

**Proposed Residential Development at  
105 Robinson Road, Mid-Level, Hong Kong**

**Traffic Review Report**

**October 2023**



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## **1. INTRODUCTION**

### **1.1 Background**

- 1.1.1 The subject site is currently zoned as R(C)5 zone in the outline zoning plan and is permitted for residential use with maximum building height of 161m above Principal Datum (mPD).
- 1.1.2 Sino Noble Enterprises Limited (the owner of the lot) intends to redevelop the current residential site. A general building plan (GBP) with 217 flats was approved by Buildings Department in 17 March 2023.
- 1.1.3 In October 2023, an amended scheme for minor height relaxation (from 161mPD to 215mPD), with the same number of 217 flats, is proposed by the Owner. A S16 application is therefore required to support the proposed relaxation.
- 1.1.4 Ho Wang SPB Limited is commissioned by the Owner to review the associated traffic impact due to height relaxation and internal parking arrangements for this S16 planning application.

## 2. THE PROPOSED DEVELOPMENT

### 2.1 Site Location

2.1.1 The Application Site is located at Inland Lot No. 942 on No. 105 Robinson Road, Mid-Level, Hong Kong as shown in **Figure 2.1**.

2.1.2 The subject site is connected by an access road branching off from Robinson Road. It is bounded by Robinson Road to its north, Panorama Gardens to its east, Woodland Gardens to its south and Imperial Court to its west.

### 2.2 Development Schedule

2.2.1 The site area of the proposed development remains the same as 2,557.620m<sup>2</sup>.

2.2.2 The building design will be modified from 2 towers to 1 tower, with a minor height increase from 161m to 215m as compared with the recent approved GBP in 17 March 2023.

2.2.3 The comparison of the approved and proposed development schemes is summarized in **Table 2.1**.

**Table 2.1 Comparison of Development Parameters between Previously Approved Scheme and Proposed Scheme**

		Previously Approved Scheme (A) in September 2023	Proposed Scheme (B)	Changes (B)-(A)
Development		Residential	Residential	No change
Site Area (m <sup>2</sup> )		2,557.620	2,557.620	No change
Plot Ratio		5	5	No Change
Building Height (mPD)		161	215	+54
No. of Block		2	1	-1
Gross Floor Area (m <sup>2</sup> )		12,787.8	12,787.8	No Change
No. of Flat	GFA 40-70m <sup>2</sup>	203	189	-14
	GFA 70-100m <sup>2</sup>	14	27	+13
	GFA 130-160m <sup>2</sup>	0	1	+1
	<b>Total</b>	<b>217</b>	<b>217</b>	<b>No Change</b>

2.2.4 Despite the building design is changed from 2 towers to 1 tower, the total number of flats remains the same.

### 3. INTERNAL TRANSPORT FACILITIES

#### 3.1 Parking and Loading / Unloading Provisions

3.1.1 There is no specific parking requirement for this site as stipulated in the Land Lease. The proposed parking and loading / unloading provisions based on the latest HKPSG's and Lease requirement are summarised in **Table 3.1**.

**Table 3.1 Parking and Loading / Unloading Provisions for the Proposed Residential Scheme under Lease Conditions and HKPSG**

Lease Requirement	HKPSG Requirement	Proposed Provision
No specific requirement on parking and loading / unloading provisions	<u>Private Car Parking Spaces</u> <sup>(1)</sup>  Flat size (40 – 70m <sup>2</sup> ): 189 units = 189/7 x 1.2 x 0.75 x 1 to 189/4 x 1.2 x 0.75 x 1 = 25 to 43  Flat size (70 – 100m <sup>2</sup> ): 27 units = 27/7 x 2.4 x 0.75 x 1 to 27/4 x 2.4 x 0.75 x 1 = 7 to 12  Flat size (130 – 160m <sup>2</sup> ): 1 unit = 1/7 x 5.5 x 0.75 x 1 to 1/4 x 5.5 x 0.75 x 1 = 1 to 1  Total = 33 to 56	33
	<u>Visitor Parking Spaces</u> 5 visitor parking spaces per block	5 (including 1 accessible parking space)
	<u>Motorcycle Parking Spaces</u> 1 space per 100-150 flats = 2	2
	<u>Loading / Unloading</u> Minimum 1 bay per housing block	1 (LGV) <sup>(2)</sup>

Notes:

- (1) Parking Requirement = 1 parking space per 4-7 flats x Demand Adjustment Ratio (R1) x Accessibility Adjustment Ratio (R2) x Development Intensity Adjustment Ratio (R3), where  
R1 = 1.2 for flat size between 40-70m<sup>2</sup>; 2.4 for flat size between 70-100m<sup>2</sup>; 5.5 for flat size between 130-160m<sup>2</sup>  
R2 = 0.75 for site within a 500m-radius of rail station  
R3 = 1 for Domestic Plot Ratio between 2-5
- (2) Due to the width constraint of the existing access road which can only accommodate the manoeuvrability of vehicles below 9m in length, a LGV loading / unloading bay instead of HGV loading / unloading bay is provided.

3.1.2 The comparison of the internal transport facilities between the previous scheme and the current proposed scheme is summarized in **Table 3.2**.

**Table 3.2 Comparison of Internal Parking and Loading / Unloading Provisions  
between Previously Approved Scheme and Proposed Scheme**

Internal Transport Facilities	Previously Approved Scheme	Proposed Scheme
Private Car Parking Spaces	13 + 1 (accessible)	33
Visitor Parking Spaces	0	4 + 1 (accessible)
Motorcycle Parking Spaces	2	2
LGV Loading / Unloading Spaces	2	1

- 3.1.3 With the site constraint (i.e. bulk excavation limit) that limits the extension of basement levels, the owner attempts to adopt the minimum requirement under HKPSG the car parking numbers at the basement floors with 33 private car parking spaces, 5 visitor car parking spaces (including 1 accessible car parking space) and 2 motorcycle parking spaces.

Ground Floor (G/F)

- 3.1.4 1 LGV loading / unloading bay [with dimension of 7m (length) x 3.5m (wide) x 3.6m (height)] is proposed at G/F. The G/F layout plan is shown in **Figure 3.1**.

Lower Ground 1 Floor (LG1/F)

- 3.1.5 25 private car parking spaces and 2 motorcycle parking spaces are proposed at LG1/F. The LG1/F layout plan is shown in **Figure 3.2**.

Lower Ground 2 Floor (LG2/F)

- 3.1.6 8 private car parking spaces, 4 visitor parking spaces and 1 accessible visitor parking space are proposed at LG2/F.
- 3.1.7 A designated waiting space is also provided for vehicles using the car lift to access the G/F.
- 3.1.8 The LG2/F layout plan is shown in **Figure 3.3**.

### 3.2 Internal Traffic Circulation

3.2.1 A two-way ramp is provided from G/F to LG1/F. However, only a one-way downward ramp can be served for vehicles between LG1/F and LG2/F due to bulk excavation limit.

3.2.2 A car lift is proposed for vehicles from LG2 to G/F.

### 3.3 Car Lift Capacity Assessment

#### Performance Factors of Car Lift Operation

3.3.1 To estimate the operation cycle of the car lift, a survey on a similar carpark was conducted.

3.3.2 Vertical speed is a critical factor in the measurement of car lift performance. It mainly depends on the power of the drive units and the operation frequency. The survey result shows that the vertical speed is generally about 0.5m/sec.

3.3.3 The loading / unloading activities, controlled by the operation speed of lift doors, driver skill and human reaction time, determine the operation cycle. Based on the survey results, the operation speed of lift doors is 3 seconds per open/close, the in / out manoeuvring time of a vehicle is normally within 3 seconds, and the driver's reaction time is 3 seconds in general. In addition, an extra 20 seconds for motorists to enter the lift is taken into this assessment for conservative purpose.

3.3.4 According to the building layout, the maximum vertical distance from LG2/F to G/F is 5.8m.

3.3.5 **Table 3.3** illustrates the maximum cycle time of the car lift operation between G/F and LG2/F.

**Table 3.3 Maximum Cycle Time of Proposed Car Lift**

Location	Activity	Calculation	Time (Sec.)
Proposed Scheme			
LG2	Door Open	-	3
	Car In	3 + 20 + 5	28
	Door Close	-	3
From LG2 to G/F	Vertical Traveling Time	5.8 @ 0.5m/sec	12
G/F	Door Open	-	3
	Car Out	3 + 3	6
	Door Close	-	3
From G/F to LG2	Vertical Traveling Time	5.8 @ 0.5m/sec	12
<b>Total :</b>			<b>70</b>



- 3.3.6 The maximum cycle time of the car lift will be approximately 70 seconds for traveling between G/F and LG2/F.

#### Car Lift Assessment

- 3.3.7 The car lift assessment for vehicles queuing to leave the car park is calculated as follows:

Number of Car Lift	N = 1
Average Arrival Rate Per Hour ( $\lambda$ )	$\lambda = 7$ veh/hr (21 veh/hr worst AM peak generation *Details refer to Table 4.2 x 12 car parking spaces at LG2/F / 38 total car parking spaces)
Average Service Time of Car Lift	70 seconds
Average Service Rate ( $\mu$ )	$\mu = 3,600 / 70 = 51$ veh/hr
$p = \frac{\text{Average Arrival Rate Per Hour ( } \lambda \text{ )}}{\text{Average Service Rate ( } \mu \text{ )}} = 0.137$	

- 3.3.8 The car lift queuing analysis is calculated with reference to Principles of Highway Engineering and Traffic Analysis by Fred L. Mannering and Walter P. Kilareski. The results of the car lift queuing analysis are summarised in **Table 3.4**.

**Table 3.4 Vehicle Queuing Analysis for the Proposed Car Lift**

Number of Vehicles Waiting for the Car Lift (n)	Probability of Number of Vehicles Waiting p(n)	Accumulative Probability of More Than n Vehicles Generation p( $\leq n$ )
(a) n = 0	0.864	0.864
(b) n = 1	0.118	0.981
(c) n $\geq 2$	1 - (a) ~ (c) = 0.018	N.A.

- 3.3.9 From the results of vehicle queuing analysis, the probability of 1 vehicle queuing for the car lift at LG2/F while another 1 vehicle is using the car lift is less than 2% which represents almost no vehicle will be expected to queue for the car lift at LG2/F.

