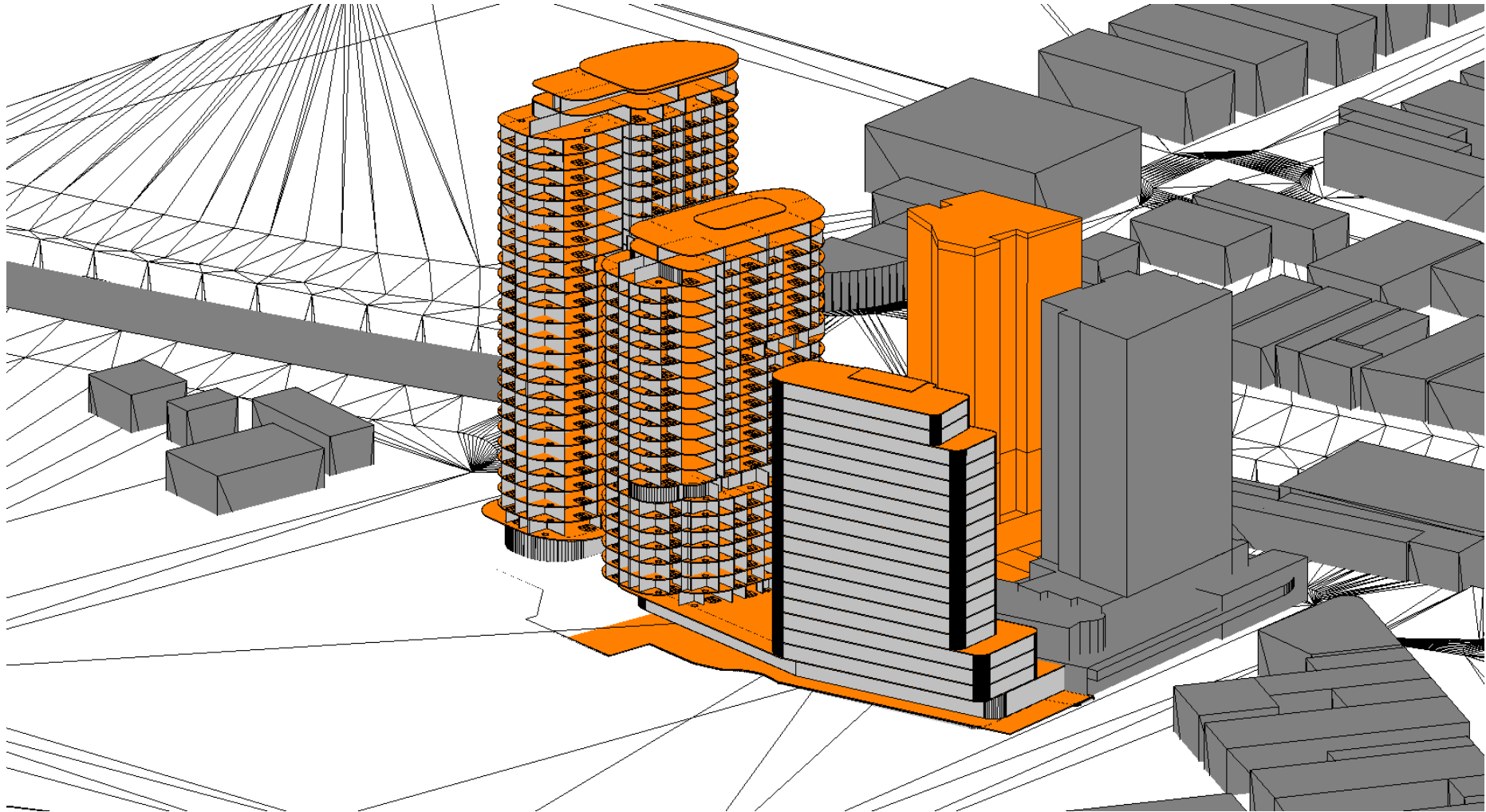


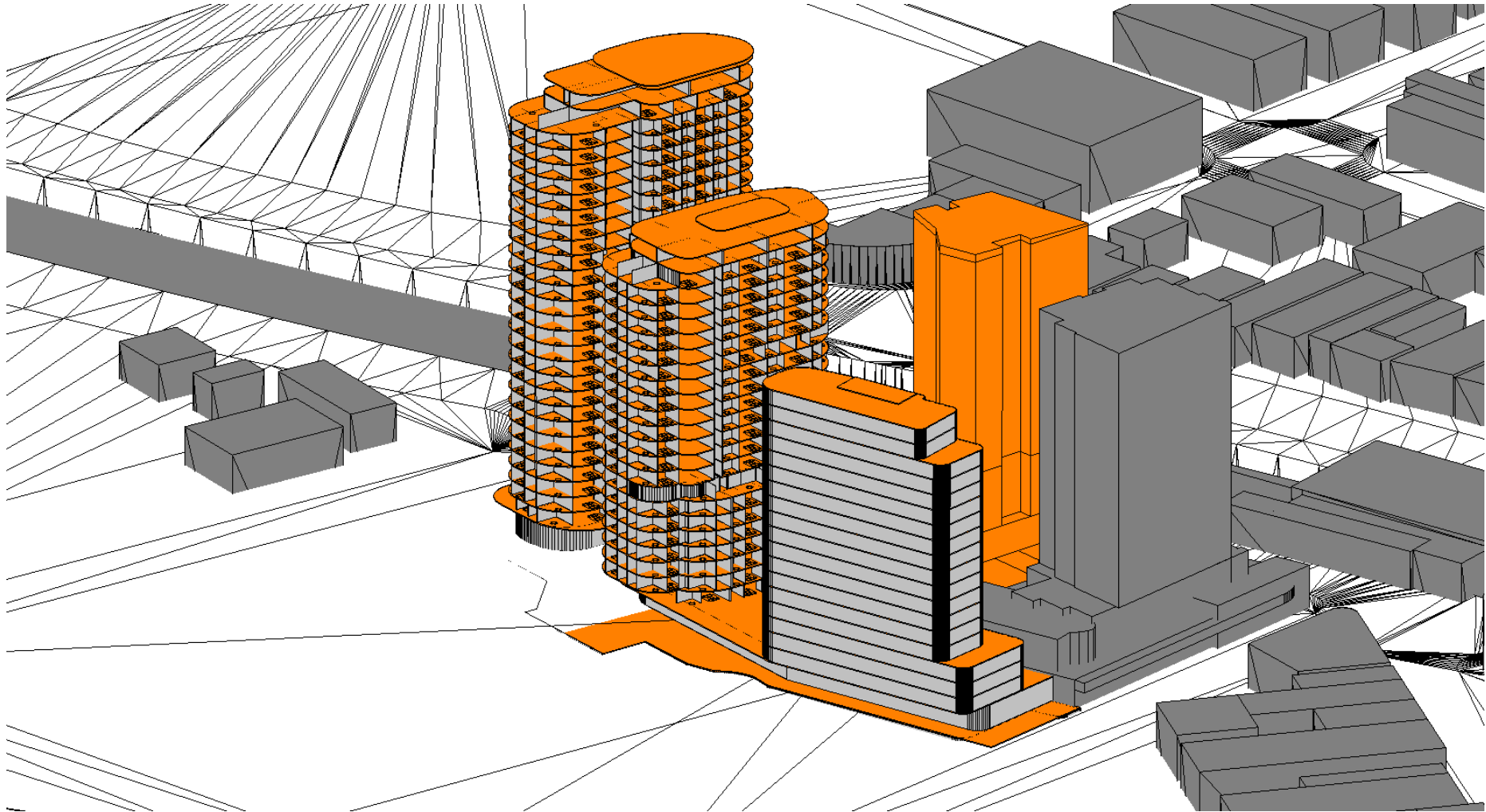


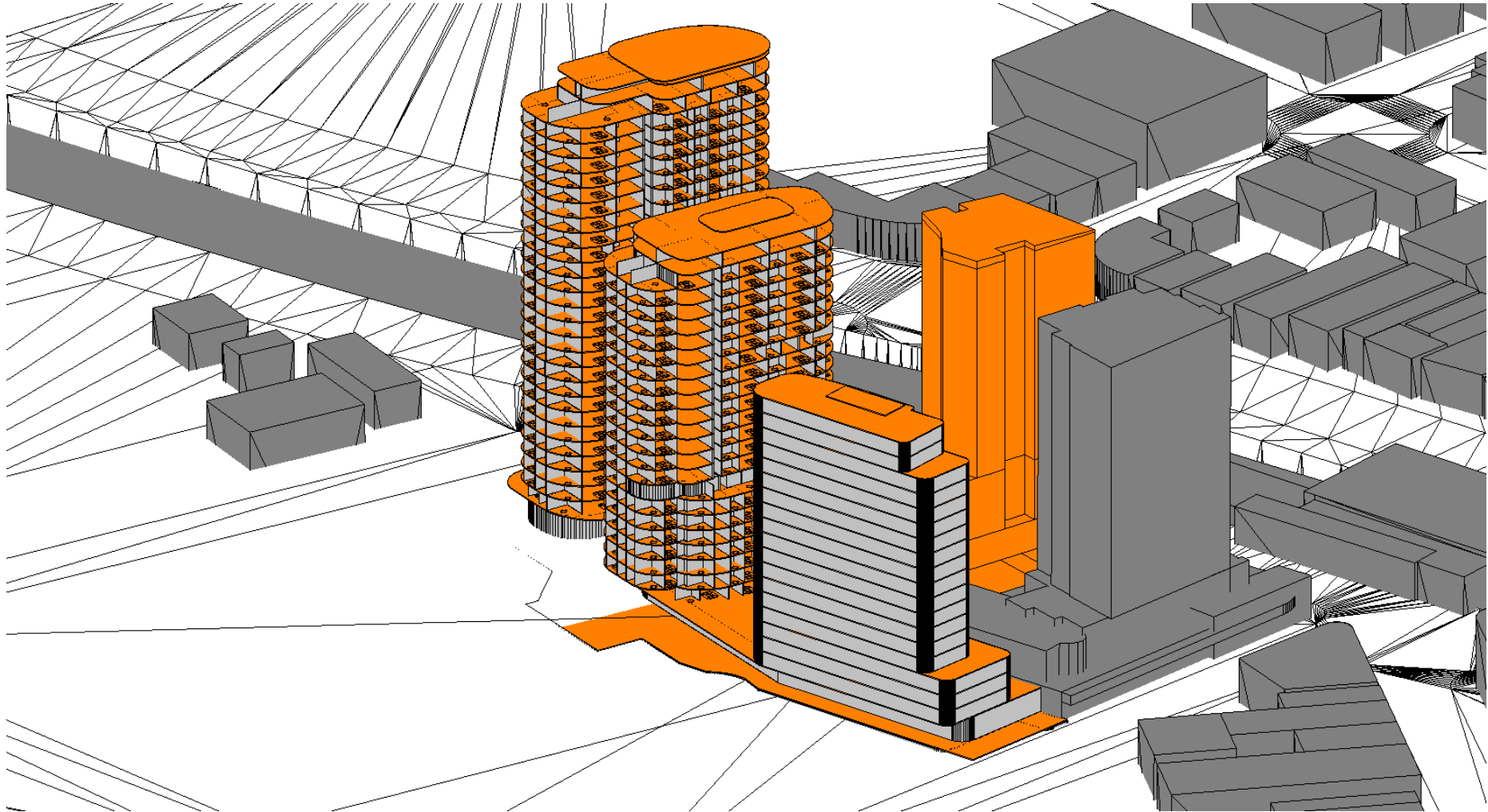




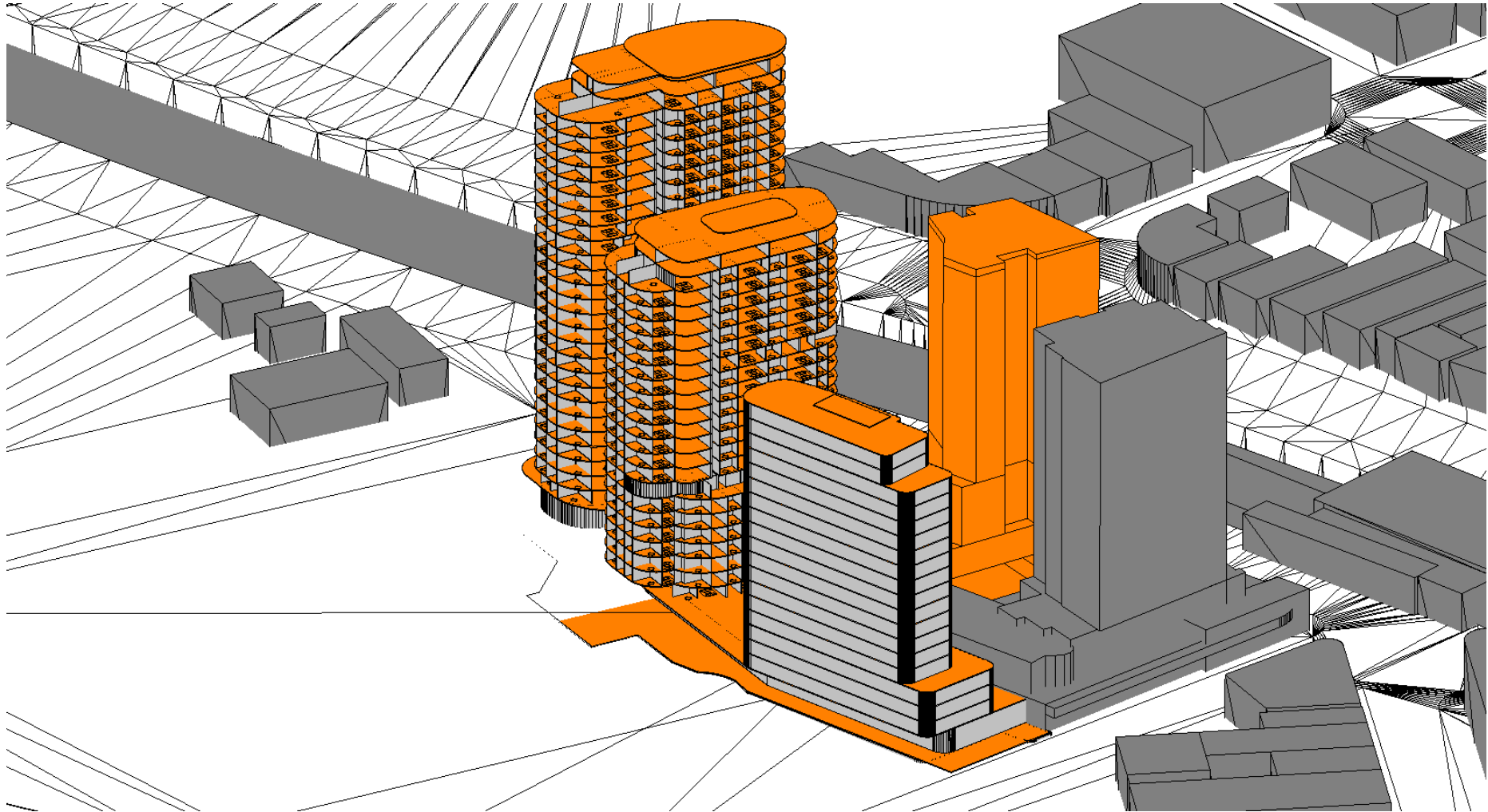


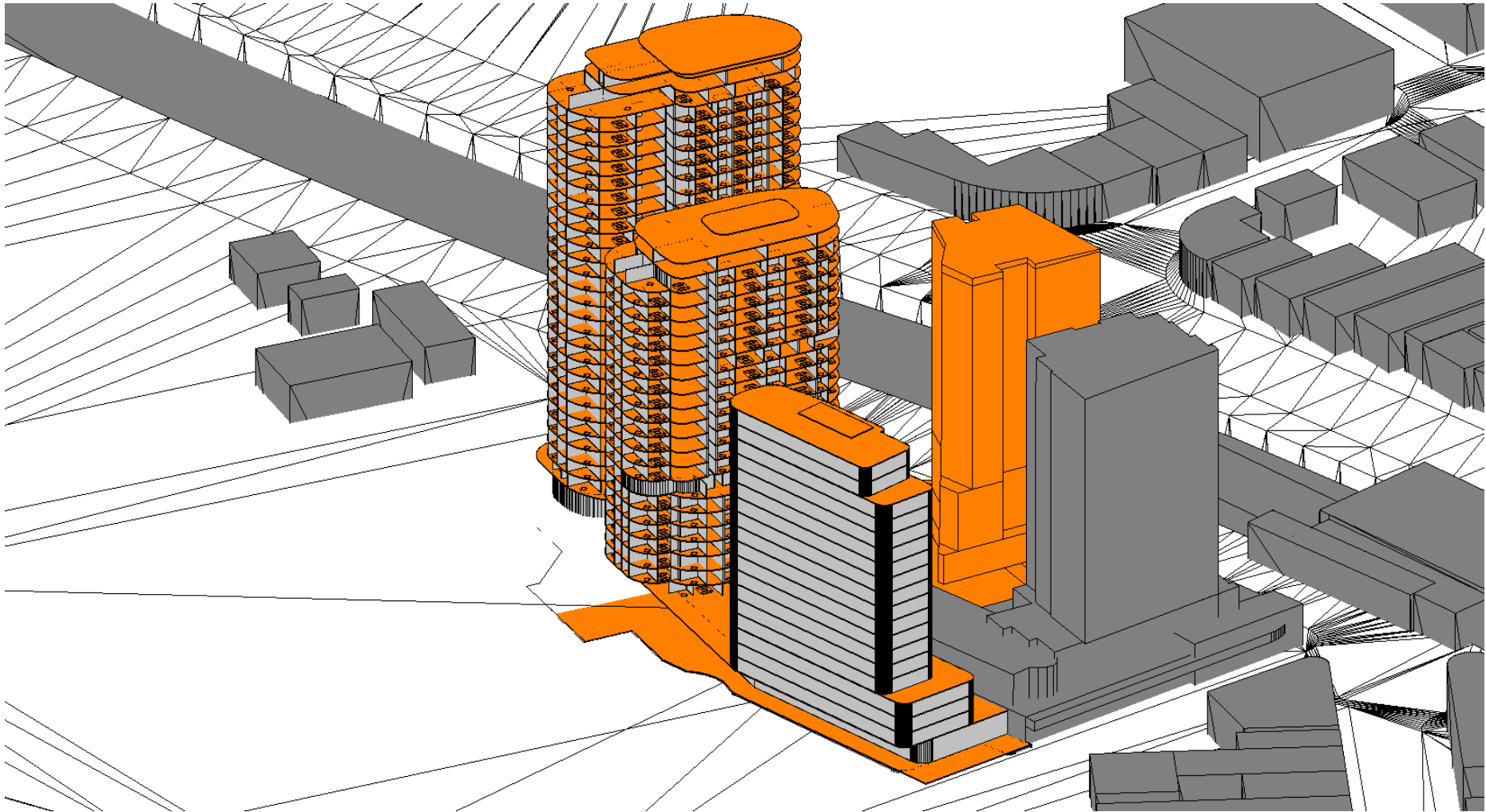


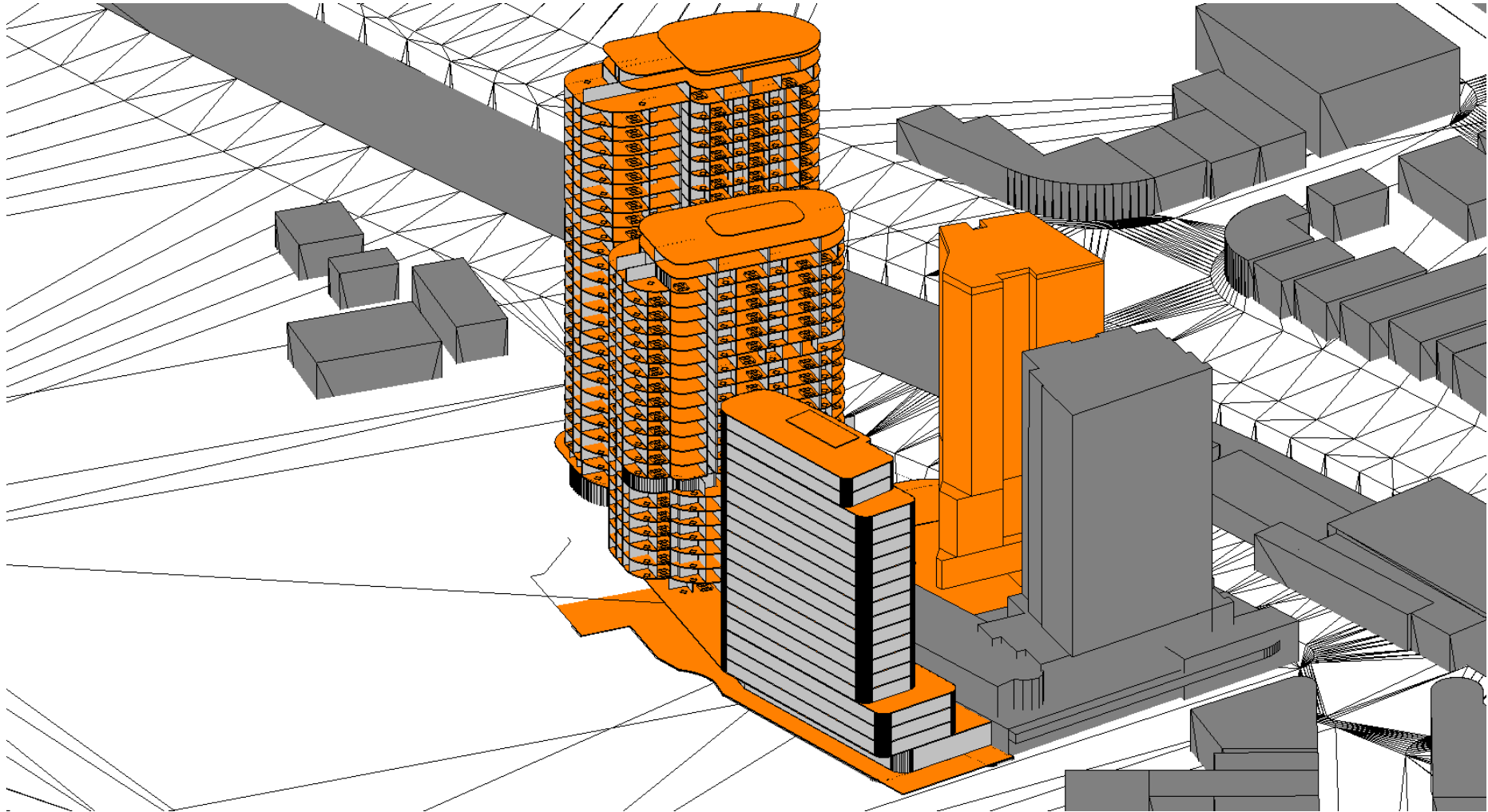


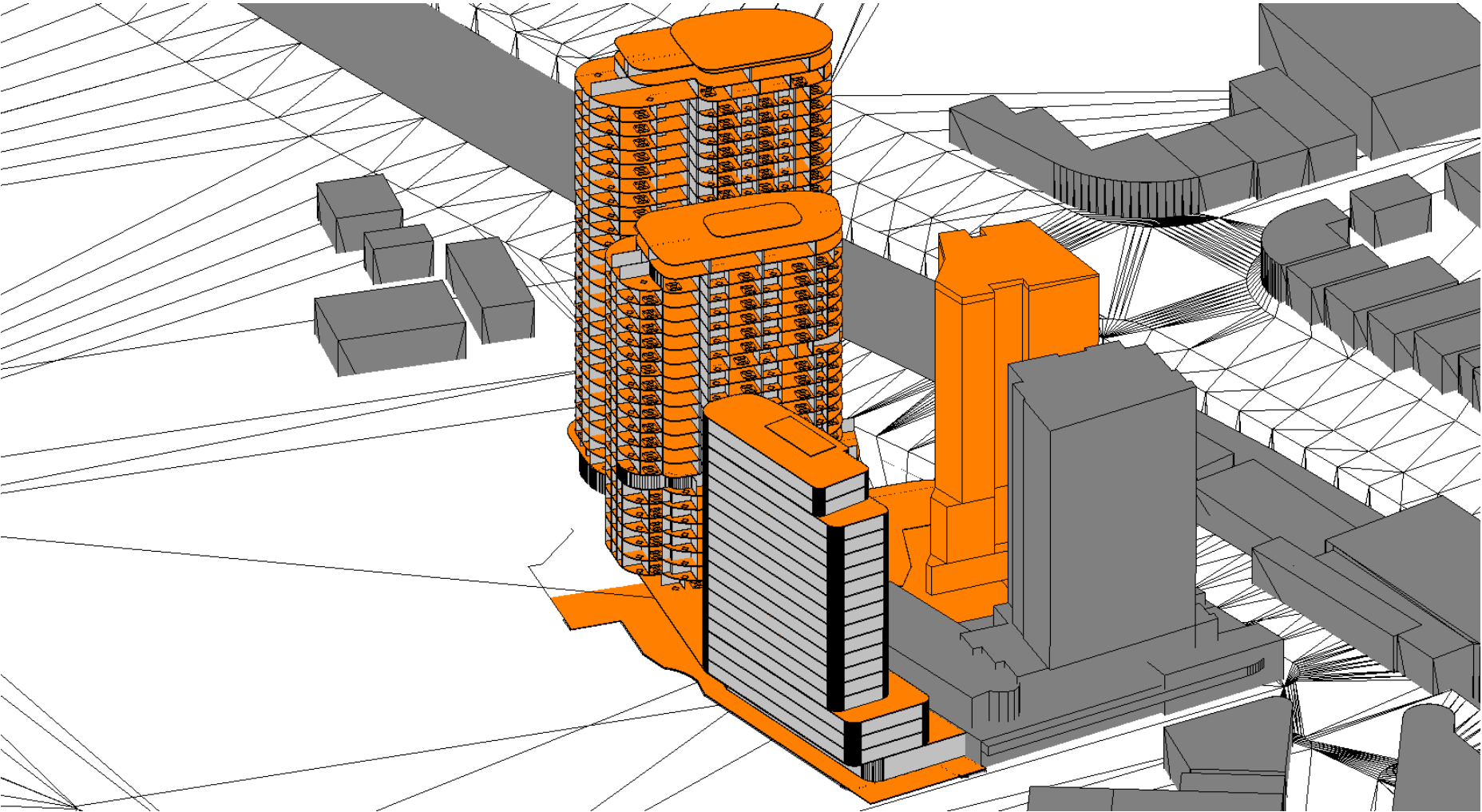


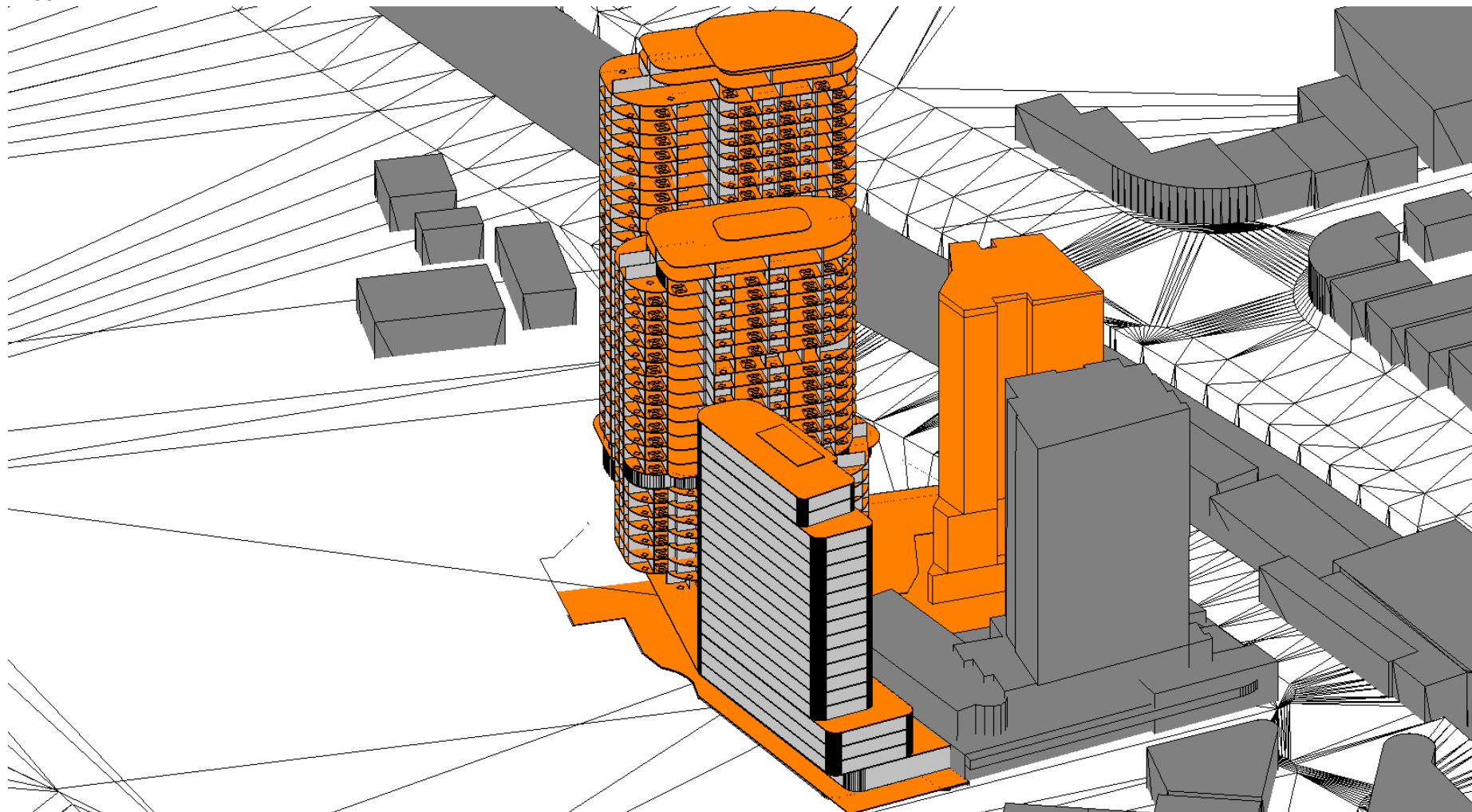
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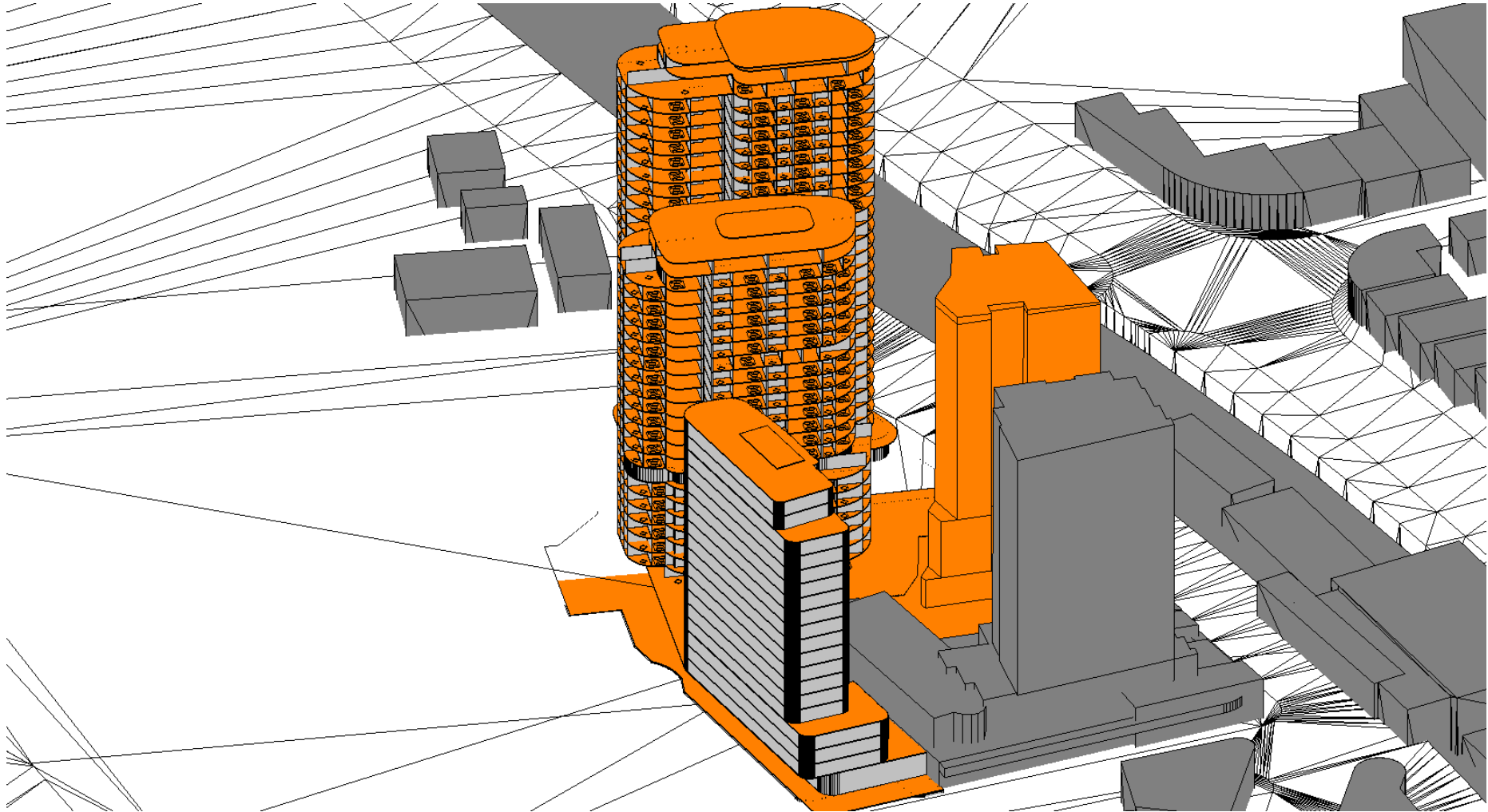


