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17 March 2020
Project: (190494)

Nancy Frieday, M.Sc. (Pl.), MCIP, RPP
Senior Planner
GSP Group Inc.
162 Locke Street South, Suite 200
Hamilton, ON, L8P 4A9

Dear Ms. Frieday:

RE: 4063 UPPER MIDDLE ROAD, BURLINGTON ON – SITE CIRCULATION REVIEW

Paradigm Transportation Solutions Limited (Paradigm) has reviewed the updated Site Plan for the proposed development of 4063 Upper Middle Road in the City of Burlington. This memorandum reviews the design of the parking structure ramp and the overall circulation of the site.

Parking Structure Ramp

Proposed

The City's guideline stipulates that the maximum ramp grade should not exceed 12%; ramps with 8% or more will require heating coils. The proposed ramp for the parking structure will have a maximum grade of 15% which is required given the elevation change to accommodate parking facilities on the lower and upper levels of the site and to avoid a parking deficit. To achieve a maximum grade of 12%, at least eight (8) parking spaces would need to be removed.

Vehicular access to the parking structure is proposed by two (2), two-way ramps. Both lower and upper ramps measures 6.8 metres in width and consists of a 15.0% gradient ramp followed by a 7.5% transition ramp. The landing areas for the ramp are considered to be flat and connect to the surface and parking structure's drive aisle. All on-site two-way driveway aisles measure at least 6.0 metres in width.

Vertical Simulation (AutoTURN)

The design of the parking structure ramp has been assessed using AutoTURN vertical swept path analysis. **Drawing AT 1 (attached)** illustrates the vertical clearance simulation for the proposed ramp design. Based on our assessment the ramp is designed to adequately provide

the necessary ground and vertical clearance needed to accommodate a typical Transportation Association of Canada (TAC) Passenger (P) car design vehicle.

Precedent

The City of Vancouver's Parking and Loading Design Supplement[1] and the City of Toronto's Guidelines for the Design and Management of Bicycle Parking Facilities[2] stipulate that the maximum acceptable ramp gradient for automobiles within a parking garage is 15% followed by a 7.5% transition ramp. Similar ramp slopes have also been previously been approved by the City of Burlington for the Berkley Condominiums at 2025 Maria Street, 101 Masonry Court and at 35 Plains Road East.

Summary

As it is understood that the proposed design deviates from the City's ramp slope standards, the proposed ramp is noted to be consistent with the intent of the standards. As the proposed ramp is designed with transition grades and flat landing areas, the proposed ramp slopes would provide for a smooth transition for vehicles as they enter and exit the garage and it is not anticipated to impinge on the undercarriage of a vehicle. In addition, a subsurface melting device would still be implemented for the portion of ramp that will be exposed to inclement weather. The deviation from the City's ramp slope standards is consistent with the City of Toronto's requirements and previous designs that have been accepted within the City of Burlington.

Vehicle Access

The site is accessed through a single driveway connection from Upper Middle Road located to the east of the site. Internally, the site will have a loading zone and three entrances to the parking areas on site: lower, upper and, at grade.

Loading Zone

A Medium Single Unit (MSU) as instructed by the City of Burlington has been utilized to assess the adequacy of the loading zone. The AutoTURN analysis indicated that an MSU will have difficulty accessing the loading zone within the at grade parking area where it was initially proposed. The vehicle tracking diagrams are illustrated in **Drawing AT2 (attached)**

Given the site is limited to a single access to Upper Middle Road, there is a limited number of areas able to accommodate a loading zone where an MSU can enter and exit the site in a forward motion. With that said, relocating the loading zone to the east portion of the site is a feasible solution, adjacent to the lower ramp. The vehicle tracking diagrams are illustrated in **Drawing AT3 (attached).**

[1] City of Vancouver Parking and Loading Design Supplement
[2] 2 Guidelines for the Design and Management of Bicycle Parking Facilities. City of Toronto May 2008. Section 2.4.3 Indoor Bicycle Parking (Parking Garage)

It is recognized that the MSU will require vehicle backing towards the top of the lower ramp and a 3-point turn is required for an MSU to exit the site. However, given the low frequency of large moving vehicles, the operations can be appropriately managed by site management.