3.3.10 It is therefore concluded that the proposed 1 car lift with 1 waiting space is adequate to meeting the proposed development traffic demand and will not cause circulation problem at LG2/F.

3.3.11 The owner will propose and implement suitable traffic management plan and contingency plan for scheduled maintenance and emergency maintenance of car lift to ensure smooth traffic circulation within the development.

### **3.4 Swept Path Analysis**

3.4.1 Computerized swept path analysis is conducted for the design vehicles manoeuvring at critical parking spaces and the loading / unloading bay as well as entering and leaving the car lift.

3.4.2 Adequate manoeuvre space is provided for the design vehicles as demonstrated in the swept path drawings **Appendix A (Figures SP1 – SP6)**.

## 4. TRAFFIC IMPACT ASSESSMENT

### 4.1 Traffic Assessment

4.1.1 The development traffic generation are estimated based on the trip rate in TPDM. The adopted trip rates summarised in **Table 4.2**.

**Table 4.1 Trip Generation Rates of Residential Development**

Private Housing <sup>(1)</sup>	AM Peak (pcu/hr/flat)		PM Peak (pcu/hr/flat)	
	Generation	Attraction	Generation	Attraction
Average flat size: 60m <sup>2</sup>	0.0718	0.0425	0.0286	0.0370
Average flat size: 80m <sup>2</sup>	0.1058	0.0605	0.0426	0.0590
Average flat size: 140m <sup>2</sup>	0.2604	0.1372	0.1275	0.1722

Note:

(1) Trip generation rates are adopted from Annex C of TPDM Volume 1 Chapter 3.

4.1.2 The subject site is always permitted to residential development with plot ratio of 5 and height limit of 161mPD.

4.1.3 The comparison of traffic generated by the previously approved scheme in 17 March 2023 and the proposed scheme is summarised in **Table 4.2**.

**Table 4.2 Comparison of Traffic Generation between Previously Approved Scheme and Proposed Scheme**

Private Housing	AM Peak (pcu/hr) <sup>(1)</sup>		PM Peak (pcu/hr) <sup>(1)</sup>	
	Generation	Attraction	Generation	Attraction
Previously Approved Scheme				
Average flat size: 60m <sup>2</sup> : 203 units	15	9	6	8
Average flat size: 80m <sup>2</sup> : 14 units	2	1	1	1
<b>Total (pcu/hr) (A)</b>	<b>17</b>	<b>10</b>	<b>7</b>	<b>9</b>
Proposed Scheme				
Average flat size: 43.3m <sup>2</sup> : 189 units	14	9	6	7
Average flat size: 77.6m <sup>2</sup> : 27 units	3	2	2	2
Average flat size: 141m <sup>2</sup> : 1 unit	1	1	1	1
<b>Total (pcu/hr) (B)</b>	<b>18</b>	<b>12</b>	<b>9</b>	<b>10</b>
<b>Net Difference in Traffic (pcu/hr) (B)-(A)</b>	<b>+1</b>	<b>+2</b>	<b>+2</b>	<b>+1</b>

Note:

(1) Total vehicular trips (pcu/hr) are rounded up to the nearest pcu.

- 4.1.4 The above table shows that the traffic generation of the proposed development scheme is insignificant (i.e. +3 pcu/hr in AM peak and +3 pcu/hr in PM peak). Hence, the traffic impact on the local road network is considered negligible and minimal.
- 4.1.5 Before the redevelopment of the subject site, there were 54 number of car parking spaces provided in Jade Garden. In comparison, the traffic generation by the proposed development site with proposed provision of 38 numbers of car parking spaces (refer to **Table 3.1**) shall be lower.

## **5. SUMMARY AND CONCLUSION**

### **5.1 Summary**

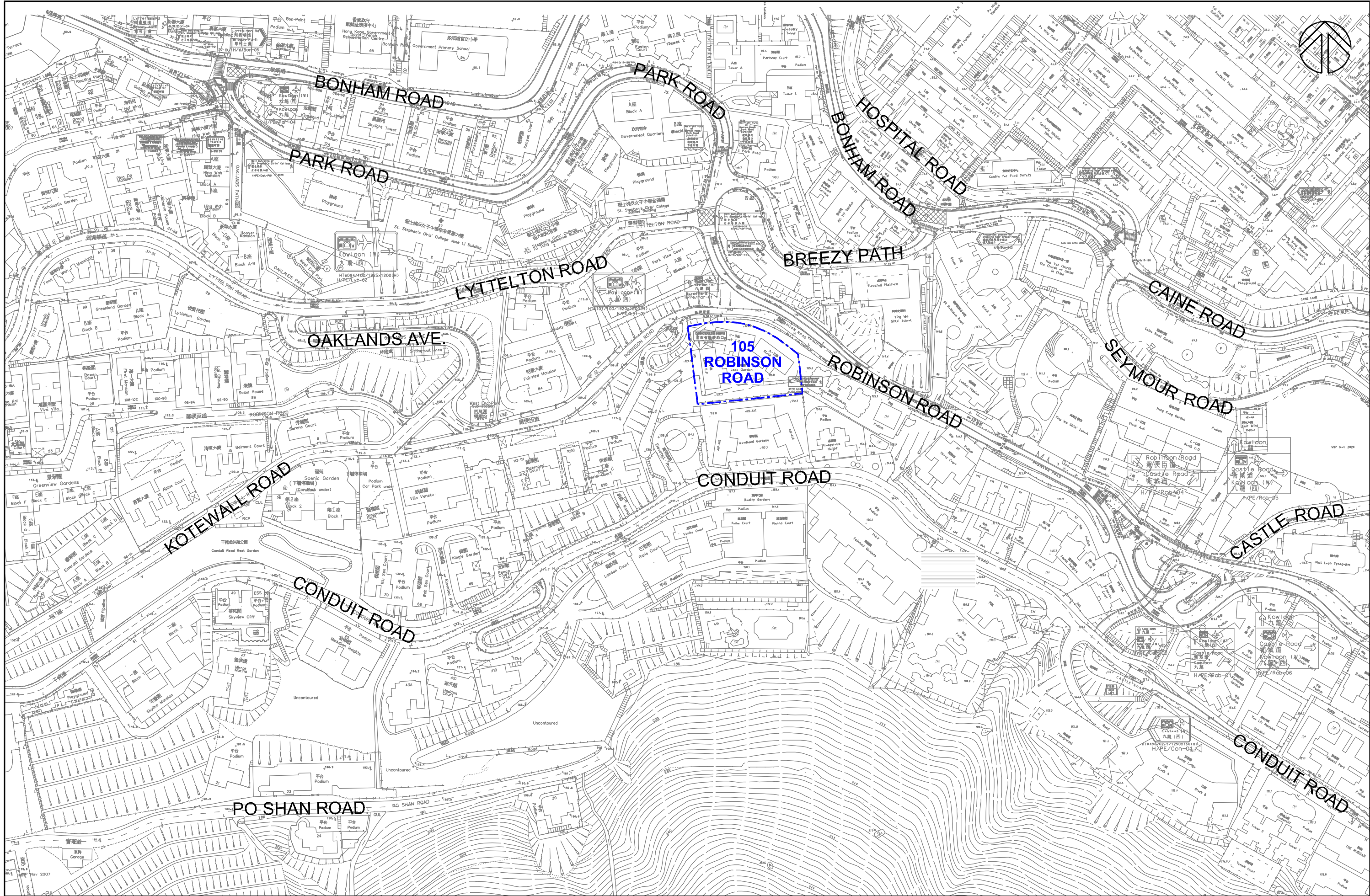
- 5.1.1 The subject site is currently zoned as R(C)5 zone in the outline zoning plan and is permitted for residential use with maximum building height of 161m above Principal Datum (mPD).
- 5.1.2 Further to the approval of GBP with 217 flats submitted in 17 March 2023, an amended scheme for minor height relaxation from 161mPD to 215mPD, with the same number of 217 flats, is proposed in October 2023. Therefore, a S16 application is required to support the proposed relaxation.
- 5.1.3 A total of 38 car parking spaces (33 private cars + 4 visitor cars + 1 accessible visitor car), 2 motorcycle parking spaces and 1 LGV loading / unloading bay are provided for this proposed scheme.
- 5.1.4 A two-way ramp is provided between G/F and LG1/F and one-way downward ramp is proposed between LG1/F and LG2/F. The provision of 1 car lift and 1 waiting space at LG2 is justified by the queuing analysis.
- 5.1.5 The additional traffic generation by the proposed development scheme is insignificant (i.e. 5pcu/hr in AM peak and 5 pcu/hr in PM peak). Hence, the traffic impact on the local road networks is considered negligible.


### **5.2 Conclusion**

- 5.2.1 Based on the findings, the traffic impact onto the local road network by the proposed height relaxation from 161m to 215m with 217 residential flat units is minimal and insignificant.
- 5.2.2 The proposed residential development is therefore supported from a traffic engineering point of view.