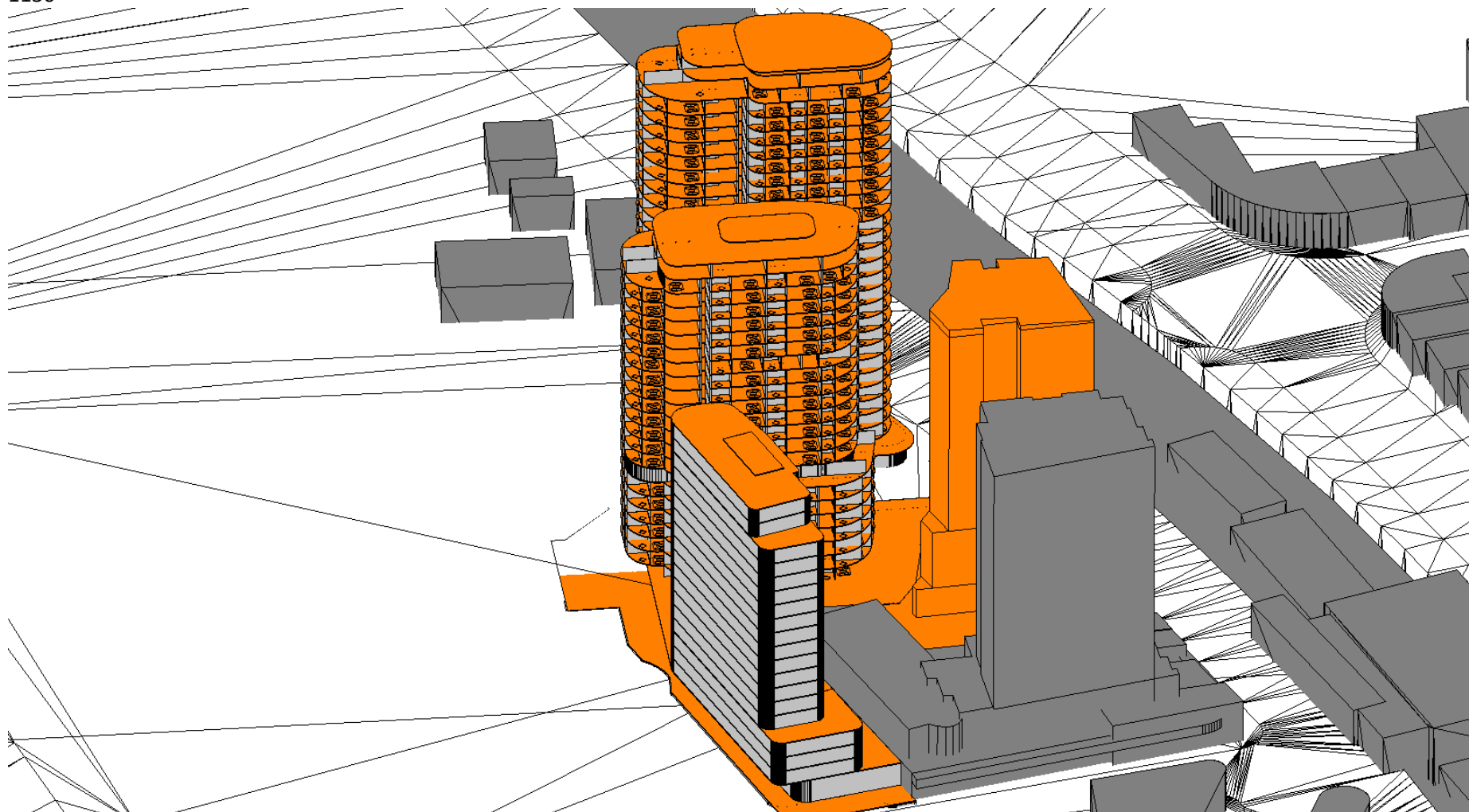


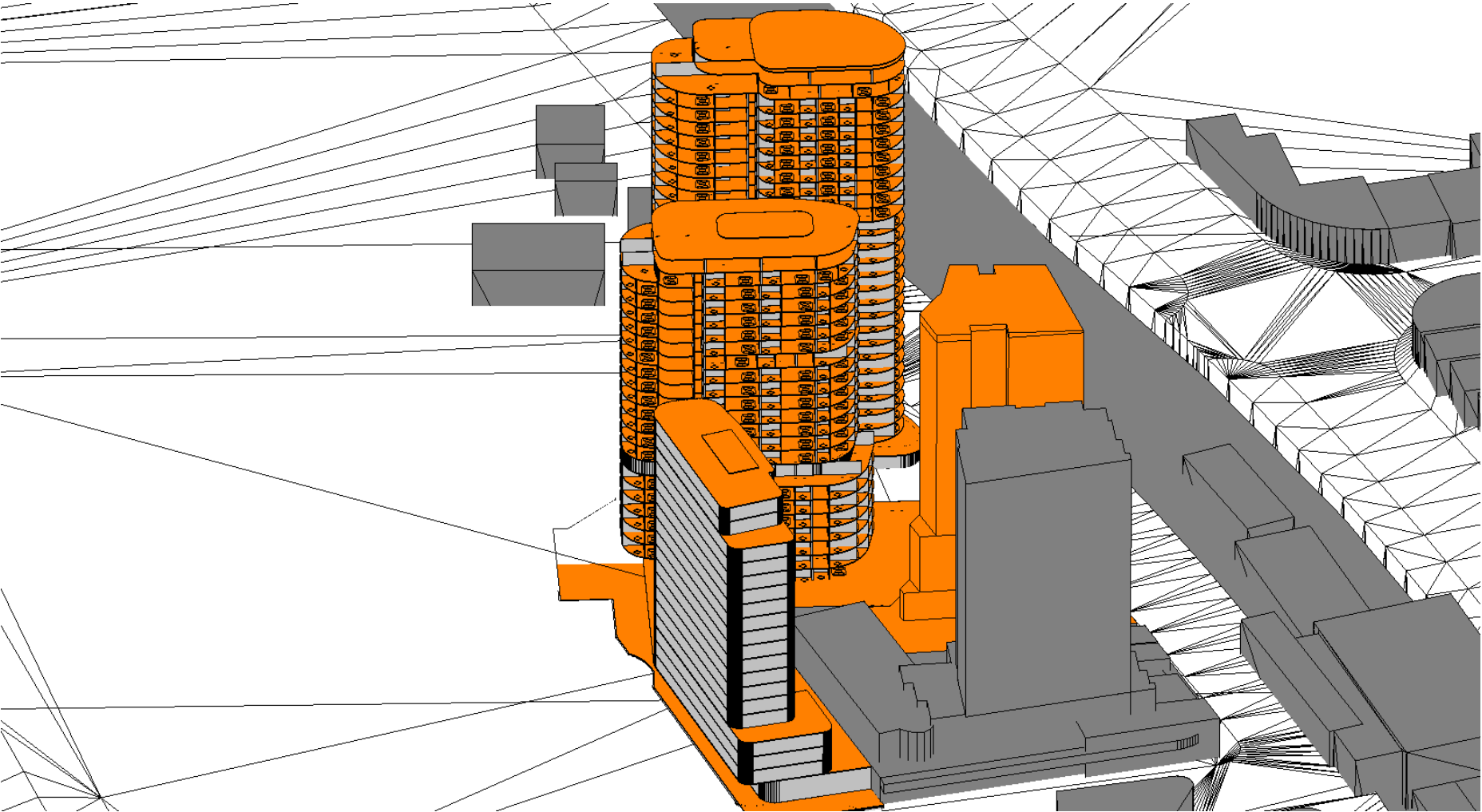


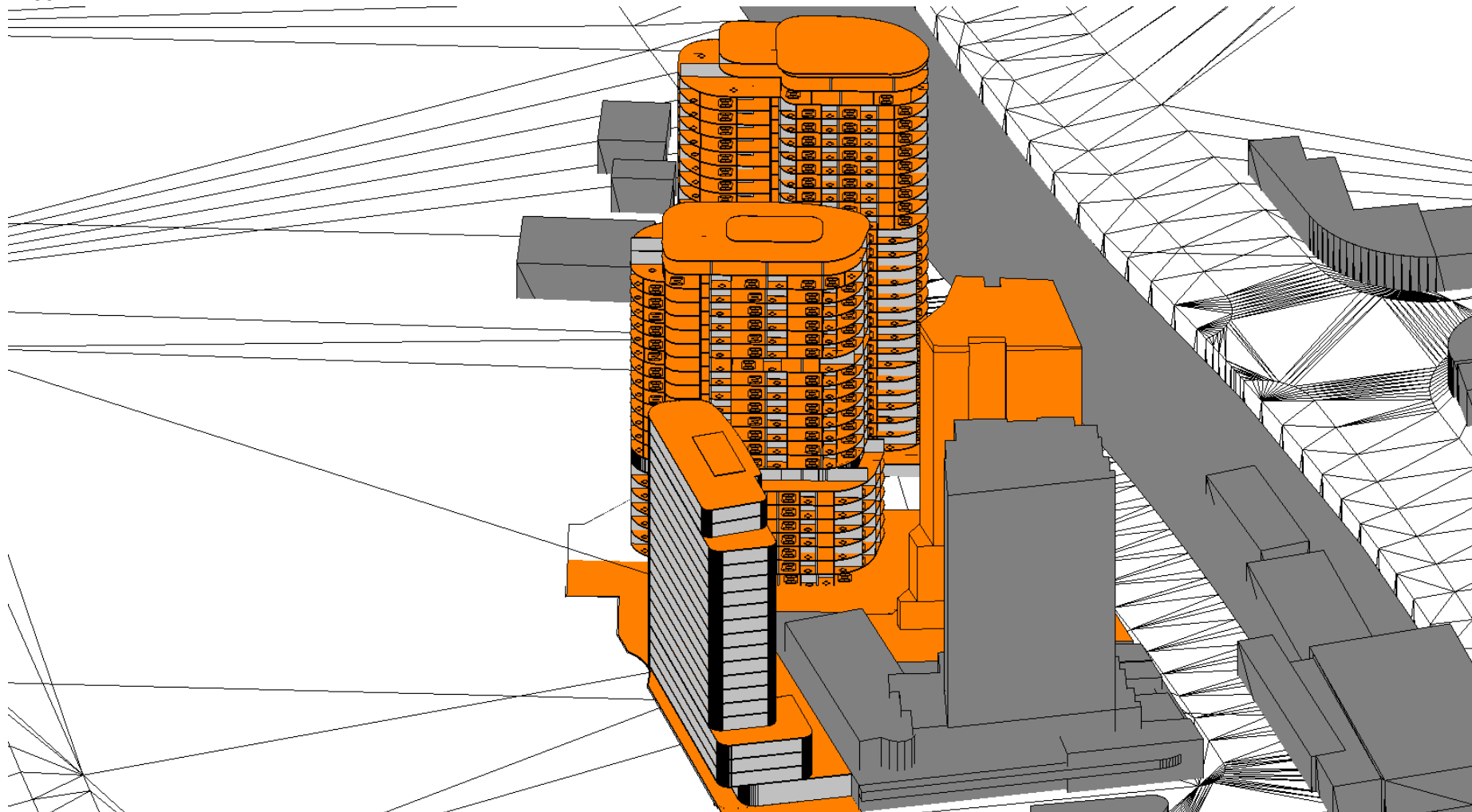


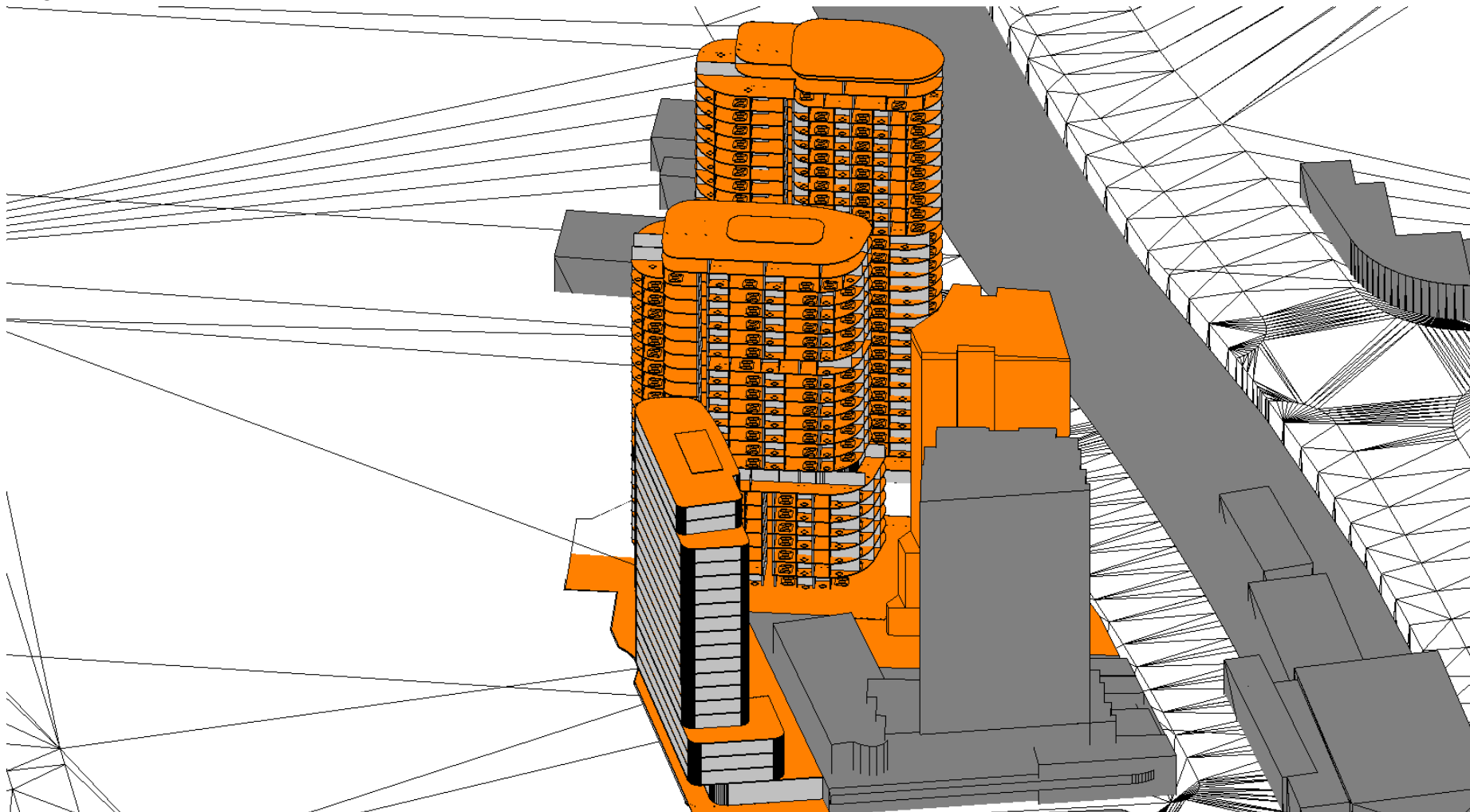


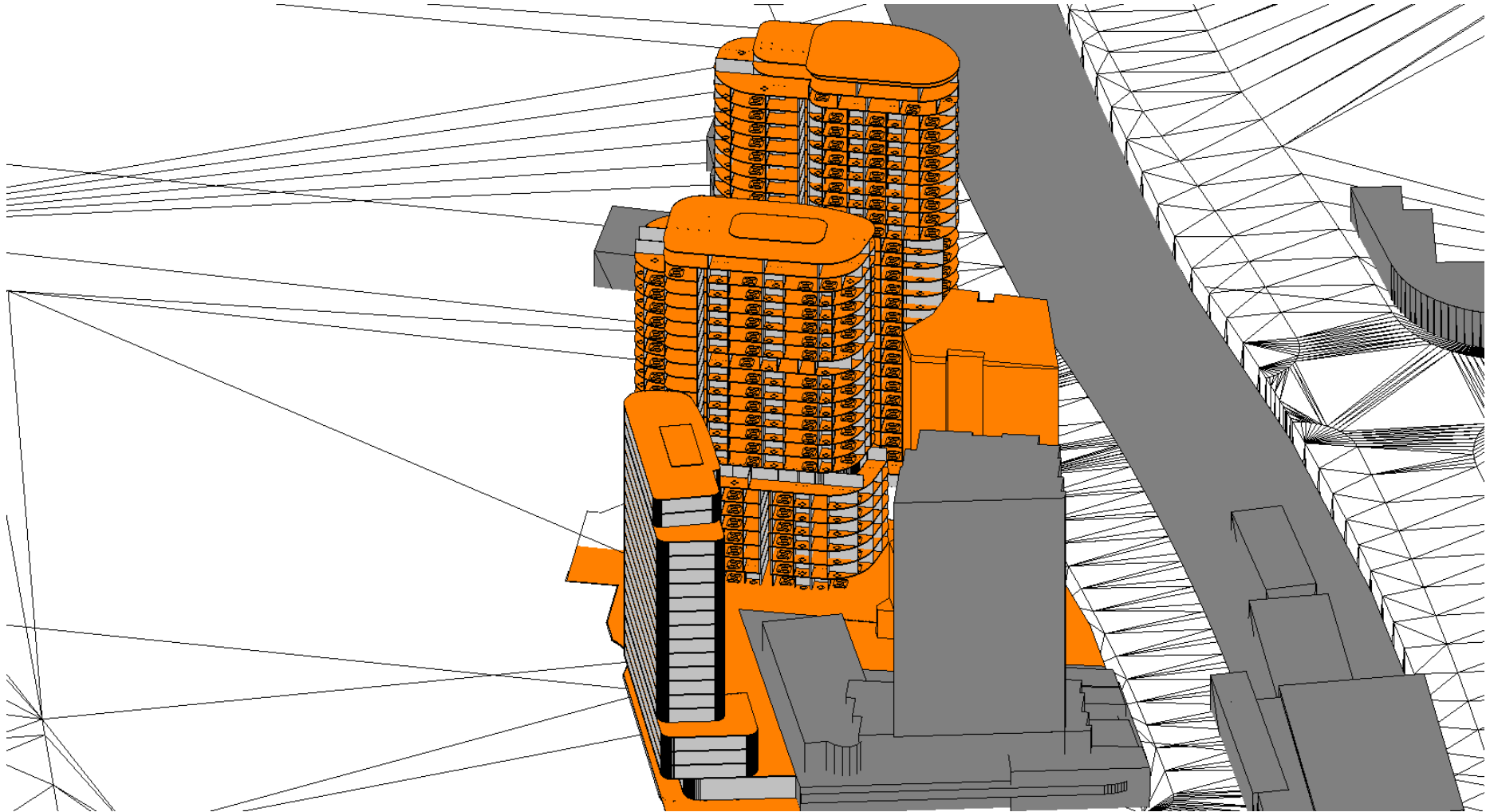


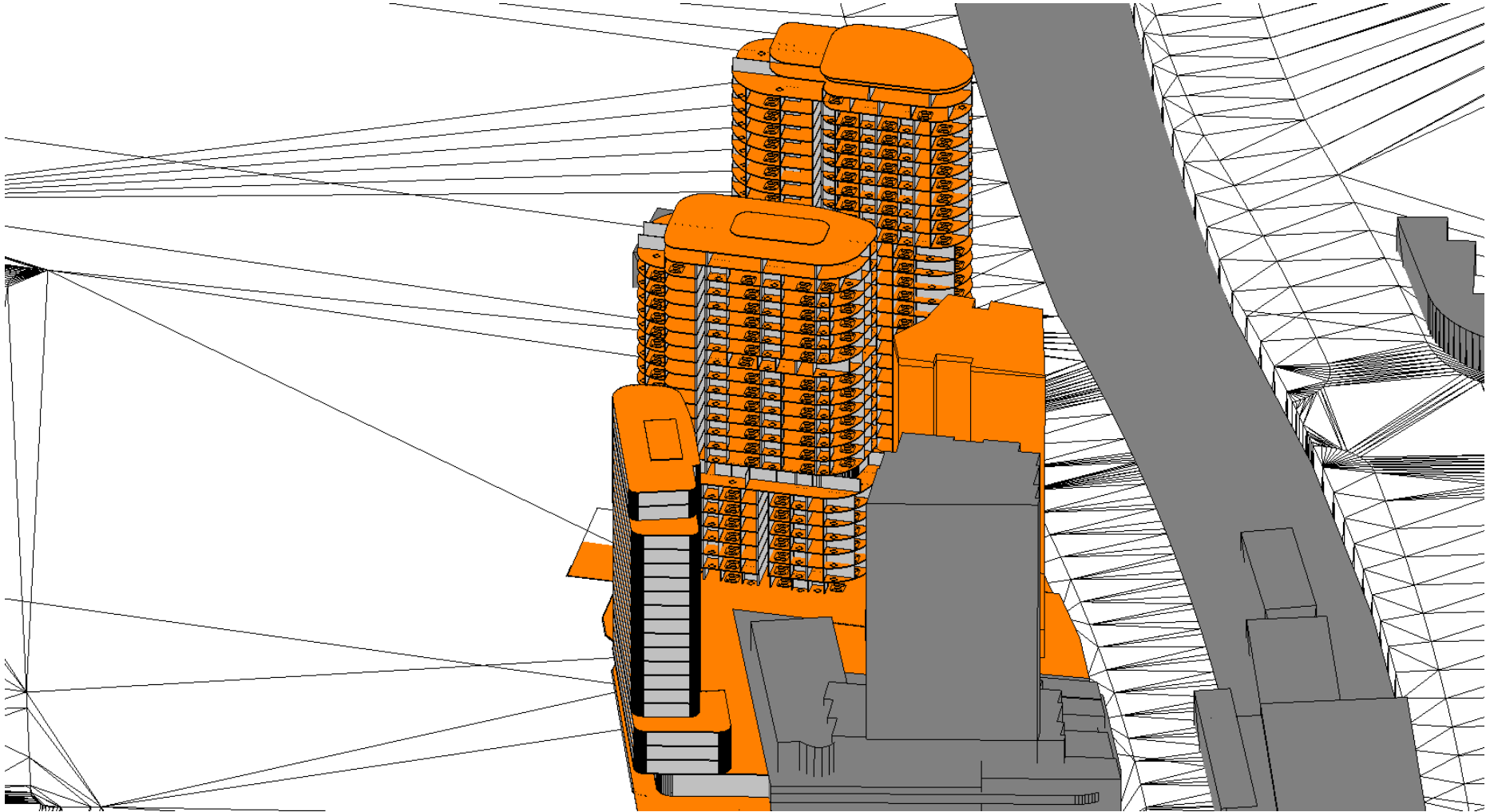


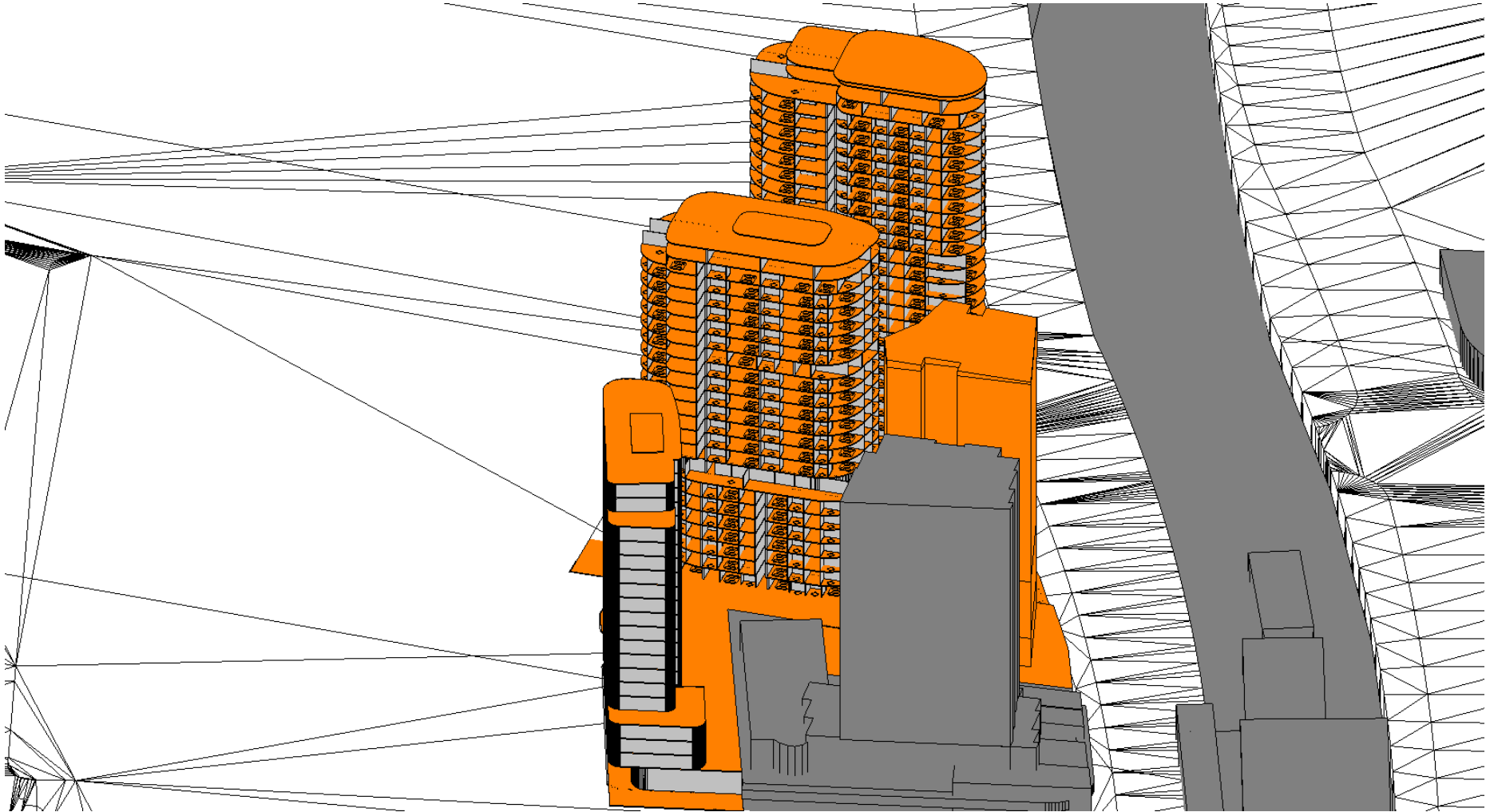


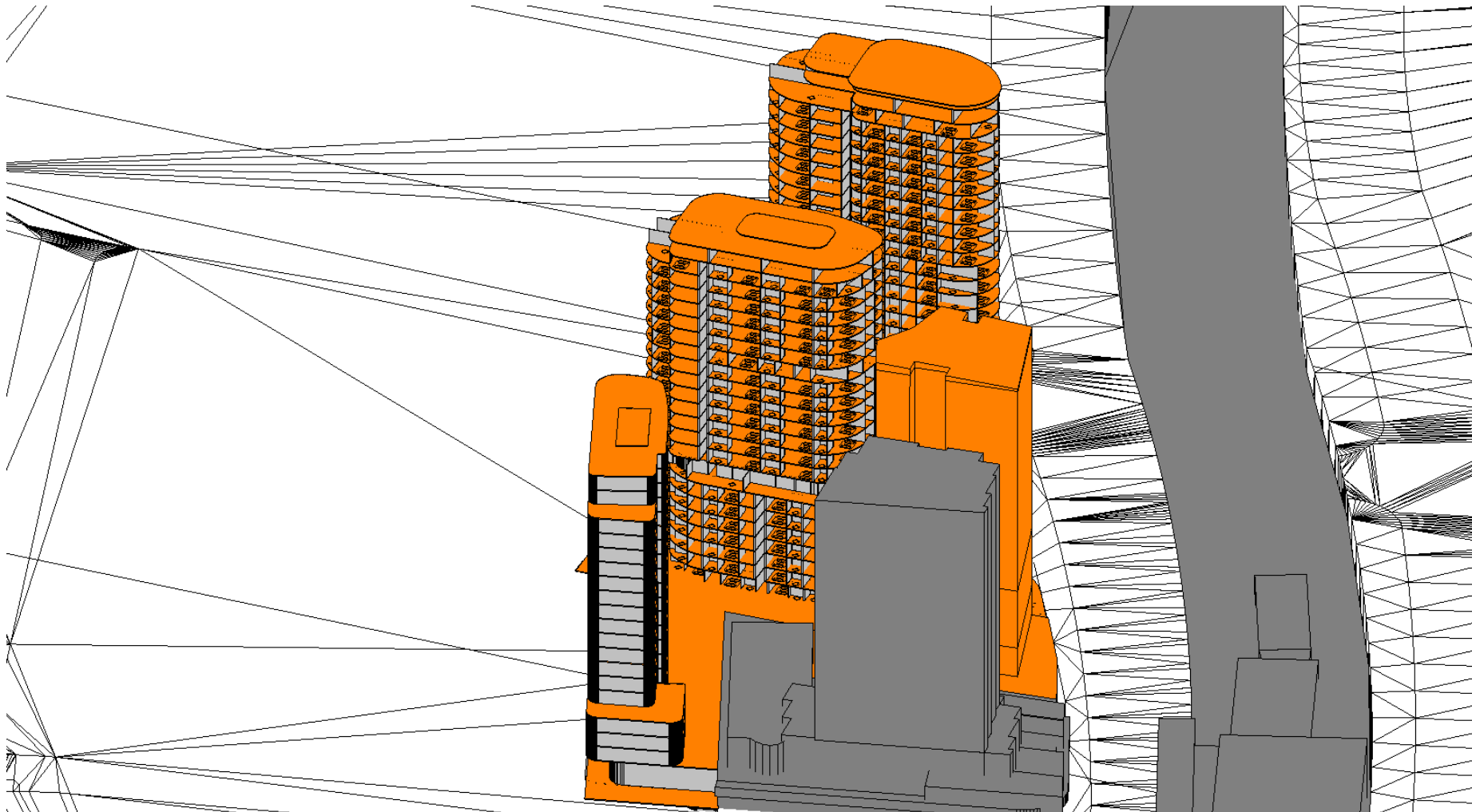


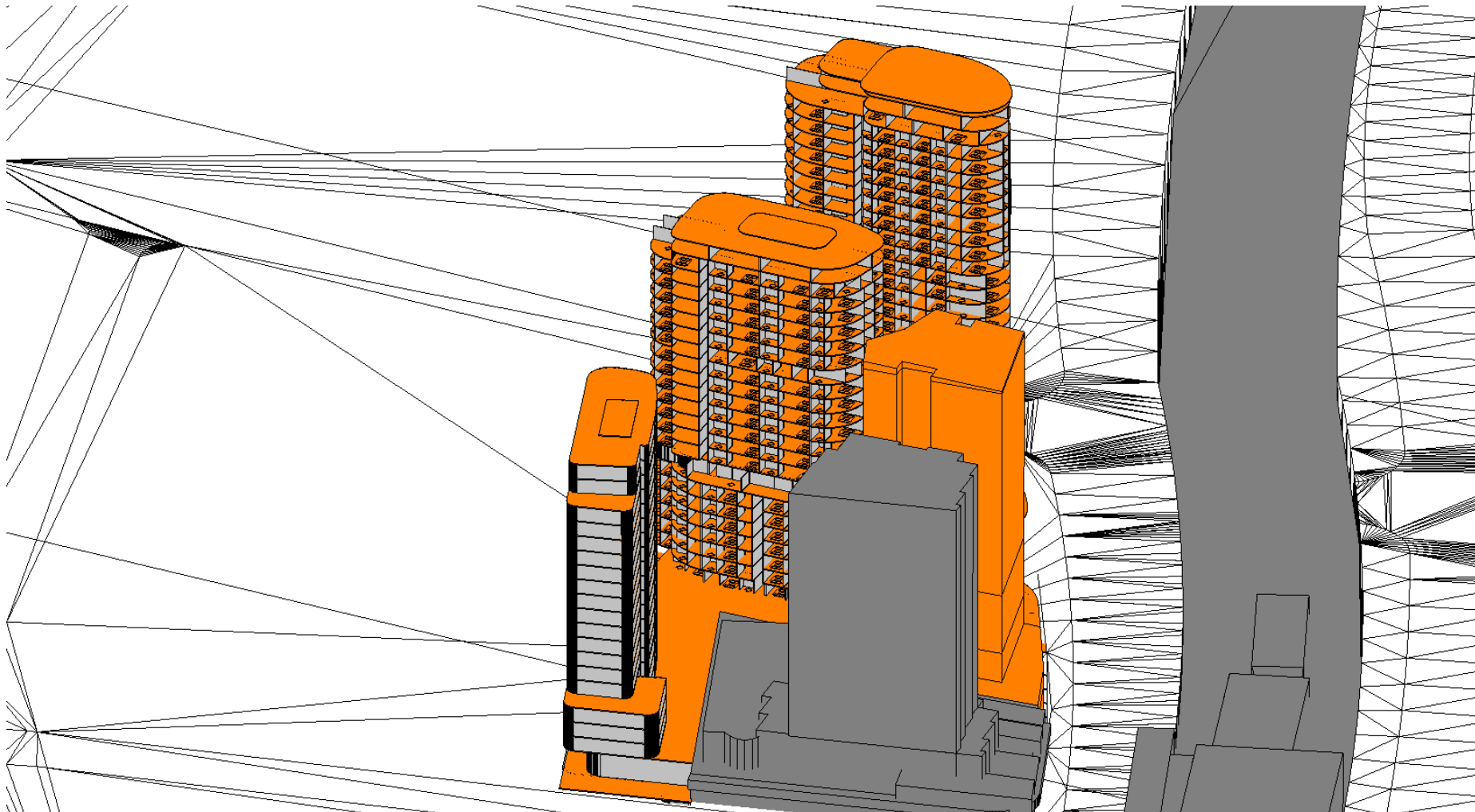


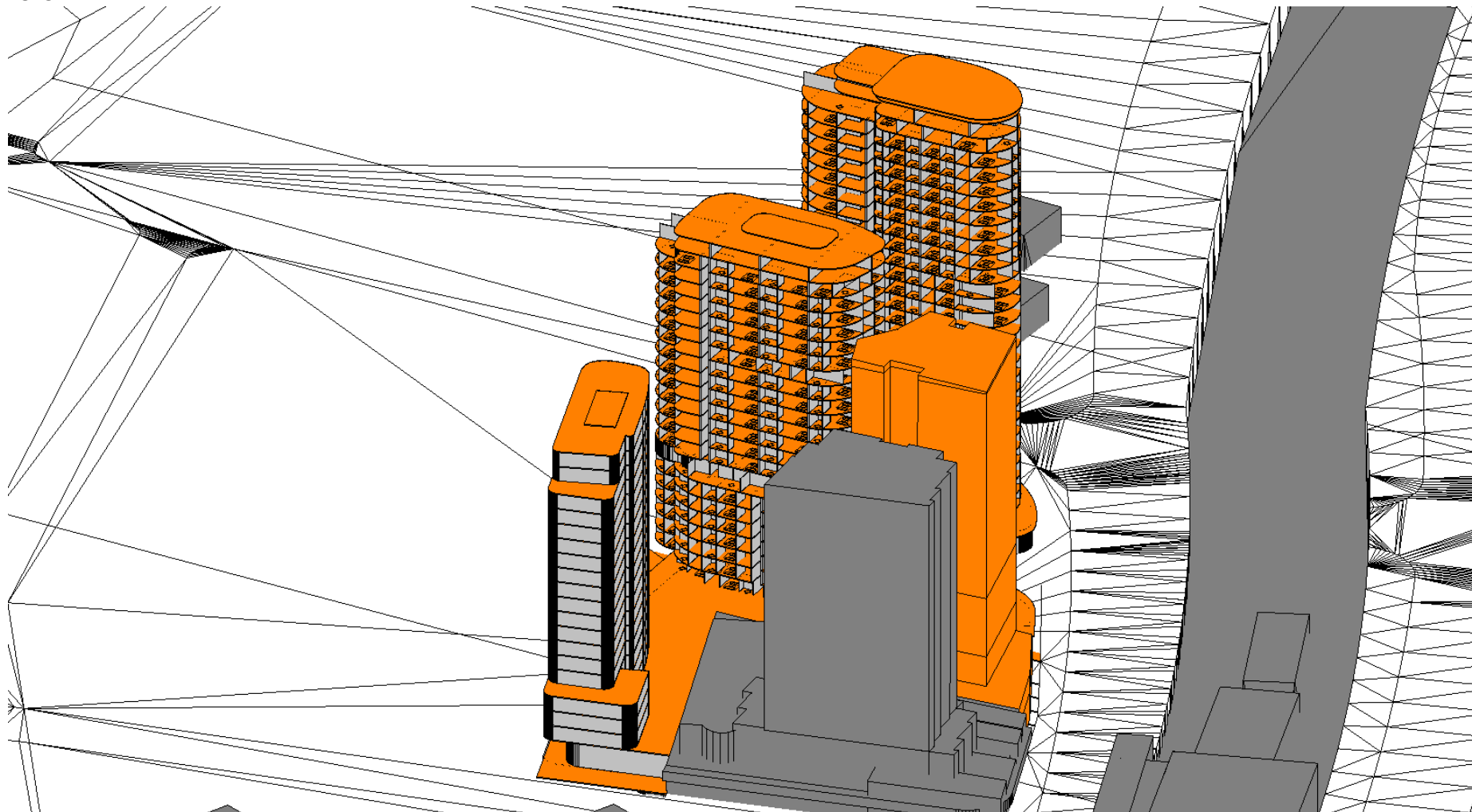


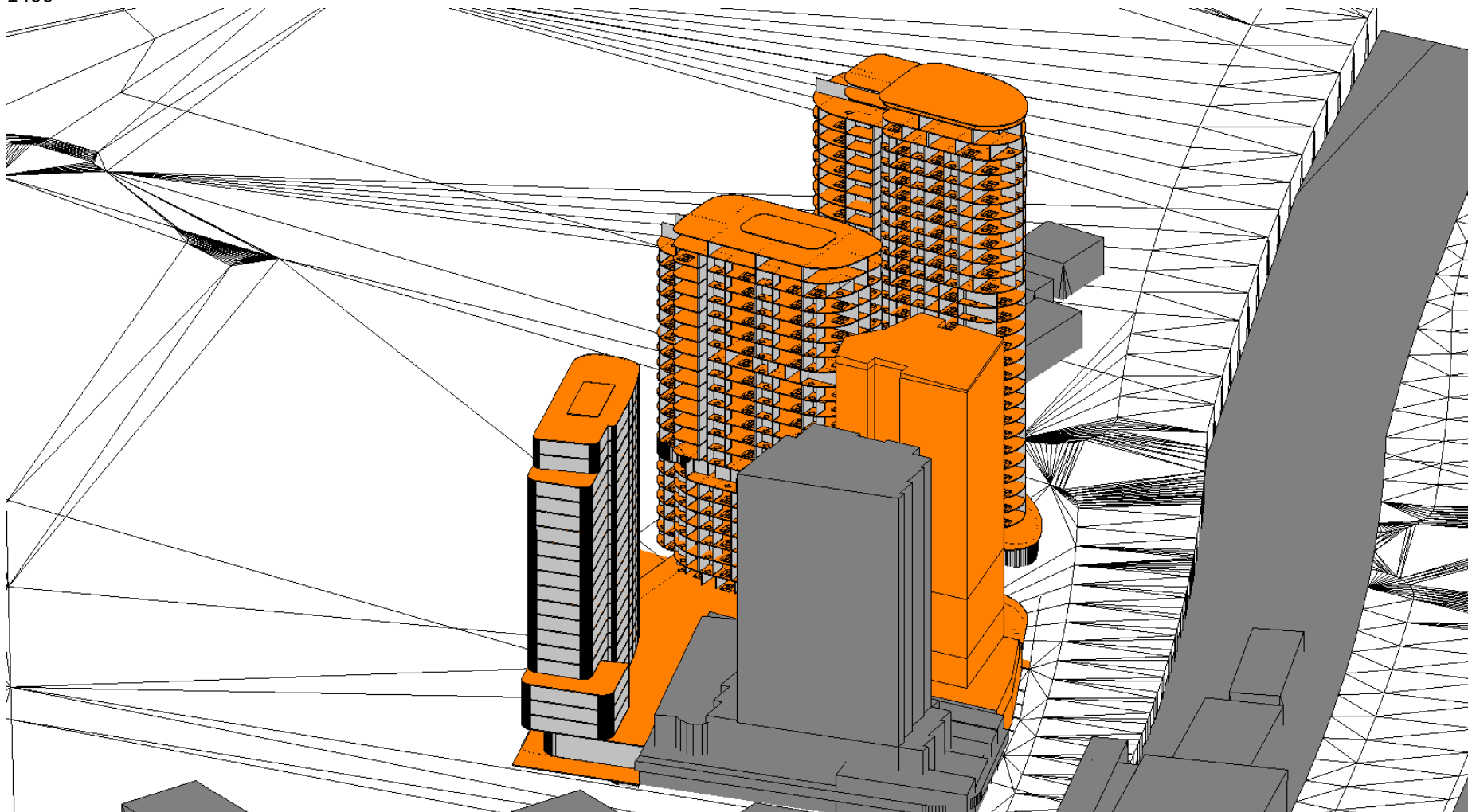


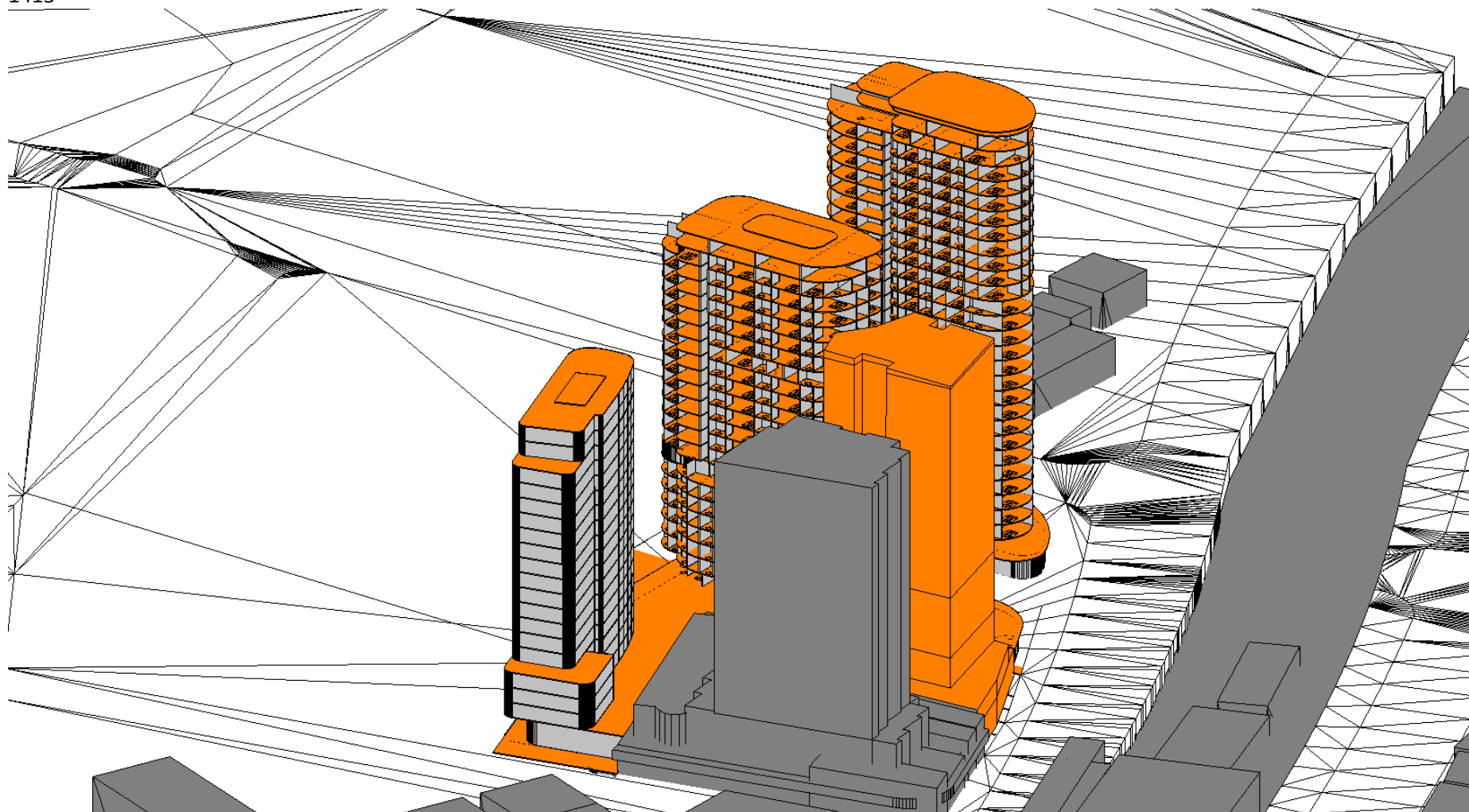


