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11-13 Spring Street, Fitzroy

Transport Impact Assessment



ADVERTISED PLAN

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onemilegrid operates from Wurundjeri Woiworong Country of the Kulin nation. We acknowledge and extend our appreciation to the Wurundjeri People, the Traditional Owners of the land. We pay our respects to leaders and Elders past, present and emerging for they hold the memories, the traditions, the culture, and the hopes of all Wurundjeri Peoples.

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1 INTRODUCTION

onemilegrid has been requested by Antipodean Land Developments to undertake a Transport Impact Assessment of the proposed residential development at 11-13 Spring Street, Fitzroy.

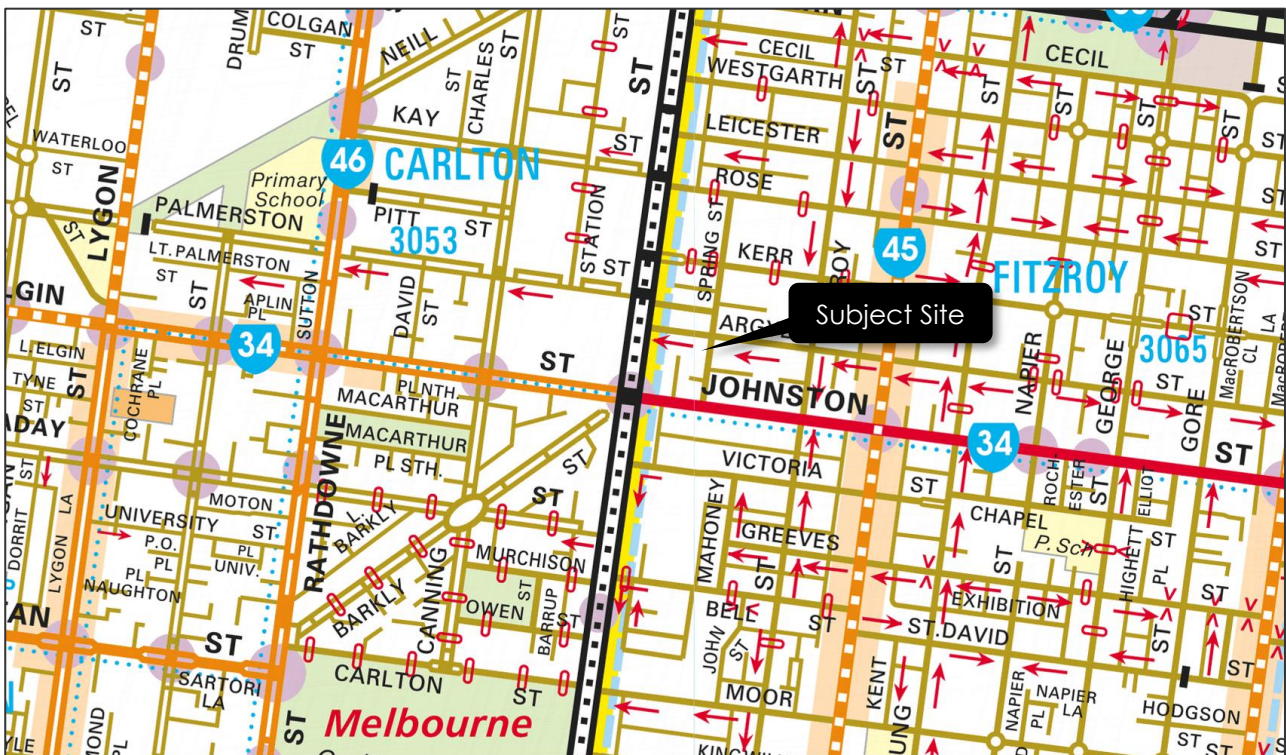
As part of this assessment the subject site has been inspected with due consideration of the development proposal, and relevant background information has been reviewed.

2 EXISTING CONDITIONS

2.1 Site Location

The subject site is located at the south-western corner of the intersection between Spring Street and Argyle Street, shown in Figure 1.

Figure 1 Site Location



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The subject site is made up of two parcels and when combined is L-shaped, with a frontage to Argyle Street for approximately 18.45 metres, a frontage to Spring Street for approximately 25.12 metres, and a total site area of approximately 554 m².

The southern parcel is occupied by a two-storey warehouse building ², whilst the northern parcel is occupied by a two-storey residential building.

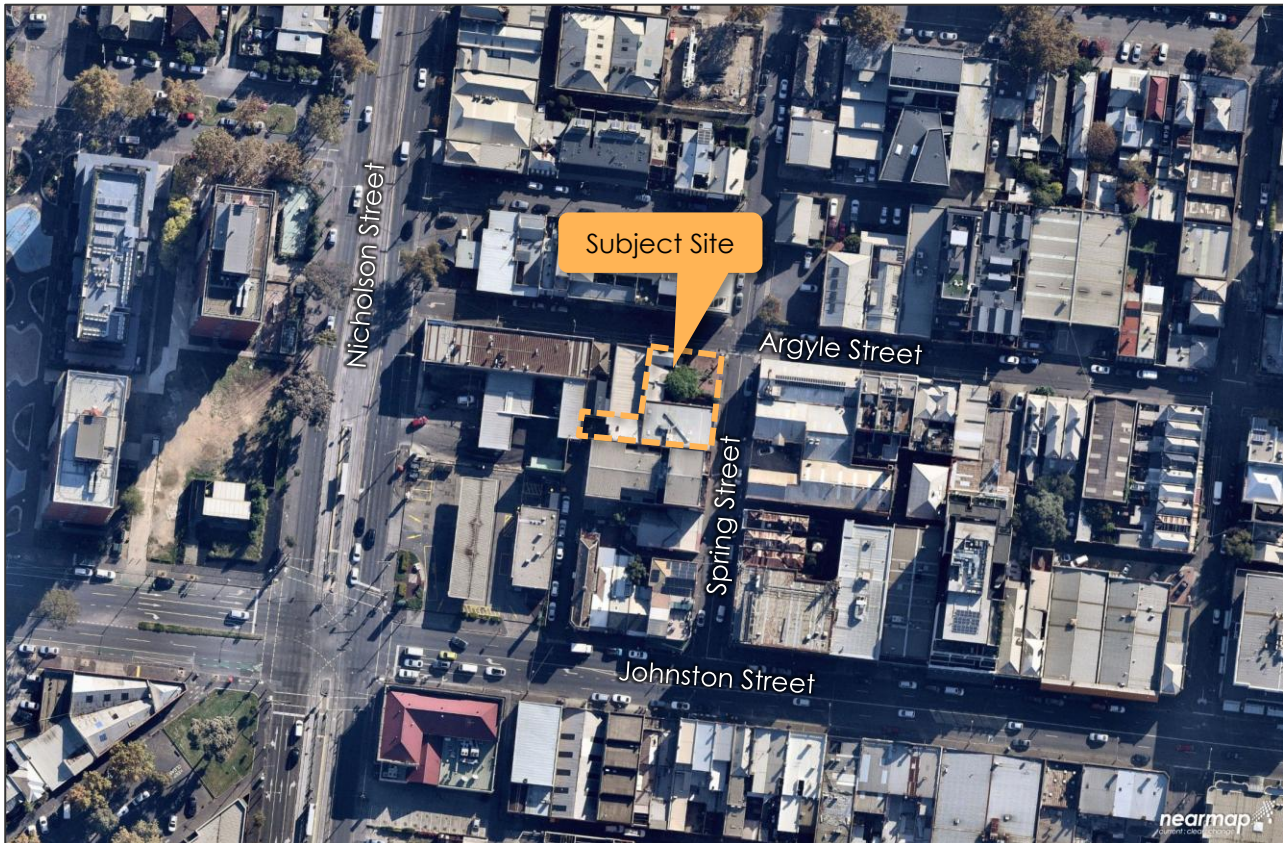
The subject site is provided with vehicular access via three crossovers including two single width crossovers via Spring Street and a 4.5-metre wide crossover along Argyle Street.

Car parking is provided at-grade within the residential property boundary and can accommodate up to four parking spaces.

Land use in the immediate vicinity of the site is mixed in nature, with largely commercial and retail uses along Nicholson Street and Johnston Street, and residential uses surrounding the main commercial strips.

An aerial view of the subject site is provided in Figure 2.

Figure 2 Site Context (29 April 2021)



Copyright Nearmap

2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a Mixed Use Zone (MUZ).

In addition, the site is subject to the following overlays:

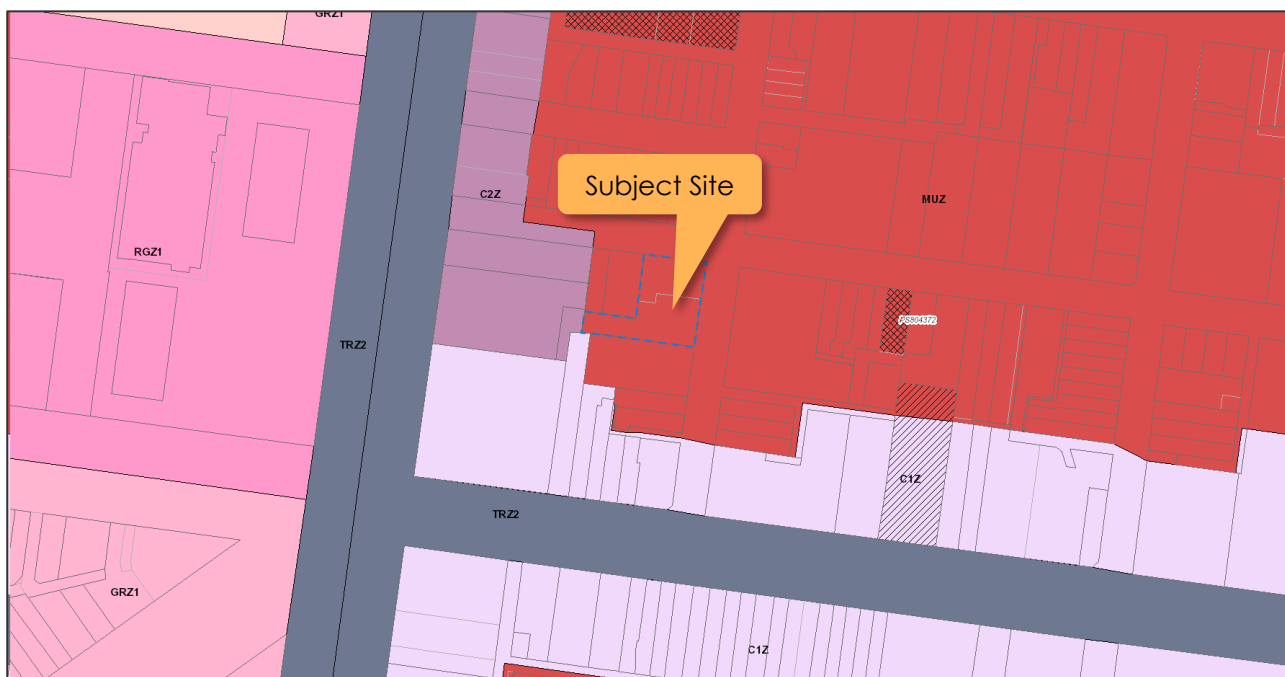
- Heritage Overlay (HO334)
- Environmental Audit Overlay (EAO);
- Development Contributions Plan Overlay – Schedule 1 (DCPO1); and
- Design and Development Overlay – Schedule 40 (DDO40).

The Design and Development Overlay identified above has the following guidelines in regard to access, car parking and loading:

- Pedestrian access to buildings should be achieved via streets and avoid primary access from laneways. Where pedestrian access from a laneway is appropriate, it should include a pedestrian refuge or landing.
- Ensure pedestrian entrances are clearly visible, secure and have an identifiable sense of address.
- Residential and commercial pedestrian entrances should be distinguishable from each other.

- The common pedestrian areas of new buildings should be designed with legible and convenient access, with hallway and lobby areas of a size that reflects the quantity of apartments serviced and which can be naturally lit and ventilated.
- Resident and staff bicycle parking should be located and designed to be secure and conveniently accessible from the street and associated uses.
- Vehicle access should be achieved from laneways or side streets (in that order of preference).
- At the intersection of laneways and footpaths, development to non-heritage buildings should provide a minimum 1 x 1 metre splay to ensure pedestrian safety.
- Car parking should be located within a basement or concealed from the public realm.
- Vehicle ingress and egress into development, including loading facilities and building servicing, should be designed to ensure a high standard of pedestrian amenity and limit potential conflict between vehicle movements and pedestrian activity.
- Development with redundant vehicle access points should reinstate the kerb, line-marked parking bays, and relocate any parking signs.
- Development with laneway access may require a ground level set back in order to achieve practicable vehicle access. Between ground level and first floor, a headroom clearance of 3.5 meters minimum should be achieved.
- Properties on the inside corner of bends in laneways or at intersections between two laneways should provide a minimum 3m x 3m splay to facilitate vehicle access.

Figure 3 Planning Scheme Zones



The site falls within the Principal Public Transport Network Area, as shown in Figure 4.

Figure 4 Principal Public Transport Network Area Map



2.3 Road Network

2.3.1 Spring Street

Spring Street is a local road generally aligned north-south, running between Rose Street in the north and Johnston Street in the south.

Along the site's frontage, Spring Street is provided with a carriageway width of approximately 7.3 metres allowing for two-way traffic and kerbside parking on the western side of the road only. Kerbside parking along the frontage of the site is generally restricted to 2-hour parking between 7:00am and 11:00pm. North of Argyle Street, kerbside parking is provided on both sides of the road, with the western side generally restricted to 2-hour parking between 7:00am and 7:00pm, and the eastern side being 'Permit Zone' restricted.

A signed 30km/h speed limit applies to Spring Street in the vicinity of the site.

The cross-section of Spring Street at the frontage of the site is shown in Figure 5.

Figure 5 Spring Street, looking south from the subject site



2.3.2 Argyle Street

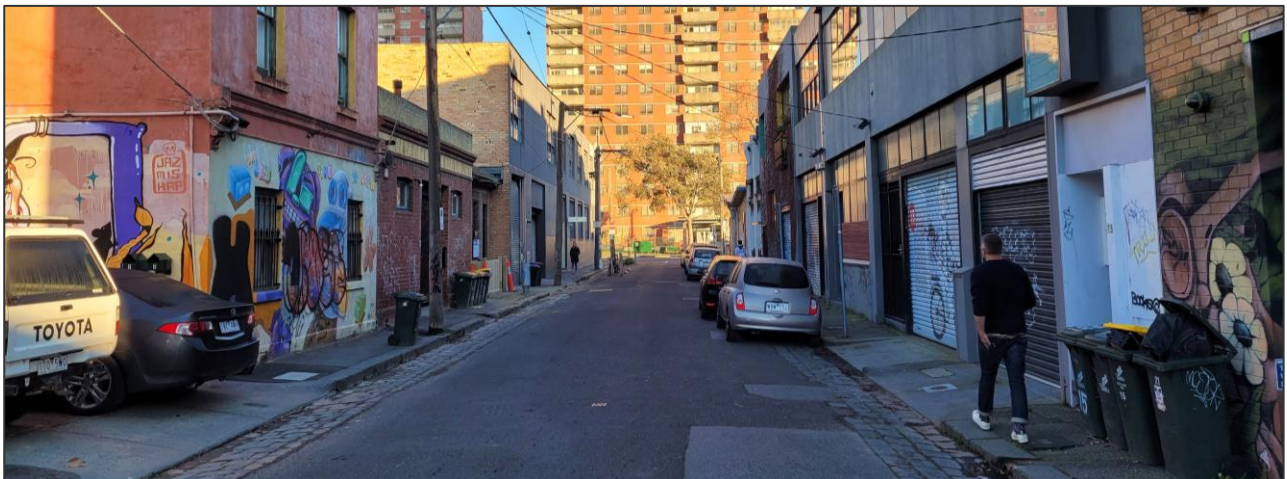
Argyle Street is a local road generally aligned east-west, running between Nicholson Street in the west and Smith Street in the east.

