

Noise Feasibility Study

Proposed Mixed-Use/Residential Development

166 South Service Road

Oakville, Ontario

Prepared for:

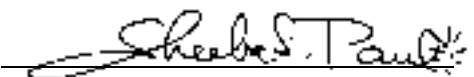
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1 Introduction and Summary

HGC Engineering was retained by 166 South Service Inc. to conduct a noise feasibility study for a proposed mixed-use/residential development located at 166 South Service Road in Oakville, Ontario. The study is required by the municipality as part of the approvals process.

The primary source of noise is road traffic on the Queen Elizabeth Way (QEW). Rail traffic on the Canadian National (CN) railway to the south of the site as well as road traffic on Trafalgar Road to the east and Cross Avenue to the south are secondary sources of noise. Road traffic data was obtained from the Ministry of Transportation (MTO), Region of Halton, and the Town of Oakville. Rail traffic data was obtained from Metrolinx and CN personnel. Traffic data was used to predict future traffic sound levels at the proposed buildings. The predicted sound levels were evaluated with respect to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP), Region and Town.

The study finds that the traffic noise exceeds the MECP sound level criteria during daytime and nighttime hours at the proposed development. Central air conditioning is required for the proposed buildings. Upgraded building and glazing constructions are required for the proposed buildings. When detailed floor plans and building elevations are available for the proposed buildings, the window glazing requirements should be refined based on actual window to floor area ratios.

Sound level impacts from the existing neighbouring commercial/retail uses were also investigated and were determined to have the potential to exceed the background sound levels during a worst-case operational scenario. Mitigation in the form of architectural solutions, such as utilizing balconies of appropriate height to mitigate sound levels at the façades of the buildings are recommended if specific commercial uses are to remain. Detailed noise studies are recommended for each building as the development proposal proceeds.

Associated acoustical requirements are specified in this report. Warning clauses are recommended to inform future residents of the road traffic noise impacts, the presence of the neighbouring commercial facilities and to address sound level excesses.

2 Site Descriptions and Sources of Sound

An aerial photo showing a key plan is attached as Figure 1 also showing the surrounding land uses. A proposed site plan prepared by Sweeny & Co Architects dated January 18, 2022 is included as Figure 2. The proposed development will consist of three residential towers: 50-storeys (Tower 1) with a 6-storey podium; 58-storeys (Tower 2) and 44-storeys (Tower 3) connected by a 6-storey podium. Six levels of underground parking are expected to be provided beneath the towers. The ground floors of the proposed buildings are proposed to include primarily retail uses. The 6-storey podium associated with Tower 1 is proposed to include office uses with residential suites beginning on the 7th floor of Tower 1. For Towers 2 and 3, residential suites begin on the 2nd floor. The 6th floor of all of the buildings are proposed to include amenity spaces. Appendix C includes the preliminary drawings for the proposed development.

The site is located at 166 South Service Road in Oakville, Ontario. Currently the subject site includes various commercial buildings which are to be removed. The remaining surrounding lands are primarily existing commercial/industrial land uses including: Holiday Inn Oakville and an office building to the northeast; Value Village, Famijoy Supermarket, and mixed commercial uses to the southwest; a car wash among other commercial buildings to the southeast; and the Oakville GO Station further to the southeast. A site visit was conducted to investigate the noise sources associated with the surrounding uses and is further discussed in Section 6.0.

3 Sound Level Criteria

3.1 Road and Rail Traffic Noise

Guidelines for acceptable levels of road and rail traffic noise applicable to residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, release date October 21, 2013 and are listed in Table 1 below. The Federation of Canadian Municipalities (FCM) and Railway Association of Canada (RAC) “Guidelines for New Development in Proximity to Railway Operations”, dated May 2013 (RAC/FCM guidelines were also reviewed dated November 2006). The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table 1: MECP Road and Rail Traffic Noise Criteria [dBA]

Space	Daytime L_{EQ} (16 hour) Road/Rail	Nighttime L_{EQ} (8 hour) Road/Rail
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA / 40 dBA	45 dBA / 40 dBA
Inside Bedrooms	45 dBA / 40 dBA	40 dBA / 35 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the sound level in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

Indoor guidelines for rail noise are 5 dBA more stringent than for road noise, to account for the low frequency (rumbling) character of locomotive sound, and its greater potential to transmit through exterior wall/window assemblies.

A central air conditioning system as an alternative means of ventilation to open windows is required for all dwellings where nighttime sound levels outside bedroom/living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom/living/dining room windows exceed 65 dBA.

Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom/living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom/living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of bedroom/living/dining room window sound level is greater than 55 dBA due to nighttime and greater than 60 dBA during the daytime hours due to rail traffic noise.

Warning clauses are required to notify future residents of possible excesses when nighttime sound levels exceed 50 dBA at the plane of the bedroom/living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom/living/dining room window due to rail traffic.

4 Traffic Noise Predictions

4.1 Road Traffic Data

Road traffic data for the QEW was obtained from the MTO in the form of summer average daily traffic (SADT) for the year 2016 and is provided in Appendix B. The data was projected to the year 2032 using a 2.5%/year growth rate. A daytime commercial vehicle percentage of 14% was split into 5.4% medium trucks and 8.6% heavy trucks, was used in the analysis. A day/night split of 67%/13% and a posted speed limit of 100 km/h were used in the analysis.

Road traffic data for Cross Avenue was obtained from the Town of Oakville. The data was provided in the form of peak hour turning movement counts for the year 2020 and is provided in Appendix B. The traffic data was projected to the year 2032 using a 2.5% growth rate. A commercial vehicle percentage for Cross Avenue of 5.4% was provided and split into 2.1% medium trucks and 3.3% heavy trucks. A day/night split of 90%/10% was assumed in the analysis. A posted speed limit of 50 km/h was used for Cross Avenue.

Ultimate road traffic information for Trafalgar Road was obtained from Region of Halton personnel and is provided in Appendix A. A posted speed limit of 50 km/h was used for Trafalgar Road. An existing commercial vehicle percentage of 2.7% was obtained from the Region of Halton, split into 1.5% medium trucks and 1.2% heavy trucks was also used in the analysis, along with a day-night split of 90%/10%. Table 2 summarizes the road traffic data used in the analysis.

Table 2: Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
QEW <i>Projected to 2032</i>	Daytime	202 296	12 702	20 230	235 228
	Nighttime	99 638	6 256	9 964	115 858
	Total	301 934	18 958	30 194	351 086
Cross Avenue <i>Projected to 2032</i>	Daytime	16 979	377	592	17 948
	Nighttime	1 887	42	66	1 995
	Total	18 866	419	658	19 943
Trafalgar Road <i>Ultimate</i>	Daytime	24 082	371	297	24 750
	Nighttime	2 676	41	33	2 750
	Total	26 758	412	330	27 500

4.2 Rail Traffic

Rail traffic data for the CN Oakville Subdivision was obtained from CN railway and Metrolinx/GO Transit personnel and is attached in Appendix B. This line is used for way freight and passenger operations and is classified as a principal main line. The maximum permissible train speed for way freight trains in the area of the site is 97 kph (60 mph), 129 kph (80 mph) for passenger, and 153 kph (95 mph) for GO trains. In conformance with CN and GO Transit assessment requirements, the maximum speeds, maximum number of cars and locomotives per train were used in the traffic noise analysis to yield a worst-case estimate of train noise. The data was projected to the year 2032 using a 2.5% per year growth rate. Table 3 summarises the Metrolinx and CN rail traffic data used in the analysis.

Table 3: Rail Traffic Data Projected to the Year 2032

Type of Train	Number of Trains Day/ Night	Number of locomotives	Number of cars	Max Speed (KPH)
Way Freight	5.6 / 2.9	4	25	56
Passenger	18.3 / 0.0	2	10	56
GO	165 / 29.7	1	12	129
GO	54.3 / 12.3	2	12	129

Note: All GO trains are modelled as diesel, as per Metrolinx requirements

4.3 Traffic Noise Predictions

To assess the levels of traffic noise which will impact the site in the future, predictions were made using a numerical computer modeling package (*Cadna-A version 2022 build 189.5221*) due to the complexity of the site. The model is based on the methods from ISO Standard 9613-2.2, “*Acoustics - Attenuation of Sound During Propagation Outdoors*”, which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures.

The road and rail noise sources have been included in the model using line sources included in Cadna/A. Road traffic noise sources were calibrated using STAMSON 5.04. The rail traffic noise reference levels are based on the Federal Transit Authority (FTA) noise prediction manual (2018) which contains data on the modern vehicle and rolling stock noise emissions. Our experience suggests that road and rail sound levels predicted by Cadna are reasonably accurate.

Predictions of overall sound levels from all road and rail sources were made at various representative façade locations throughout the site. The predicted sound levels from road and rail traffic impacting the proposed development are summarized in the following tables at each façade. Appendix C shows the figures showing the predicted sound level from road and rail traffic along each façade of the proposed buildings. The 6-storey podium below Tower 1 is proposed to include office use and has not been considered in the analysis below.

Table 4: Daytime Predicted Future Sound Levels [dBA], Without Mitigation

Building	Façade	Daytime - at Façade L _{EQ(16)}		Daytime - at Façade Total L _{EQ(16)}
		Road	Rail	
Tower 1 50-Storey	Northwest	80	<55	80
	Northeast	77	57	77
	Southeast	64	58	65
	Southwest	77	56	77
6-Storey Podium	7 th Floor OLA	--	--	63*
Tower 2 58-Storey	Northwest	75	<55	75
	Northeast	74	59	74
	Southeast	60	61	64
	Southwest	72	57	72
Tower 3 44-Storey	Northwest	73	<55	73
	Northeast	71	60	71
	Southeast	59	62	64
	Southwest	71	57	71
6-Storey Podium	Northwest	74	<55	74
	Northeast	74	60	74
	Southeast	59	62	63
	Southwest	71	59	71
	Interior Northwest	72	<55	72
	Interior Southwest	71	<55	71
	7 th Floor OLA between Towers 2 and 3	--	--	68*
	7 th Floor OLA to SW of Tower 3	--	--	71*

Note: *With a minimum 1.07 m solid parapet wall

Table 5: Nighttime Predicted Future Sound Levels [dBA], Without Mitigation

Building	Façade	Nighttime - at Façade L _{EQ(8)}		Nighttime - at Façade Total L _{EQ(8)}
		Road	Rail	
Tower 1 50-Storey	Northwest	80	<50	80
	Northeast	77	53	77
	Southeast	64	54	64
	Southwest	77	52	77
Tower 2 58-Storey	Northwest	75	<50	75
	Northeast	74	55	74
	Southeast	59	57	61
	Southwest	72	53	72
Tower 3 44-Storey	Northwest	73	<50	73
	Northeast	71	56	71
	Southeast	56	58	60
	Southwest	71	53	71
6-Storey Podium	Northwest	74	<55	74
	Northeast	74	56	74
	Southeast	58	58	61
	Southwest	71	55	72
	Interior Northwest	71	<50	72
	Interior Southwest	71	51	70

5 Traffic Noise Recommendations

The predictions indicate that traffic sound levels exceed MECP limits during daytime and nighttime hours at the proposed façades of the buildings. The following recommendations are provided.

5.1 Outdoor Living Areas

There are outdoor amenity spaces indicated on the drawings located on the 7th floor of the podium for Tower 1, on the podium between Towers 2 and 3, and to the southwest of Tower 3. The predicted sound level at all of the common outdoor amenity terraces were predicted with a minimum 1.07 m high solid parapet wall.

The maximum predicted sound level on the identified amenity spaces located on the podium for Tower 1 and on the podium between Towers 2 and 3 is 68 dBA, well in excess of the MECP limit of 55 dBA. Acoustic barriers on these terraces would need to exceed 4.0 m in height in order to reduce sound levels to below 60 dBA, which is not considered feasible technically or economically for the project. Consideration could be given in detail design to integrating some smaller structures, screens or landscaping features to create quieter pockets or zones on this terrace. A unique warning clause is suggested below to advise tenants that noise levels on this terrace will be high.

For the amenity space located to the southwest of Tower 3, the sound level is predicted to be 71 dBA, well in excess of the MECP limit of 55 dBA. With an acoustic barrier 3.3 m in height, the predicted sound level in this amenity space can be reduced to 59 dBA. The 4 dBA sound level excess is acceptable to the MECP if it is acceptable to the municipality.

As a general note, the wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m². The walls may be constructed from a variety of materials such as wood, brick, pre-cast concrete or other concrete/wood composite systems or transparent materials provided that it is free of gaps or cracks within or below its extent.

The dwelling units may have balconies that are less than 4 m in depth. These balconies are not considered outdoor living areas and do not need to be assessed under MECP guidelines.

5.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

The predicted sound levels at the proposed buildings will exceed 65 dBA during the daytime hours and 60 dBA during the nighttime hours, and thus air conditioning systems are required so that windows may remain closed.

Window or through-the-wall air conditioning units (similar to motel style) are not recommended for any residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. This can be achieved if the heating and cooling within each unit is housed in its own closet with an access door for maintenance. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300, as applicable.

5.3 Building Façade Constructions

Future sound levels at the proposed buildings will exceed 65 dBA during the day and 60 dBA during the night due to road and rail traffic noise. MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

Detailed glazing requirements for different facades and spaces could be considered in value engineering, if required, when detailed floor plans and building elevations are available.

Exterior Wall Constructions

The exterior walls of the proposed buildings may include precast/masonry panel portions, as well as spandrel glass panels within an aluminum window system. In this analysis, it has been assumed that sound transmitted through elements other than the glazing elements is negligible in comparison. For this assumption to be true, spandrel or metal panel sections must have an insulated drywall partition on separate framing behind.

Exterior Doors

There may be swing doors and some glazed sliding patio doors for entry onto the balconies from living/dining/bedrooms and some bedrooms. The glazing areas on the doors are to be counted as part of the total window glazing area. If exterior swing doors are to be used, they shall be insulated metal doors equipped with head, jamb and threshold weather seals.

Acoustical Requirements for Glazing

At the time of this report, detailed floor plans and elevations are under development. Assuming a typical window to floor area of 50% (40% fixed and 10% operable) for the living/dining rooms and 40% (30% fixed and 10% operable) bedrooms, the minimum acoustical requirement for the basic window glazing, including glass in fixed sections, swing or sliding doors, and operable windows, is provided in Table 6.

Table 6: Required Minimum Glazing STC Proposed Buildings

Building	Façade	Preliminary Glazing STC ^{1, 2}
Tower 1 50-Storeys	Northwest	STC-45
	Northeast	STC-42
	Southeast	STC-33
	Southwest	STC-42
Tower 2 58-Storeys	Northwest	STC-40
	Northeast	STC-39
	Southeast	STC-33
	Southwest	STC-37
Tower 3 44-Storeys	Northwest	STC-38
	Northeast	STC-37
	Southeast	STC-33
	Southwest	STC-36
6-Storey Podium	Northwest	STC-39
	Northeast	STC-39
	Southeast	STC-33
	Southwest	STC-37
	Interior Northwest	STC-36
	Interior Southwest	STC-36

Note:

¹ Based on 50% window to floor area ratio for living/dining rooms and 40% for bedrooms.

² STC requirement refers to fixed glazing. Small leaks through operable doors and windows are assumed, however, tight weather seals should be provided to reduce such leakage to the extent feasible.
 OBC – Ontario Building Code

The northwest, and northeast, and southwest façades of Towers 1, and northwest façade of Tower 2 have significant STC requirements. It may be difficult to find suitable STC constructions. It is suggested that the window to floor area ratios be minimized as much as possible along these façades. Sliding patio doors should not be included into bedrooms, swing doors are more suitable for suites with exposure to the QEW.

These calculations assume insignificant sound transmission through the walls in comparison with the windows. Exterior walls that are not glazed should have sufficient acoustical insulation value such that the noise transmitted through is negligible in comparison with the windows. These aspects can be verified as part of the detail design of the envelope, as needed.

Note that acoustic performance varies with manufacturer's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required. Acoustical test data for the selected assemblies should be requested from the suppliers, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Further Review

When detailed floor plans and building elevations are available for the buildings, the glazing requirements should be refined based on actual window to floor area ratios.

5.4 Warning Clauses

The guidelines recommend that warning clauses be included in the development agreements, purchase and tenancy agreements and offers of the purchase and sale for the dwelling units. These are provided below.

Suitable wording for future dwellings with minor sound level excesses is given below.

Type A:

Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road and rail traffic may continue to be of concern, occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria.

Suggested wording for future dwellings requiring central air conditioning systems is given below.

Type B:

This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

Suggested wording for future dwellings where terraces cannot be sufficiently mitigated against traffic noise.

Type C:

Due to site constraints, an acoustical barrier to shield the outdoor amenity terrace from the road and rail traffic could not be accommodated. Noise levels on this terrace are expected to be well above the sound level limits of the Ministry of the Environment, Conservation and Parks.

5.5 Impact of the Development on Itself

Section 5.8.1.1 of the Ontario Building Code (OBC), released on January 1, 2020, specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) or Apparent Sound Transmission Class (ASTC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50 or ASTC-47. Suite separation from a refuse chute or elevator shaft must meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising construction and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

5.6 Impact of the Development on the Environment

Sound levels from noise sources such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception. Based on the levels observed during our site visit, the typical minimum ambient sound levels in the area are expected to be 50 dBA or more during the day and 45 dBA or more at night. Thus, any electro-mechanical equipment associated with this development (e.g. emergency generator testing, fresh-air handling equipment, etc.) should be designed such that they do not result in noise impact beyond these ranges.

6 Assessment of Stationary Sources of Sound at the Proposed Residential Units

6.1 Noise Source Description

There are existing commercial facilities surrounding the site including: Holiday Inn Oakville and an office building to the northeast; Value Village, Famijoy Supermarket, and mixed commercial uses to the southwest; a car wash among other commercial buildings to the southeast; and the Oakville GO Station further to the southeast.

The rooftop mechanical equipment (air conditioning units), car wash bays, and trucks arriving for deliveries (primarily at the grocery store) are potentially significant stationary sources of sound. A site visit was conducted in January 2022 to investigate the acoustical environment. Sensitive receptor locations were taken at the façades of the proposed buildings.

At the Oakville GO Station, when trains were operated in reverse and when the train is about to leave the station, a warning bell is operated. Communications with GO transit staff indicate that these bells are safety devices used for warning purposes only, and are thus exempt from noise assessment under MECP guidelines. Other occasional noises emitted from this station (such as occasional announcements over the outdoor PA system) are not anticipated to be an issue.

6.2 Criteria for Acceptable Sound Levels

6.2.1 Stationary Noise Criteria

Under MECP guidelines, the acoustical environment in this area is classified as “urban” or “Class I”, as background sound levels are set by significant volumes of road traffic on surrounding roadways during daytime and nighttime hours.

Stationary sources of sound are collectively defined as all sources that emit sound within a commercial or industrial facility boundary. The facilities to the north, northwest and west are therefore classified as a stationary source of sound.

MECP Guideline NPC-300 is the applicable guideline for use in investigating Land Use Compatibility issues with regard to noise. A commercial facility is classified in NPC-300 as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. A stationary noise source encompasses the noise from all the activities and equipment within the property boundary of a facility including regular on-site truck traffic for deliveries, material handling and mechanical equipment. In terms of background sound, the development is located in an urban acoustical environment which is characterized by an acoustical environment dominated by road traffic and human activity.

Stationary Source (Steady Sound)

NPC-300 is intended for use in the planning of both residential and commercial/industrial land uses and provides the acceptability limits for sound due to commercial operations in that regard. The facade of a residence (i.e., in the plane of a window), or any associated usable outdoor area is considered a sensitive point of reception (within 30 m of a dwelling façade). NPC-300 stipulates that the exclusionary sound level limit for a stationary noise source in urban Class 1 and 2 areas are taken to be 50 dBA during daytime and evening hours (07:00 to 19:00 and 19:00 to 23:00), and 45 dBA during nighttime hours (23:00 to 07:00) at the plane of the windows of noise sensitive spaces. If the background sound levels due to road traffic exceed the exclusionary limits, then that background sound level becomes the criterion. The background sound level is defined as the sound level that occurs when the source under consideration is not operating, and may include traffic noise and natural sounds.

Commercial activities such as the occasional movement of customer/employee vehicles, deliveries to conveniences stores and restaurants and garbage collection are not of themselves considered to be significant noise sources in the MECP guidelines. Accordingly, these sources have not been considered in this study.

Hourly daytime traffic data was obtained for the QEW from the MTO and for Trafalgar Road from the Region of Halton. Hourly daytime traffic data was not available for Cross Avenue. Using the current traffic volumes obtained from the Town, the traffic data was applied to a generic 24 hour traffic pattern developed by the US Department of Transportation, Federal Highways Administration contained in the report titled “Summary of National and Regional Travel Trends 1970 – 1995” dated

May 1996. The traffic volumes were then used to predict sound levels at the residential receptors during the day/nighttime hours to determine the minimum hour background sound levels at those locations due to the traffic on the public roadways.

The minimum hour traffic volumes used in the analysis are summarized in the following table.

Table 7: Minimum Hourly Traffic Volumes on Surrounding Roadways

Roadway	Hourly Data		Commercial Vehicle %
	Day	Night	
QEW	3 921	922	14
Trafalgar Rd	1 099	59	2.7
Cross Ave	395	91	5.4

The predicted quietest daytime hour and nighttime hour sound levels at the facades of the proposed residences, which will be exposed to the commercial facilities are found to be higher than the MECF exclusionary limits in the daytime hours for the majority of facades with exposure to the QEW and Cross Avenue. As such, the sound level limits as summarized in Table 8 are therefore used in the following sections of this report as the applicable criteria for each façade of the proposed residential buildings.

Table 8: Applicable Sound Level Limits, L_{EQ} (dBA) for Class I Areas

Building	Façade	Sound Level Limits	
		Daytime (07:00 to 23:00)	Nighttime (23:00 to 07:00)
Tower 1 50-Storey Building	Northwest	69	63
	Northeast	65	59
	Southeast	53	47
	Southwest	66	60
	7 th Floor Amenity	56*	--
Tower 2 58-Storey Building	Northwest	66	60
	Northeast	64	58
	Southeast	53	47
	Southwest	63	57
Tower 3 44-Storey Building	Northwest	66	59
	Northeast	62	56
	Southeast	52	45
	Southwest	64	58
6-Storey Podium	Northwest	62	56
	Northeast	59	53
	Southeast	54	51
	Southwest	64	57
	Interior Northwest	64	58
	Interior Southwest	63	58
	7 th Floor Amenity between Towers 2 and 3	62*	--
	7 th Floor SW of Tower 3	65*	--

Note: *With minimum 1.07 m solid parapet

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may be residual audibility during periods of low background sound.

6.3 Stationary Source Assessment

Predictive noise modelling was used to assess the potential sound impact of the nearby land uses at the closest sensitive receptors. The noise prediction model was based on sound emission levels for the nearby noise sources, assumed operational profiles (during the day and night), and established

engineering methods for the prediction of outdoor sound propagation. These methods include the effects of distance, air absorption, and acoustical screening by barrier obstacles.

Sound emission data for the rooftop equipment was obtained from HGC Engineering project files for typical commercial facilities. The source levels associated used in the analysis is listed in Table 9 below.

Table 9: Source Sound Power Levels [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]							
	63	125	250	500	1k	2k	4k	8k
Exhaust Fan	84	88	86	85	80	80	76	74
Car Wash Bay	85	76	75	77	76	79	81	83
Vacuum	86	74	87	82	84	89	90	88
Condenser Fans	84	79	78	77	76	70	63	59
Tractor Trailer Acceleration	101	100	94	96	97	95	91	86
Medium Truck Acceleration	108	90	92	90	94	91	84	77
Medium Truck Reefer	82	77	78	67	67	64	58	50
Medium Truck Idle	72	68	70	65	72	69	60	52
Restaurant Exhaust Fan	86	74	87	82	84	89	90	88
Lennox KG060 (A-Weighted)	--	67	72	77	76	73	68	61
Lennox KG120 (A-Weighted)	--	76	79	84	83	79	73	66
Lennox KG150 (A-Weighted)	--	77	80	85	84	79	74	66
Lennox KG240 (A-Weighted)	--	79	84	88	89	85	82	73
Cooling Tower	95	91	86	86	84	85	86	85

The above outlined sound levels and site features were used as input to a predictive computer model. The software used for this purpose (*Cadna-A Version 2021 build: 187.5163*) is a computer implementation of ISO Standard 9613-2.2 “Acoustics - Attenuation of Sound During Propagation Outdoors.” The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The following information and assumptions were used in the analysis.

Commercial Buildings

- The rooftop units were assumed to be located as shown in Figure 4. The majority of rooftop units were assumed to be 1 m to 2.5 m tall with the exception of the condenser fans which were 4.0 m in height.
- Lines indicate truck movements.
- Typical hours of operation for the majority of the commercial buildings are daytime only (07:00 to 23:00).

Receptors

- Façades of proposed residential development.

Assumed daytime worst-case scenario:

- All rooftop HVAC equipment operating for 40 minutes in an hour;
- Two medium trucks arriving for deliveries at the Famijoy idling for 10 minutes each, with one truck with a “reefer” operating for 20 minutes in an hour;
- Two tractor trailers arriving for deliveries at the Home Depot;
- All car wash bays (coin operated) operating for 30 minutes each;
- All vacuums operating for 15 minutes each at the car wash;

Assumed night-time worst-case scenario:

- All rooftop HVAC equipment operating for 20 minutes in an hour;
- Two tractor trailers arriving for deliveries at the Home Depot;
- All car wash bays (coin operated) operating for 10 minutes each;
- All vacuums operating for 10 minutes each at the car wash;

6.4 Results

The calculations consider the acoustical effects of distance and shielding by the buildings. The sound levels due to the rooftop mechanical equipment at the façades of the proposed buildings are summarized in the following table and Figures 5 and 6.

Table 10: Predicted Stationary Source Sound Levels at the Proposed Residential Buildings [dBA]

Building	Façade	Criteria Day/Night	Daytime	Nighttime
Tower 1 50-Storey Building	Northwest	69 / 63	36	<30
	Northeast	65 / 59	44	41
	Southeast	53 / 47	48	44
	Southwest	66 / 60	48	44
	7 th Floor Amenity	56*	47*	
Tower 2 58-Storey Building	Northwest	66 / 60	40	35
	Northeast	64 / 58	49	46
	Southeast	53 / 47	51	47
	Southwest	63 / 57	50	45
Tower 3 44-Storey Podium	Northwest	66 / 59	51	44
	Northeast	62 / 56	52	49
	Southeast	52 / 45	53	50
	Southwest	64 / 58	54	49
6-Storey Podium	Northwest	62 / 56	39	35
	Northeast	59 / 53	53	50
	Southeast	50 / 45	54	51
	Southwest	64 / 57	56	50
	Interior Northwest	64 / 58	52	43
	Interior Southwest	63 / 58	50	45
	7 th Floor Amenity between Towers 2 and 3	62*	46*	--
	7 th Floor SW of Tower 3	65*	50*	--

The results of this analysis indicate that the predicted steady sound levels due to the surrounding facilities has the potential to be in excess of the sound level criteria by up to 4 dBA during the day and 6 dBA during the night considering a worst-case operational scenario.

6.5 Discussion and Recommendations with Regard to the Commercial Facilities

While the MECP does not generally accept central air conditioning or mechanical ventilation as mitigation measures for stationary noise sources per se, it is noted that central air conditioning is likely to be installed in the proposed buildings for the residential units so that the windows can remain closed against both traffic and stationary noise.

NPC-300 encourages noise mitigation at the source if possible. In this case, physical noise source mitigation options are quite limited due to the nature of the nearby commercial and residential buildings and the height of the residential receptors.

Sound level excesses may occur along the southeastern façades of the 6-storey podium connecting Towers 2 and 3, and Tower 3 with direct exposure to the coin operated car wash during the day and night. The excesses are primarily due to operations of the car wash located directly to the southeast and commercial uses to the west of the site.

One option is to address the excesses at these façades of the buildings through modification to the buildings themselves, especially if the proposed development is to proceed with the existing commercial uses remaining as is. The following are some conceptual mitigation measures to achieve the criteria.

- Spaces along the southeast façades of the 6-storey podium connecting Towers 2 and 3, and Tower 3, could be designed to include windows into non-sensitive spaces (e.g. office space, indoor amenity space, etc.).
- Minor excesses along 3, could also include receptor mitigation in the form of architectural solutions such as utilizing balconies of appropriate height (solid parapet made of glass) to shield any windows to sensitive spaces behind for the affected buildings. As this is an area in transition, the surrounding uses may change.
 - If the coin operated car wash and neighboring commercial uses ceased operation prior to occupancy of the proposed development, there would be no excesses along the

façades of the proposed development. Figure 7 indicates the areas for potential noise mitigation.

- Other options include mitigating noise at the source which implies replacement of existing rooftop units with quieter models or enclosing the rooftop units, or relocating or removing the coin operated car wash from the current location. These options will need the co-operation of the commercial uses.

A warning clause should be included in purchase and tenancy agreements to inform future occupants of the existing commercial facilities. Suggested wording is included below:

Type D:

Purchasers/tenants are advised that due to the proximity of nearby commercial facilities, sound from those facilities may at times be audible.

7 Summary and Recommendations

The following recommendations are provided with regard to noise control. Please refer to previous sections of this report where these recommendations are discussed in more detail.

Transportation Noise

1. A 3.3 m acoustic barrier will reduce the sound level in the amenity space to the southwest of Tower 3 to reduce the sound level to 59 dBA. For the other common amenity spaces, acoustic barriers exceeding 4.0 m in height would be required to reduce sound levels in those spaces to less than 60 dBA, which is not considered feasible. A unique warning clause is recommended for these amenity spaces.
2. Central air conditioning is required for all of the proposed buildings.
3. Upgraded building constructions are required for the façades of the proposed buildings as indicated in Section 5.3.
4. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform the future owners/residents of the presence of the roadways, railway

and the nearby commercial operations.

5. When detailed drawings are available, at SPA or as a condition, a detailed noise study should be conducted to refine the glazing constructions based on actual window to floor area ratios. It is suggested that the window to floor area ratios be minimized as much as possible along the façades with exposure to the QEW. Sliding patio doors should not be included into bedrooms, swing doors are more suitable for suites with exposure to the QEW.
6. Tarion's Builder Bulletin (B19R) requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels. Outdoor sound emissions should also be checked to ensure compliance with the Town's by-law.

Stationary Noise

1. Sound level excesses may be expected at some areas of the building façades due to existing stationary noise sources, primarily rooftop mechanical equipment from surrounding buildings (grocery store building to the west) and an existing coin operated car wash to the southeast. Conceptual options are provided.
2. A site visit of the commercial buildings to the west of the proposed development should be conducted during the summer months to determine the make and model numbers of the rooftop mechanical units and to conduct sound level measurements of those units to confirm the sound level assumptions, confirm the need for mitigation and inform the design of that mitigation should it be required.
3. To address the potential for audible sound from the neighbouring commercial and residential buildings and nuisance sources, specific noise warning clauses are required as indicated in the above sections of this report.

8 Conclusions

Based on the assessment presented herein, the conceptual development proposal is considered to be feasible from a noise impact perspective. Preliminary noise modelling of the nearby existing commercial facilities indicates results to be within criteria at the majority of residential facades, with the exception of façades directly facing the existing coin operated car wash. Conceptual recommendations for mitigation were provided to achieve the relevant Class I criteria. Detailed noise studies are recommended for each building as the development proposal proceeds.

Limitations

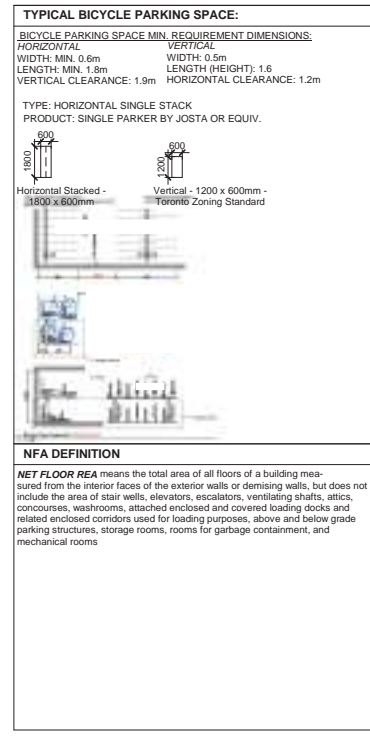
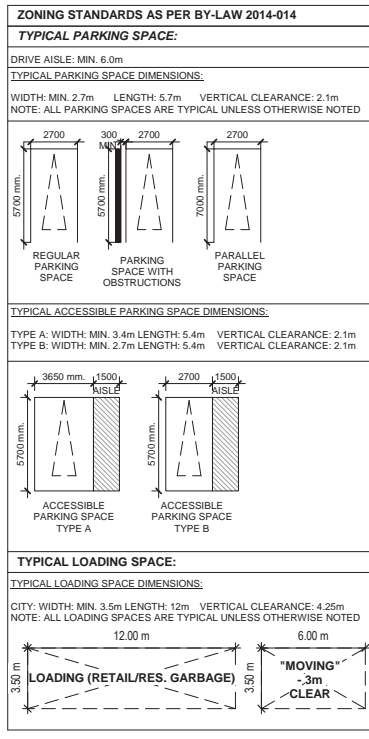
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Any conclusions and/or recommendations herein reflect the judgment of HGC Engineering based on information available at the time of preparation, and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.



Figure 1 Key Plan

ZONING REQUIREMENTS				
VEHICULAR PARKING				
TYPE	UNITS / M2	REQUIRED	PROVIDED	
Residential	1,606 units	0.5 spaces/unit	=	803
Residential Visitor	1,606 units	0.2 spaces/unit	=	322
Retail	2,013.81 m ²	1.08 per 100.00 m ²	=	22
Office	3,872.52 m ²	1.08 per 100.00 m ²	=	42
TOTAL				1189
				1191
BICYCLE PARKING				
TYPE	UNITS / M2	REQUIRED	PROVIDED	
Res LONG TERM	1,606 units	0.75 spaces/unit	=	1205
Res SHORT TERM	1,606 units	0.25 spaces/unit	=	402
Office LONG TERM	3,872.52 m ²	1 per 1000.00 m ²	=	4
Retail LONG TERM	2,013.81 m ²	1 per 1000.00 m ²	=	2
TOTAL BICYCLE PARKING				1613
				1613
LOADING & STAGING				
TYPE	REQUIRED	PROVIDED		
Loading (Moving) - 3.5m x 6m				3
Loading (Retail) - 0.5m x 10m				1
Loading (Res Garbage) - 3.5m x 12m				1
STAGING		155.00 m ²		174.00 m ²
RESIDENTIAL AMENITY				
TYPE	UNITS / M2	PROVIDED RATIO	PROVIDED (sqm)	
INDOOR	1,606 units	1 m ² /unit	1,649.13 m ²	
OUTDOOR	1,606 units	3 m ² /unit	4,572.37 m ²	
TOTAL RESIDENTIAL AMENITY		4 m ² /unit	6,221.50 m²	
SITE AMENITY				
TYPE	NOTES	PROVIDED (sqm)	PROVIDED (sf)	
TOTAL SITE AREA		11887.3	127,953.71 m ²	
(POPS - NOT DEDUCTED FROM SITE AREA)		4572	49,212.55 m ²	
FUTURE CONVEYANCES*		2934.4	31,595.59 m ²	
NET SITE AREA		8952.9	96,368.12 m ²	
TOTAL GFA (OAKVILLE 'NET FLOOR AREA')		106,443	1,145,740	
FSI (TOTAL SITE)		9.88		
FSI (NET SITE)		11.88		

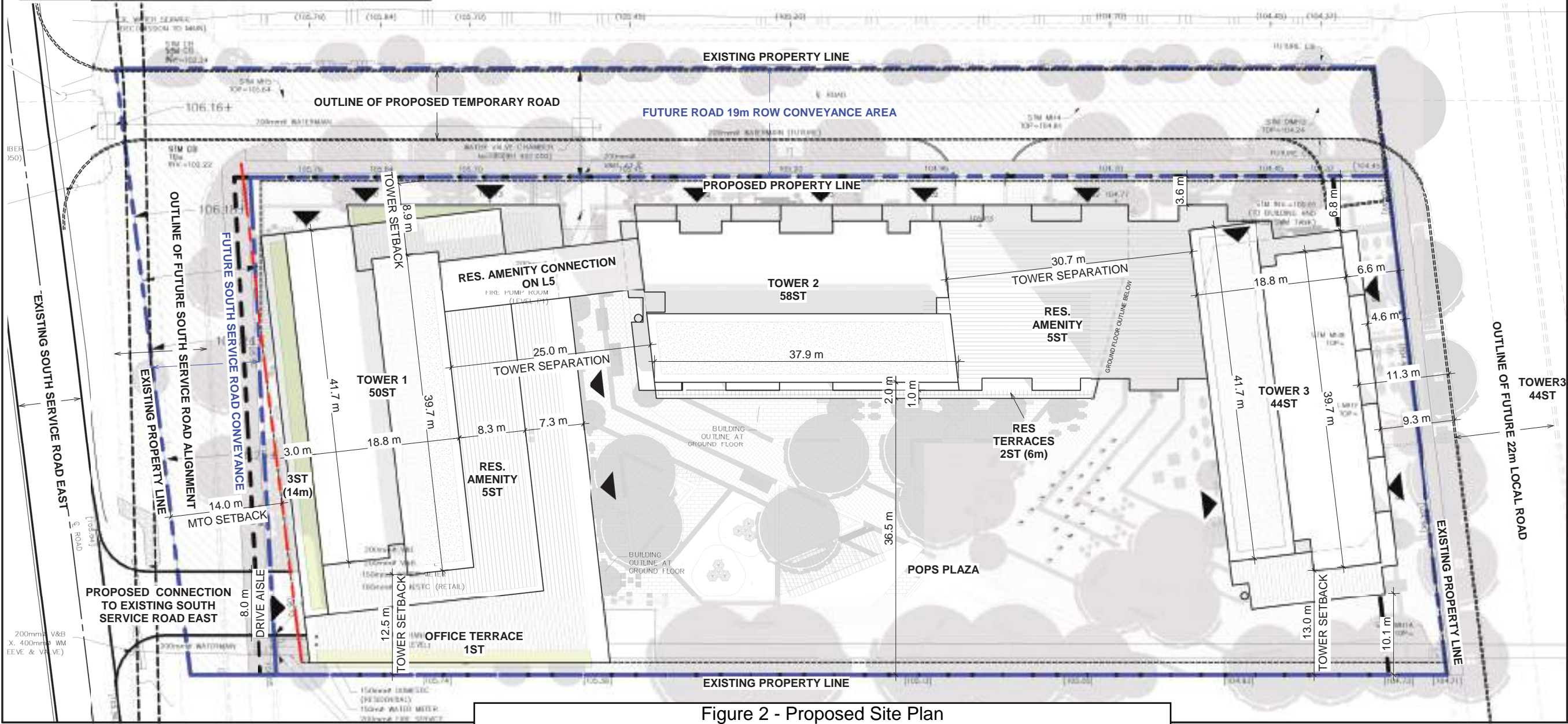


DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

This drawing shall not be used for construction purposes until signed by the consultant responsible. This drawing, as an instrument of service, is provided by and is the property of Sweeny & Co. Architects.