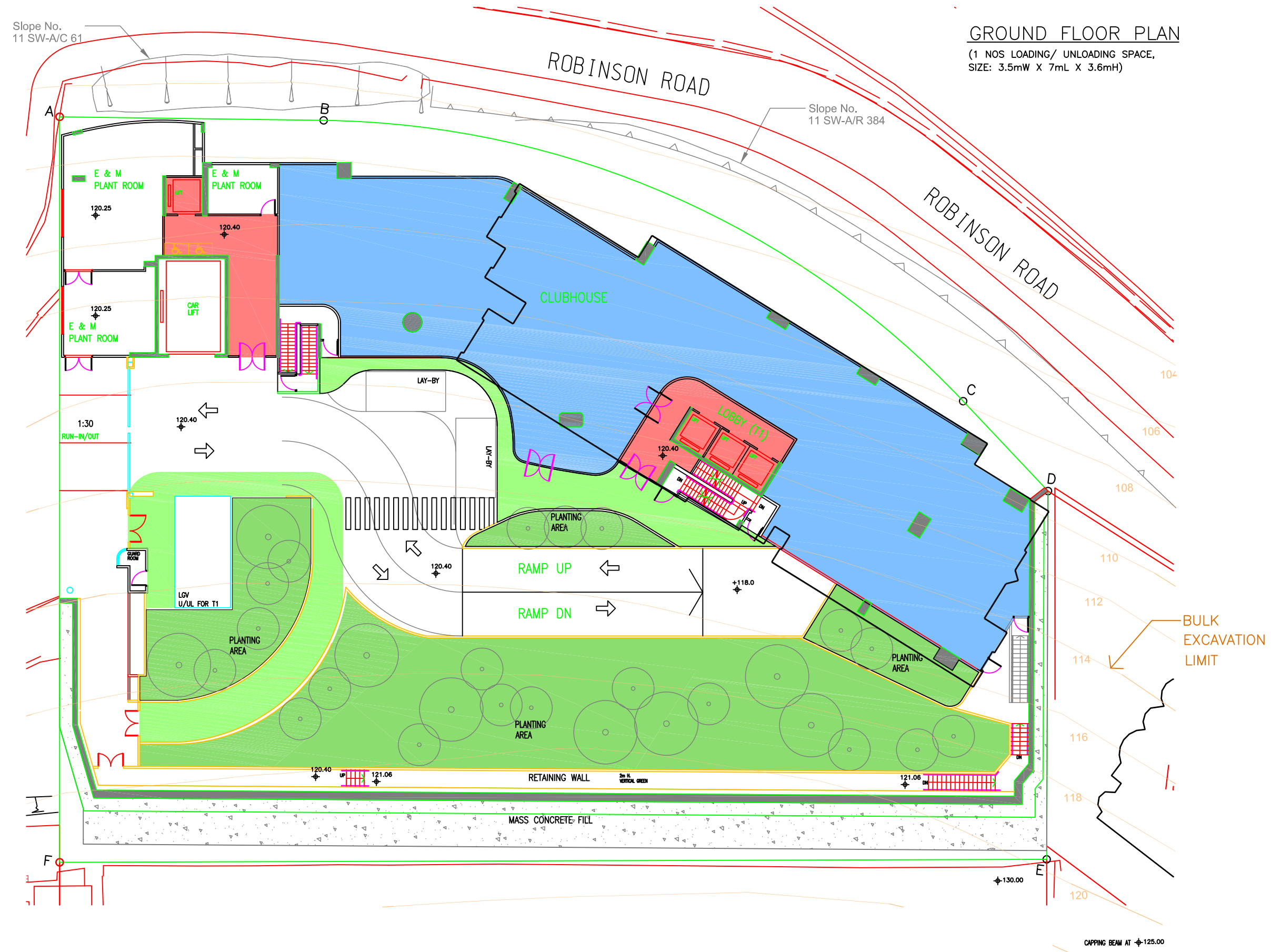
# Figures





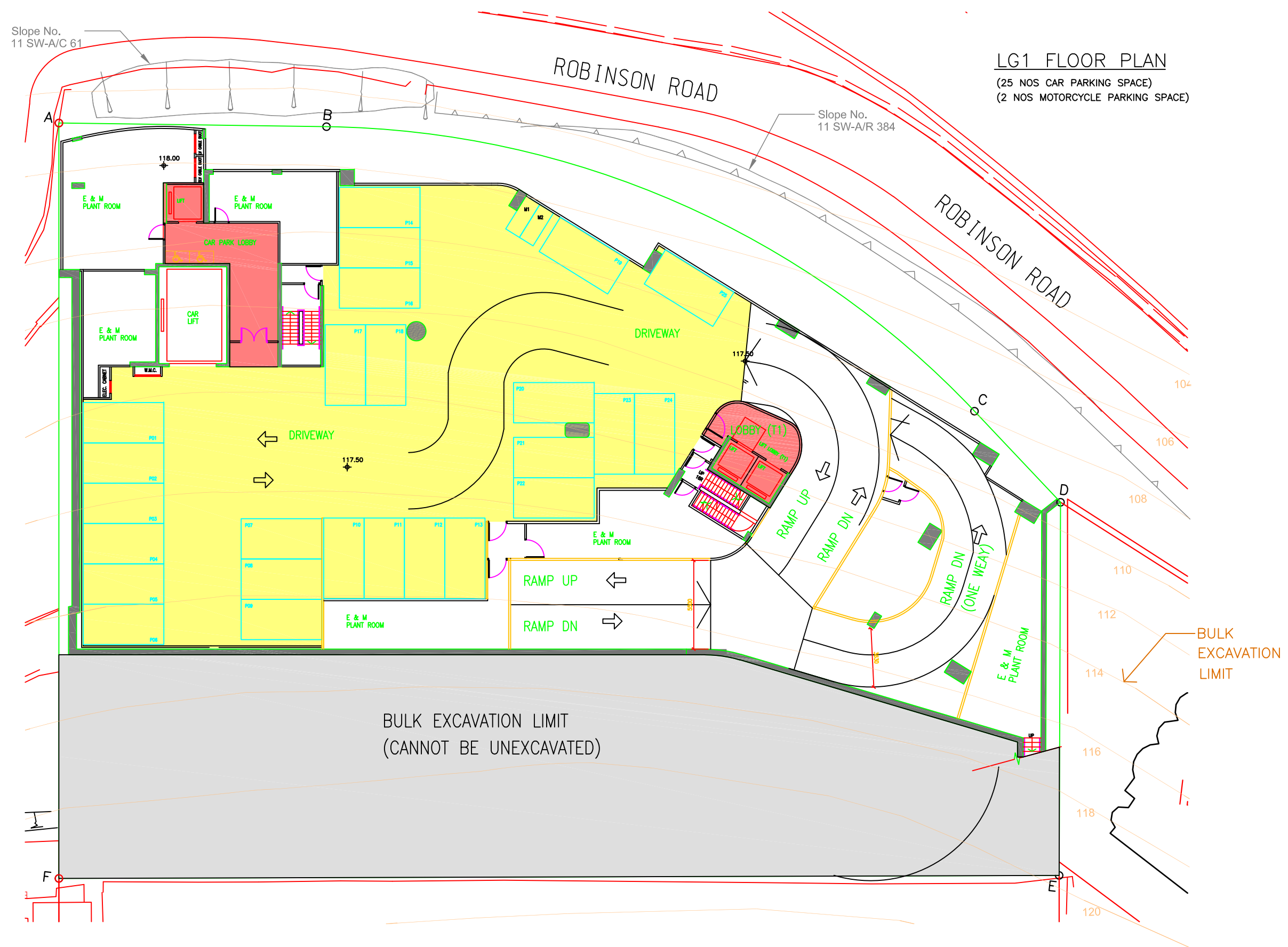
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	Figure Title	SITE LOCATION PLAN	Project No.	J1494	CAD Ref.	J1494/TN6/F21/2023-09-27	Rev.	—