Along the site's frontage, Argyle Street is provided with a carriageway width of approximately 6.5 metres allowing for one-way traffic westbound and kerbside parking on the northern side of the road. Kerbside parking along the frontage of the site is generally restricted to 2-hour parking between 7:00am and 7:00pm, Monday to Friday and 'Permit Zone' restricted for all other times.

A signed 30km/h speed limit applies to Argyle Street in the vicinity of the site.

The cross-section of Argyle Street at the frontage of the site is shown in Figure 6.

Figure 6 Argyle Street, looking west from the subject site



2.4 Sustainable Transport

2.4.1 Public Transport

The site has excellent public transport accessibility, with numerous tram and bus routes servicing the immediate vicinity of the site. In addition, Parliament train station is located approximately 1.5km south of the subject site which provides access to the majority of Metropolitan Melbourne train lines and is easily accessed with the 96 tram service.

The full public transport provision in the vicinity of the site is shown in Figure 7 and detailed in Table 1.

Figure 7 Public Transport Provision

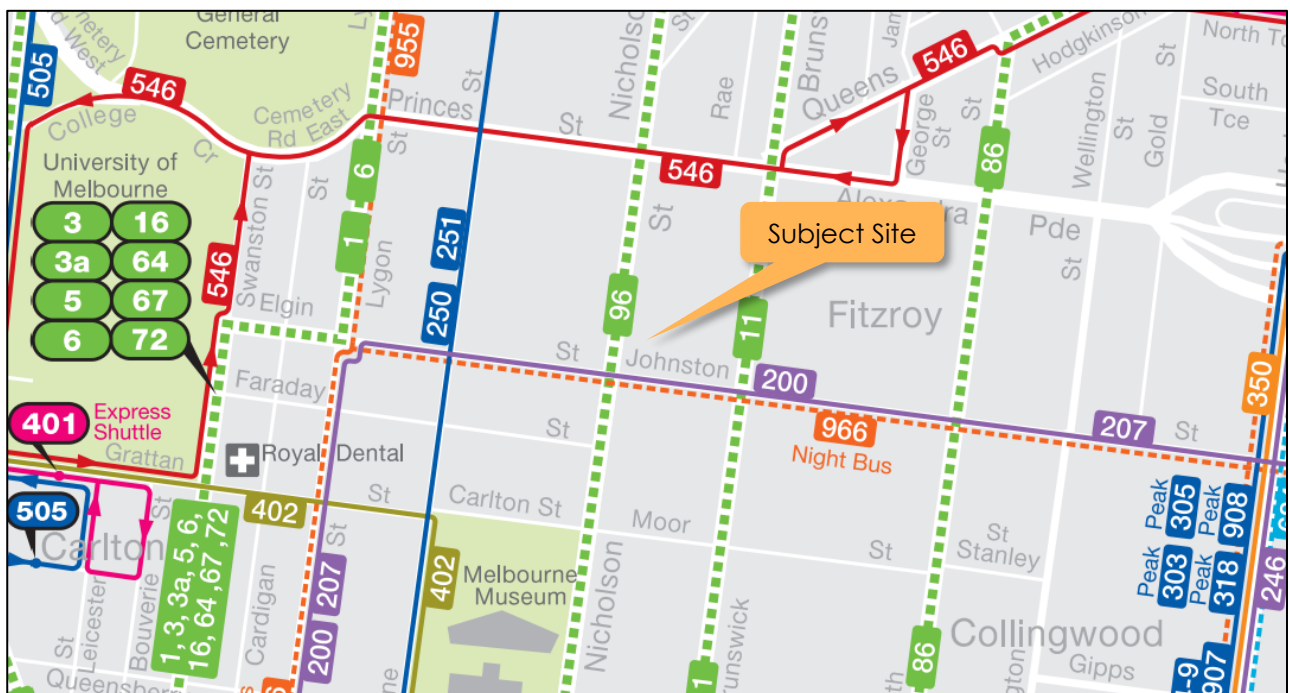


Table 1 Public Transport Provision

Mode	Route No.	Route Description	Nearest Stop/Station
Tram	1	East Coburg - South Melbourne Beach	Lygon Street
	6	Moreland - Glen Iris	Lygon Street
	11	West Preston - Victoria Harbour Docklands	Brunswick Street
	86	Bundoora RMIT - Waterfront City Docklands	Smith Street
	96	East Brunswick - St Kilda Beach	Nicholson Street
Bus	200	City (Queen St) - Bulleen	Johnston Street
	207	City - Doncaster SC via Kew Junction	Johnston Street
	250	City (Queen St) - La Trobe University	Rathdowne Street
	251	City (Queen St) - Northland SC	Rathdowne Street
	402	Footscray Station - East Melbourne via North Melbourne	Rathdowne Street
	546	Heidelberg Station - Melb Uni - Queen Victoria Market via Clifton Hill and Carlton	Alexandra Parade
	955	Night Bus - City - Brunswick - Ivanhoe - Bundoora - Mill Park - South Morang - Mernda	Lygon Street
	966	Night Bus - City - Kew - Doncaster Rd - Box Hill	Johnston Street

2.4.2 Bicycle and Walking Facilities

An extract of the TravelSmart Map for the City of Yarra is shown in Figure 8, highlighting the public transport, bicycle and pedestrian facilities in the area.

A number of formal on-road bicycle lanes are provided within the immediate proximity of the site, including along Elgin Street (west of Nicholson Street) which provides strong bicycle connections to a wider bicycle network.

Figure 8 TravelSmart Map

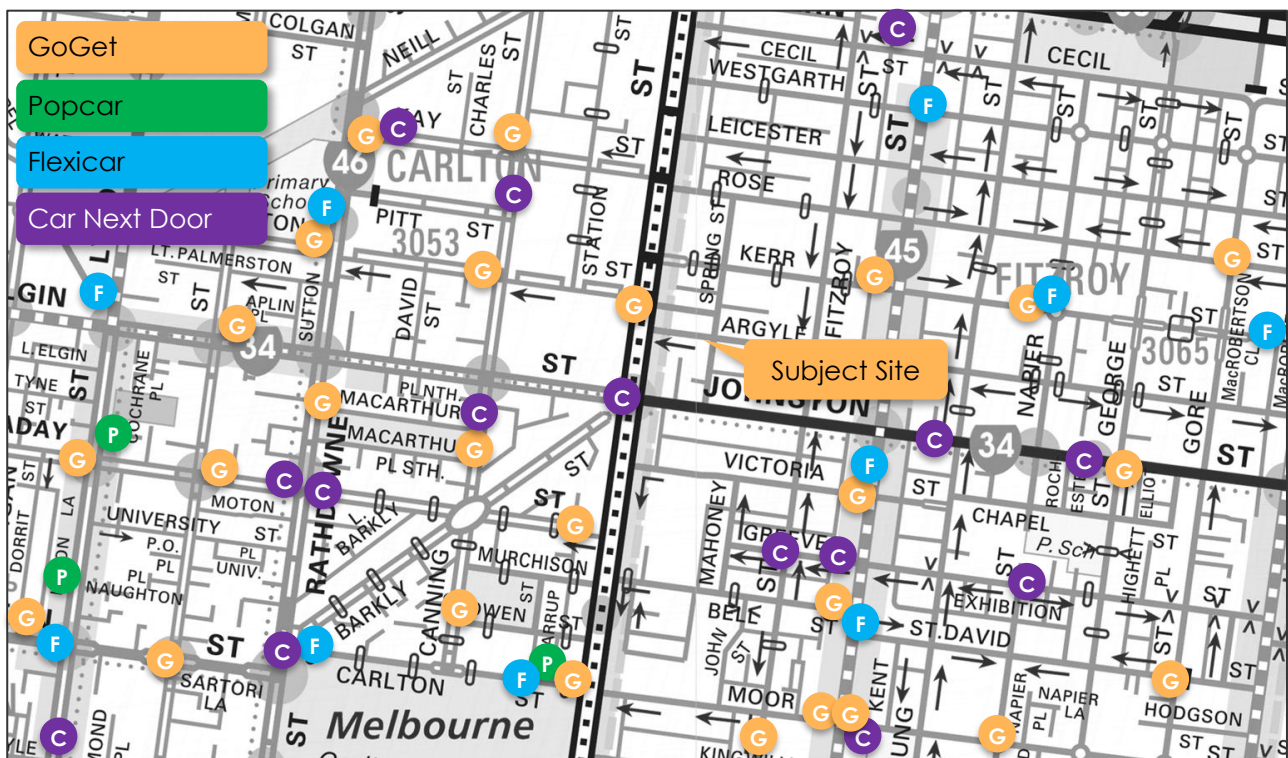


2.4.3 Share Cars

Car sharing is becoming increasingly popular within highly populated areas for both employees and residents, where parking is restrictive and expensive. Car sharing operates similar to a car rental company, except that users join as members and are charged on an hourly rate rather than a daily.

The location of the share cars within close proximity of the site are shown in Figure 9.

Figure 9 Share Car Locations



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2.5 Walkability

Walkability is a measure of how friendly an area is to walking. Walkability has many health, environmental, and economic benefits. Factors influencing walkability include the presence or absence and quality of footpaths or other pedestrian rights-of-way, traffic and road conditions, land use patterns, building accessibility, and safety.

The site has a Walk Score rating of 99/100 and is a "walkers paradise", with all daily errands able to be accomplished on foot.

3 APPROVED DEVELOPMENT

A Planning Permit has been approved for the site (Ref: PLN14/0846) for the partial demolition of the site to allow for a residential development, most recently amended in June 2025. The endorsed plans illustrate 8 x 3 and 4 bedroom apartments over five levels.

Vehicular access was to be provided from the heritage façade at the south-eastern frontage of the site, with a total of 10 car parking spaces provided on-site for resident use only within a ground level car park, in a combination of mechanical parking systems ("stackers").

It was proposed to utilise a 3-level semi-automated *Wohr Comblift 543 MR* system (or similar alternative) to accommodate 8 spaces, in tandem with a 2-level pit stacker *Wohr Parklift 450* (or similar alternative) for the additional 2 spaces.

In addition, a total of nine bicycle spaces were proposed on the ground level, for both resident and visitor use. Resident spaces were located within a secure room in the south-west corner of the ground floor, and a visitor space located within the car park adjacent to the building entry from Spring Street. A bicycle repair station was also provided adjacent to the bicycle parking spaces.

4 DEVELOPMENT PROPOSAL

4.1 General

It is proposed to obtain a new planning permit for a residential development.

The new proposal seeks to retain the warehouse Spring Street façade and two storey Argyle Street terrace façade. The visible side walls are to be retained, and the remainder of the buildings are to be demolished to allow for a residential development over 8 above-ground storeys with ground level car parking.

The residential development will contain 13x 3-bedroom apartments.

4.2 Car Parking and Vehicular Access

Consistent with the approved scheme, vehicular access will be provided from the heritage façade at the south-eastern frontage of the site to Spring Street.

A total of 12 car parking spaces will be provided for resident use only within a ground level car park, via a 5-level (2 up | 3 down) semi-automated Wöhr Combiparker 560 (or similar alternative) mechanical parking system.

A vehicle turn table is also proposed within the site to assist vehicles exiting the site on to Spring Street in a forward direction.

4.3 Bicycle Parking

A total of 26 bicycle spaces are proposed on the ground level, for both resident and visitor use.

The resident spaces (19 spaces, including 4 cargo bike spaces) are located within a secure room adjacent to the building's pedestrian entry from Spring Street, with the visitor spaces (7 spaces) located opposite the entry to the resident bicycle parking room.

A bicycle repair station is also provided adjacent to the bicycle parking spaces.

4.4 Waste Collection

Waste collection will be undertaken by a private contractor, with bins stored within a dedicated bin storage area on the ground level of the proposed development, between collections.

On collection days, a waste collection vehicle will prop adjacent to the site access along Spring Street. The private contractor will then transfer the relevant waste bins between the bin room and collection vehicle before continuing along Spring Street in a forward direction.

Refer to the Waste Management Plan for further information.

5 DESIGN ASSESSMENT

5.1 Yarra Planning Scheme – Clause 52.06

onemilegrid has undertaken an assessment of the car parking layout and access for the proposed development with due consideration of the Design Standards detailed within Clause 52.06-9 of the Planning Scheme. A review of those relevant Design Standards is provided in the following section.

5.1.1 Design Standard 1: Accessways

A summary of the assessment for Design Standard 1 is provided in Table 2.

Table 2 Clause 52.06-9 Design Assessment – Design Standard 1

Requirement	Comments
Be at least 3 metres wide.	Satisfied – Minimum width of access is 3.05 metres.
Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide.	N/A – No change in direction along accessway.
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	N/A – Private car park.
Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres.	Satisfied – A minimum height clearance of 2.8 metres is achieved at the entry from Spring Street.
If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction.	Satisfied – All vehicles may exit the site in a forward direction.
Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.	N/A – Does not connect to a Transport Zone.
Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900 mm in height.	Not Satisfied – The required corner splay is not able to be provided due to the façade that must be retained at the site access. Therefore, to improve visibility, convex mirrors are provided on both sides of the site access to provide improved sight lines in both directions.
If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway.	N/A – Does not connect to a Transport Zone

A swept path assessment has been undertaken to confirm the accessibility of the site and the mechanical parking system spaces with a B85 and B99 design vehicle (85th and 99.8th percentile length passenger vehicles respectively). The swept paths, attached within Appendix A, demonstrate that access to and from the site and the parking space can be readily accommodated by both design vehicles.

It is noted that on arrival from the north or south, there is some clearance encroachment to the walls of the heritage façade, however this is unavoidable considering the façade that must be retained and there is existing on-street parking along Spring Street. Furthermore, given the low speeds and driver familiarity with the movement it is considered appropriate for access to the site and car on-site car parking.

The proposed access arrangement is consistent with the approved scheme and is therefore considered appropriate.

5.1.2 Design Standard 3: Gradients

A summary of the assessment for Design standard 3 is provided in Table 3.