As garbage collection for the site will be privately collected, various sizes of garbage truck would be available for the site and would require less space than that of an MSU. As a result, site management should consider a restriction on the size of garbage trucks.

Based on the above assessment, the repositioning of the loading zone allows an MSU to maneuver in and out of the site satisfactorily.

Passenger Vehicles

The proposed site plan includes three levels for parking areas: lower, upper and, at grade. The lower and upper levels will accommodate residential parking while the at grade parking will accommodate visitors. The vehicle tracking diagrams are illustrated in **Drawing AT4 (attached).**

Overall, there is a minor overlap conflict between the two travel lines: mainly at the top of the lower and upper ramps. As these spaces are residential spaces, the minor overlap is not seen as a critical issue and is consistent with constrained environments such as parking garages. The AutoTURN analysis indicated that a Passenger Car (P) can effectively maneuver through the site and access the lower, upper and, at grade parking areas.

Yours very truly,

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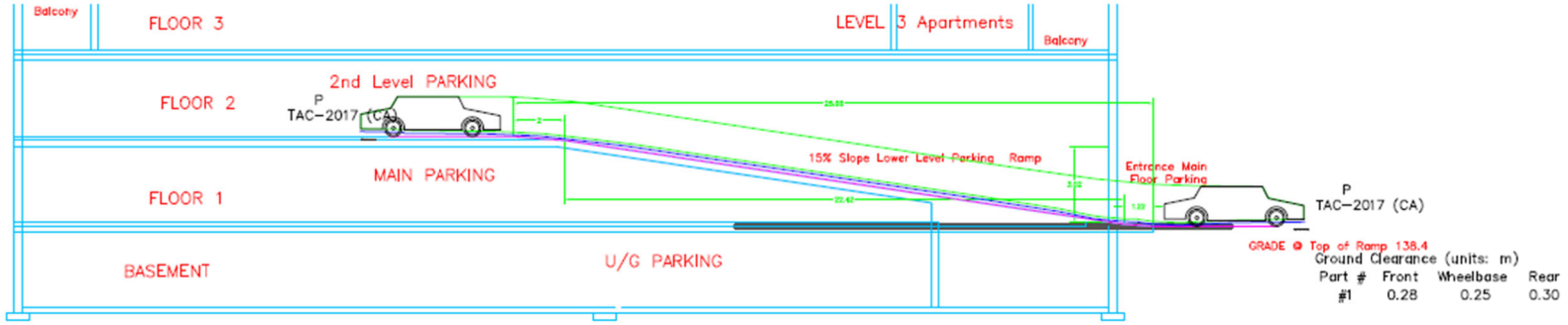