ISSUED
 22-05-30 ISSUED FOR REZONING



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PROJ. NAME
 166 South Service Road
 South Service Road & Trafalgar

OWNER
 166 South Service Inc.

DWG TITLE
 Site Plan & Zoning Information

DATE: 2022-01-18
SCALE: As indicated
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128 DWG No.

AZ100

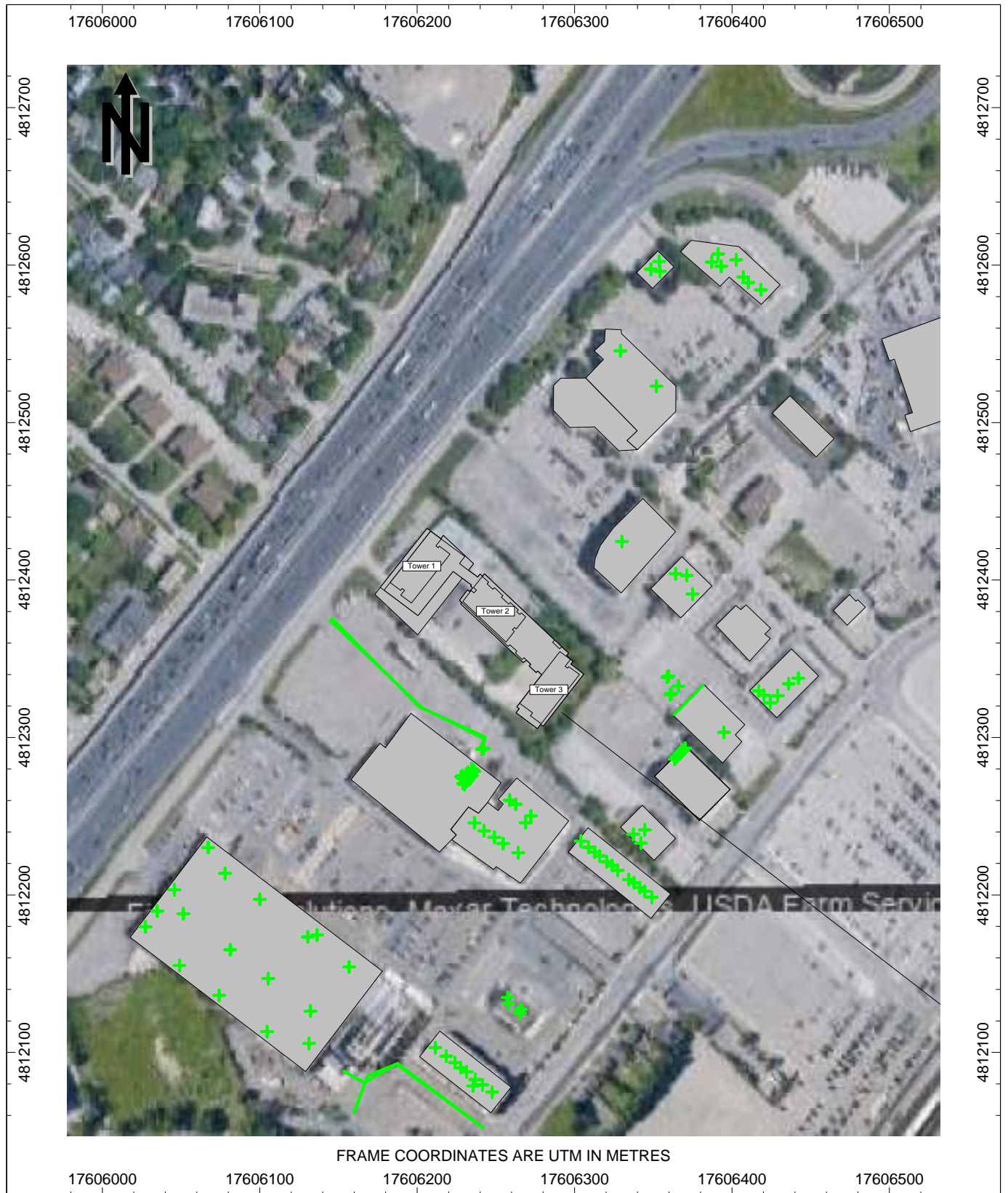


Figure 4: Aerial Photo Showing Source and Receptor Locations

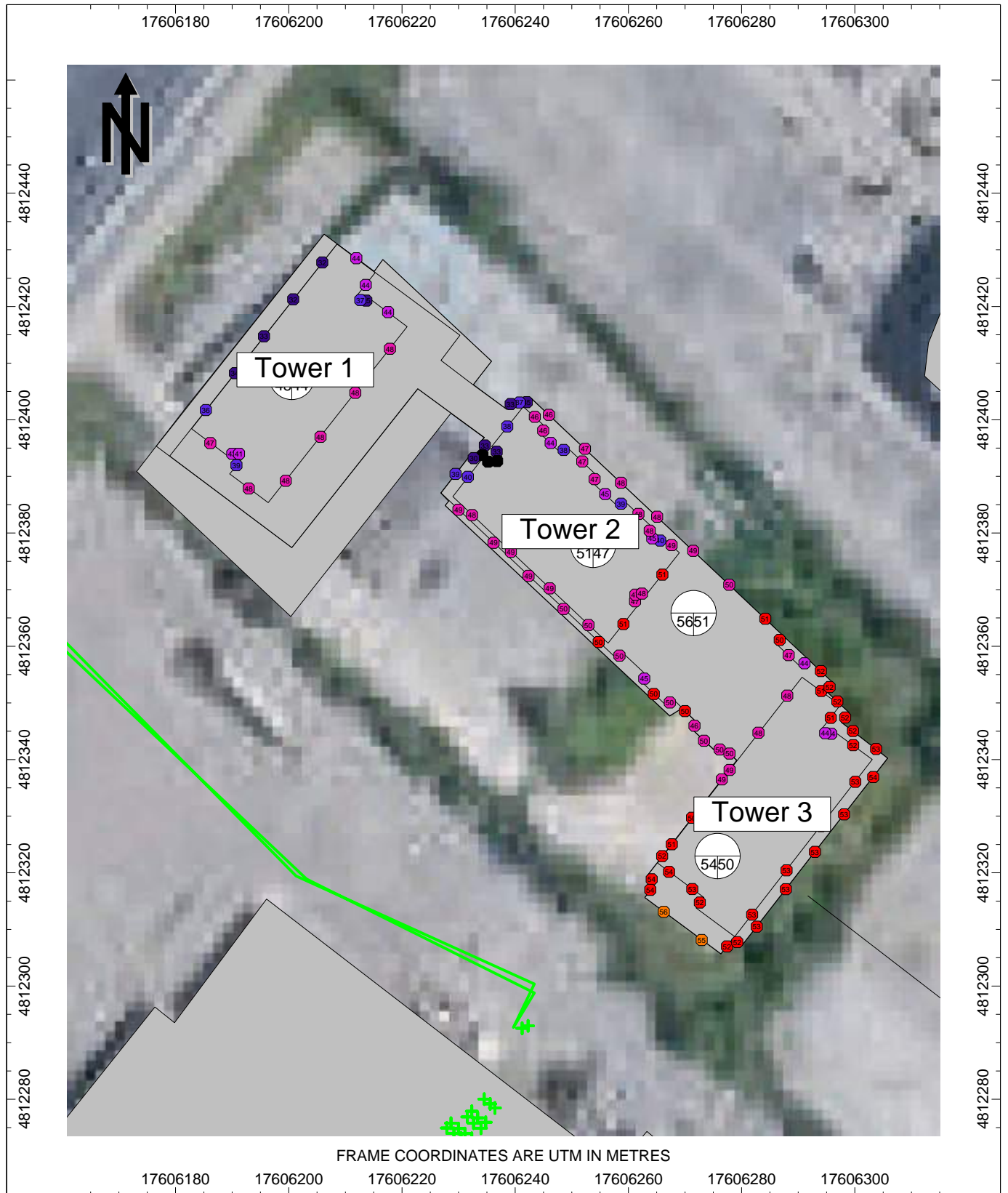


Figure 5: Sound Levels, dBA, Due to Steady Stationary Noise Sources, Daytime

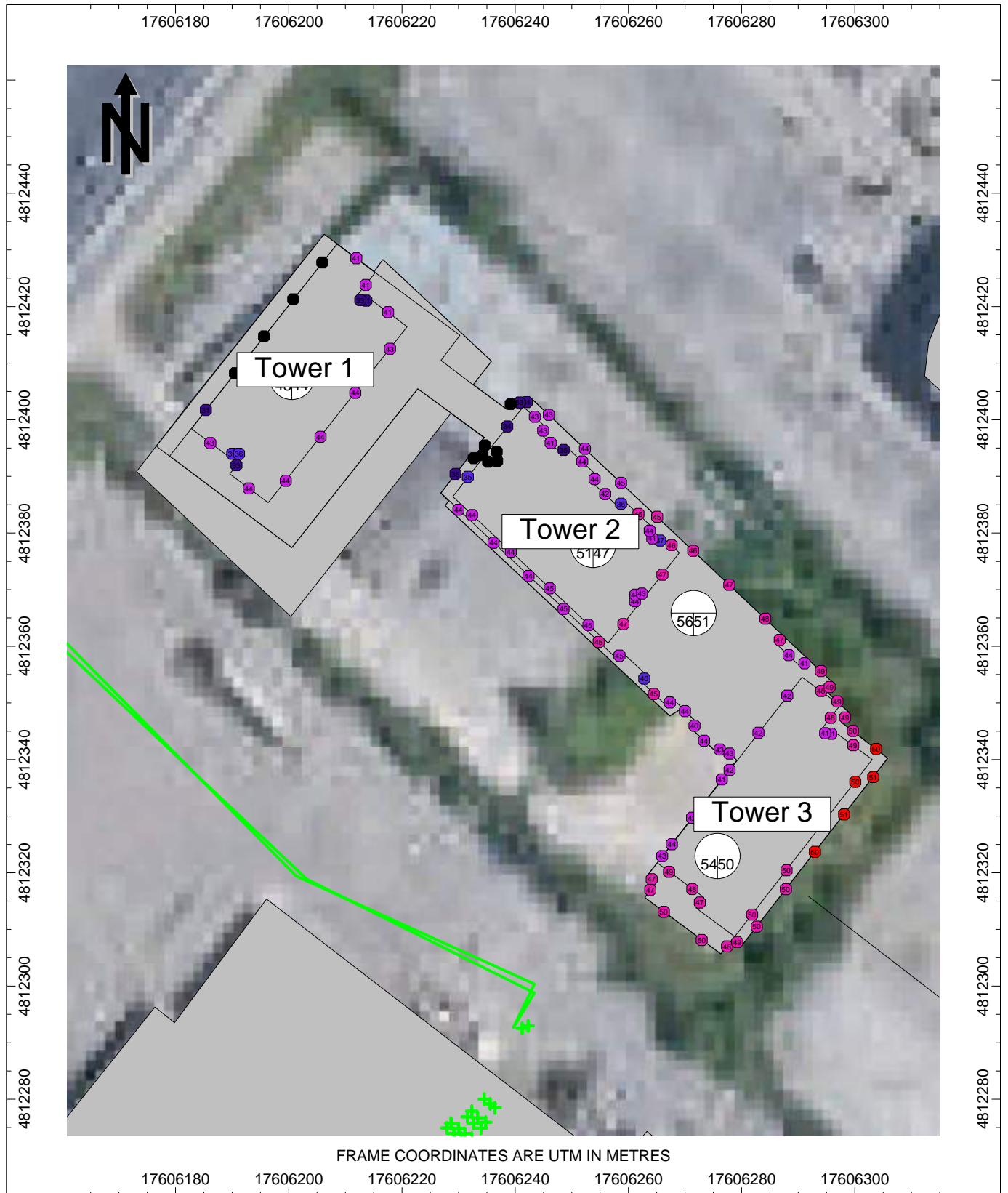
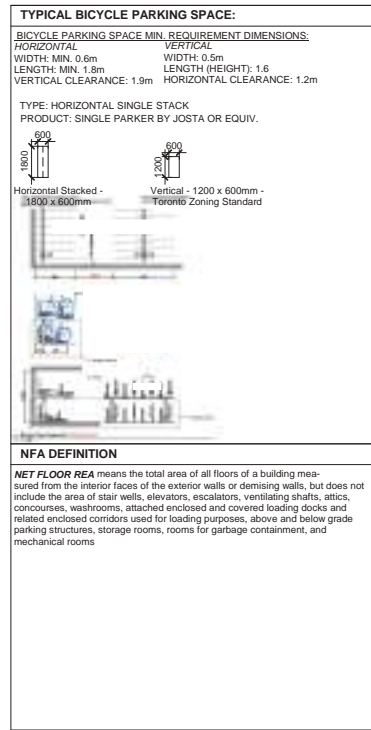
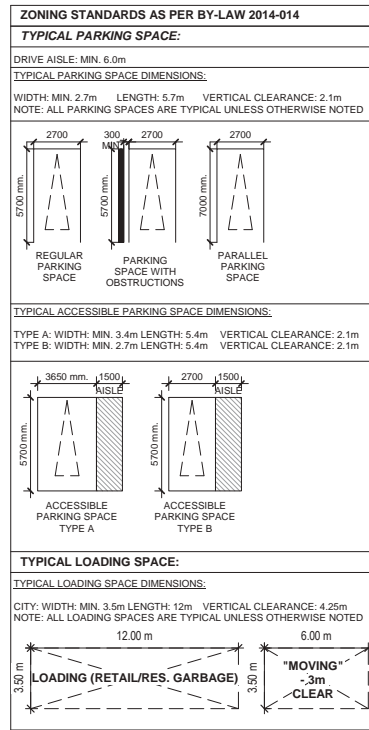


Figure 6: Sound Levels, dBA, Due to Steady Stationary Noise Sources, Nighttime

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TOTAL				1189
				1191
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Res SHORT TERM	1,606 units	0.25 spaces/unit	=	402
Office LONG TERM	3,872.52 m ²	1 per 1000.00 m ²	=	4
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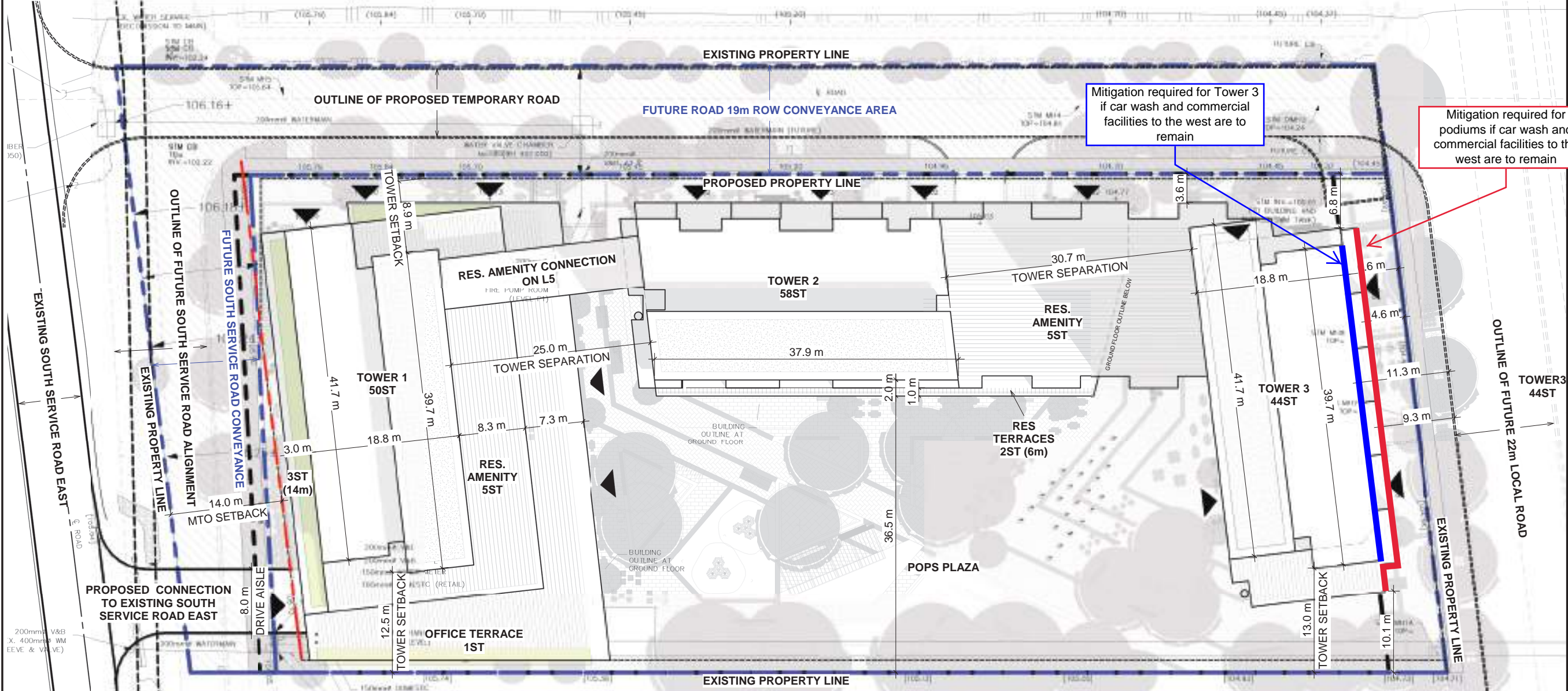


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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Site Plan & Zoning Information

DATE: 2022-01-18
SCALE: As indicated
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128 DWG No.

Figure 7 - Proposed Site Plan Showing Location of Potential Areas for Mitigation

AZ100

APPENDIX A

Road Traffic Data



ACOUSTICS



NOISE



VIBRATION

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1995	C	134,500	145,300	150,600	123,700	0.9
			1996	C	137,500	154,700	156,800	123,900	0.8
			1997	C	140,600	158,200	160,300	126,700	0.9
			1998	C	143,600	161,600	162,100	129,400	0.8
			1999	C	144,400	163,200	163,000	130,100	1.3
			2000	C	147,500	165,900	166,500	132,900	1.4
			2001	C	150,700	170,300	170,300	135,600	1.2
			2002	C	153,800	172,200	173,600	138,400	1.0
			2003	C	157,000	175,800	177,400	141,300	0.9
			2004	C	159,200	177,800	179,000	143,700	1.1
			2005	C	161,900	180,300	181,800	145,400	1.2
			2006	C	164,700	183,000	184,400	148,200	1.1
			2007	C	167,400	186,000	188,600	150,400	1.0
			2008	C	170,100	187,700	185,100	152,600	0.9
			2009	C	172,900	190,800	192,700	155,600	0.8
			2010	C	175,600	193,500	195,300	158,100	0.6
			2011	C	178,400	196,200	198,000	160,500	N/A
			2012	C	181,100	199,200	195,600	163,000	N/A
			2013	C	187,000	205,700	203,800	168,300	N/A
			2014	C	206,000	226,600	220,400	185,400	N/A
			2015	C	210,000	231,000	224,700	189,000	N/A
			2016	C	215,000	236,500	230,100	193,500	N/A
QEW	TRAFALGAR RD IC-118	1.3	1988	C	111,500	123,700	123,700	100,300	0.8
			1989	C	115,300	127,900	129,100	103,700	1.3
			1990	C	120,100	133,300	133,300	108,000	1.1
			1991	C	121,300	133,400	134,600	110,300	1.3
			1992	C	123,300	133,100	136,800	114,600	1.0
			1993	C	129,500	139,800	143,700	119,100	1.5
			1994	C	130,800	142,600	146,500	117,700	1.3
			1995	C	133,800	144,500	149,900	123,100	1.1
			1996	C	136,800	153,900	156,000	123,300	0.9
			1997	C	139,800	157,300	159,400	126,000	1.4
			1998	C	142,700	160,500	161,100	128,600	1.1

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1999	C	143,400	162,000	161,900	129,200	1.7
			2000	C	146,500	164,800	165,400	132,000	1.3
			2001	C	149,700	169,200	169,200	134,700	1.2
			2002	C	152,800	171,100	172,400	137,500	1.0
			2003	C	156,000	174,700	176,300	140,400	1.0
			2004	C	158,100	176,600	177,800	142,700	1.4
			2005	C	160,800	179,000	180,500	144,400	1.3
			2006	C	163,500	181,700	183,100	147,100	1.5
			2007	C	166,200	184,700	187,200	149,300	1.1
			2008	C	168,900	186,400	183,800	151,500	1.4
			2009	C	171,600	189,400	191,200	154,400	1.0
			2010	C	174,300	192,100	193,800	156,900	0.8
			2011	C	177,000	194,700	196,500	159,300	N/A
			2012	C	179,700	197,700	194,100	161,700	N/A
			2013	C	195,000	214,500	212,600	175,500	N/A
			2014	C	200,000	220,000	214,000	180,000	N/A
			2015	C	210,000	231,000	224,700	189,000	N/A
			2016	C	215,000	236,500	230,100	193,500	N/A
QEW	ROYAL WINDSOR DR(WBL)IC-119	3.0	1988	C	96,000	106,500	106,500	86,300	0.8
			1989	C	99,300	110,100	111,100	89,300	0.8
			1990	C	103,200	114,500	114,500	92,800	0.5
			1991	C	103,900	114,200	115,300	94,500	0.4
			1992	C	105,400	113,800	116,900	98,000	0.5
			1993	C	106,000	114,400	117,600	97,500	0.6
			1994	C	109,600	119,500	122,800	98,600	0.6
			1995	C	111,800	120,700	125,200	102,900	0.5
			1996	C	113,900	128,100	129,800	102,600	0.6
			1997	C	116,100	130,600	132,400	104,600	0.9
			1998	C	118,200	133,000	133,400	106,500	0.6
			1999	C	136,900	154,700	154,600	123,300	0.4
			2000	C	140,000	157,500	158,100	126,100	0.8
			2001	C	143,200	161,800	161,800	128,900	0.5
			2002	C	146,300	163,800	165,100	131,700	0.6

Highway	QEW	Direction	FORT ERIE	Descriptor	WEST OF R	Highway	QEW	Direction	TORONTO	Descriptor					
VDS	Stator	LHRS	OS	VDS	Stator	LHRS	OS	Date	Time	VDS1	Volur	VDS2	Volur	Total	Volun
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	1:00	1393	980	2373					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	2:00	779	629	1408					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	3:00	635	546	1181					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	4:00	991	661	1652					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	5:00	825	1552	2377					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	6:00	1924	5898	7822					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	7:00	4837	7597	12434					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	8:00	6373	7750	14123					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	9:00	5980	7466	13446					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	10:00	6466	6269	12735					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	11:00	5989	6433	12422					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	12:00	6066	6798	12864					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	13:00	6374	6347	12721					
QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/08/2019	14:00	6383	6487	12870					
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QEWDE02E	10135	0.7	QEWDE02E	10135	0.7	05/14/2019	23:59	2318	1806	4124

Victor Garcia

From: Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
Sent: February 17, 2021 2:24 PM
To: Victor Garcia
Cc: Bee, Christopher (MTO)
Subject: RE: Commercial Vehicle % for QEW at Trafalgar Rd

To Victor Garcia, HGC Engineering

This location's major intersection is QEW and Trafalgar Road.

The % commercial vehicle at QEW near Trafalgar was 14% steady every year from 2007 to 2016 (10 yrs). 2016 is the latest year of official MTO data.

"% commercial" includes large long trucks, small short trucks, vans, cars with trailer, buses, and specials, but DOES NOT INCLUDE REGULAR CARS.

There is no further breakdown details within these classes.

Christopher Bee
MTO Central Region Traffic Office
Safety Traffic Information and Roadwork Coordination Section (STIRCS)

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: February-16-21 11:41 AM
To: Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
Subject: Commercial Vehicle % for QEW at Trafalgar Rd

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good morning,

HGC Engineering is conducting a noise feasibility study for a proposed residential development located at 157 – 165 Cross Avenue in Oakville, Ontario. A google link is included for your reference:

<https://goo.gl/maps/7G5T3Uj5vL8GTjAc6>

Do you have commercial vehicle percentages available for the QEW in the vicinity of this site?

Thanks,

Victor Garcia, P.Eng
Associate

HGC Engineering [NOISE / VIBRATION / ACOUSTICS](#)
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 e: vgarcia@hgcengineering.com
Visit our website – www.hgcengineering.com Follow Us – [LinkedIn](#) | [Twitter](#) | [YouTube](#)

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Victor Garcia

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: March 2, 2021 9:44 AM
To: Victor Garcia
Subject: RE: Road Traffic Data Request
Attachments: 100323 - nb & sb volume.xls

Hi Victor,

Thanks for checking. I have attached a 2019 24 hour 2-way count on Trafalgar north of Cross. It is 47,400. Therefore, to consider the existing Trafalgar at-capacity, please use 55,000.

The Trafalgar volumes likely won't significantly impact the site at 157 Cross, as it is +300m to the west.

Matt

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Tuesday, March 2, 2021 9:07 AM
To: Krusto, Matt <Matt.Krusto@halton.ca>
Subject: RE: Road Traffic Data Request

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are unsure or need assistance please contact the IT Service Desk.

Hi Matt,

We received the truck percentages from the email listed below, do you still provide ultimate traffic volumes for Trafalgar Rd or should we be projecting the volumes obtained from the TMC?

Thanks,

Victor Garcia, P.Eng
HGC Engineering **NOISE / VIBRATION / ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: February 16, 2021 11:50 AM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Road Traffic Data Request

Hi Victor,

Any requests for turning movement counts go to trafficdatarequests@halton.ca Cornwall traffic data, other than at the Trafalgar Road intersection, must be obtained from the Town of Oakville.

Truck percentages must be based on existing truck percentages from the data you receive.

Master Station	Description	Count date	total vol	ampk.cnt	lampk.vol	off pk.cnt	offpk.vol	pm.pk.cnt	pkhr.vol	8hr.vol	3hr.vol	posted speed (km)	50%speed (km)	avg (km)	85Percent	Variance	exceeding (%)	accs	# and tck	# med tck/hrs	# hvy tck	Seata	%normal tck	% med tck/hrs	% hvy tck	headway max (sec)	headway min (sec)	Temp min (C)	Temp max (C)	surface
10000	Trafalgar Road - between QEW WB Off-Ramp and Leighland/Innes	12-Sep-19	45,085	8-45	3,422	1300	2,944	1800	3,562	24,146	36,231	60	50	54	66.67	6.67	28.20%	43,237	343	692	540	96.5%	0.8%	1.5%	1.2%	0.93	64.29	19	29 Dry	

Prepared For: Halton Region
 Prepared By: *PYRAMID* Traffic Inc.
 Location: REG. RD. #3 200m north of Cross Ave
 Start Date: Thursday Sep 12, 2019

Site ID: 100323
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	153	44		12:15	466	357	3070
0:30	68	37		12:30	419	326	3078
0:45	76	29		12:45	421	353	3135
1:00	35	28	470	13:00	428	368	3138
1:15	27	5	305	13:15	415	325	3055
1:30	15	24	239	13:30	438	298	3046
1:45	32	10	176	13:45	405	315	2992
2:00	14	11	138	14:00	438	315	2949
2:15	23	12	141	14:15	416	305	2930
2:30	20	6	128	14:30	458	278	2930
2:45	7	15	108	14:45	433	325	2968
3:00	8	7	98	15:00	435	343	2993
3:15	12	6	81	15:15	496	350	3118
3:30	7	3	65	15:30	501	324	3207
3:45	9	7	59	15:45	478	371	3298
4:00	9	7	60	16:00	483	331	3334
4:15	11	9	62	16:15	550	319	3357
4:30	12	15	79	16:30	518	337	3387
4:45	17	22	102	16:45	569	319	3426
5:00	19	47	152	17:00	467	316	3395
5:15	32	33	197	17:15	640	375	3541
5:30	33	56	259	17:30	635	343	3664
5:45	49	73	342	17:45	628	310	3714
6:00	67	103	446	18:00	492	323	3746
6:15	72	89	542	18:15	663	319	3713
6:30	97	158	708	18:30	436	312	3483
6:45	154	235	975	18:45	506	322	3373
7:00	164	280	1249	19:00	348	305	3211
7:15	200	295	1583	19:15	480	296	3005
7:30	255	381	1964	19:30	349	266	2872
7:45	283	389	2247	19:45	336	243	2623
8:00	326	449	2578	20:00	349	217	2536
8:15	343	452	2878	20:15	357	208	2325
8:30	446	496	3184	20:30	294	221	2225
8:45	437	406	3355	20:45	310	195	2151
9:00	339	453	3372	21:00	235	200	2020
9:15	328	376	3281	21:15	293	156	1904
9:30	301	324	2964	21:30	219	145	1753
9:45	314	340	2775	21:45	258	124	1630
10:00	341	340	2664	22:00	188	116	1499
10:15	325	276	2561	22:15	206	105	1361
10:30	363	284	2583	22:30	191	84	1272
10:45	336	305	2570	22:45	194	78	1162
11:00	354	301	2544	23:00	140	104	1102
11:15	369	305	2617	23:15	178	90	1059
11:30	399	338	2707	23:30	100	75	959
11:45	372	345	2783	23:45	144	55	886
12:00	414	379	2921	0:00	64	87	793

AM Peak: 3372

PM Peak: 3746

24 HR VOLUME: 47408



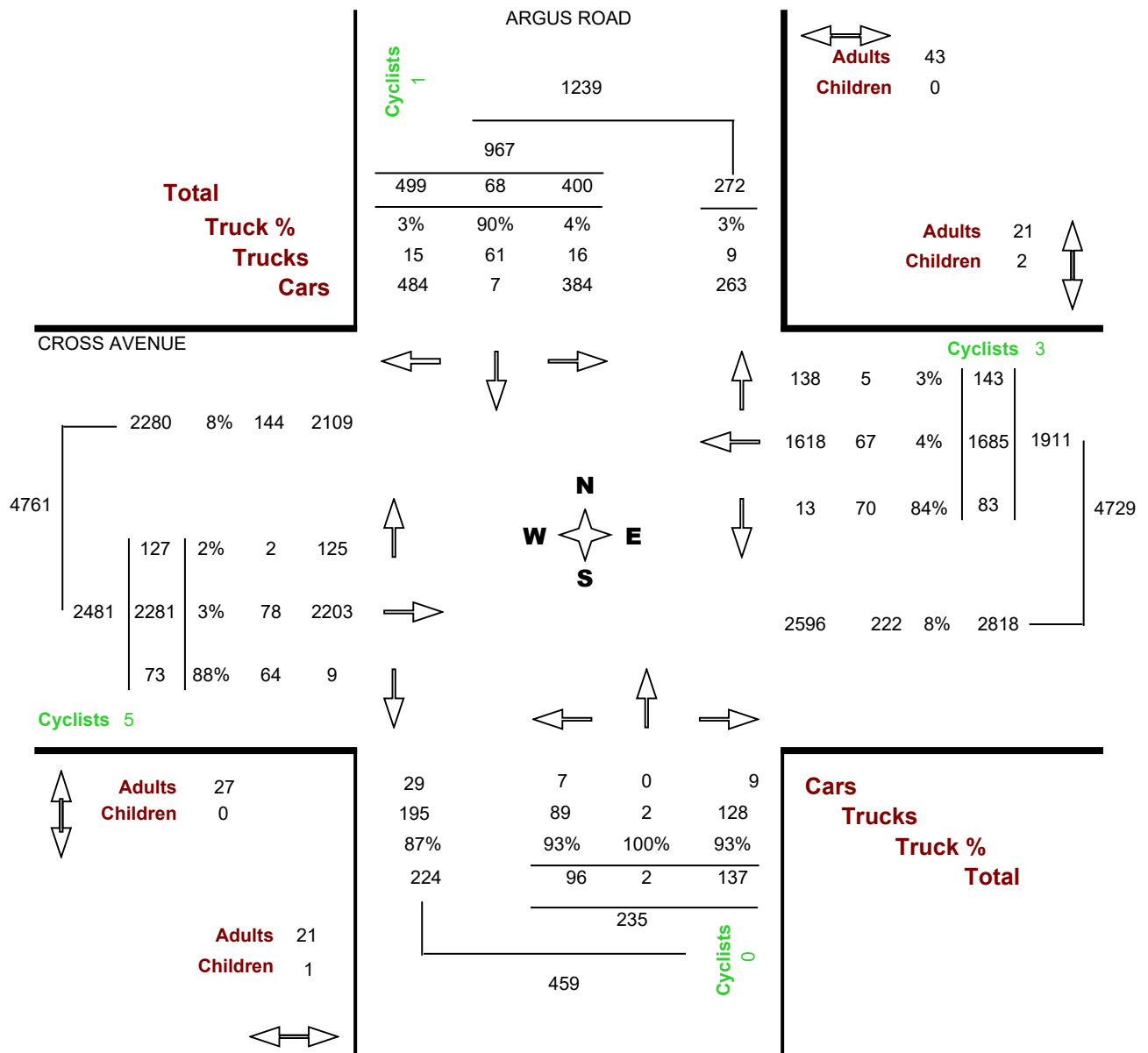
Turning Movements Count - Full Study Report

Location..... CROSS AVENUE @ ARGUS ROAD

Municipality..... OAKVILLE

GeoID..... 30151301

Count Date..... Wednesday, 30 September, 2020



In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movements Report - AM Period

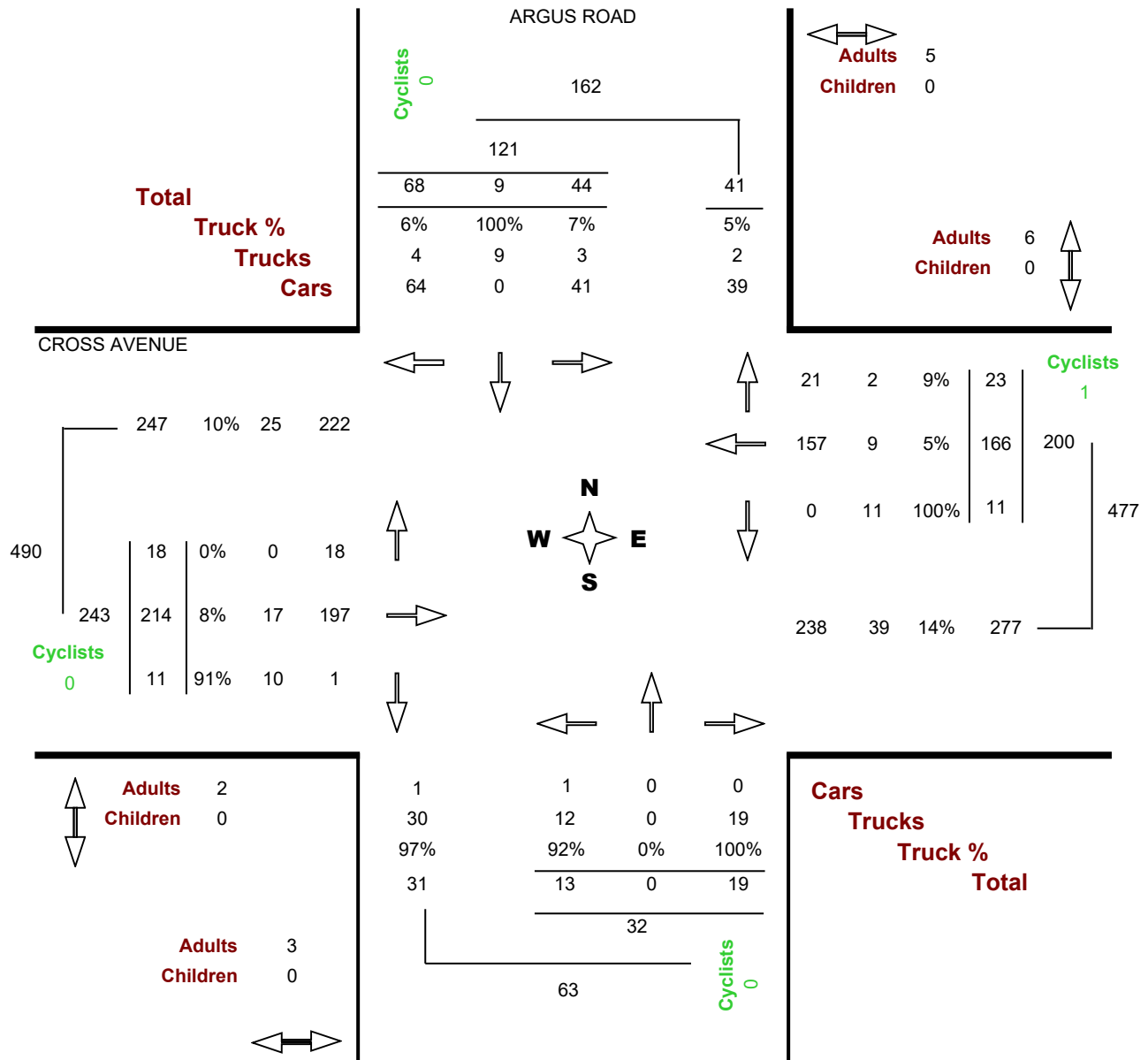
Location..... CROSS AVENUE @ ARGUS ROAD

Municipality..... OAKVILLE

GeoID..... 30151301

Count Date..... Wednesday, 30 September, 2020

Peak Hour..... 08:00 AM — 09:00 AM



THIS INFORMATION IS SUPPLIED FROM OUR RECORDS AND IS NOT GUARANTEED TO BE CORRECT. WE RECOMMEND FIELD CHECKING TO VERIFY THE INFORMATION SHOWN.