Table 3 Clause 52.06-9 Design Assessment – Design Standard 3

Requirement	Comments
Accessway grades must not be steeper than 1:10 (10 per cent) within 5 metres of the frontage to ensure safety for pedestrians and vehicles. The design must have regard to the wheelbase of the vehicle being designed for; pedestrian and vehicular traffic volumes; the nature of the car park; and the slope and configuration of the vehicle crossover at the site frontage. This does not apply to accessways serving three dwellings or less.	Satisfied – A maximum grade of 1:18 is proposed for the first 5 metres from the property boundary, and 1:30 throughout the remainder of the car park
Ramps (except within 5 metres of the frontage) must have the maximum grades as outlined in Table 3 (of Design standard 3) and be designed for vehicles travelling in a forward direction.	Satisfied – Grades within the site are compliant
Where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5 per cent) for a summit grade change, or greater than 1:6.7 (15 per cent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.	Satisfied – Grade changes do not exceed 12.5%

5.1.3 Design Standard 4: Mechanical Parking

As outlined previously, it is proposed to utilise mechanical parking systems to accommodate all parking spaces for the development. The development will utilise a *Wohr Combiparker 560* system (or similar alternative), accommodating 12 car spaces in a 2-up and 3-down arrangement.

The *Combiparker 560* system is arranged in a grid of five levels, with platforms below-ground, above-ground and at ground level. All platforms in middle levels move horizontally, allowing platforms on the upper and lower levels to move vertically and shuffle the platforms to the ground-level as required. A vacant platform will be provided on each level within this mechanism, except for the top and bottom levels.

All residents will be allocated a specific car space within the stacker system, which is reserved for their use only. As such, the driver will enter and exit the system from the same row at all times. When storing a vehicle within the system, a driver will approach the stacker system from inside the site and prop in front of their designated parking row. They will then 'call' the platform, using either a remote control or pressing the appropriate button on a control panel, and their parking space will be shuffled from within the system to the ground-level.

The gates will then open and permit access onto the car platform. Once the driver has parked, they will exit their vehicle and walk outside of the stacker, the doors will close, and the car will be shuffled into position for storage.

The specification sheets for the *Wohr Combiparker 560* system are provided within Appendix B.

The *Combiparker 560* system has been dimensioned with a total length of 6 metres, sufficient to accommodate vehicles up to 5.2 metres length in all spaces. Each space will be provided an effective platform width of 2.6 metres. The system is also provided with a minimum access aisle of approximately 5 metres in width.

Whilst it is acknowledged that these dimensions do not strictly accord with those specified in the Planning Scheme for standard car spaces, the Planning Scheme states that the design and operation of stackers is to the satisfaction of the responsible authority.

A review of the stacker design against the specific Planning Scheme requirements is provided in Table 4 below.

Table 4 Clause 52.06-9 Design Assessment – Design Standard 4

Requirement	Comments
At least 25 per cent of the mechanical car parking spaces can accommodate a vehicle clearance height of at least 1.8 metres.	Satisfied – A clear height of 4.0 metres is provided at the car stacker. Within the <i>Combiparker 560</i> system, clearances on each level are as follows: - Lower levels: 1.8m - Gound level: 1.8m - Upper level: 1.55m
Car parking spaces that require the operation of the system are not allocated to visitors unless used in a valet parking situation.	Satisfied - All stacker spaces will be allocated to residents.

To ensure all spaces are suitably designed, and provide for appropriate access, **onemilegrid** has undertaken a swept path analysis for all critical parking spaces.

The swept paths demonstrate access using the B85 design vehicle (85th percentile passenger vehicle length). The swept path assessment demonstrates that all spaces are accessible with a single manoeuvre entry and correction on exit.

The need for some resident spaces to undertake a corrective movement is therefore deemed to be acceptable, in accordance with Australian Standards, and not an uncommon requirement in both new and existing residential dwellings. Furthermore, it should be noted that:

- Vehicles smaller than B85 vehicles may be able to access the parking spaces or car lift without a corrective movement; and
- Residents will become familiar with the access conditions, and may accept a smaller clearance than the 300mm identified in the Australian Standard, allowing them to enter the parking space or car lift in a single movement.
- Vehicles can also choose to utilise the turntable (refer below) to remove the need to perform a corrective manoeuvre to exit the site in a forward direction.

The swept path assessment is provided in Appendix A.

5.2 Crossover

A vertical clearance check of the driveway crossover has been undertaken and is attached within Appendix D.

This illustrates that a 99.8th percentile passenger vehicle (B99) may readily access the site in both directions without scraping or bottoming out on the driveway, car park, or Spring Street carriageway, in accordance with conditions of the crossover permit (Council Ref: PLN18/0618).

5.3 Turntable

A vehicle turntable is proposed to be installed within the ground level car park to ensure all vehicles may exit the site in a forward direction.

The turntable will operate as follows:

1. Prior to parking, or when leaving their car space, the user manoeuvres their vehicle centrally on the turntable platform;
2. The driver activates the turntable from either within the vehicle with a remote control, or from outside the vehicle from the control box. A warning light will engage indicating the turntable is in use;
3. The vehicle spins on the turntable until facing the exit or parking direction; and
4. The driver stops the turntable operation (enters the vehicle if using the control panel) and drives forward out of the site or reverses into the car space.

The turntable is provided a platform diameter of 4.5 metres and clear diameter of 7 metres to any structure to ensure that it can accommodate the turning of resident vehicles, without risk of damaging vehicles or structure.

The turntable will be utilised by residents of the proposed development only, all of which will be inducted for its use.

Specifications for a typical turntable system are provided attached within Appendix C.

5.4 Waste Collection

A bin storage area is located on the ground level. Bins will be transferred by the private contractor to Spring Street for collection on collection days.

Refer to the Waste Management Plan for further information.

5.5 Bicycle Parking

Bicycle parking is provided in a mixture of vertically mounted and staggered bicycle racks, and in on-ground bicycle hoops.

The vertical mounted and staggered bicycle racks are provided with a separation of 500mm, effectively providing a separation of 1.0m between bicycles, with a 1.2m envelope provided for bicycles.

The horizontal bicycle hoops are designed in accordance with the Australian Standards, provided at one metre centres, with an envelope of at least 1.8 metres provided, with additional length and access aisle provided to the cargo bicycles.

All bicycle spaces are accessed from a 1.5 metre aisle.

Fifty per cent (50%) of bicycle parking spaces are provided at horizontal rails, satisfying Australian Standard requirements.

6 SUSTAINABLE DESIGN

Clause 22.17 of the Yarra Planning Scheme is Council's Environmentally Sustainable Development policy, which includes a number of objectives and requirements to ensure that development achieves "best practice in environmentally sustainable development".

In relation to Transport, the following objectives are identified:

- To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order.
- To minimise car dependency.
- To promote the use of low emissions vehicle technologies and supporting infrastructure.

Bicycle parking is proposed in excess of the Planning Scheme requirements to promote the use of sustainable methods of transport.

Furthermore, provision will be made for electric vehicle charging with all residents provided with a conduit at the front of the car stacker systems, for future installation of an EV charger as required by residents.

7 BICYCLE PARKING

The bicycle parking requirements for the subject site are identified in Clause 52.34 of the Yarra Planning Scheme, which specifies the following requirements for the proposal.

Table 5 Clause 52.34 – Bicycle Parking Requirements

Component	No.	Requirement	Total
Dwelling (four or more storeys)	13 dwellings	1 space per 5 dwellings for residents	3
		1 space per 10 dwellings for visitors	1
Total			3

It is proposed to provide a total of 26 bicycle parking spaces on the ground floor, including 19 resident spaces and 7 visitor spaces, which is in excess of the Planning Scheme requirements and therefore appropriate for the site.

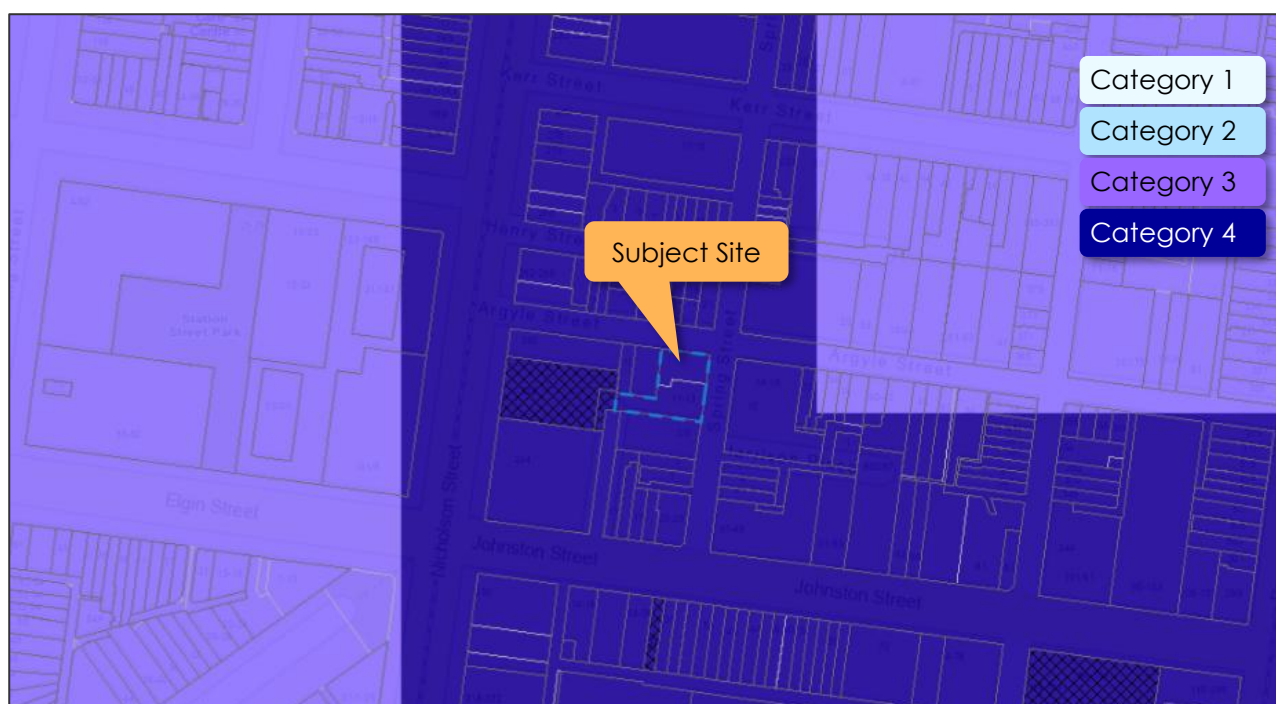
8 CAR PARKING

8.1 Car Parking Requirements – Clause 52.06

The car parking requirements for the subject site are identified in Clause 52.06 of the Yarra Planning Scheme, which provides different requirements depending on the public transport accessibility of the site. This can be determined from the land category, which is identified in the Car Parking Requirement Maps published by the Department of Transport and Planning.

As shown in Figure 10, the site is located within Category 4.

Figure 10 Car Parking Requirement Map



It is noted that for sites within Category 4, only **maximum** car parking rates apply.

The resulting car parking requirements for the proposed development are shown in Table 6.

Table 6 Clause 52.06 – Car Parking Requirements

Use	No.	Rate	Car Parking Measure	Total
Dwelling	13	2	to each dwelling	26
Total				26

Based on the above calculations, a maximum of 26 parking spaces are permitted to be provided within the proposed development.

8.2 Proposed Car Parking Provision

It is proposed to provide a total of 12 car parking spaces on-site, which falls within the maximum provision rates. Therefore the provision of carparking satisfied Planning Scheme Requirements..

9 TRAFFIC

Surveys undertaken by other traffic engineering firms at residential dwellings have shown that the daily traffic generation rates vary depending on the size, location and type of the dwelling, the parking provision and proximity to local facilities and public transport.

Medium to high density dwellings in inner areas generate traffic with rates between 3.0 and 6.0 movements per dwelling. Considering the location of the subject site and moreover the excellent access to public transport, it is expected that generation rates will be towards the lower end of the range. For the purposes of this assessment a daily rate of in the order of 3.0 movements per day per car parking space will be adopted with 10% of traffic generation occurring during the peak hours.

Application of the above rates indicates that the development may generate up to 36 movements per day, inclusive of 3-4 vehicle movements during the morning and afternoon peak hours.

This level of traffic is very low in traffic engineering terms and equates to less than one movement every three minutes during the peak hours and as such is not expected to have a material impact on the operation of the surrounding road network.

In consideration of the above, the proposed development is considered satisfactory from a traffic perspective and is largely consistent with the approved scheme.