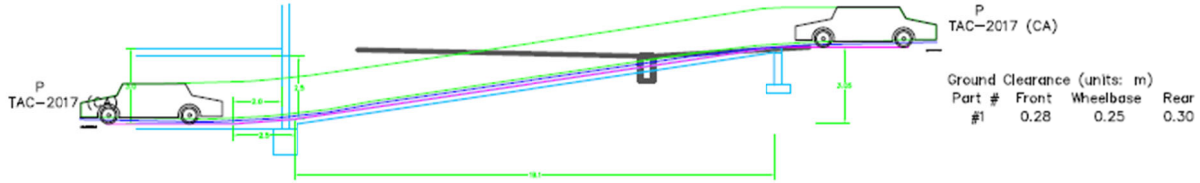


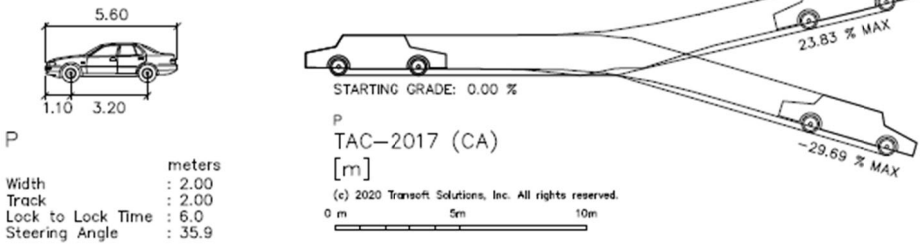
Adam J. Makarewicz
Dipl.T., C.E.T. MITE
Senior Project Manager

