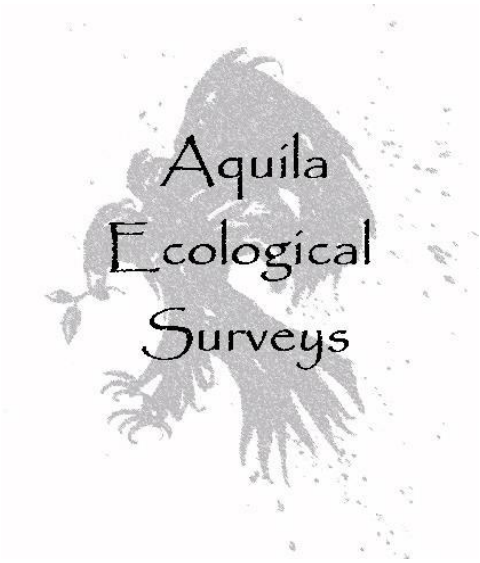
Flora & Fauna Assessment,
Stoney Range Regional Botanic Garden
as impacted by the proposed development of
4 Delmar Parade & 812 Pittwater Road, Dee Why.
July 2023.



Introduction

In August 2021 Ecological Surveys and Planning (ESP) prepared a flora and fauna assessment report for a proposed redevelopment at 4 Delmar Parade and 812 Pittwater Road, Dee Why. In response to the development application lodged by Landmark in relation to this proposal, North Beaches Council has advised that ESP (2021) did not address the impacts of shading over native vegetation in Stony Range Regional Botanic Garden, and that the proposal is inconsistent with one of objectives of the Warringah Development Control Plan Clause E5(3), namely the maintenance of natural shade profiles.

Aquila Ecological Surveys (AES) was contracted by Landmark Group to address the concerns raised by Council and assess the impact of the proposed neighbouring development of 4 Delmar Parade and 812 Pittwater Road, Dee Why upon the Heritage Conservation Area of Stoney Range Reserve. In order to determine the potential indirect impacts of shade, that part of Stony Range Regional Botanic Garden that would be affected by the proposed development during autumn, winter and spring were surveyed by Paul Burcher[1] (B.App.Sc.) between 11 a.m. and 1 p.m. on 12 June 2023. As this date is approximately one week away from the winter solstice, it is considered to accurately cover the period of most concern. Detailed notes were made of the nature of the vegetation that could potentially be affected and the component species therein.

Description of the Affected Area

Extents of overshadowing presented by the proposed development were prepared by Rothelowman Architects, who have prepared the shadow diagrams on Drawings TP05.03 to TP05.14 (addendum A). The highest proportion of shading and hence effect on the reserve is during the winter solstice, and this area, although highly conservative as it is only applicable for a single day, was taken to form the measure of the affected area.

Vegetation within the affected part of the reserve is composed of a mix of remnant locally occurring native plant species and a wide variety of Australian plants that have been planted in the reserve since its establishment.[2] The planted specimens are mostly comprised of species from the eastern seaboard including some that occur locally. The affected area also includes a vehicular entrance lane, walking paths, a barbecue area and a pond.

The vegetation has a canopy to 25 metres tall that is dominated by the locally occurring native plant species Smooth-barked Apple (*Angophora costata*) and Sydney Peppermint (*Eucalyptus piperita*) along with Bangalay (*E.botryoides*), Lemon-scented Gum (*Corymbia citriodora*) and Red Cedar (*Toona ciliata*).

There is a moderately dense to very dense understorey that includes locally occurring native plant species Cheese Tree (*Glochidion ferdinandi*), Saw Banksia (*Banksia serrata*), Lilly Pilly (*Acmena smithii*), Cabbage Tree Palm (*Livistona australis*) and NSW Christmas Bush (*Ceratopetalum*

1 Paul is the principal of Aquila Ecological Surveys (ABN 75 407 030 097). He has been an independent environmental consultant for over 30 years. He is a practicing member of the Ecological Consultants Association of NSW and is a signatory to its Code of Business Practice, Professional Conduct and Ethics.

2 In relation to State legislative definitions, some of the plant species in the affected part of the reserve are not "native vegetation." Native vegetation in NSW under the *Local Land Services Act 2013* and thus the *Biodiversity Conservation Act 2016* and *State Environmental Planning Policy (Biodiversity and Conservation) 2021* is defined as trees, understorey plants, groundcover and wetland plants that are native to New South Wales. Plants in the affected area of the reserve that are not native to NSW include species that constitute a significant amount of foliage cover, namely Lemon-scented Gum and Queensland Tree Waratah, the natural distributions of which are confined to Queensland. A similar definition of 'native vegetation' was in force under the Native Vegetation Act 2003 in 2011 when the DCP was adopted.

gummiferum). There is a wide variety of planted rainforest trees the most common of which are Illawarra Flame Tree (*Brachychiton acerifolius*) and Queensland Tree Waratah (*Alloxylon flammeum*), and there is a grove of planted Macaranga (*Macaranga tanarius*) near the northern boundary west of the barbecue area.

The shrub stratum mostly consists of planted Narrow-leaved Palm Lily (*Cordyline stricta*), *Grevillea* cultivars, Blackthorn (*Bursaria spinosa*), Mint-bushes (*Prostanthera spp*), Blueberry Ash (*Elaeocarpus reticulatis*), Bolwarra (*Eupomatia laurina*) and Pink Wax Flower (*Eriostemon australasius*).

The groundcover is composed of a range of species tolerant of the heavy shade cast mostly by the small tree layer. Common species are Harsh Ground Fern (*Hypolepis muelleri*), Bracken (*Pteridium esculentum*), Maidenhair Fern (*Adiantum aethiopicum*), Basket Grass (*Oplismenus aemulus*), Native Violet (*Viola hederacea*), Climbing Guinea Flower (*Hibbertia scandens*), Weeping Grass (*Microlaena stipoides*) and Sword Sedge (*Lepidosperma laterale*).