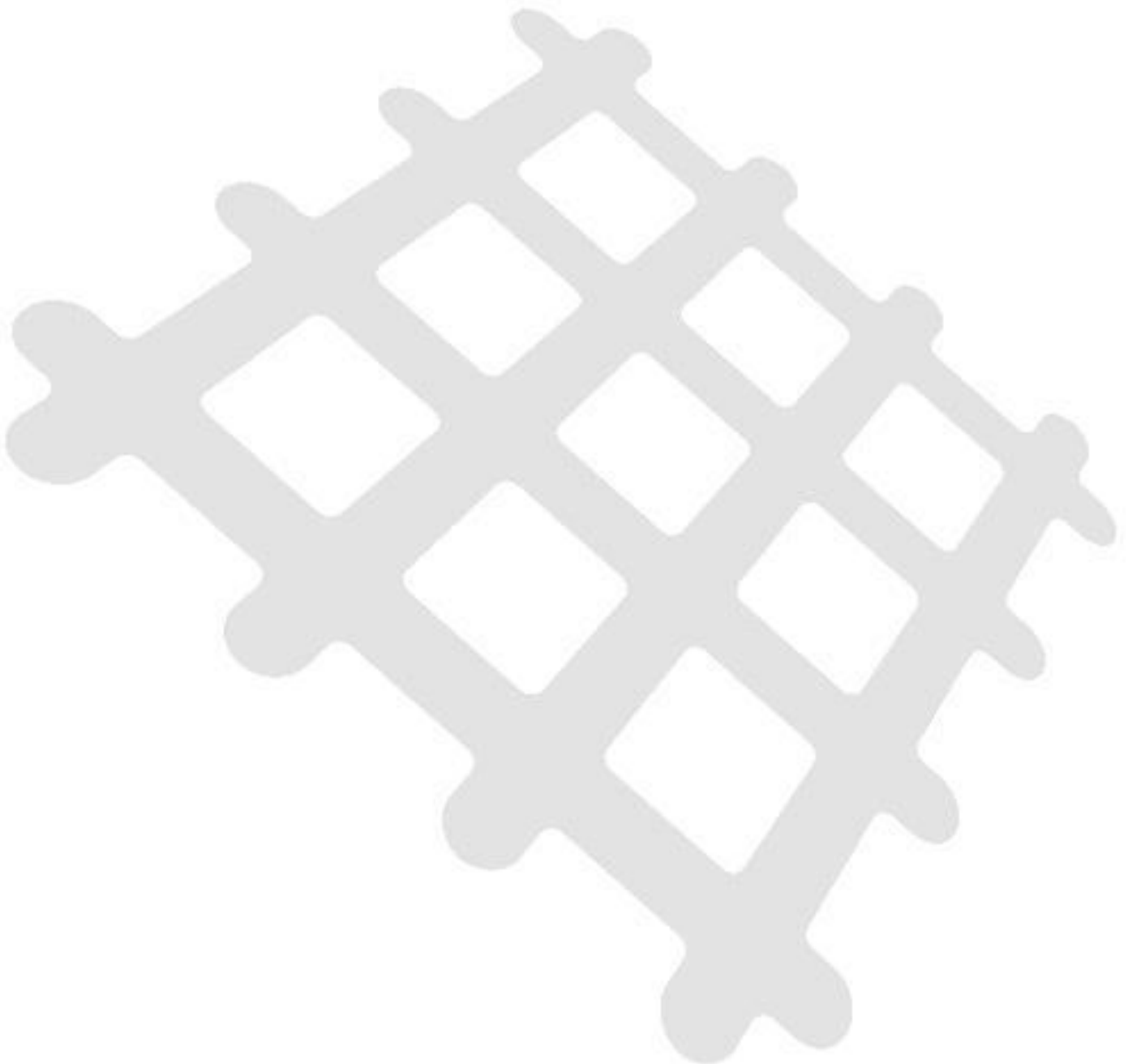
10 CONCLUSIONS

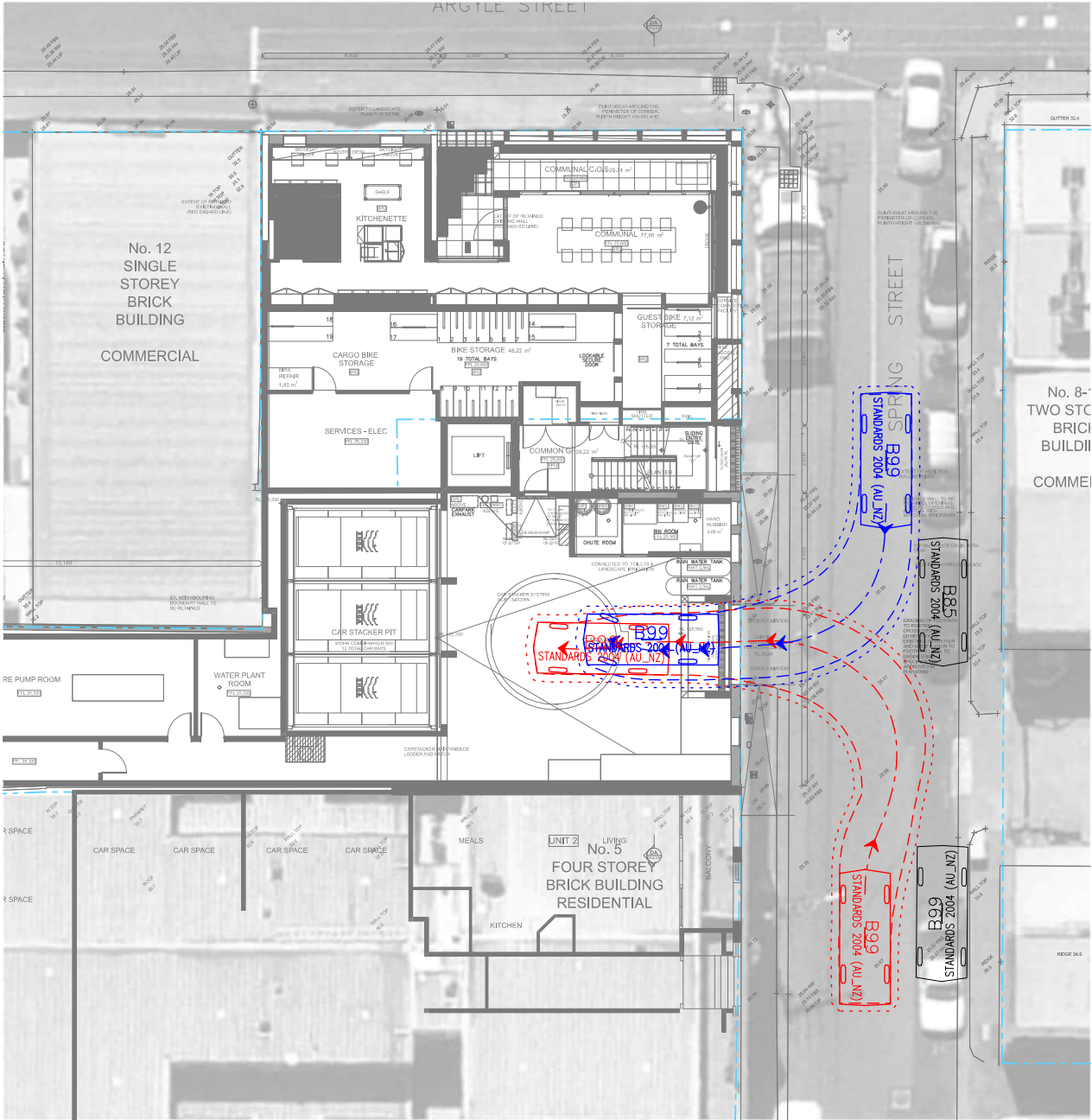
It is proposed to seek approval for a new development scheme to allow a residential development comprising 13 dwellings, with a ground floor car park consisting of 12 car parking spaces within mechanical parking systems.

Considering the analysis presented above, it is concluded that:

- The proposed car parking and access design is considered appropriate;
- The bicycle design is in accordance with the Australian Standard;
- The proposed provision of resident and visitor bicycle parking exceeds the requirements of the Planning Scheme, and is therefore considered appropriate;
- The proposed supply of car parking is appropriate for the proposed development and falls below the maximum provision requirements from Clause 52.06;
- The anticipated traffic volumes generated by the development is not expected to have an impact on the operation of the surrounding road network; and
- There are no traffic engineering reasons which would preclude a permit from being issued for this proposal.

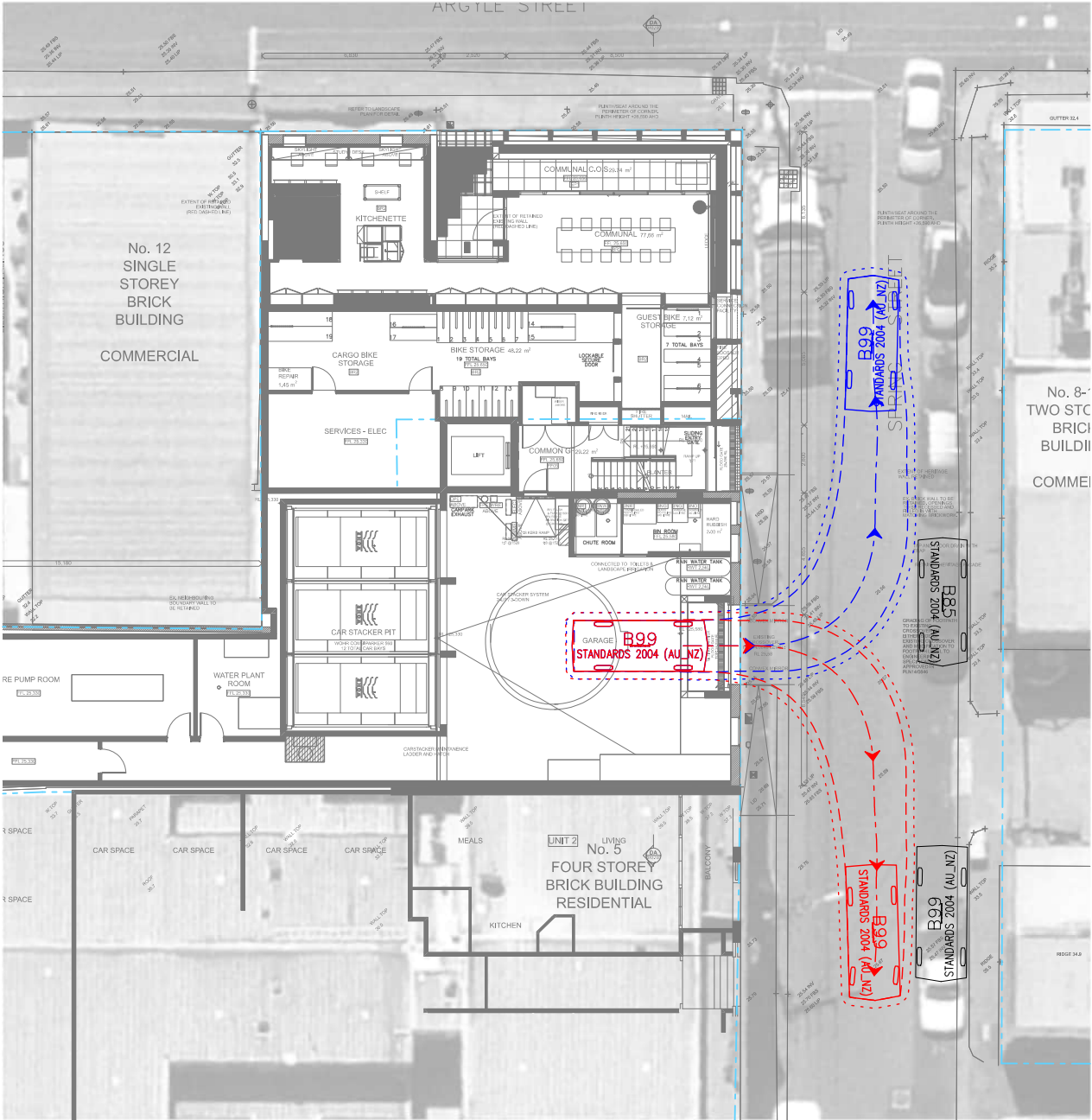
Appendix A Swept Path Diagrams





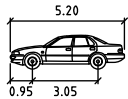
ENTRY MANOEUVRES

- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



EXIT MANOEUVRES

- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



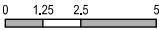
B99
Width : 1.94
Track : 1.84
Lock to Lock Time : 6.0
Steering Angle : 33.9

meters
meters
meters
meters
meters



Wurundjeri Woiwurrung Country
56 Down Street, Collingwood, VIC 3066
Email: info@onemilegrid.com.au Web: www.onemilegrid.com.au
Phone: (03) 9939 8250