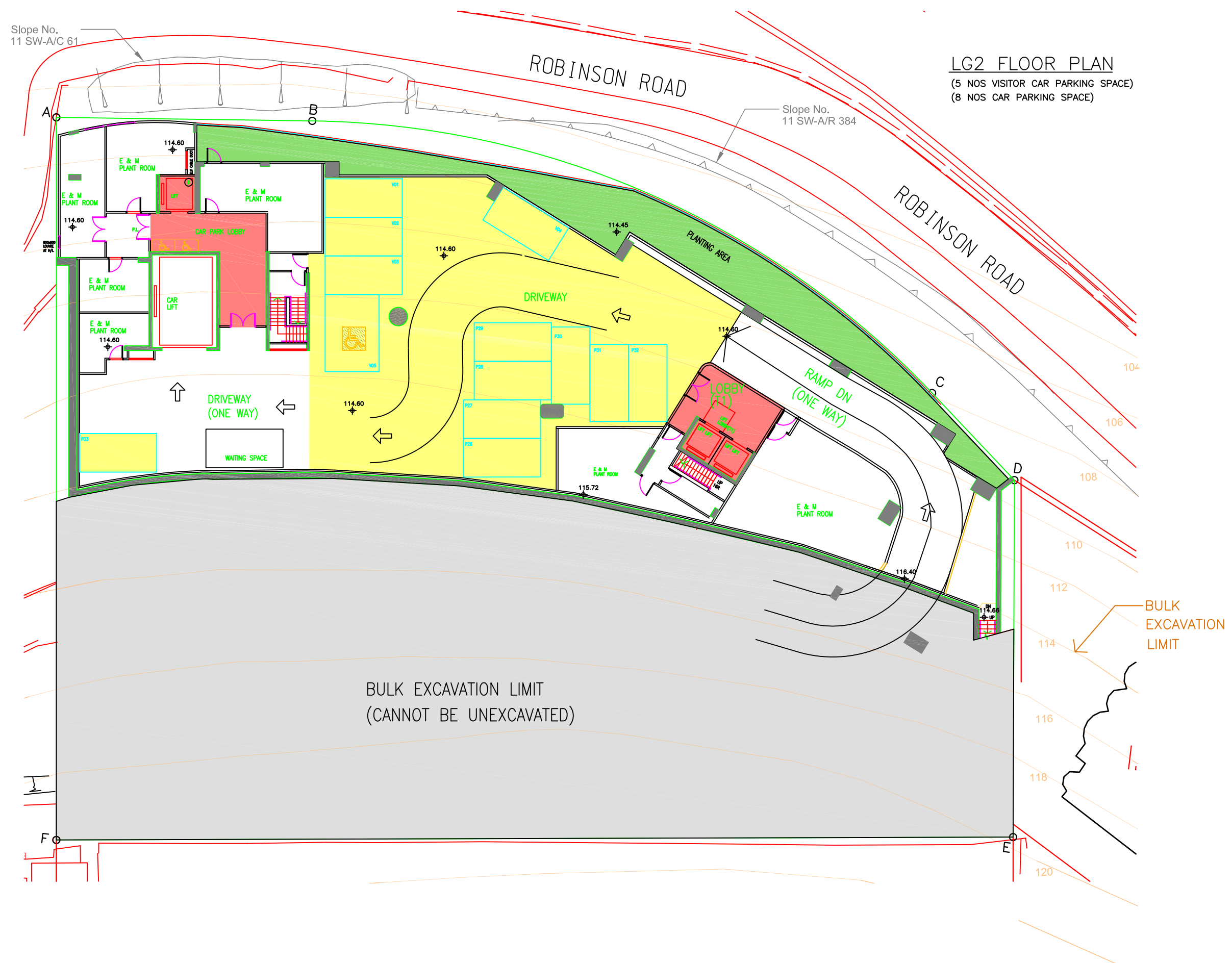
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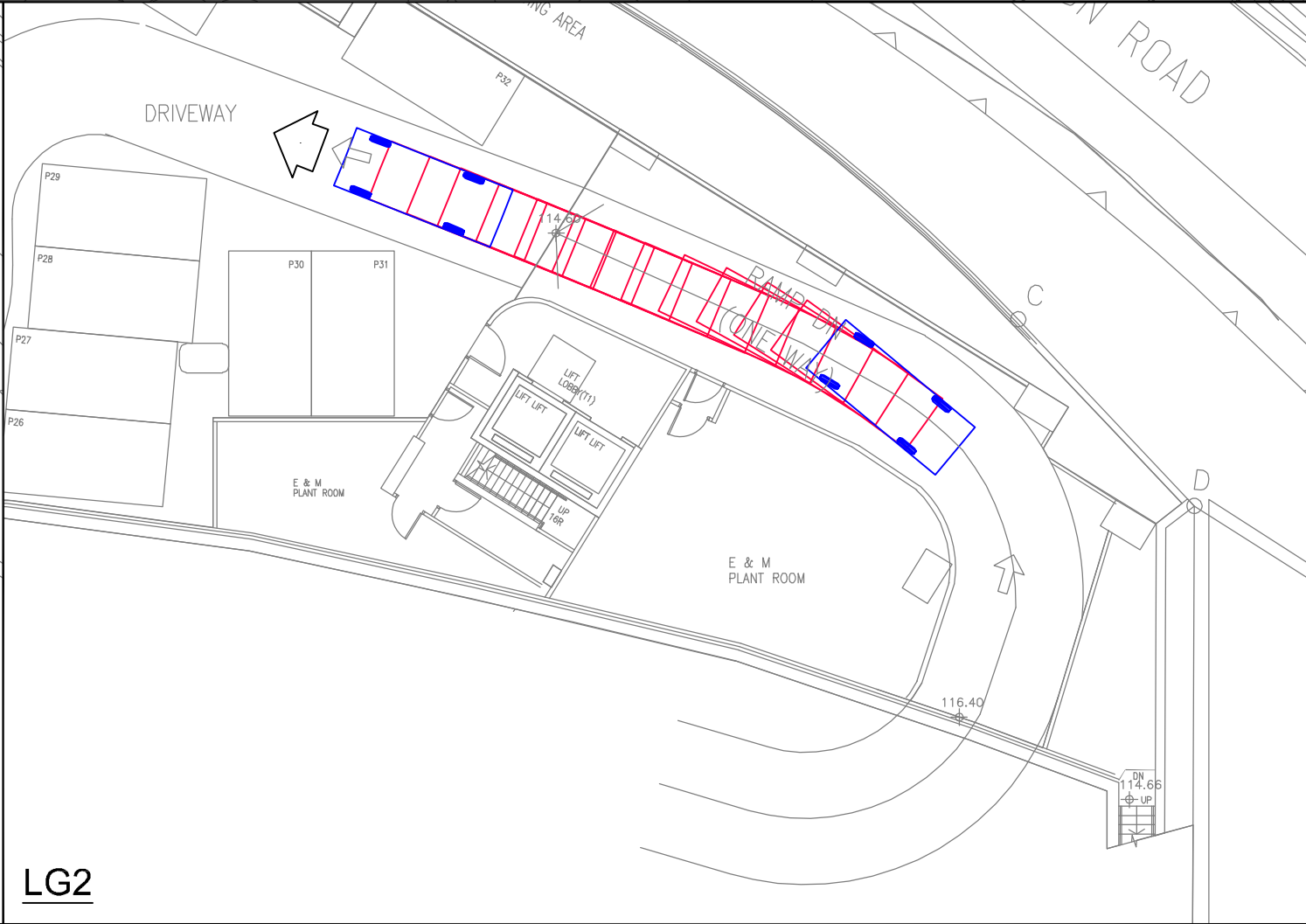
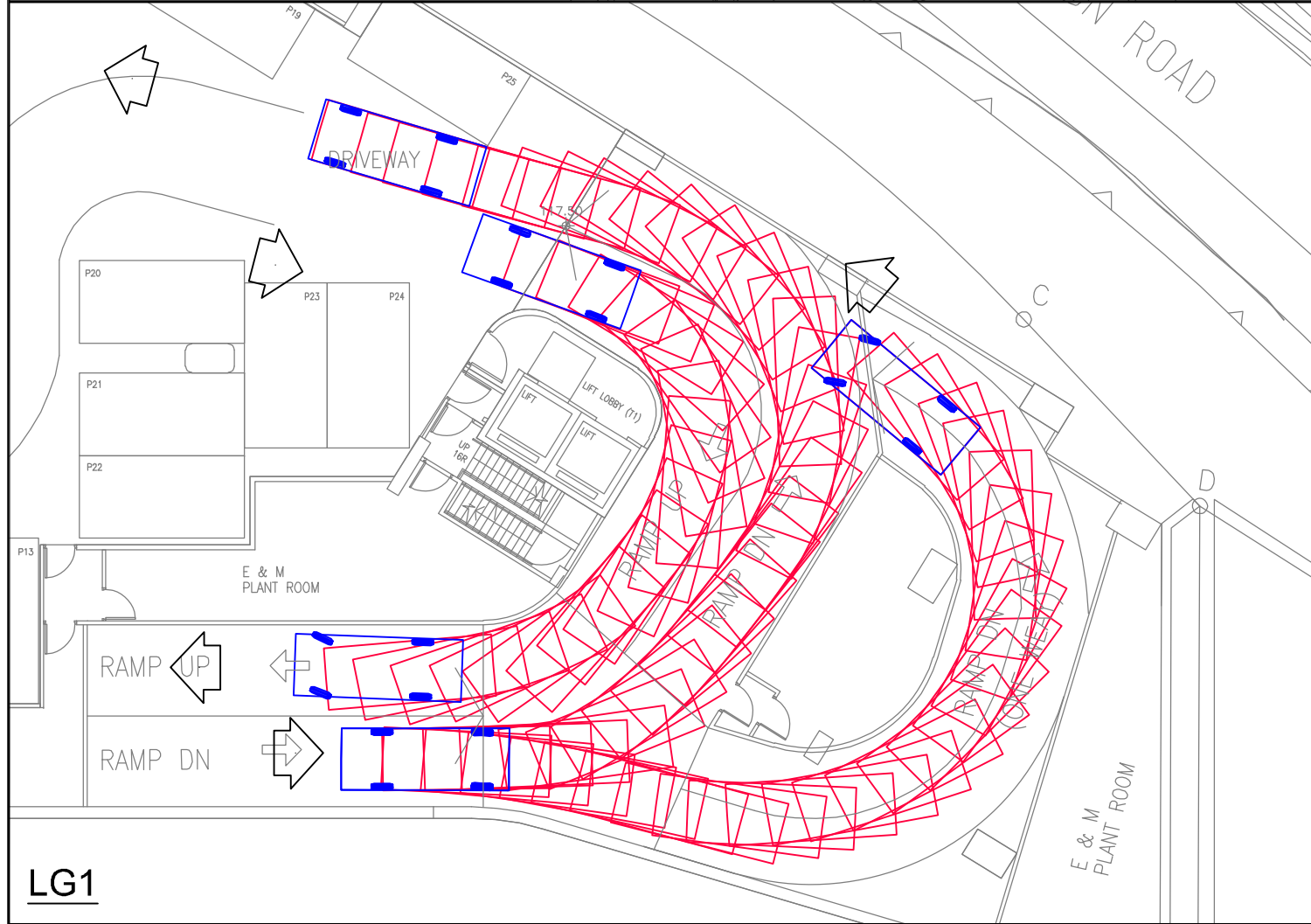
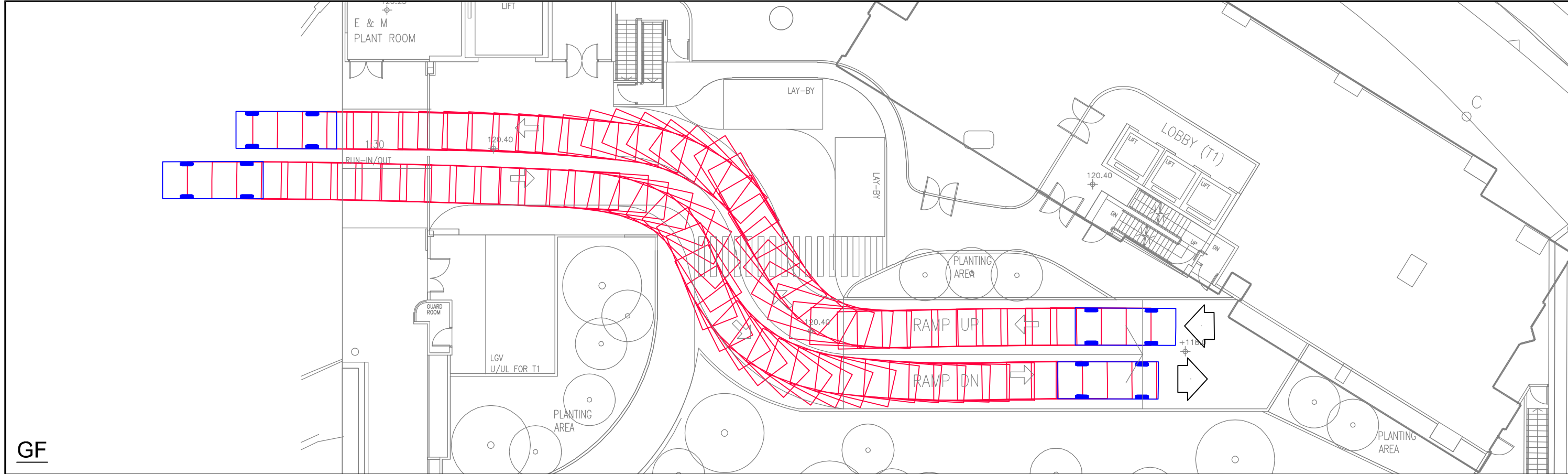
LG1 FLOOR PLAN  
(25 NOS CAR PARKING SPACE)  
(2 NOS MOTORCYCLE PARKING SPACE)