Intact remnant bushland, less subject to planting, occurs on the slope in the east of the affected area (Figure 1). Here there is a canopy of Smooth-barked Apple and Grey Gum (*Eucalyptus punctata*) with a shrub layer that includes Black She-oak (*Allocasuarina littoralis*), Black Wattle (*Callicoma serratifolia*), Blueberry Ash, Hairpin Banksia (*Banksia spinulosa*) and Bushy Needlebush (*Hakea sericea*). Groundcover species include Sword Sedge, Spiny-headed Mat-rush (*Lomandra longifolia*), Wiry Panic (*Entolasia stricta*), Forest Grass-tree (*Xanthorrhoea media*), Apple Berry (*Billardiera scandens*) and Trailing Guinea Flower (*Hibbertia dentata*).

Figure 1. Extract from shade diagram illustrating worst-case scenario for shading of intact bushland (stippled) at 3 p.m. in winter.

This vegetation conforms to Plant Community Type (PCT) 3592 Sydney Coastal Enriched Sandstone Forest. The State Vegetation Type Map (Department of Planning and the Environment 2023) erroneously indicates that whole of the reserve is vegetated with this PCT.

Photo 1. Intact bushland (PCT 3592) on the north-west-facing slope east of the barbecue area.

Discussion

As evidenced by the shade profiles prepared by Rothelowman on behalf of Landmark Group (Addendum A), the proposed development would modify shade profiles in the northern part of the reserve. However, it is considered impacts of this shading are likely to be minimal.

The canopy trees in the affected area are as tall or taller than the proposed building height. Given the angle of the shadow cast , this mean that access to light for leaves in the canopy would not be diminished by the proposed building, even at the winter solstice. Hence there is unlikely to be any effect on the vigour of the canopy trees.

It is also considered unlikely that any of the plants in the understorey, shrub or groundcover strata would be significantly affected by the shade cast by the proposed buildings. In the affected area, there would still be access to the extant level of light during the main growing season (late spring to early autumn). Groundcover and shrub species are already heavily shaded by the small tree layer which is mostly composed of the rainforest/wet sclerophyll forest species Cheese Tree, Illawarra Flame Tree and Queensland Tree Waratah, each of which is also tolerant of shade. It should also be noted that the extent of shading moves throughout the day and shading is inconsistent, thereby further decreasing any impact. Although shading would be exacerbated by the proposed building

during late autumn to early spring in a minor portion of the affected area, the species composition and health of individual plants is unlikely to be modified.

Some species, for example ferns, may proliferate during the affected months at the expense of species adapted to higher light levels such as Basket Grass and Bordered Panic. Nevertheless, most if not all of the component species in the groundcover, including these grass species, are adapted to low light levels.

This is equally applicable to the intact bushland in the east of the affected area. On this western facing slope constituent plant species would still be subject to full afternoon sun during summer. There would be decreased penetration of light into the groundcover in this area, and likely increased soil moisture. Again, this may have a temporary seasonal impact favouring some species adapted to lower light levels (e.g. Trailing Guinea Flower) at the expense of species such as Wiry Panic.

However, this would be negated by the full sun effects experienced during summer which would not be modified by the proposed development. When overlain on the shade diagram it is estimated that the partial winter shading would affect at the most approximately 1000m^2 of this vegetation (of which just above 200m2 would be subject to shade throughout the whole day). However, the model does not take into account that ground level elevations in the reserve increase moving eastward from just east of from the barbecue area; or that the easternmost building is 15 m above ground level, some 8 m lower than that part of the proposed development that affects the more modified areas of the reserve. Therefore the affected area is likely to be considerably less than a maximum of 1000 m^2 and likewise the area subject to shading throughout the day to be considerably less than 200m^2.

In relation to likely impacts on fauna movement, existing buildings on the site already compromise ingress and egress of birds and bats north of the reserve. The proposed development site offers little function as a wildlife corridor as apart from a few plantings it contains buildings and hard surfaces and adjoins the shopping centre to the north, Pittwater Road to the west and a residential area to the east. The flora reserve represents more of a stepping stone for fauna movement and that function is unlikely to be compromised by the development.

The following threatened plant species occur within the affected area (Figure 2):

- Rough-shelled Bush Nut (*Macadamia tetraphylla*) – listed as vulnerable on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act).
- Chef's Hat Correa (*Correa baeuerlenii*) – listed as vulnerable on the EPBC Act and BC Act.
- Queensland Tree Waratah - listed as vulnerable on the EPBC Act (not indicated on Figure 2).
- *Grevillea shiressii* - listed as vulnerable on the EPBC Act and BC Act.