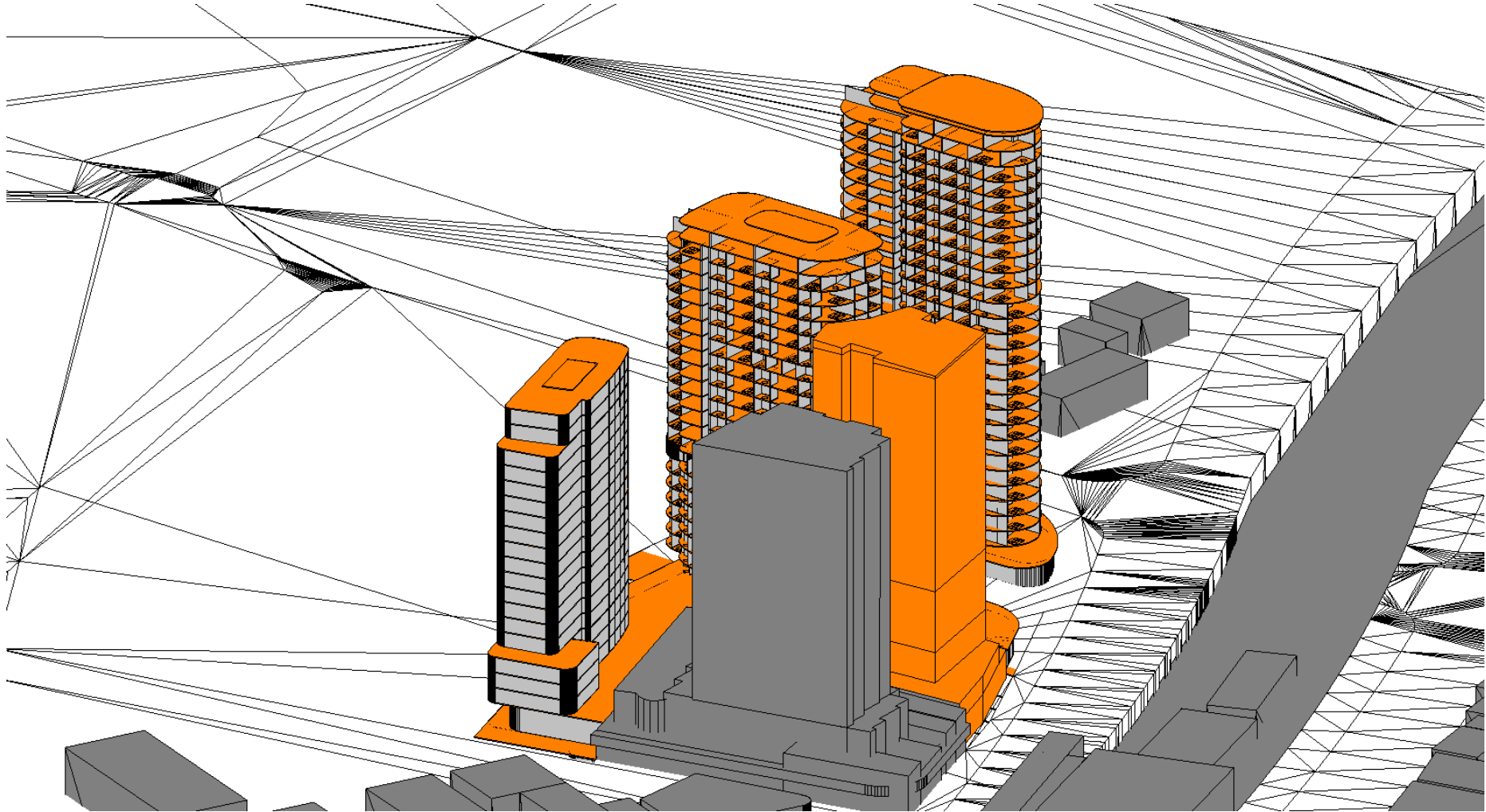


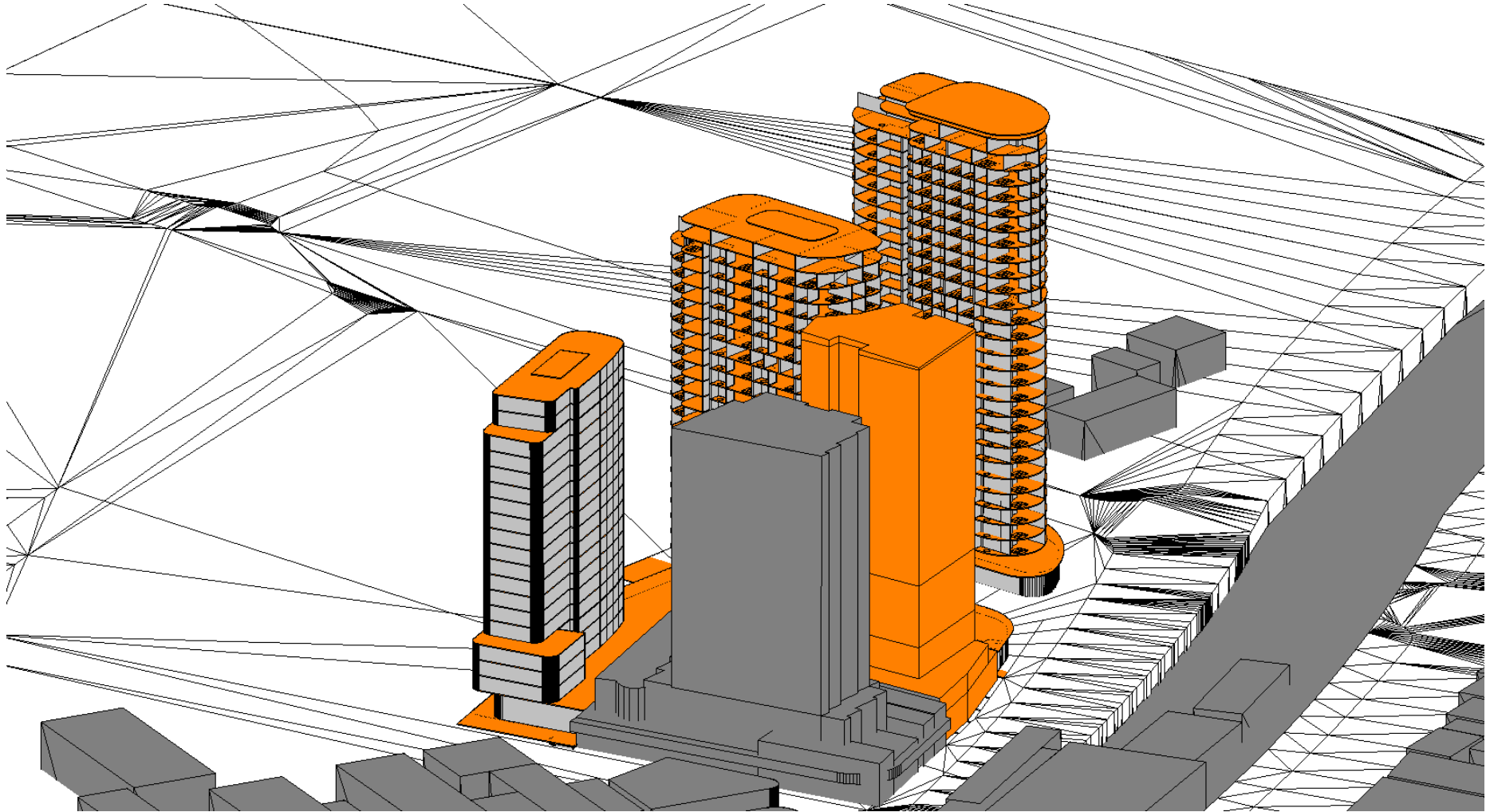


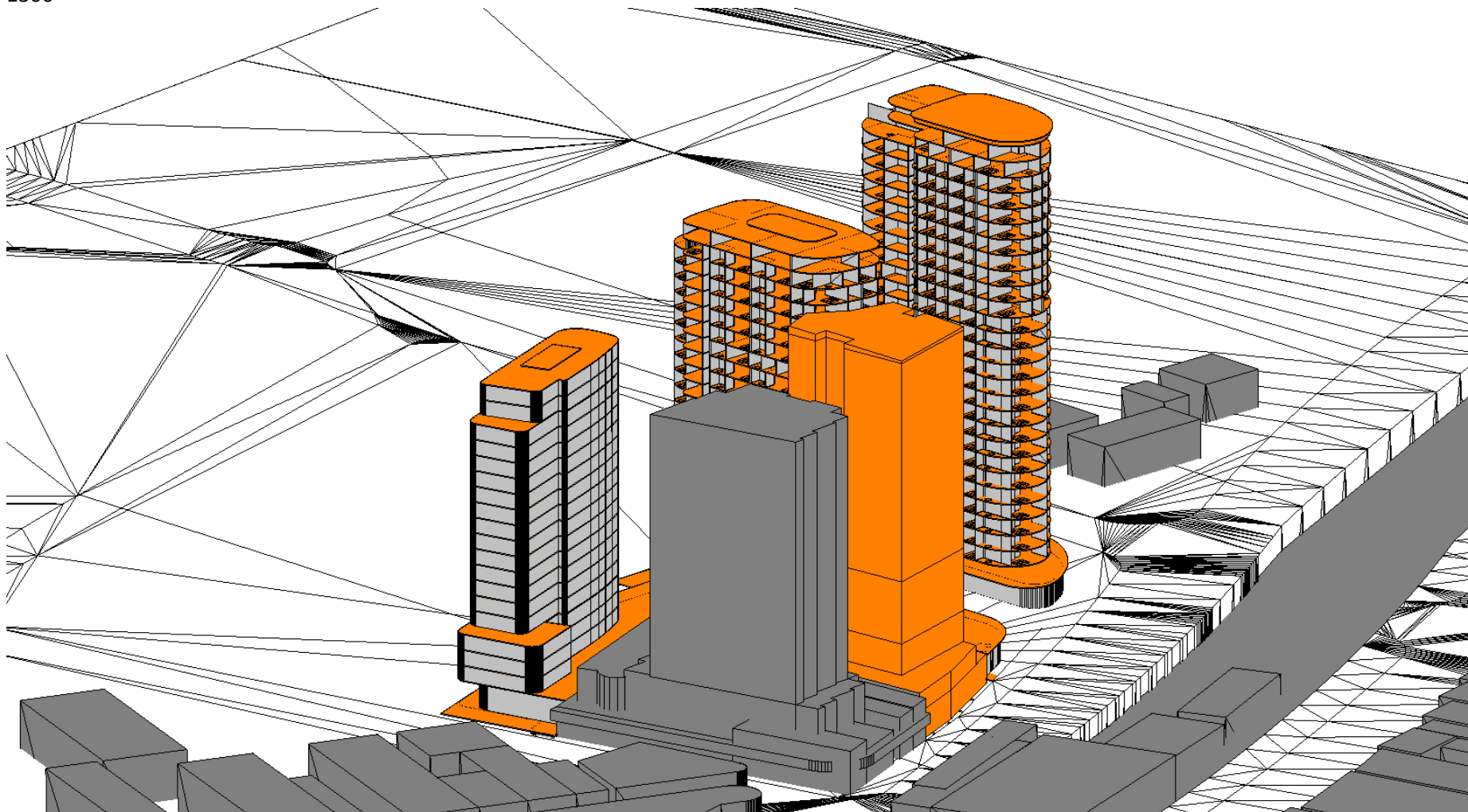


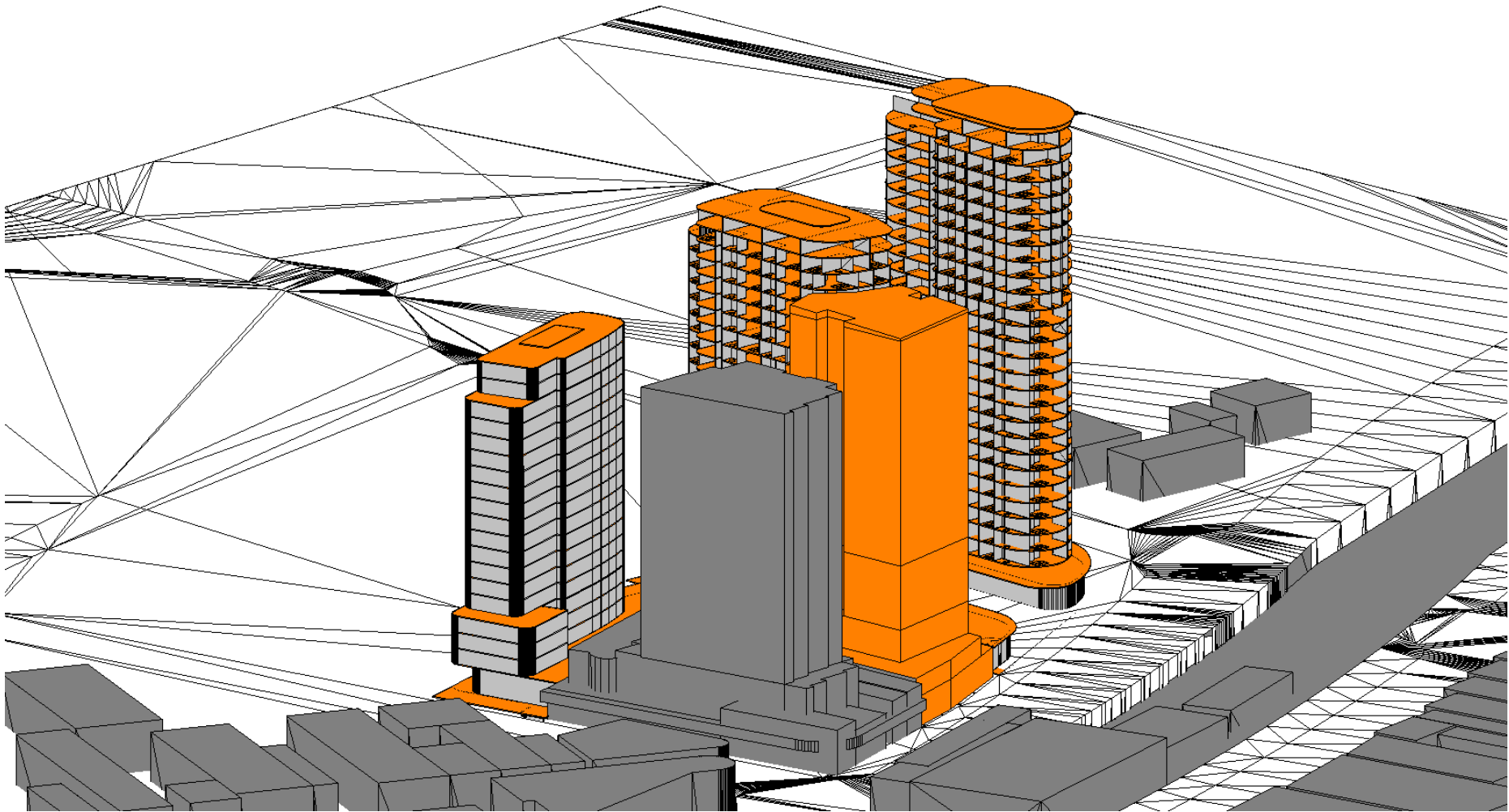


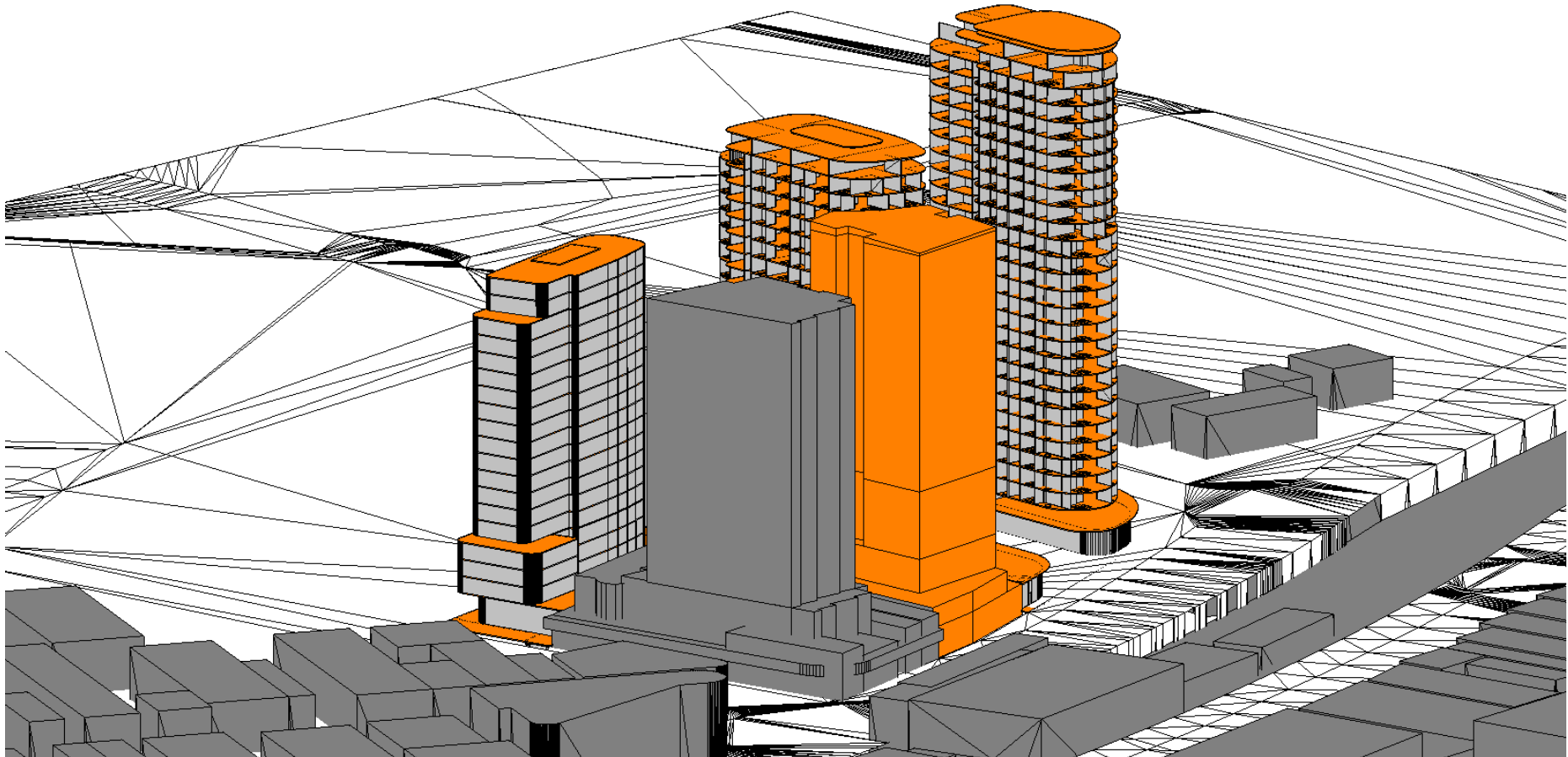


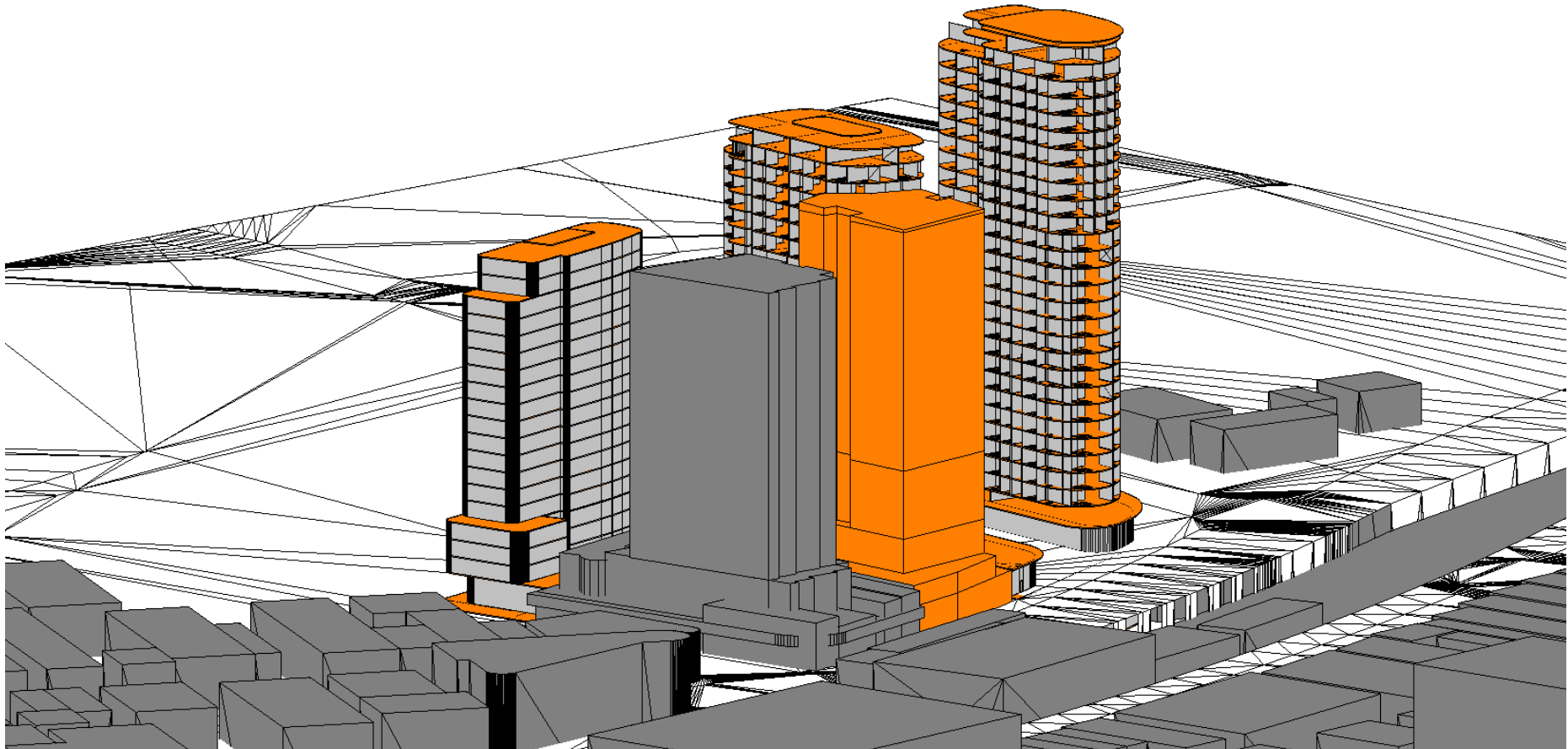


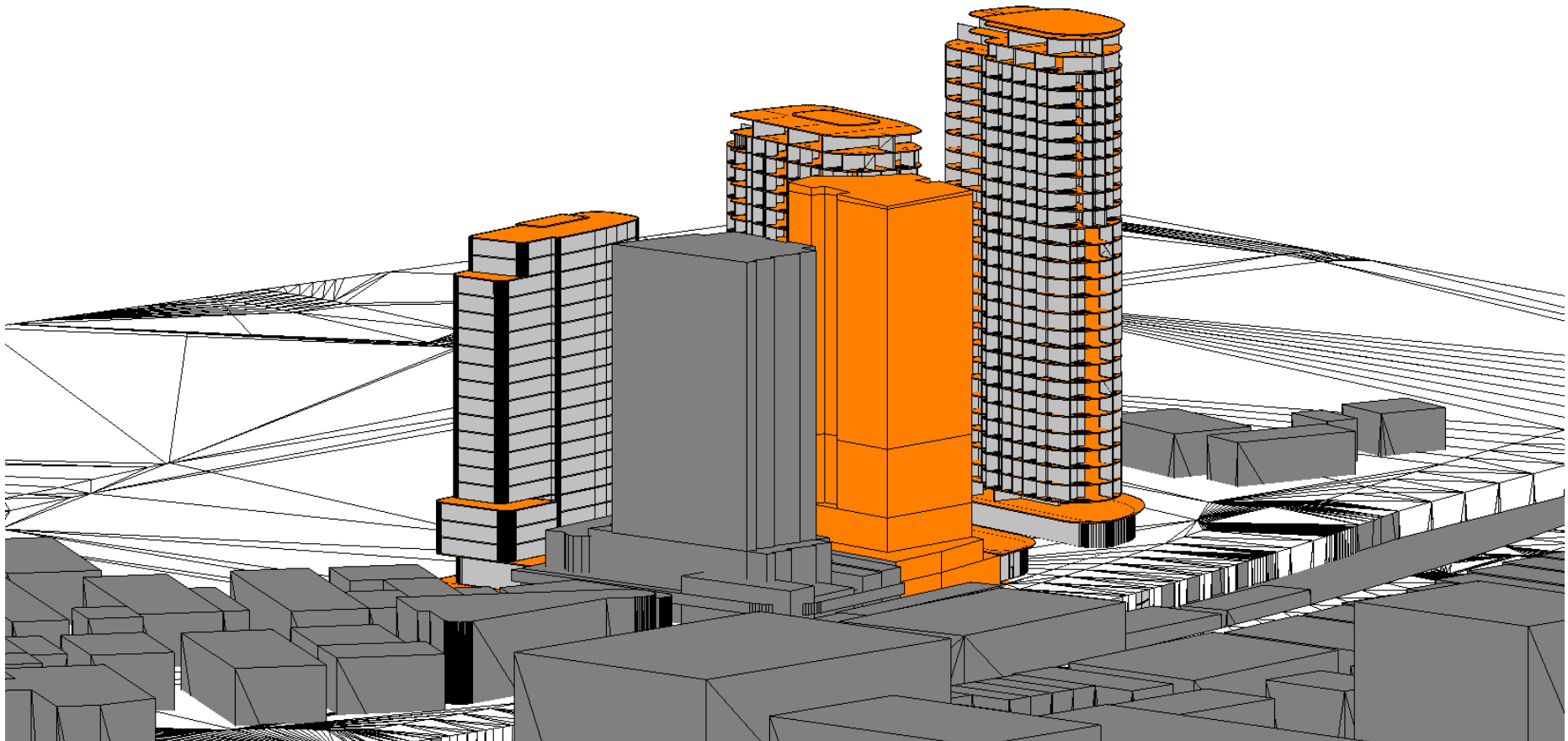








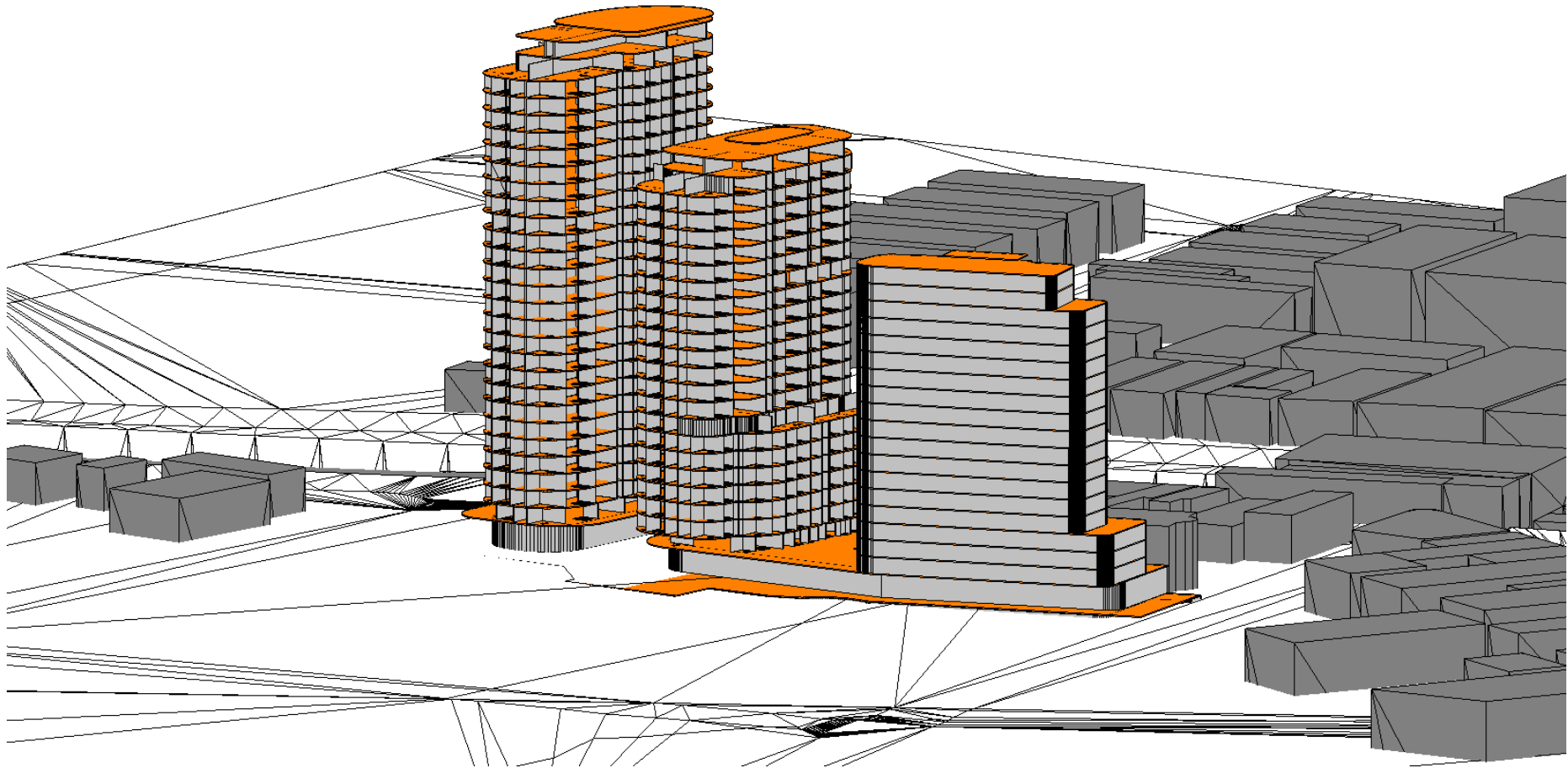


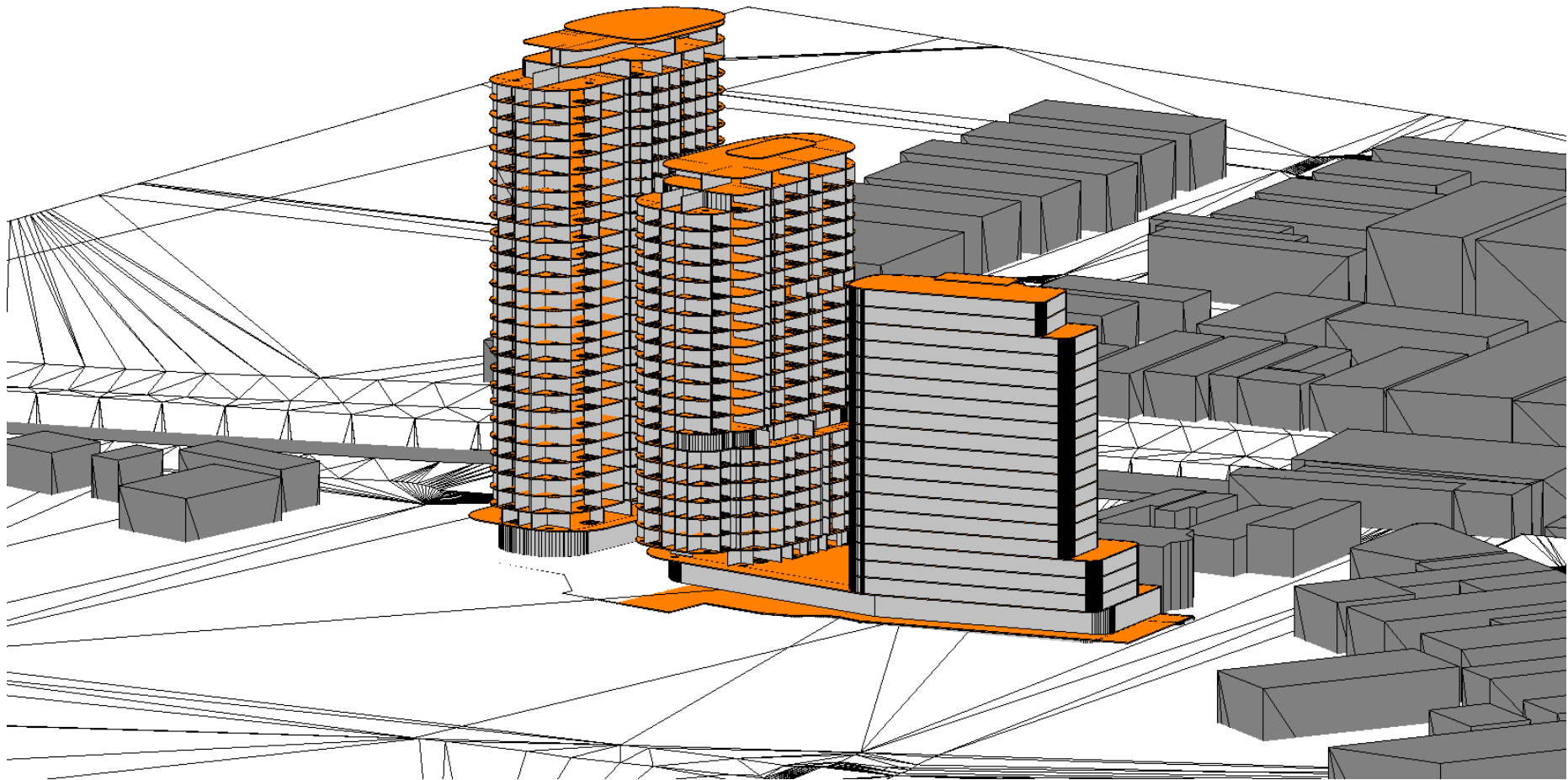


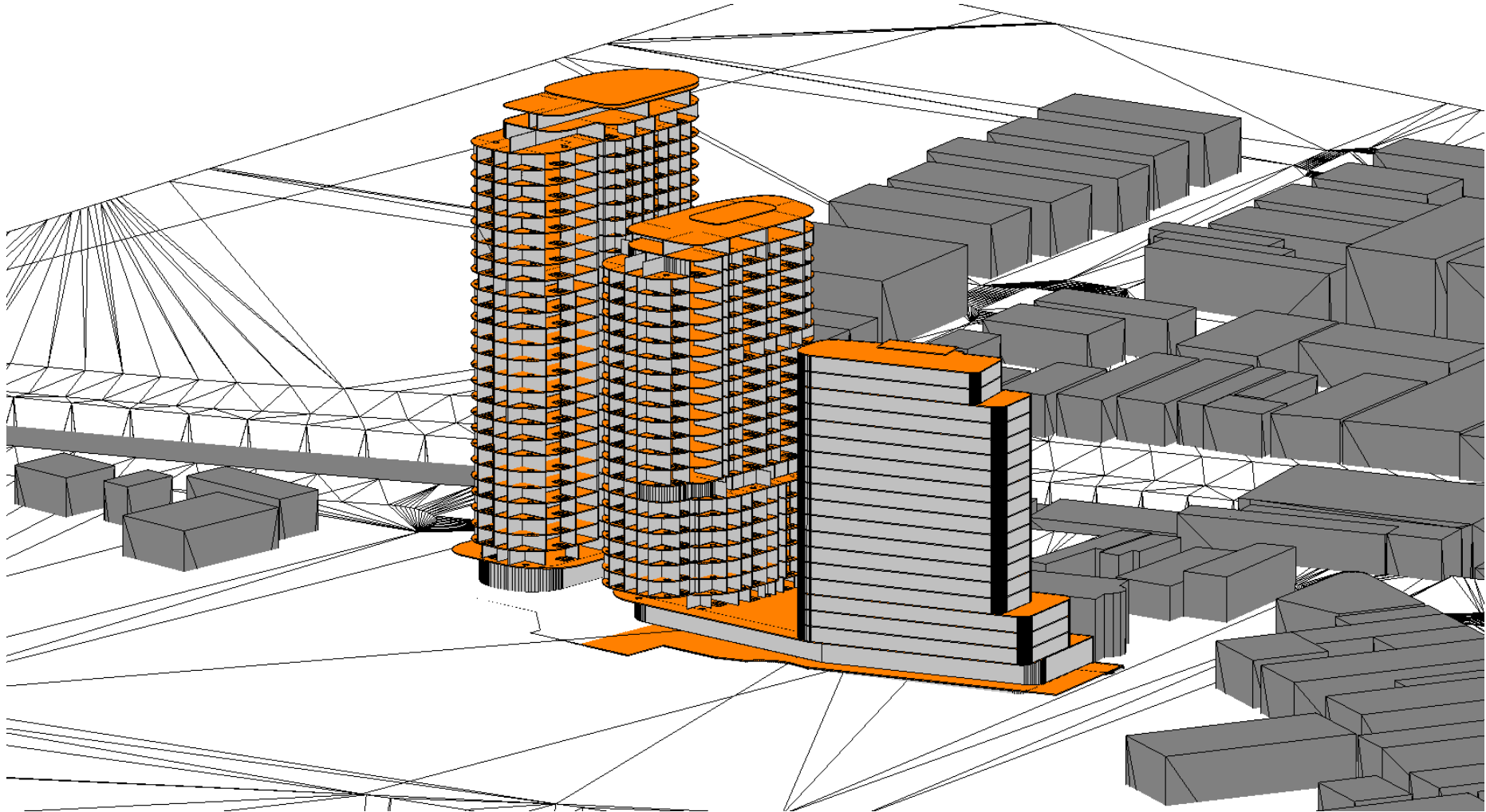
APPENDIX F

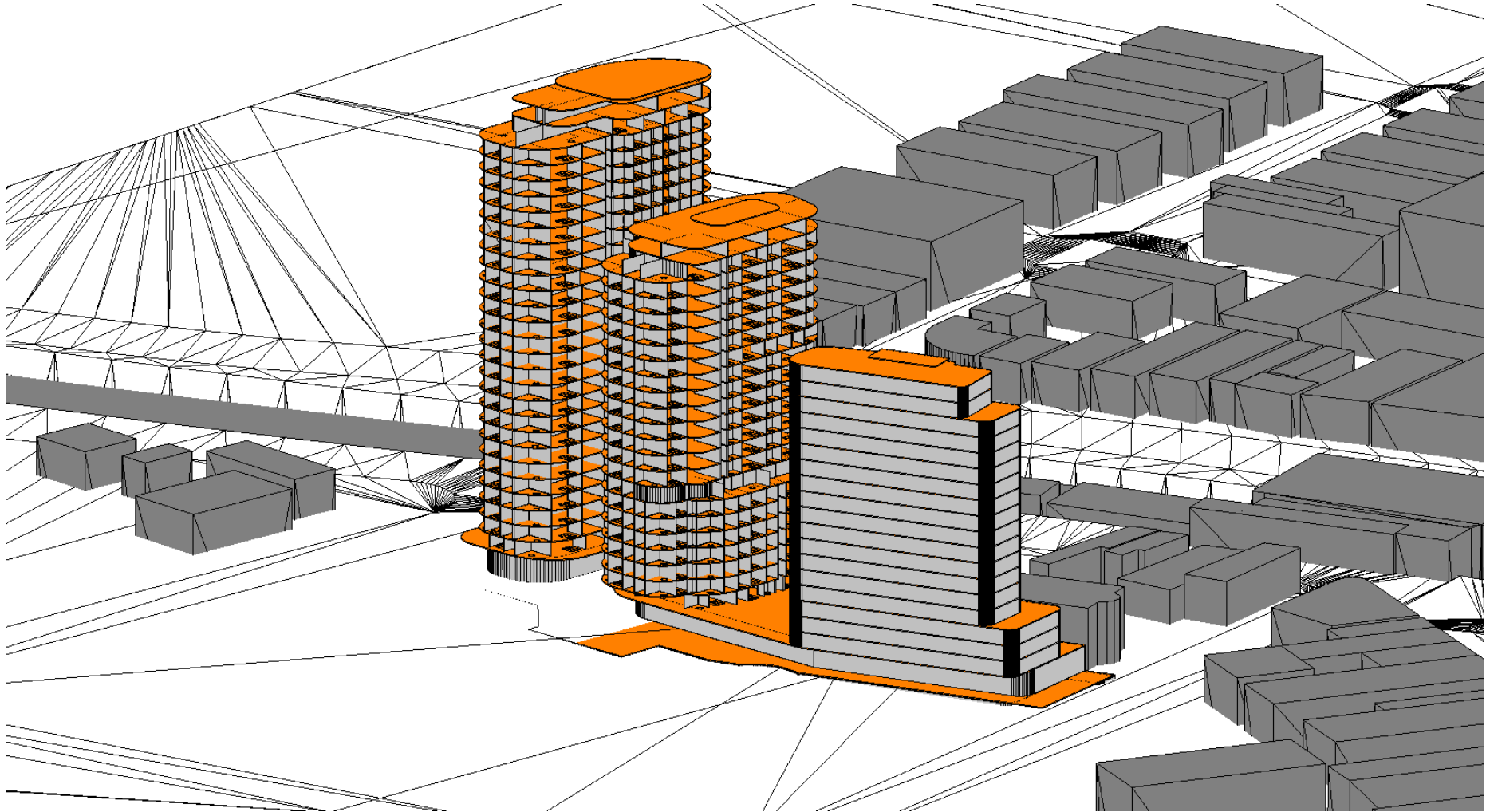
Sun Eye Views CBUS Development with no other Proposed Development