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# **Appendix A**

## **Swept Path Analysis**

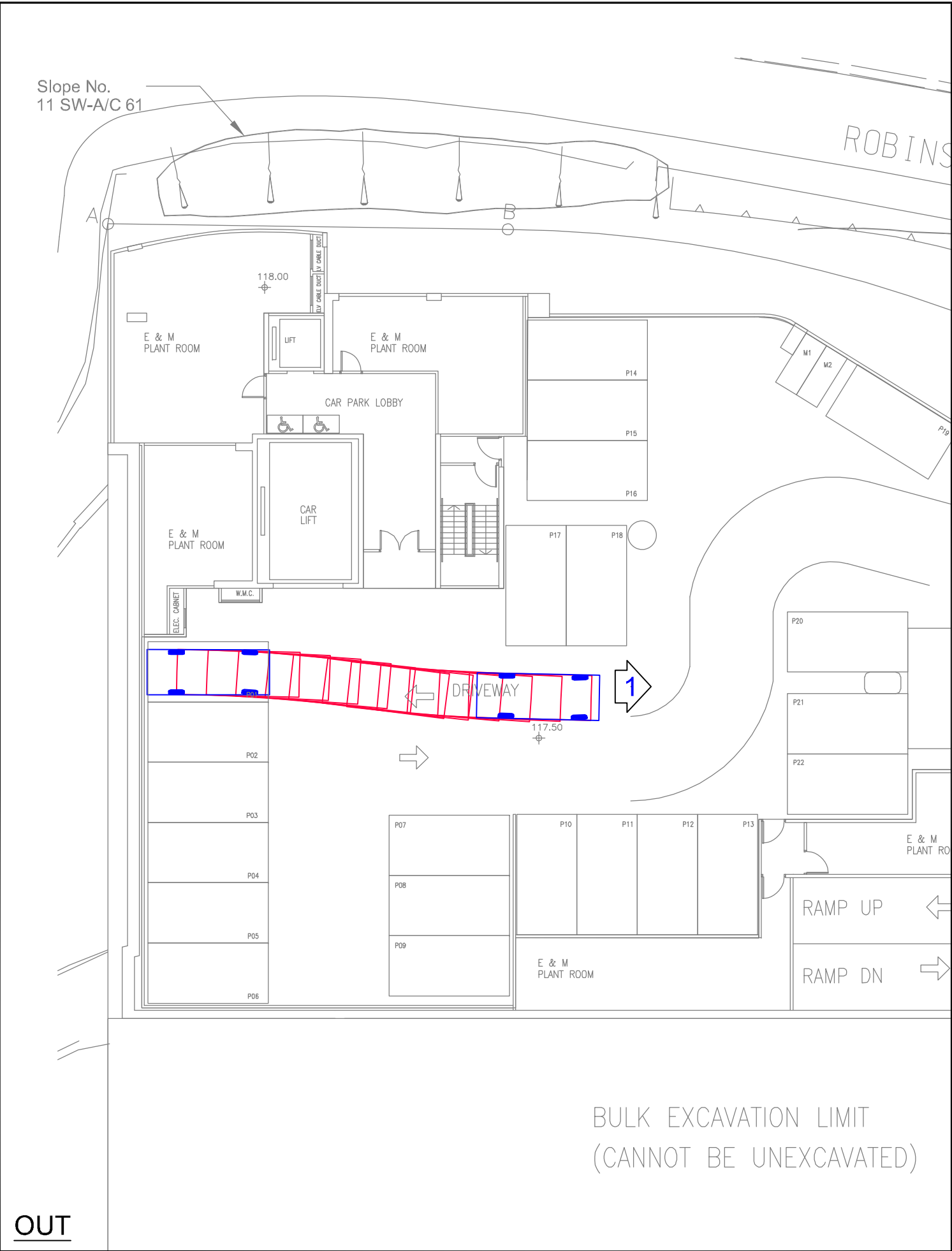
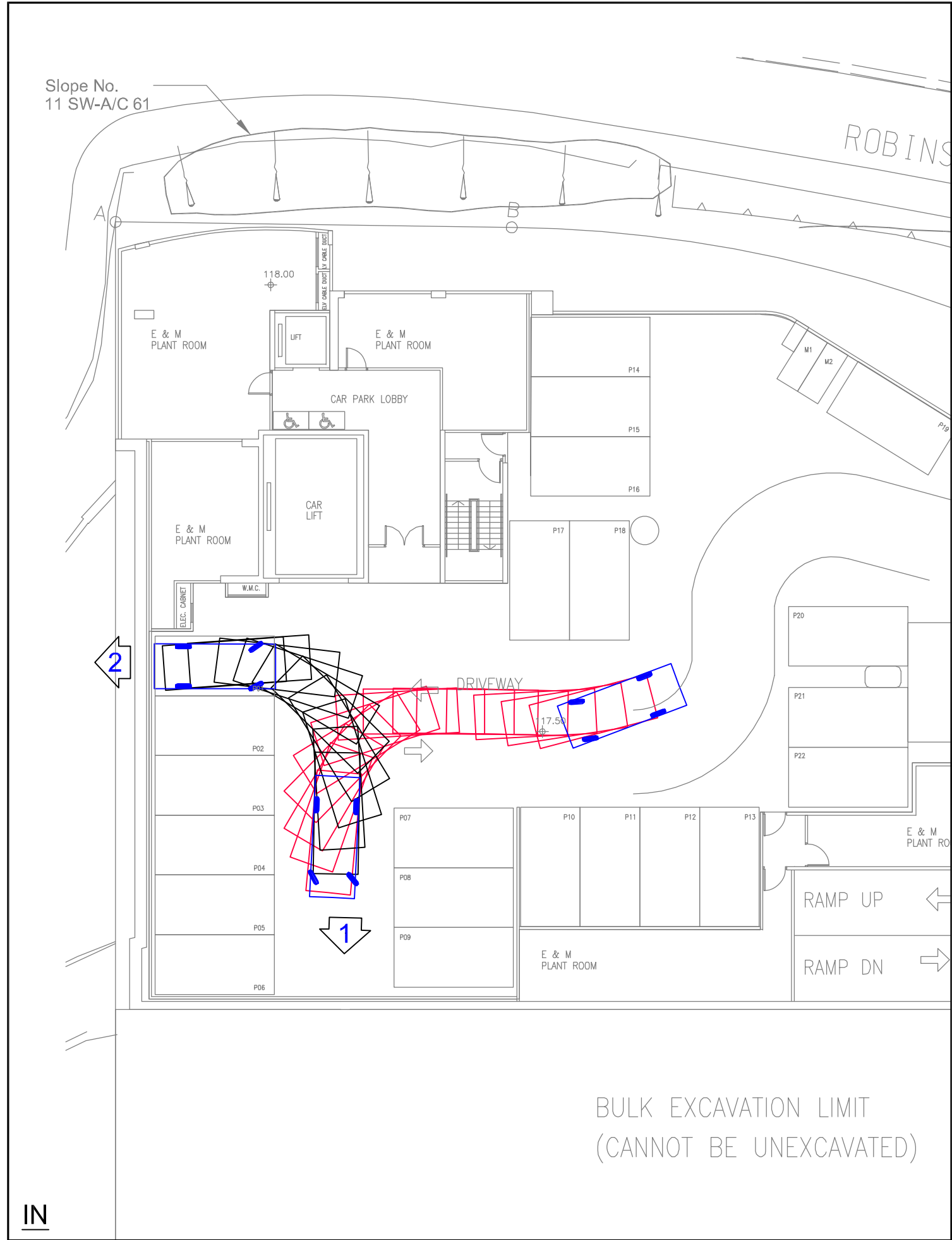



 <b>HWSPB</b> Traffic & Transportation Consultants Ho Wang SPB Limited	Project Title ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG		Scale 1 : 200	Date OCT 2023	Figure No. SP1
	Figure Title SWEPT PATH ANALYSIS OF 7m VEHICLE MANOEUVRE INTO AND OUT OF THE L/UL BAY AT GROUND FLOOR		Project No. J1494	CAD Ref. J1494/SWP25/SP/2023-10-12	Rev. -