Stew Elkins
B.E.S., MITE
Vice President

Attachments

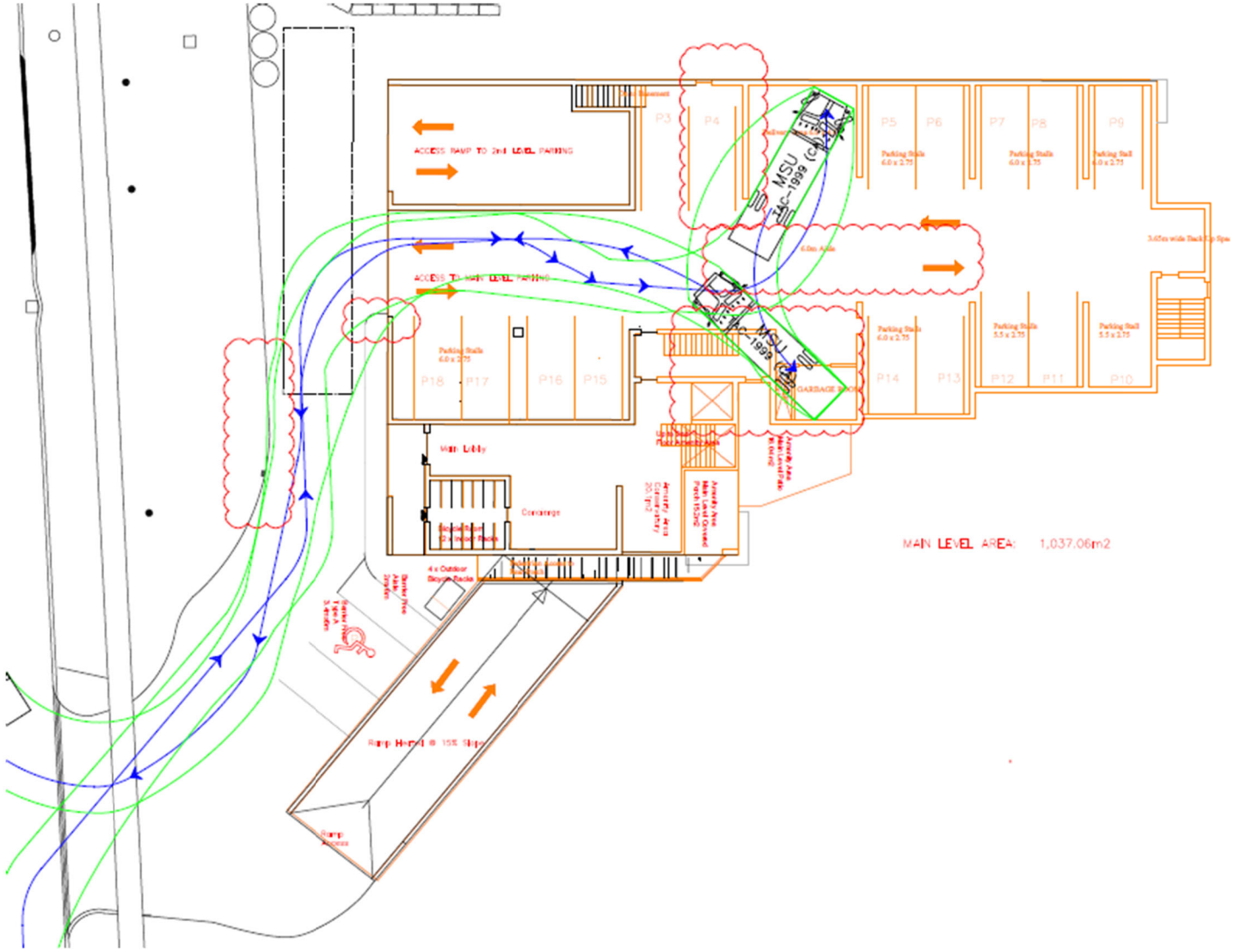






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Vertical