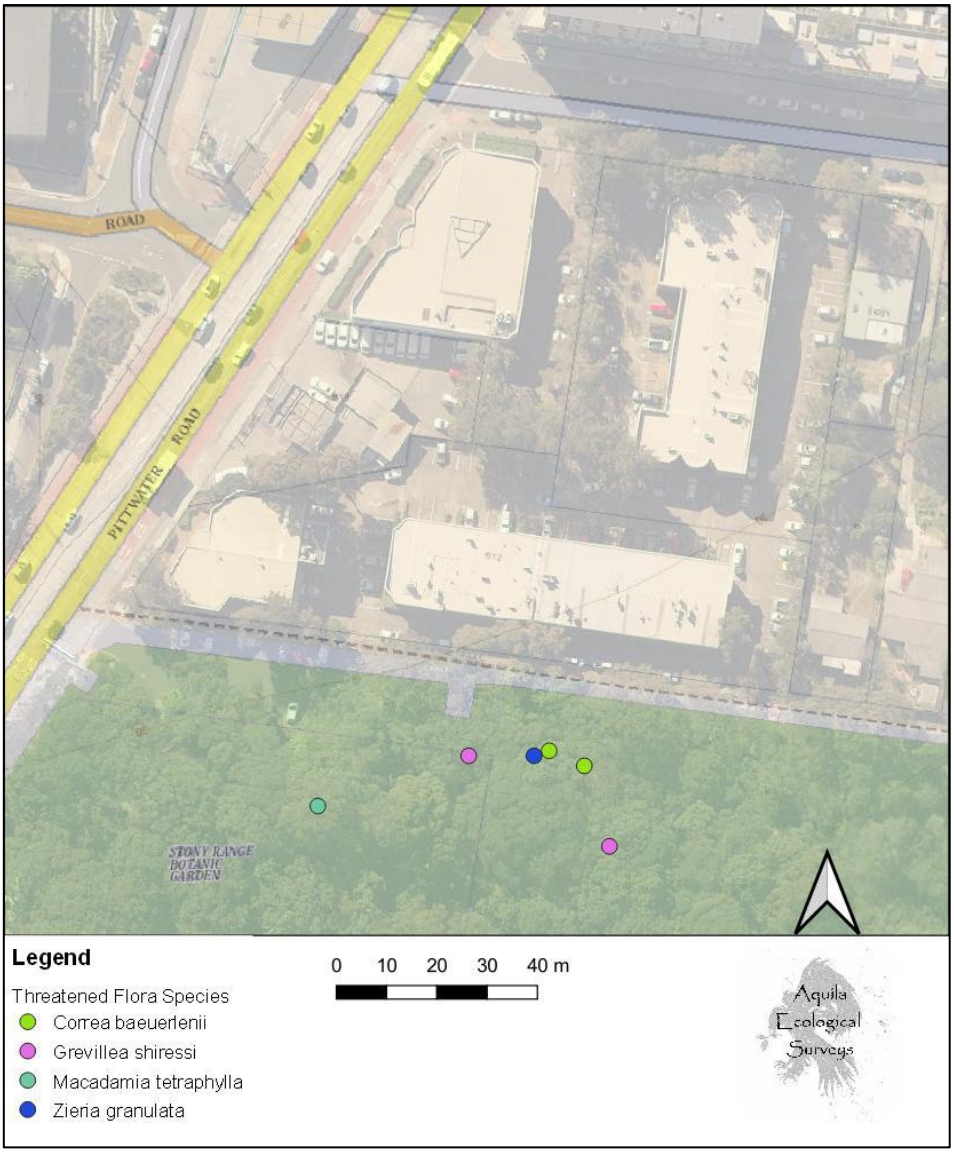


Figure 2. Locations of threatened flora species in the affected part of the reserve.

None of these species occur naturally in the reserve nor the local area. All specimens of these species in the reserve have been planted and it is considered that that under the EPBC Act there are no important populations of any of the species. Therefore, there would not be a significant impact on any of the four EPBC Act listed species. Under the BC Act there are no viable local populations of the three listed species. The proposed development would not significantly affect any of the species, or their habitats.

Conclusion

An assessment was undertaken of the potential impacts shading from the proposed development would have on vegetation within Stony Range Regional Botanic Gardens. It was found that the impacts are likely to be negligible and seasonal in nature. There is unlikely to be any appreciable long-term impact on the composition of native vegetation within the reserve.

References

Department of Planning and the Environment (2023) *State Vegetation Type Map.* Accessed June 2023. https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map/resource/anzlic-web-map.

Ecological Surveys and Planning (2021) *Flora & Fauna Assessment, 4 Delmar Parade & 812 Pittwater Road, Dee Why.* Unpublished report prepared for Willow Frank Architects, Kogarah.

Report prepared by

Paul Burcher 03/07/2023

Addendum Shadow Diagrams

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- APPROXIMATE LOCATION OF TRACKS

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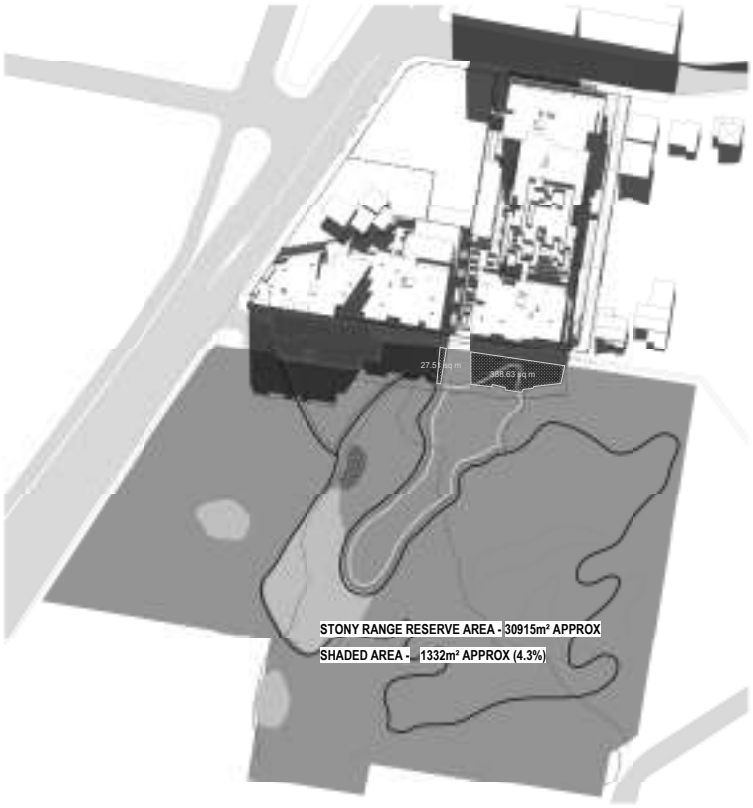

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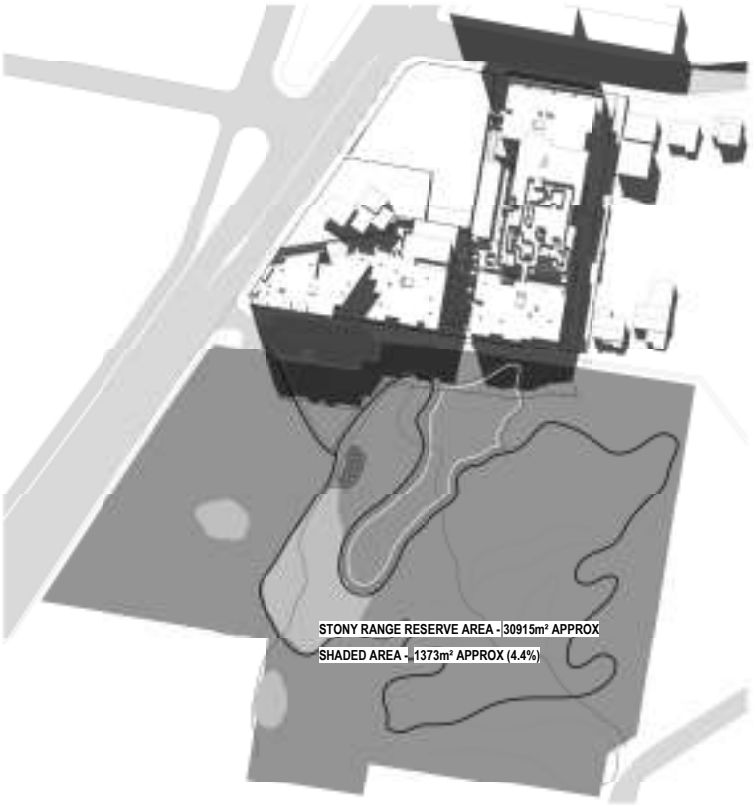