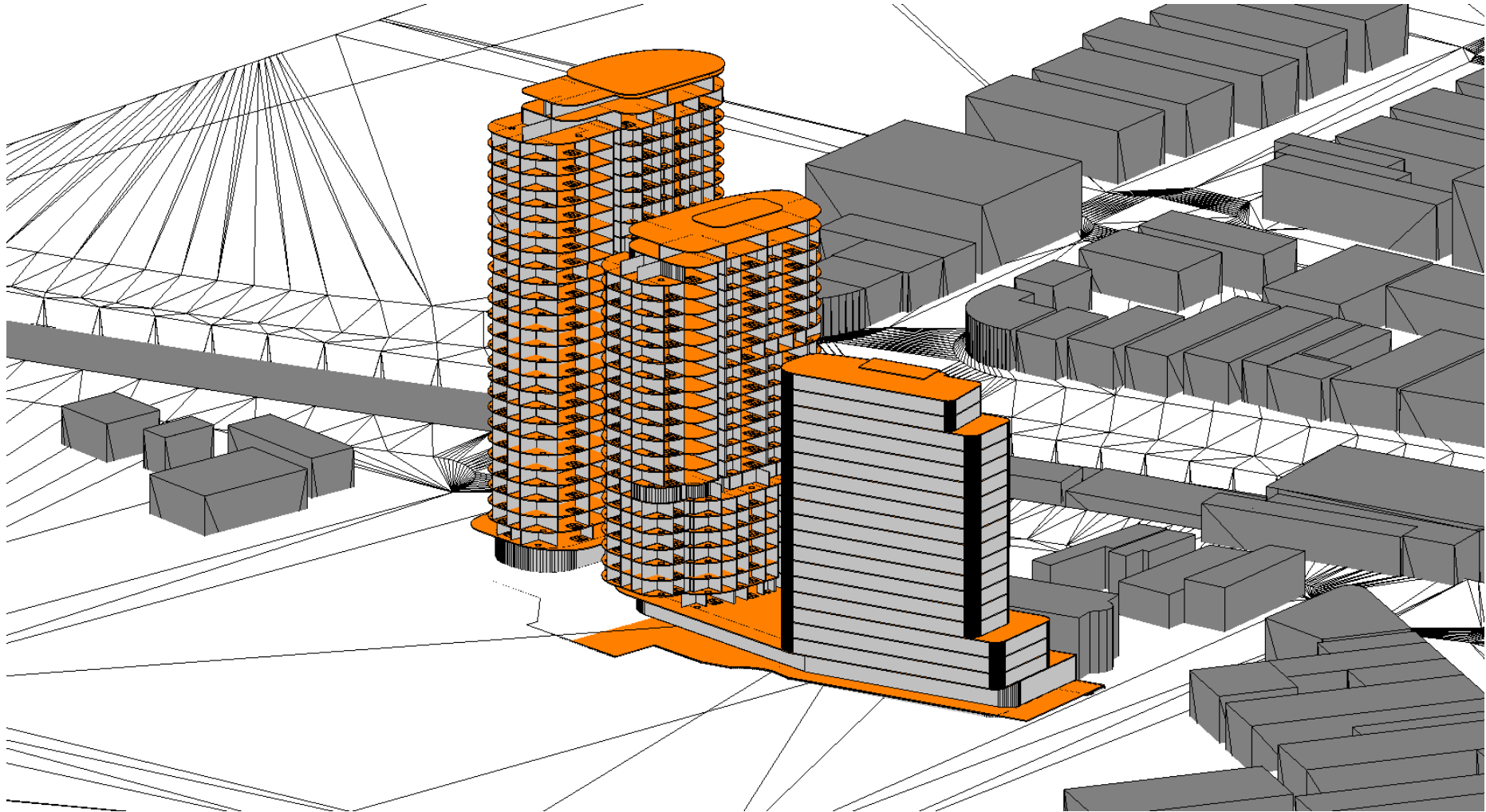
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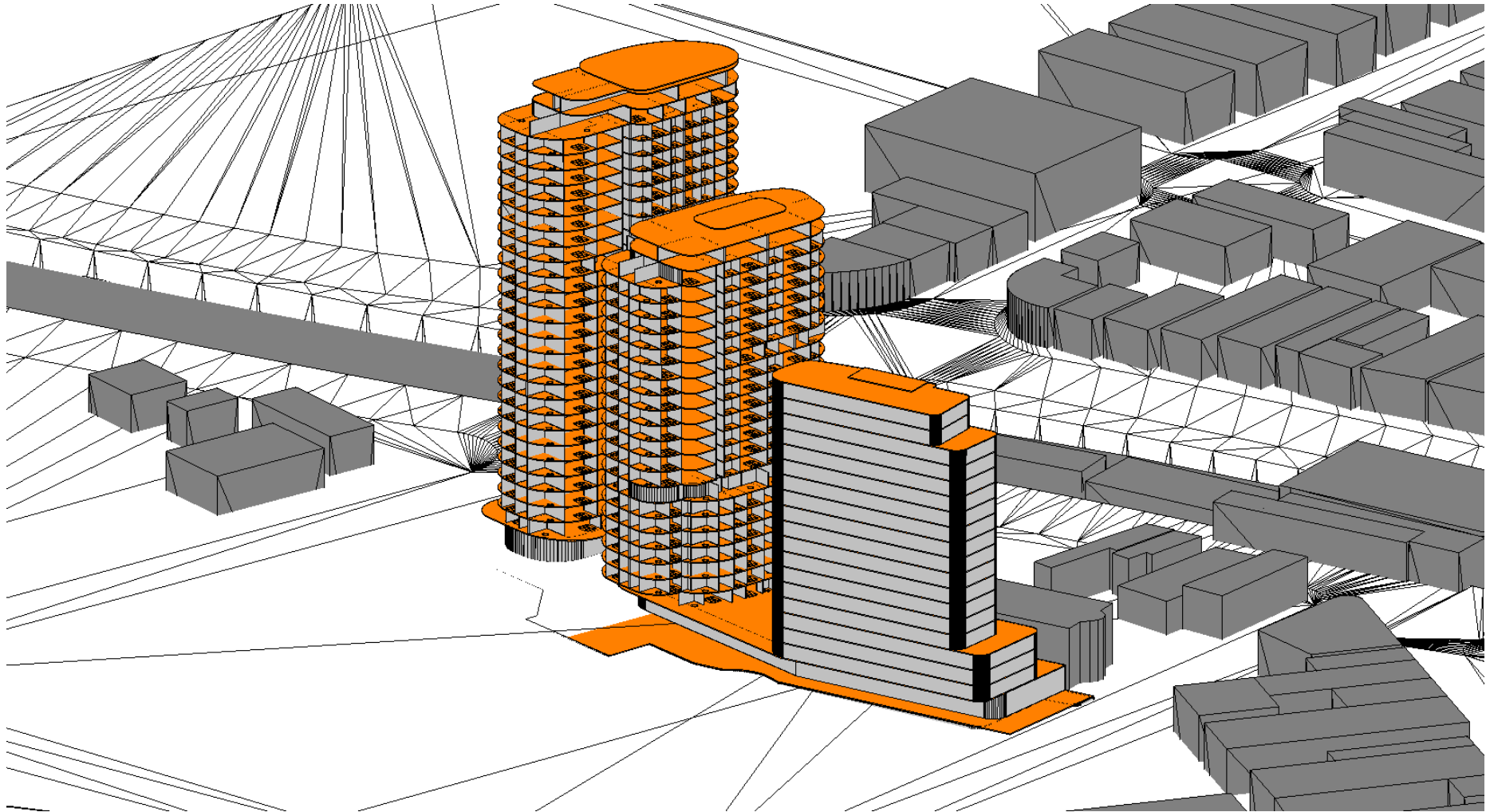


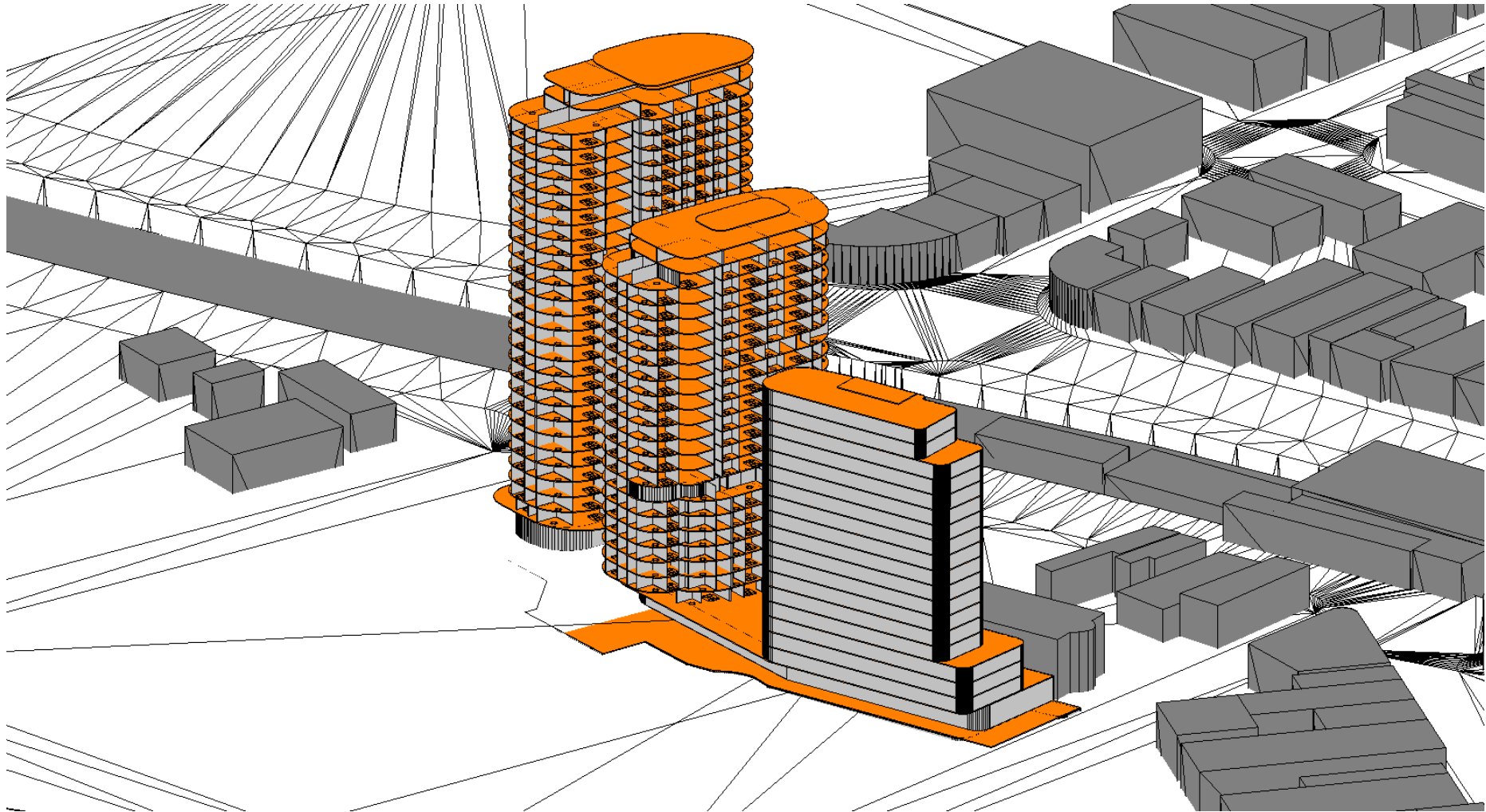


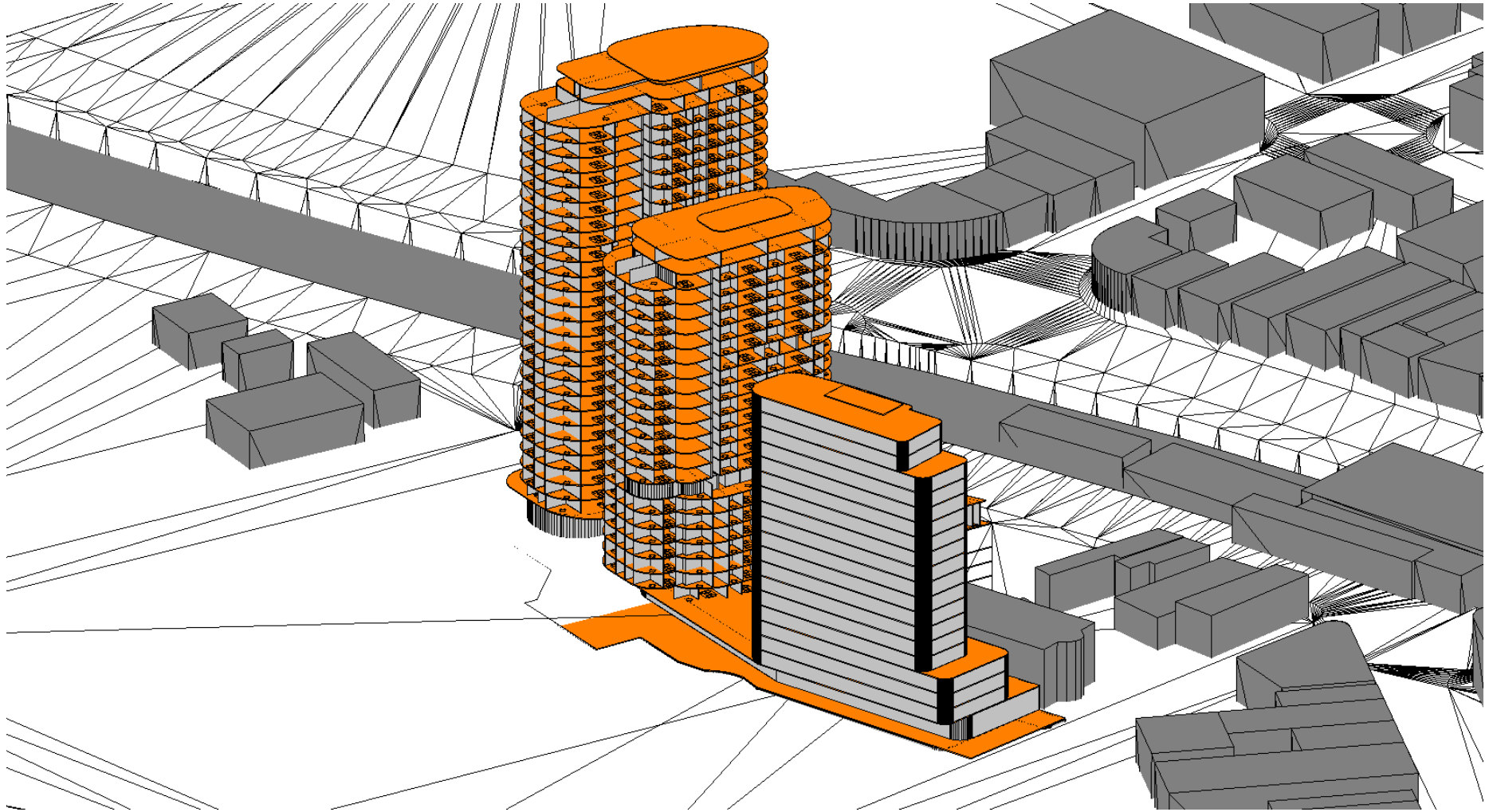




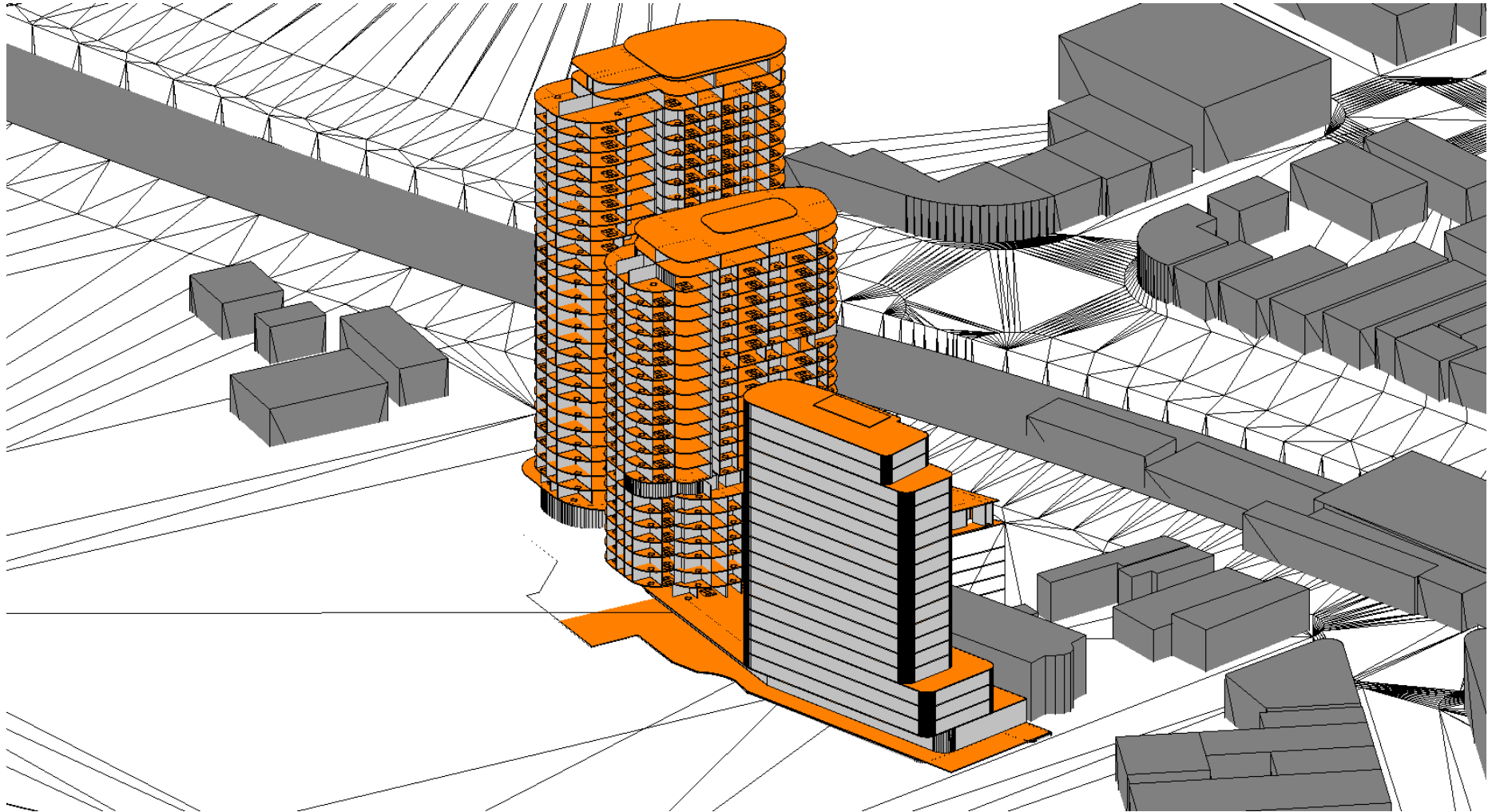


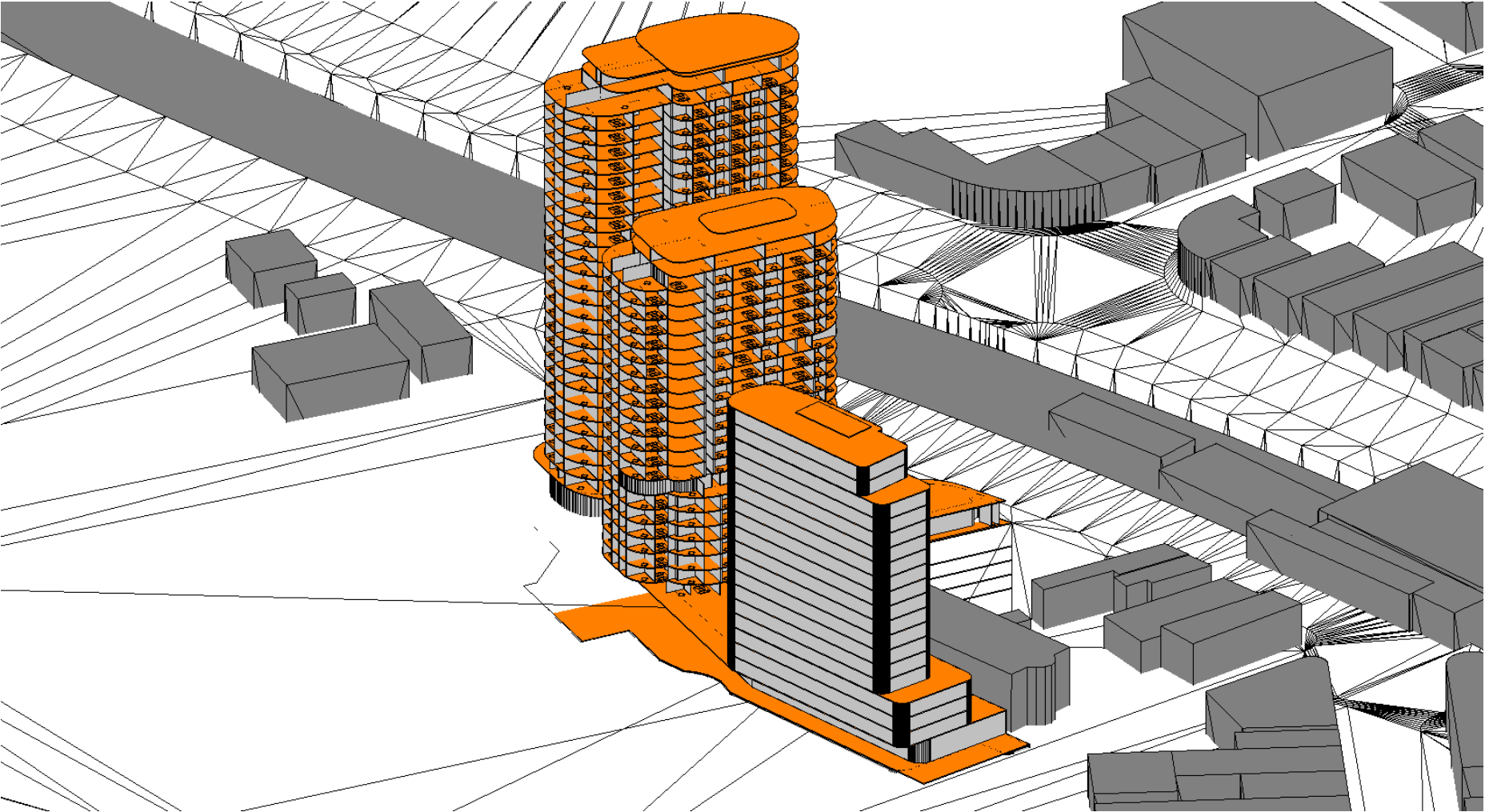


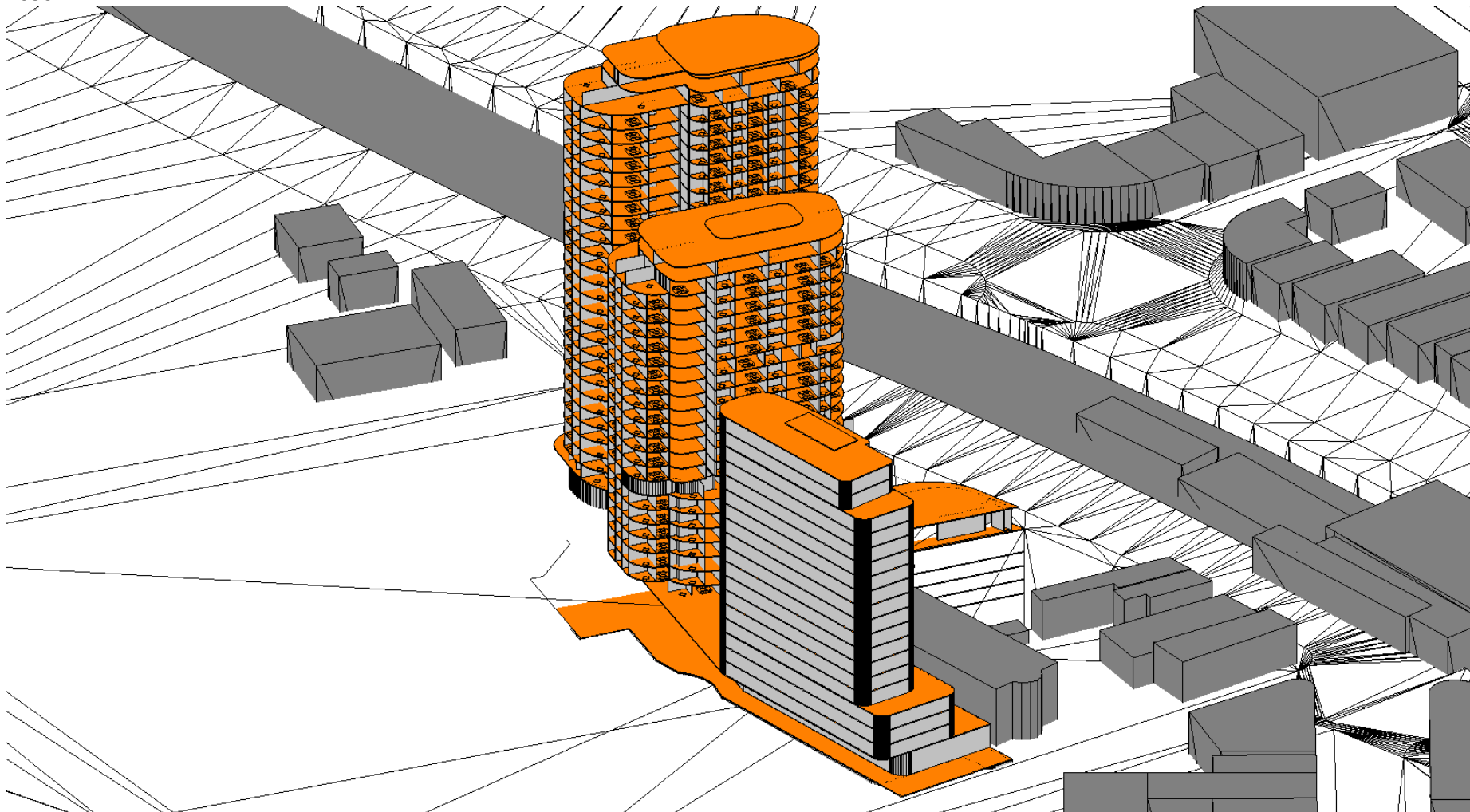


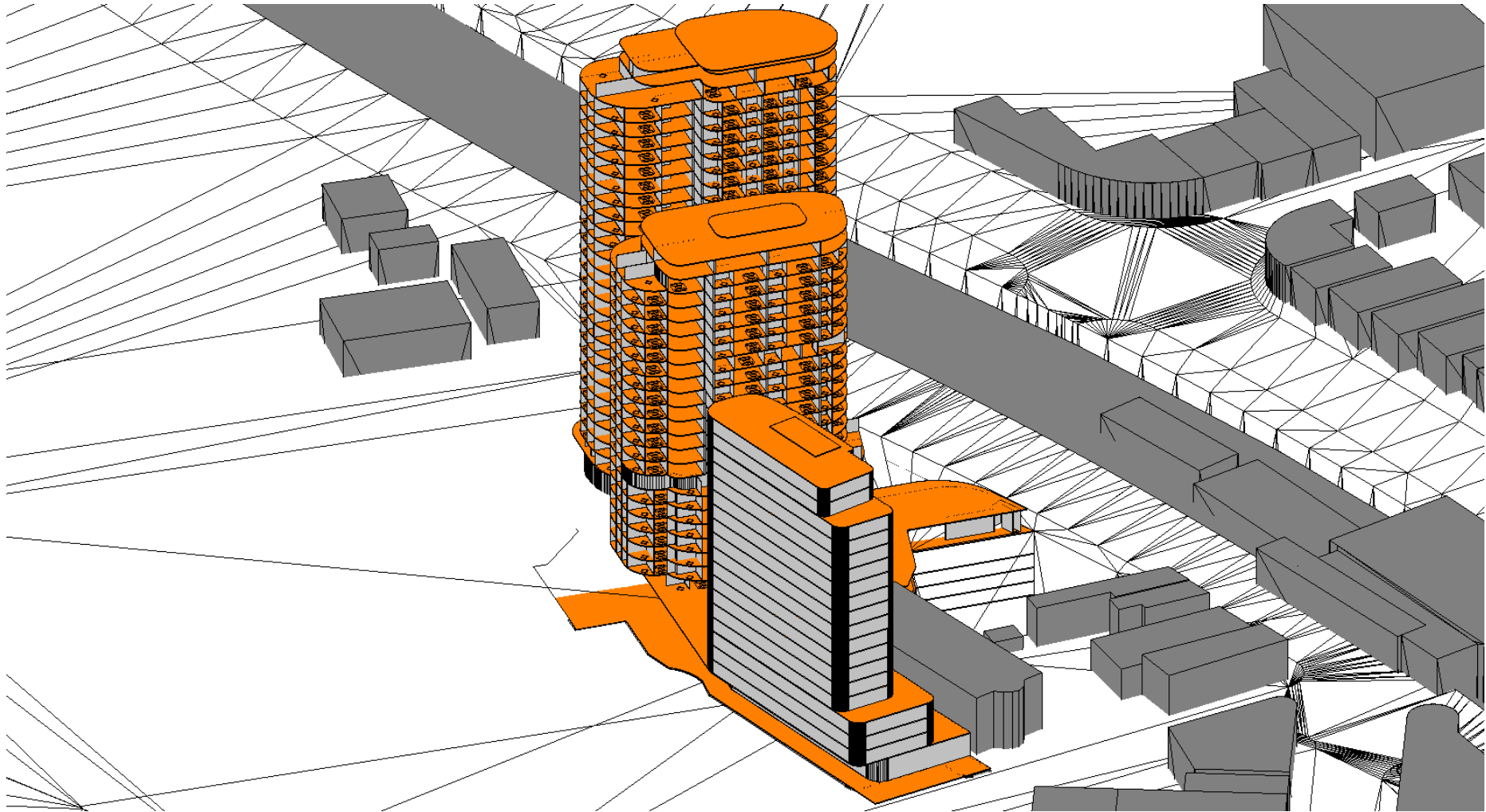


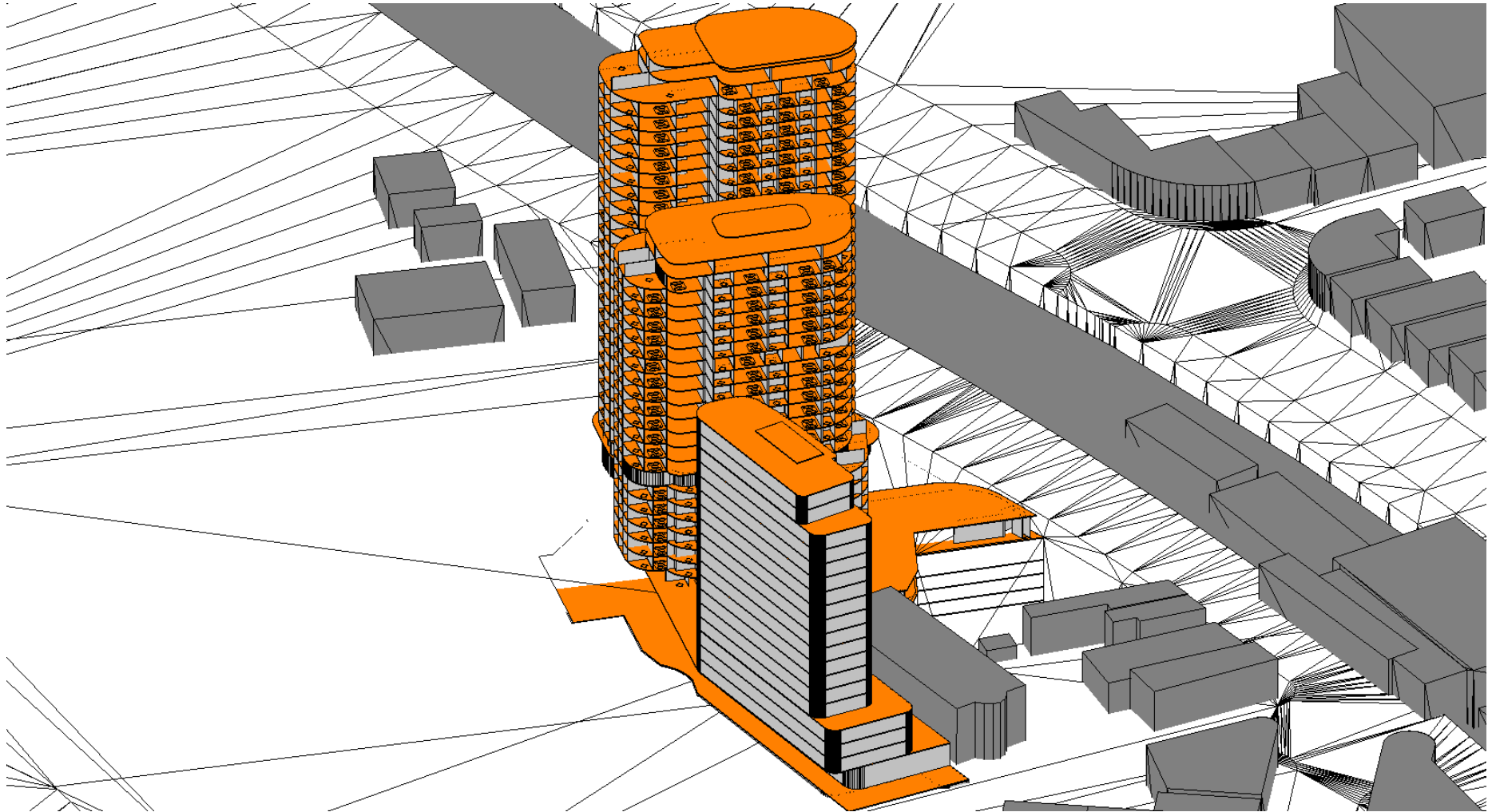
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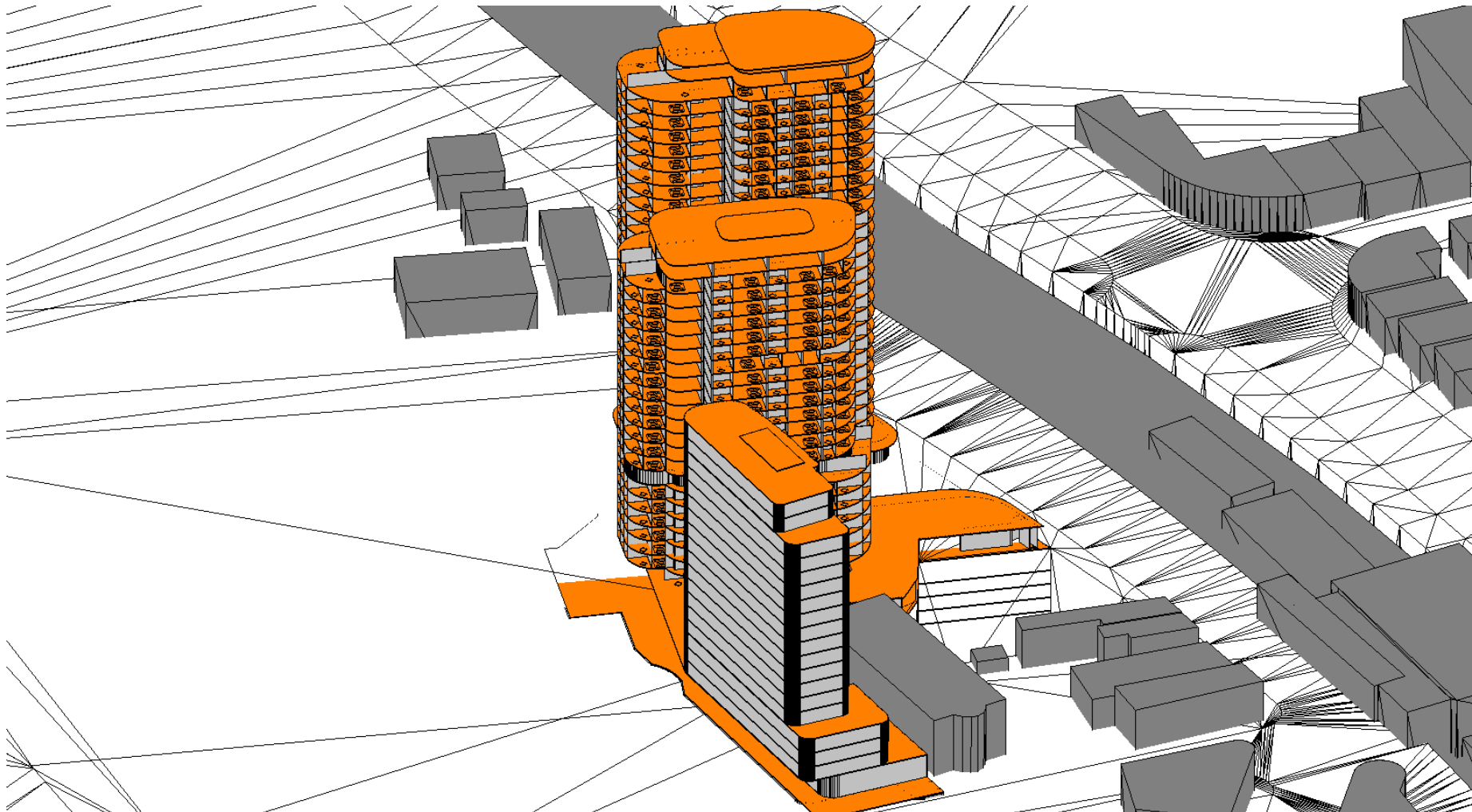