Simulation

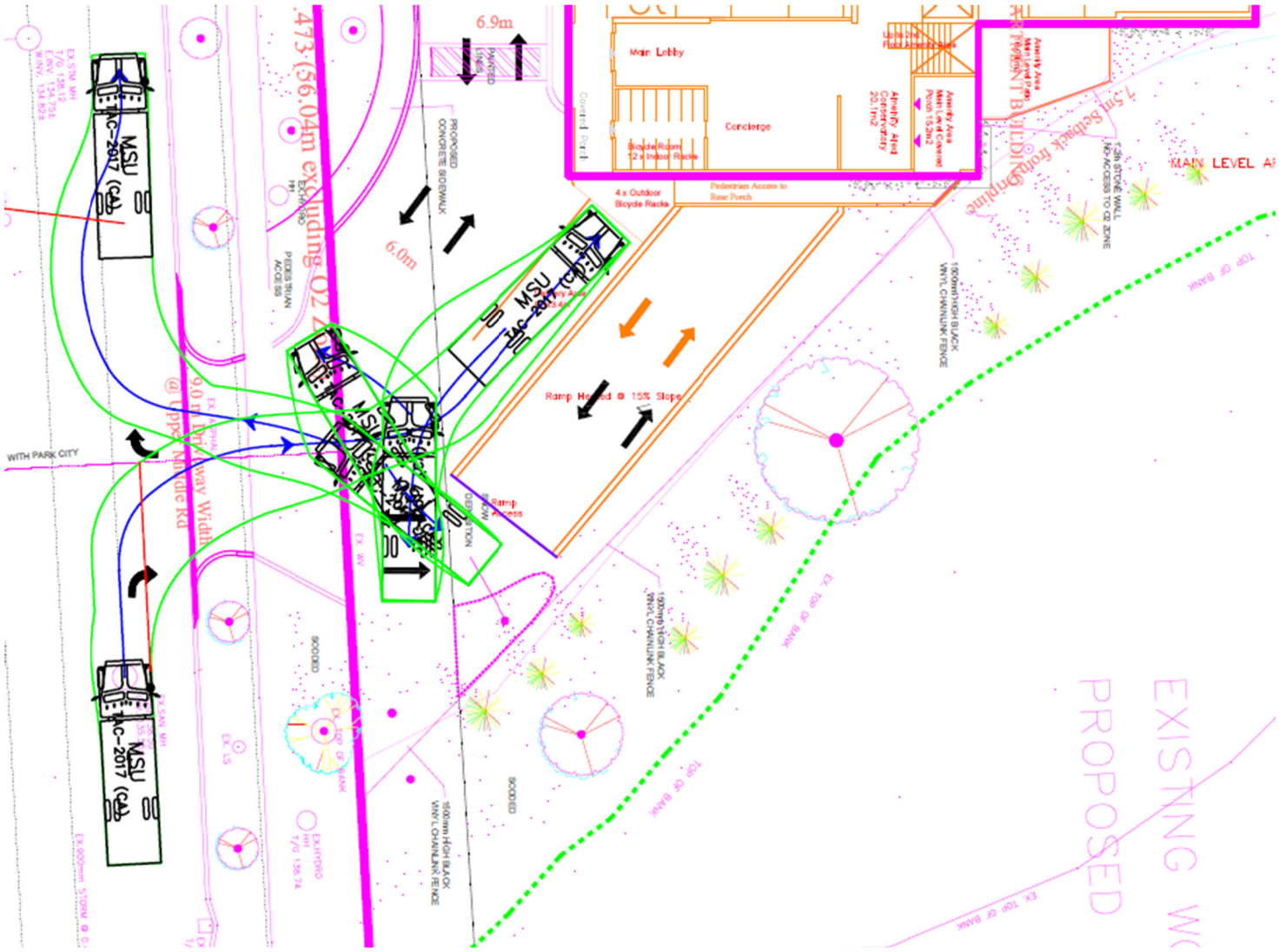


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Loading Zone (Parking Area)