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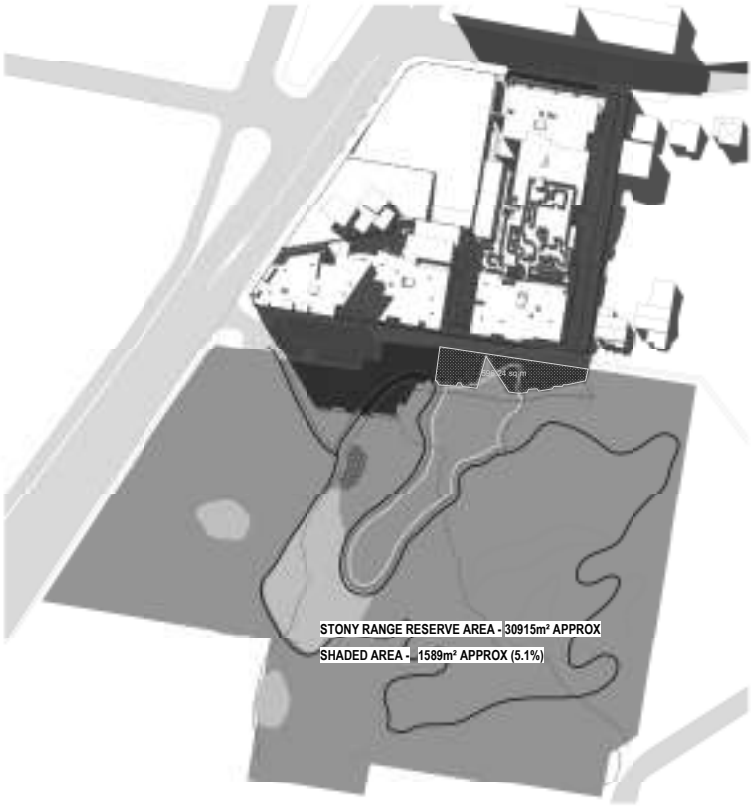

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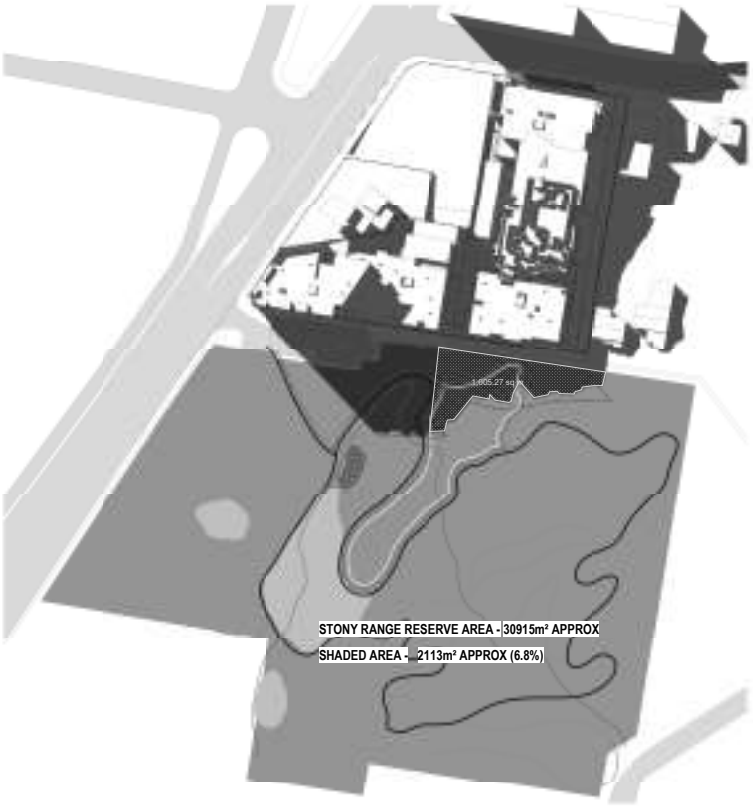

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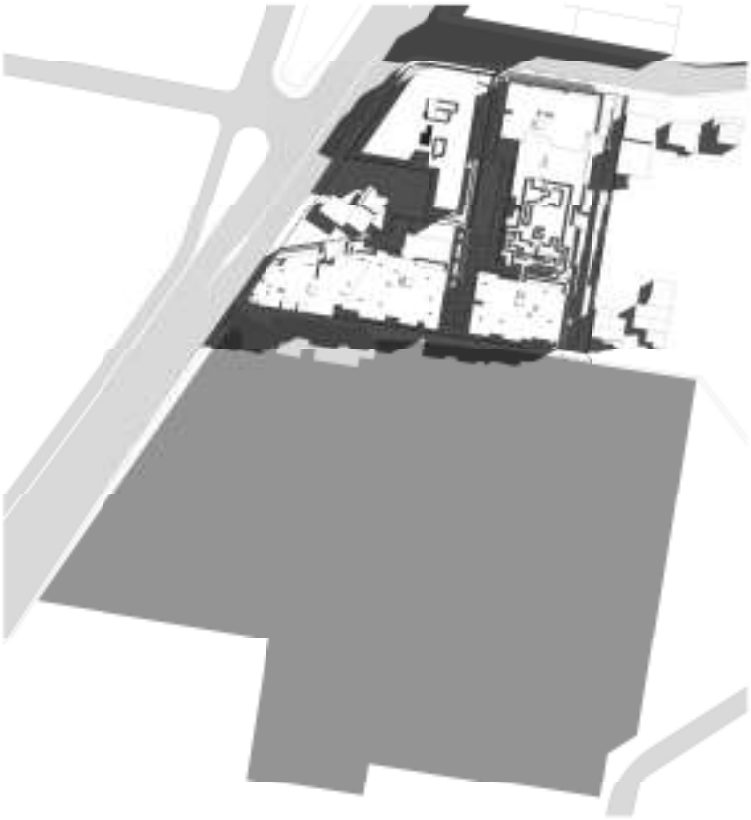