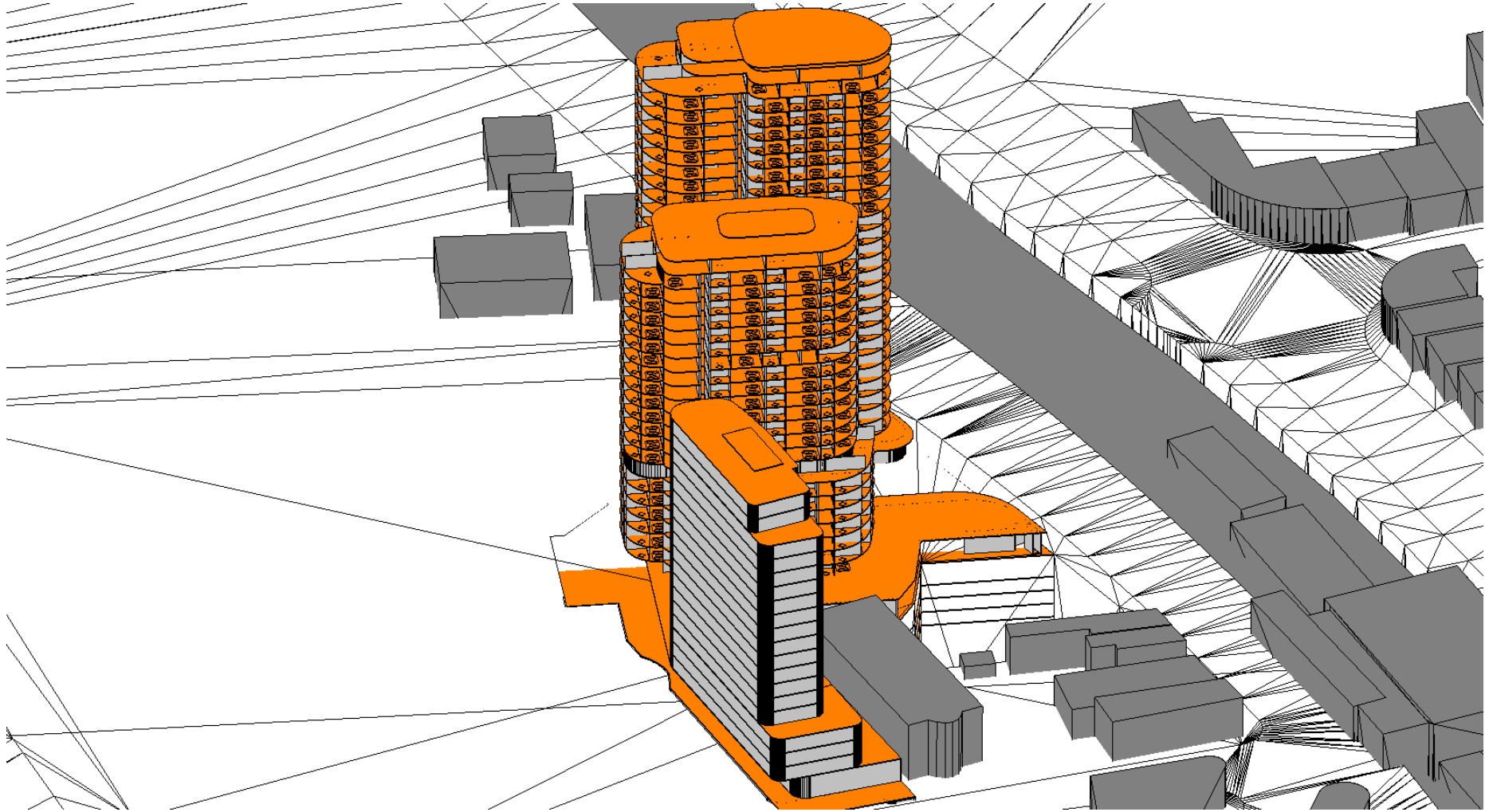


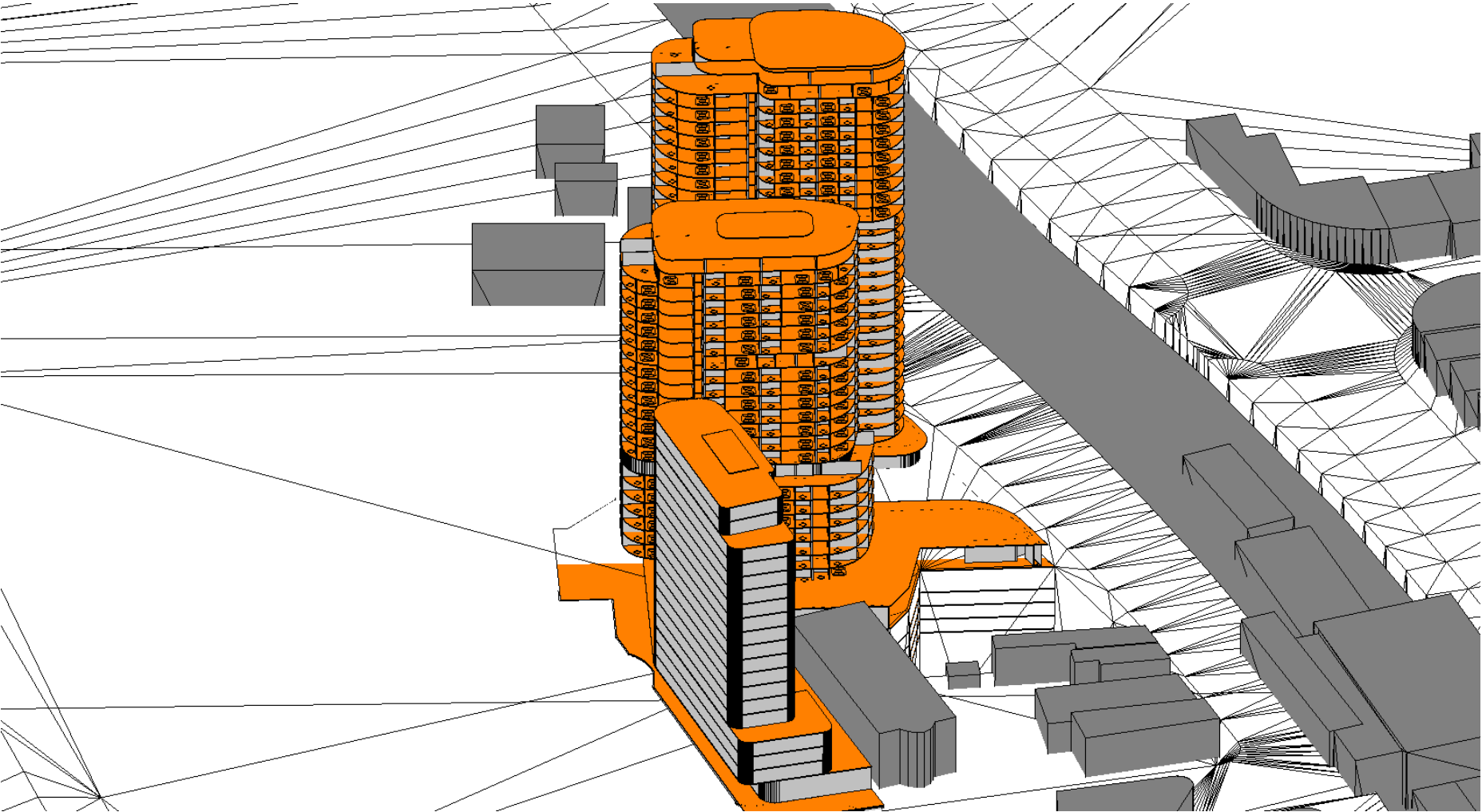


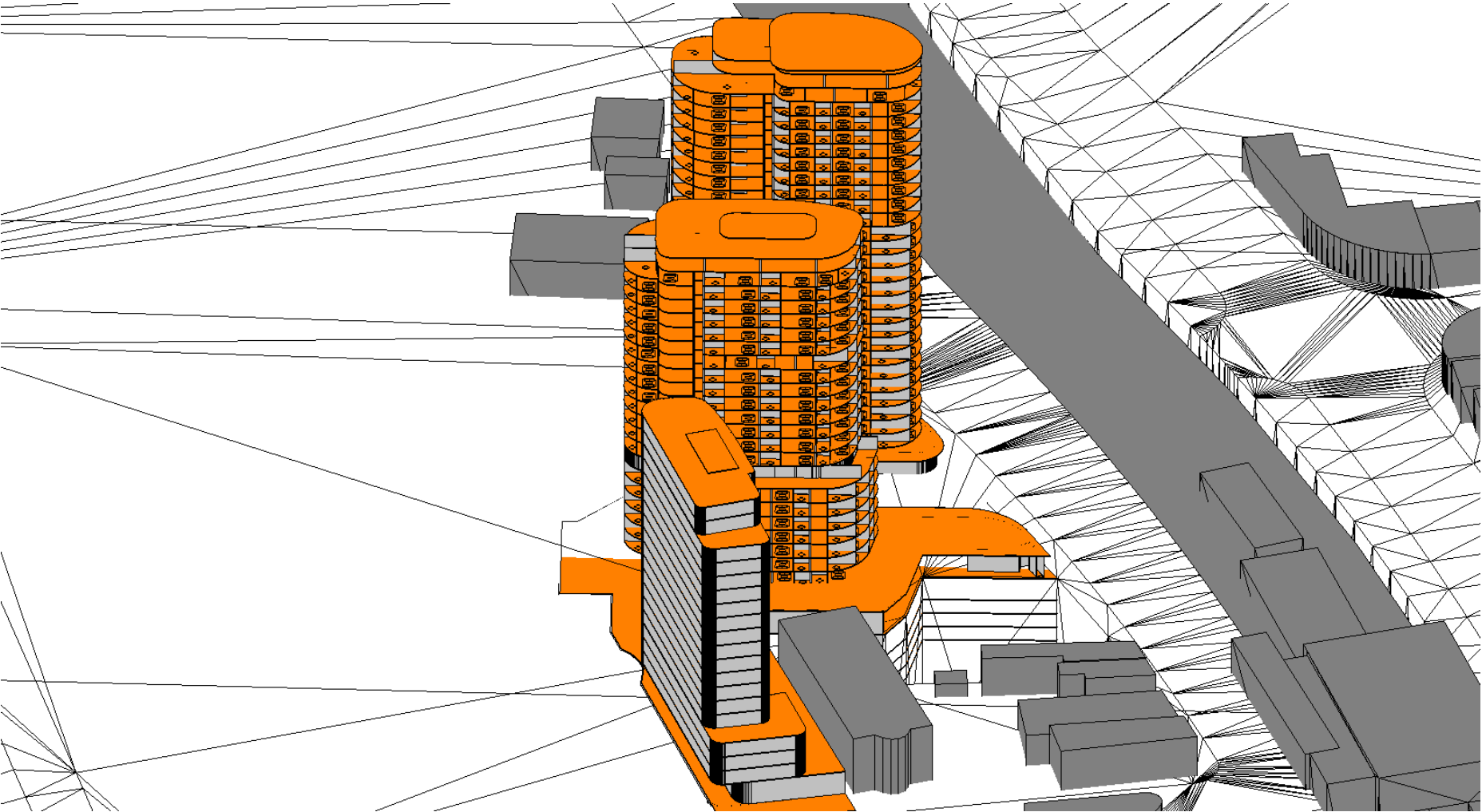


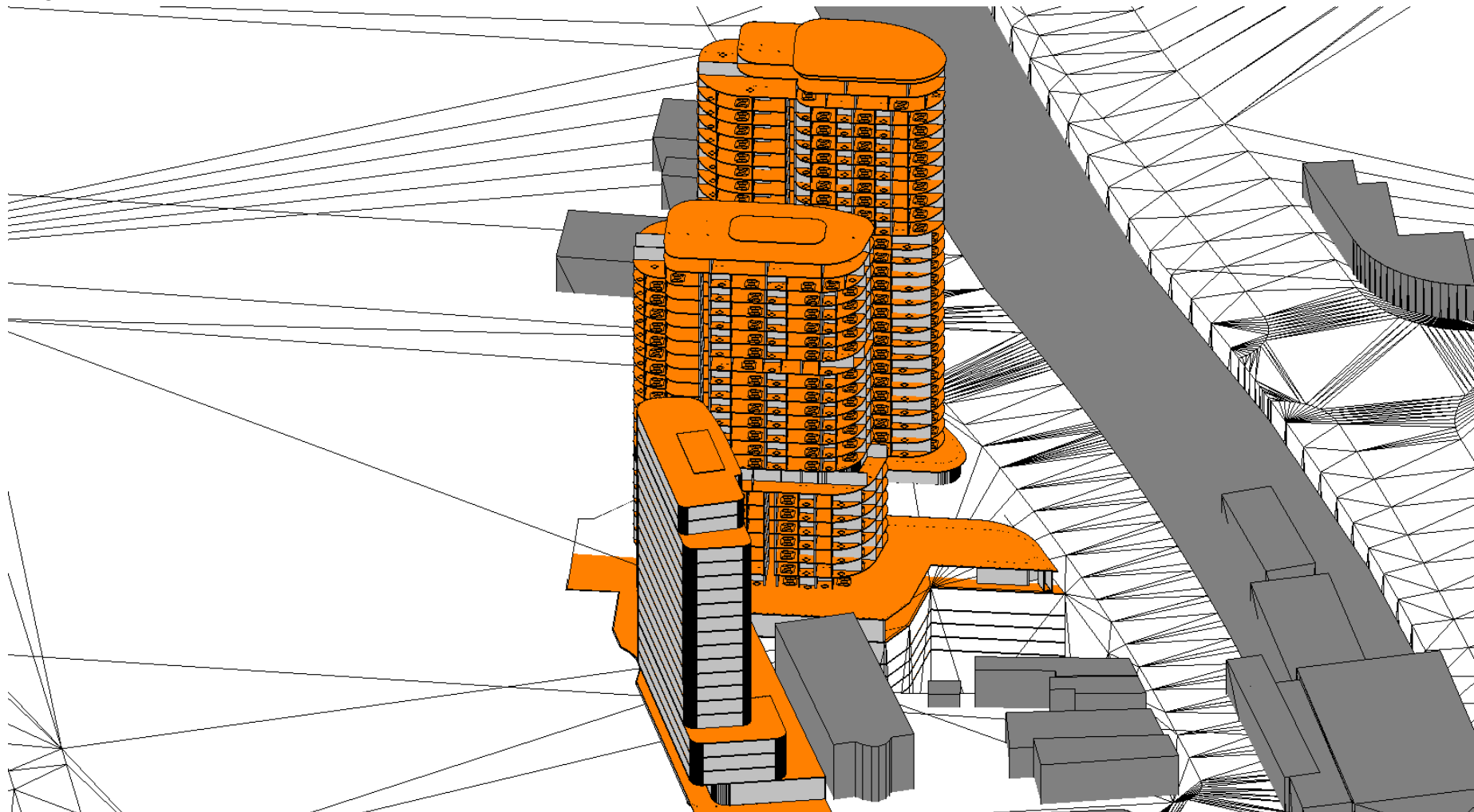


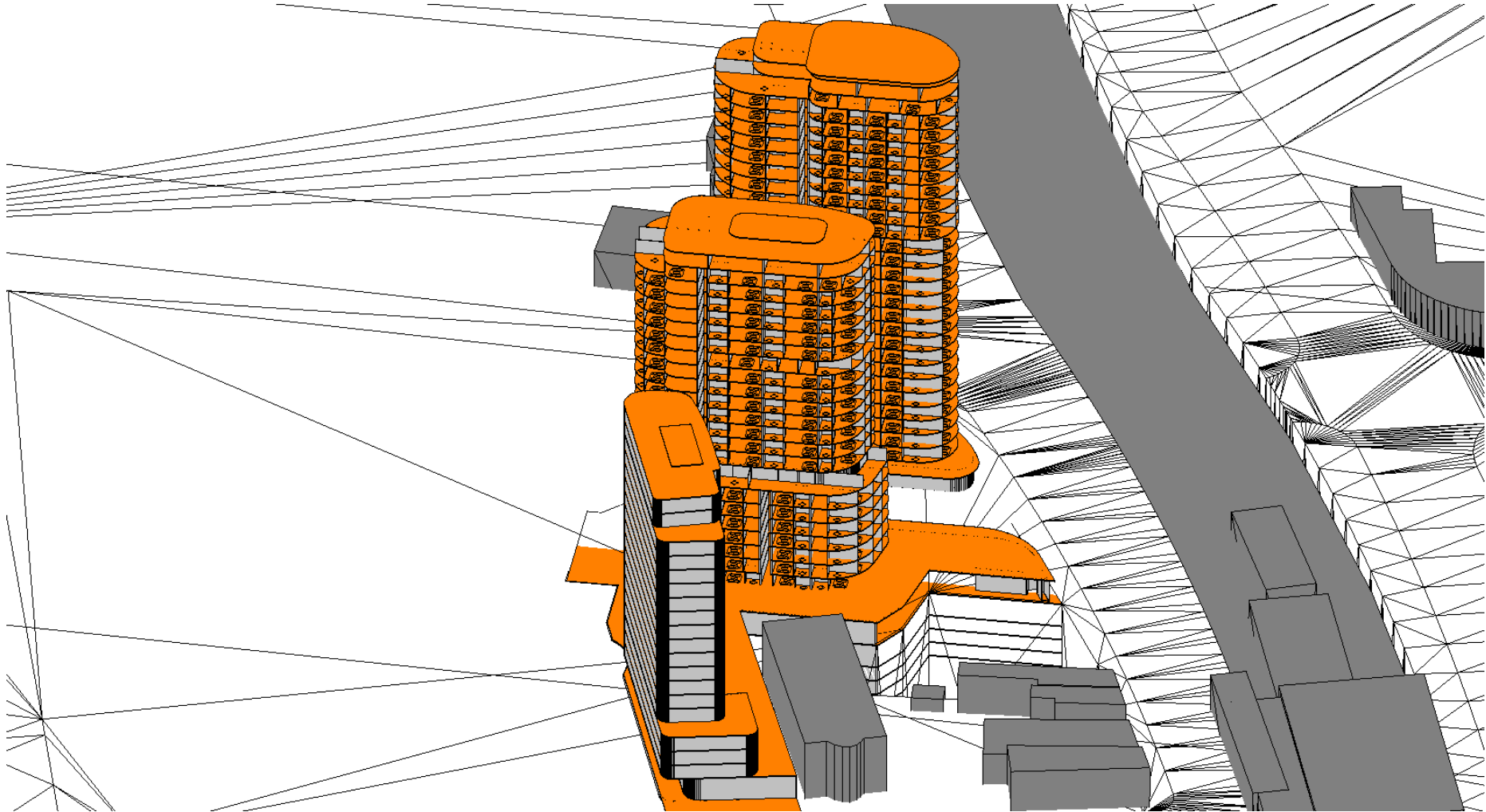


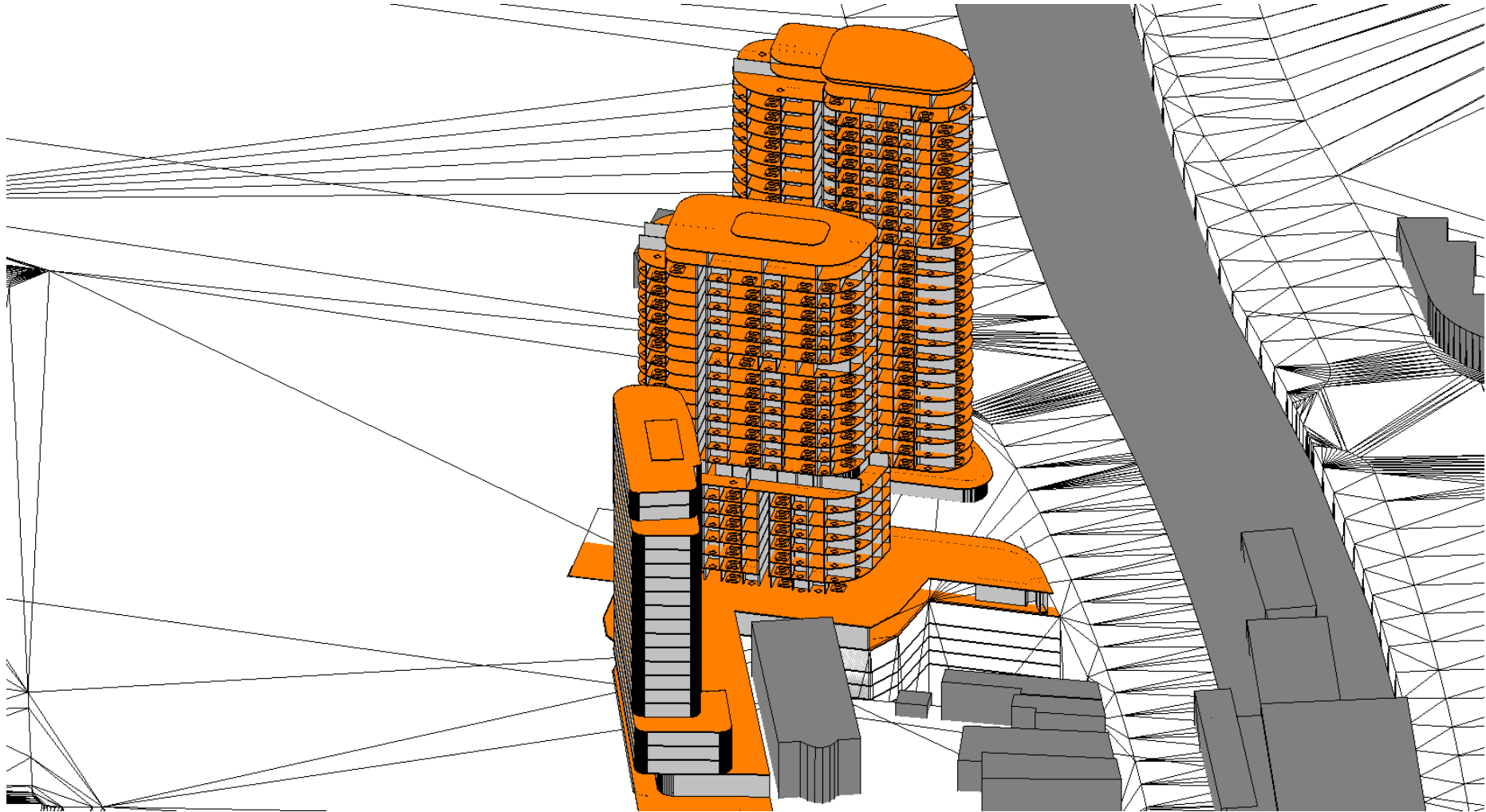


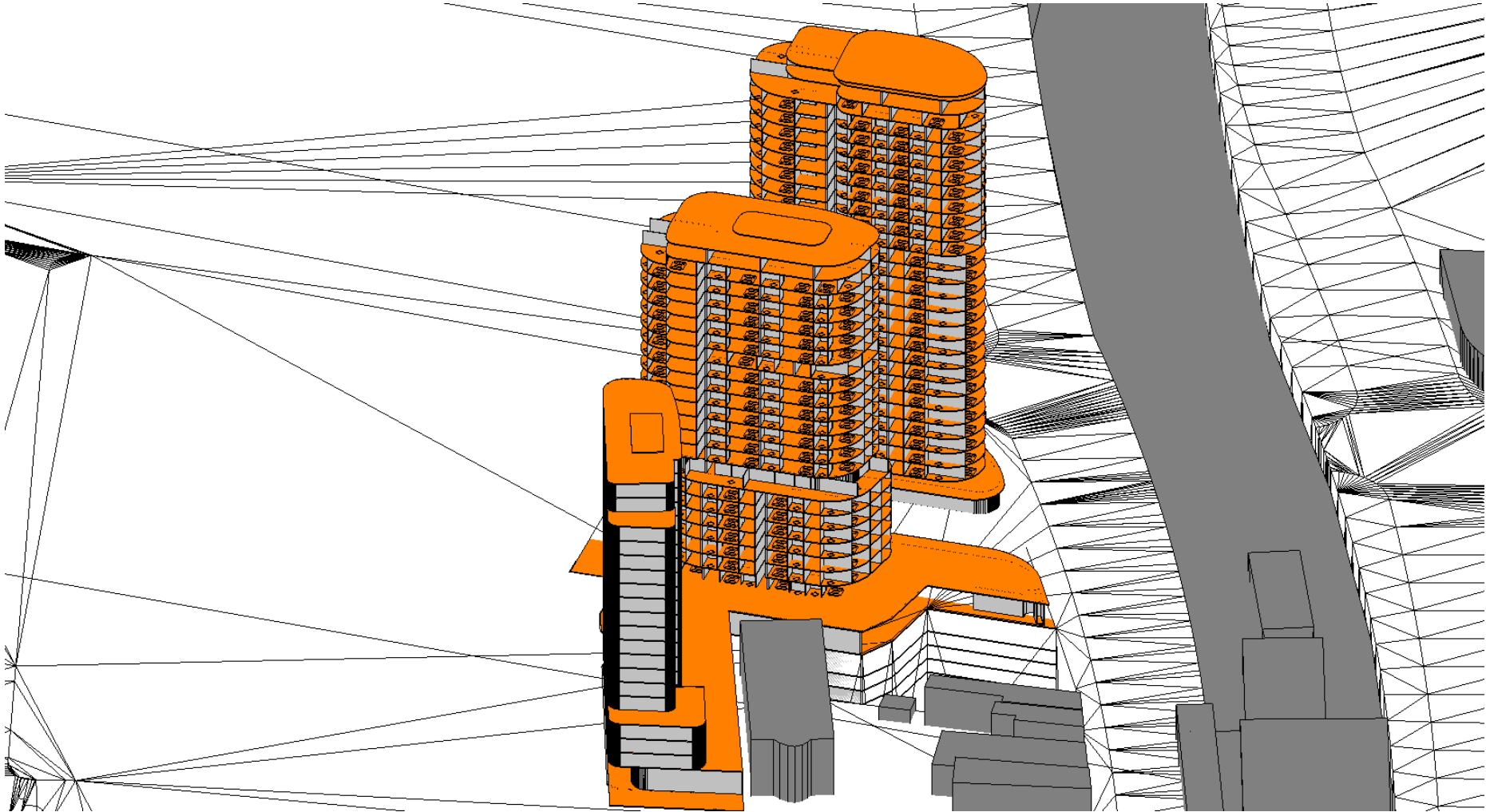


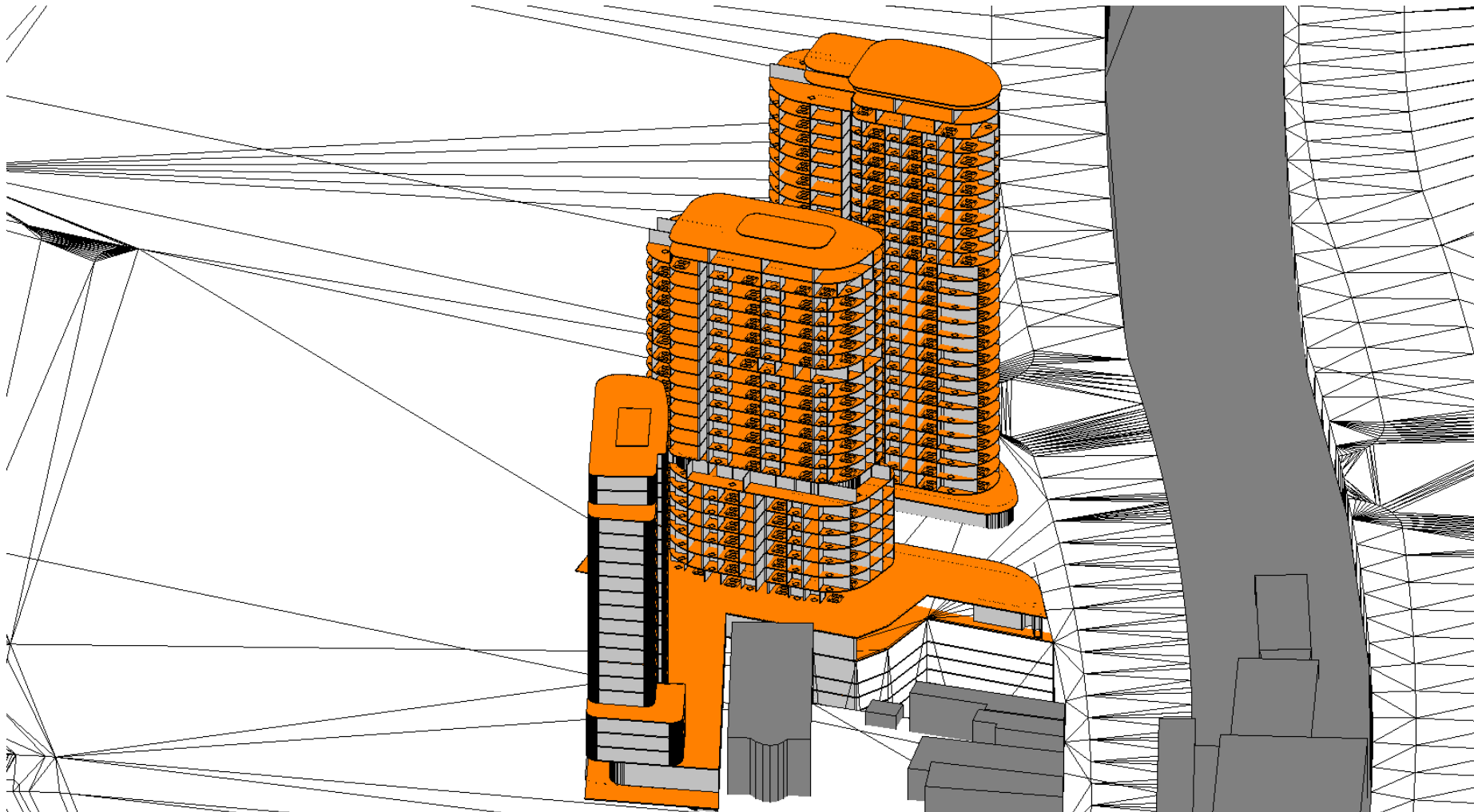


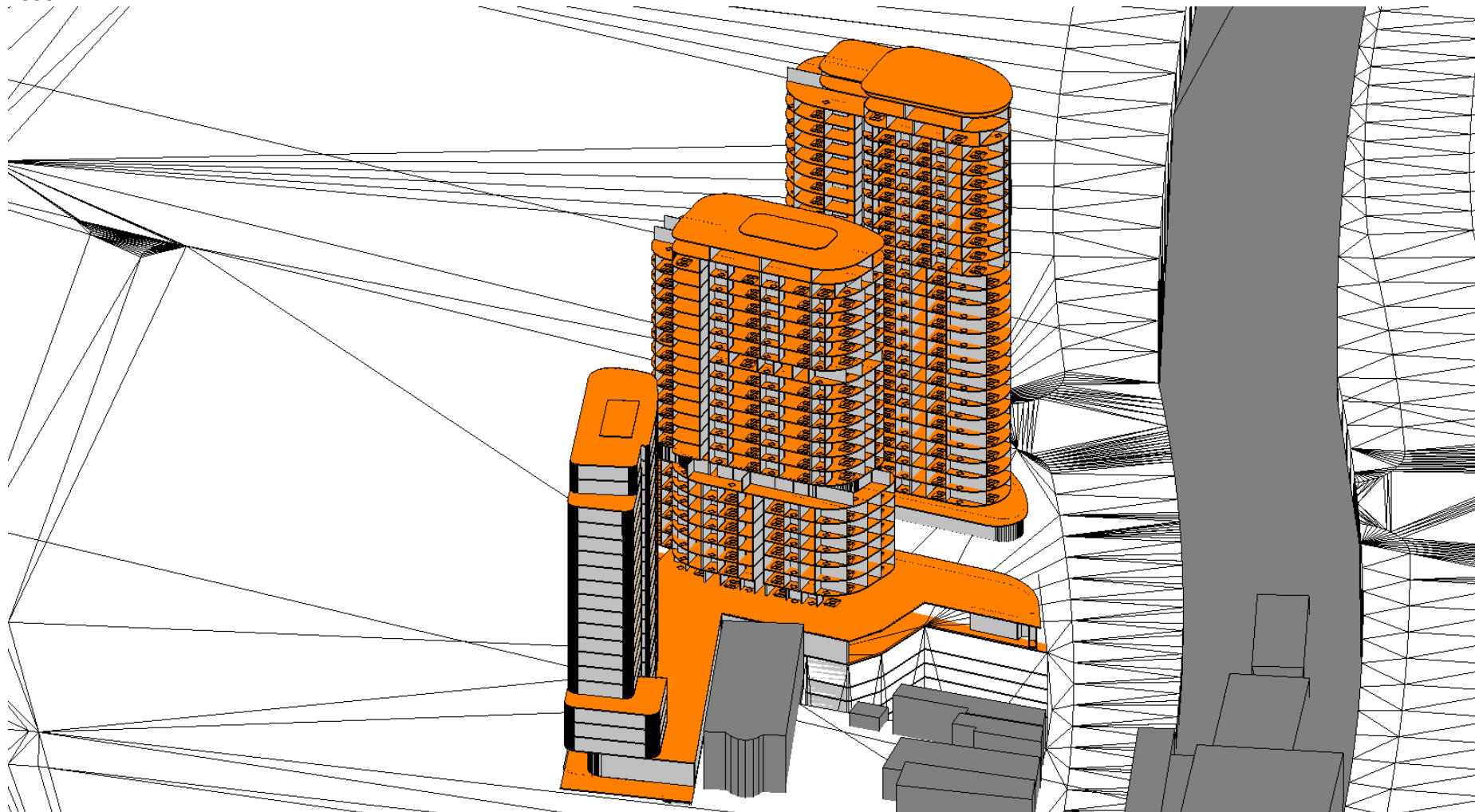


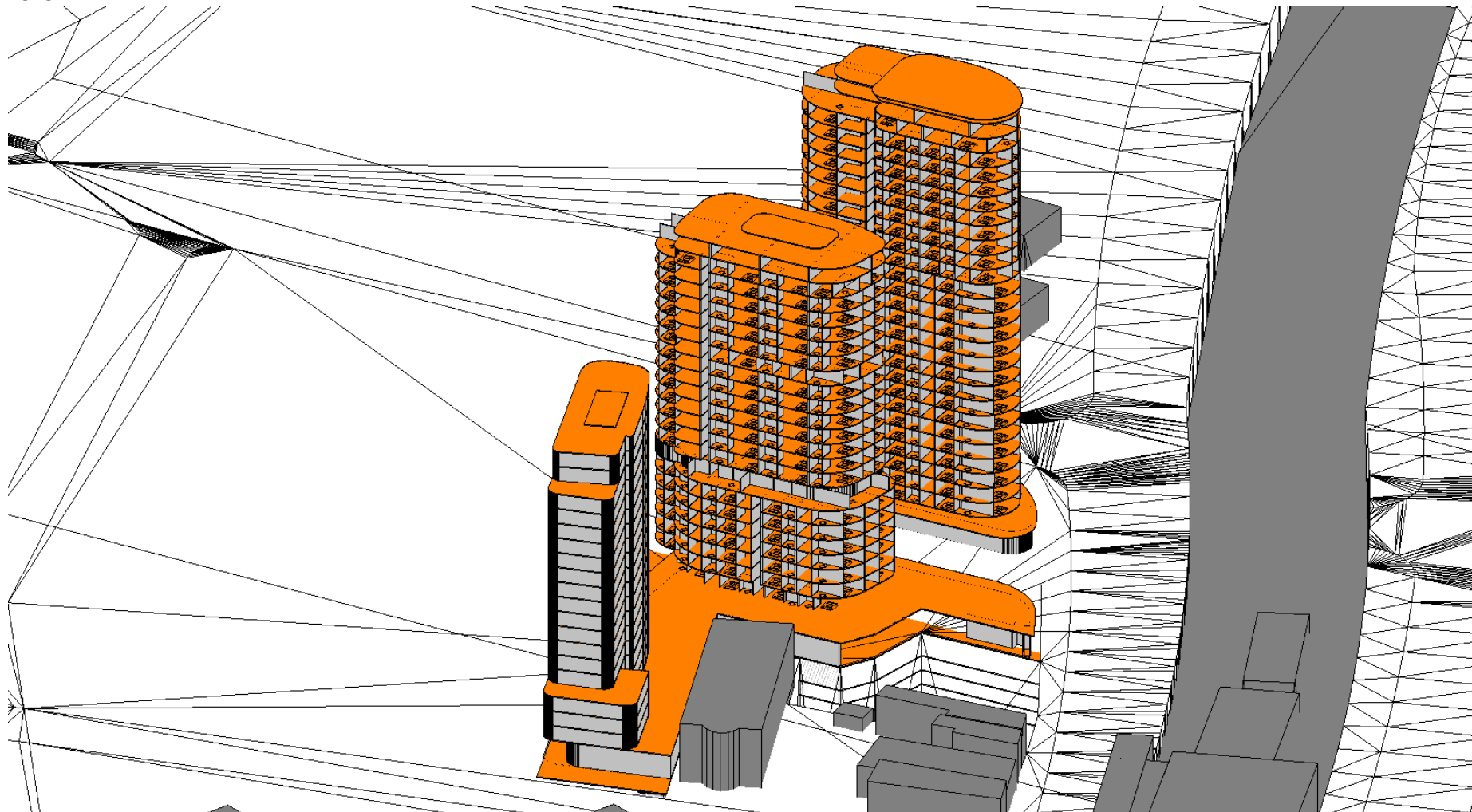


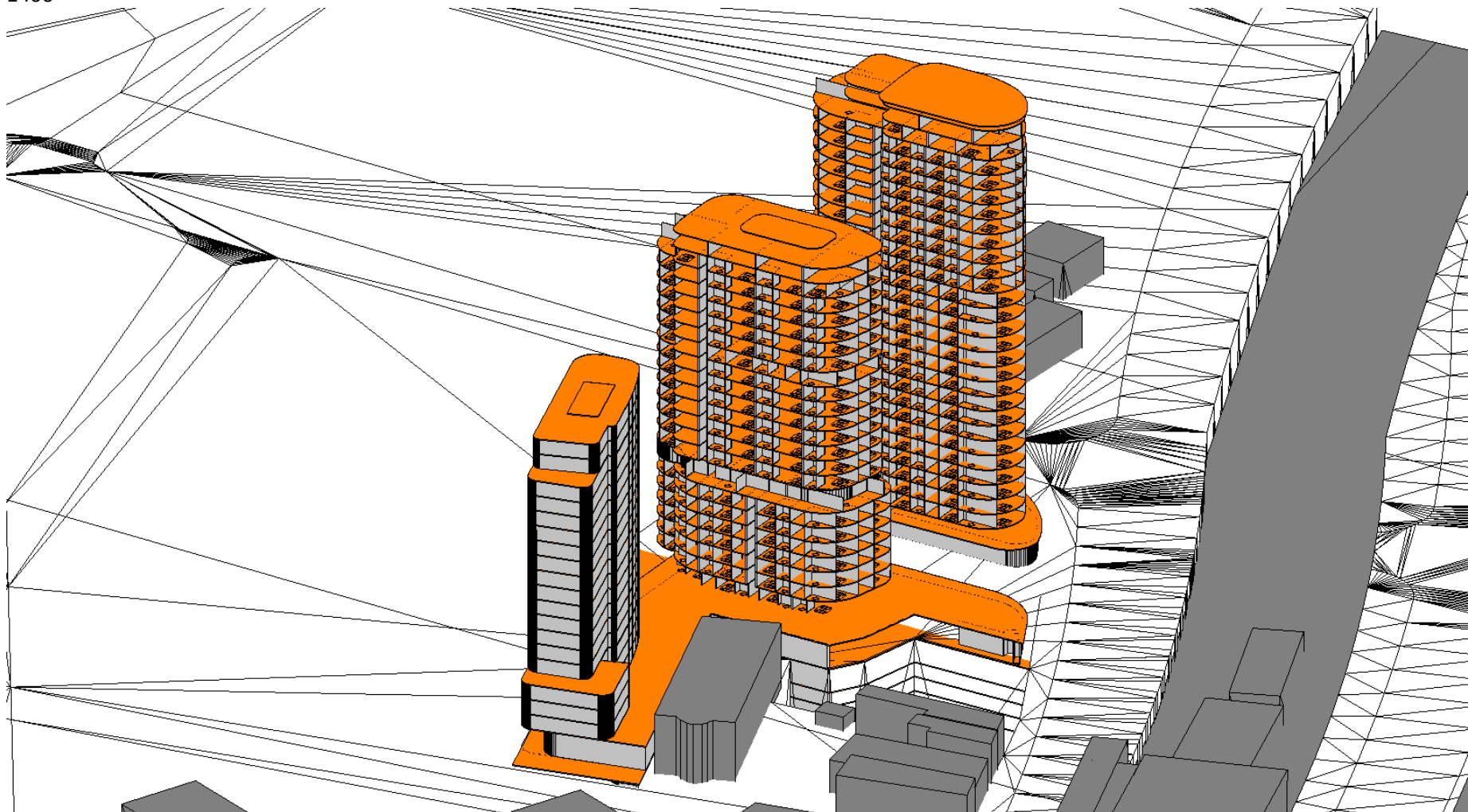


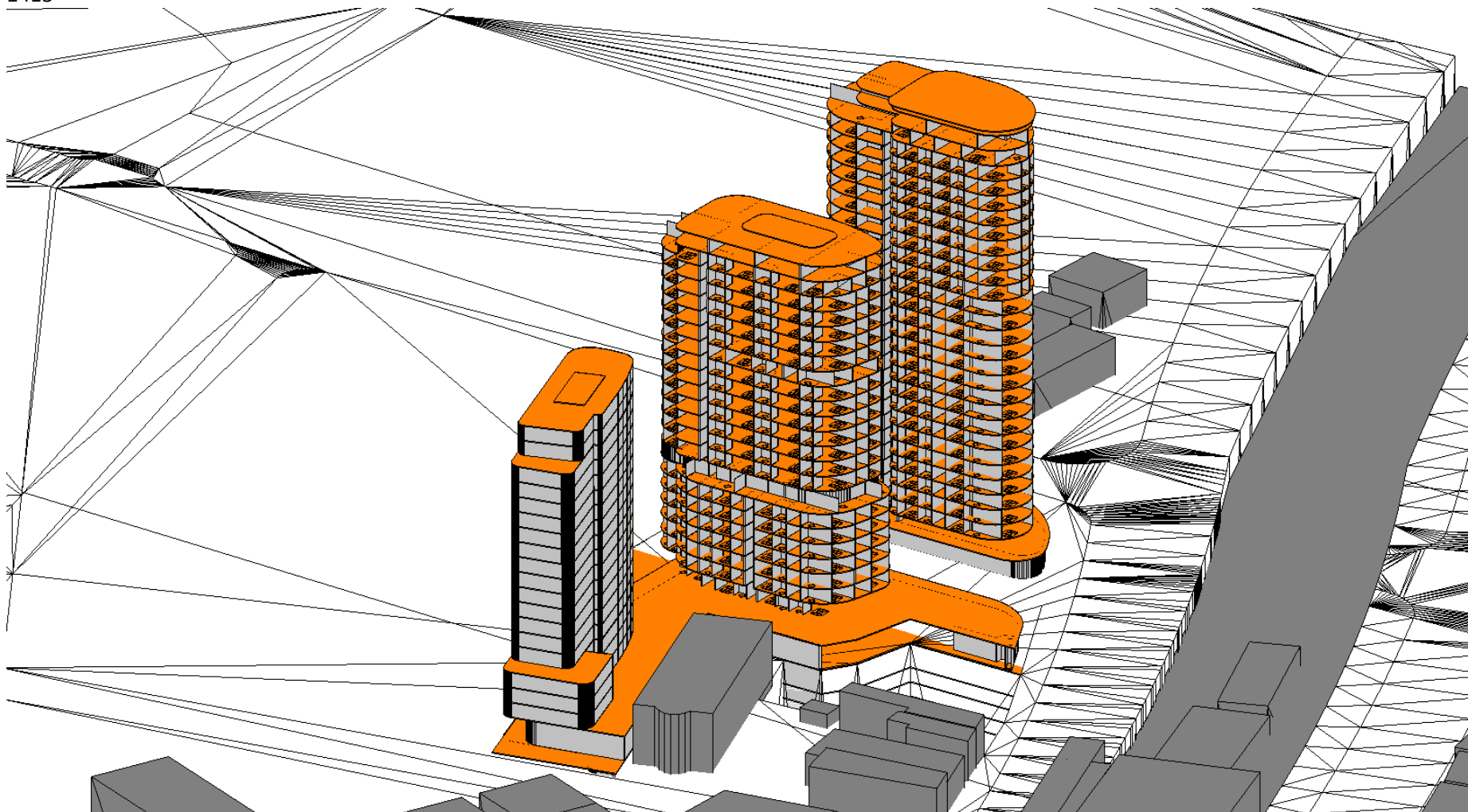


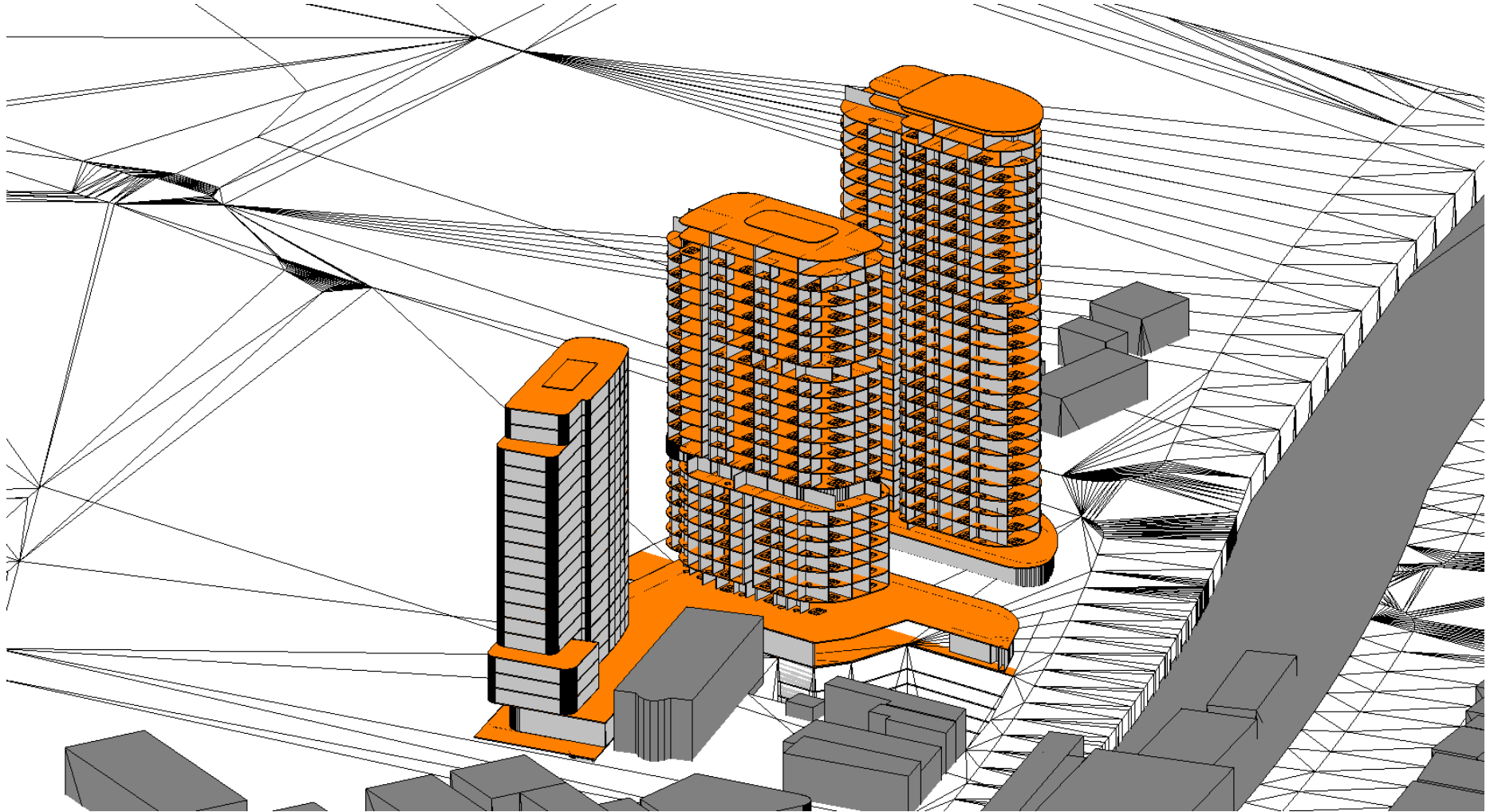


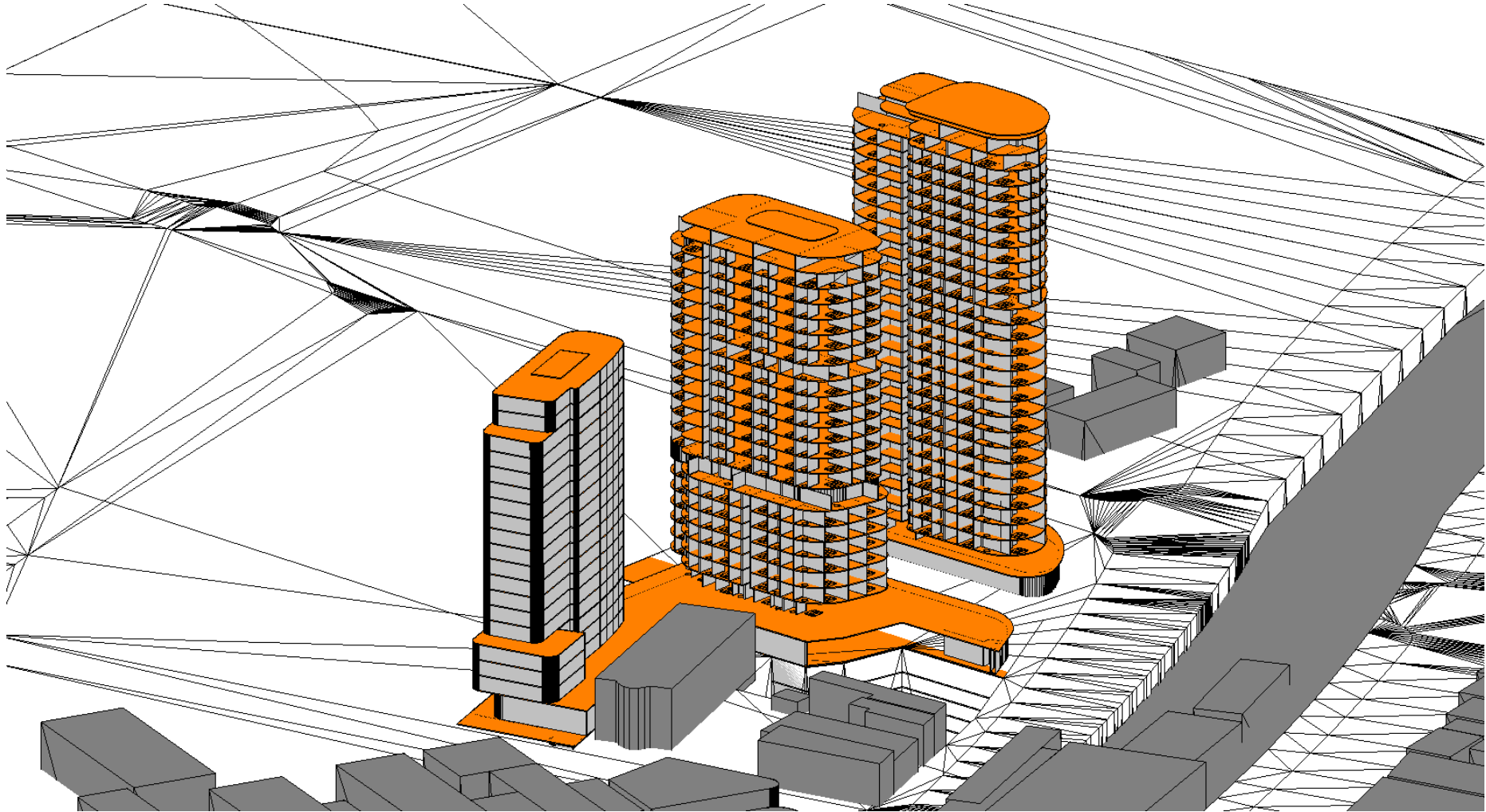


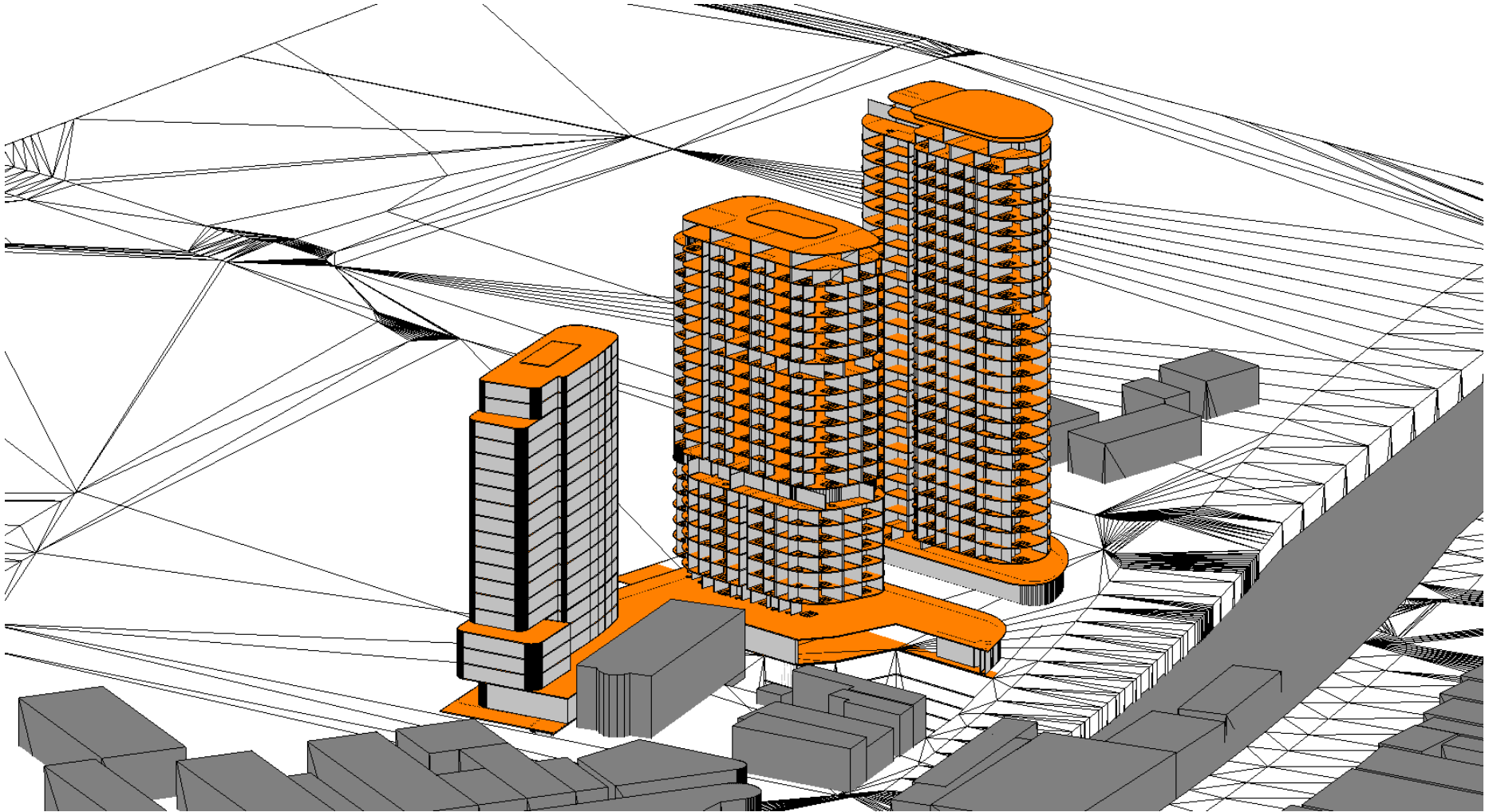


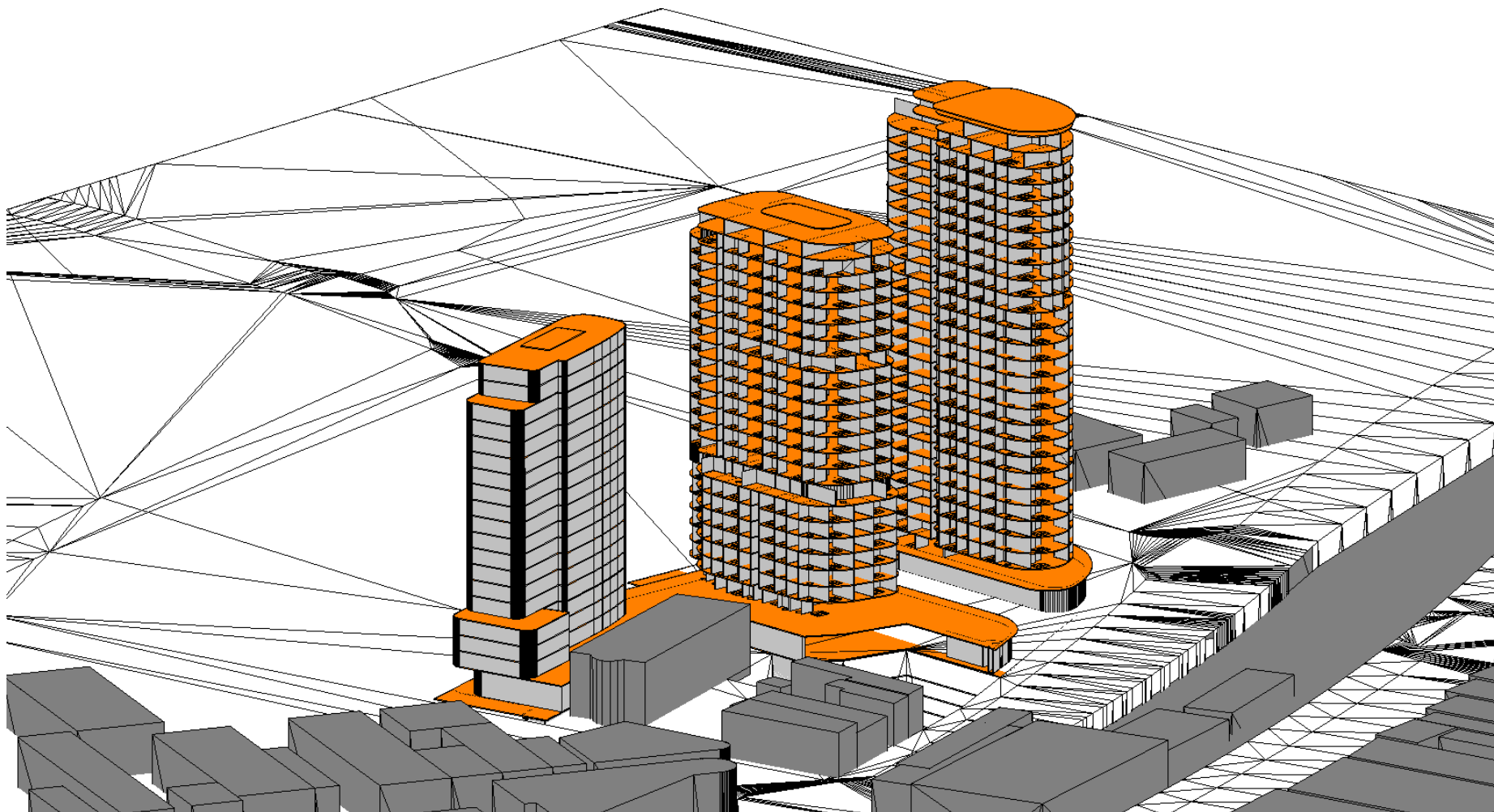


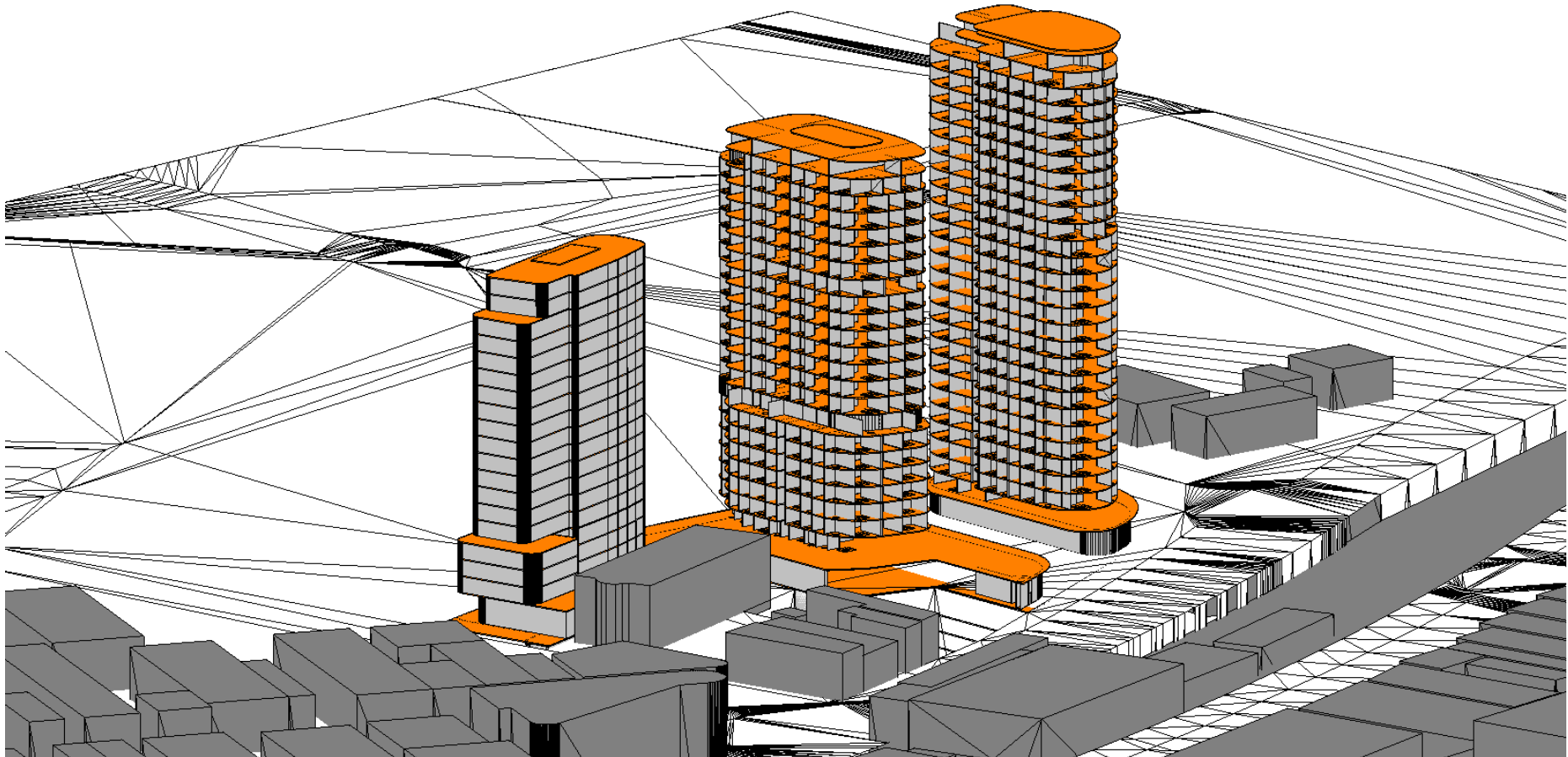


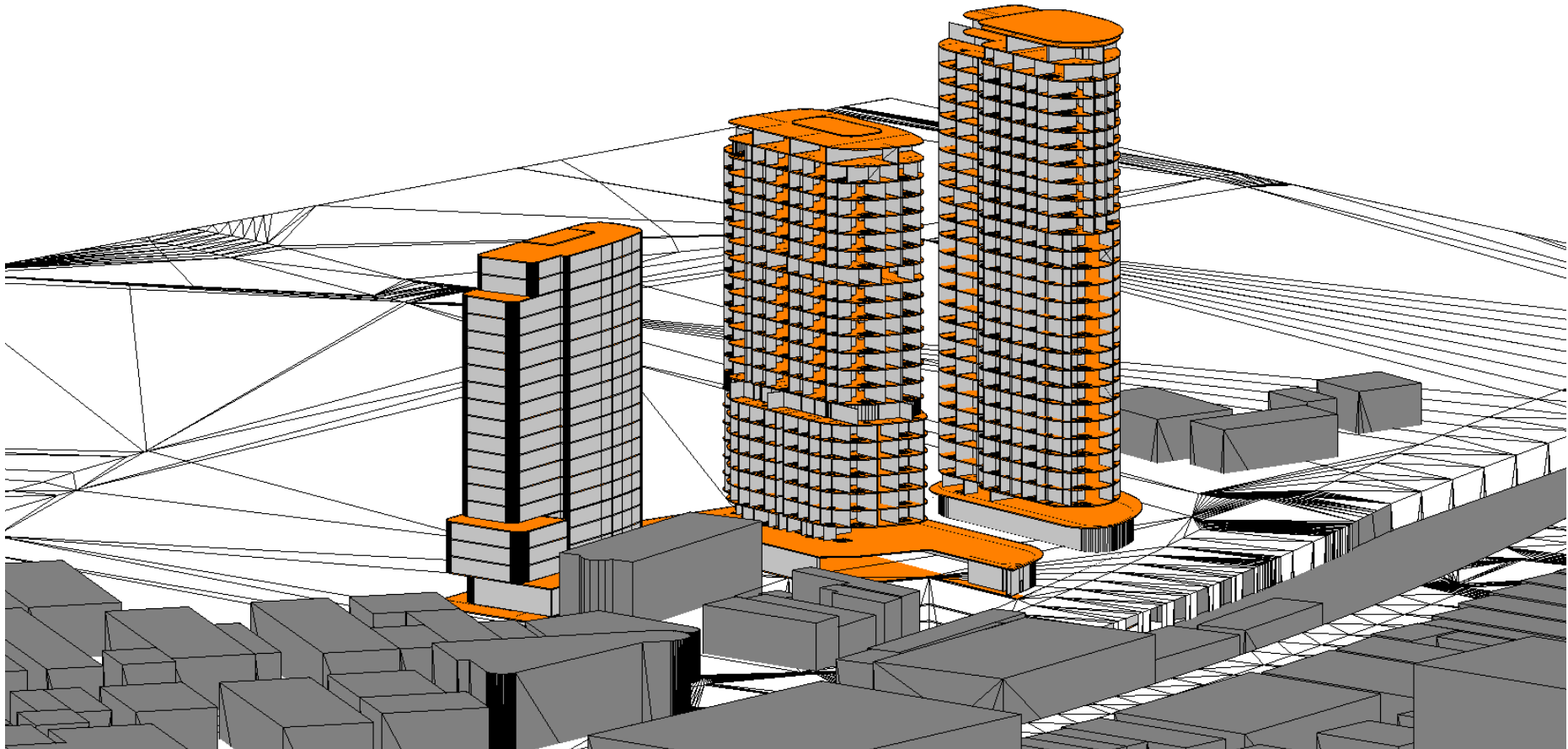


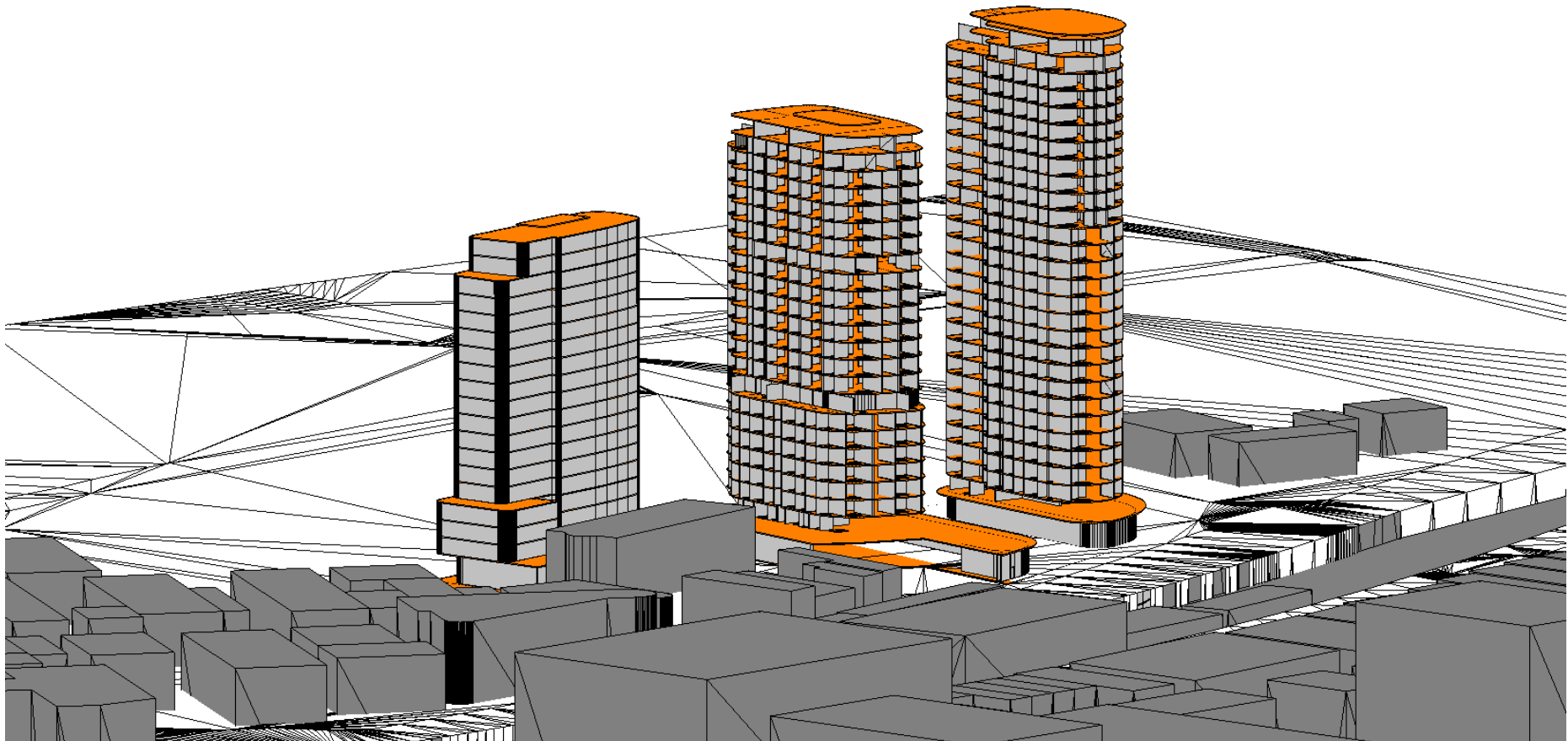












APPENDIX G

Solar Access to Private Living Space Calculation - DA Scheme

[illegible]

APPENDIX H

Solar Access to Private Living Space Calculation - ADG Massing

APPENDIX I

Solar Access to Private Living Space Calculation - ADG Massing + Future Northern Development

[illegible]

	Demonstrates when apartment balcony has achieved solar access through borrowing light from the living room
	Solar Access to one living area only (either balcony or living room)

APPENDIX J

Solar Access to Private Living Space Calculation - CBUS Development with no other Proposed Development

[illegible]

[illegible]

	Demonstrates when apartment balcony has achieved solar access through borrowing light from the living room
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APPENDIX K