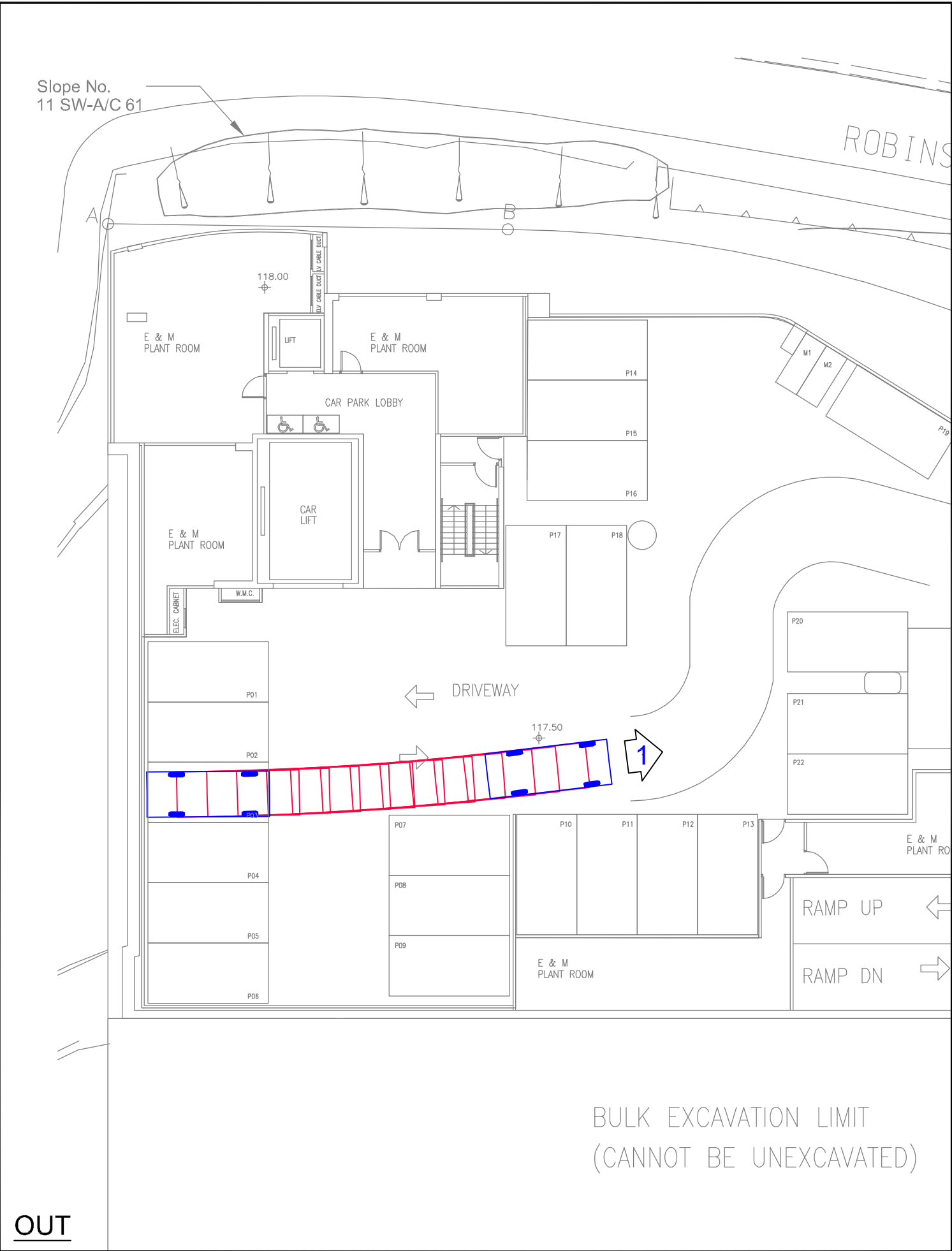
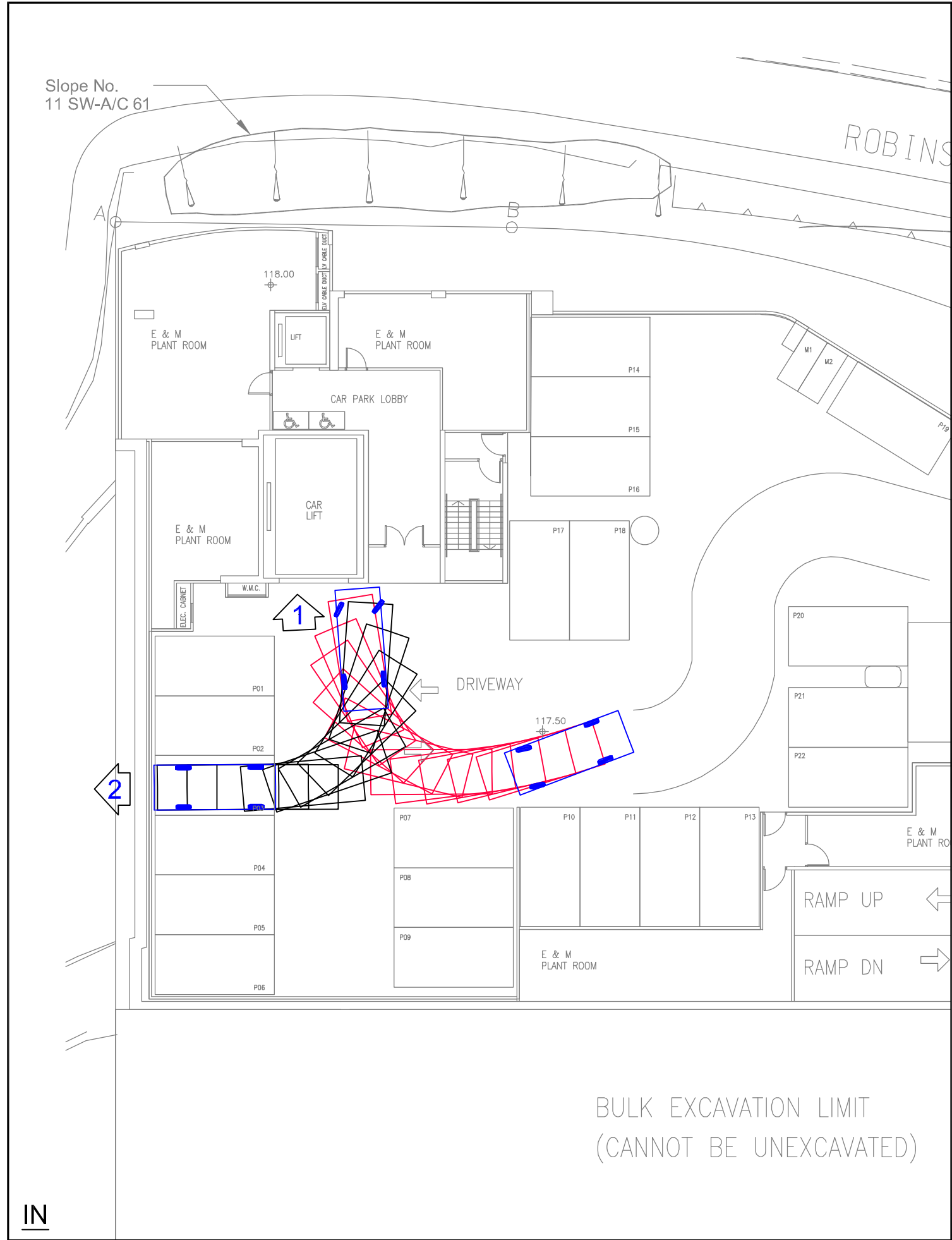







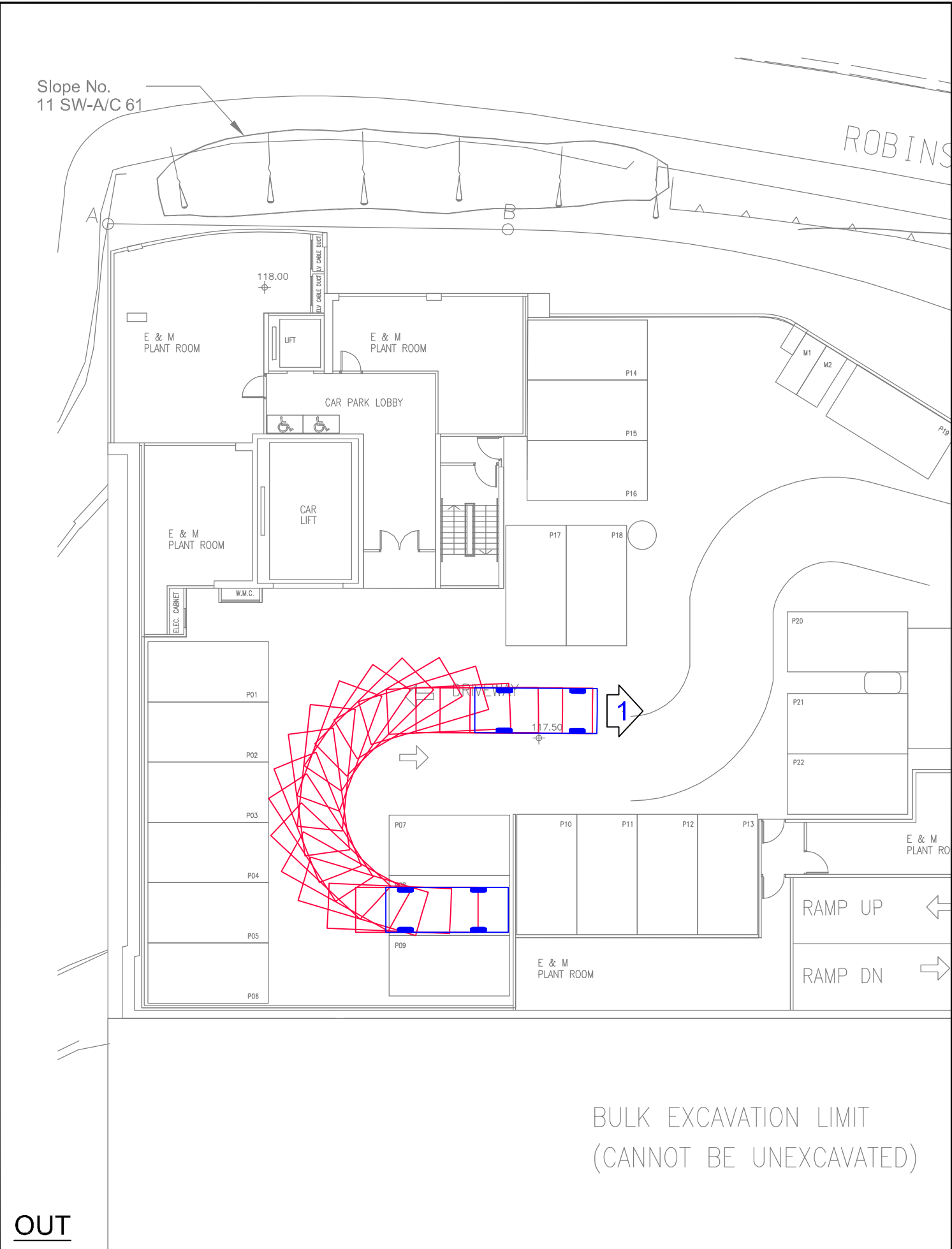
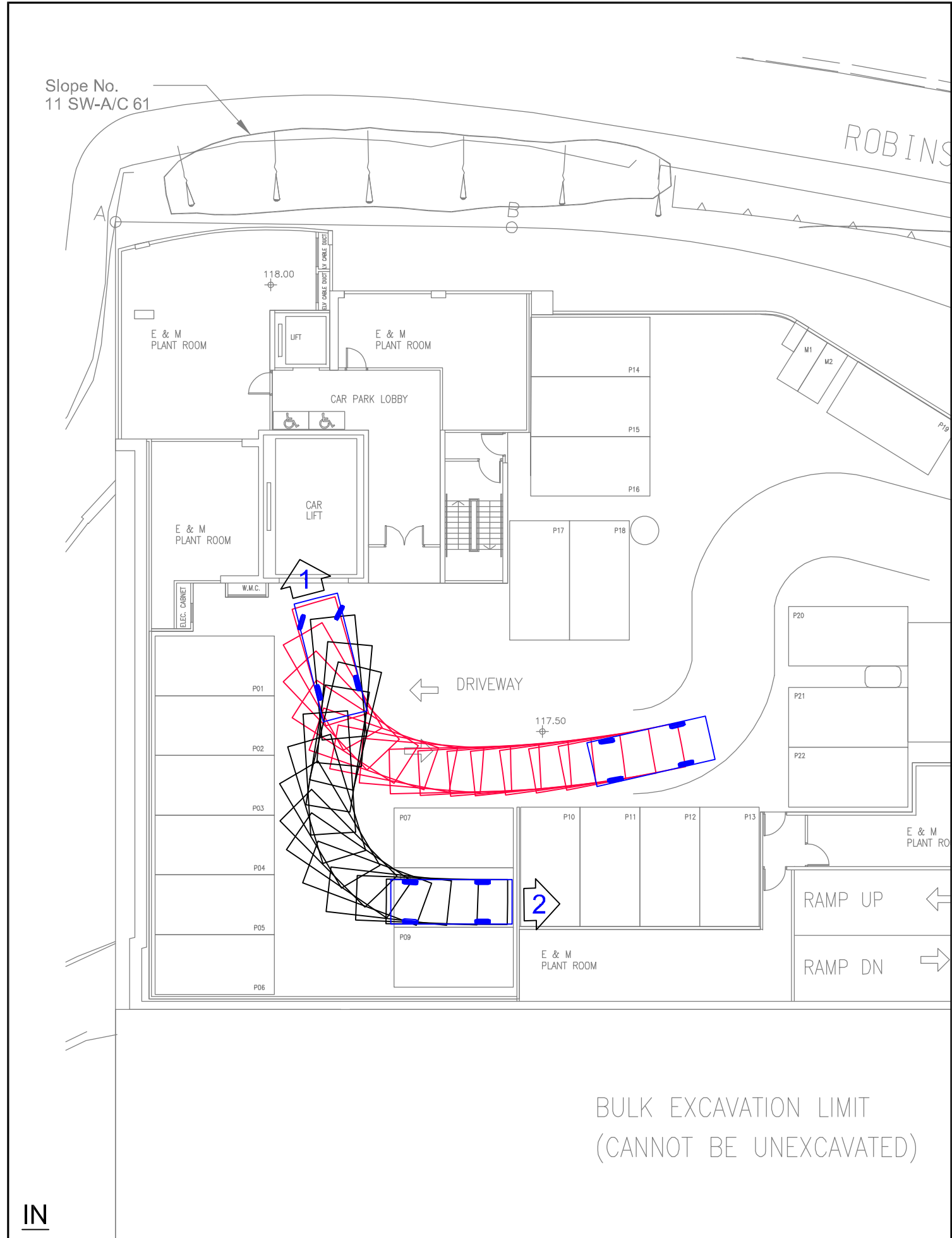