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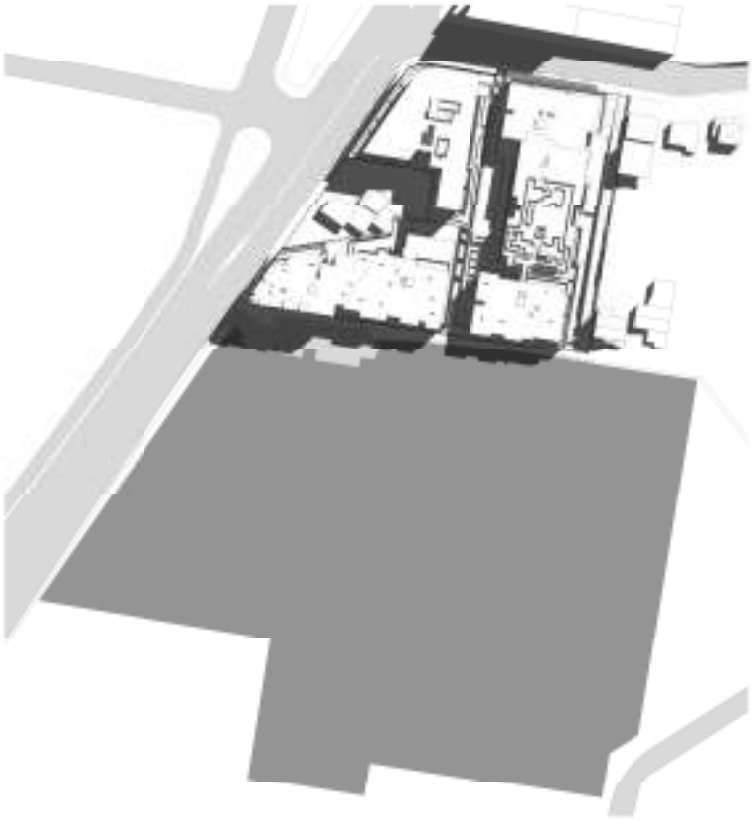

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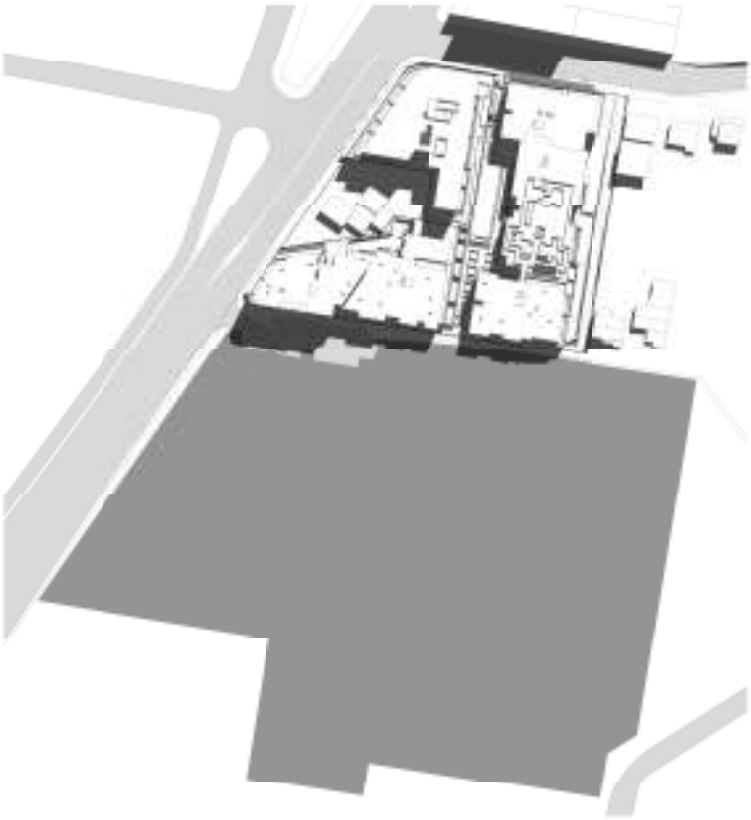

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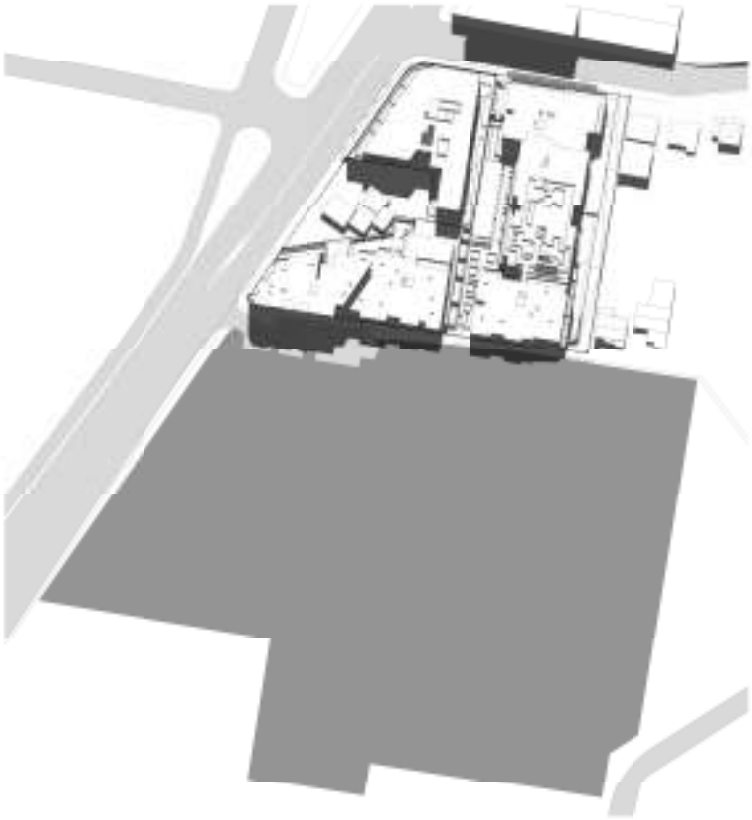