Shadow Diagrams Existing surrounds to Tower 1 and 2







1100















APPENDIX L

Shadow Diagrams DA + Future Northern Development surrounds to Tower 1 and 2









1100



1115









APPENDIX M

Shadow Diagrams ADG + Future Northern Development surrounds to Tower 1 and 2









1100



1115









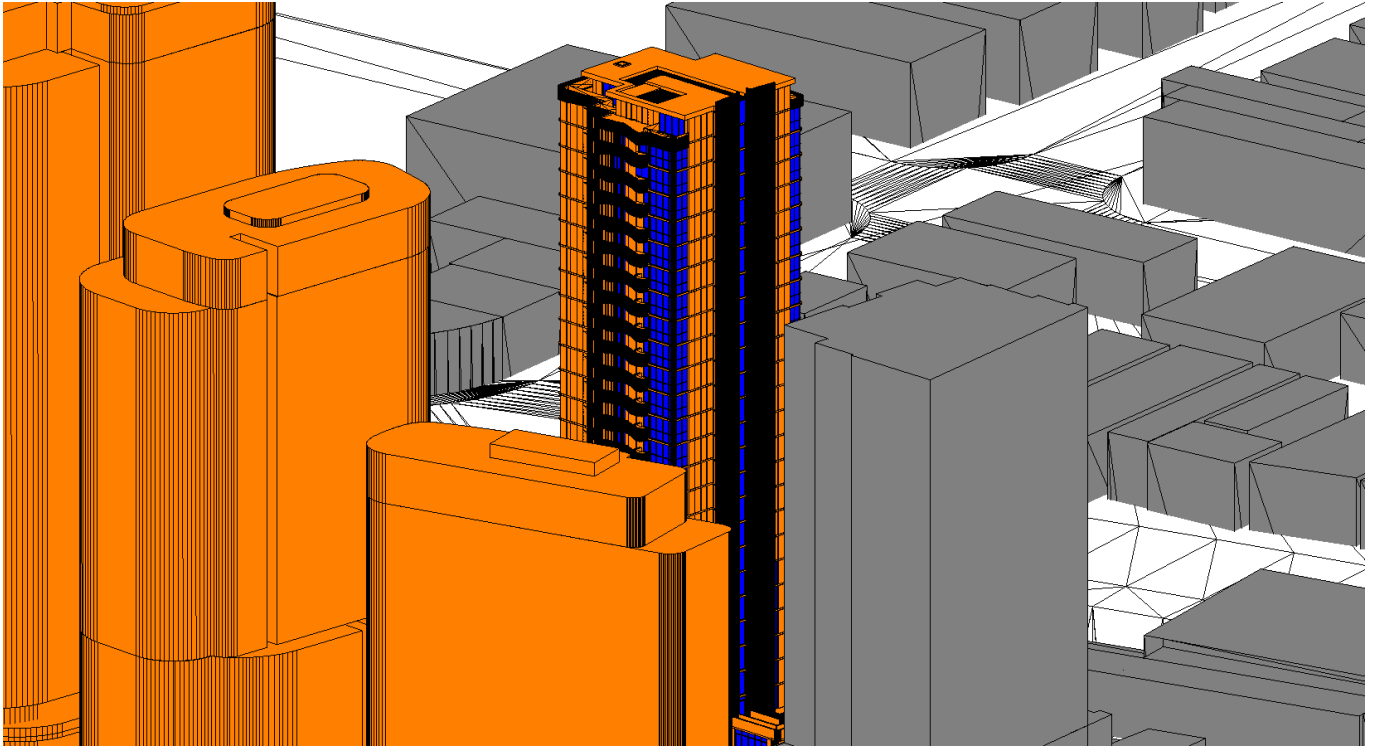




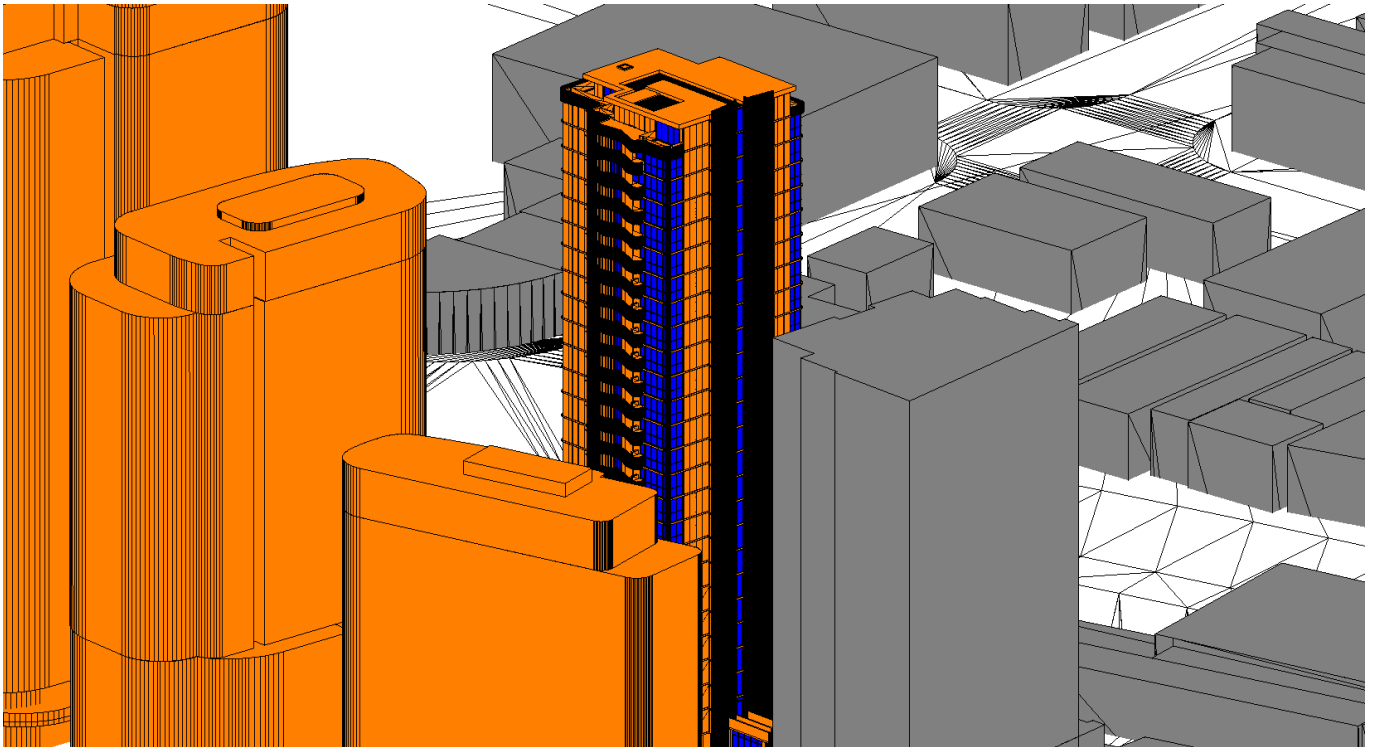
APPENDIX N

Sun Eye Views DA Scheme + Future Northern Development

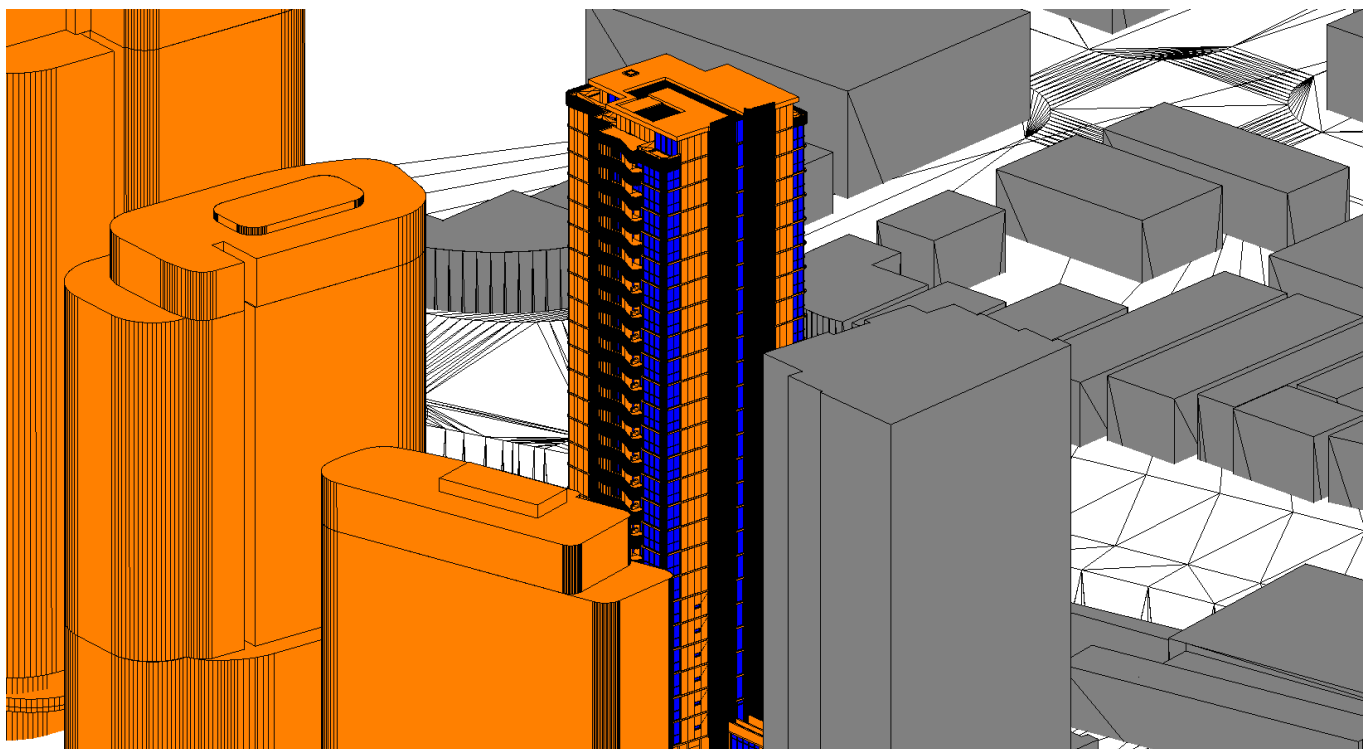
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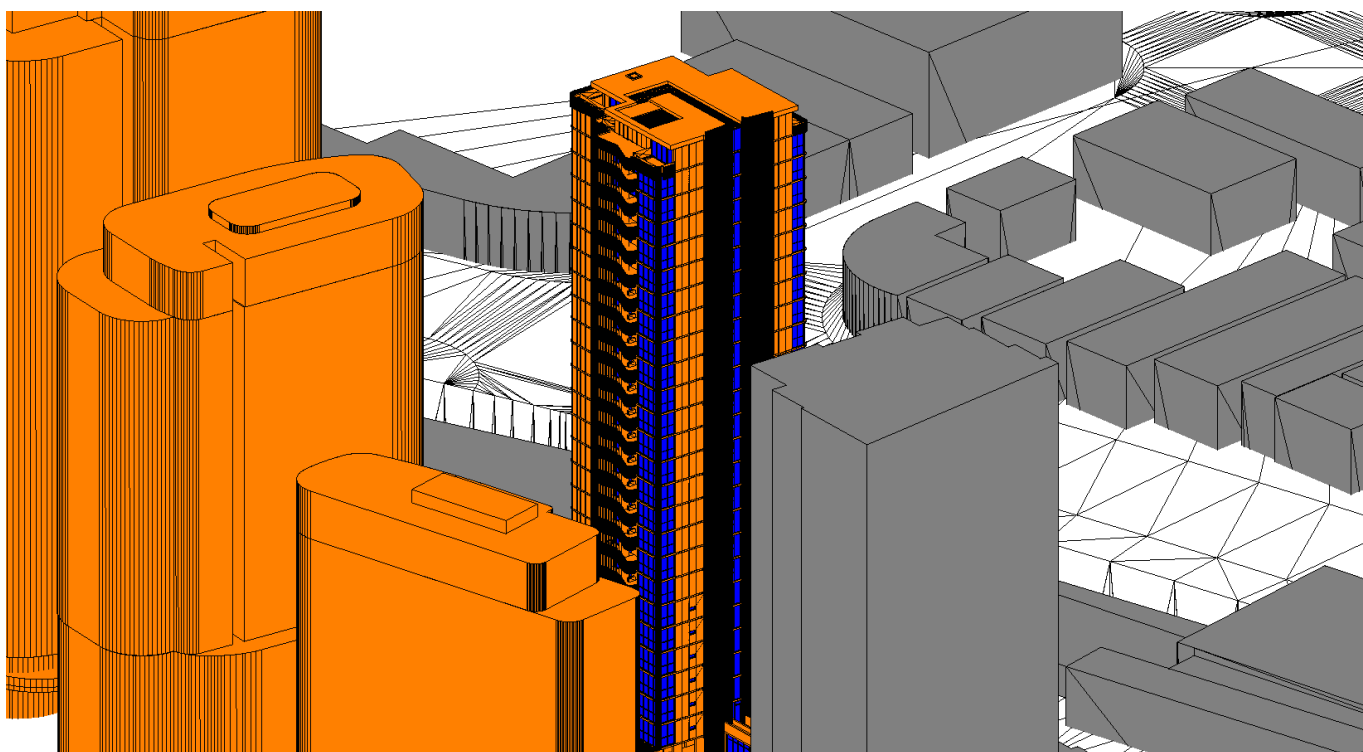
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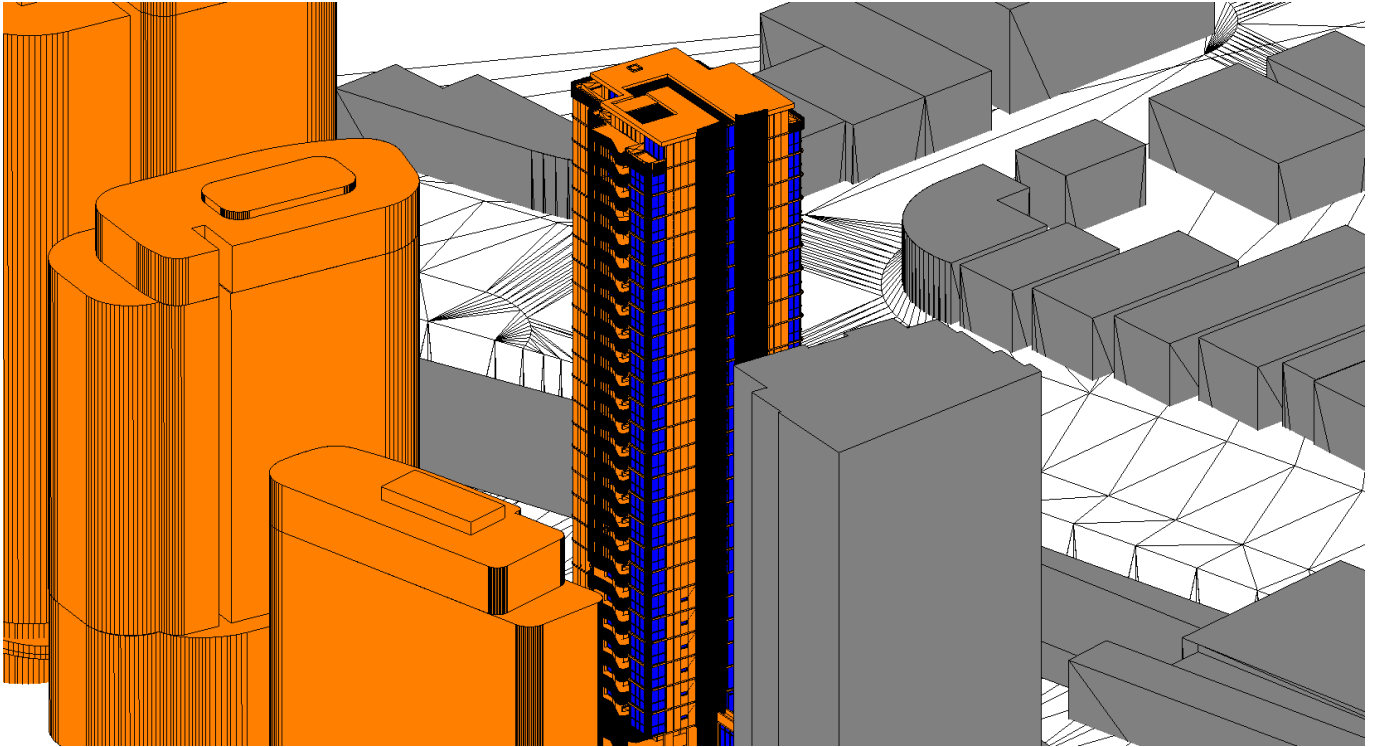
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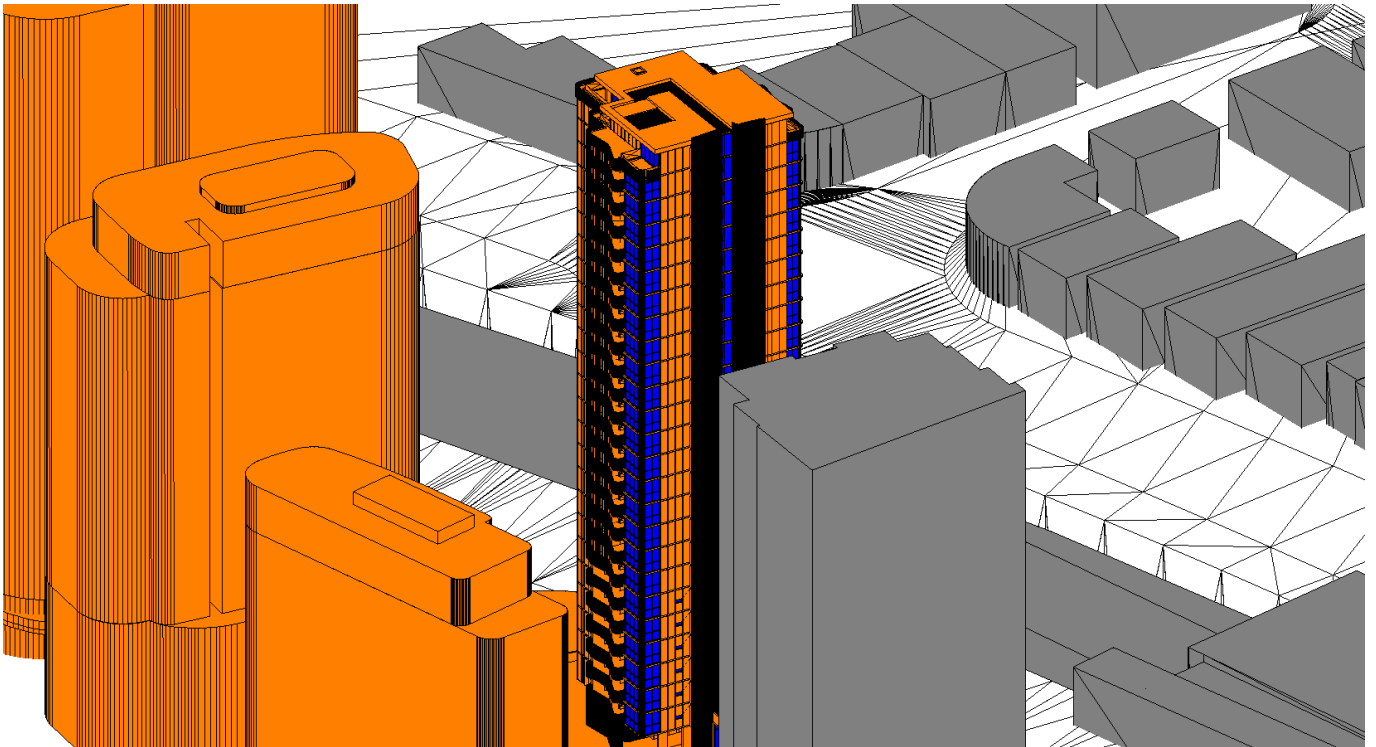
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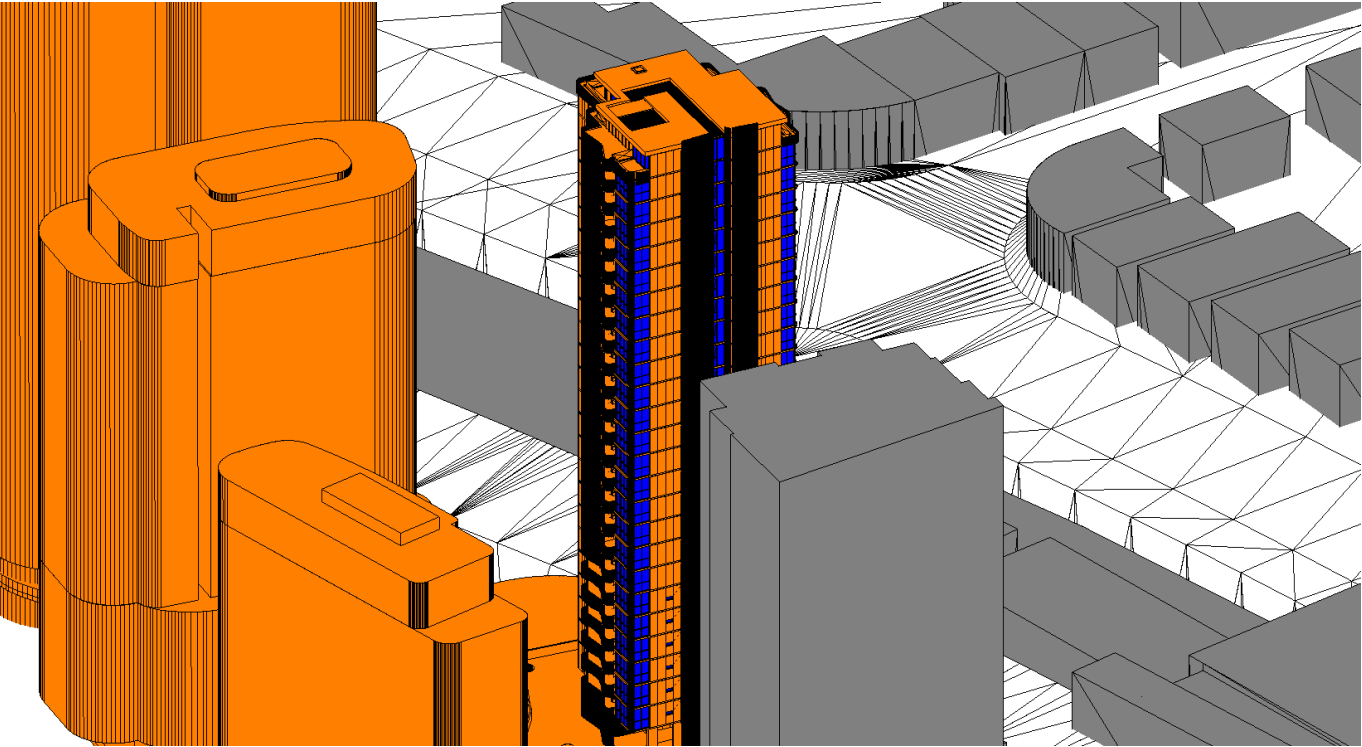
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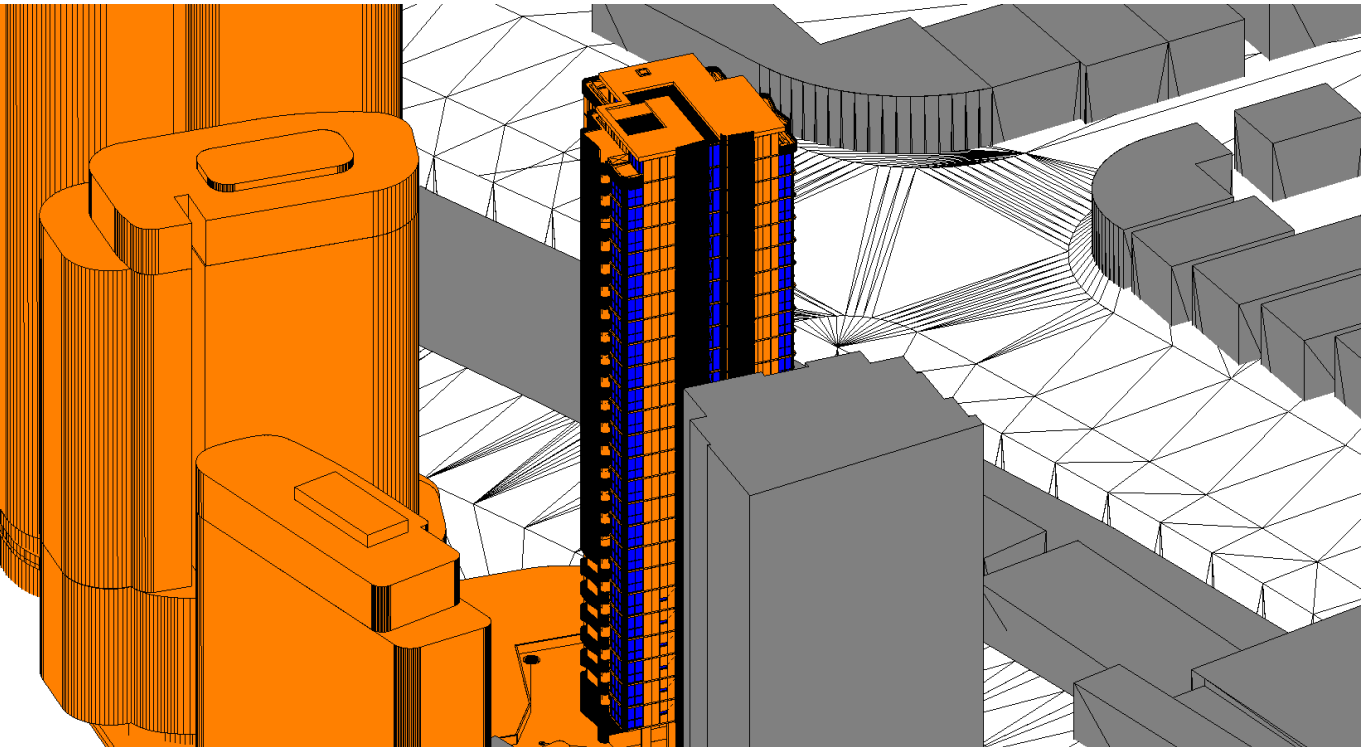
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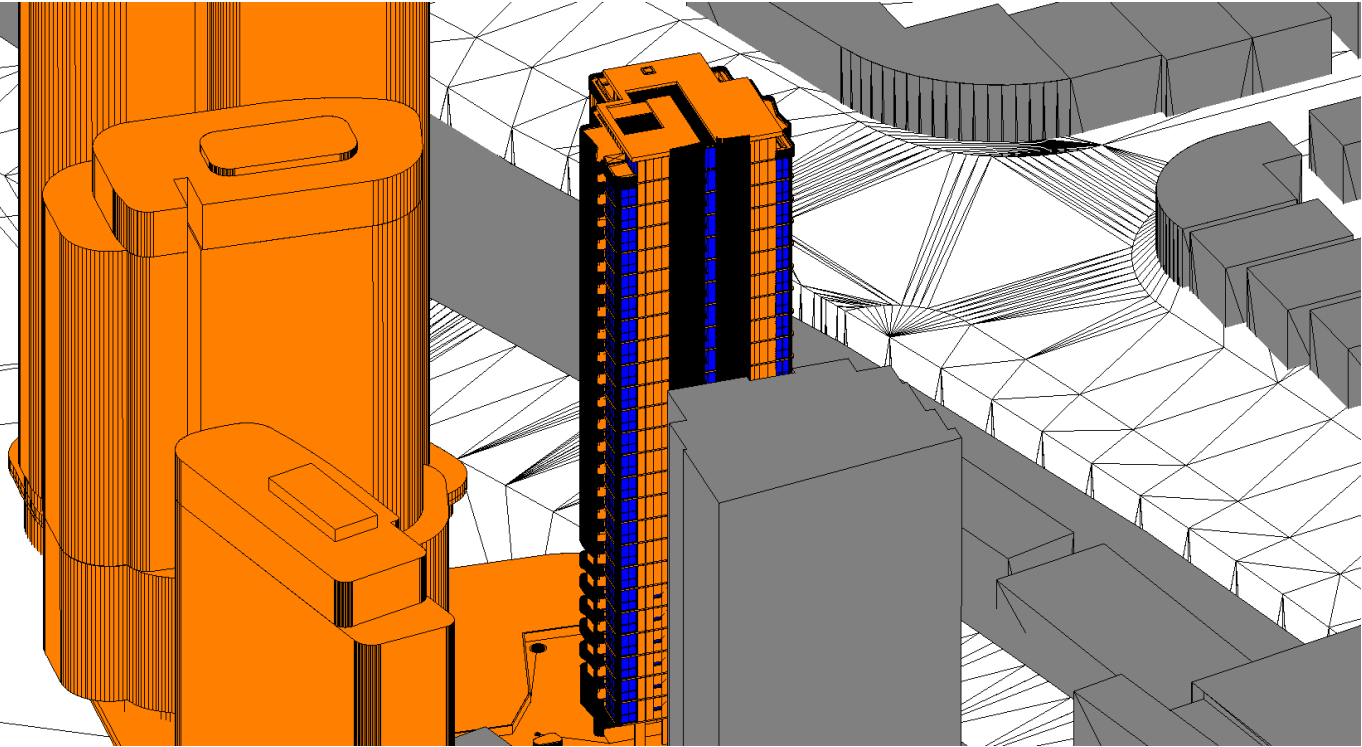
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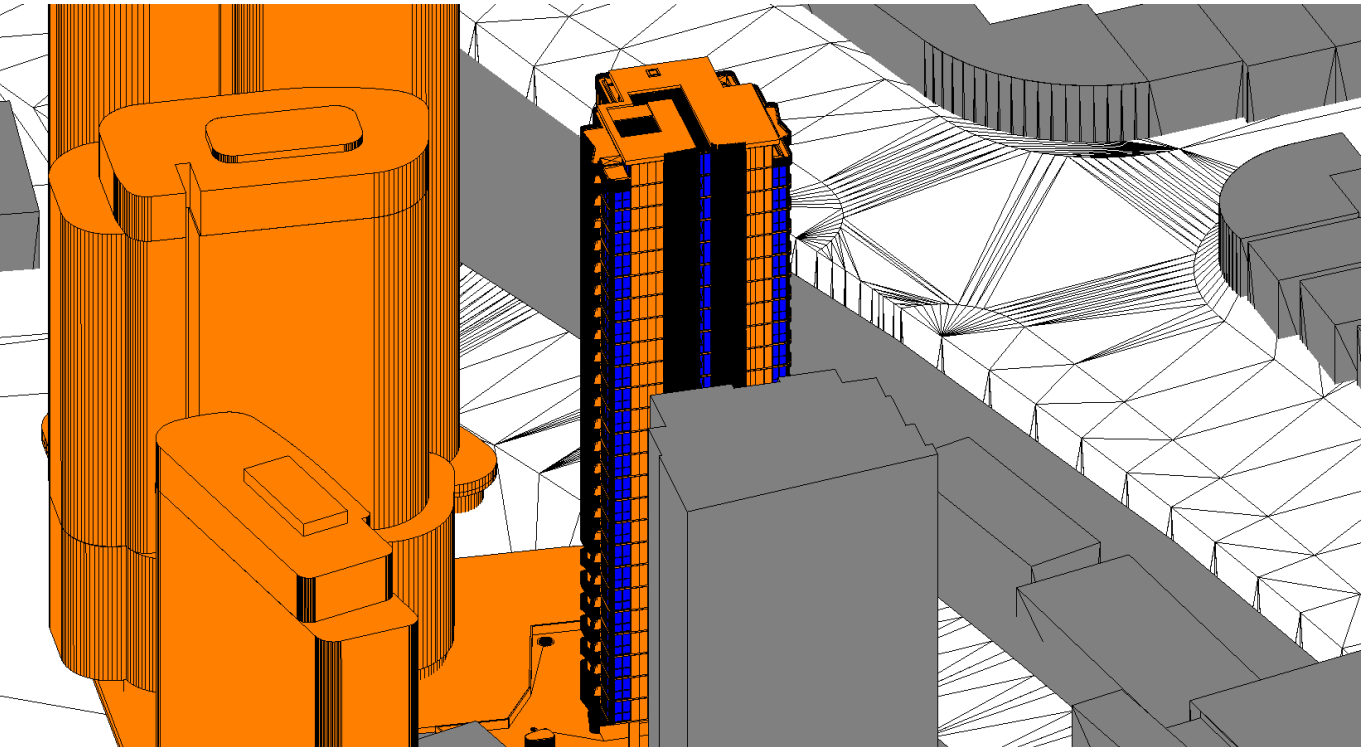
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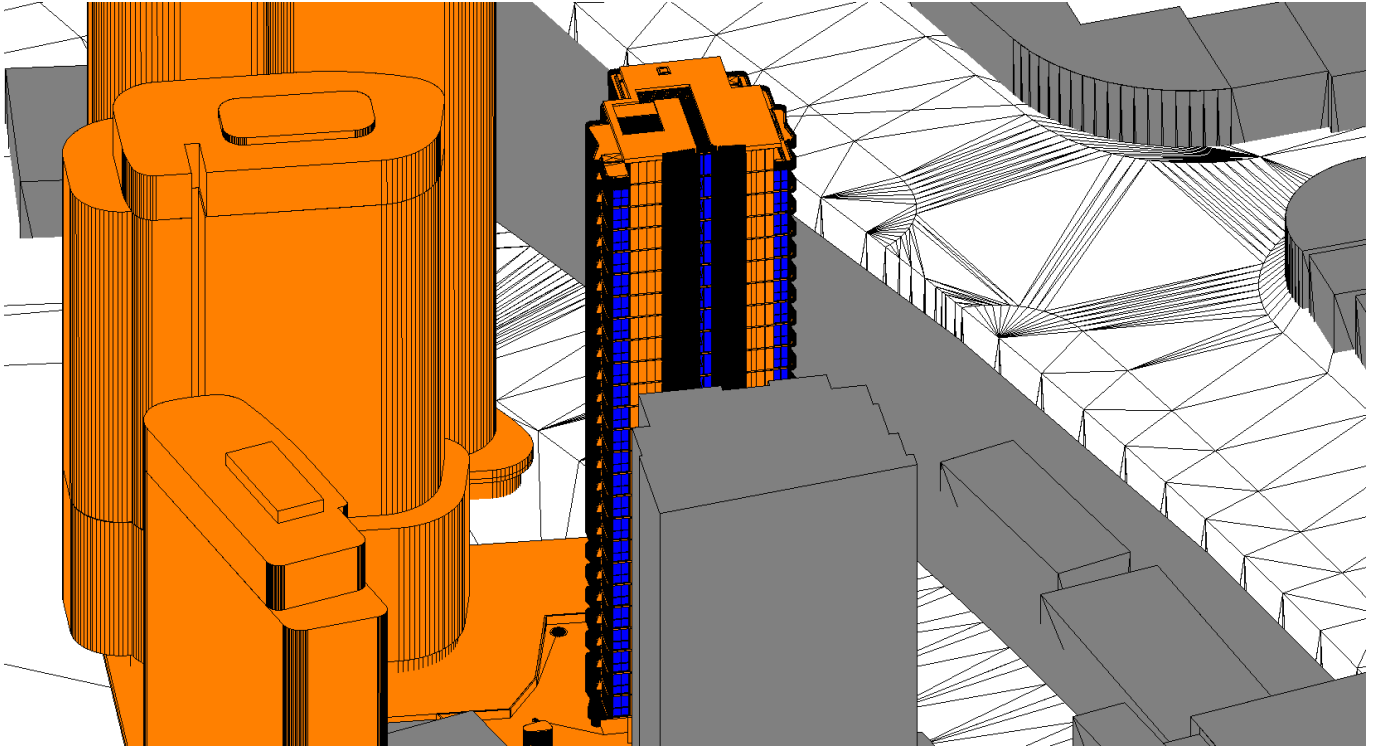