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Drawing AT2

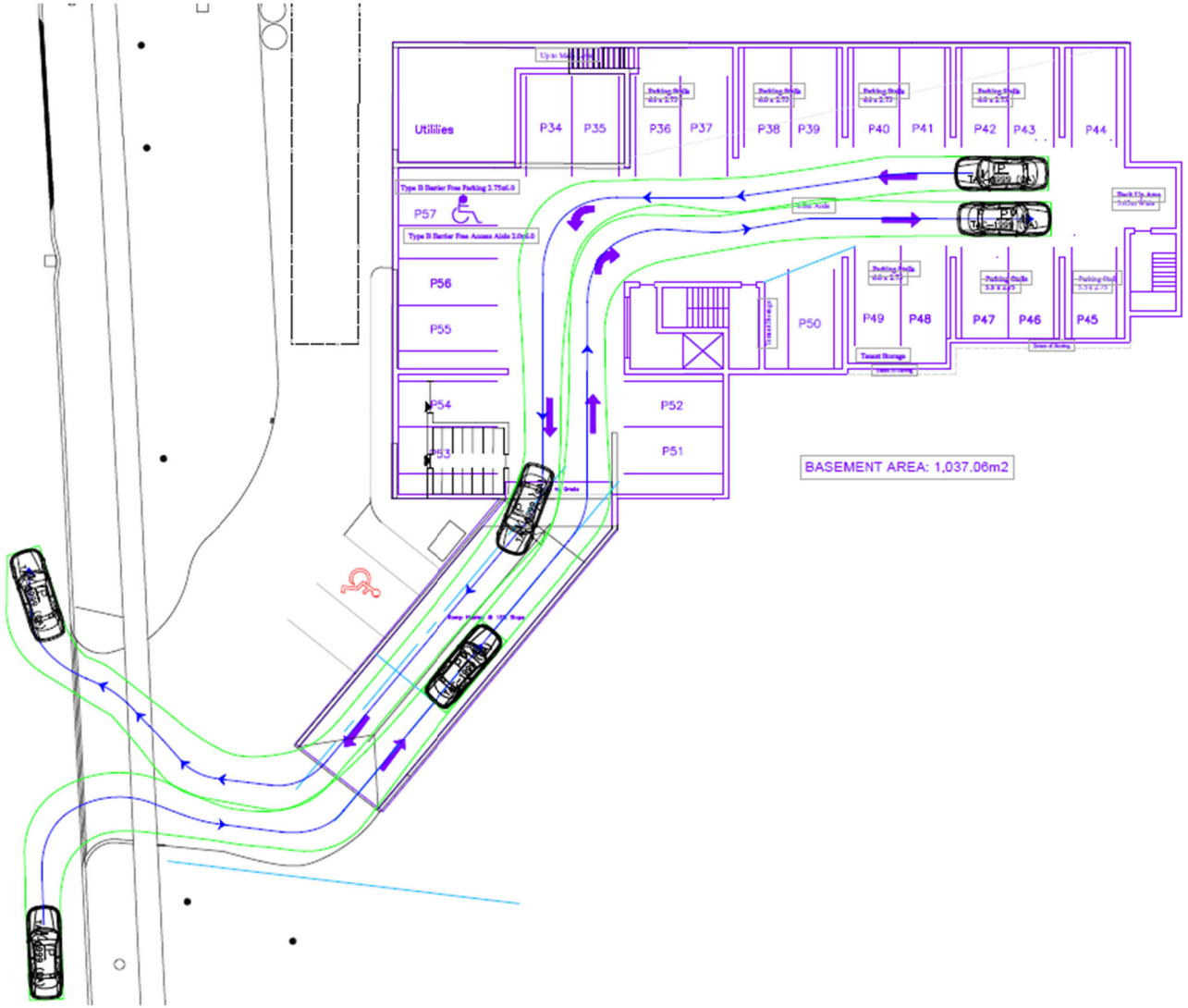


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Loading Zone (Lower Ramp)

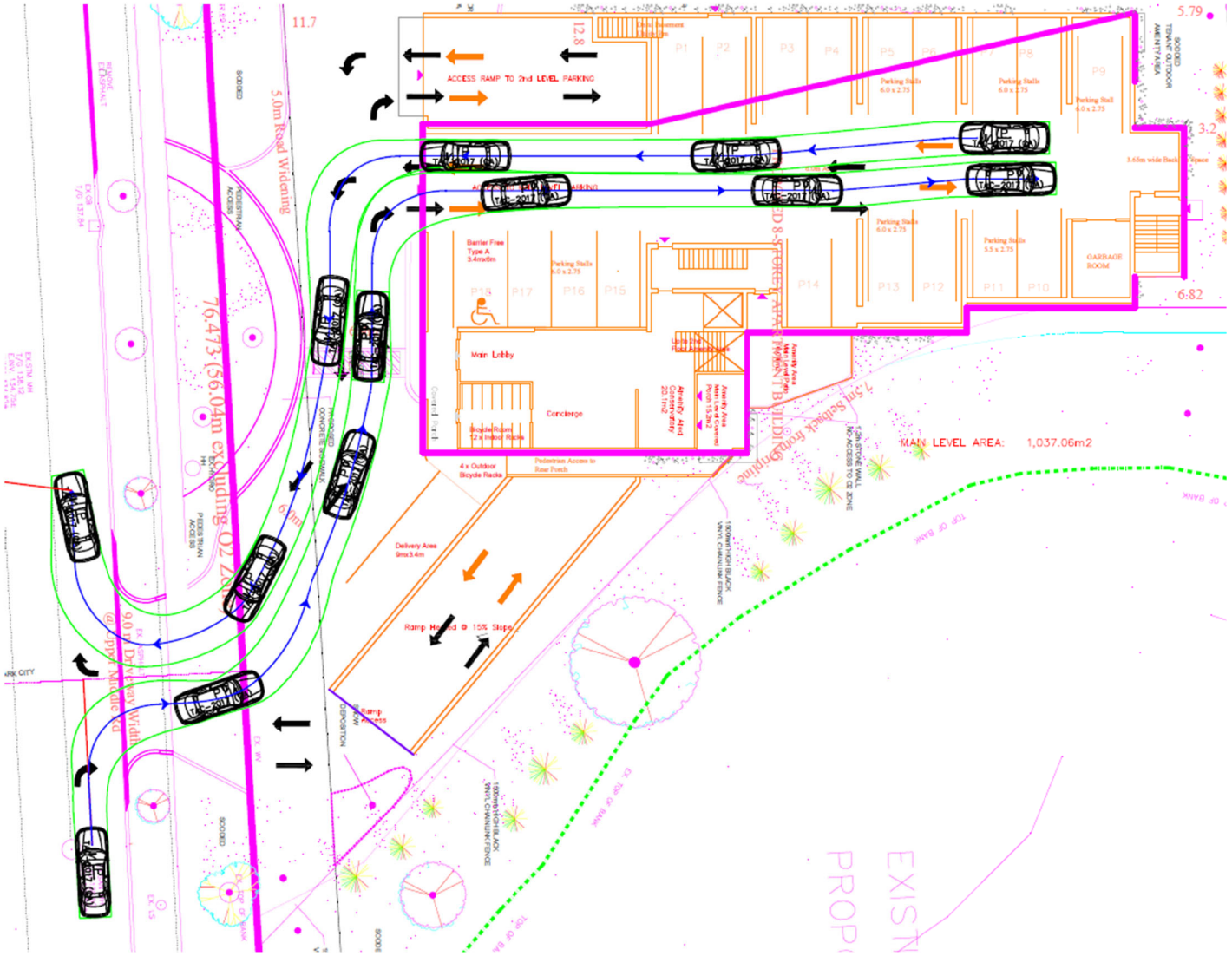
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Drawing AT3