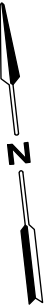
Scale 1:250 @ A3

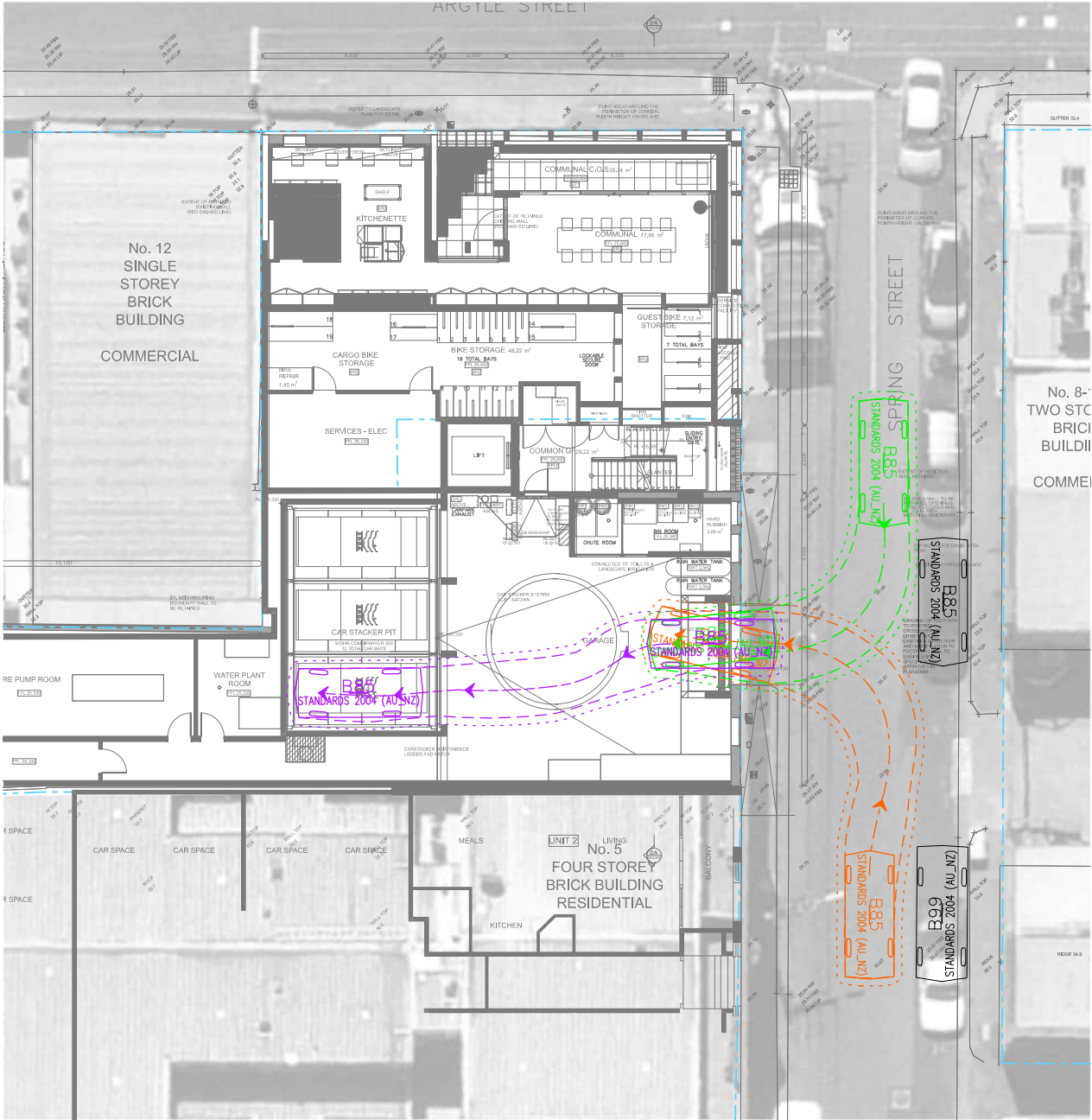


Drawing Title
11-13 SPRING STREET, FITZROY
VEHICLE SITE ACCESS
SWEEP PATH ANALYSIS

Designed DJW	Approved JD	Melway Ref 44 A3
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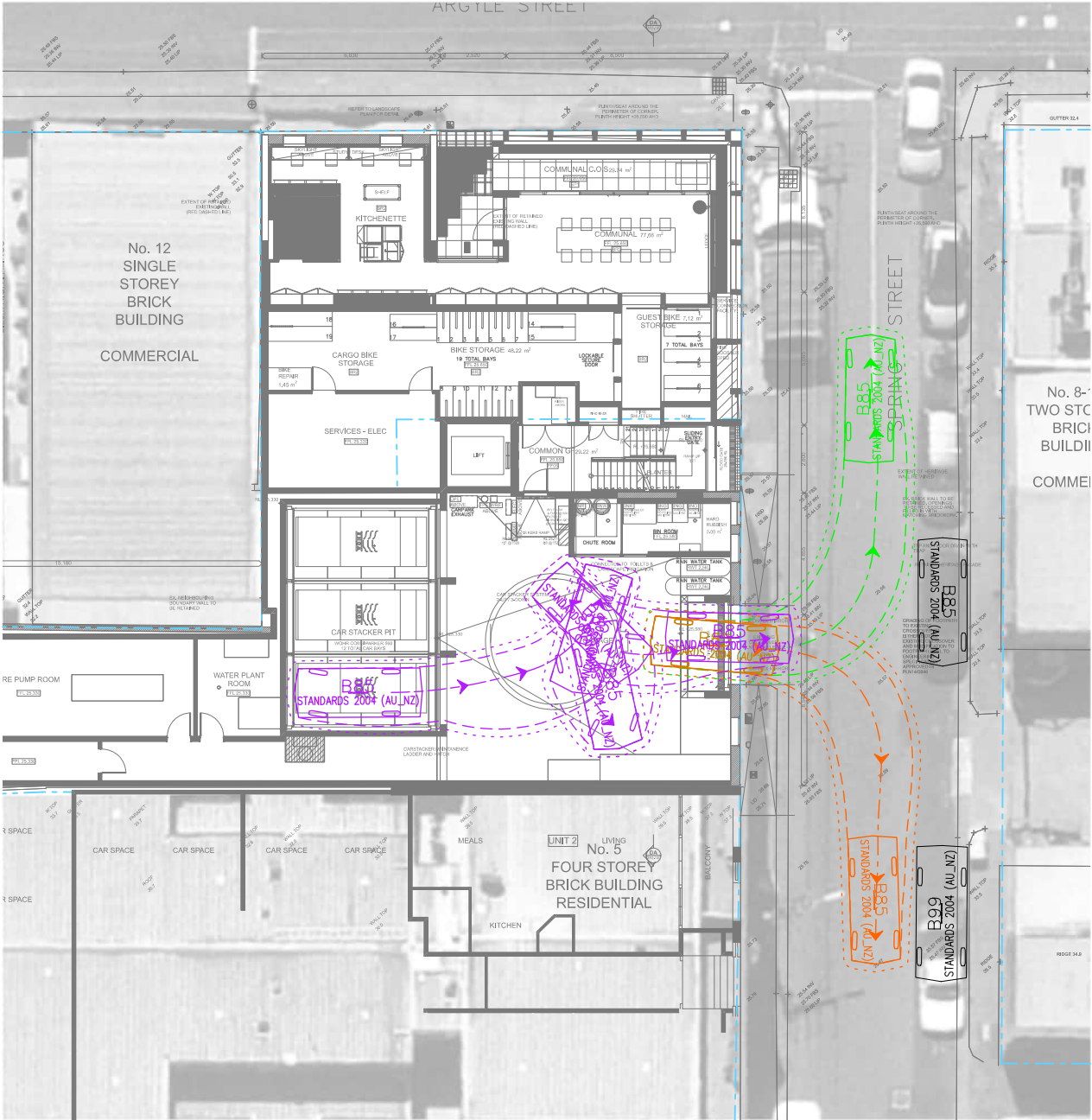
Drawing Number 210281	SPA300	Revision D
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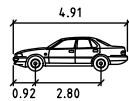
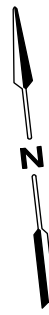
ENTRY MANOEUVRES

- - - - - DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



EXIT MANOEUVRES

- - - - - DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



B85
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.1



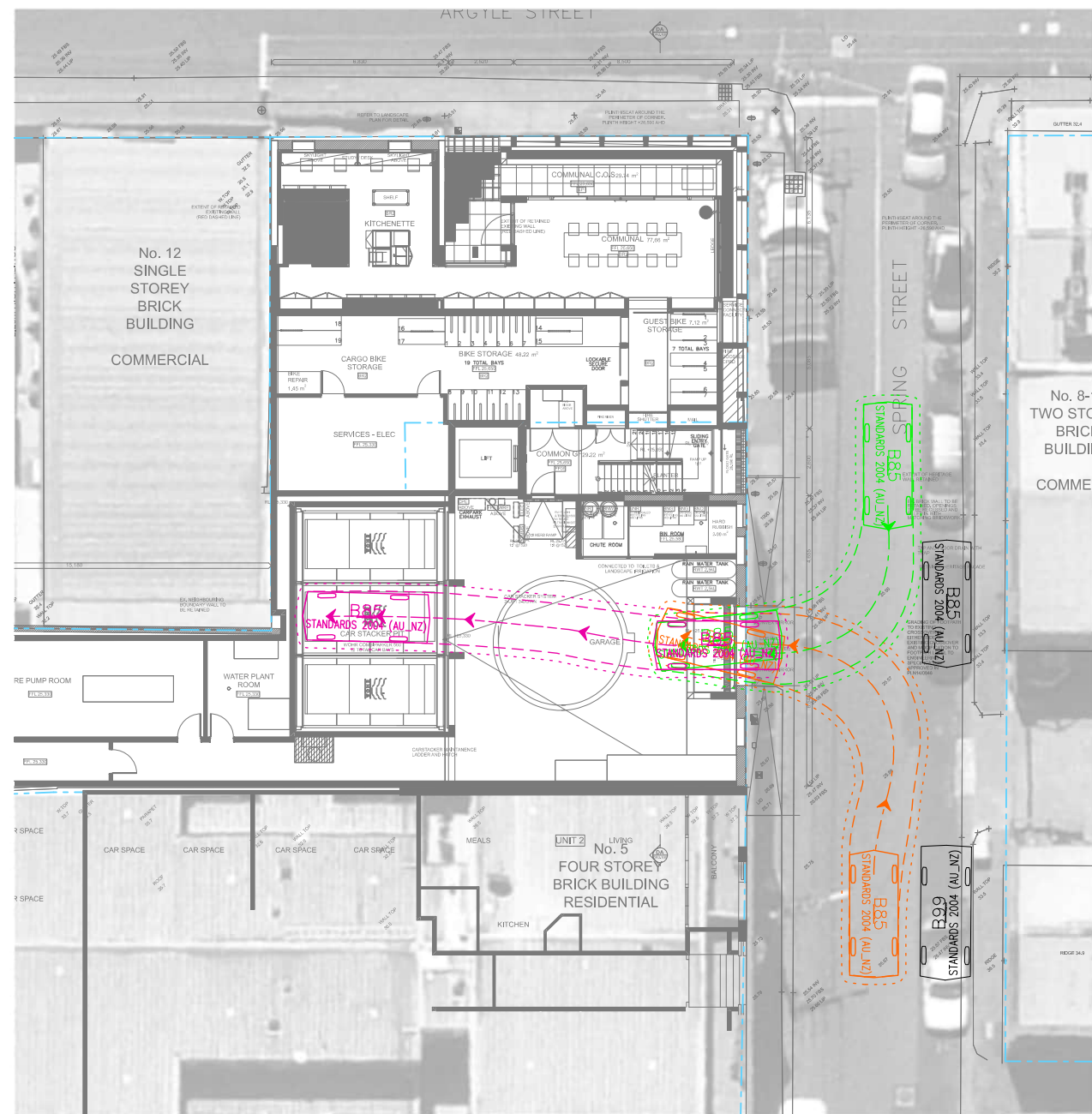
Wurundjeri Woiwurrung Country
56 Down Street, Collingwood, VIC 3066
Email: info@onemilegrid.com.au Web: www.onemilegrid.com.au
Phone: (03) 9939 8250

Scale 1:250 @ A3

Drawing Title
11-13 SPRING STREET, FITZROY
VEHICLE SITE ACCESS
SWEEP PATH ANALYSIS

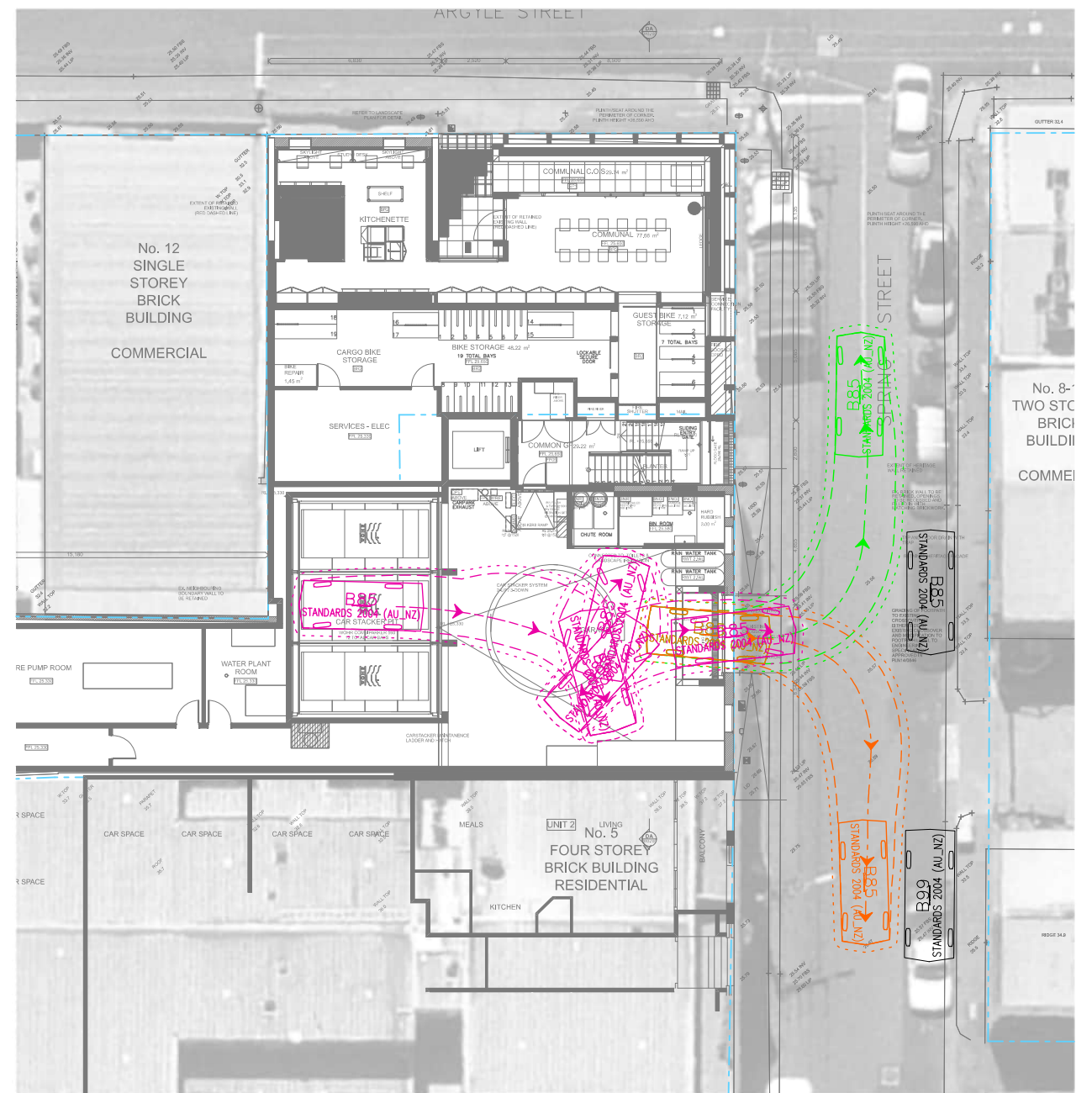
Designed DJW	Approved JD	Melway Ref 44 A3
-----------------	----------------	---------------------

Drawing Number 210281	Revision D
--------------------------	---------------



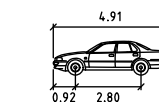
ENTRY MANOEUVRES

- - - - - DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
 300mm CLEARANCE ENVELOPE SHOWN DOTTED



EXIT MANOEUVRES

- - - - - DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
 300mm CLEARANCE ENVELOPE SHOWN DOTTED



B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



onemilegrid

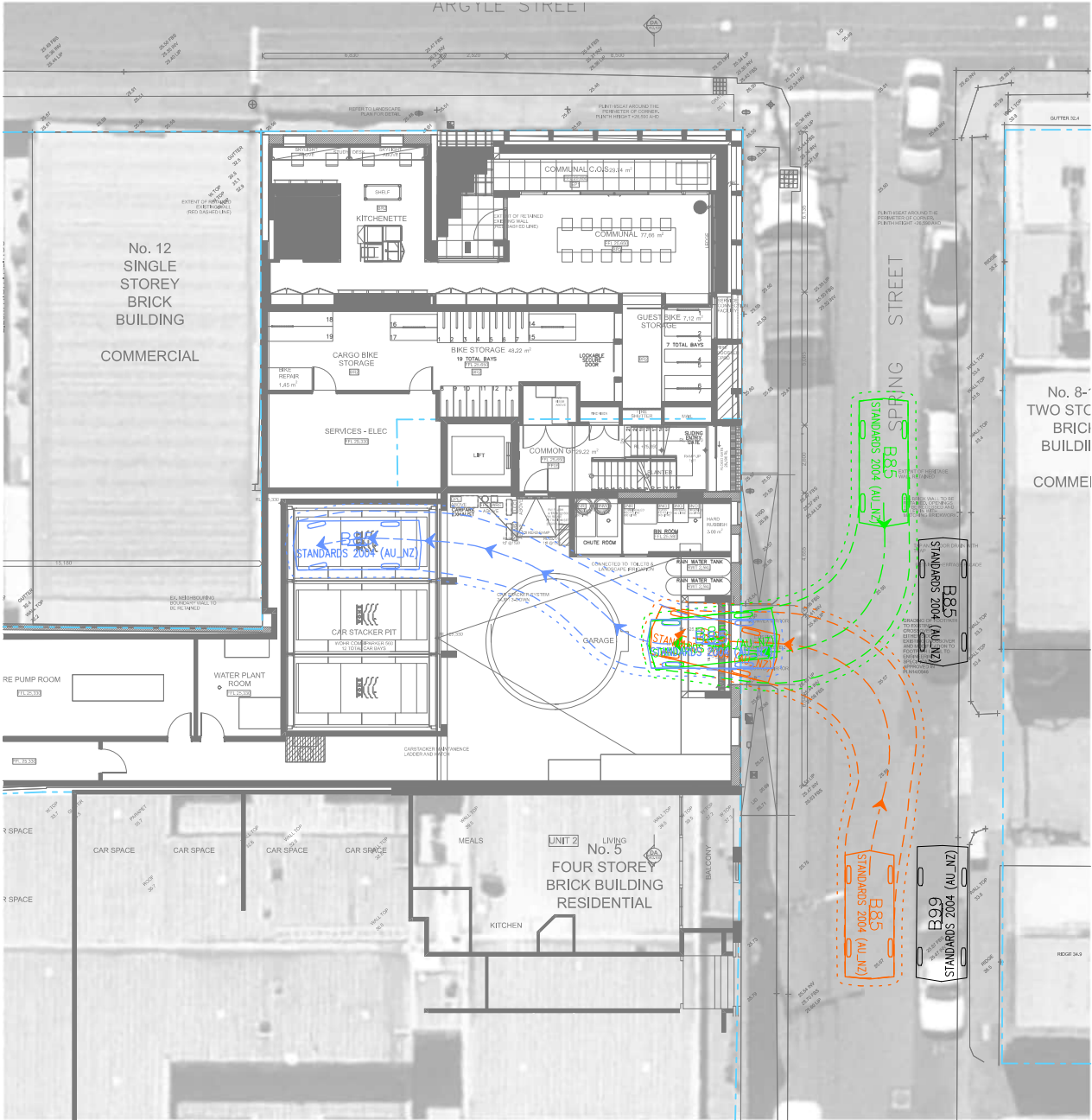
Wurundjeri Wolkwong Country
56 Down Street, Collingwood, VIC 3066
Email: info@onemilegrid.com.au Web: www.onemilegrid.com.au
Phone (03) 9939 8250