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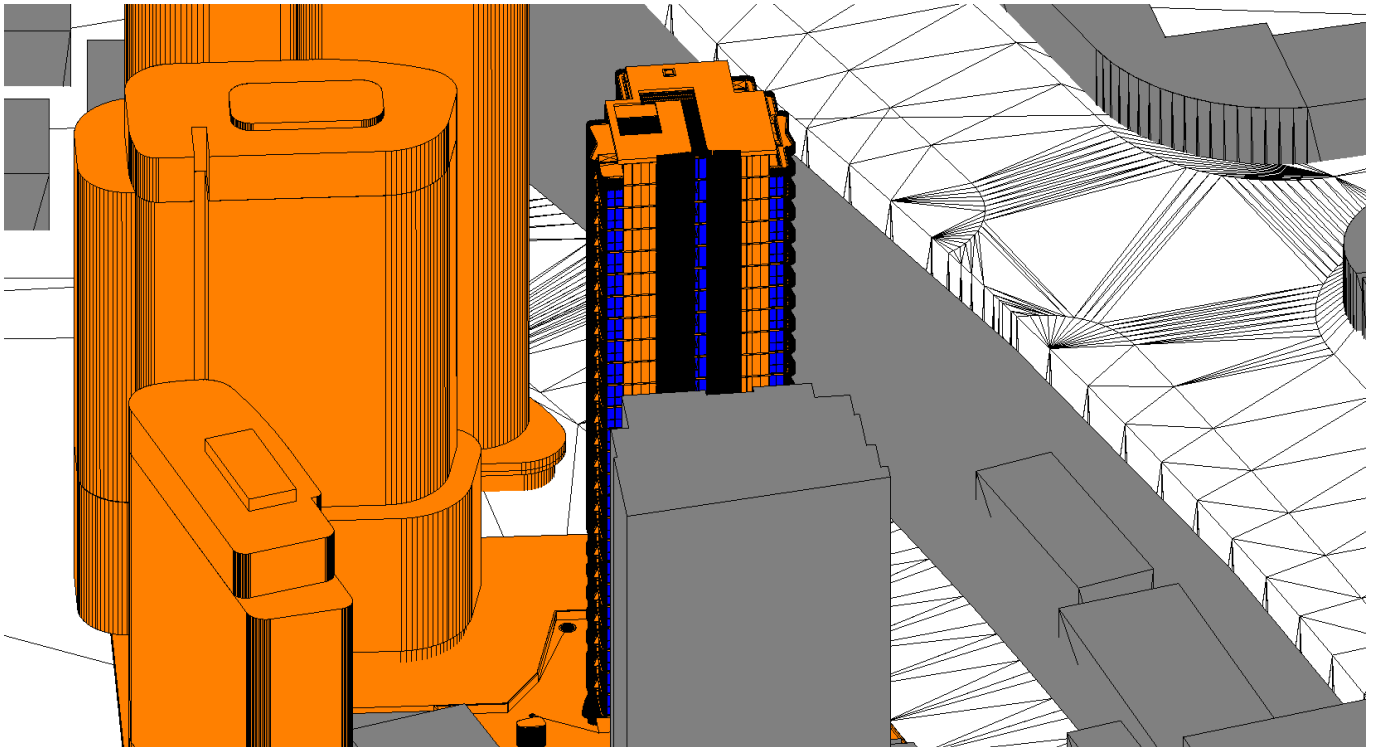
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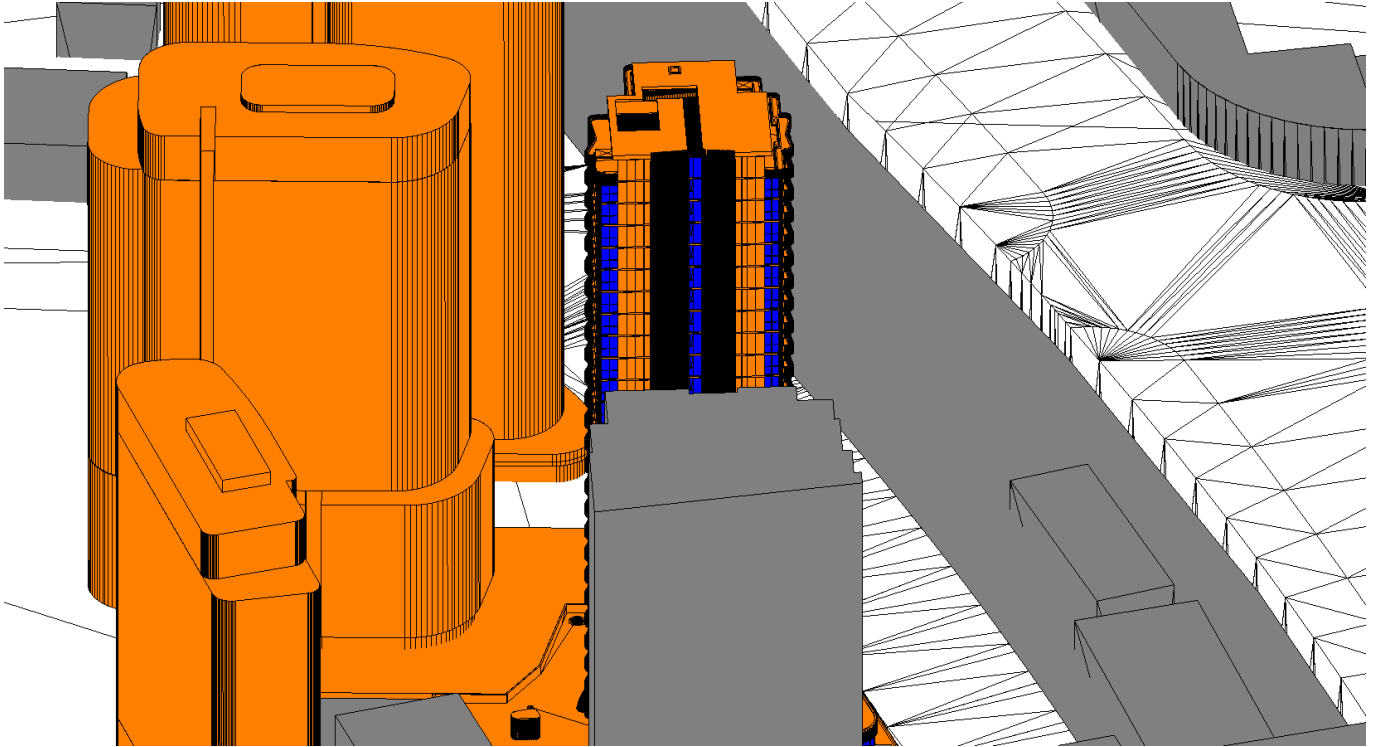
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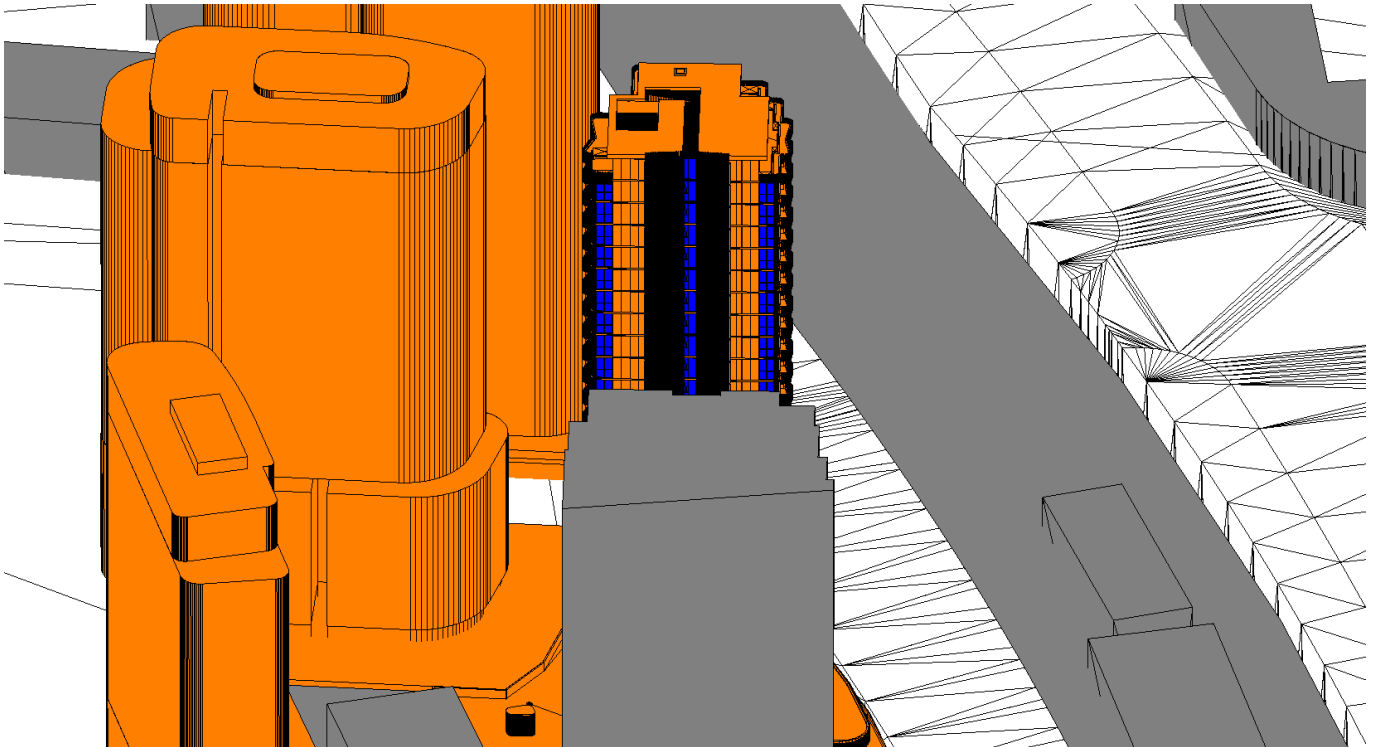
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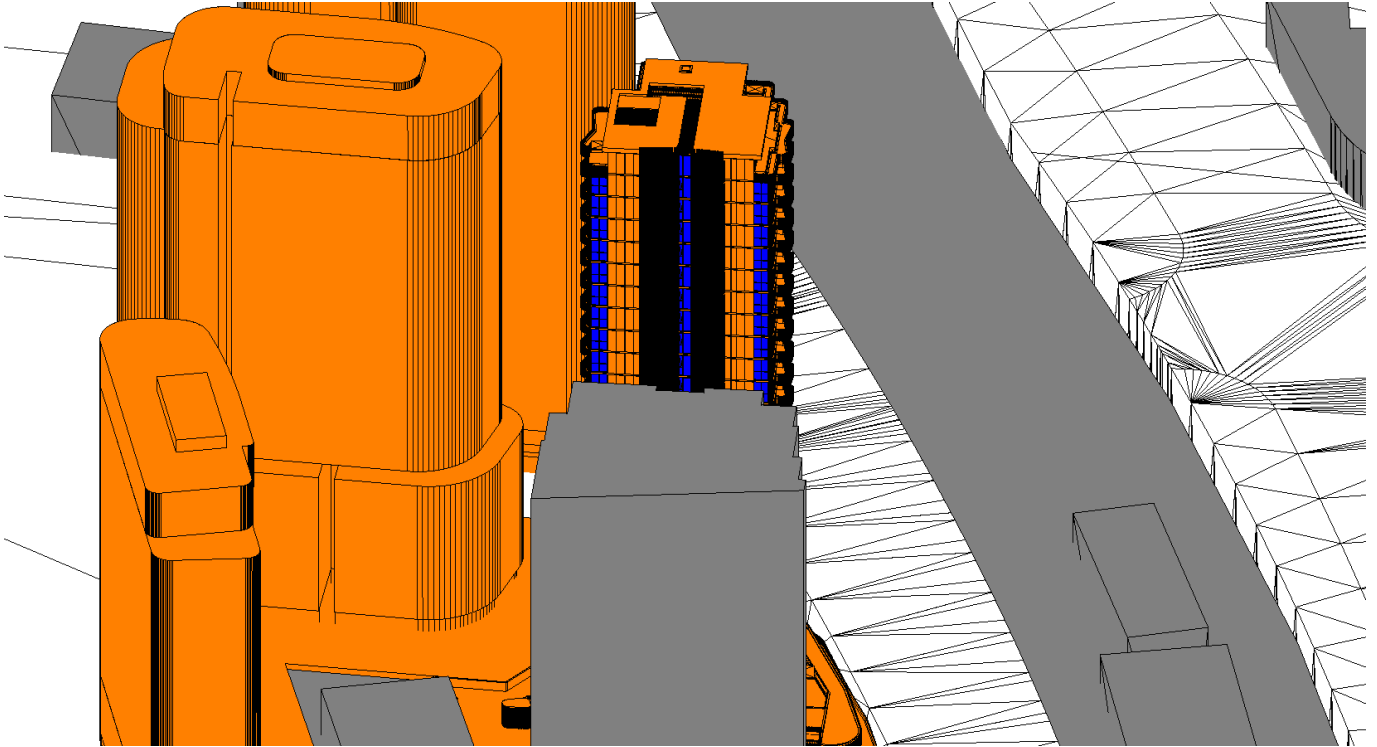
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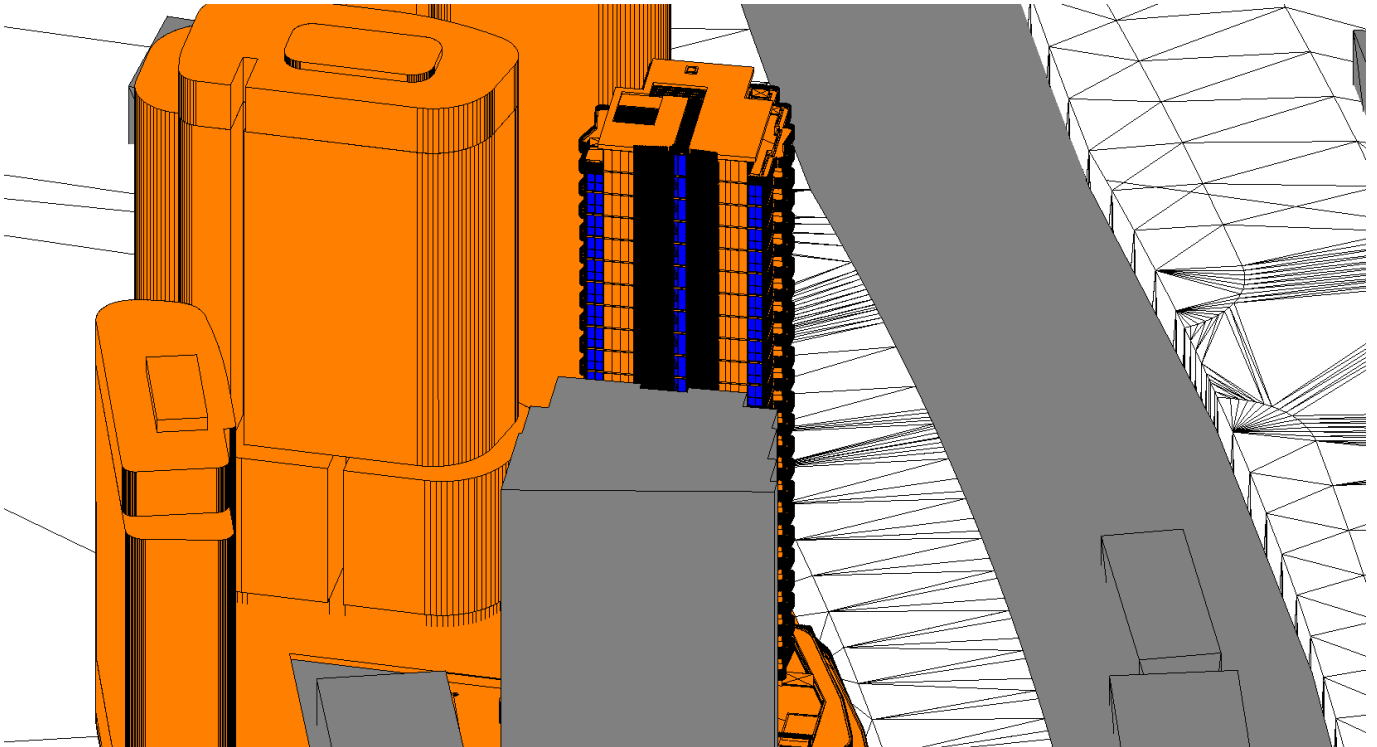
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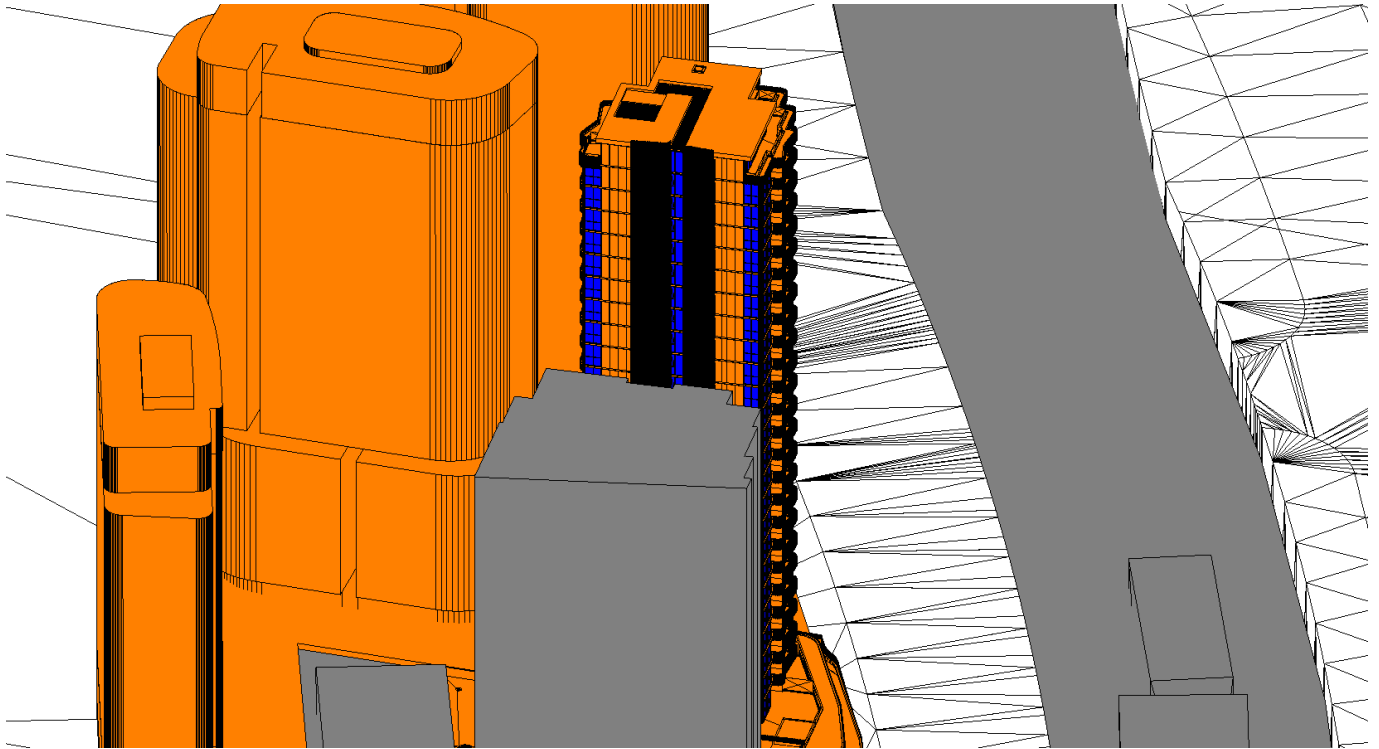
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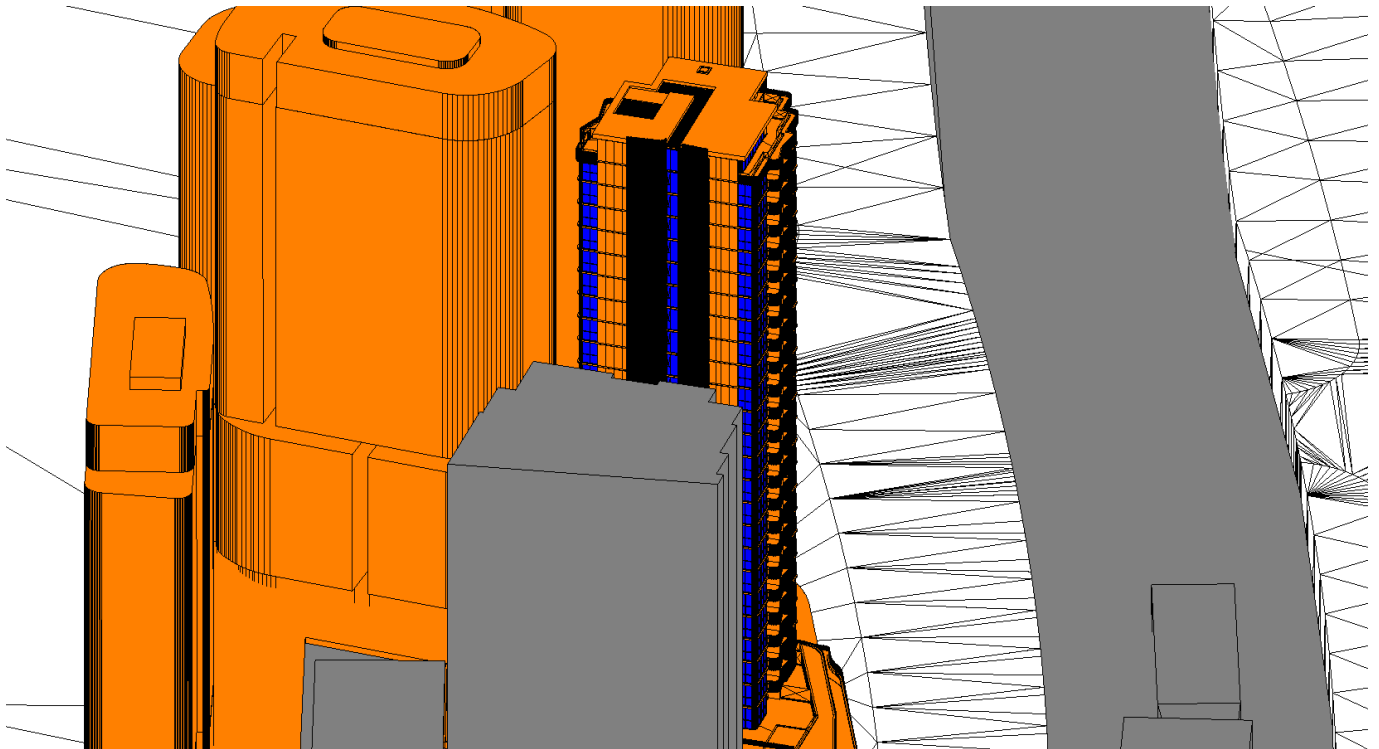
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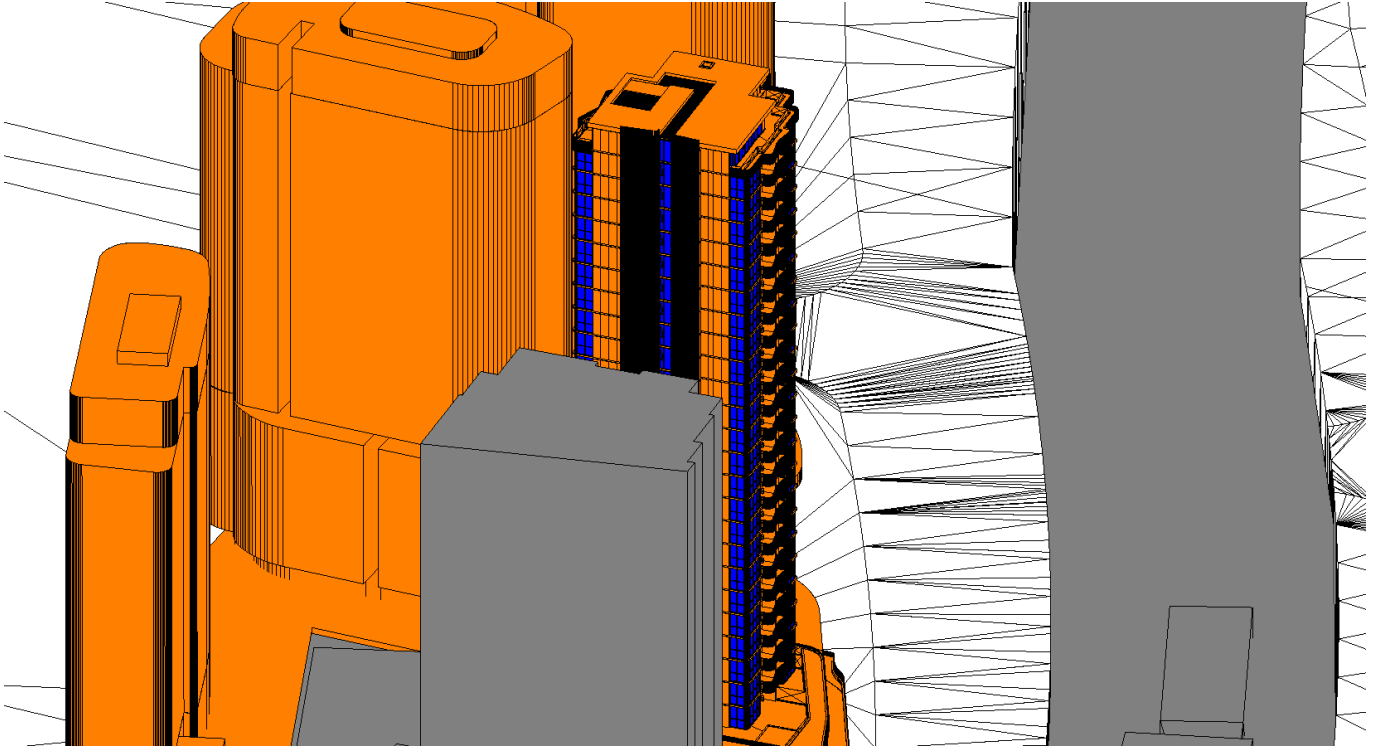
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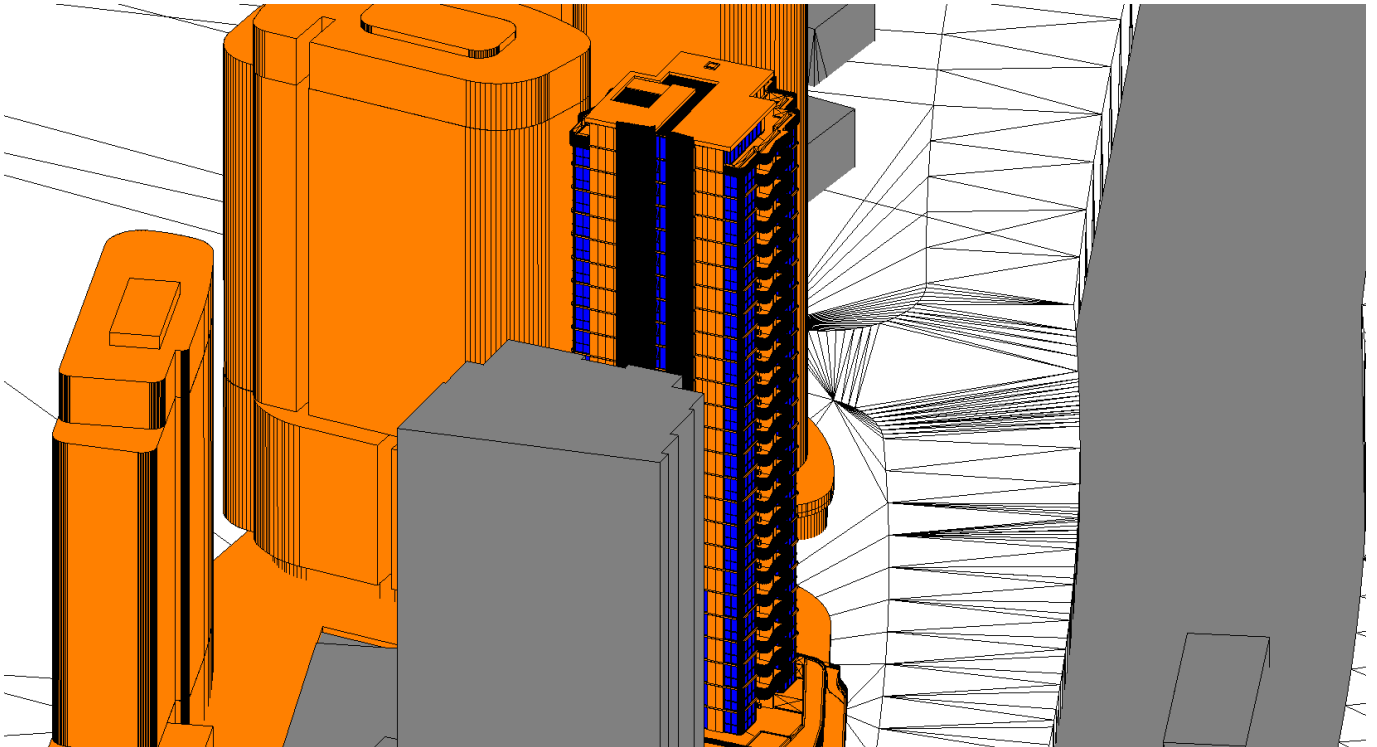
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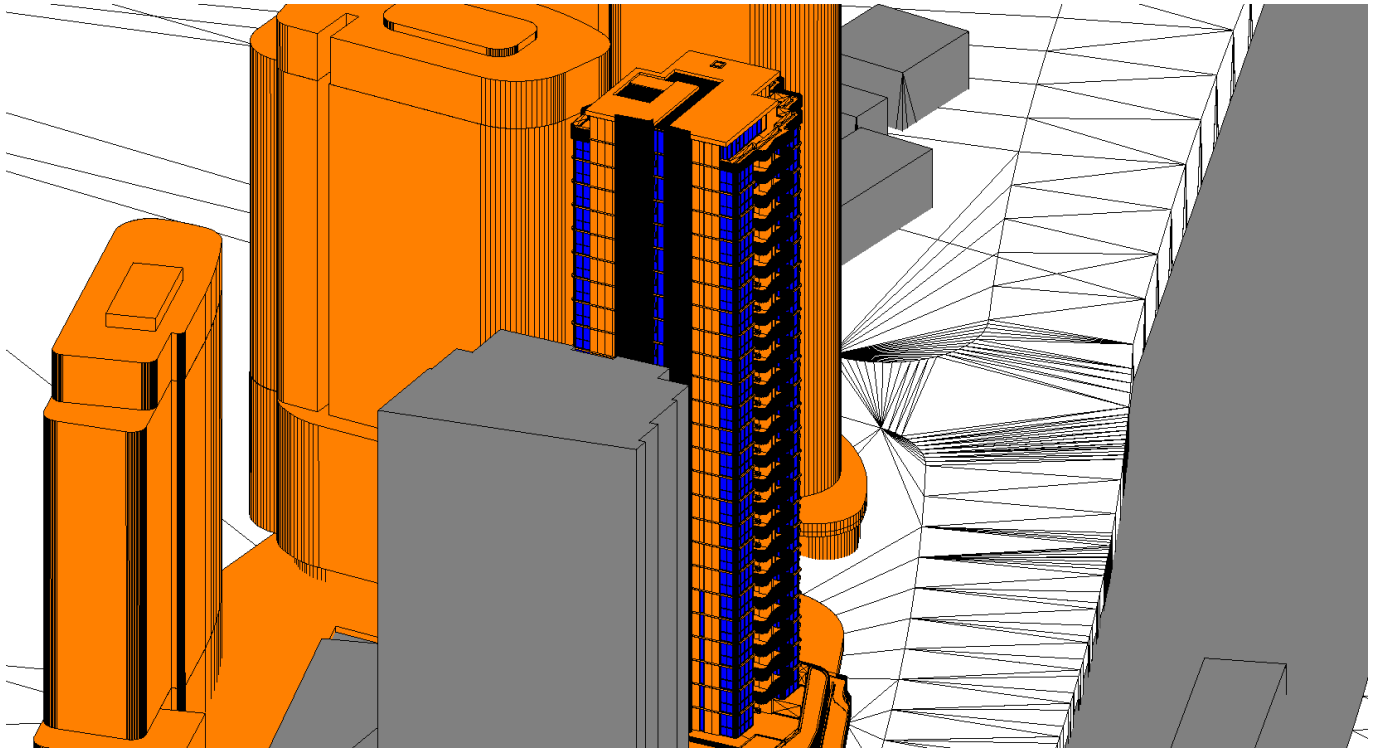
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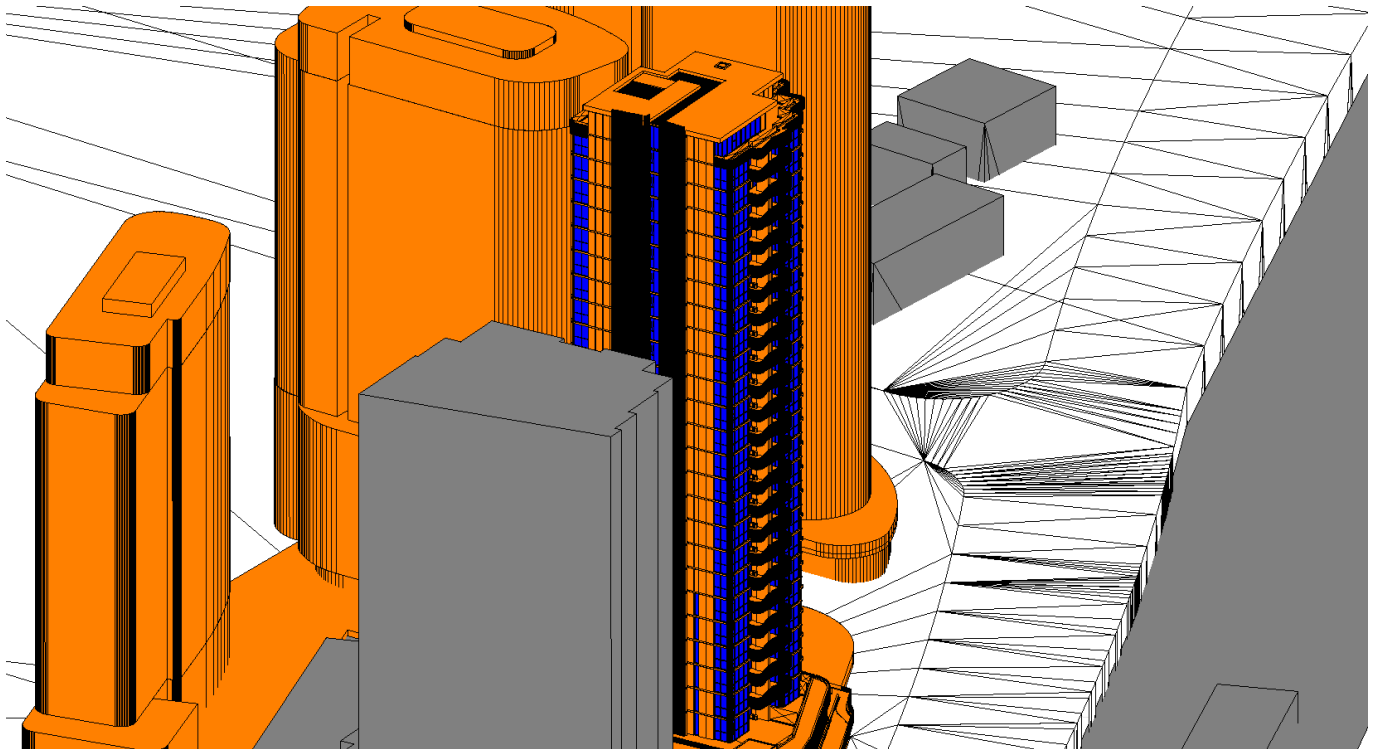
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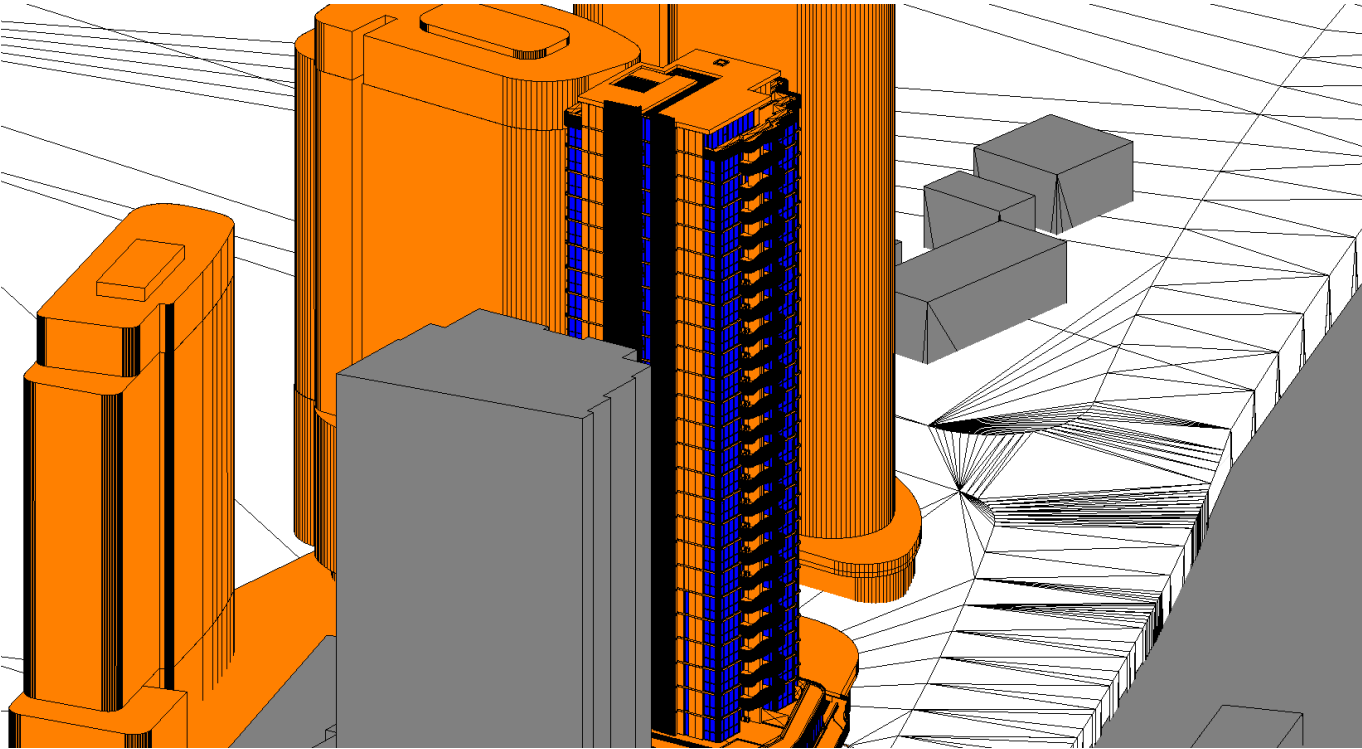
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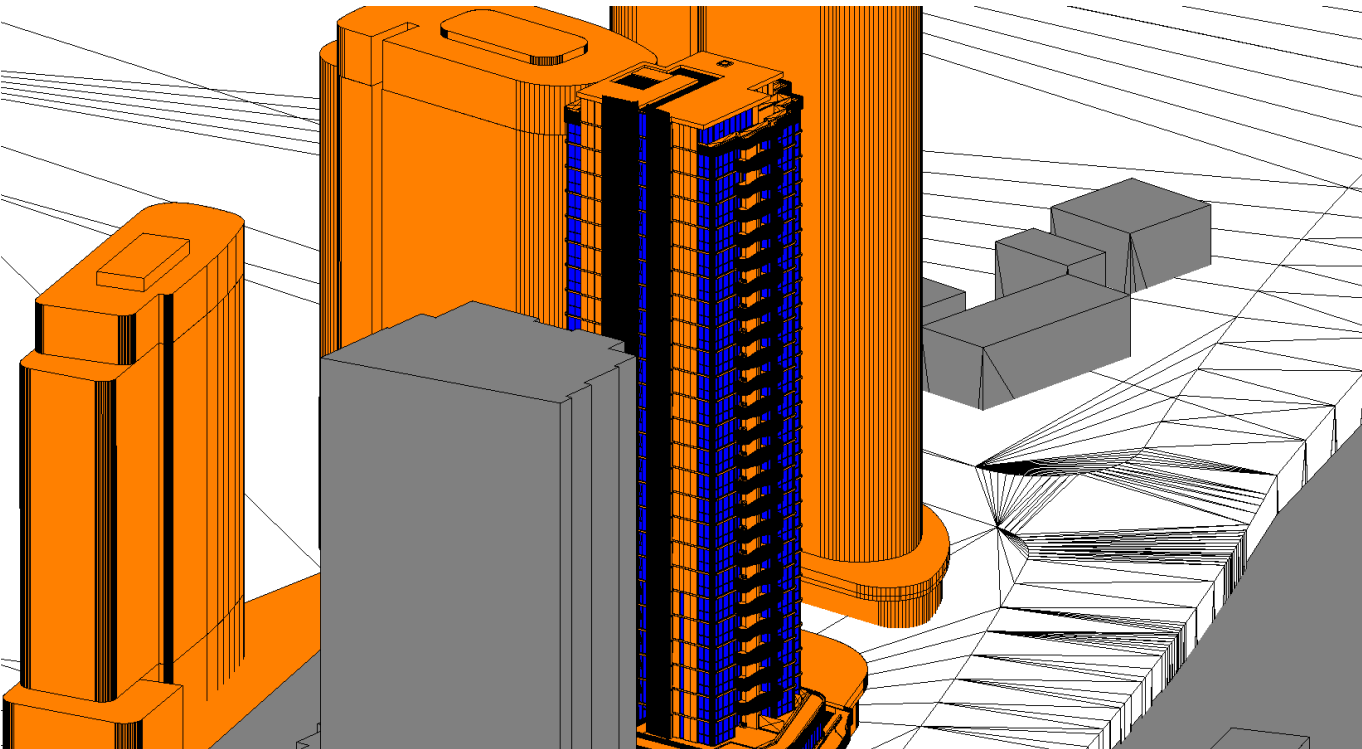
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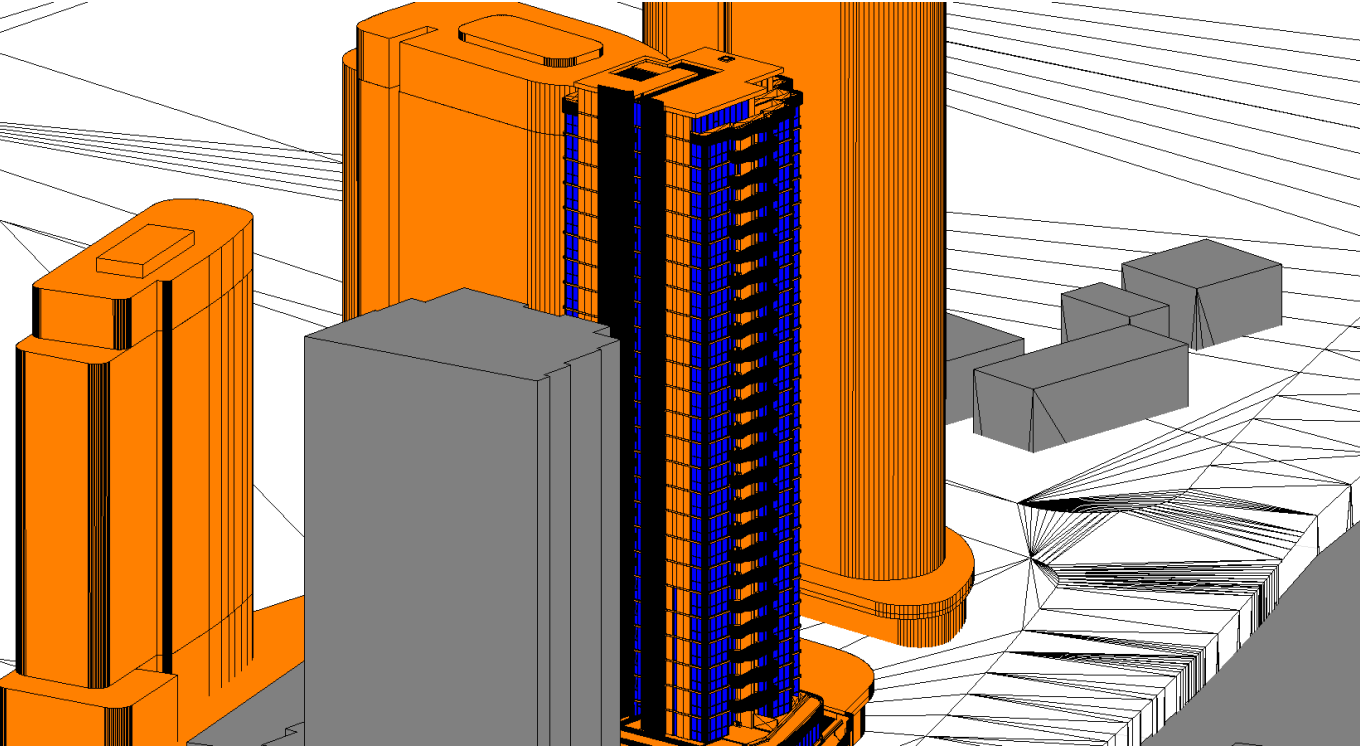