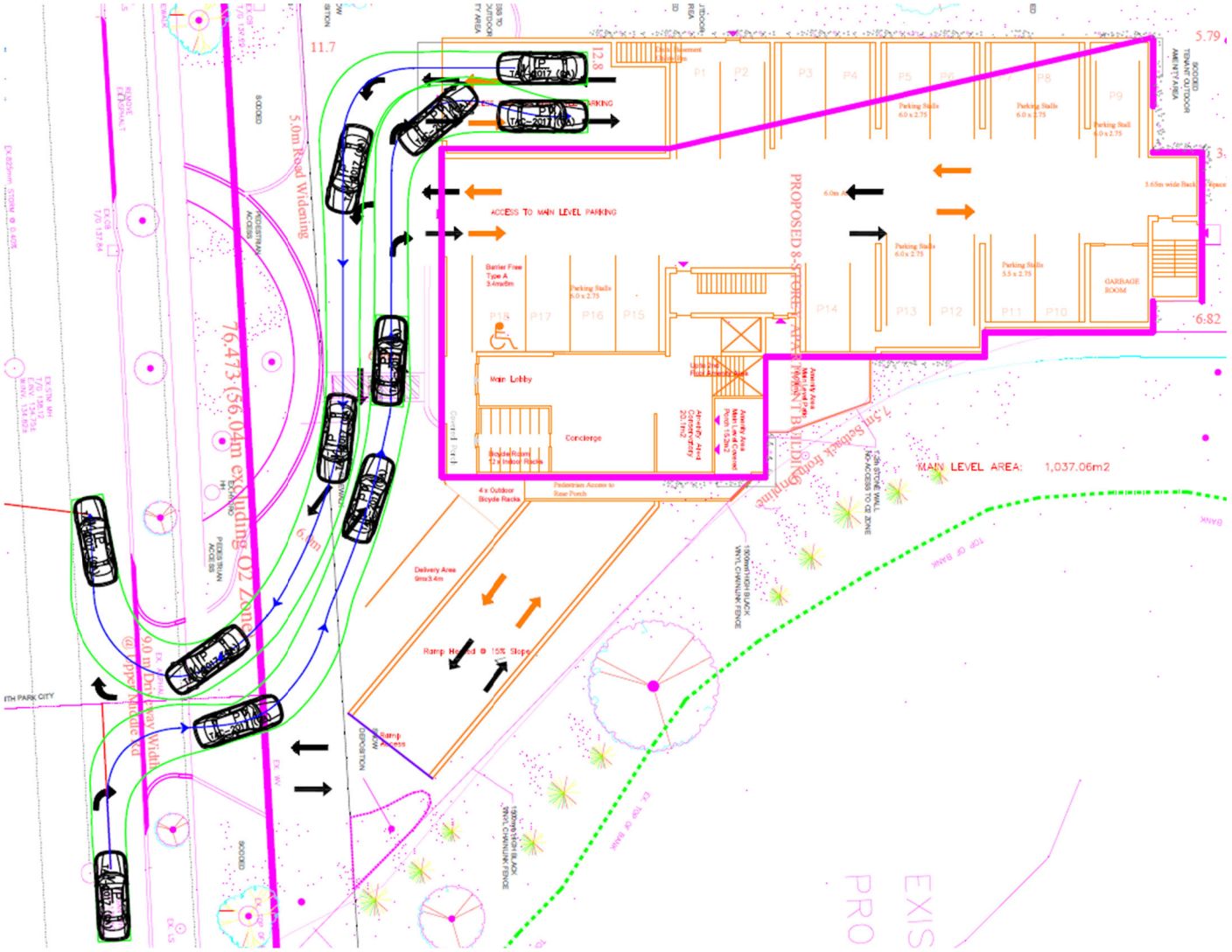
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Passenger Vehicle (Lower Ramp/Parking Area)