Scale
1:250 @ A3



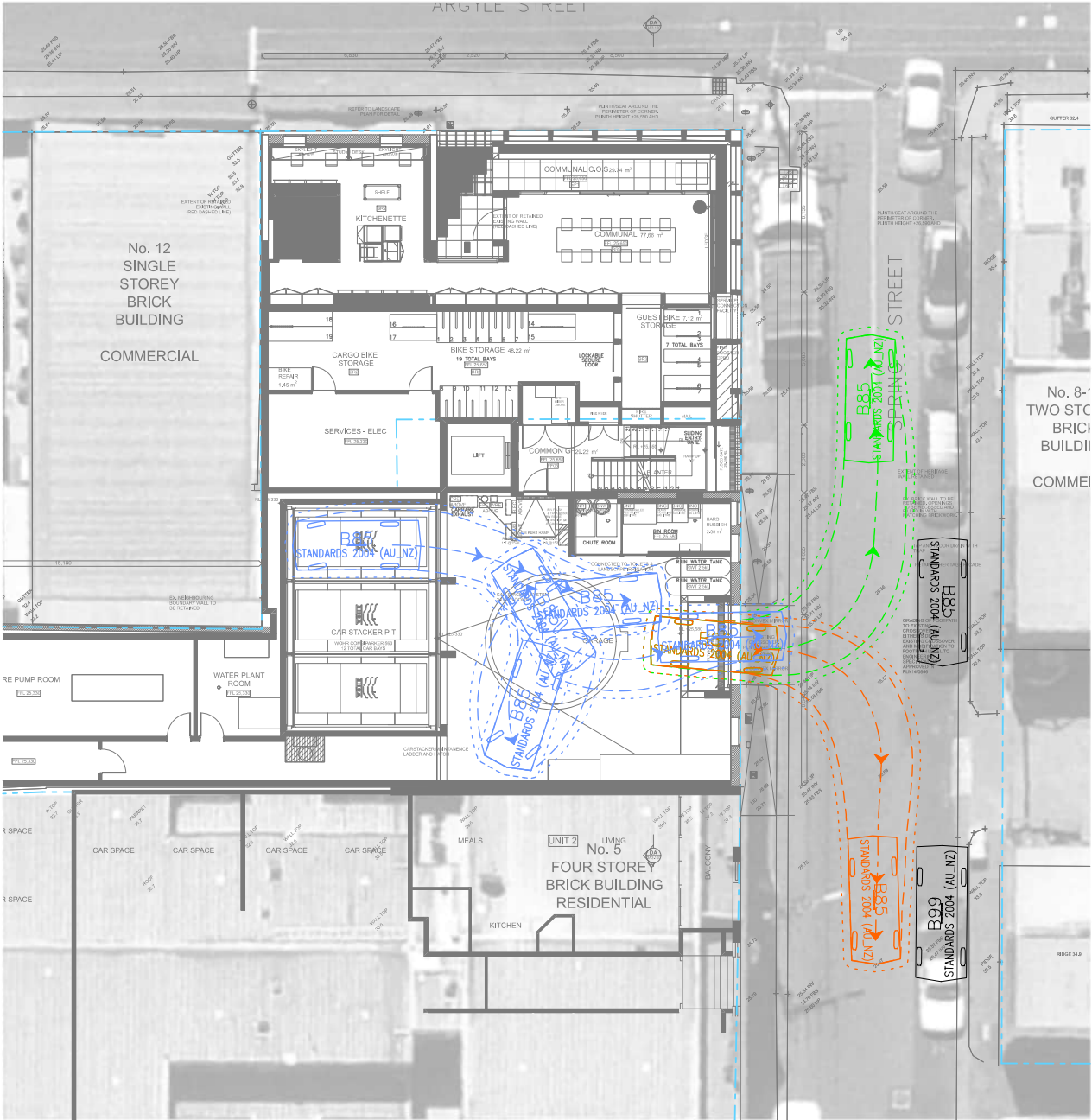
Drawing Title
11-13 SPRING STREET, FITZROY
VEHICLE SITE ACCESS
SWEEP PATH ANALYSIS

Designed DJW	Approved JD	Melway Ref 44 A3
Drawing Number 210281 SPA302		Revision D



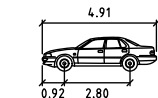
ENTRY MANOEUVRES

- - - - - DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



EXIT MANOEUVRES

- - - - - DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



B85
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.1

meters
Scale
1:250 @ A3



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Phone: (03) 9939 8250

Scale
1:250 @ A3

Drawing Title
11-13 SPRING STREET, FITZROY
VEHICLE SITE ACCESS
SWEPT PATH ANALYSIS

Designed
DJD

Approved
JD

Melway Ref
44 A3

Drawing Number
210281

Revision
D

Appendix B Car Stacker Specifications



Data Sheet

WÖHR COMBIPARKER 560



Platform load options:

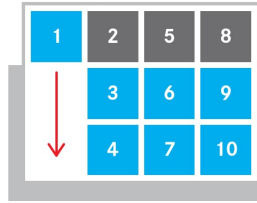
- max. 2000 kg, per 500 kg wheel load
- max. 2600 kg, per 650 kg wheel load **1**
- max. 3000 kg, per 750 kg wheel load **1**

Platform load can be increased later (also individual parking spaces)

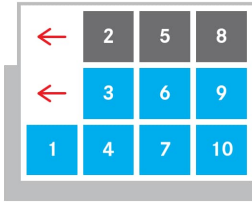
Platforms are in horizontal position to drive on

Grid arrangement:

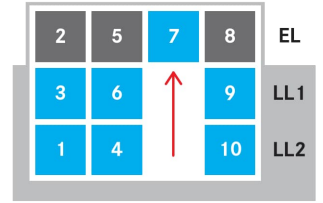
- minimum 2 grids to maximum 10 grids
- for 3 to 5 levels



The vehicle on parking space 7 is requested. Parking space 1 is lowered.

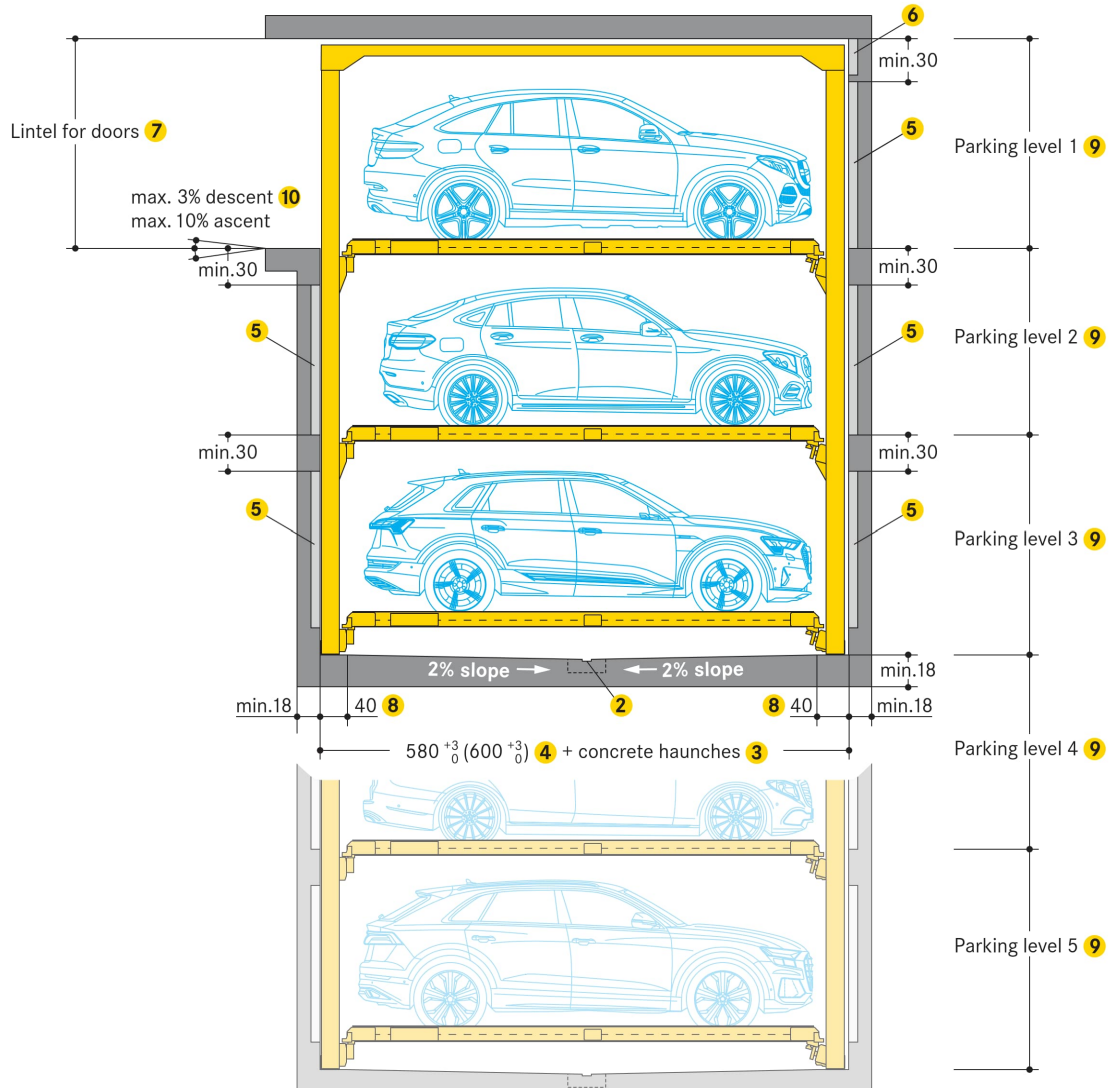


The parking spaces 2, 3, 5 and 6 are shifted to the left.



Parking space 7 is lifted up to the entrance level (EL), the vehicle is now ready for exit.

Length dimensions underground car park (height dimensions see page 3–6)



1 Extra platform load at additional cost (platform load of 3000 kg up to max. 270 cm platform width)

2 Drainage channels (on site/by the customer):
– 10 x 2 cm, with a 50 x 50 x 20 cm drainage pit
– when installing an on site sump pump, observe the dimensions of the drainage pit according to the manufacturer's specifications

3 Channels or undercuts/concrete haunches (on site/by the customer):
– should channels or undercuts be necessary, the pit needs to be wider and longer

4 500 cm vehicle length = 580 cm pit length
520 cm vehicle length = 600 cm pit length

5 Optional free space for on site/customer performed ventilation or sprinklers:
– please ask WÖHR for the dimension sheets

6 A recess of 5 cm depth is required in the area of the lifting actuator (consultation with WÖHR strongly recommended)

7 Doors (see page 8/9)

8 In this area, 0% of downward/upward slope in longitudinal and cross direction

9 Max. 5 parking levels in any above/below ground combination

10 For above ground garages with a slope, a drainage channel in the driveway is recommended

Dimensions

- all specified dimensions are minimum finished dimensions
- additionally, tolerances according to the DIN 18330 and 18331, as well as DIN 18202 should be observed
- all dimensions are given in cm

■ Decision support for the vehicle height

Choosing the right vehicle height for your project is essentially based on any building regulations, user expectations and building specifications. Criteria can include:

Residential buildings:

Different parking space heights are conceivable and can affect the sales price. For example, lower parking spaces could be provided for higher vehicles. This results in more convenient access to the vehicle. Less high vehicles in the upper parking spaces and thus reduced building height and less enclosed space. The ramp to the underground car park will be less steep or less long. To make it easier to sell parking spaces, we recommend that the vehicle heights be the same.

Office buildings:

For this parking concept, we recommend the same vehicle height for all parking spaces. If permanently assigned parking spaces are preferred for parking permittees, different parking space heights could be provided.

Hotels:

Whether city hotel, vacation hotel or vacation apartments: With changing occupancy, all parking spaces should have the same vehicle height. Maximum parking space heights should be selected to allow parking for vehicles with roof-mounted structures, if necessary.

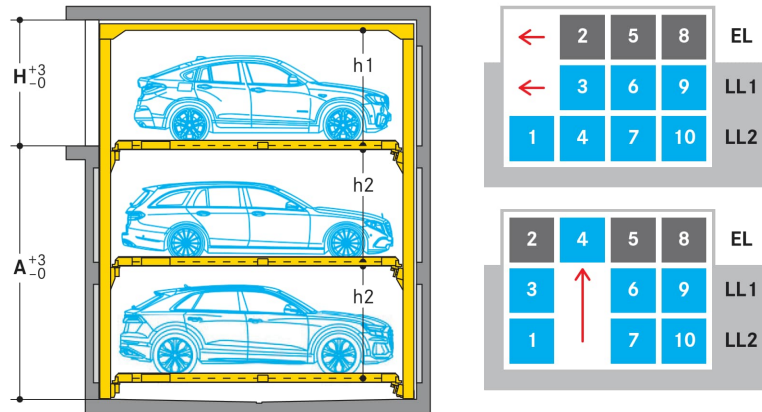
■ Vehicle heights

The following table is intended as a guide to help you select the platform distance and construction dimensions:

Aston-Martin DBX	168 cm	Dacia Duster	170 cm	Porsche Cayenne Coupé	168 cm
AUDI A6	151 cm	Ford Galaxy	175 cm	Porsche Macan	162 cm
AUDI Q4	163 cm	Ford Kuga	167 cm	Skoda Kodiak	168 cm
AUDI Q7	174 cm	Jaguar F-Pace	166 cm	Tesla Model X	168 cm
Bentley Bentayga	173 cm	Landrover Defender	198 cm	Toyota Highlander	173 cm
BMW iX	170 cm	Maserati Levante	169 cm	VW Sharan	174 cm
BMW X3	166 cm	Mercedes G-Class	195 cm	VW T 3	196 cm
BMW X5	176 cm	Mercedes GLE Coupé	173 cm	VW Tiguan	167 cm
BMW X6	176 cm	Mercedes V-Class	191 cm	VW Touareg	170 cm

All vehicle heights are non-binding, due to the wide range of model variants and the year of construction.