1430



1445





APPENDIX O

Solar Access to Private Living Space Calculation 24-36 Langston Place

Building	Level	Unit	9:00	9:15	9:30	9:45	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00	12:15	12:30	12:45	13:00	13:15	13:30	13:45	14:00	14:15	14:30	14:45	15:00	Total hr of sunlight betw 9am- 3pm	2hr sunlight betw 9.00- 15.00	No direct sunlight			
1	2	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	2	1	0		
1	2	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0	
1	2	3						0.25																				0.25	0	1	0		
1	2	4																										0	0	1	0		
1	2	5																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	3	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	2	1	0	
1	3	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	3	3						0.25																				0.25	0	1	0		
1	3	4																										0	0	1	0		
1	3	5																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	4	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	4	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	4	3						0.25																				0.25	0	1	0		
1	4	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	4	5																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	5	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	5	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083													0.25	2	1	0		
1	5	3						0.25																				0.25	0	1	0		
1	5	4																										0	0	1	0		
1	5	5																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	6	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	6	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	6	3						0.25																				0.25	0	1	0		
1	6	4																										0	0	1	0		
1	6	5																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	7	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	7	2					0.167	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	7	3						0.25																				0.25	0	1	0		
1	7	4																										0	0	1	0		
1	7	5																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	8	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	8	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	8	3																										0	0	1	0		
1	8	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	9	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	9	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083													2.33333333	2	1	0		
1	9	3																										0	0	1	0		
1	9	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	10	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	10	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.33333333	2	1	0	
1	10	3																										0	0	1	0		
1	10	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	11	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	11	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.33333333	2	1	0	
1	11	3					0.25																					0.25	0	1	0		
1	11	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	12	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	12	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083													2.58333333	2	1	0		
1	12	3					0.25	0.25	0.25																			0.5	0	1	0		
1	12	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0		
1	13	1					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.83333333	2	1	0	
1	13	2					0.25	0.25	0.25																			0.75	0	1	0		
1	13	3					0.25	0.25	0.25										0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	13	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2	1	0		
1	14	1																		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.83333333	2	1	0	
1	14	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.083					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	14	3					0.25	0.25	0.25										0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	14	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	15	1																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
1	15	2					0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25													3	1	0	0		
1	15	3					0.25	0.25	0.25										0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0
1	15	4																	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	2	1	0	
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