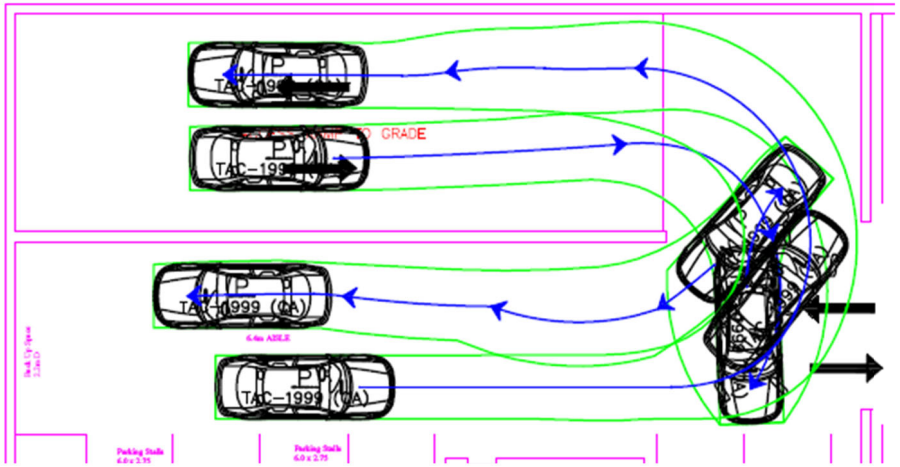
Passenger Vehicle (Ground Parking Area)

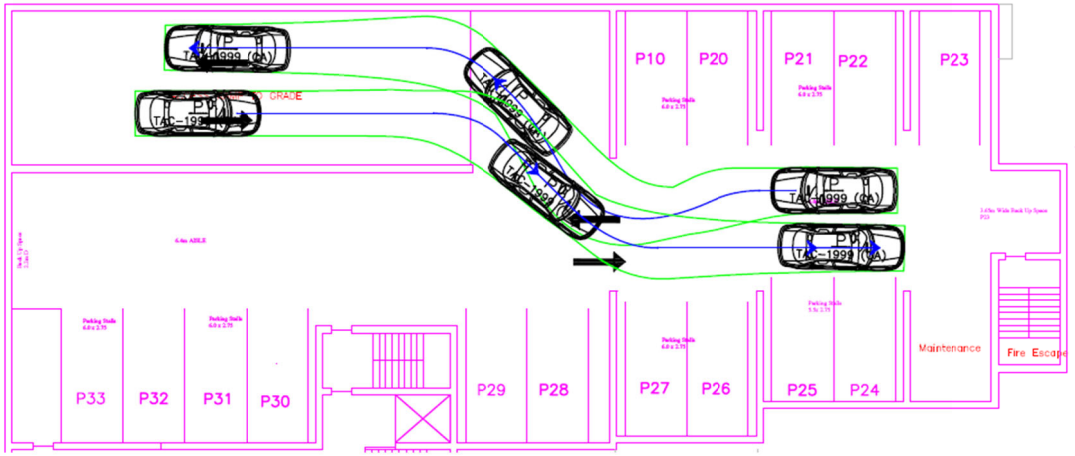
Drawing AT4B



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Passenger Vehicle (Upper Ramp)





Passenger Vehicle (Upper Parking Area)

Drawing AT4D