In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movements Report - MD Period

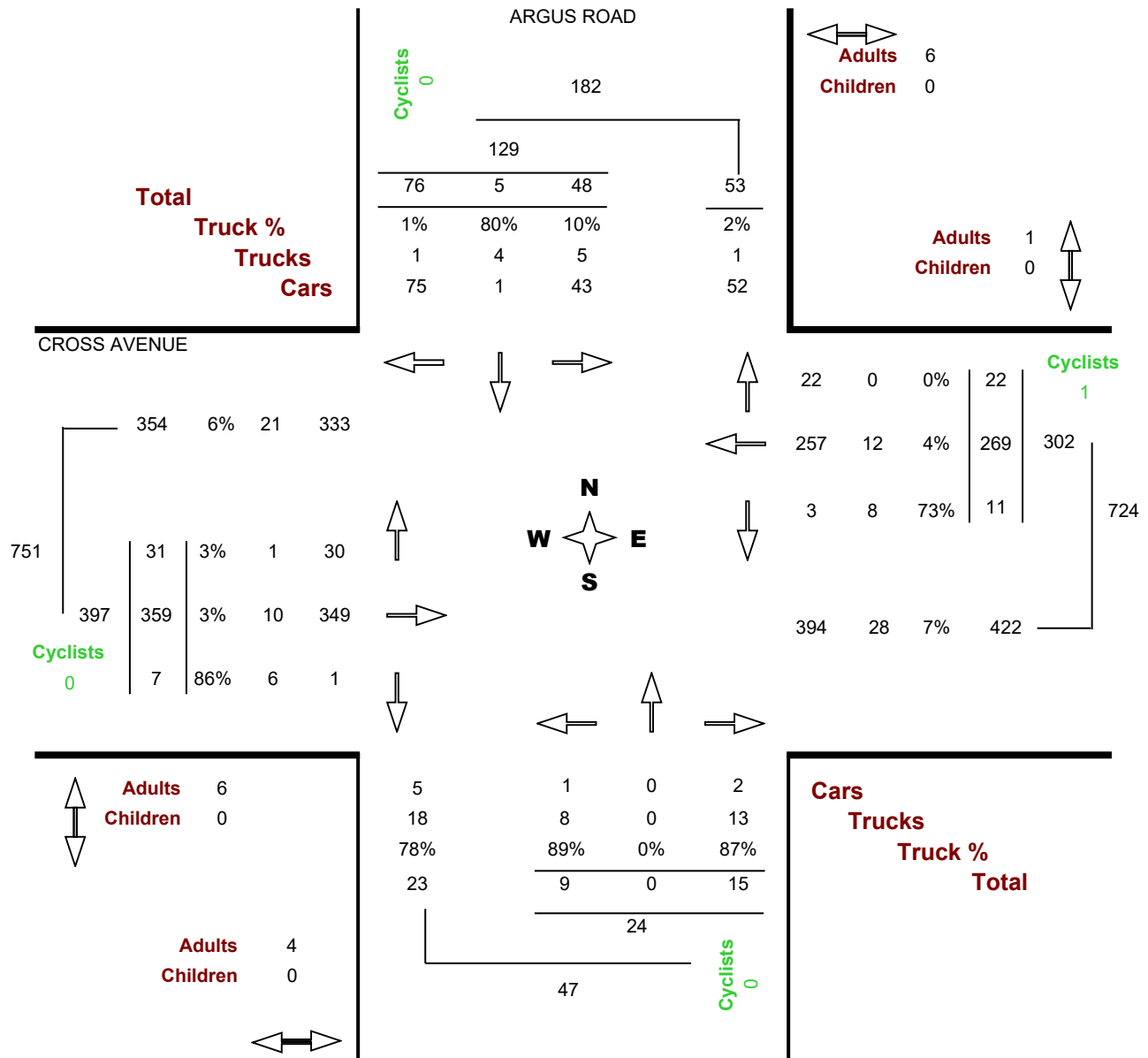
Location..... CROSS AVENUE @ ARGUS ROAD

Municipality..... OAKVILLE

GeoID..... 30151301

Count Date..... Wednesday, 30 September, 2020

Peak Hour..... 01:00 PM — 02:00 PM



THIS INFORMATION IS SUPPLIED FROM OUR RECORDS AND IS NOT GUARANTEED TO BE CORRECT. WE RECOMMEND FIELD CHECKING TO VERIFY THE INFORMATION SHOWN.

In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movements Report - PM Period

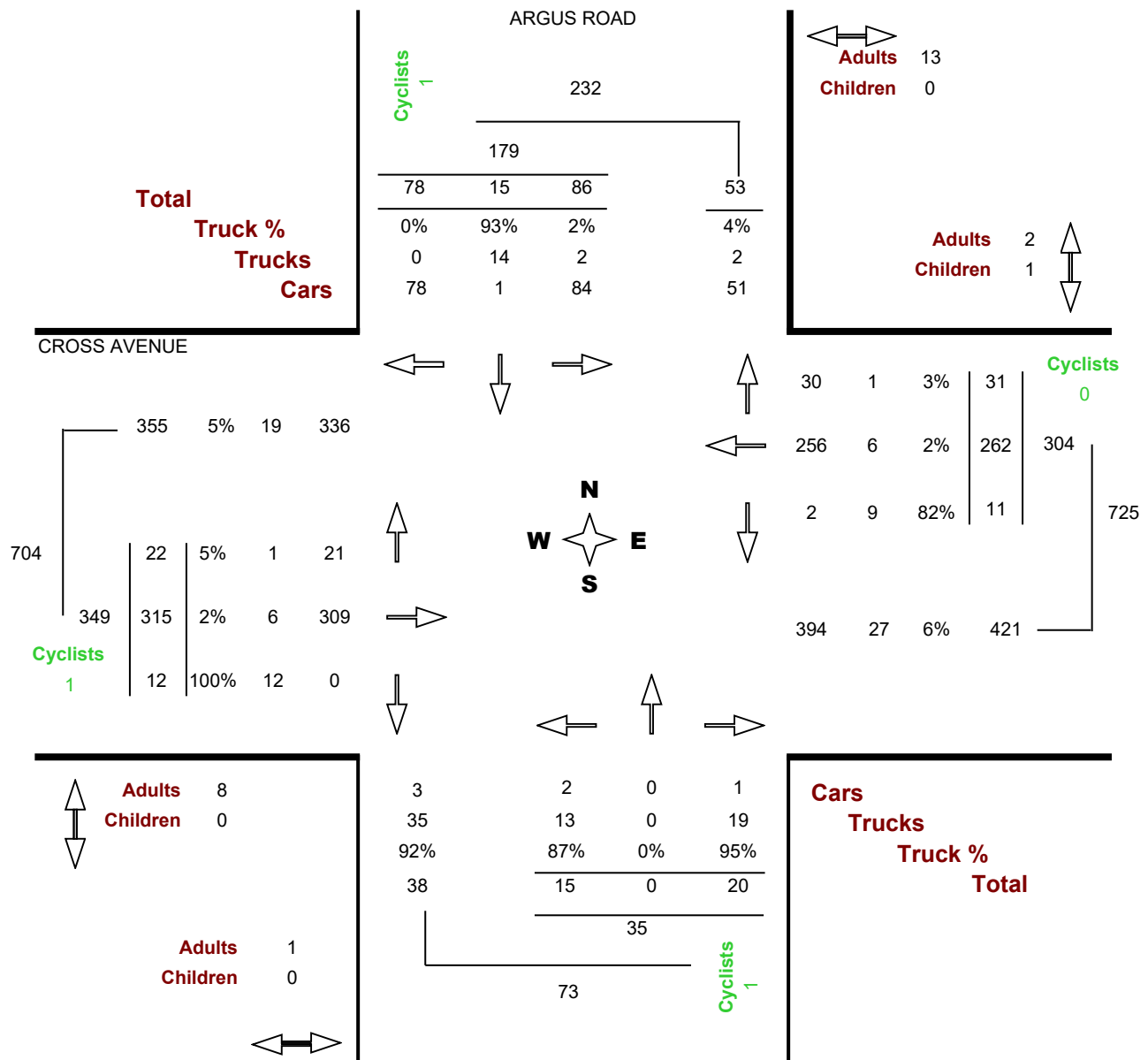
Location..... CROSS AVENUE @ ARGUS ROAD

Municipality..... OAKVILLE

GeoID..... 30151301

Count Date..... Wednesday, 30 September, 2020

Peak Hour..... 03:15 PM — 04:15 PM



THIS INFORMATION IS SUPPLIED FROM OUR RECORDS AND IS NOT GUARANTEED TO BE CORRECT. WE RECOMMEND FIELD CHECKING TO VERIFY THE INFORMATION SHOWN.

In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movement Count - Details Report

Location..... CROSS AVENUE @ ARGUS ROAD
Municipality..... OAKVILLE
Count Date..... Wednesday, September 30, 2020

ARGUS ROAD

CROSS AVENUE

North Approach

South Approach

East Approach

West Approach

Time Period	North Approach					South Approach					East Approach					West Approach				
	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped
07:00 07:15	3	4	9	0	1	6	0	7	0	1	4	29	1	0	0	1	19	3	0	0
07:15 07:30	3	1	12	0	0	1	0	1	0	0	1	31	3	0	2	4	41	2	0	1
07:30 07:45	3	3	7	0	0	5	0	8	0	0	6	36	1	0	0	2	37	4	0	1
07:45 08:00	6	1	18	0	4	0	0	3	0	0	2	29	3	0	2	1	40	1	0	0
Hourly Total	15	9	46	0	5	12	0	19	0	1	13	125	8	0	4	8	137	10	0	2
08:00 08:15	4	1	21	0	1	7	0	8	0	3	6	34	3	0	1	2	61	5	0	2
08:15 08:30	16	1	9	0	0	0	0	1	0	0	1	37	11	0	0	3	42	1	0	0
08:30 08:45	13	6	17	0	3	5	0	8	0	0	3	36	6	0	1	7	53	3	0	0
08:45 09:00	11	1	21	0	1	1	0	2	0	0	1	59	3	1	4	6	58	2	0	0
Hourly Total	44	9	68	0	5	13	0	19	0	3	11	166	23	1	6	18	214	11	0	2
11:00 11:15	4	0	4	0	0	6	0	6	0	0	1	28	3	0	0	1	41	1	0	0
11:15 11:30	10	0	23	0	1	2	1	1	0	1	1	64	2	0	0	5	84	1	3	0
11:30 11:45	14	2	24	0	0	2	0	3	0	0	2	79	7	0	1	3	91	1	1	3
11:45 12:00	7	0	8	0	0	3	1	3	0	0	4	56	4	0	0	3	95	0	0	1
Hourly Total	35	2	59	0	1	13	2	13	0	1	8	227	16	0	1	12	311	3	4	4
12:00 12:15	21	2	20	0	3	4	0	3	0	0	3	58	8	1	0	3	77	3	0	0
12:15 12:30	6	2	12	0	0	1	0	3	0	4	2	53	4	0	0	4	96	2	0	0
12:30 12:45	13	2	17	0	0	6	0	4	0	3	8	58	4	0	0	1	91	2	0	0
12:45 13:00	15	0	20	0	2	0	0	3	0	2	2	71	6	0	0	5	93	2	0	2
Hourly Total	55	6	69	0	5	11	0	13	0	9	15	240	22	1	0	13	357	9	0	2
13:00 13:15	15	4	23	0	0	5	0	4	0	1	4	66	3	1	0	2	95	2	0	0
13:15 13:30	8	0	16	0	0	0	0	3	0	1	0	71	6	0	0	6	94	2	0	3
13:30 13:45	12	0	18	0	3	3	0	4	0	1	4	55	6	0	1	5	82	2	0	2
13:45 14:00	13	1	19	0	3	1	0	4	0	1	3	77	7	0	0	18	88	1	0	1
Hourly Total	48	5	76	0	6	9	0	15	0	4	11	269	22	1	1	31	359	7	0	6
15:00 15:15	6	2	9	0	2	6	0	7	0	0	5	42	2	0	0	4	50	2	0	0
15:15 15:30	21	3	27	0	3	2	0	3	0	0	2	71	16	0	0	6	85	1	1	1
15:30 15:45	19	5	14	0	6	3	0	6	0	0	3	70	8	0	2	8	63	4	0	7
15:45 16:00	23	2	19	1	2	3	0	3	0	1	2	54	3	0	1	4	81	1	0	0
Hourly Total	69	12	69	1	13	14	0	19	0	1	12	237	29	0	3	22	279	8	1	8
16:00 16:15	23	5	18	0	2	7	0	8	0	0	4	67	4	0	0	4	86	6	0	0
16:15 16:30	6	1	13	0	2	1	0	4	0	0	0	55	5	0	2	4	89	3	0	0
16:30 16:45	17	6	15	0	2	4	0	6	0	0	3	57	2	0	4	3	72	5	0	0
16:45 17:00	19	1	23	0	0	1	0	3	0	0	1	58	3	0	1	4	94	1	0	0
Hourly Total	65	13	69	0	6	13	0	21	0	0	8	237	14	0	7	15	341	15	0	0
17:00 17:15	31	3	11	0	0	3	0	7	0	1	3	43	0	0	1	2	88	3	0	1
17:15 17:30	15	0	15	0	2	2	0	3	0	2	1	57	4	0	0	1	72	1	0	2
17:30 17:45	14	8	12	0	0	5	0	7	0	0	1	47	5	0	0	3	65	4	0	0
17:45 18:00	9	1	5	0	0	1	0	1	0	0	0	37	0	0	0	2	58	2	0	0
Hourly Total	69	12	43	0	2	11	0	18	0	3	5	184	9	0	1	8	283	10	0	3
Grand Total	400	68	499	1	43	96	2	137	0	22	83	1685	143	3	23	127	2281	73	5	27
Truck %	4%	90%	3%			93%	100%	93%			84%	4%	3%			2%	3%	88%		

APPENDIX B

Rail Traffic Data



ACOUSTICS



NOISE



VIBRATION



Train Count Data

TRANSMITTAL

To: HGC Engineering *Project :* OAK – 21.20 – Cornwall Rd, Oakville ON
Destinataire : 2000 Argentia Rd
Plaza, Suite 203
Mississauga ON
L5N 1P7

Att'n: Victor Garcia *Routing:* vgarcia@hgcengineering.com

From: Michael Vallins *Date:* 2021/04/26
Expéditeur :

Cc: Adjacent Development
CN via e-mail

Urgent For Your Use For Review For Your Information Confidential

Re: Train Traffic Data – CN Oakville Subdivision near Cornwall Rd in Oakville, ON

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **\$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at permits.gld@cn.ca.

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager Public Works- Eastern Canada
Permits.gld@cn.ca

Date: 2021/04/26

Project Number: OAK – 21.20 – Cornwall Rd, Oakville ON

Dear Victor:

Re: Train Traffic Data – CN Oakville Subdivision near Cornwall Rd in Oakville, ON

The following is provided in response to Victor’s 2021/02/16 request for information regarding rail traffic in the vicinity of Cornwall Rd in Oakville at approximately Mile 21.20 on CN’s Oakville Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	2	140	60	4
Way Freight	0	25	60	4
Passenger	12	10	95	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	2	140	60	4
Way Freight	0	25	60	4
Passenger	1	10	95	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN’s Oakville Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There is one (1) at-grade crossing in the immediate vicinity of the study area at Mile 21.97 Kerr St. Anti-whistling bylaws are in effect at this crossing. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The four mainline tracks are considered to be continuously welded rail throughout the study area. The presence of four (4) switches located at Mile 21.85, 21.99, 22.07, and 22.20 may exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Michael Vallins P. Eng', with a long horizontal flourish extending to the right.

Michael Vallins P.Eng
Manager Public Works- Eastern Canada
Permits.gld@cn.ca

Yvonne Lo

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: February 23, 2021 4:26 PM
To: Victor Garcia
Subject: RE: Rail Traffic Data Requests-157-165 Cross Ave, Oakville

Hi Victor:

Further to your request dated February 16, 2021, the subject lands (157-165 Cross Ave, Oakville) are located within 300 metres of the Metrolinx Oakville Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel and electric trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 255 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives		1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives
Day (0700-2300)	60	11	101	42	Night (2300-0700)	8	4	21	8

The current track design speed near the subject lands is 80 mph (129 km/h).

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase.

Options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process and teams are currently completing the bids that will close in 2021. GO Expansion construction will get underway in 2022.

However, we can advise that train noise is dominated by the powertrain at lower speeds and by the wheel-track interaction at higher speeds. Hence, the noise level and spectrum of electric trains is expected to be very similar at higher speeds, if not identical, to those of equivalent diesel trains.

Given the above considerations, it would be prudent at this time, for the purposes of acoustical analyses for development in proximity to Metrolinx corridors, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future once the proponent team is selected.

There are anti-whistling by-laws in affect at Kerr St and Chartwell Rd at-grade crossings.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Regards,

APPENDIX C

Preliminary Drawings



ACOUSTICS



NOISE



VIBRATION

DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

This drawing shall not be used for construction purposes until signed by the consultant responsible. This drawing, as an instrument of service, is provided by and is the property of Sweeney & Co. Architects.

ISSUED

22-05-30 ISSUED FOR REZONING



166 SOUTH SERVICE ROAD EAST

Oakville, Ontario

OWNER:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

ARCHITECT:

Sweeney & Co Architects Inc.
134 Peter St., Suite 1601
Toronto, ON M5V 2H2
contact: [Name]
e: [email]
t: [telephone]

CIVIL:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

LEED:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

PROJECT MANAGER:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

STRUCTURAL:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

LANDSCAPE ARCHITECT:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

GEO TECH:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

MECHANICAL:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

TRANSPORTATION:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

ENVIRONMENTAL:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

ELECTRICAL:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

HERITAGE:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

SHORING:

[Name]
[Address]
contact: [Name]
e: [email]
t: [telephone]

Sweeney&Co Architects

134 PETER STREET | SUITE 1601
TORONTO, ONTARIO | M5V 2H2 | CANADA
P: 416-971-6252 | F: 416-971-5420
E: info@sandco.com | www.sweenyandco.com

PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

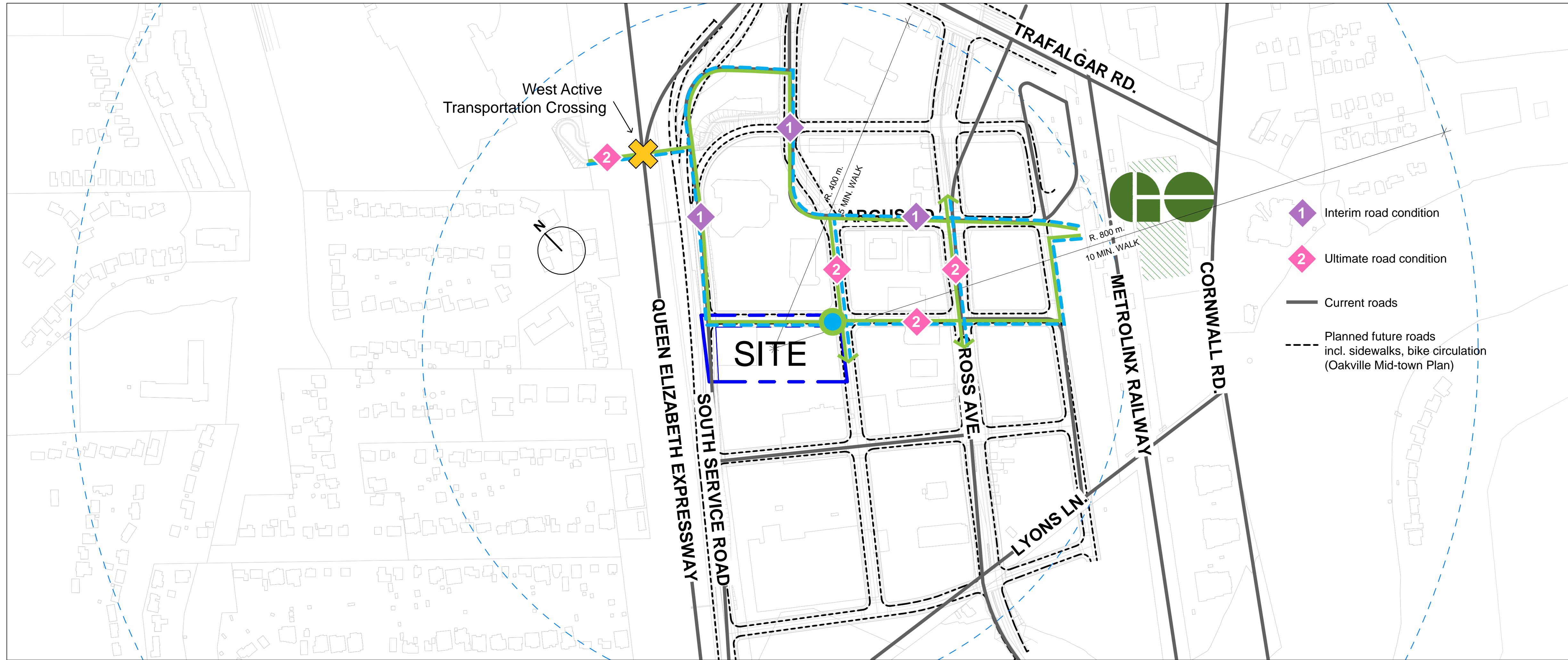
DWG TITLE
Cover Page

DATE : 2022-01-18
SCALE :
DRAWN : MS/FT
CHECKED : DS
PROJ. No. : 2128

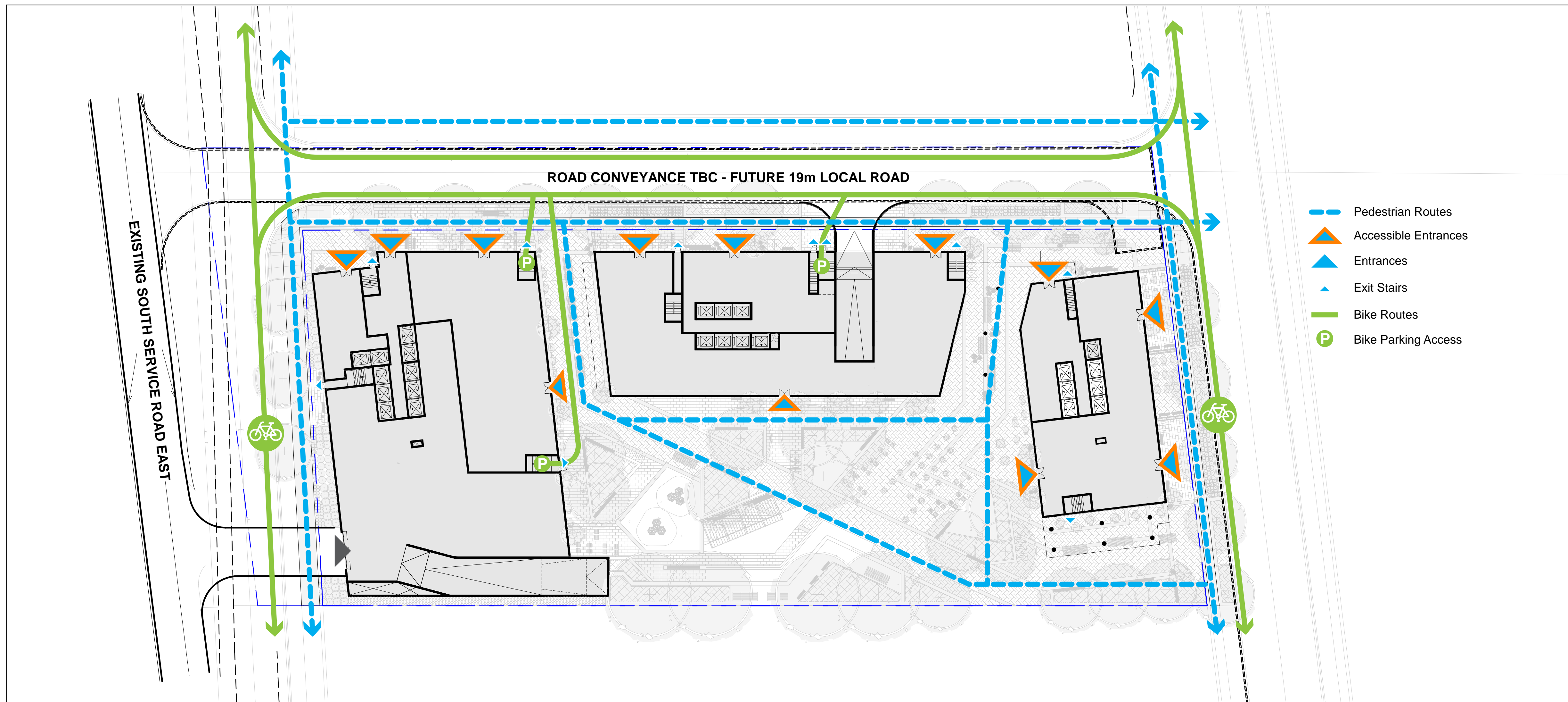
DWG No.

AZ000

ISSUED FOR REZONING 2022-02-28



- 1 Interim road condition
- 2 Ultimate road condition
- Current roads
- Planned future roads
incl. sidewalks, bike circulation
(Oakville Mid-town Plan)



DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

This drawing shall not be used for construction purposes until signed by the consultant responsible. This drawing, as an instrument of service, is provided by and is the property of Sweeny & Co. Architects.

ISSUED

22-05-30 ISSUED FOR REZONING

**Sweeny&Co
Architects**

134 PETER STREET | SUITE 1601
TORONTO, ONTARIO | M5V 2H2 | CANADA
P: 416-971-6252 | F: 416-971-5420
E: info@sandco.com | www.sweenyandco.com

PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

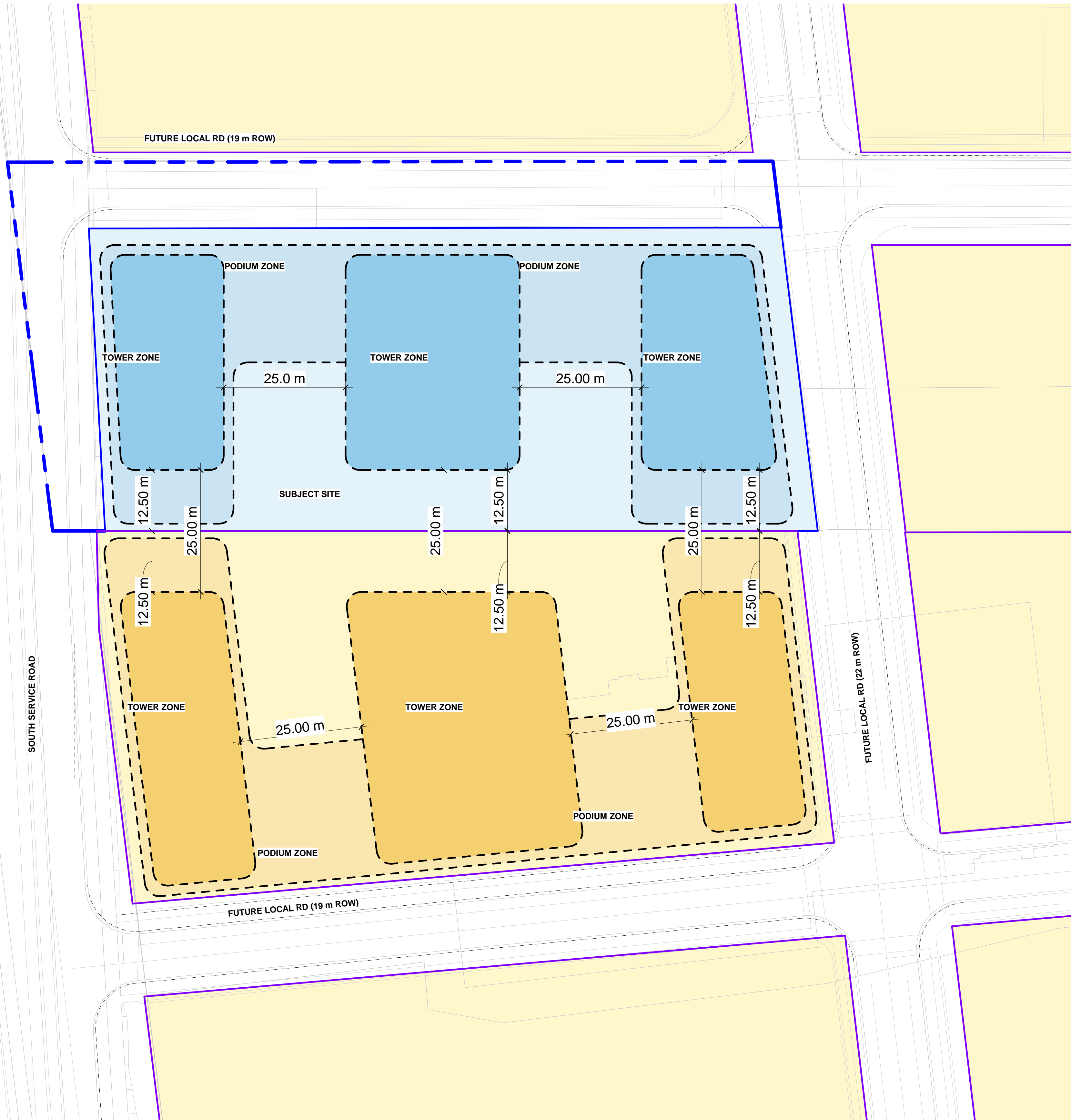
OWNER
166 South Service Inc.

DWG TITLE
Pedestrian Circulation

DATE : 2022-01-18
SCALE : As indicated
DRAWN : MS/FT
CHECKED : DS
PROJ. No. : 2128

DWG No.
AZ010

QEW



DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

This drawing shall not be used for construction purposes until signed by the consultant responsible. This drawing, as an instrument of service, is provided by and is the property of Sweeny & Co. Architects.