	<p>Project Title ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG</p> <p>Figure Title SWEPT PATH ANALYSIS OF 5m VEHICLE MANOEUVRE INTO AND OUT OF P01 PARKING SPACE AT LG1</p>	<p>Scale 1 : 200</p> <p>Project No. J1494</p>	<p>Date OCT 2023</p> <p>CAD Ref. J1494/SWP25/SP/2023-10-12</p>	<p>Figure No. SP4</p> <p>Rev. -</p>
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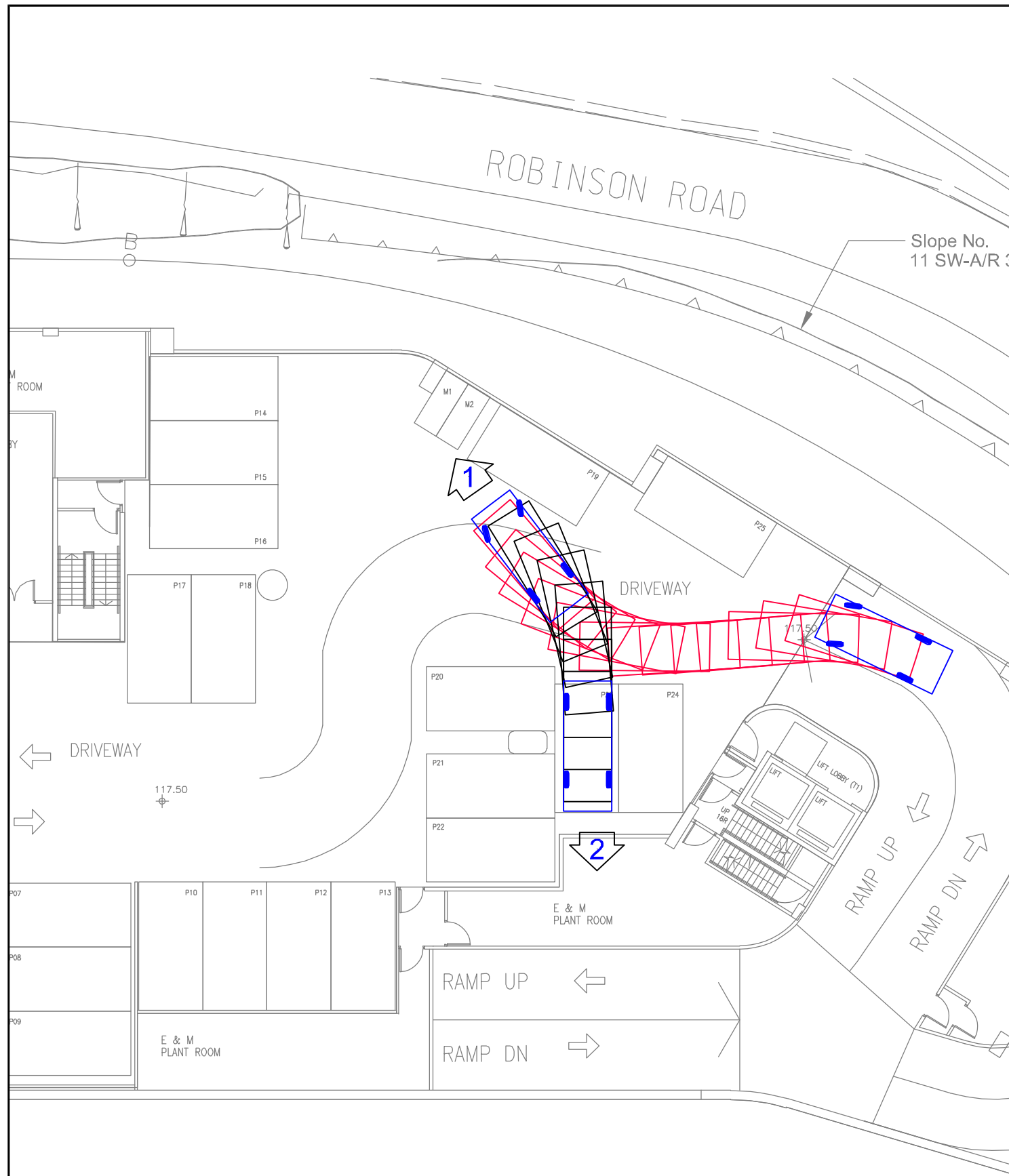


 <b>HWSPB</b> Traffic & Transportation Consultants Ho Wang SPB Limited	Project Title ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG			Scale 1 : 200	Date OCT 2023	Figure No. SP5
	Figure Title SWEPT PATH ANALYSIS OF 5m VEHICLE MANOEUVRE INTO AND OUT OF P03 PARKING SPACE AT LG1			Project No. J1494	CAD Ref. J1494/SWP25/SP/2023-10-12	Rev. -