Height dimensions COMBIPARKER 560 (1 up | 2 down)

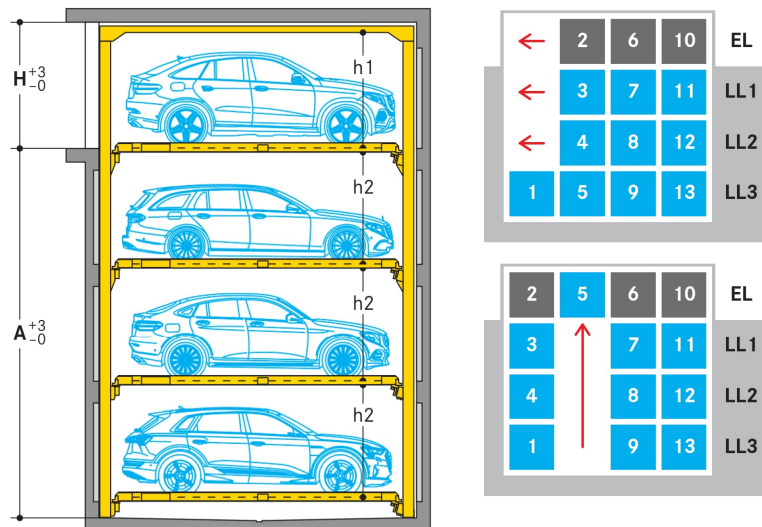


Combiparker 560 (1 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
EL	200	200	200	200	200	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	205	205	205	205	205	205	210	215
h2	180	185	190	195	200	205	210	215
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	415	425	435	445	455	465	475	485

EL = entrance level / LL = lower level

WÖHR recommends: max. 10 grids, 28 parking spaces

Height dimensions COMBIPARKER 560 (1 up | 3 down)

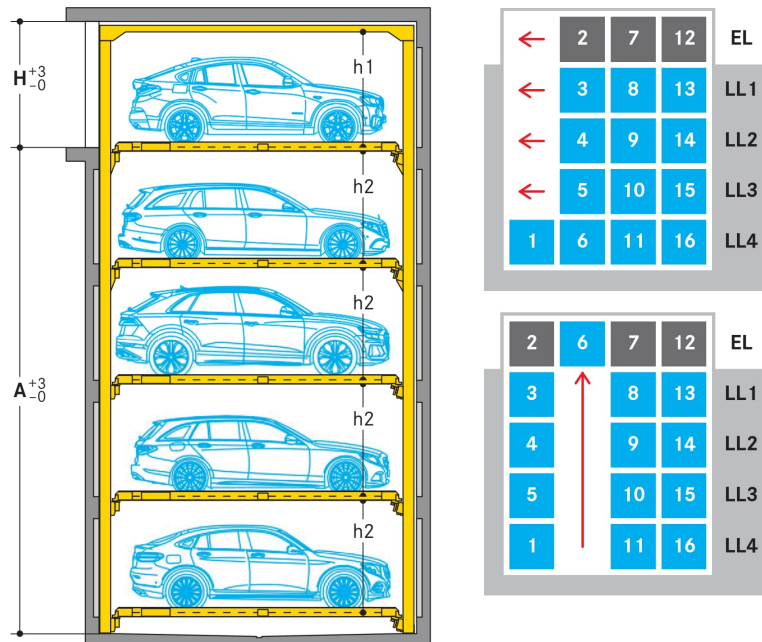


Combiparker 560 (1 up 3 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
EL	200	200	200	200	200	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	205	205	205	205	205	205	210	215
h2	180	185	190	195	200	205	210	215
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	605	620	635	650	665	680	695	710

EL = entrance level / LL = lower level

WÖHR recommends: max. 8 grids, 29 parking spaces

Height dimensions COMBIPARKER 560 (1 up | 4 down)

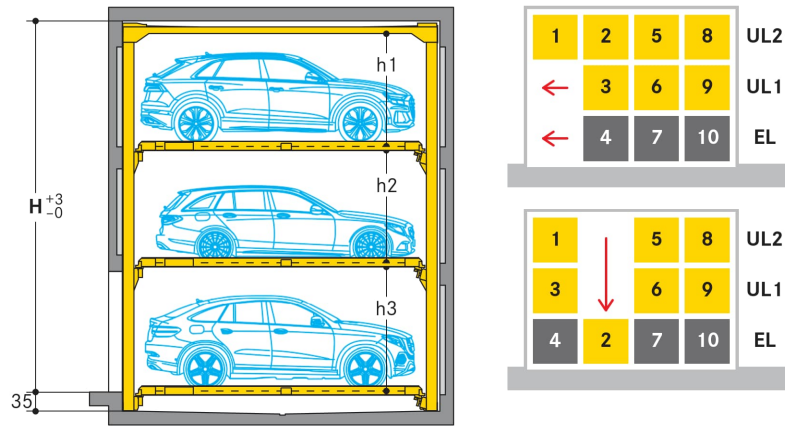


Combiparker 560 (1 up 4 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
EL	200	200	200	200	200	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	205	205	205	205	205	205	210	215
h2	180	185	190	195	200	205	210	215
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	795	815	835	855	875	895	915	935

EL = entrance level / LL = lower level

WÖHR recommends: max. 7 grids, 31 parking spaces

Height dimensions COMBIPARKER 560 (3 up)

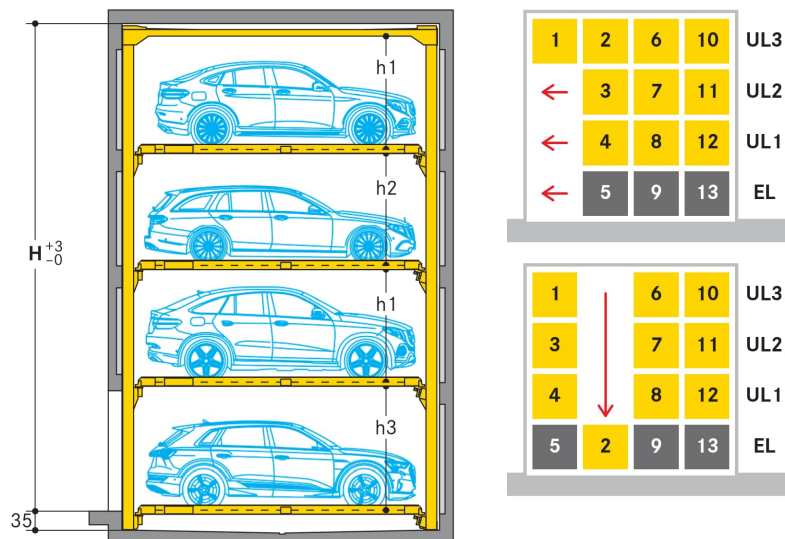


Combiparker 560 (3 up)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	610	625	640	655	670	685	700	715

UL= upper level / EL = entrance level

WÖHR recommends: max. 10 grids, 28 parking spaces

Height dimensions COMBIPARKER 560 (4 up)

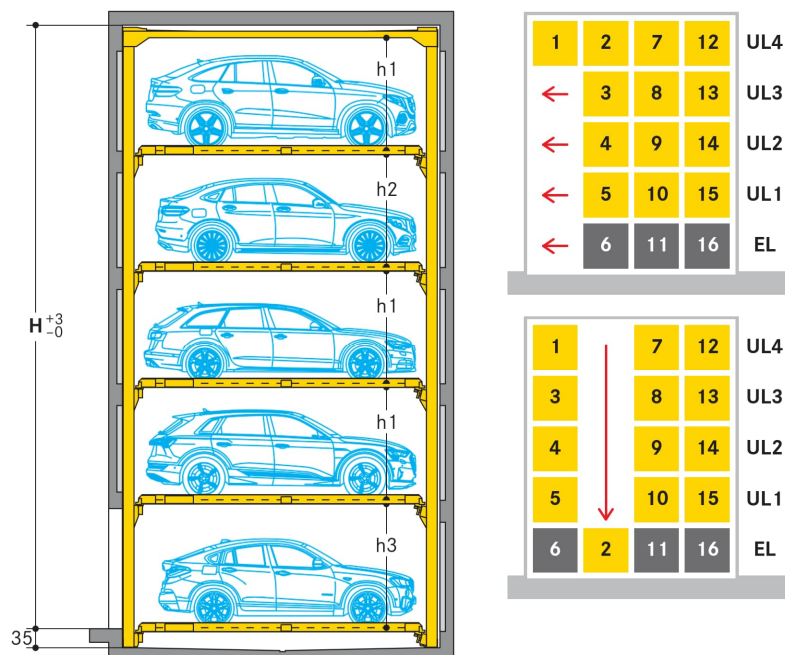


Combiparker 560 (4 up)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	800	820	840	860	880	900	920	940

UL= upper level / EL = entrance level

WÖHR recommends: max. 8 grids, 29 parking spaces

Height dimensions COMBIPARKER 560 (5 up)

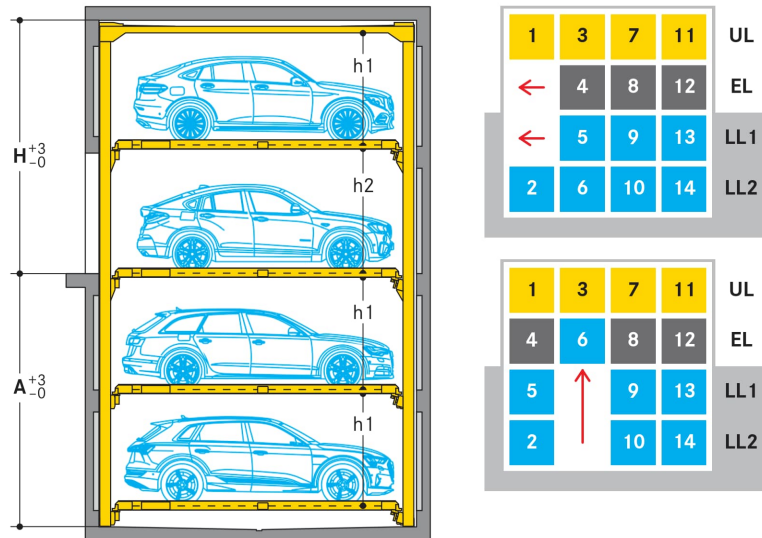


Combiparker 560 (5 up)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	990	1015	1040	1065	1090	1115	1140	1165

UL= upper level / EL = entrance level

WÖHR recommends: max. 7 grids, 31 parking spaces

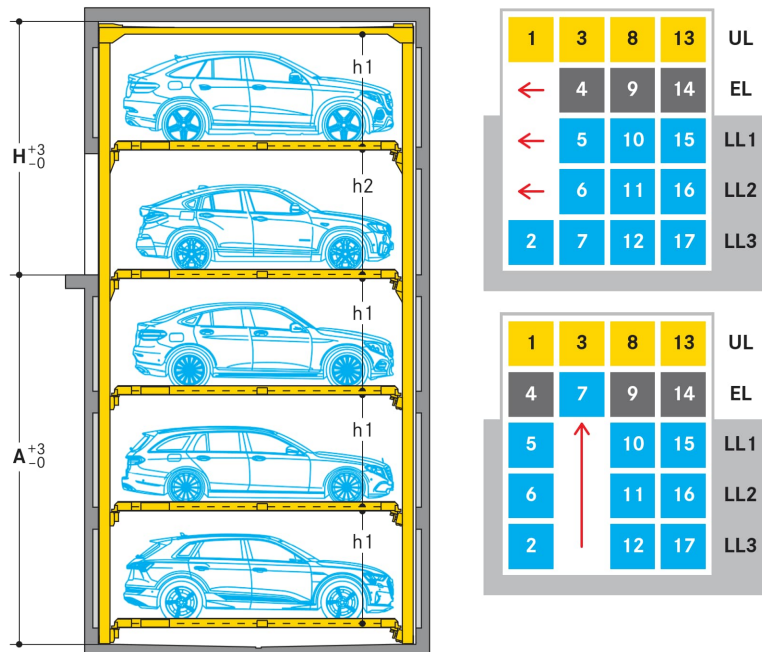
Height dimensions COMBIPARKER 560 (2 up | 2 down)



Combiparker 560 (2 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	415	425	435	445	455	465	475	485
A	415	425	435	445	455	465	475	485

UL= upper level / EL = entrance level / LL = lower level
 WÖHR recommends: max. 8 grids, 30 parking spaces

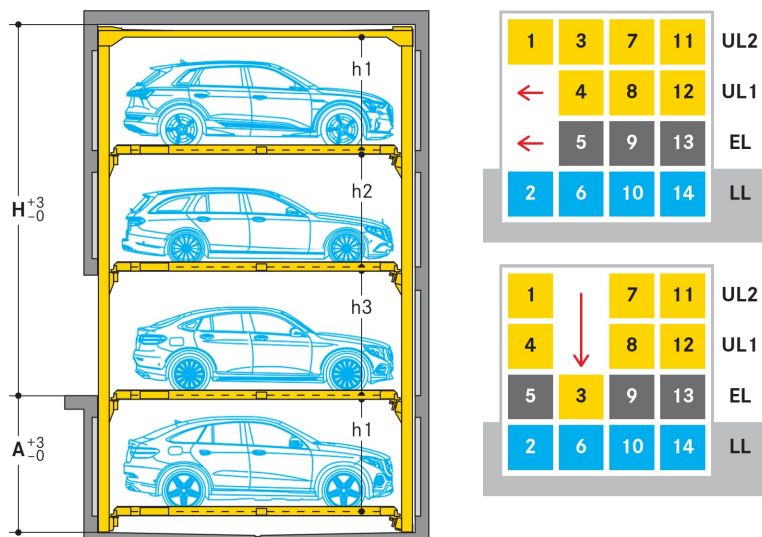
Height dimensions COMBIPARKER 560 (2 up | 3 down)



Combiparker 560 (2 up 3 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	415	425	435	445	455	465	475	485
A	605	620	635	650	665	680	695	710

UL= upper level / EL = entrance level / LL = lower level
 WÖHR recommends: max. 7 grids, 32 parking spaces

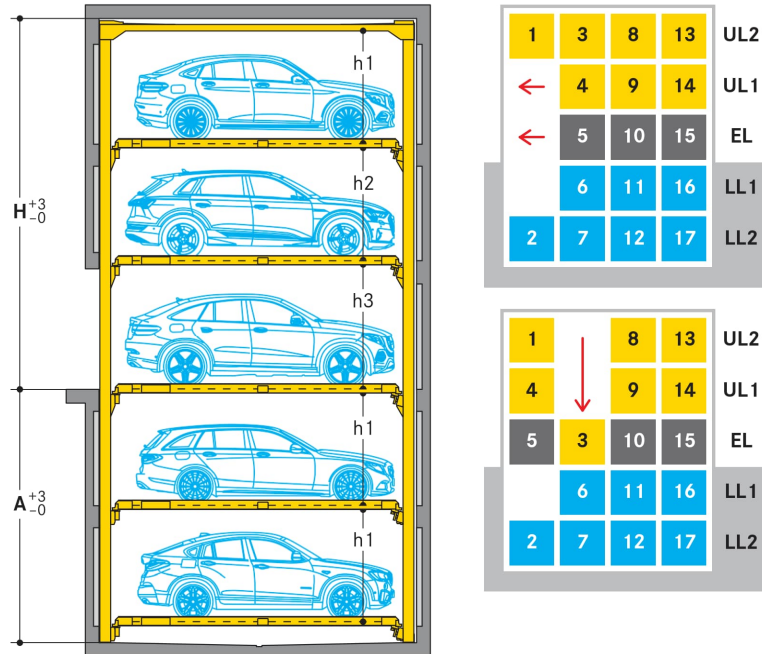
Height dimensions COMBIPARKER 560 (3 up | 1 down)