ISSUED

Sweeny&Co Architects

134 PETER STREET | SUITE 1601
TORONTO, ONTARIO | M5V 2H2 | CANADA
P: 416-971-6252 | F: 416-971-5420
E: info@sandco.com | www.sweenyandco.com

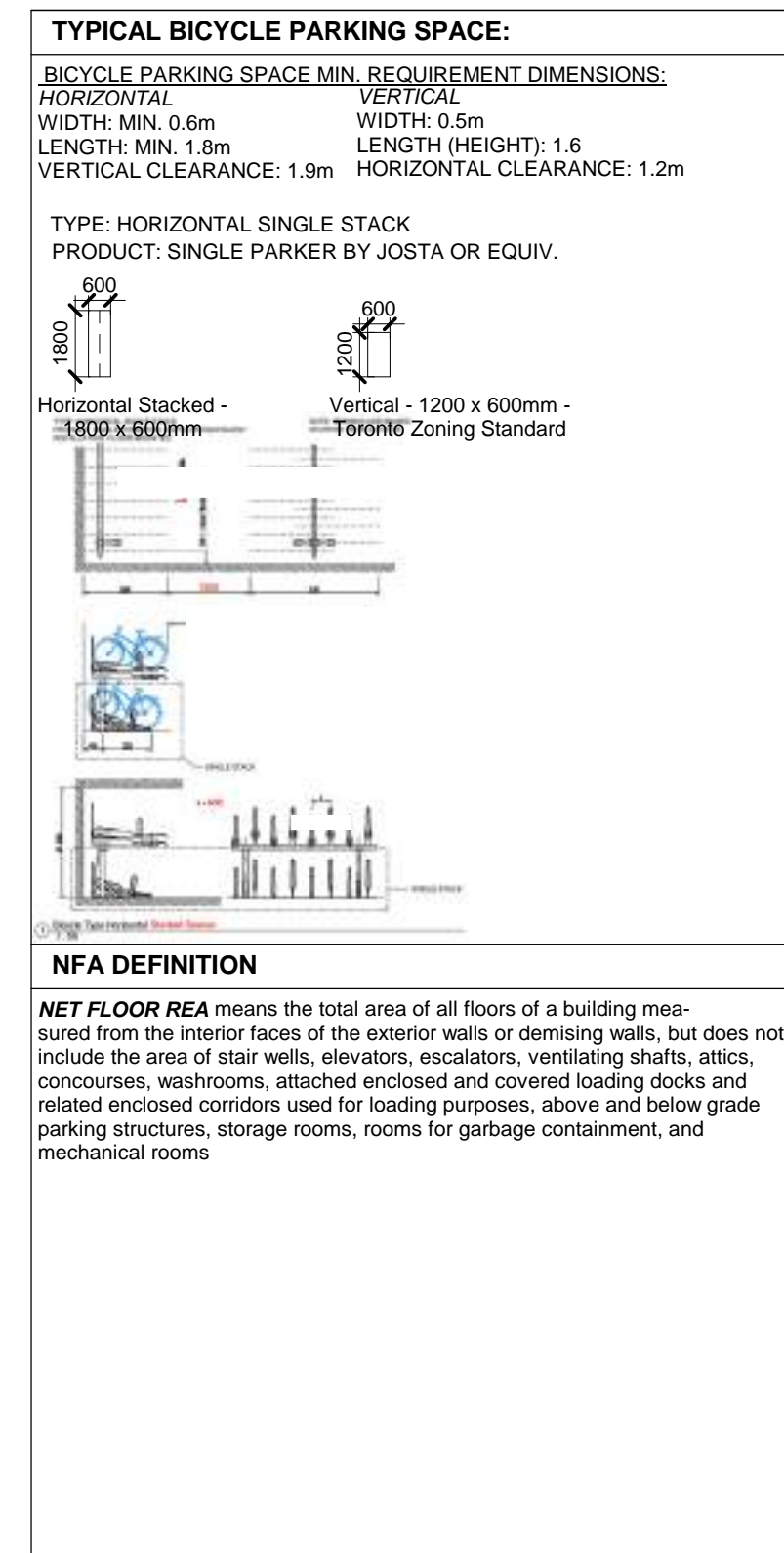
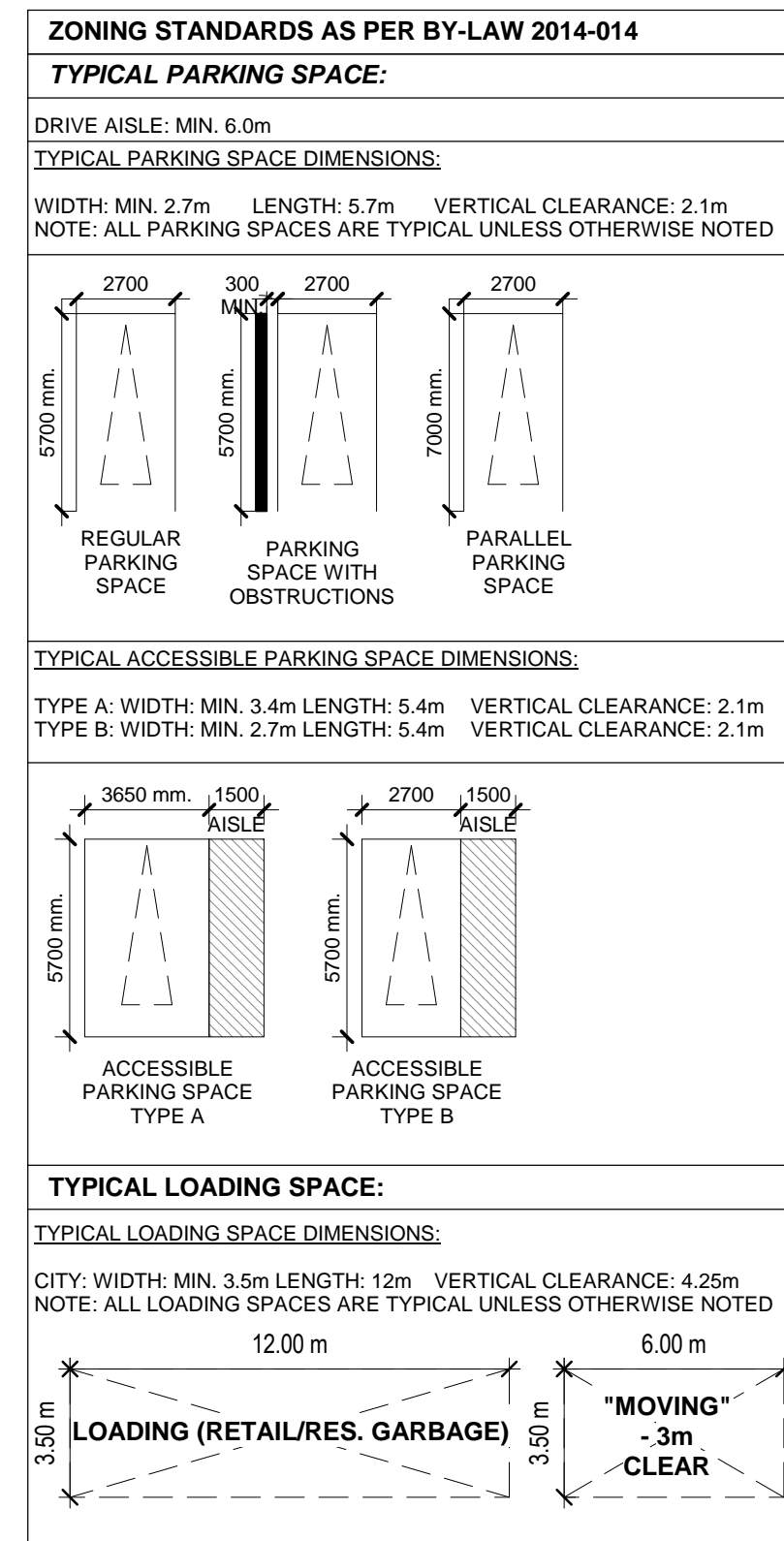
PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Block Plan

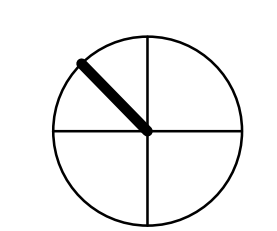
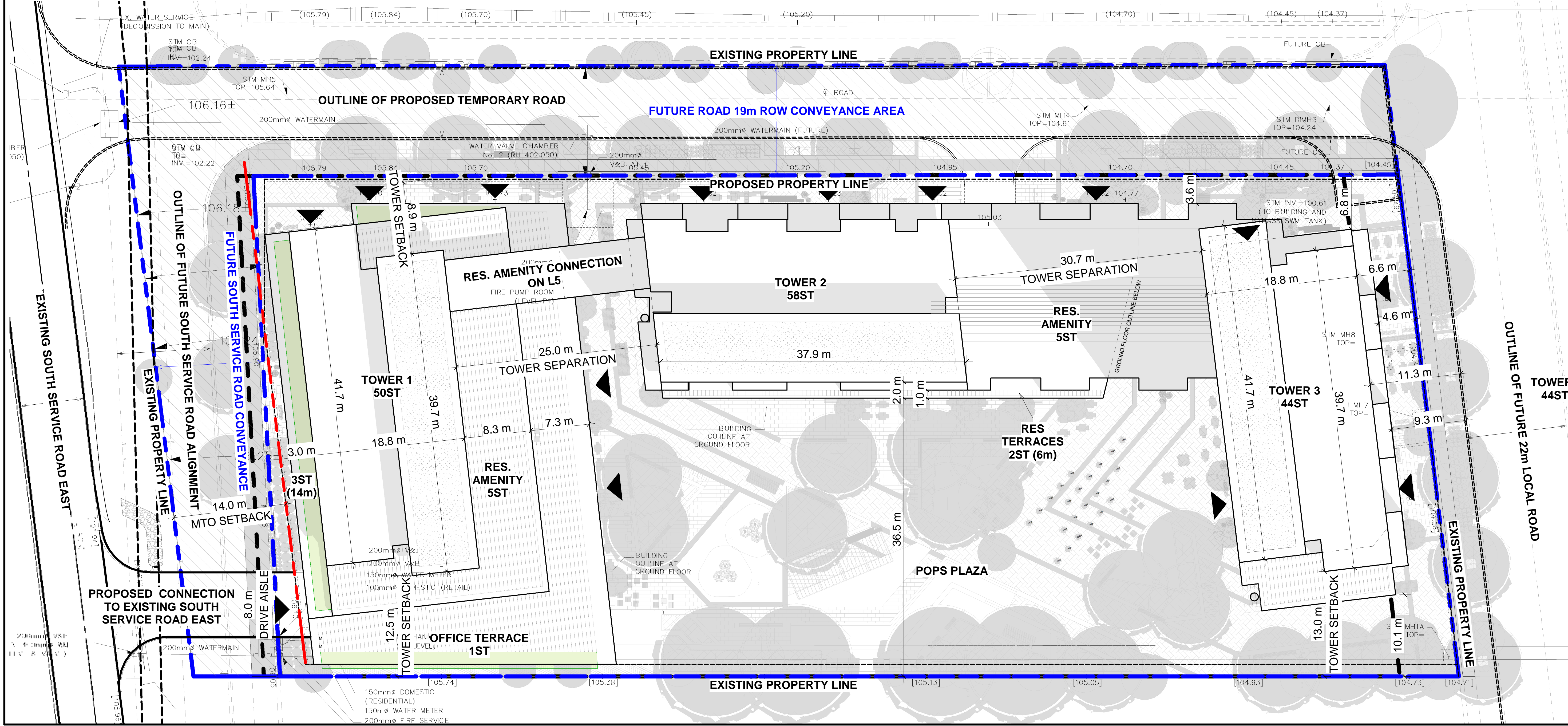
DATE : 2022-01-18
SCALE : 1 : 500
DRAWN : Author
CHECKED : Checker
PROJ. No. : 2128

ZONING REQUIREMENTS					
VEHICULAR PARKING					
TYPE	UNITS / M2	REQUIRED		PROVIDED	
Residential	1,606 units	0.5 spaces/unit	=	803	805
Residential Visitor	1,606 units	0.2 spaces/unit	=	322	322
Retail	2,013.81 m ²	1.08 per 100.00 m ²	=	22	22
Office	3,872.52 m ²	1.08 per 100.00 m ²	=	42	42
TOTAL				1189	1191
	REGULAR	VISITOR	RETAIL/OFFICE	BARRIER-FREE	LVL TOTAL
P1	0	81	64	6	145
P2	0	227	0	4	227
P3	211	14	0	6	225
P4	226	0	0	6	226
P5	226	0	0	6	226
P6	142	0	0	0	142
TOTAL PARKING	805	322	64	28	1191
BICYCLE PARKING					
TYPE	UNITS / M2	REQUIRED		PROVIDED	
Res LONG TERM	1,606 units	0.75 spaces/unit	=	1205	1205
Res SHORT TERM	1,606 units	0.25 spaces/unit	=	402	402
Office LONG TERM	3,872.52 m ²	1 per 1,000.00 m ²	=	4	4
Retail LONG TERM	2,013.81 m ²	1 per 1,000.00 m ²	=	2	2
TOTAL BICYCLE PARKING				1613	1613
LOADING & STAGING					
TYPE	REQUIRED	PROVIDED			
Loading (Moving) - 3.5mx6m				3	
Loading (Retail) - 3.5mx12m				1	
Loading (Res Garbage) - 3.5mx12m				1	
STAGING				155.00 m ²	174.00 m ²
RESIDENTIAL AMENITY					
TYPE	UNITS / M2	PROVIDED RATIO		PROVIDED (sqm)	
INDOOR	1,606 units	1 m ² /unit	=	1,649.13 m ²	
OUTDOOR	1,606 units	3 m ² /unit	=	4,872.37 m ²	
TOTAL RESIDENTIAL AMENITY		4 m²/unit		6,221.50 m²	
SITE AMENITY					
TYPE	NOTES	PROVIDED (sqm)	PROVIDED (sf)		
TOTAL SITE AREA		11887.3	127,953.71 m ²		
(POPS - NOT DEDUCTED FROM SITE AREA)		4572	49,212.55 m ²		
FUTURE CONVEYANCES*		2934.4	31,585.59 m ²		
NET SITE AREA		8952.9	96,368.12 m²		
TOTAL GFA (OAKVILLE "NET FLOOR AREA")		106,443	1,145,740		
FSI (TOTAL SITE)		8.95			
FSI (NET SITE)		11.89			



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E: info@sweeneyco.com | www.sweeneyco.com

PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

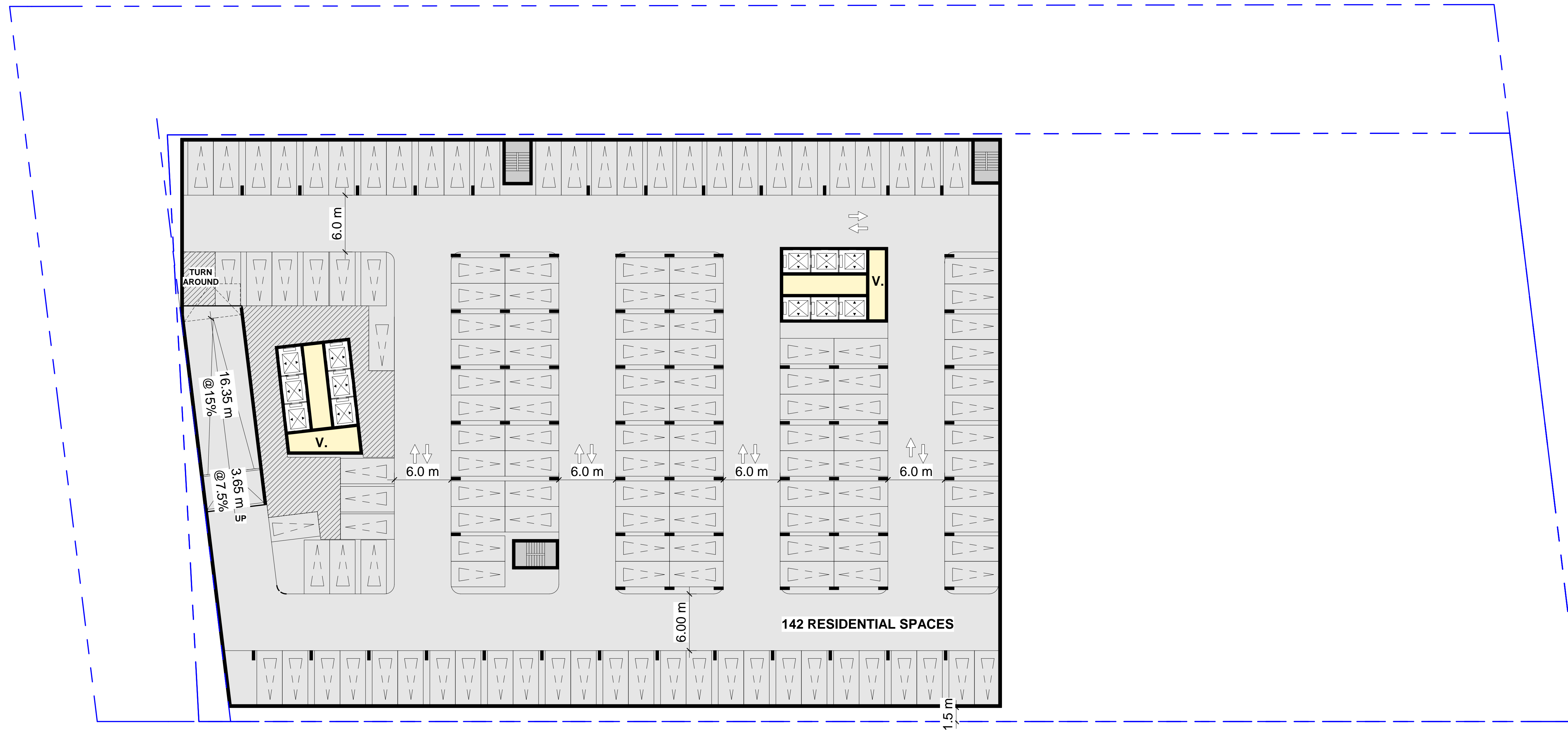
OWNER
166 South Service Inc.

DWG TITLE
Site Plan & Zoning Information

DATE: 2022-01-18
SCALE: As indicated
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128

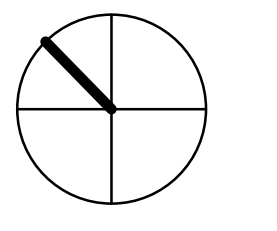
DWG No.
AZ100

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2022-05-18 10:27:44 AM



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PROJ. NAME
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OWNER
166 South Service Inc.

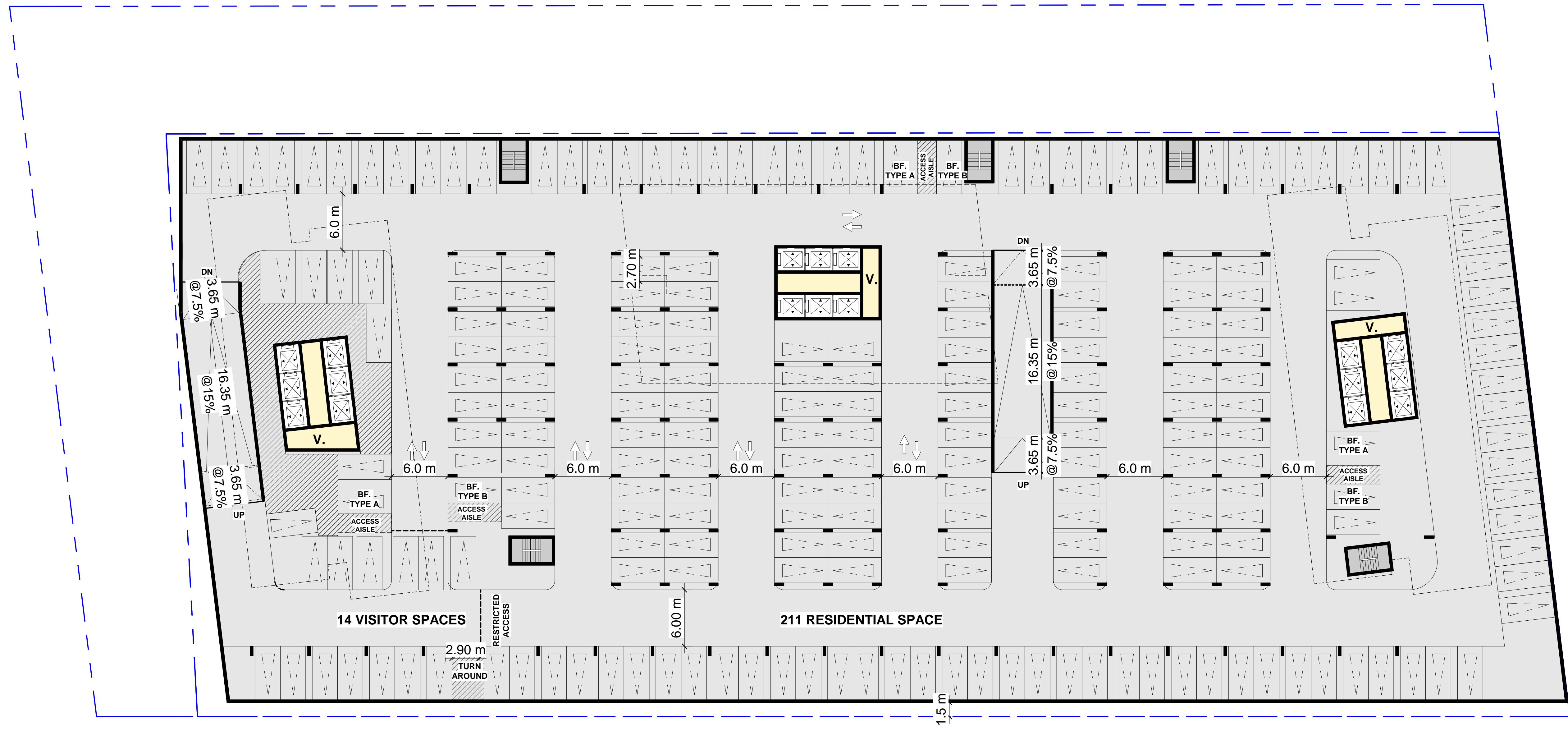
DWG TITLE
Level P6

DATE : 2022-01-18
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 CHECKED : Checker
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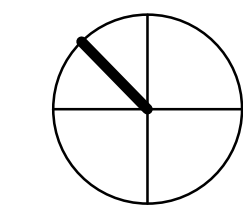
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PROJ. NAME
166 South Service Road
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OWNER
166 South Service Inc.

DWG TITLE
Level P3

DATE : 2022-01-18
 SCALE : 1 : 250
 DRAWN : Author
 CHECKED : Checker
 PROJ. No. : 2128

DWG No.
AZ103

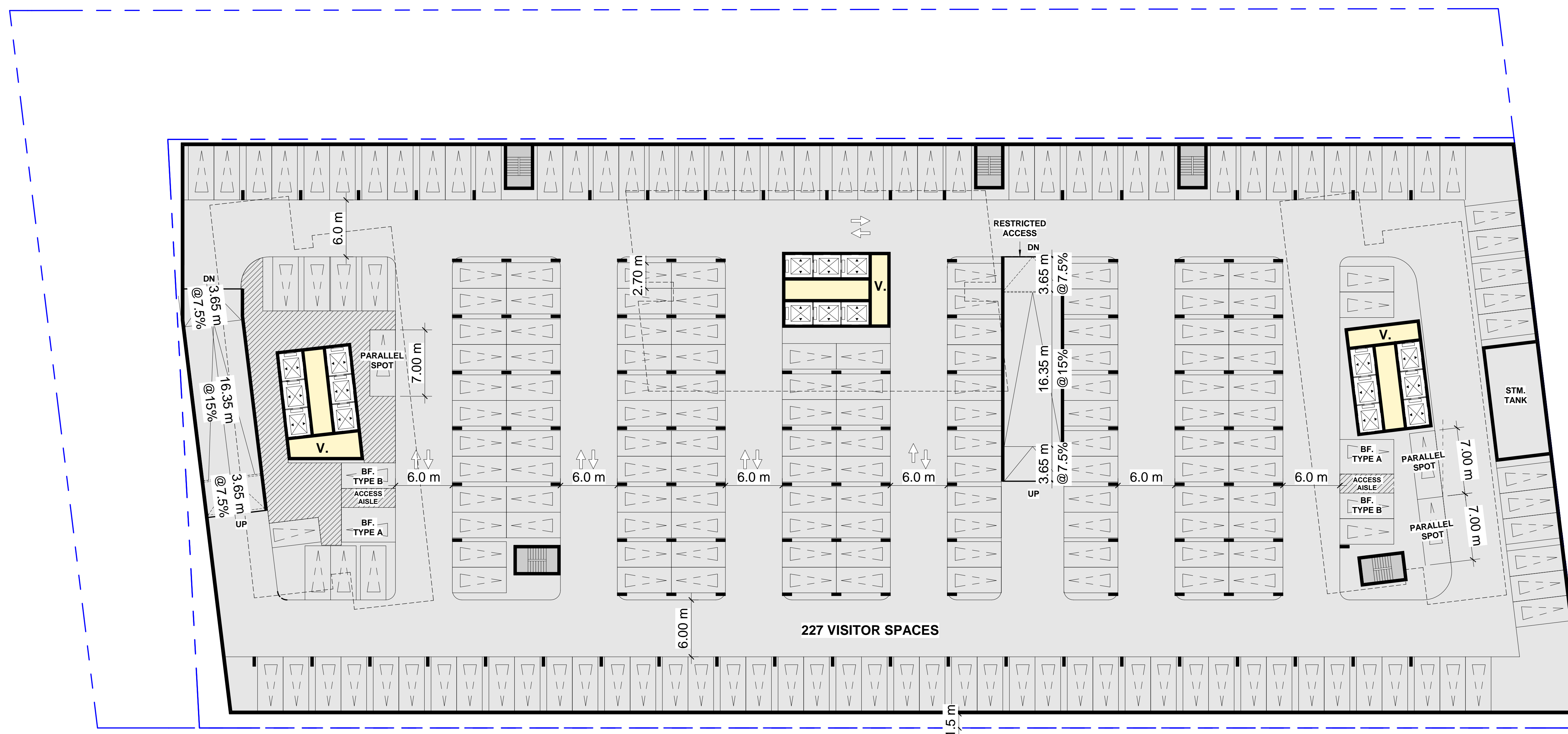
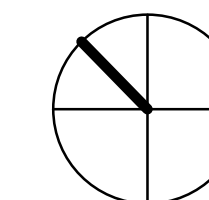
DRAWING NOT TO BE SCALED

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PROJ. NAME
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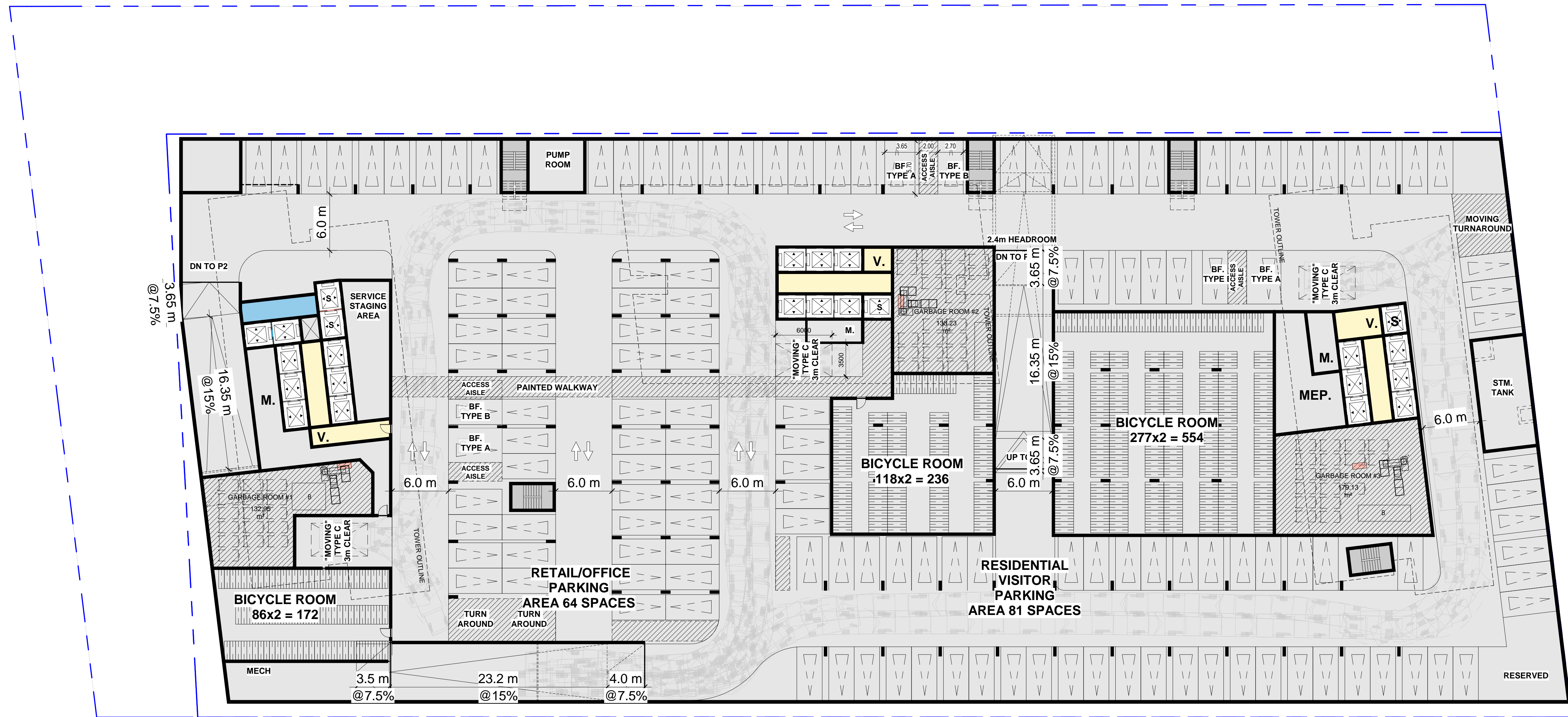
OWNER
166 South Service Inc.

DWG TITLE
Level P2

DATE: 2022-01-18
SCALE: 1 : 250
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128

DWG No.

AZ104



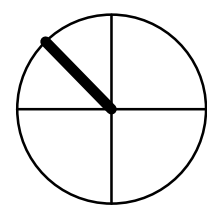
DRAWING NOT TO BE SCALED

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PROJ. NAME
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OWNER
166 South Service Inc.

DWG TITLE
Level P1

DATE : 2022-01-18
SCALE : 1 : 250
DRAWN : MS/FT/AA
CHECKED : DS
PROJ. No. : 2128 DWG No.

AZ105

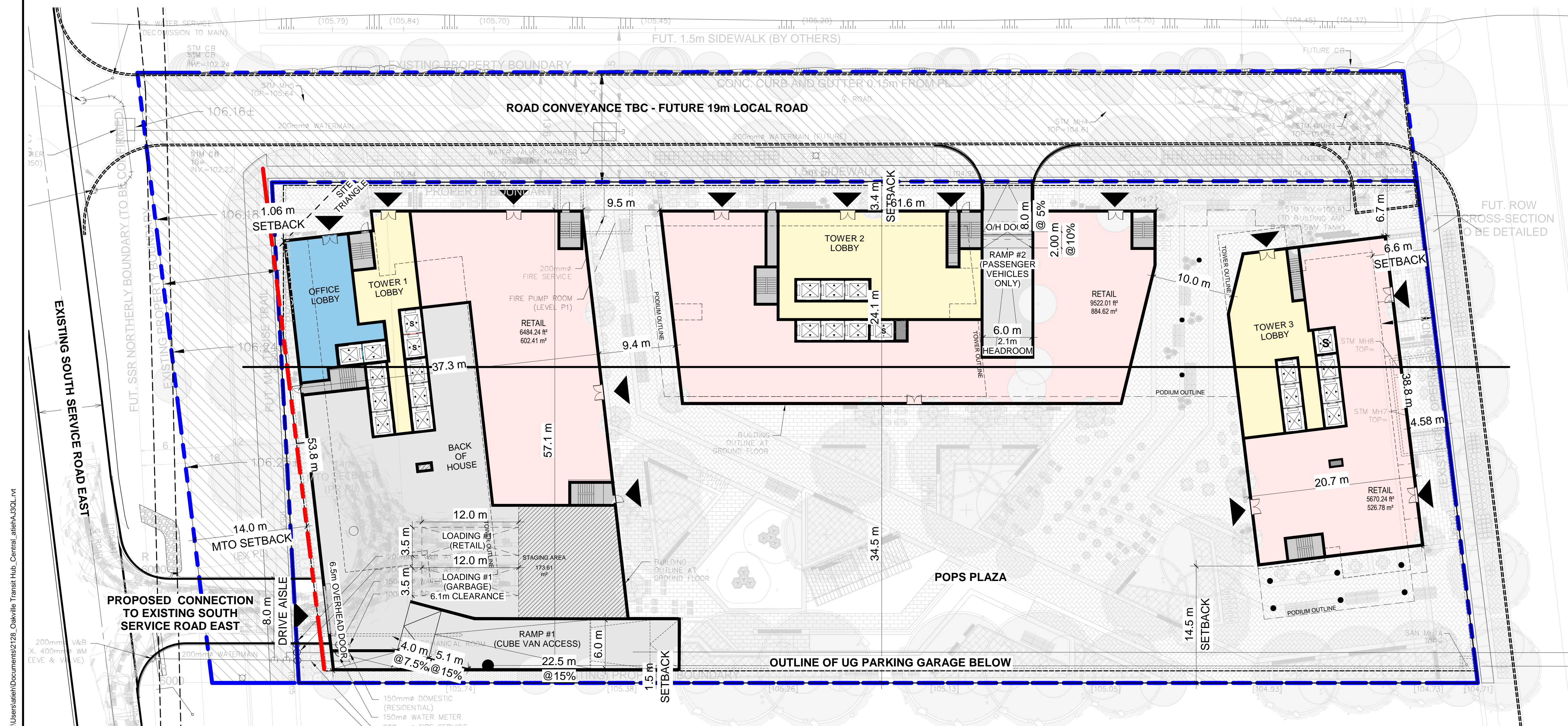
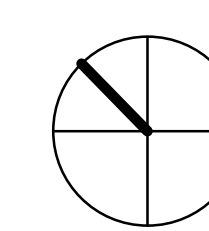
DRAWING NOT TO BE SCALED

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Level 1 - Ground Floor Plan

DATE: 2022-01-18
SCALE: 1 : 250
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128

DWG No.

AZ106

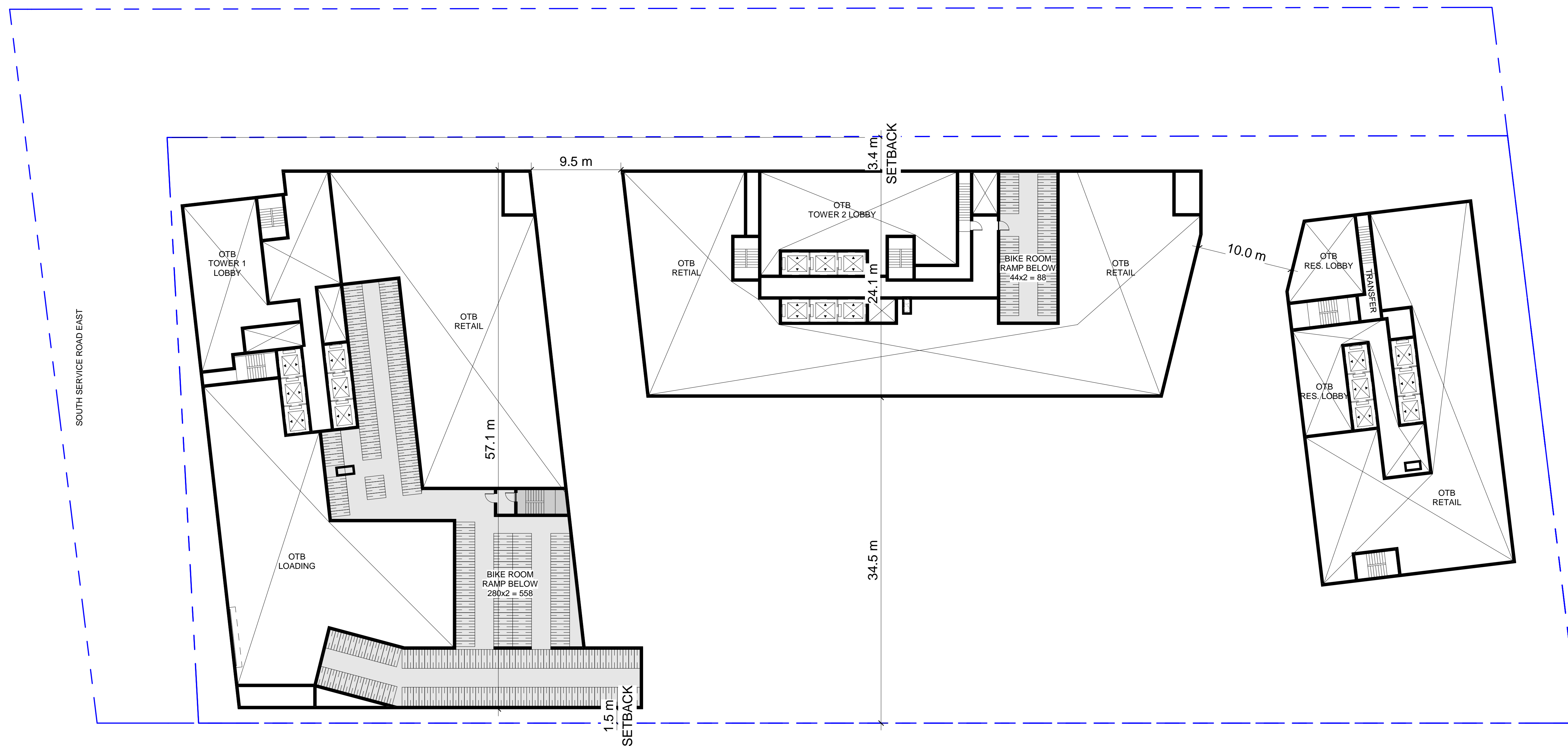
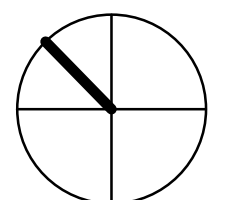
DRAWING NOT TO BE SCALED