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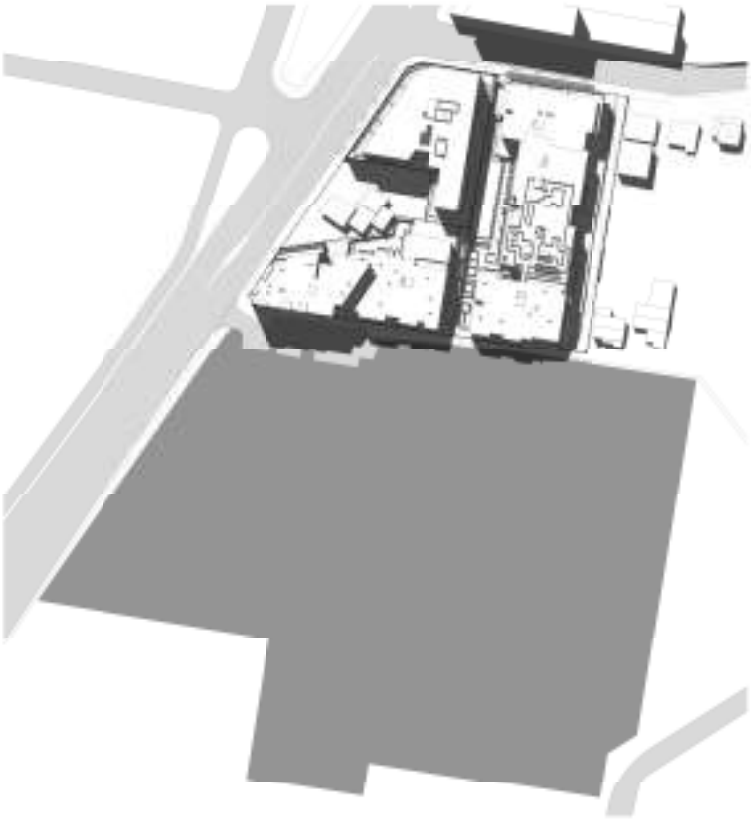

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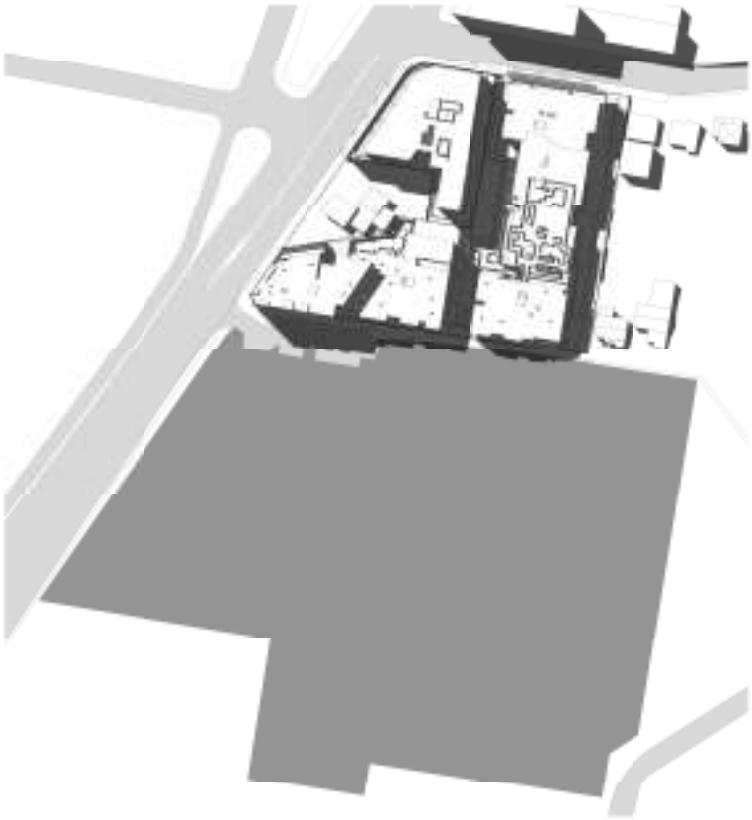

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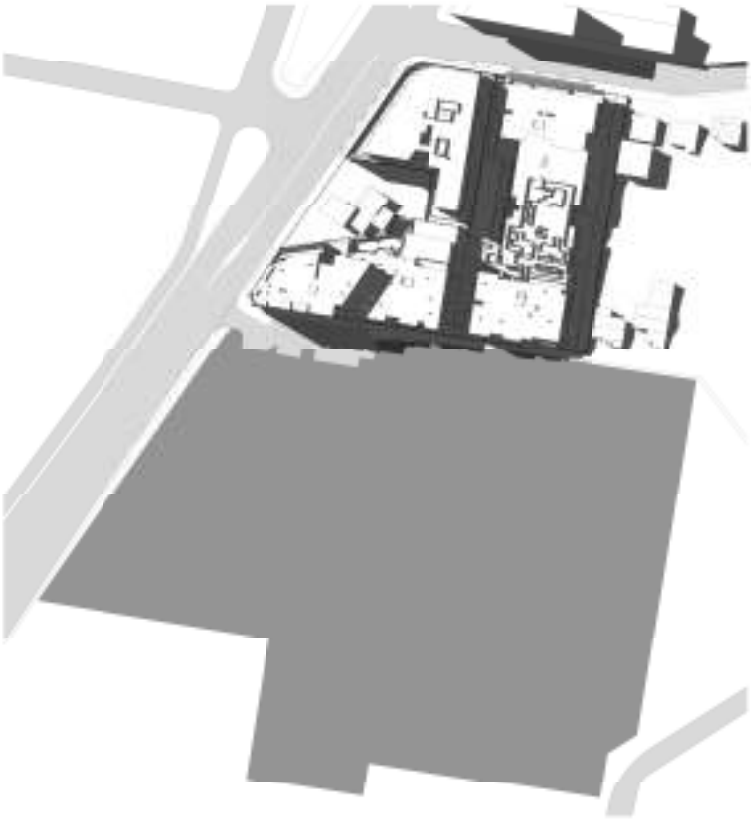