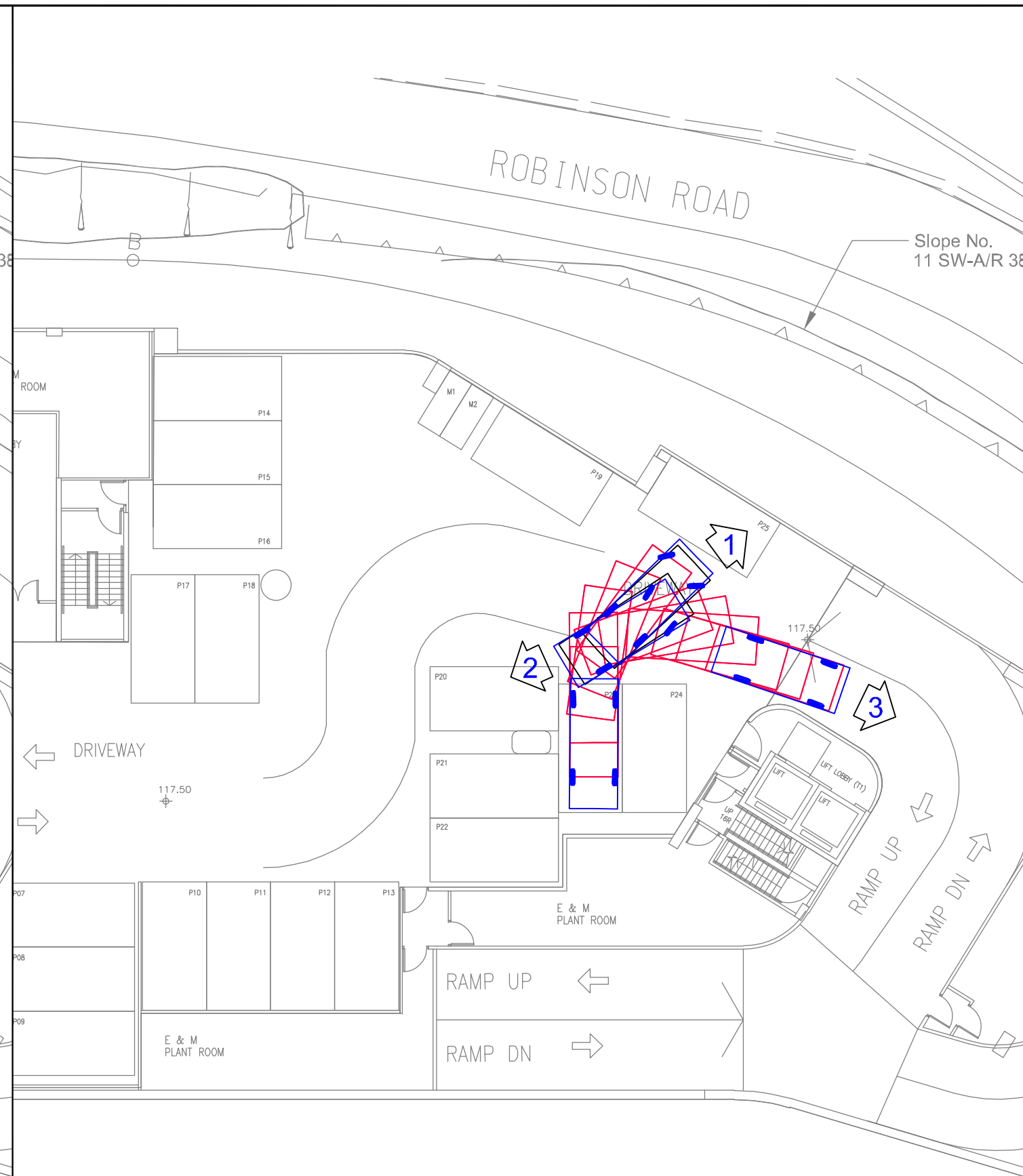





	<p>Project Title ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG</p> <p>Figure Title SWEPT PATH ANALYSIS OF 5m VEHICLE MANOEUVRE INTO AND OUT OF P01 PARKING SPACE AT LG1</p>	<p>Scale 1 : 200</p> <p>Project No. J1494</p>	<p>Date OCT 2023</p> <p>CAD Ref. J1494/SWP25/SP/2023-10-12</p>	<p>Figure No. SP6</p> <p>Rev. -</p>
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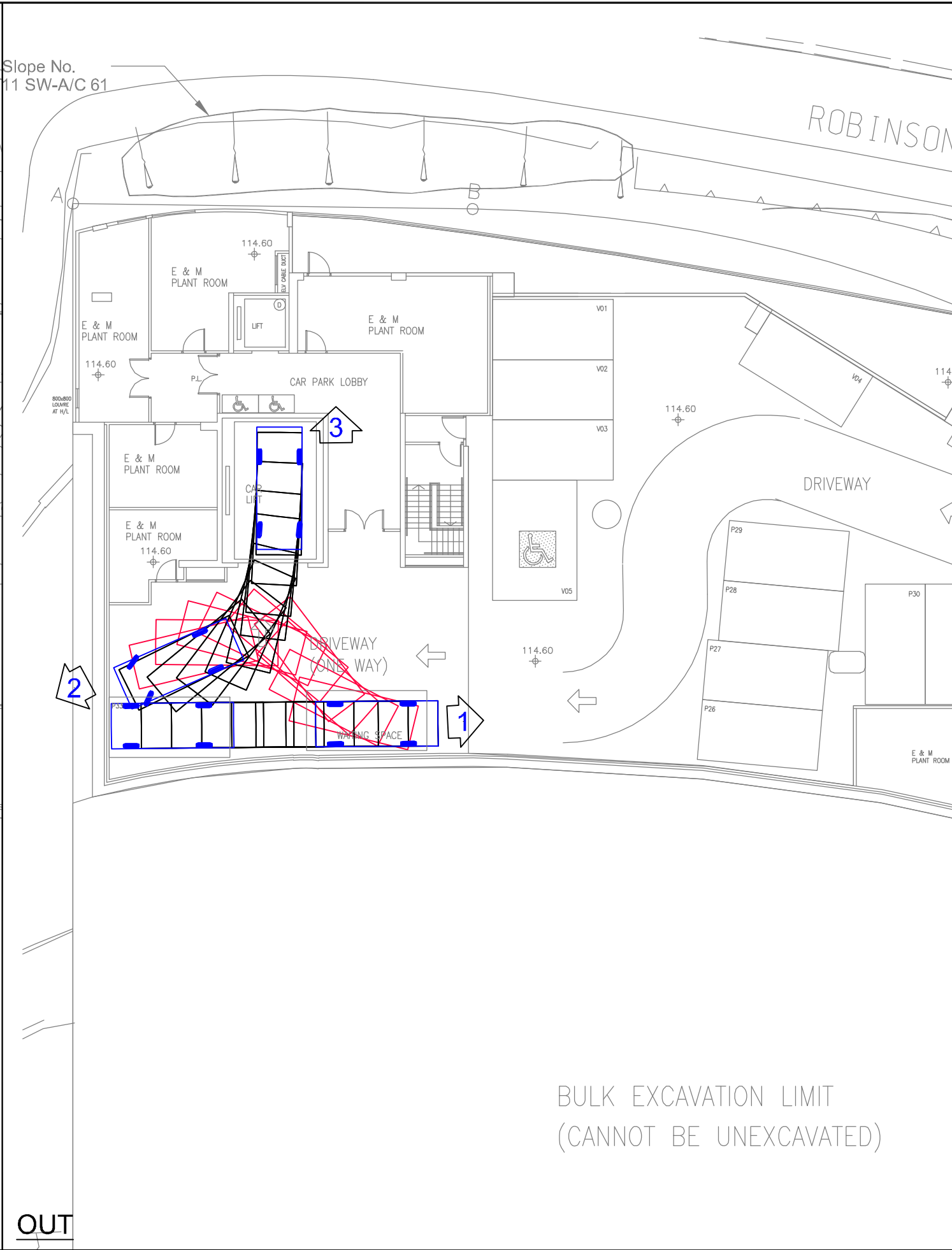
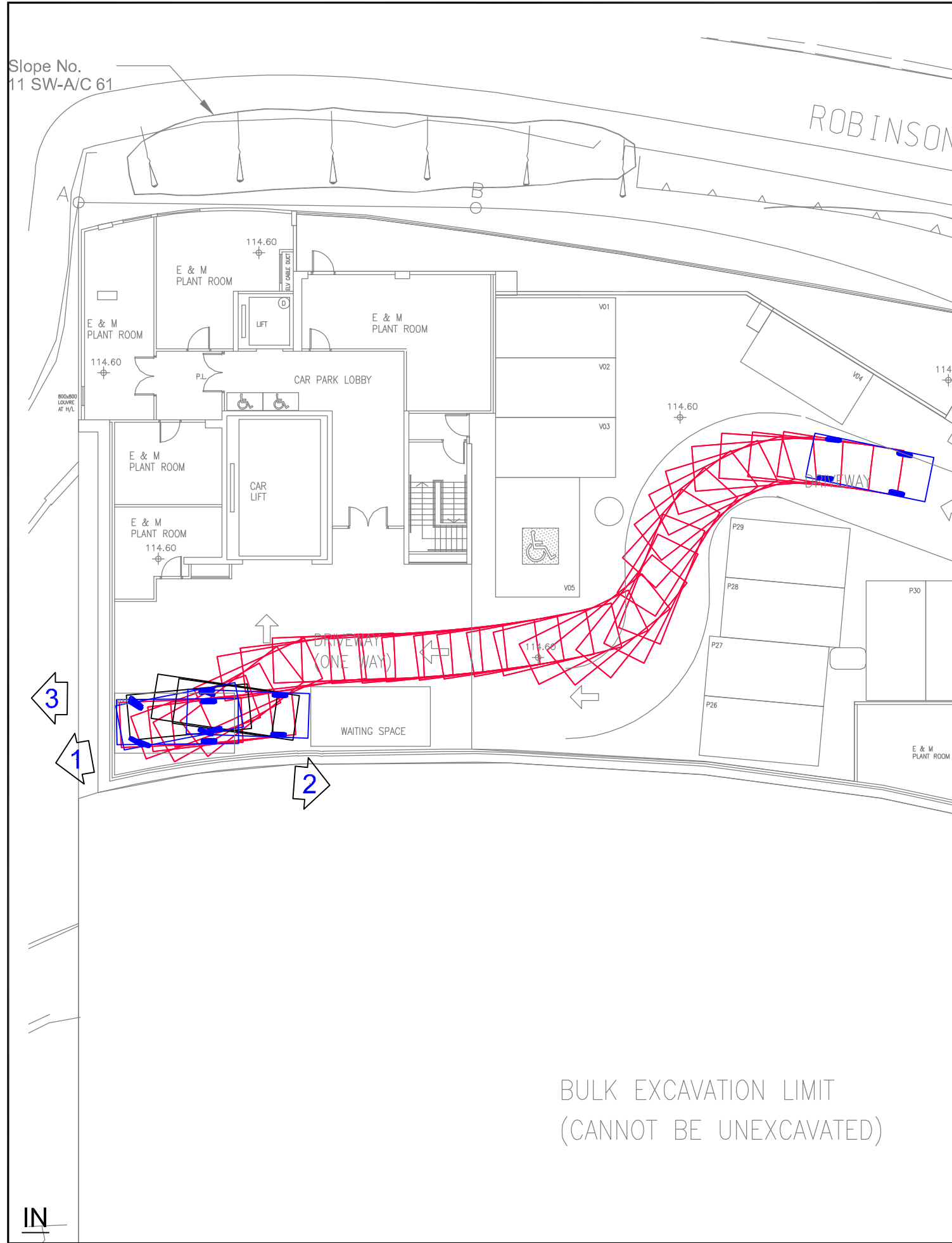



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 <b>HWSPB</b> Traffic & Transportation Consultants Ho Wang SPB Limited	Project Title ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG		Scale 1 : 200	Date OCT 2023	Figure No. SP7
	Figure Title SWEPT PATH ANALYSIS OF 5m VEHICLE MANOEUVRE INTO AND OUT OF P03 PARKING SPACE AT LG1		Project No. J1494	CAD Ref. J1494/SWP25/SP/2023-10-12	Rev. -



 <b>HWSPB</b> Traffic & Transportation Consultants Ho Wang SPB Limited	Project Title	ENQUIRY SUBMISSION FOR 105 ROBINSON ROAD, MID-LEVEL, HONG KONG	Scale	1 : 200	Date	OCT 2023	Figure No.	SP8
	Figure Title	SWEPT PATH ANALYSIS OF 5m VEHICLE MANOEUVRE INTO AND OUT OF P33 PARKING SPACE AT LG2	Project No.	J1494	CAD Ref.	J1494/SWP25/SP/2023-10-12	Rev.	-