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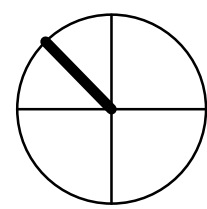
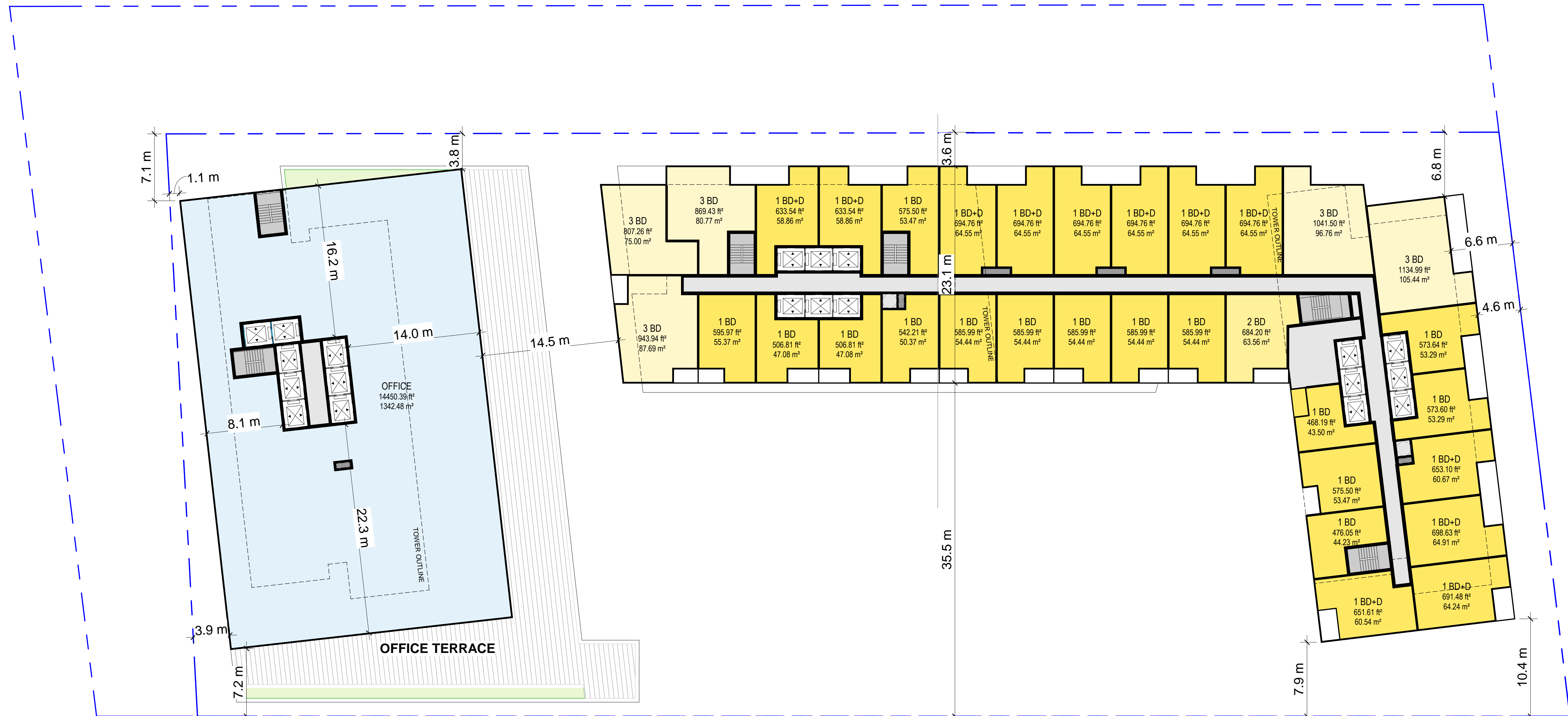
PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Level 1 Mezzanine

DATE : 2022-01-18
SCALE : 1 : 250
DRAWN : MS/FT
CHECKED : DS
PROJ. No. : 2128

DWG No.
AZ107



DRAWING NOT TO BE SCALED
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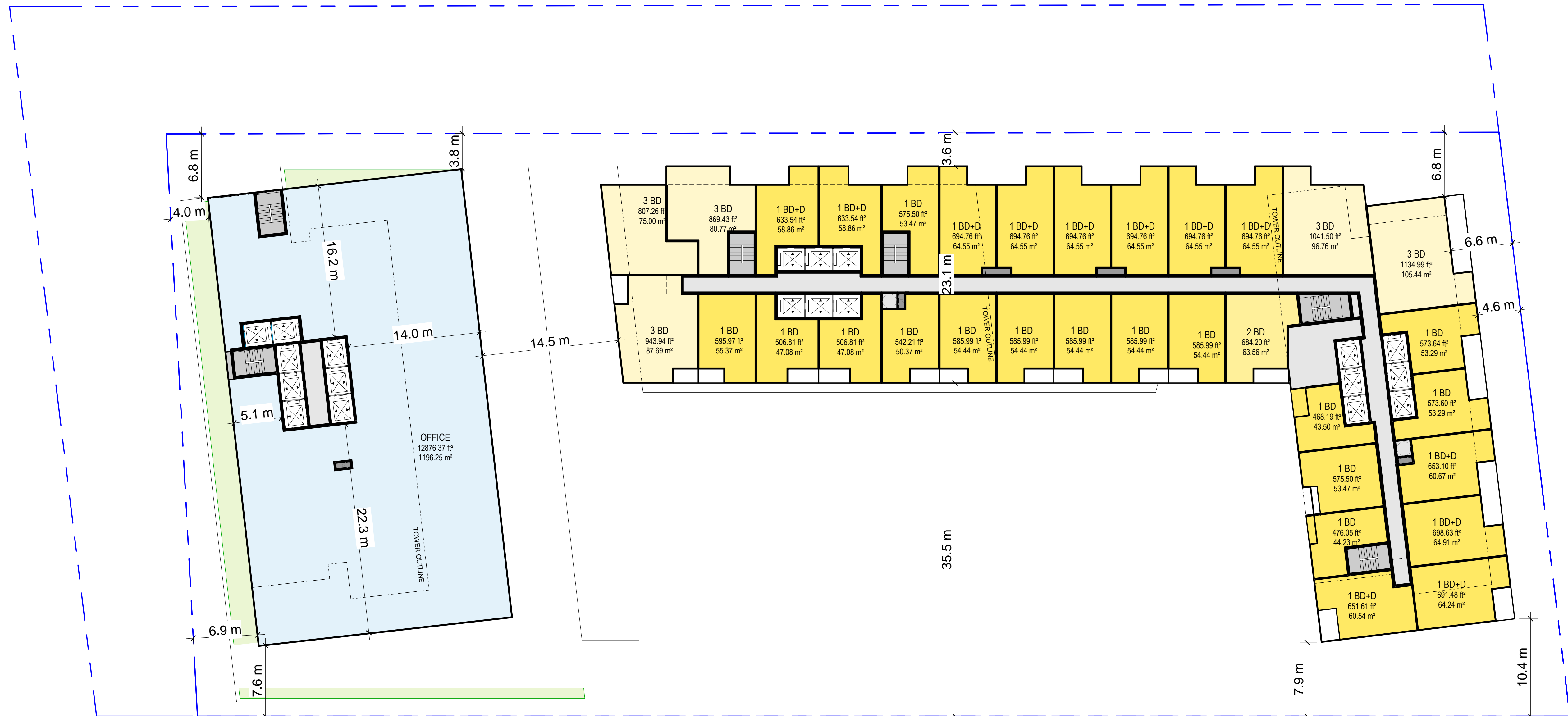
PROJ. NAME
166 South Service Road
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OWNER
166 South Service Inc.

DWG TITLE
Level 2

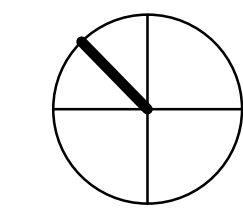
DATE: 2022-01-18
 SCALE: 1 : 250
 DRAWN: MS/FT/AA
 CHECKED: DS
 PROJ. No.: 2128 DWG No.

AZ108



DRAWING NOT TO BE SCALED
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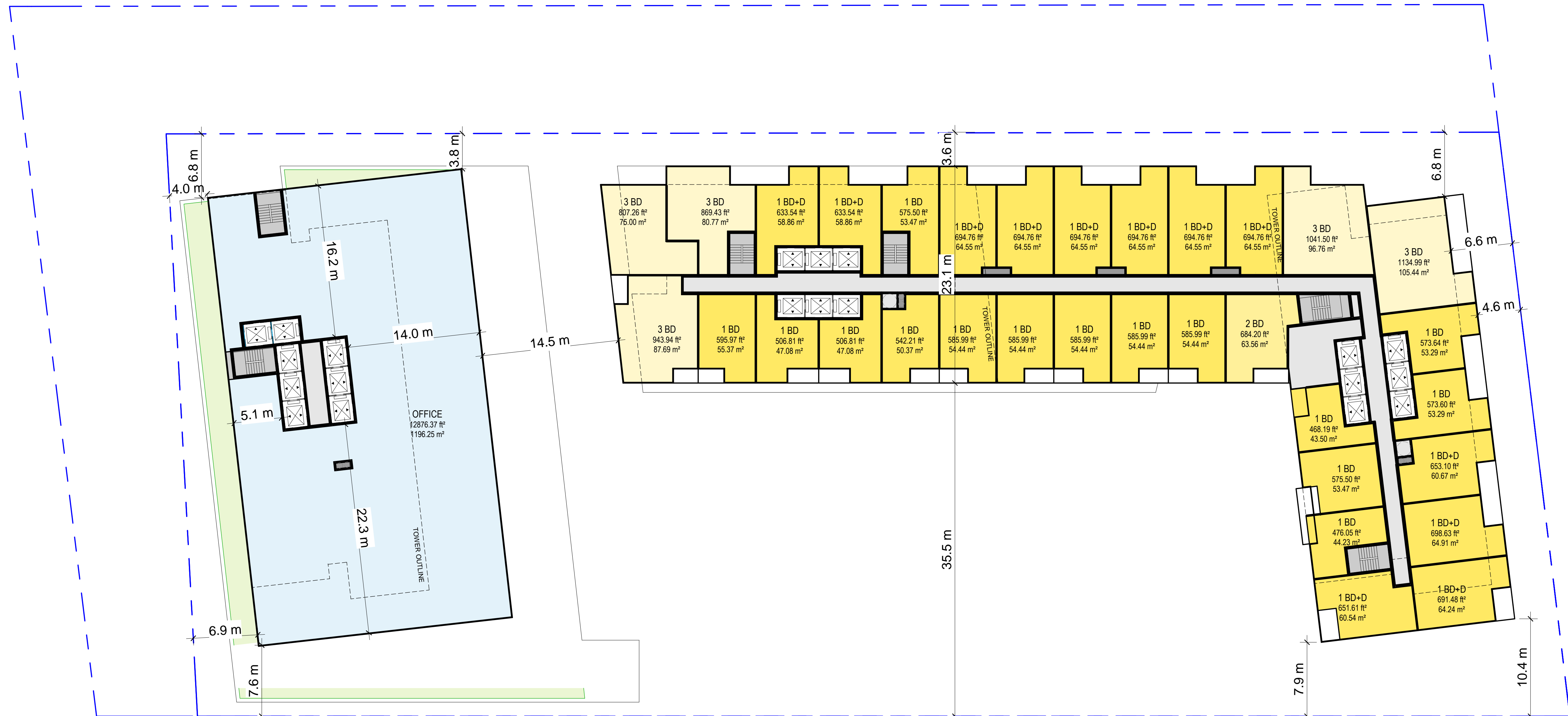
PROJ. NAME
166 South Service Road
 South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Level 3

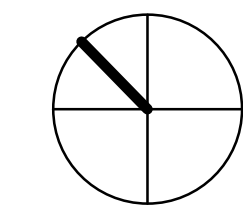
DATE : 2022-01-18
 SCALE : 1 : 250
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 CHECKED : DS
 PROJ. No. : 2128 DWG No.

AZ109



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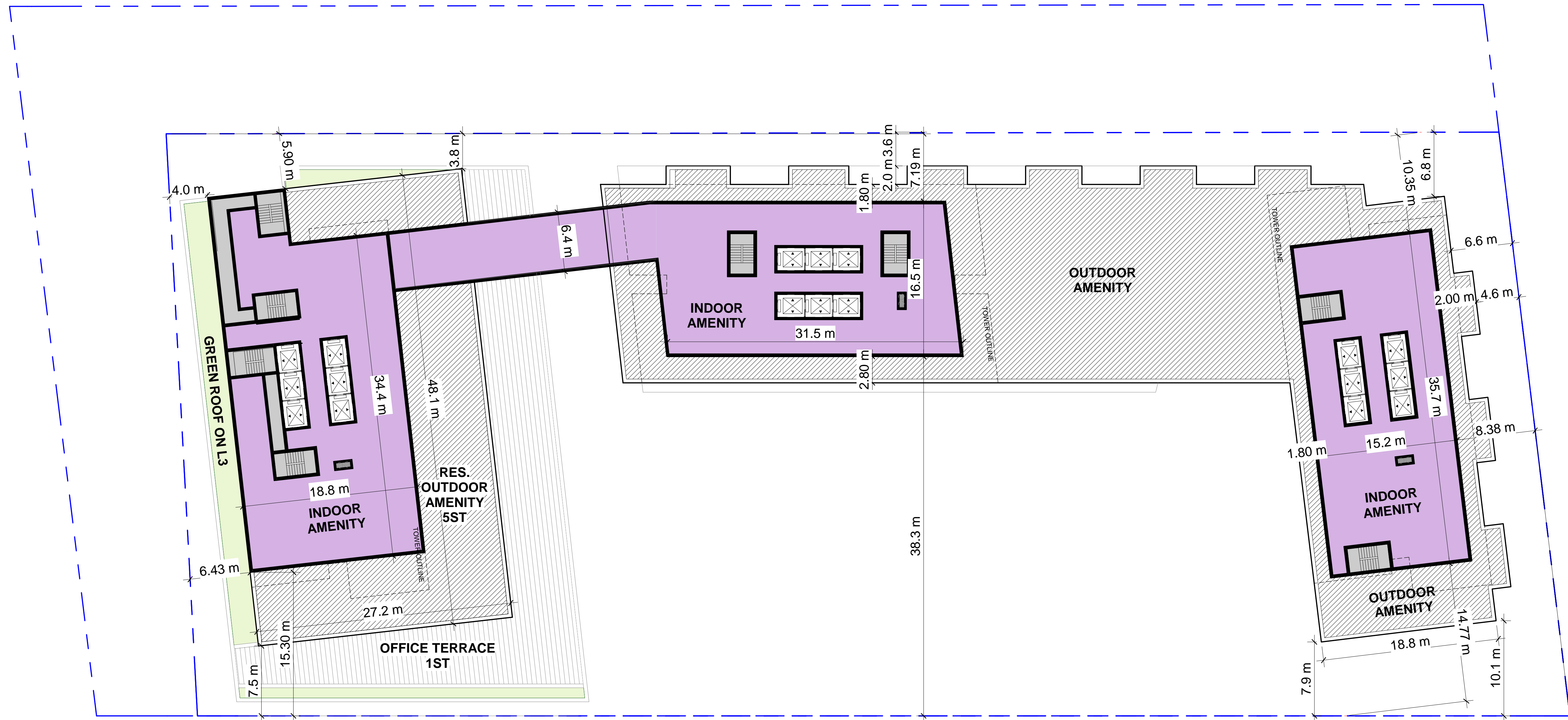
PROJ. NAME
166 South Service Road
 South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Levels 4-5

DATE : 2022-01-18
 SCALE : 1 : 250
 DRAWN : MS/FTAA
 CHECKED : DS
 PROJ. No. : 2128 DWG No.

AZ110



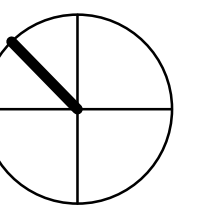
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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Level 6 - Amenity

DATE : 2022-01-18
SCALE : 1 : 250
DRAWN : MS/FT/AA
CHECKED : DS
PROJ. No. : 2128

DWG No.

AZ111

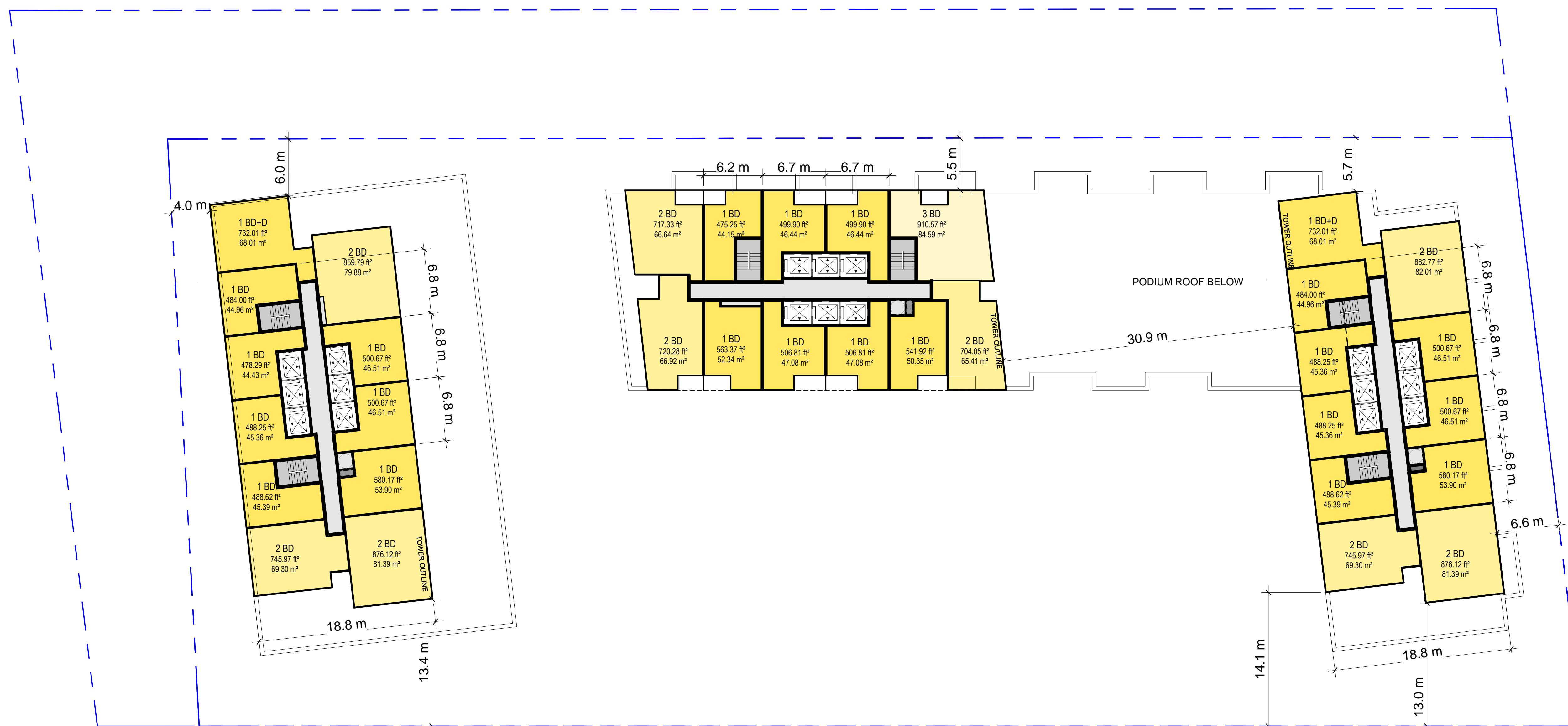
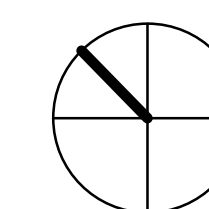
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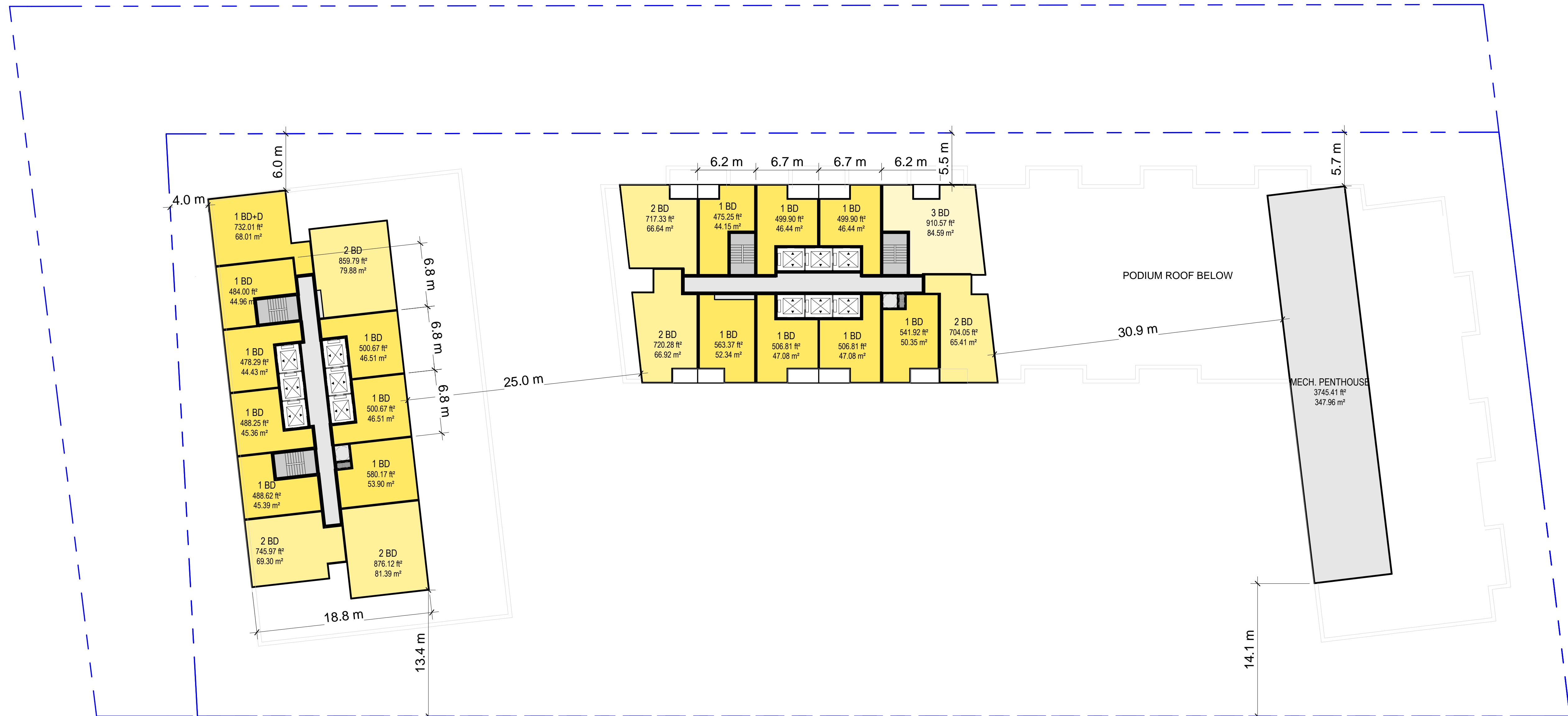
OWNER
166 South Service Inc.

DWG TITLE
Levels 7+ - Typical Tower Floor Plate

DATE: 2022-01-18
SCALE: 1 : 250
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128

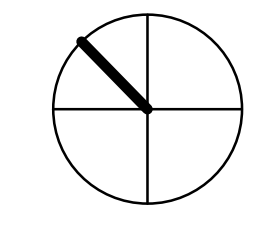
DWG No.

AZ112



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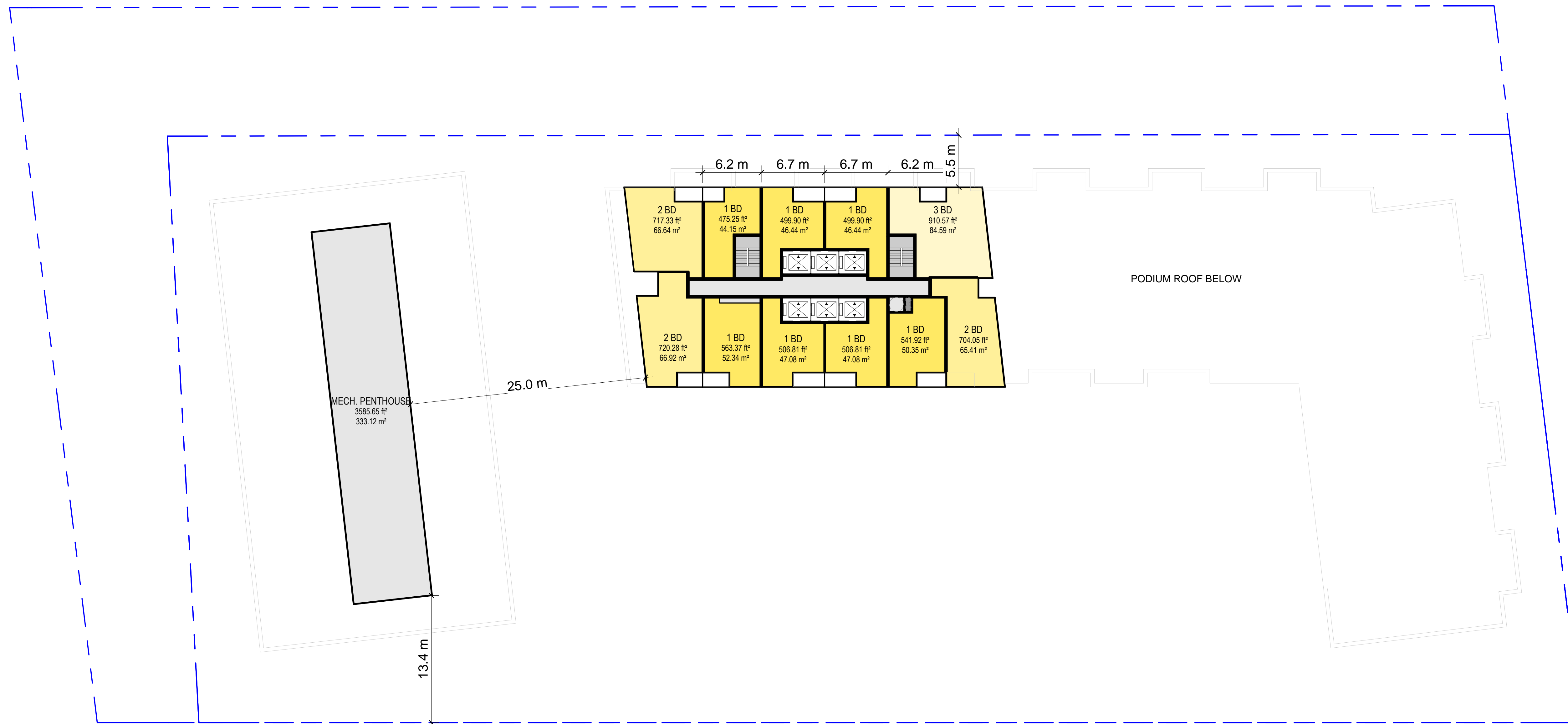
PROJ. NAME
166 South Service Road
 South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Levels 45-50

DATE : 2022-01-18
 SCALE : 1 : 250
 DRAWN : MS/FT/AA
 CHECKED : DS
 PROJ. No. : 2128

DWG No.
AZ113



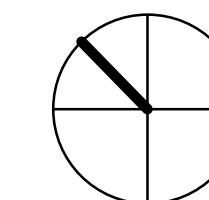
DRAWING NOT TO BE SCALED

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PROJ. NAME
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South Service Road & Trafalgar

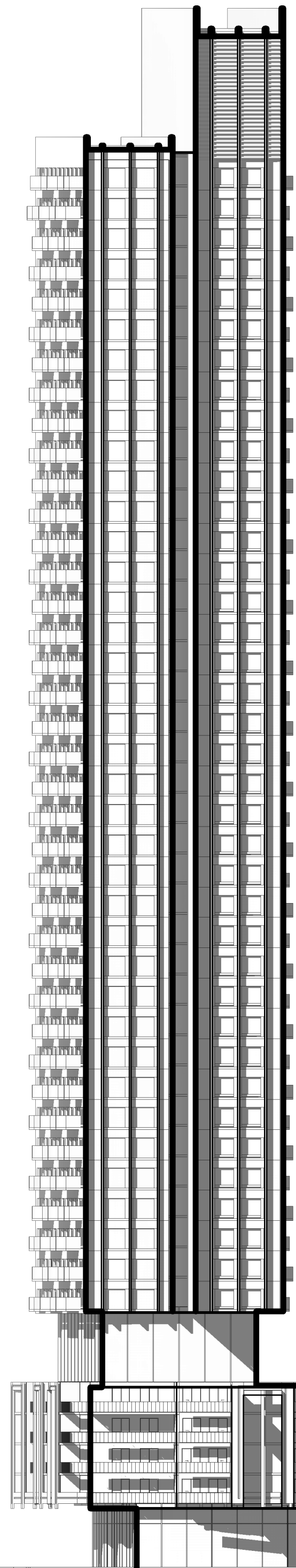
OWNER
166 South Service Inc.

DWG TITLE
Levels 51-58

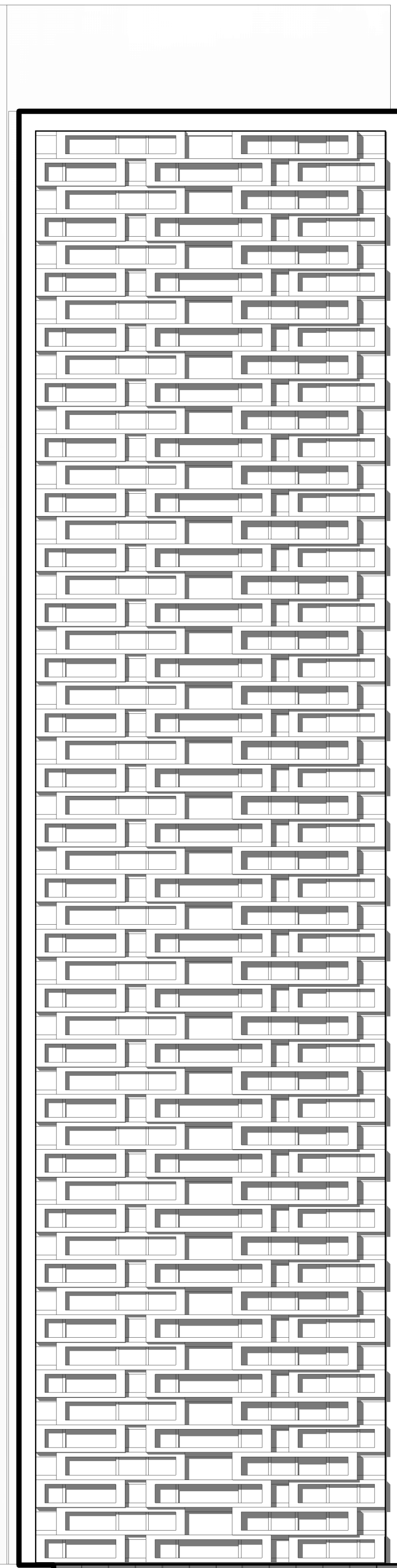
DATE : 2022-01-18
SCALE : 1 : 250
DRAWN : MS/FT/AA
CHECKED : DS
PROJ. No. : 2128

DWG No.

AZ114



1 East Elevation
AZ300 1:400



2 North Elevation
AZ300 1:400

Tower 2 MPH Roof +194.00 m

Level 59	+182.00 m
Level 58	+179.00 m
Level 57	+176.00 m
Level 56	+173.00 m
Level 55	+170.00 m
Level 54	+167.00 m
Level 53	+164.00 m
Level 52	+161.00 m
Level 51	+158.00 m
Level 50	+155.00 m
Level 49	+152.00 m
Level 48	+149.00 m
Level 47	+146.00 m
Level 46	+143.00 m
Level 45	+140.00 m
Level 44	+137.00 m
Level 43	+134.00 m
Level 42	+131.00 m
Level 41	+128.00 m
Level 40	+125.00 m
Level 39	+122.00 m
Level 38	+119.00 m
Level 37	+116.00 m
Level 36	+113.00 m
Level 35	+110.00 m
Level 34	+107.00 m
Level 33	+104.00 m
Level 32	+101.00 m
Level 31	+98.00 m
Level 30	+95.00 m
Level 29	+92.00 m
Level 28	+89.00 m
Level 27	+86.00 m
Level 26	+83.00 m
Level 25	+80.00 m
Level 24	+77.00 m
Level 23	+74.00 m
Level 22	+71.00 m
Level 21	+68.00 m
Level 20	+65.00 m
Level 19	+62.00 m
Level 18	+59.00 m
Level 17	+56.00 m
Level 16	+53.00 m
Level 15	+50.00 m
Level 14	+47.00 m
Level 13	+44.00 m
Level 12	+41.00 m
Level 11	+38.00 m
Level 10	+35.00 m
Level 09	+32.00 m
Level 08	+29.00 m
Level 07	+26.00 m
Level 06	+18.50 m
Level 05	+15.50 m
Level 04	+12.50 m
Level 03	+9.50 m
Level 02	+6.50 m
Level 01 Mezz	+3.00 m
Level 01	+0.00 m
Level -1	-4.50 m
Level -2	-7.50 m
Level -3	-10.50 m
Level -4	-13.50 m
Level -5	-16.50 m

Tower 2 MPH Roof +194.00 m

Level 59	+182.00 m
Level 58	+179.00 m
Level 57	+176.00 m
Level 56	+173.00 m
Level 55	+170.00 m
Level 54	+167.00 m
Level 53	+164.00 m
Level 52	+161.00 m
Level 51	+158.00 m
Level 50	+155.00 m
Level 49	+152.00 m
Level 48	+149.00 m
Level 47	+146.00 m
Level 46	+143.00 m
Level 45	+140.00 m
Level 44	+137.00 m
Level 43	+134.00 m
Level 42	+131.00 m
Level 41	+128.00 m
Level 40	+125.00 m
Level 39	+122.00 m
Level 38	+119.00 m
Level 37	+116.00 m
Level 36	+113.00 m
Level 35	+110.00 m
Level 34	+107.00 m
Level 33	+104.00 m
Level 32	+101.00 m
Level 31	+98.00 m
Level 30	+95.00 m
Level 29	+92.00 m
Level 28	+89.00 m
Level 27	+86.00 m
Level 26	+83.00 m
Level 25	+80.00 m
Level 24	+77.00 m
Level 23	+74.00 m
Level 22	+71.00 m
Level 21	+68.00 m
Level 20	+65.00 m
Level 19	+62.00 m
Level 18	+59.00 m
Level 17	+56.00 m
Level 16	+53.00 m
Level 15	+50.00 m
Level 14	+47.00 m
Level 13	+44.00 m
Level 12	+41.00 m
Level 11	+38.00 m
Level 10	+35.00 m
Level 09	+32.00 m
Level 08	+29.00 m
Level 07	+26.00 m
Level 06	+18.50 m
Level 05	+15.50 m
Level 04	+12.50 m
Level 03	+9.50 m
Level 02	+6.50 m
Level 01 Mezz	+3.00 m
Level 01	+0.00 m
Level -1	-4.50 m
Level -2	-7.50 m
Level -3	-10.50 m
Level -4	-13.50 m
Level -5	-16.50 m

DRAWING NOT TO BE SCALED
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22-05-30 ISSUED FOR REZONING

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E: info@sandco.com | www.sweenyandco.com

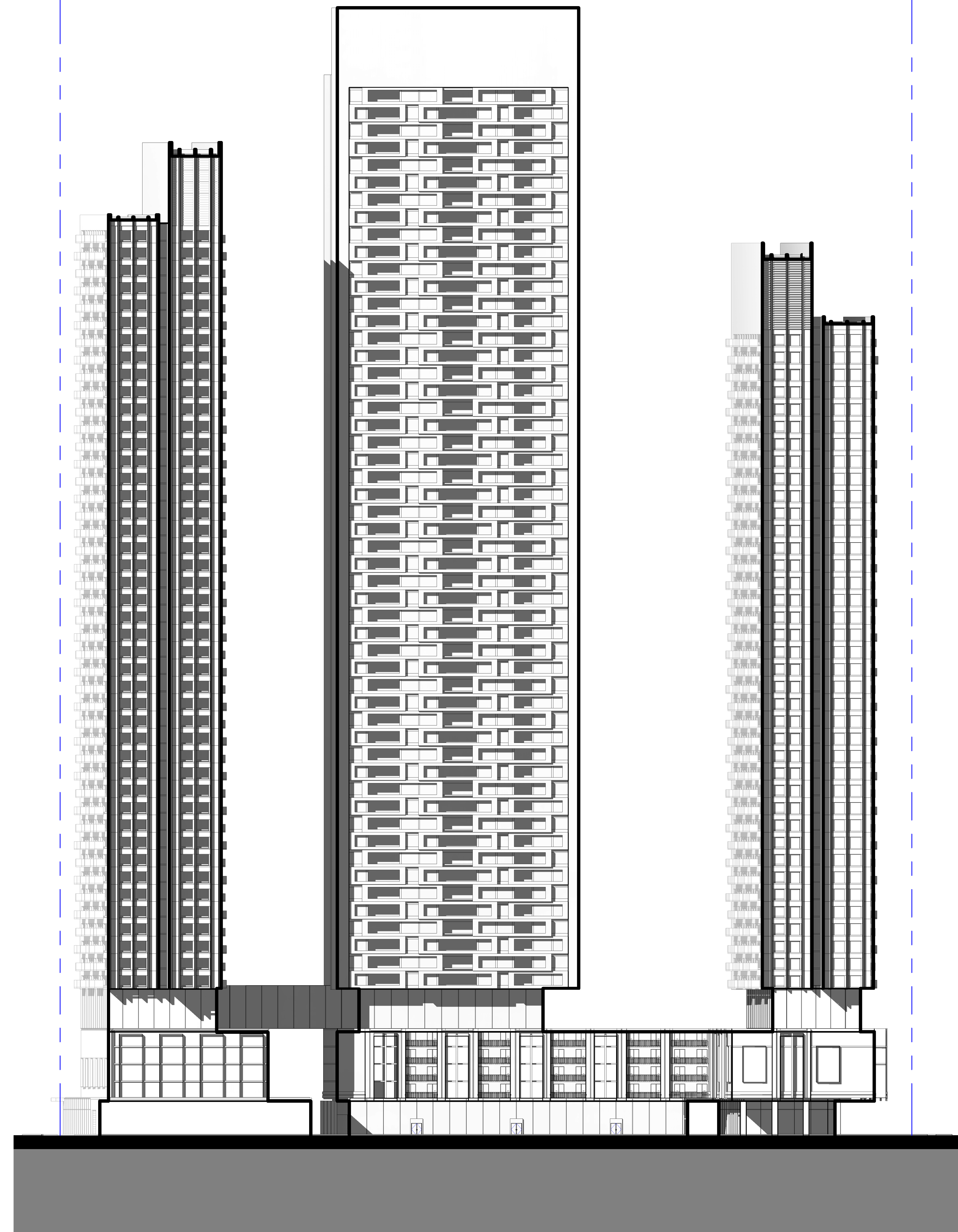
PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

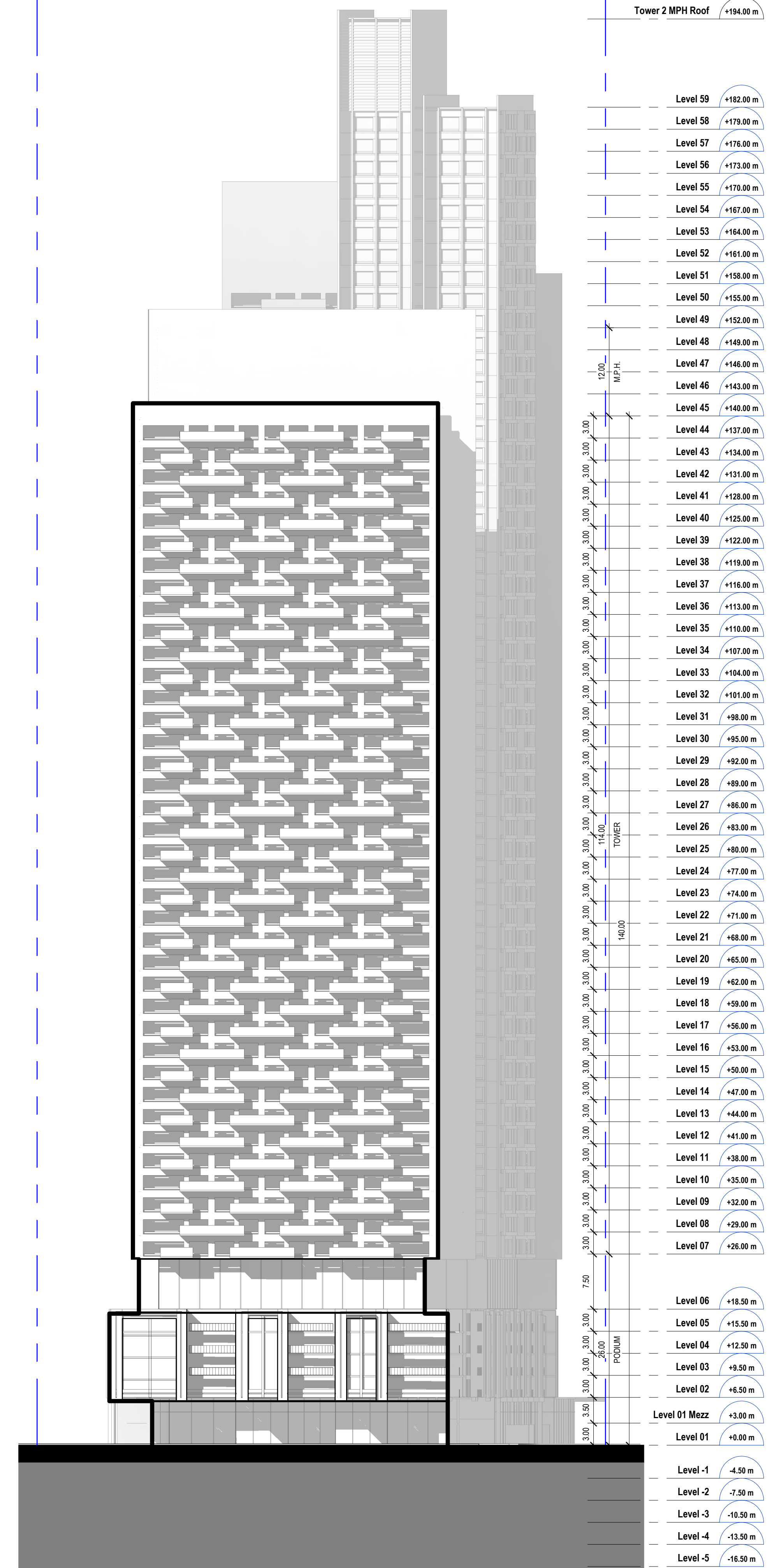
DWG TITLE
Elevations (north and east)

DATE: 2022-01-18
SCALE: 1:400
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128 DWG No.