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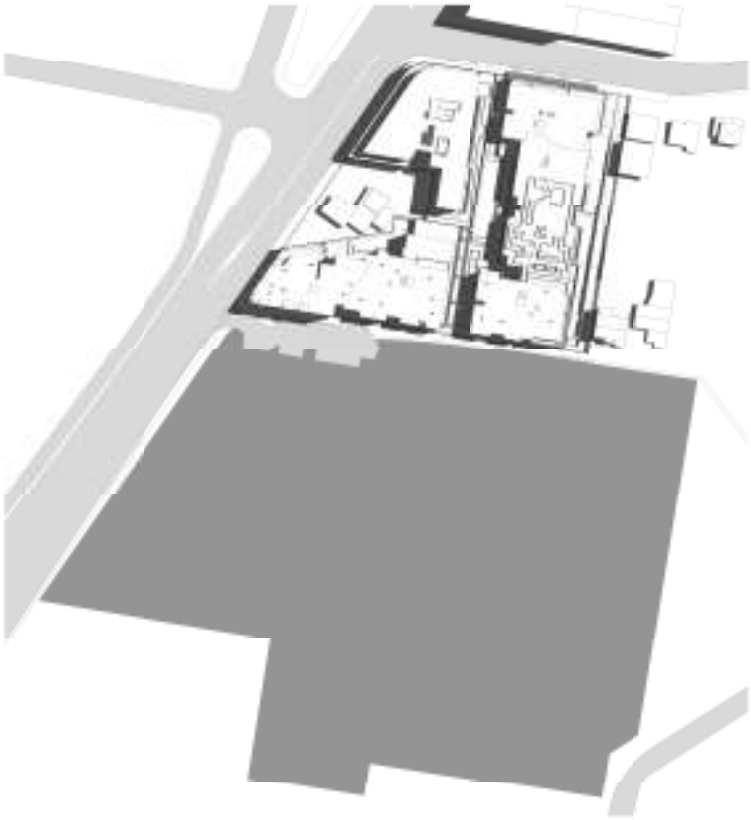

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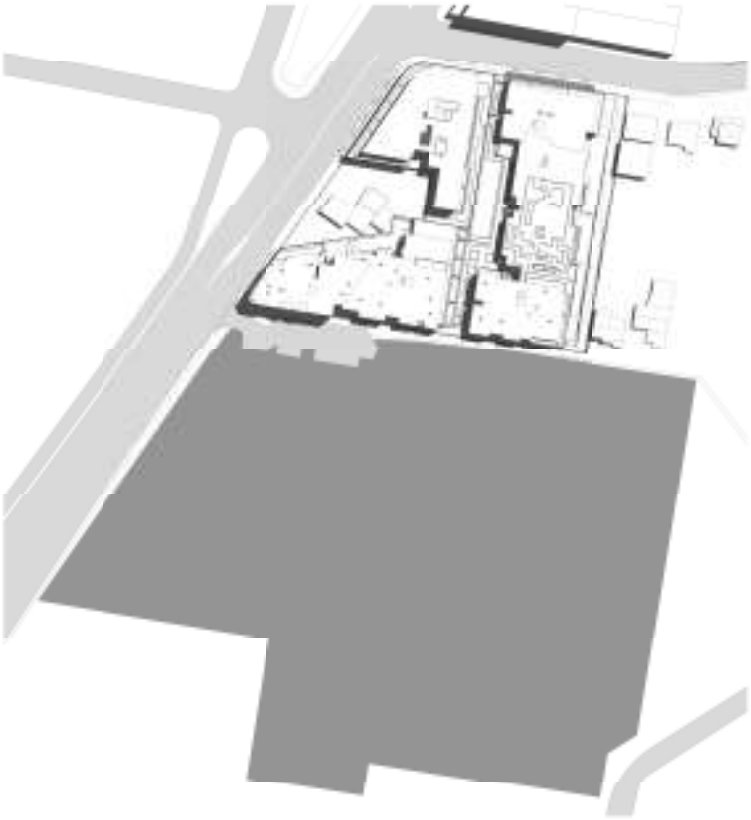

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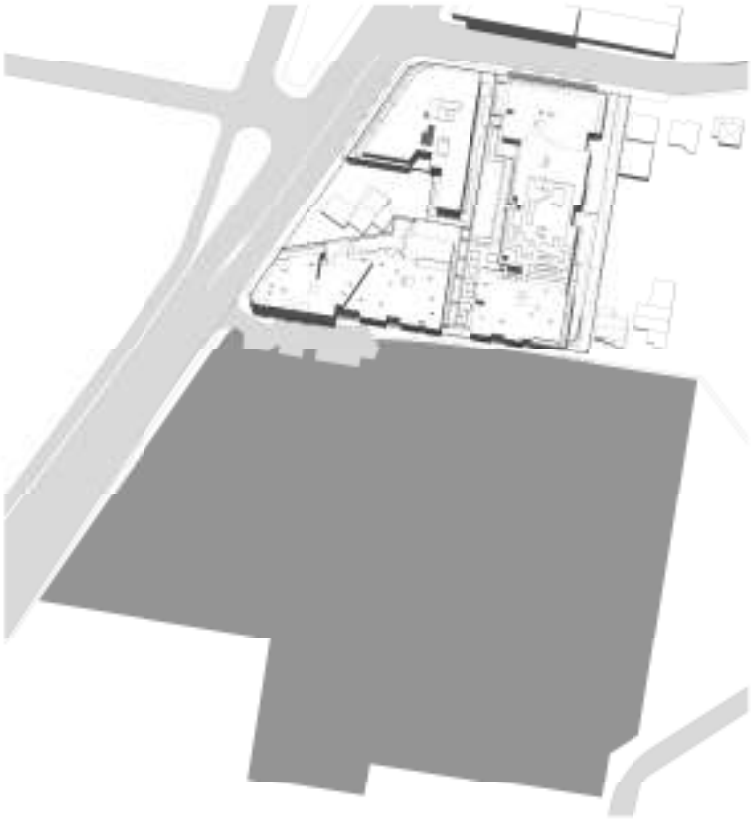