AZ300



1 West Elevation
AZ301 1:400



2 South Elevation
AZ301 1:400

Tower 2 MPH Roof	+194.00 m
Level 59	+182.00 m
Level 58	+179.00 m
Level 57	+176.00 m
Level 56	+173.00 m
Level 55	+170.00 m
Level 54	+167.00 m
Level 53	+164.00 m
Level 52	+161.00 m
Level 51	+158.00 m
Level 50	+155.00 m
Level 49	+152.00 m
Level 48	+149.00 m
Level 47	+146.00 m
Level 46	+143.00 m
Level 45	+140.00 m
Level 44	+137.00 m
Level 43	+134.00 m
Level 42	+131.00 m
Level 41	+128.00 m
Level 40	+125.00 m
Level 39	+122.00 m
Level 38	+119.00 m
Level 37	+116.00 m
Level 36	+113.00 m
Level 35	+110.00 m
Level 34	+107.00 m
Level 33	+104.00 m
Level 32	+101.00 m
Level 31	+98.00 m
Level 30	+95.00 m
Level 29	+92.00 m
Level 28	+89.00 m
Level 27	+86.00 m
Level 26	+83.00 m
Level 25	+80.00 m
Level 24	+77.00 m
Level 23	+74.00 m
Level 22	+71.00 m
Level 21	+68.00 m
Level 20	+65.00 m
Level 19	+62.00 m
Level 18	+59.00 m
Level 17	+56.00 m
Level 16	+53.00 m
Level 15	+50.00 m
Level 14	+47.00 m
Level 13	+44.00 m
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Level 11	+38.00 m
Level 10	+35.00 m
Level 09	+32.00 m
Level 08	+29.00 m
Level 07	+26.00 m
Level 06	+18.50 m
Level 05	+15.50 m
Level 04	+12.50 m
Level 03	+9.50 m
Level 02	+6.50 m
Level 01 Mezz	+3.00 m
Level 01	+0.00 m
Level -1	-4.50 m
Level -2	-7.50 m
Level -3	-10.50 m
Level -4	-13.50 m
Level -5	-16.50 m

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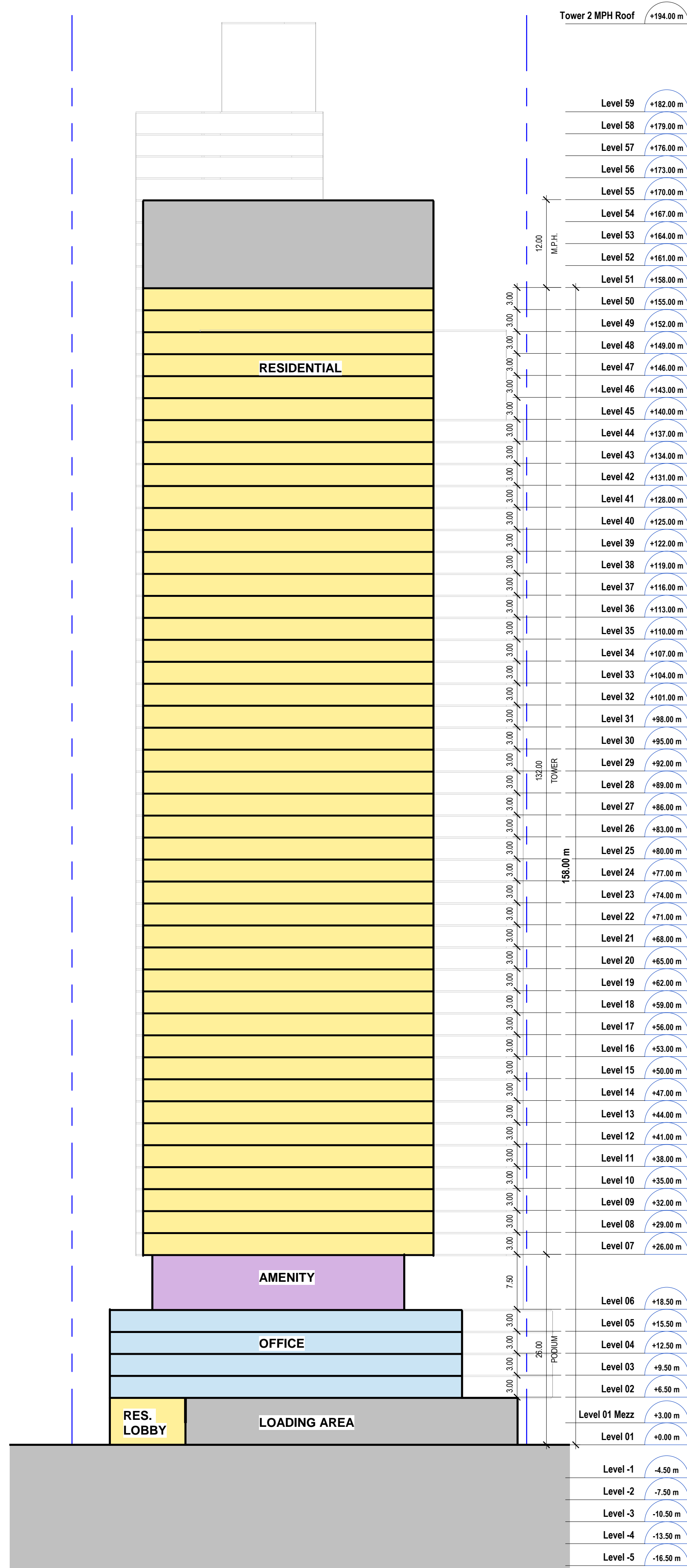
PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

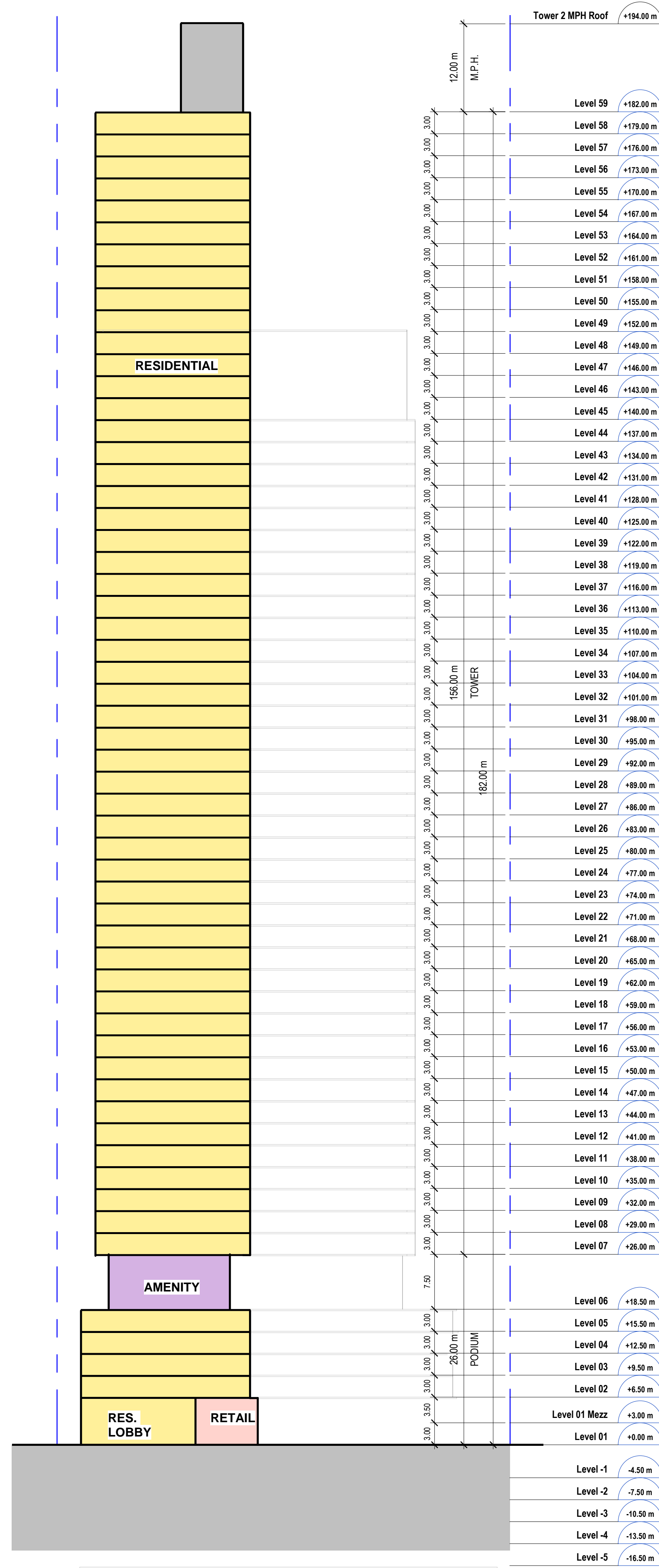
DWG TITLE
Elevation (south and west)

DATE: 2022-01-18
SCALE: 1:400
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128
DWG No. **AZ301**

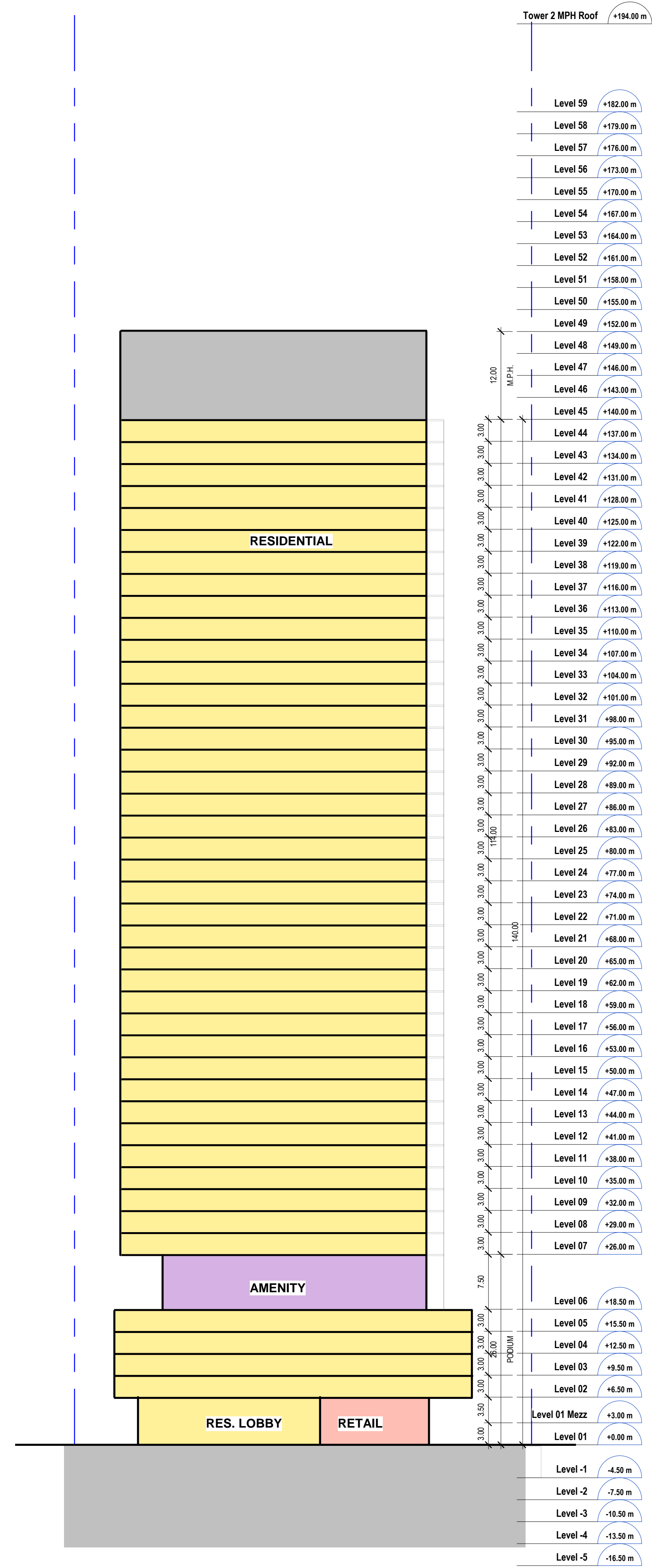
C:\Users\steh\Documents\2128_Oakville Transit Hub_Central_atksh\A2400.rvt 2022-05-18 10:29:27 AM



1 E-W Section - Tower 1
AZ400 1:400



2 E-W Section - Tower 2
AZ400 1:400



3 E-W Section - Tower 3
AZ400 1:400

DRAWING NOT TO BE SCALED

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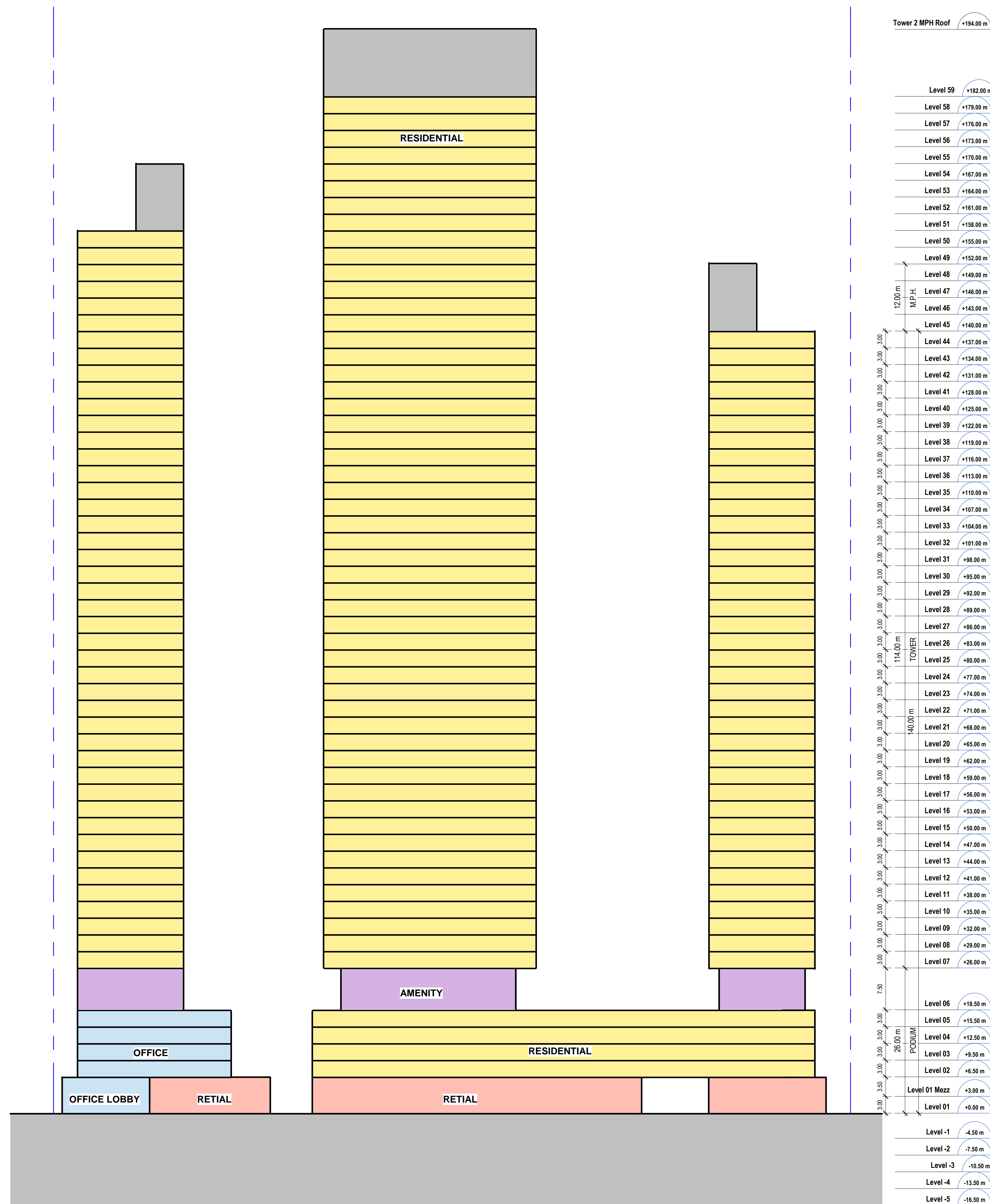
PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Sections (east-west)

DATE: 2022-01-18
SCALE: 1:400
DRAWN: MS/FT/AA
CHECKED: DS
PROJ. No.: 2128 DWG No.

AZ400



DRAWING NOT TO BE SCALED

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Sections (north-south)

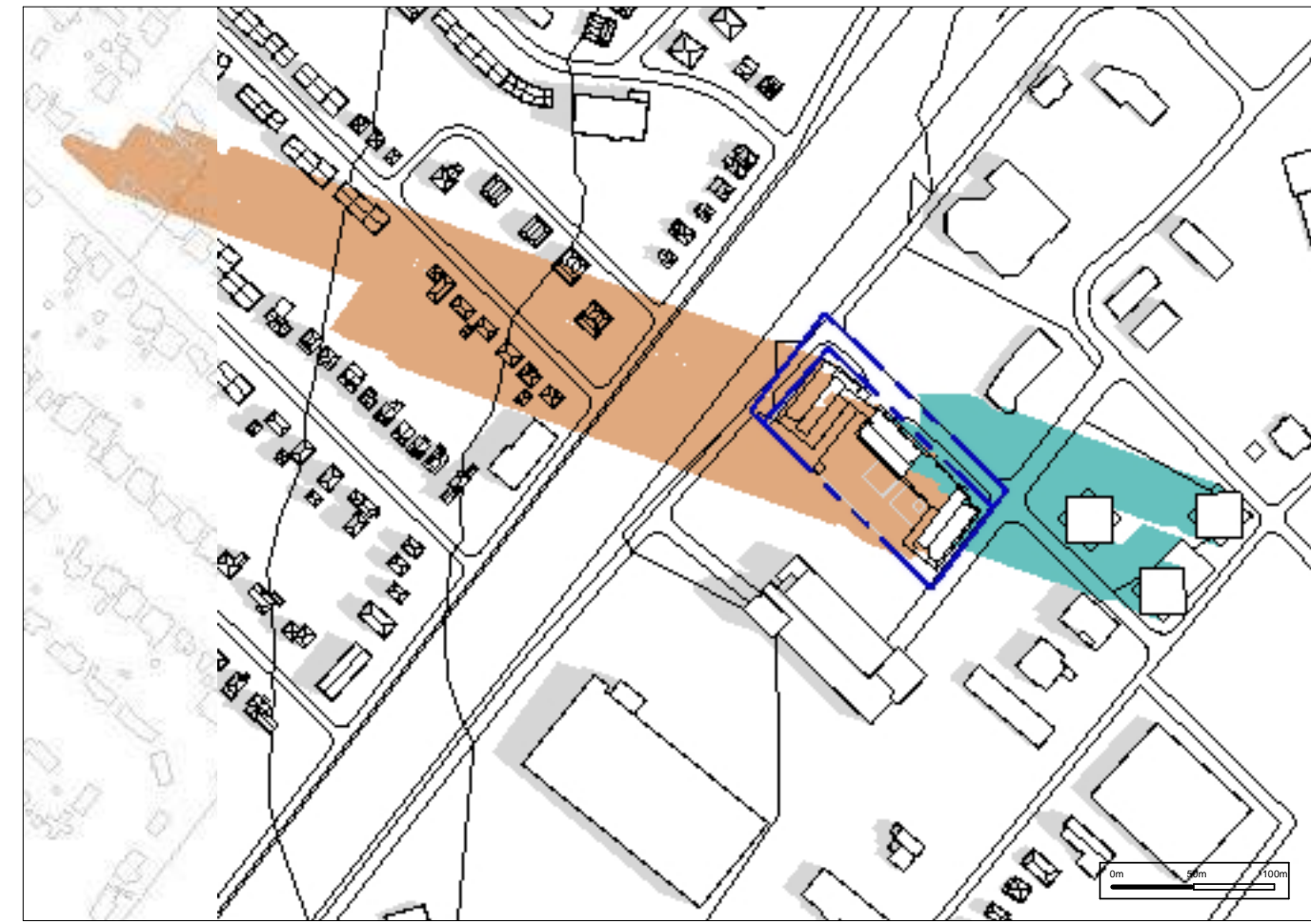
DATE : 2022-01-18
SCALE : 1 : 400
DRAWN : MS/FT/AA
CHECKED : DS
PROJ. No. : 2128

DWG No.

AZ401

MARCH 21st

- Applicant Proposal
- Approved/ Not Yet Constructed
- Existing



09:18 AM



10:18 AM



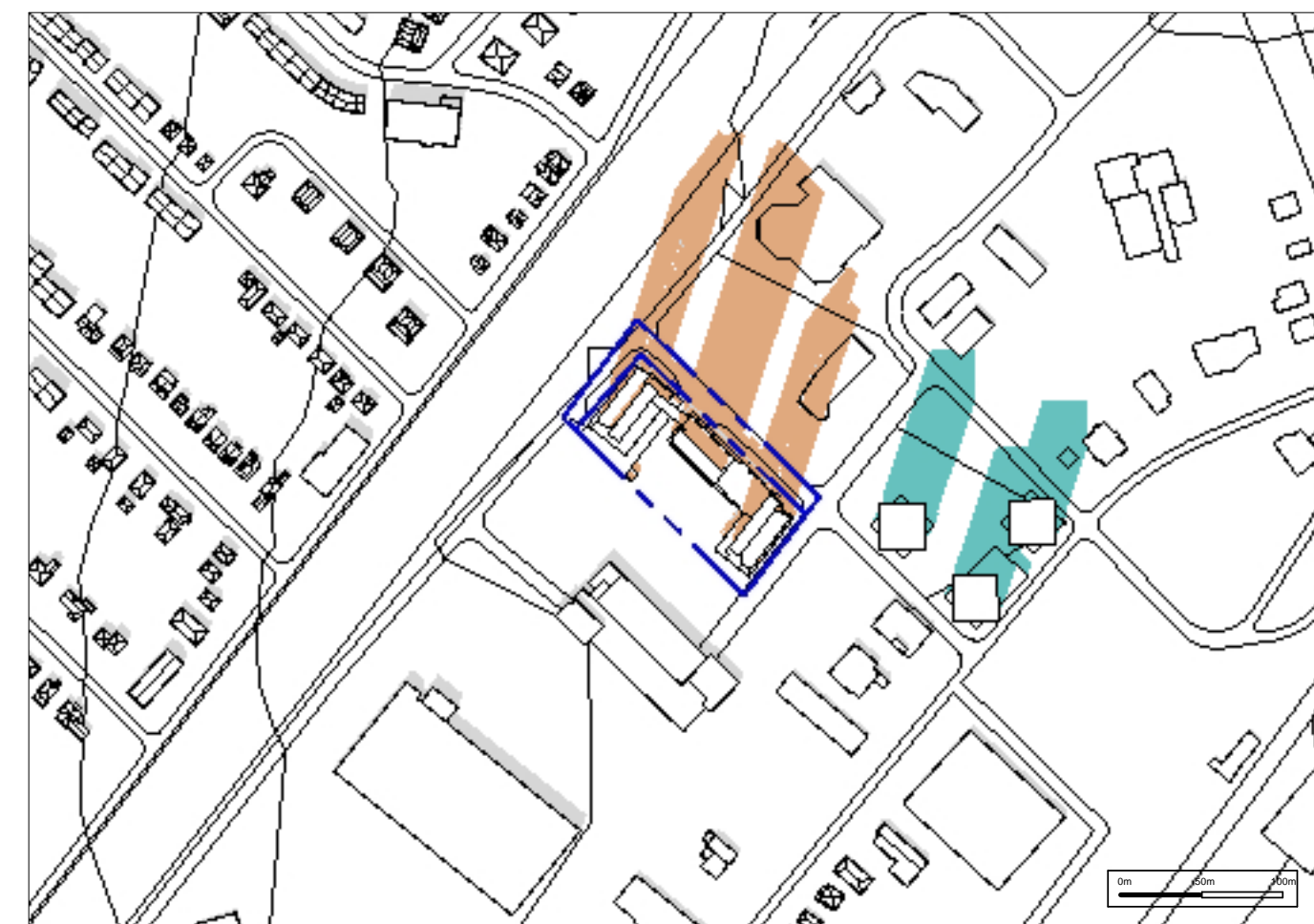
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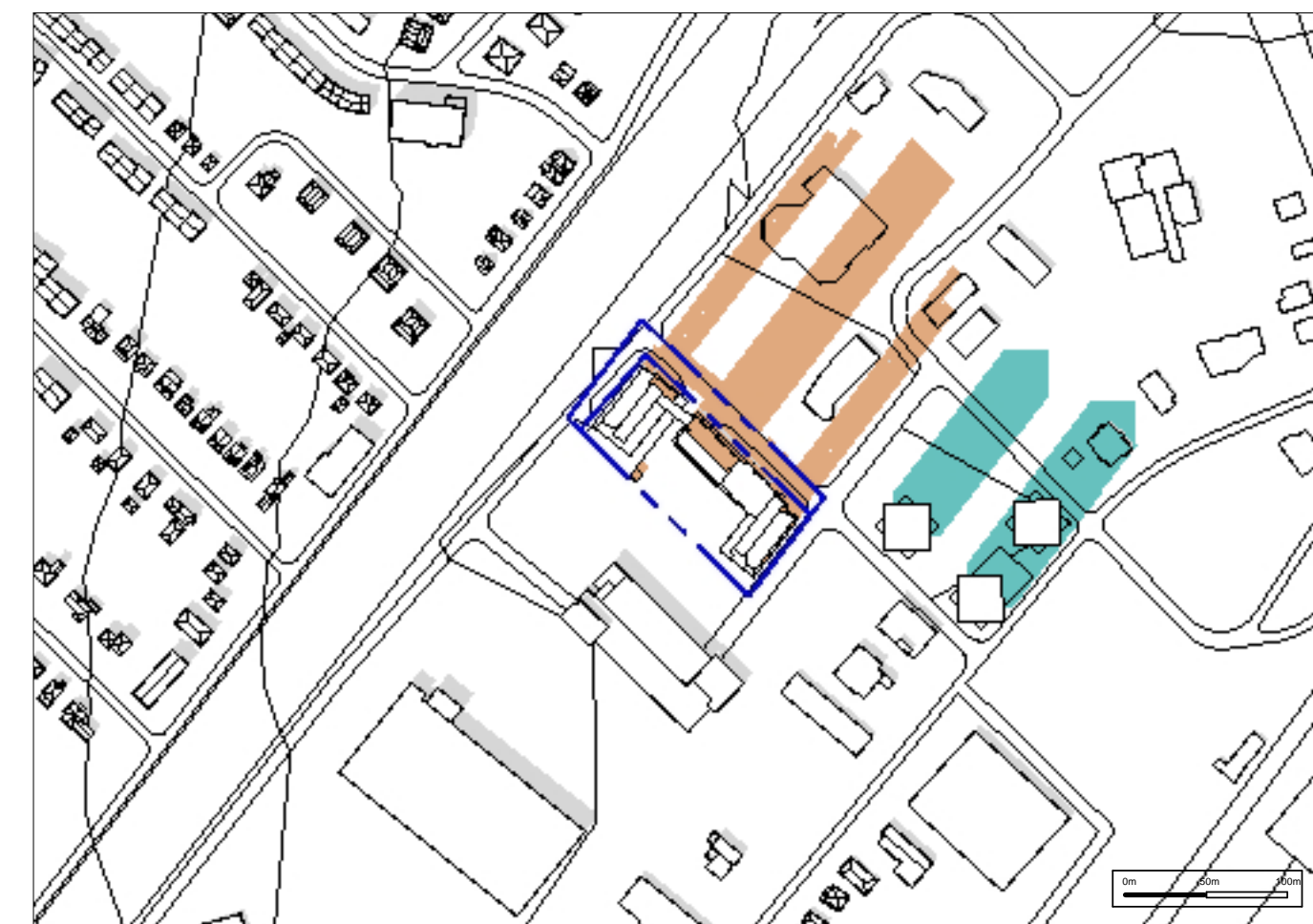
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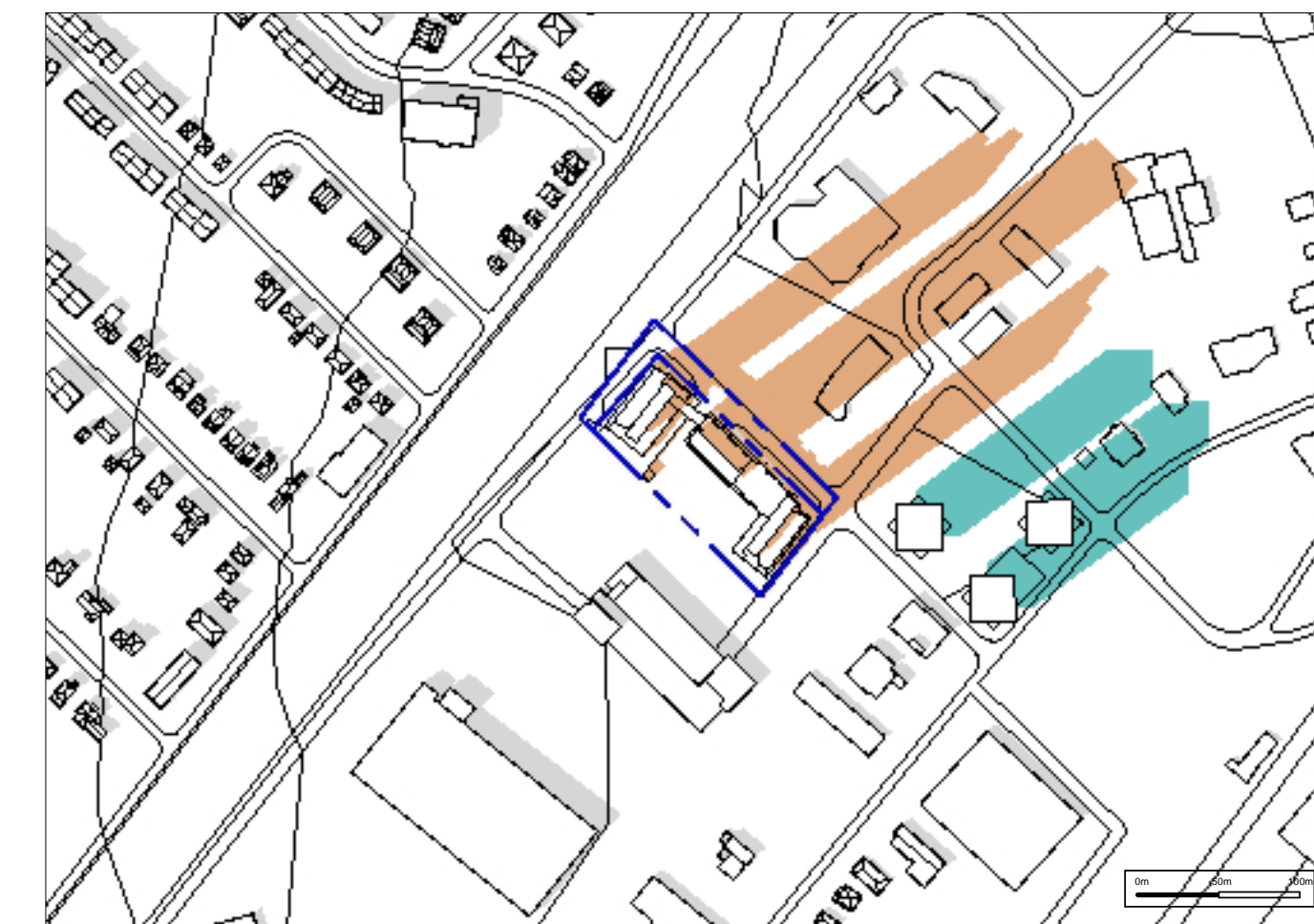
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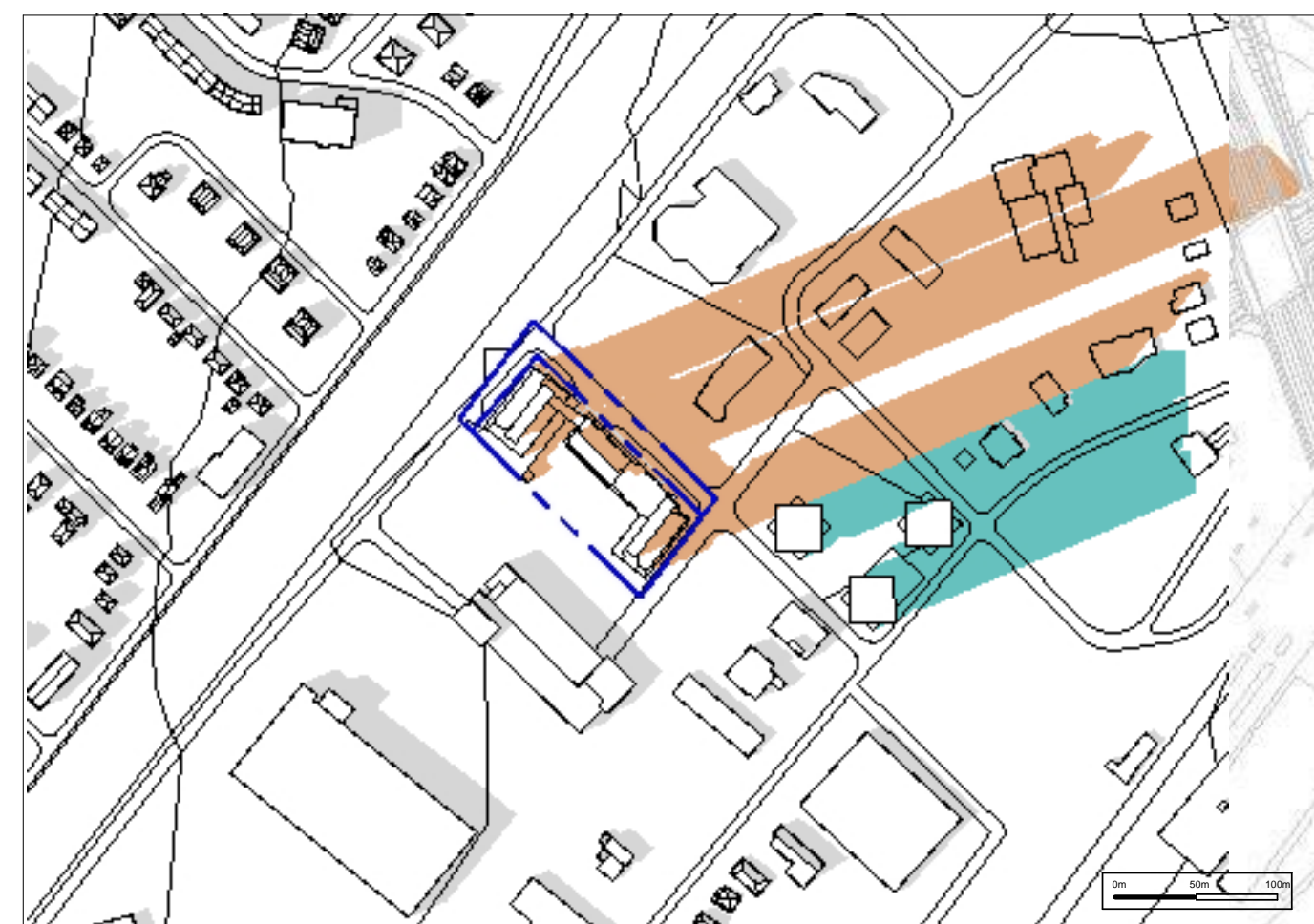
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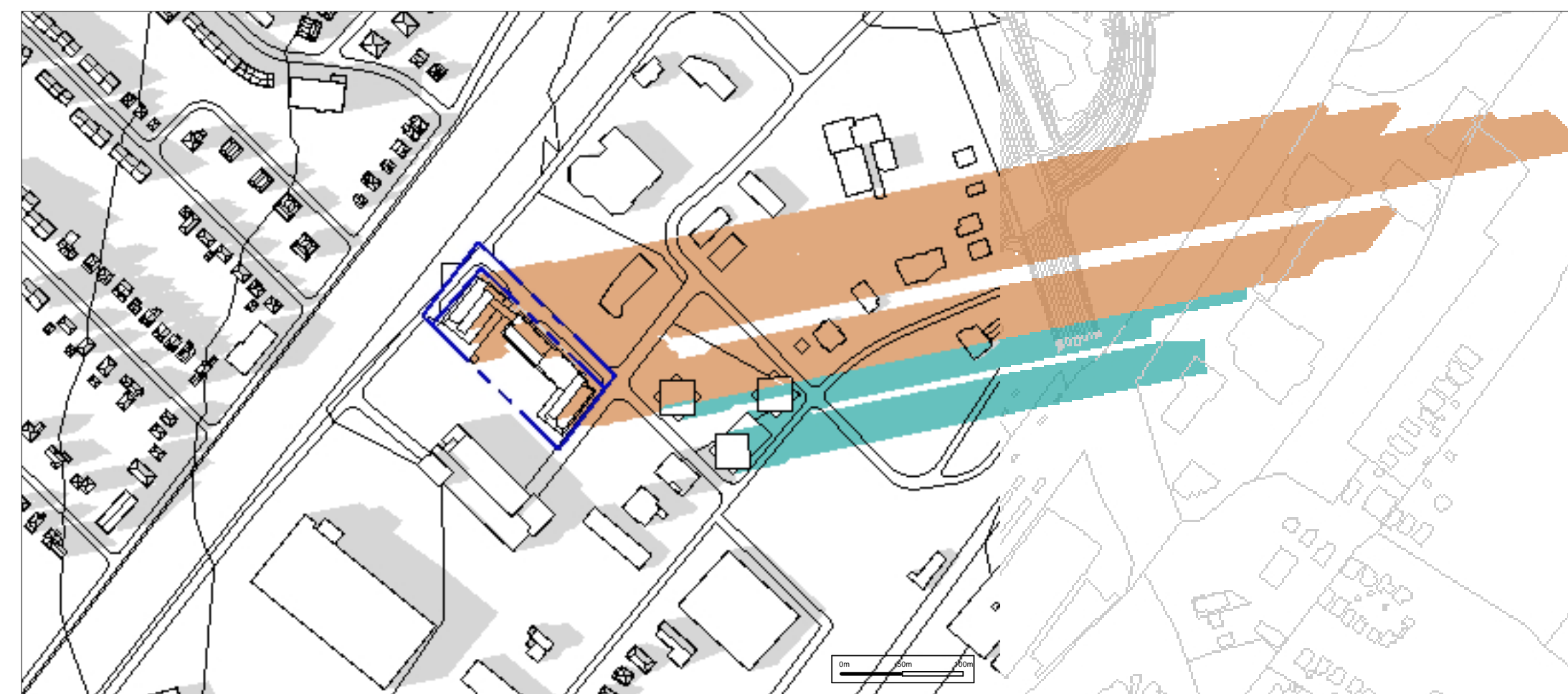
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04:18 PM