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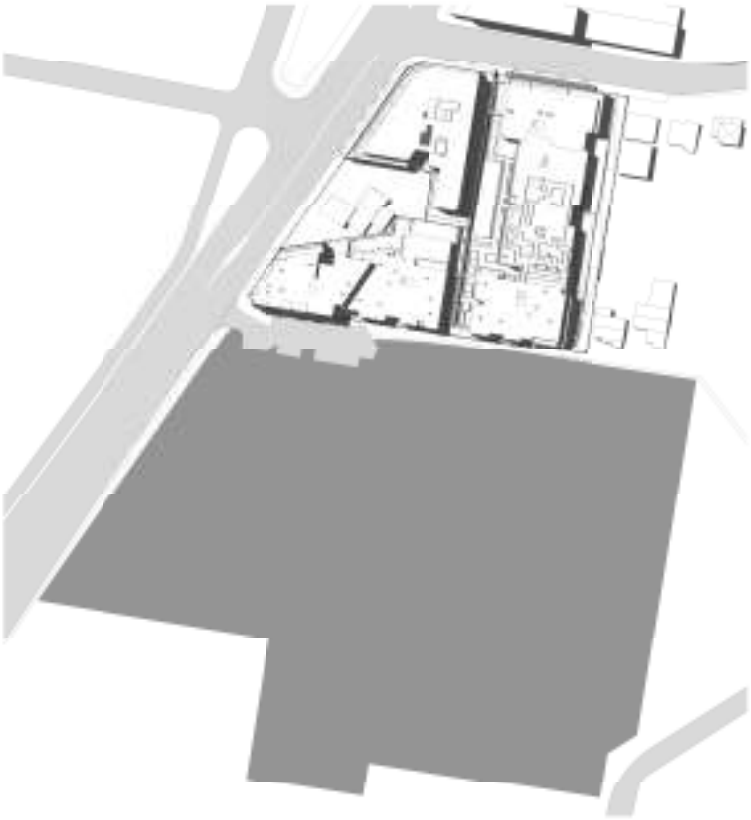

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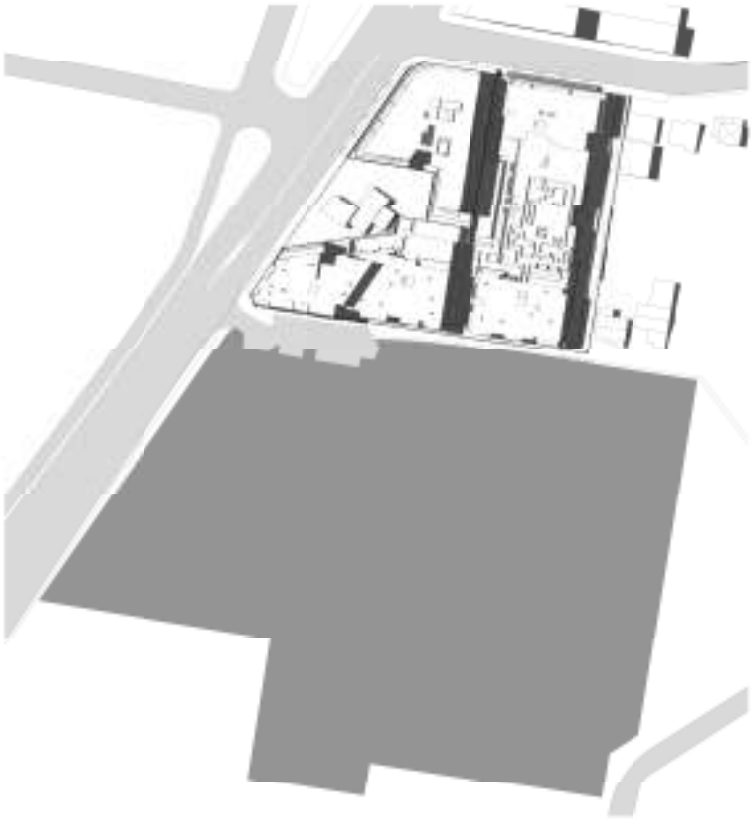

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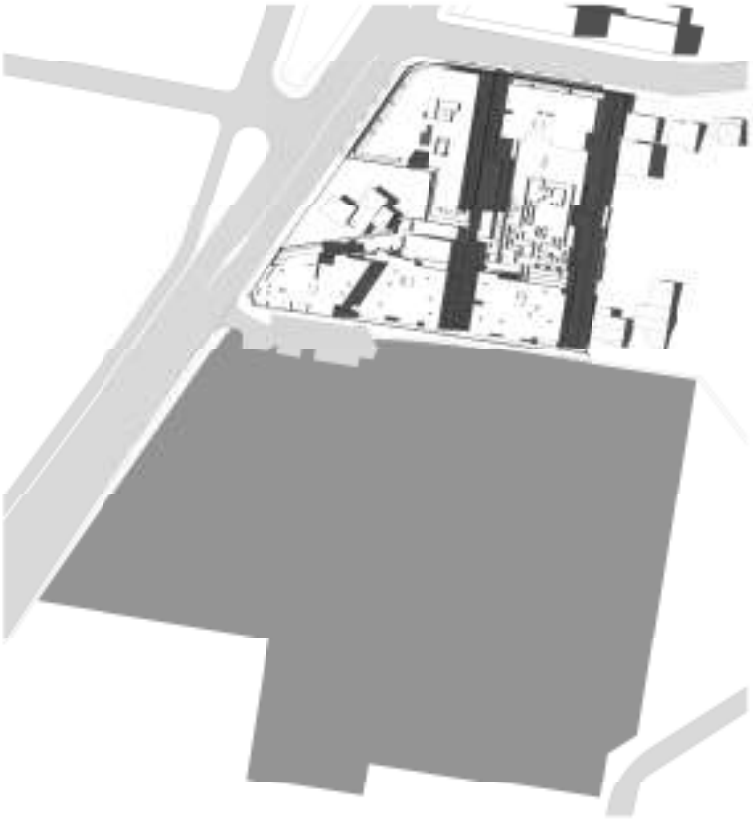

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