05:18 PM



06:18 PM

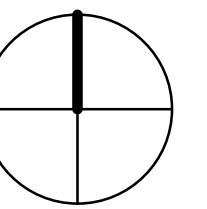
DRAWING NOT TO BE SCALED

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Shadow Studies_March

DATE : 2022-01-18
 SCALE :
 DRAWN : AA
 CHECKED : Checker
 PROJ. No. : 2128

DWG No.

AZ1100

DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

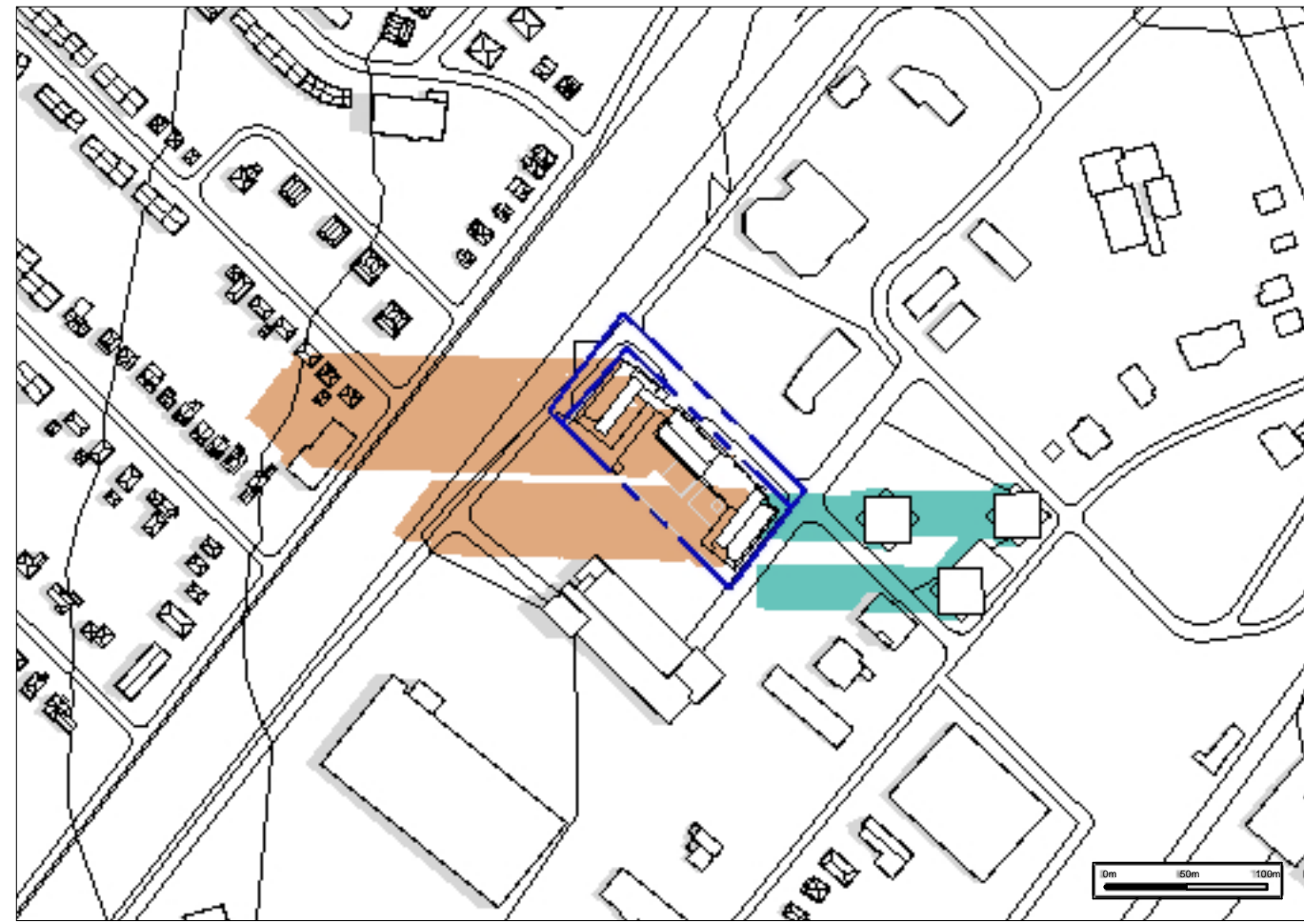
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ISSUED

22-05-30 ISSUED FOR REZONING

JUNE 21st

- Applicant Proposal
- Approved/ Not Yet Constructed
- Existing



09:18 AM



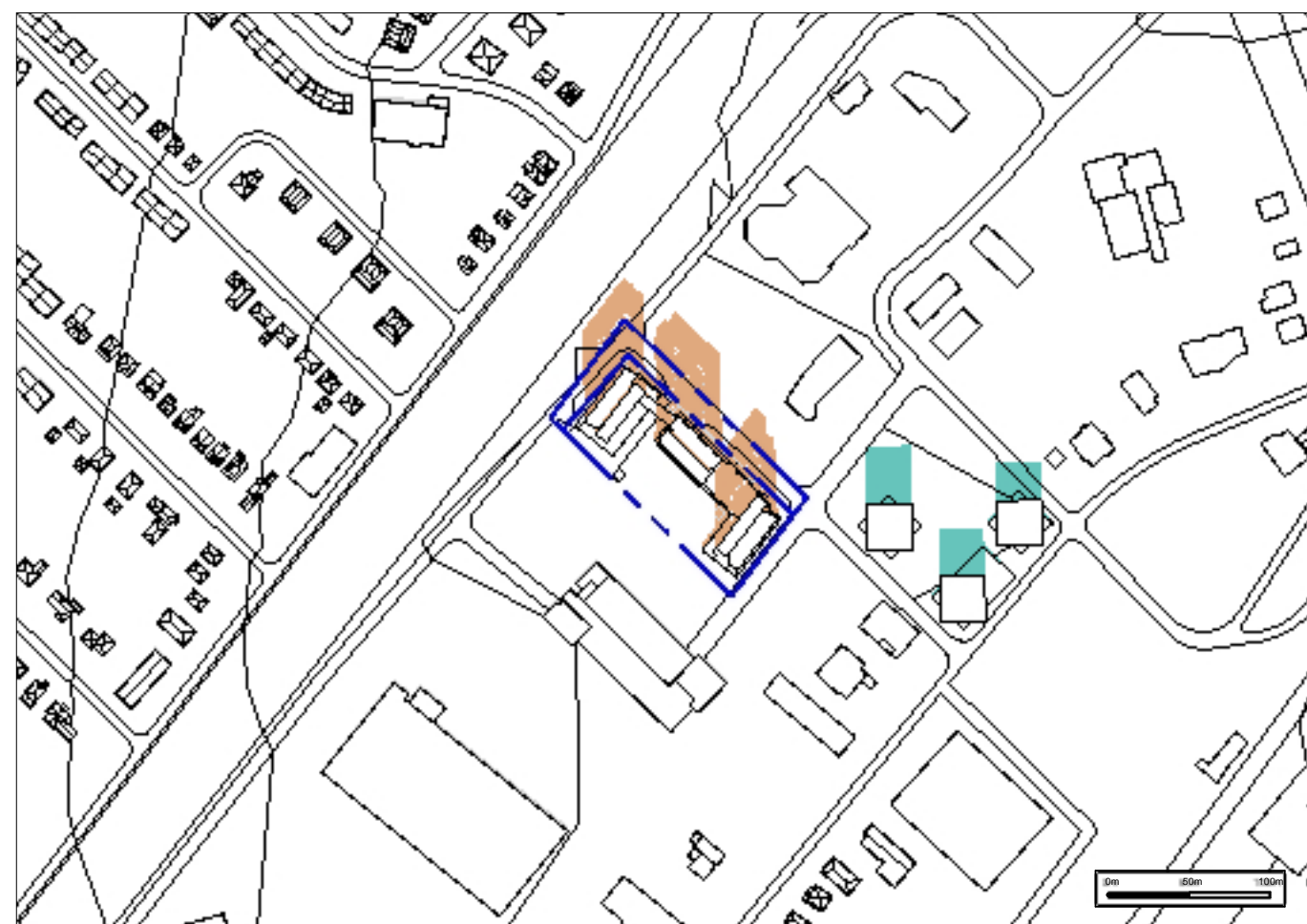
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11:18 AM



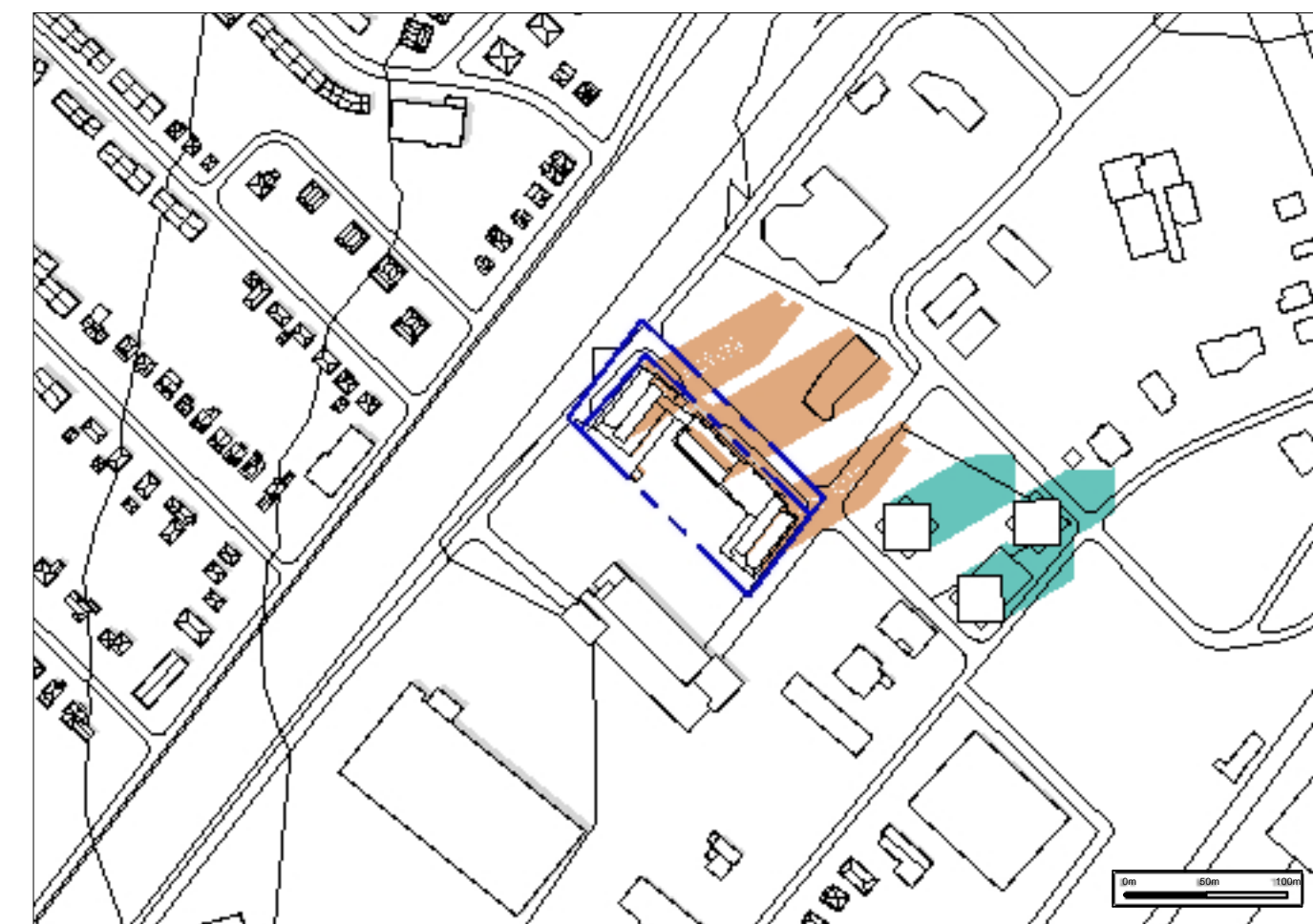
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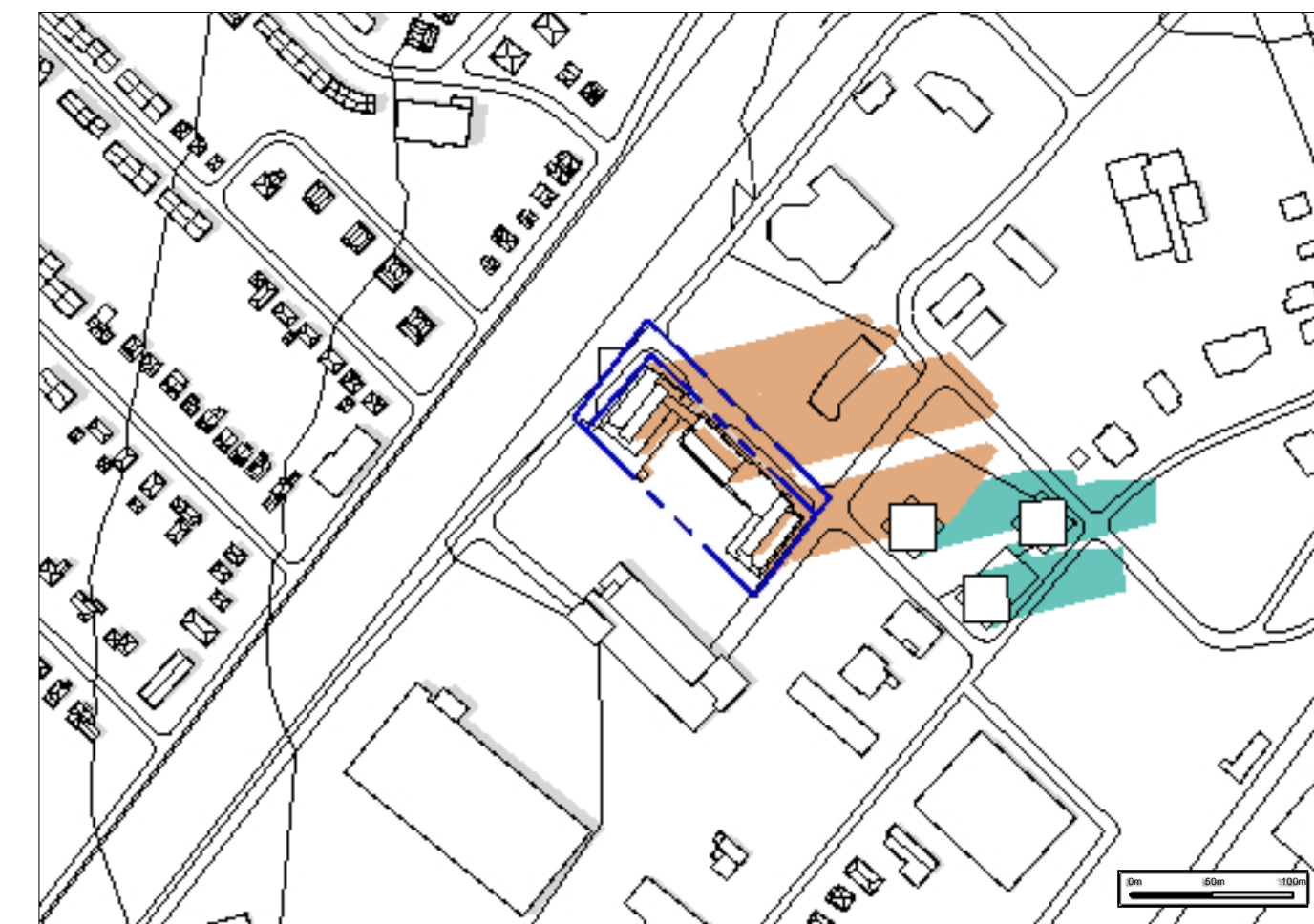
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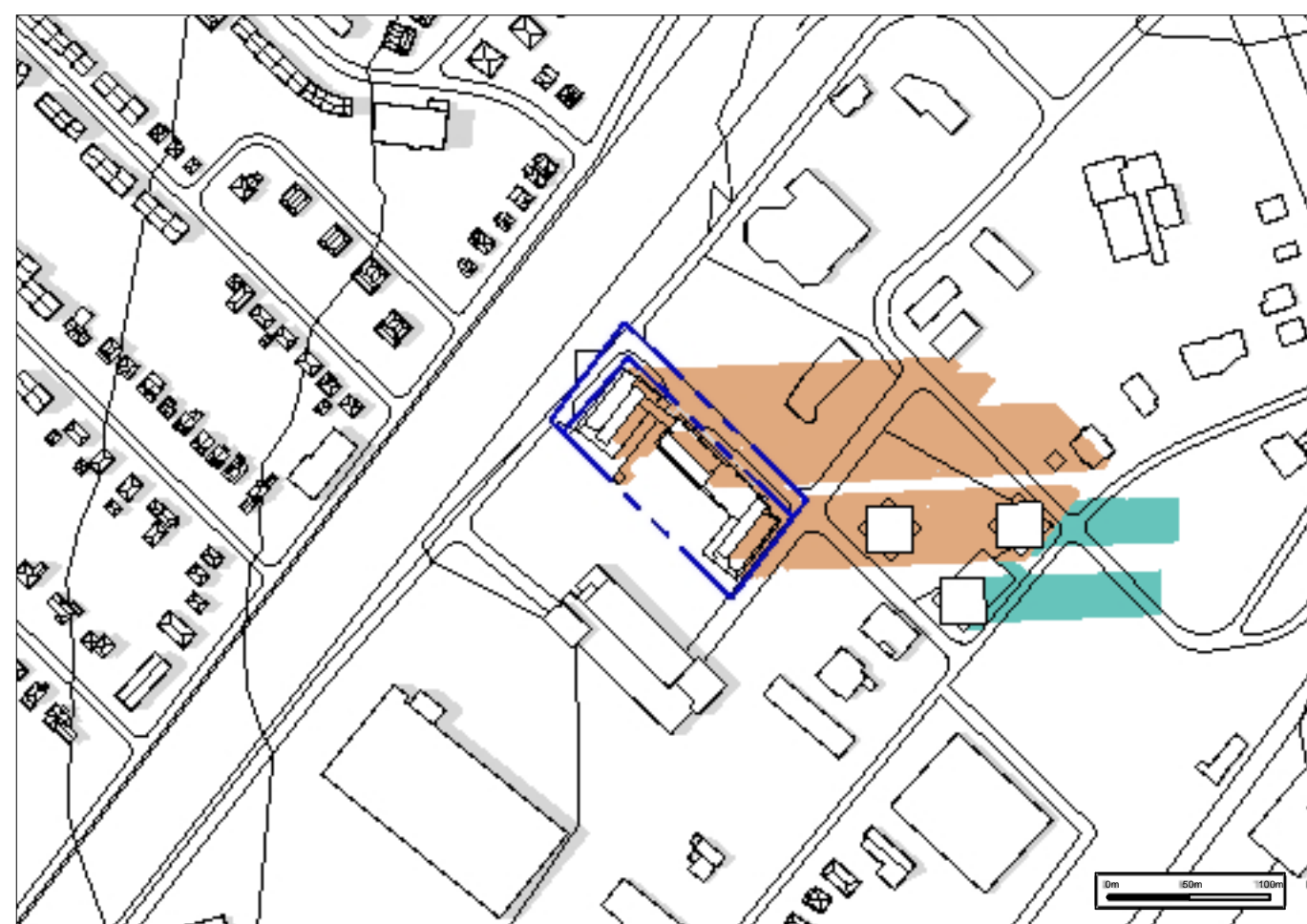
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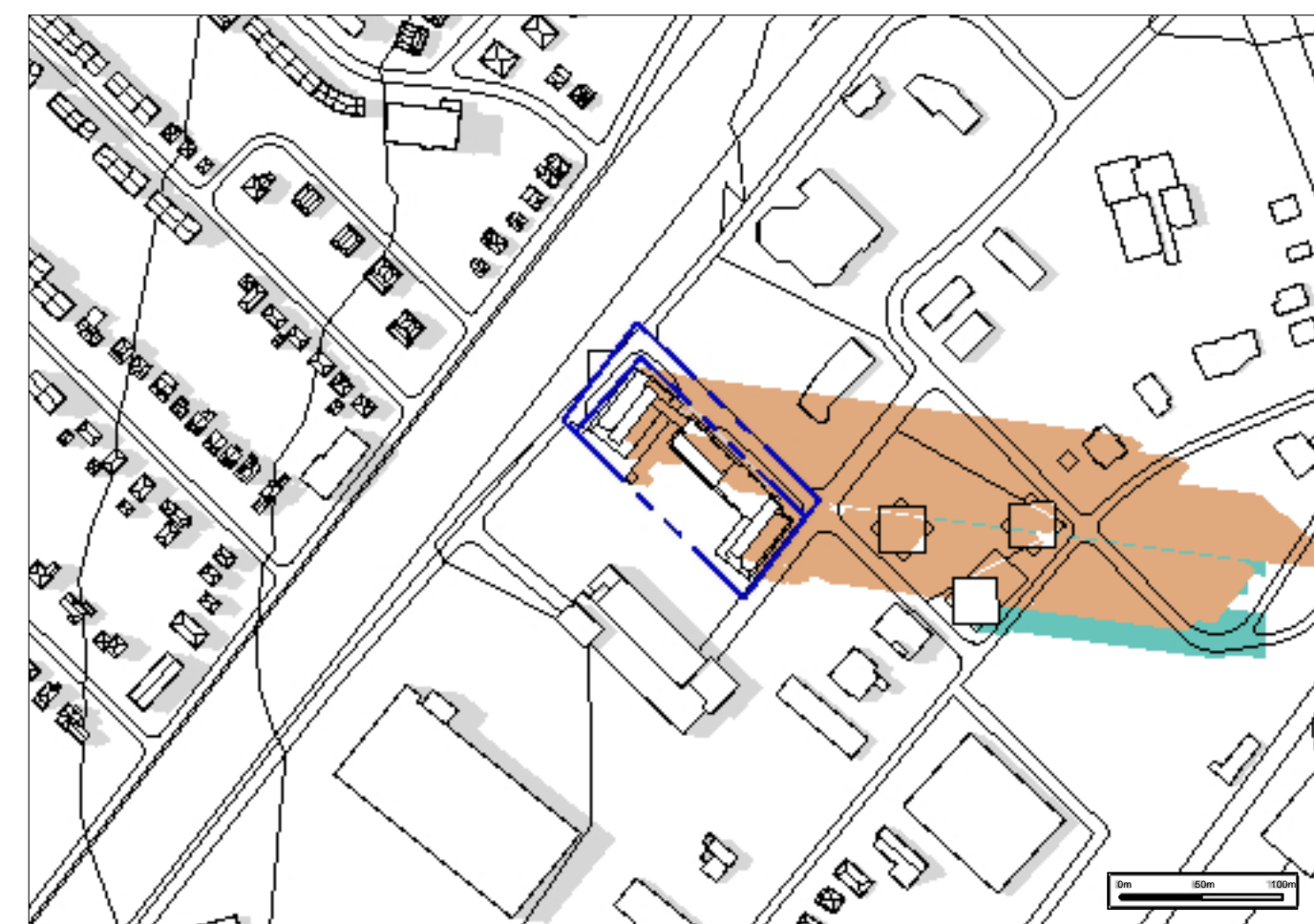
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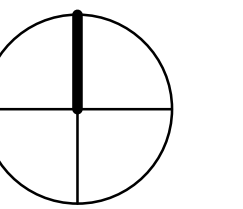
04:18 PM



05:18 PM



06:18 PM



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PROJ. NAME
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OWNER
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DWG TITLE
Shadow Studies_June

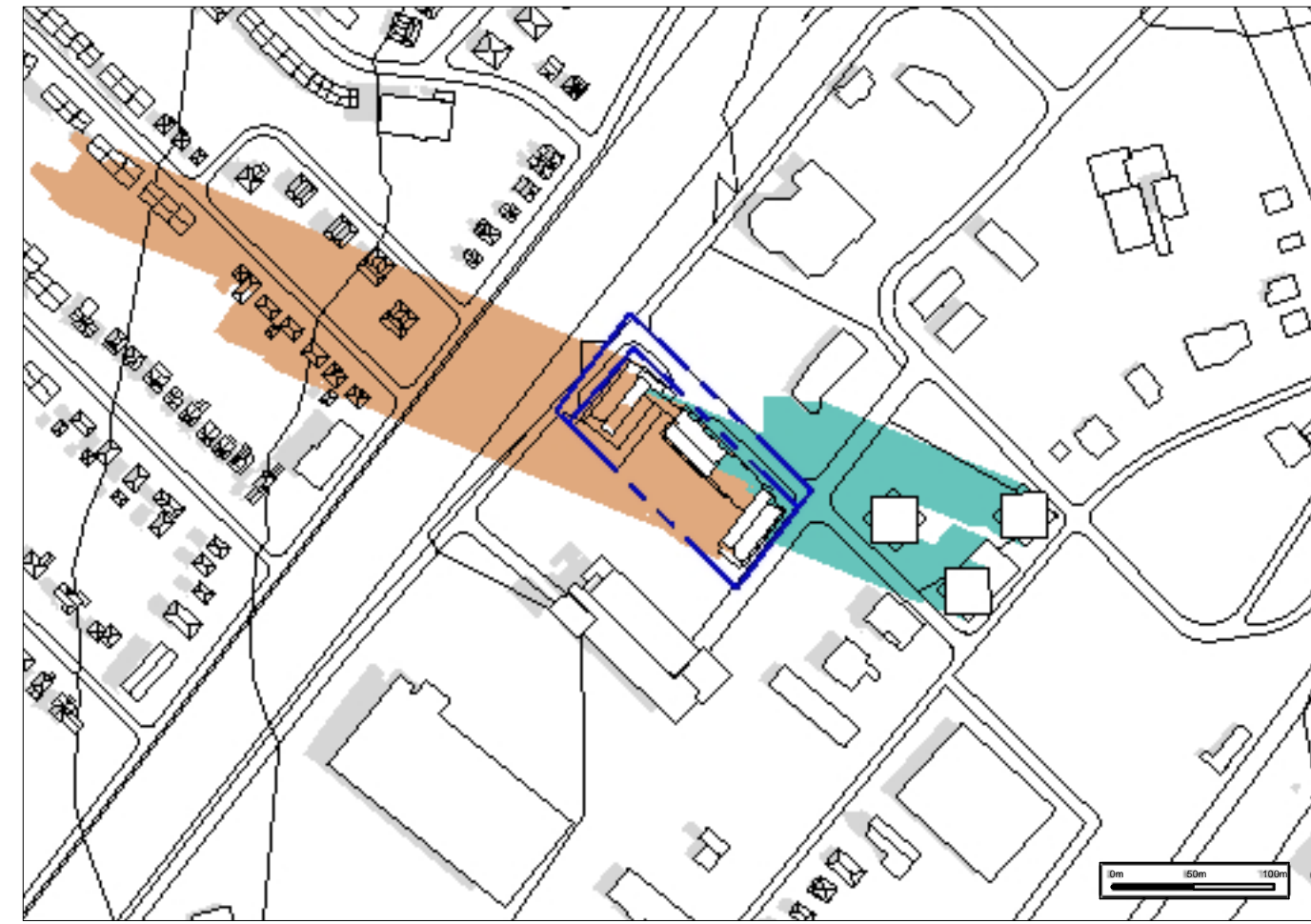
DATE : 2022-01-18
SCALE :
DRAWN : AA
CHECKED : Checker
PROJ. No. : 2128

DWG No.

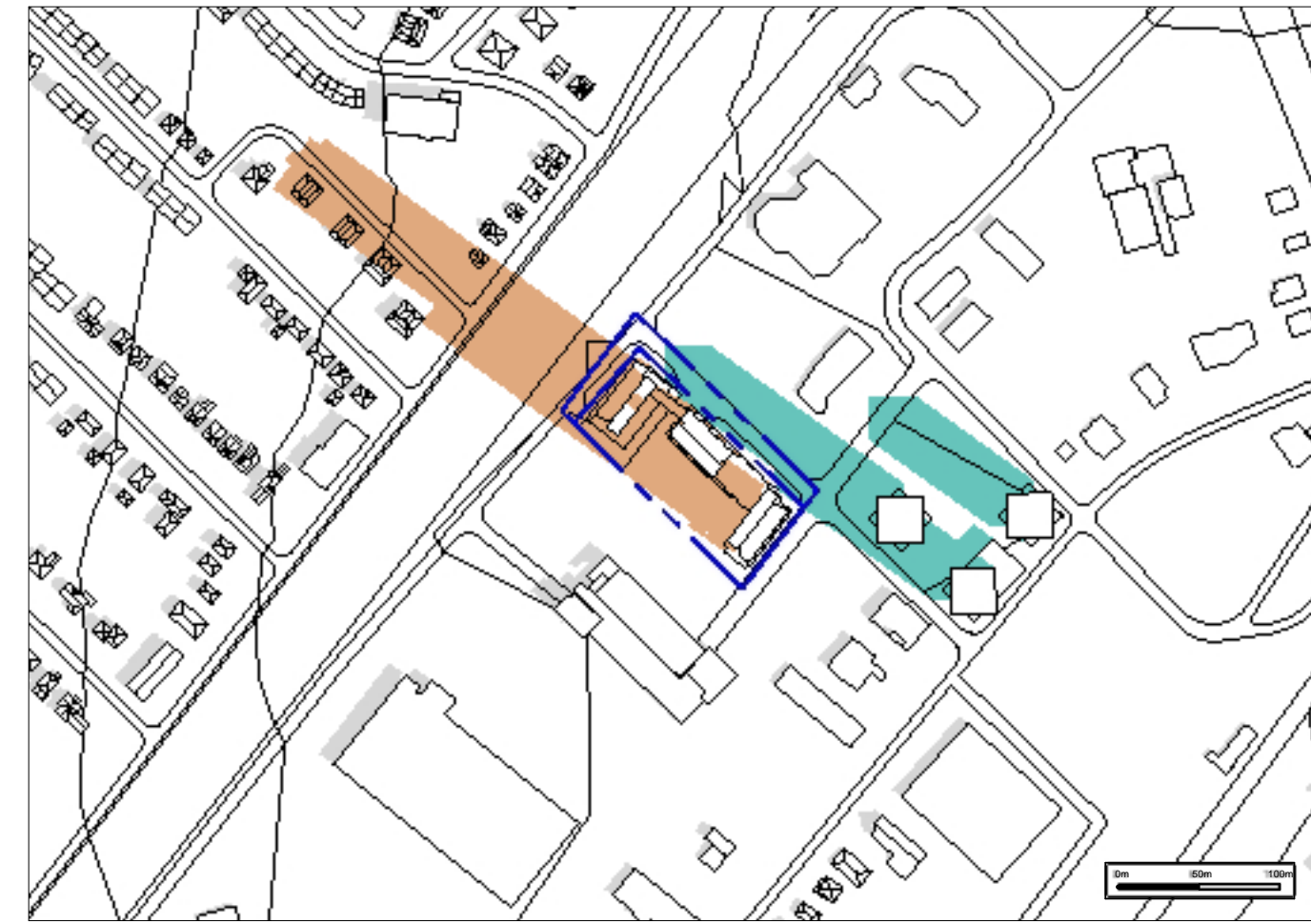
AZ1101

SEPTEMBER 21st

- Applicant Proposal
- Approved/ Not Yet Constructed
- Existing



09:18 AM



10:18 AM



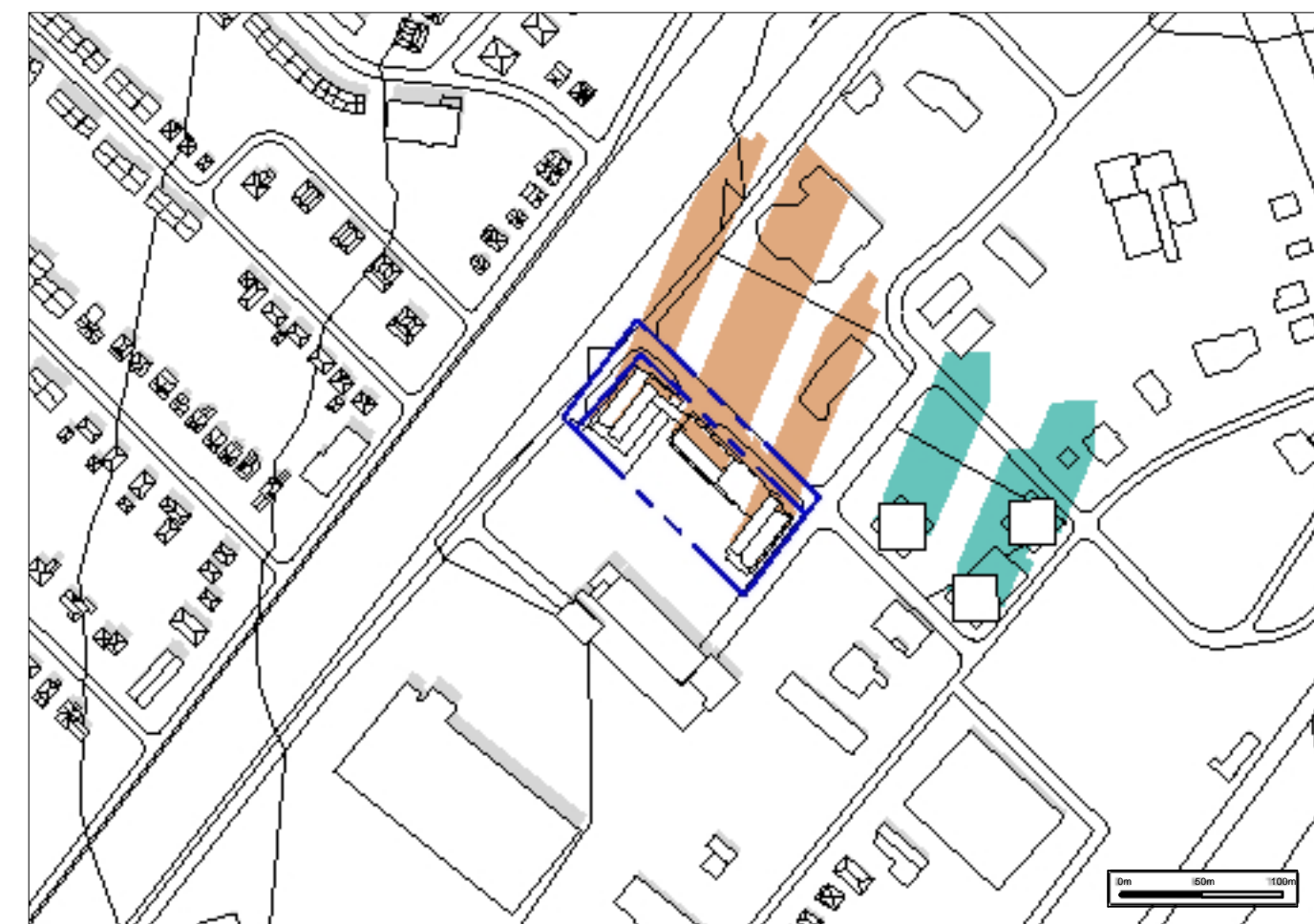
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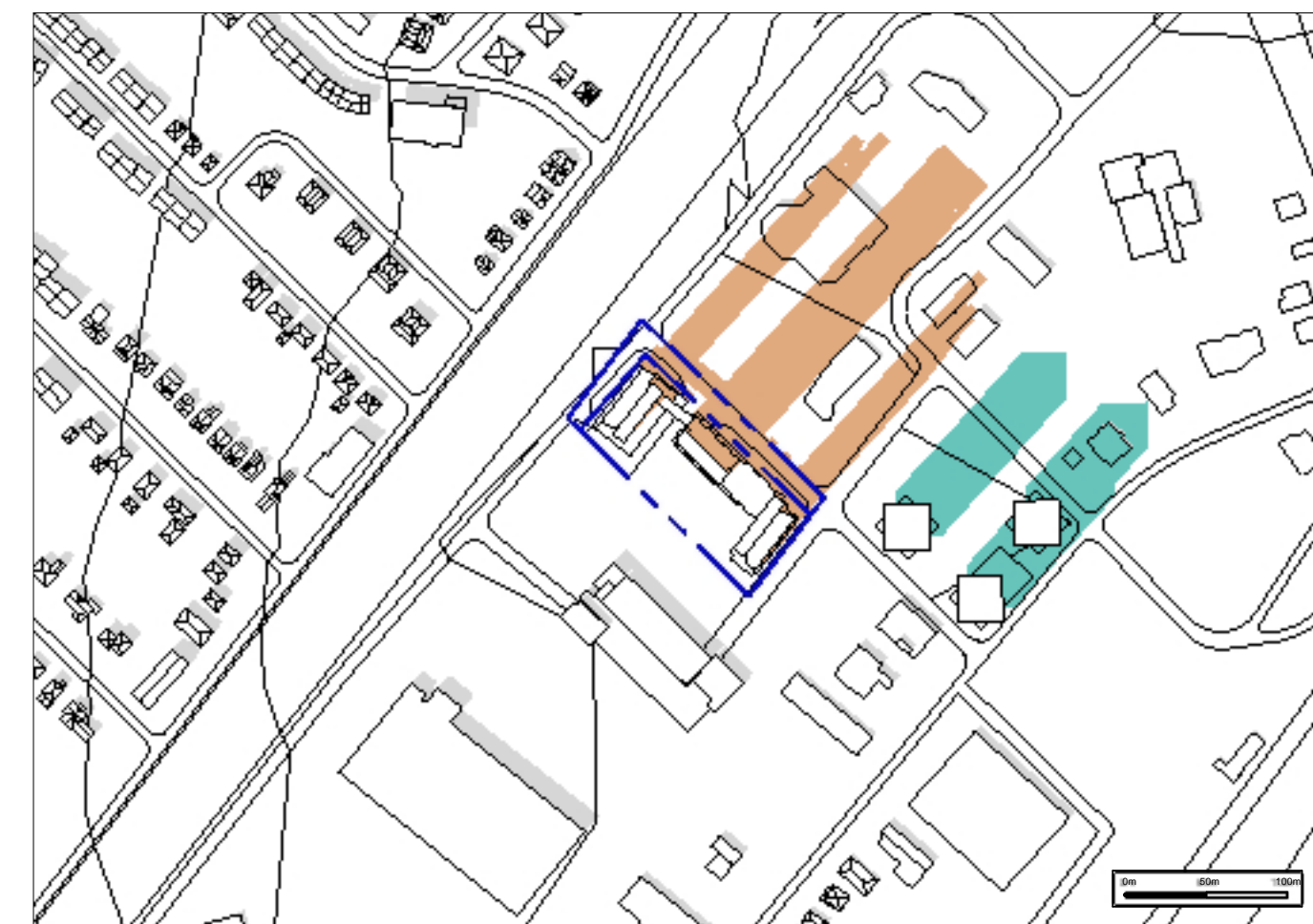
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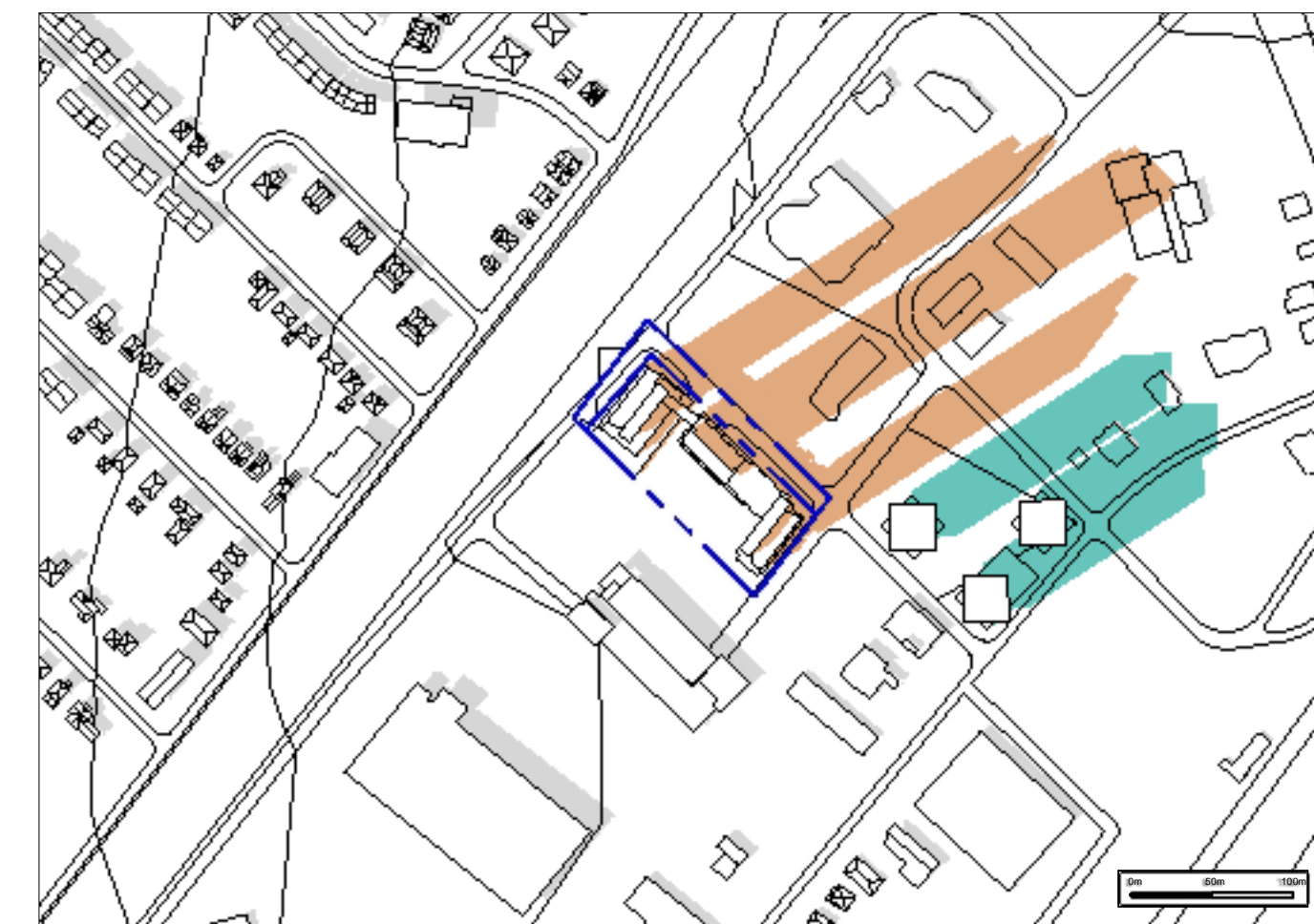
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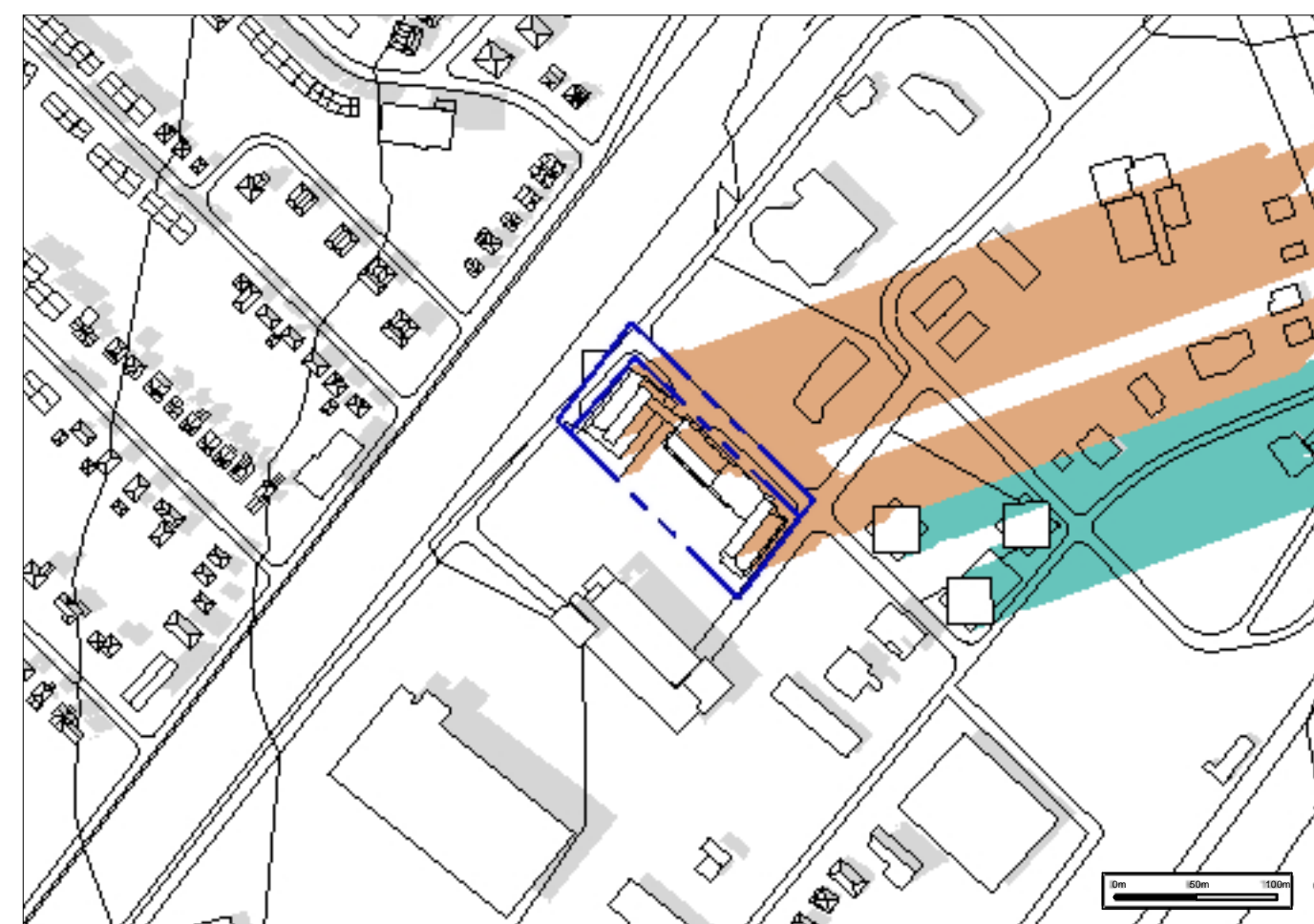
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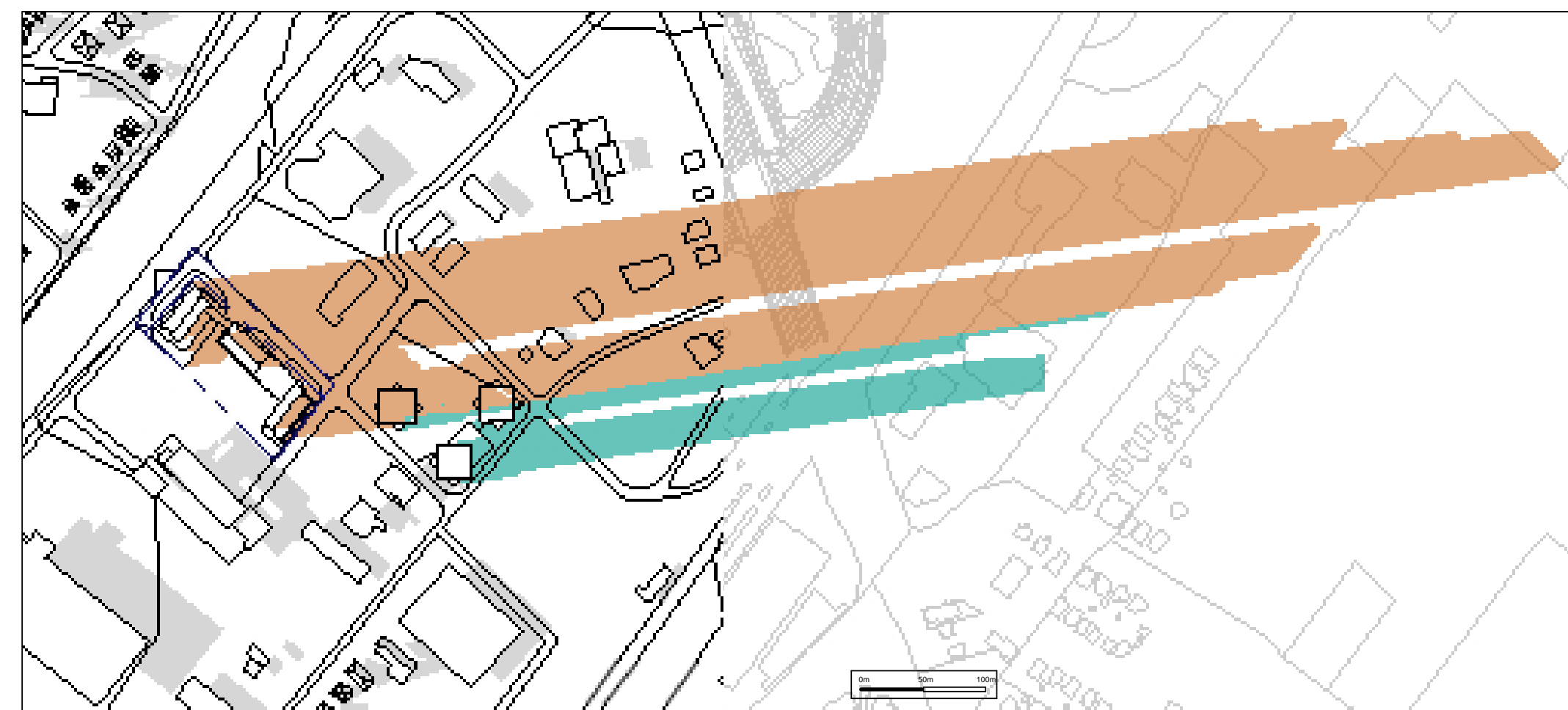
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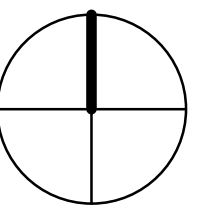
DRAWING NOT TO BE SCALED

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22-05-30 ISSUED FOR REZONING



C:\Users\stiehl\Documents\2128_Oakville Transit Hub_Central_Arch\A21102.dwg 2022-05-18 10:29:30 AM

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Shadow Studies_September

DATE : 2022-01-18
SCALE :
DRAWN : AA
CHECKED : Checker
PROJ. No. : 2128 DWG No.

AZ1102

DECEMBER 21st

- Applicant Proposal
- Approved/ Not Yet Constructed
- Existing



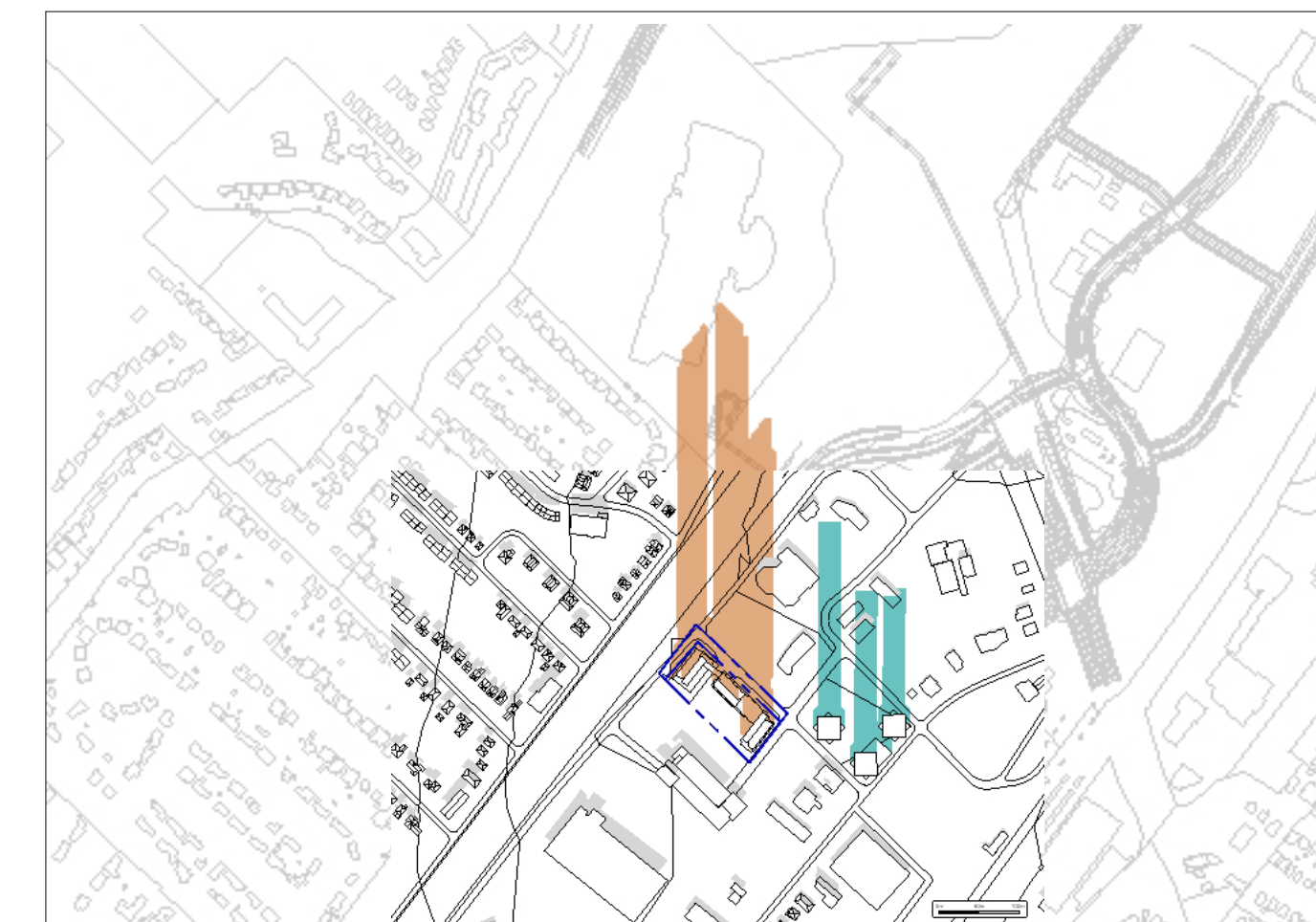
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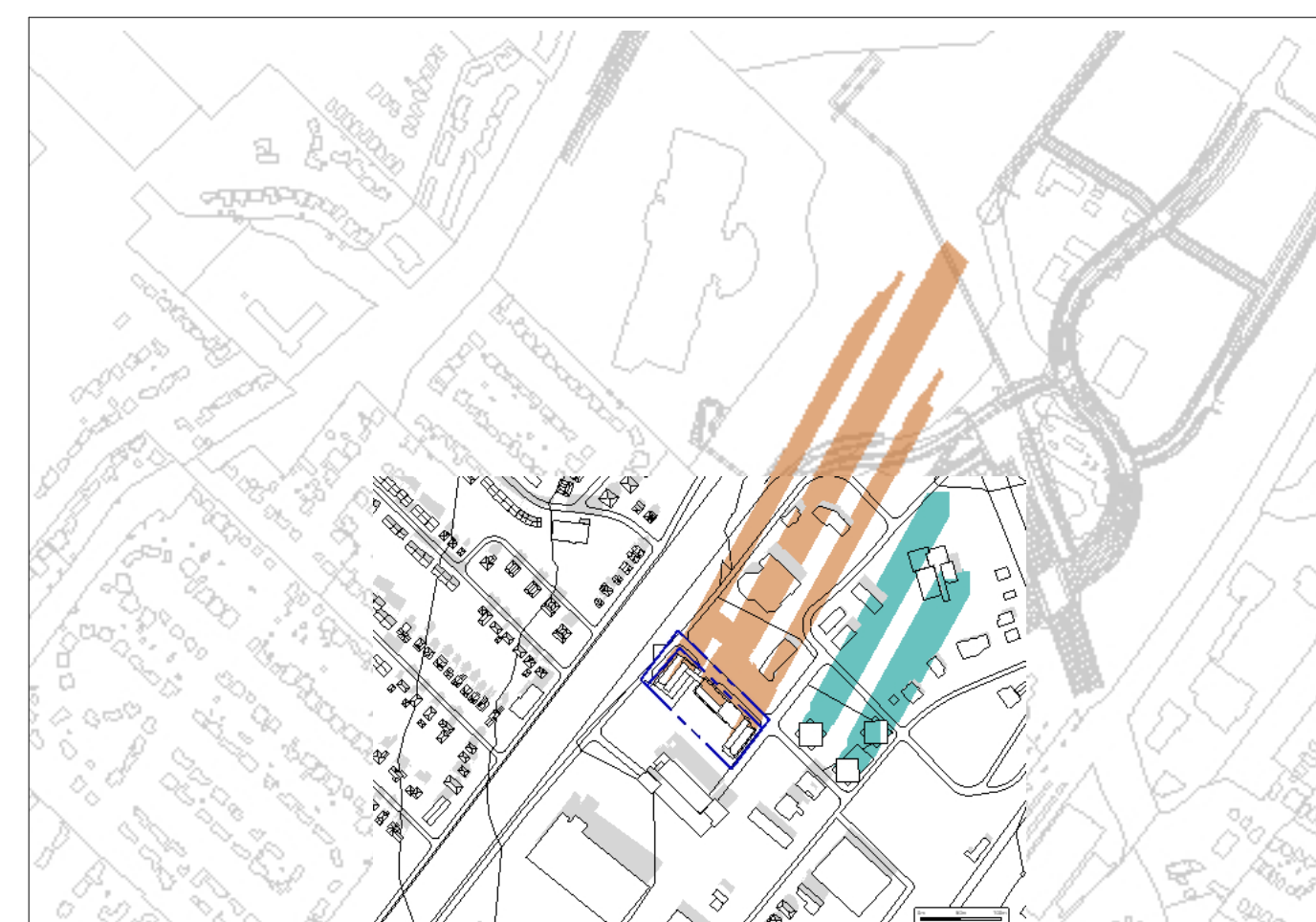
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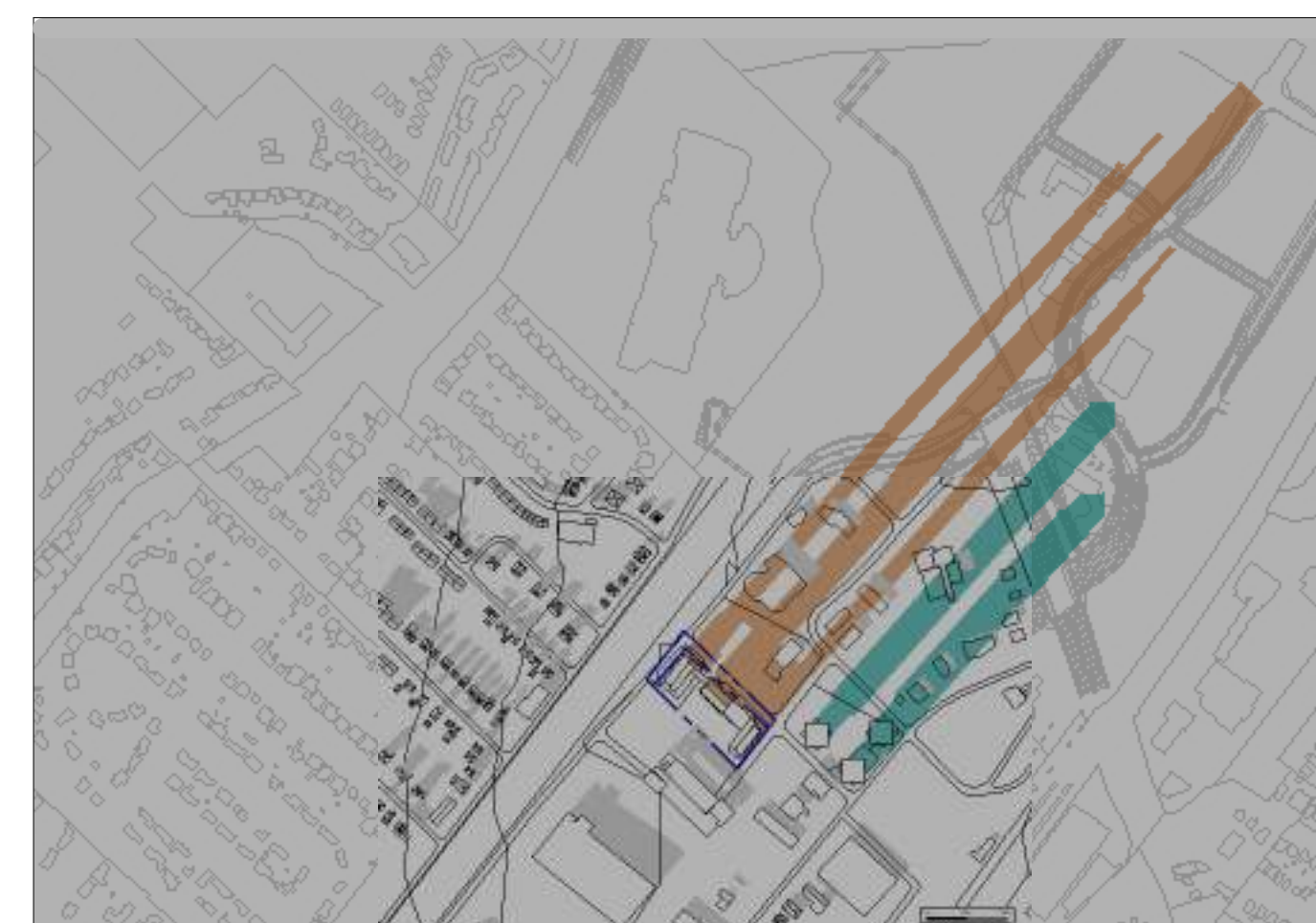
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03:18 PM

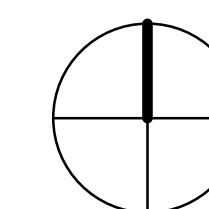
DRAWING NOT TO BE SCALED

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

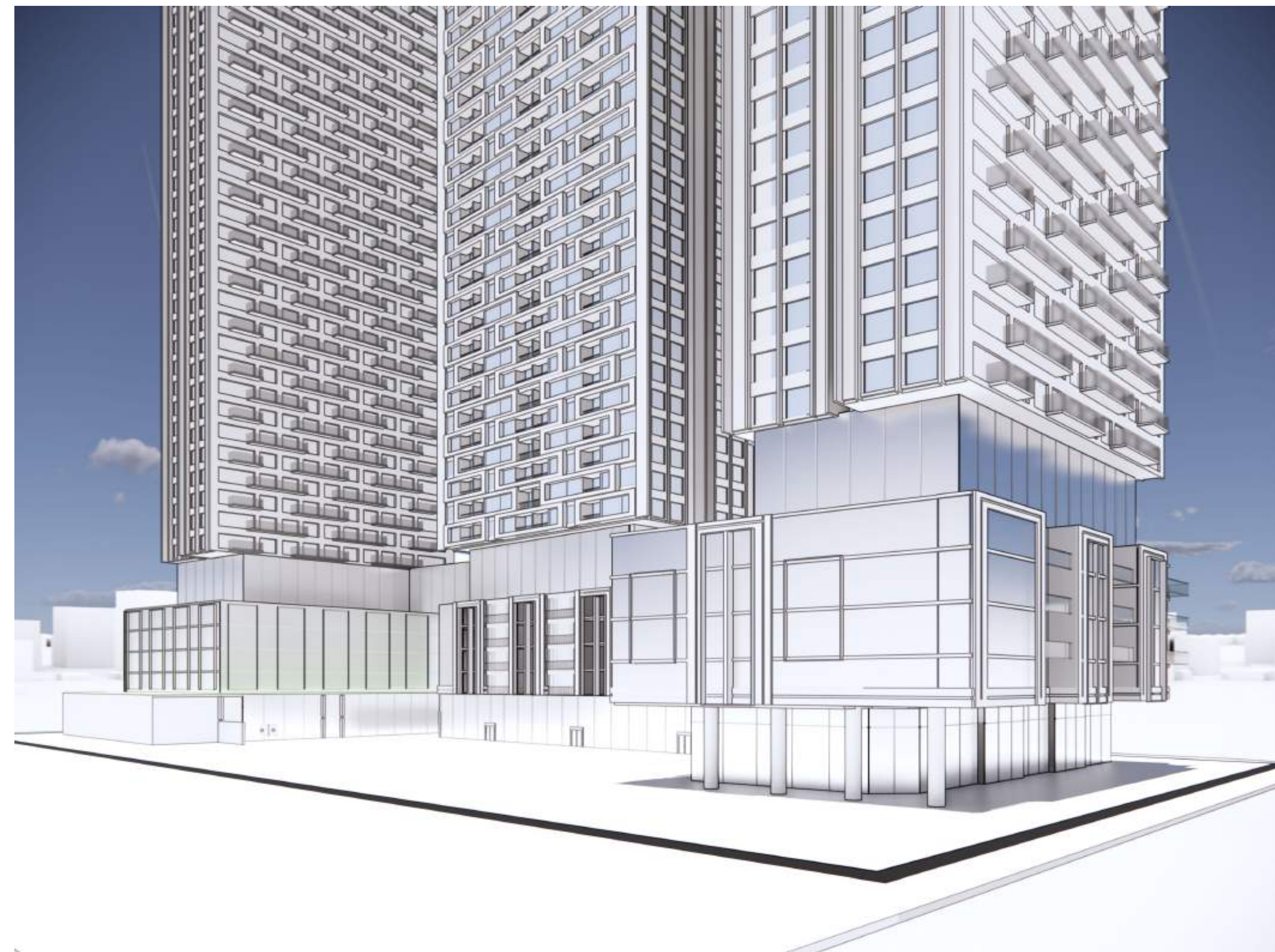
OWNER
166 South Service Inc.

DWG TITLE
Shadow Studies_December

DATE : 2022-01-18
SCALE :
DRAWN : AA
CHECKED : Checker
PROJ. No. : 2128

DWG No.

AZ1103



DRAWING NOT TO BE SCALED

Contractor must check and verify all dimensions on the job and report any discrepancies to the architect before proceeding with the work.

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PROJ. NAME
166 South Service Road
South Service Road & Trafalgar

OWNER
166 South Service Inc.

DWG TITLE
Renderings

DATE : 2022-01-18
SCALE :
DRAWN : MS/FT
CHECKED : DS
PROJ. No. : 2128

DWG No.
AZ1110