Combiparker 560 (3 up 1 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	610	625	640	655	670	685	700	715
A	225	230	235	240	245	250	255	260

UL= upper level / EL = entrance level / LL = lower level
 WÖHR recommends: max. 8 grids, 30 parking spaces

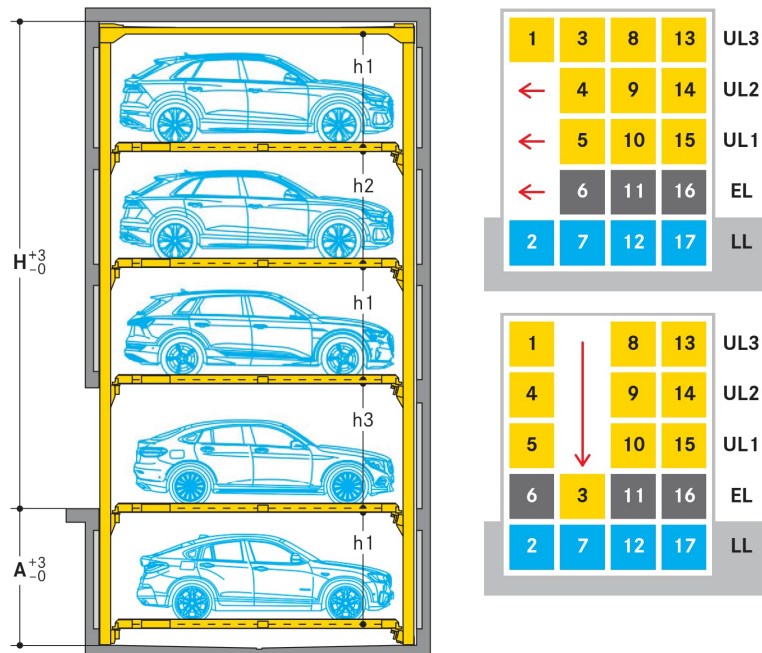
Height dimensions COMBIPARKER 560 (3 up | 2 down)



Combiparker 560 (3 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	610	625	640	655	670	685	700	715
A	415	425	435	445	455	465	475	485

UL = upper level / EL = entrance level / LL = lower level
 WÖHR recommends: max. 7 grids, 32 parking spaces

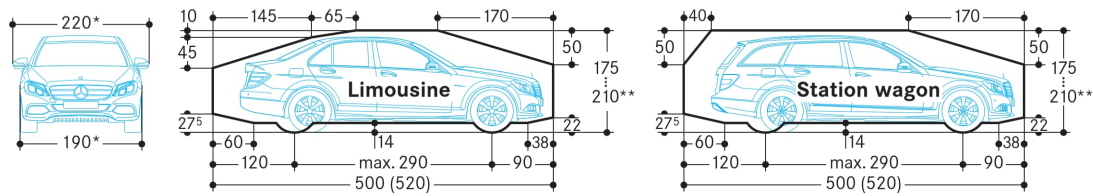
Height dimensions COMBIPARKER 560 (4 up | 1 down)



Combiparker 560 (4 up 1 down)								
Typ	175	180	185	190	195	200	205	210
Vehicle height								
UL	175	180	185	190	195	200	205	210
EL	175	180	185	190	195	200	205	210
LL	175	180	185	190	195	200	205	210
Platform distance								
h1	180	185	190	195	200	205	210	215
h2	185	190	195	200	205	210	215	220
h3	200	205	210	215	220	225	230	235
Clear installation dimensions								
H	800	820	840	860	880	900	920	940
A	225	230	235	240	245	250	255	260

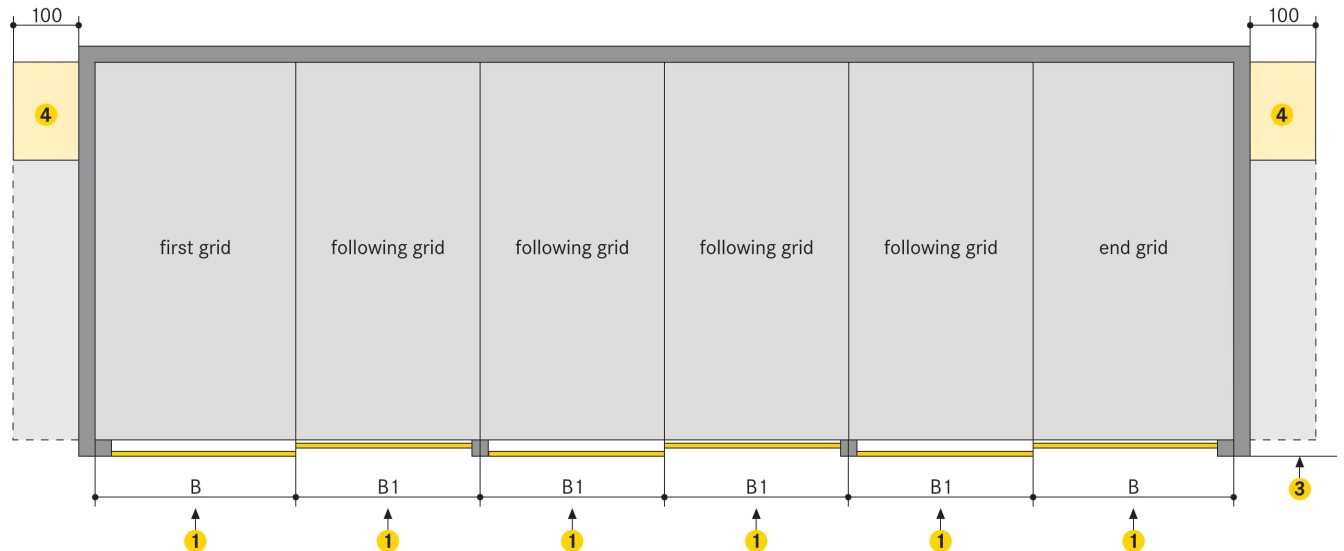
UL = upper level / EL = entrance level / LL = lower level
 WÖHR recommends: max. 7 grids, 32 parking spaces

■ Clearance profile (for standard vehicles)



* for a 250 cm platform width
 ** The overall vehicle height including roof rails and antenna mounts must not exceed the specified max. vehicle height dimensions

■ Width dimensions (underground car park)



space requirements		clear platform width 2
B	B1	
285	270	250
295	280	260
305	290	270

Platform widths:

250 cm:

– for 190 cm vehicle width (without exterior mirror)

260–270 cm:

– for vehicles wider than 190 cm (without exterior mirror)

270 cm:

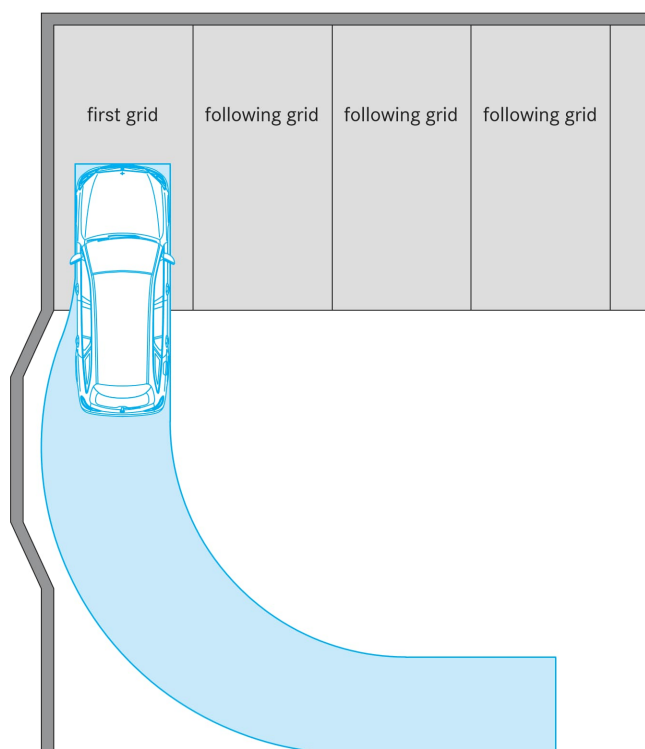
– recommended for systems at the end of the driving aisle

For convenient parking and an easy entry and exit, platform widths of 270 cm are recommended.

If the platform widths are less than specified widths, parking process may be restricted. Narrower platform widths are not recommended due to inconvenience.

- At each grid, an entry/exit is required at entrance level (EL) to reach the requested parking space
- Smaller platform widths are possible but not recommended (please contact WÖHR)
- The driving aisle width must comply with local regulations
- Maintenance access see page 9

■ Wall recess



For parking spaces that are arranged at the end of the drive aisle at an angle of 90°, the entrance width must be at least 275 cm.

WÖHR recommends to provide a wall recess at the end of the drive aisle, if technically possible.

Doors

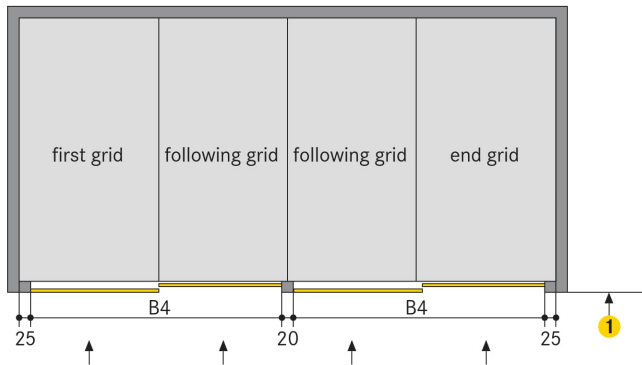
According to DIN EN 14010 doors are required.

Automatic sliding doors:

- electrical drive
- controls are integrated in the overall system
- electro-mechanically interlocked
- can only be opened when the selected parking place has reached the entry/exit position
- any crash openings are closed in the entrance area

Local requirements for electrical doors regarding the technology, maintenance and revision are not subject of our delivery. These matters have to be observed and carried out by the customer, according to the local regulations.

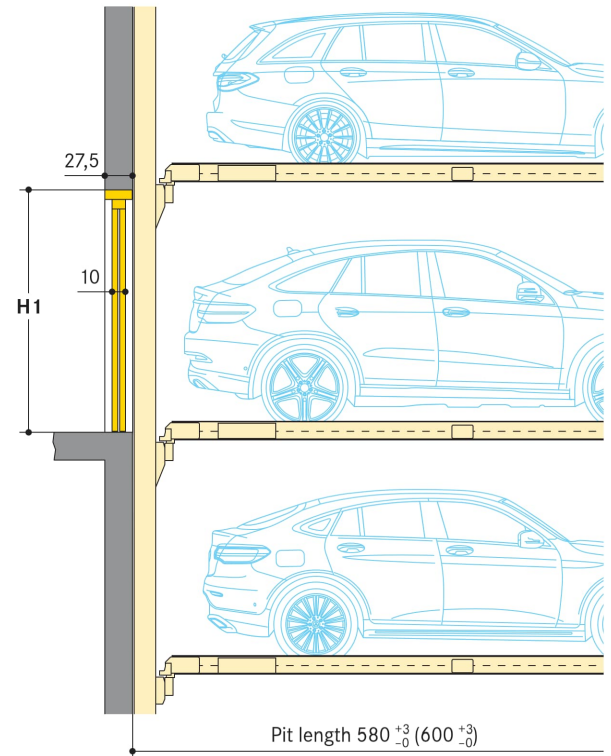
Sliding doors under the lintel, between the building pillars



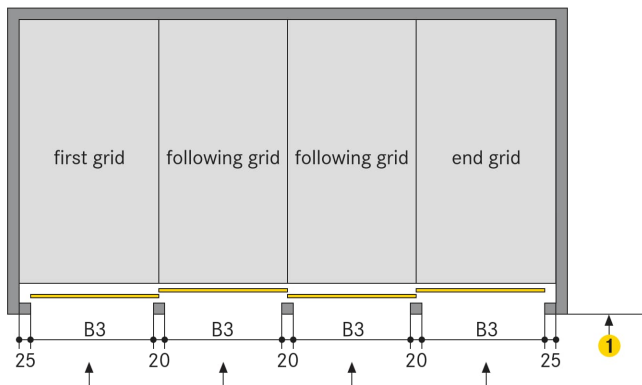
space requirements B4	clear platform width
520	250
540	260
560	270

Vehicle height								
	175	180	185	190	195	200	205	210
H1	220	220	220	220	220	220	220	225

1 The driving aisle width must comply with local regulations



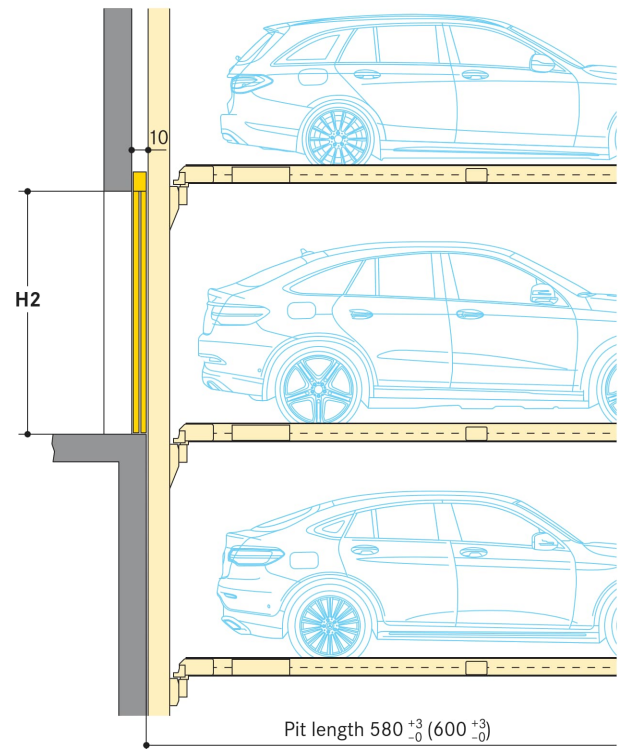
Sliding doors behind the building pillars with door offset



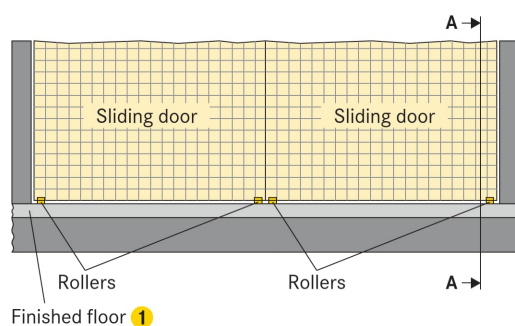
space requirements B4	clear platform width
250	250
260	260
270	270

Vehicle height								
	175	180	185	190	195	200	205	210
H2	220	220	220	220	220	220	220	220

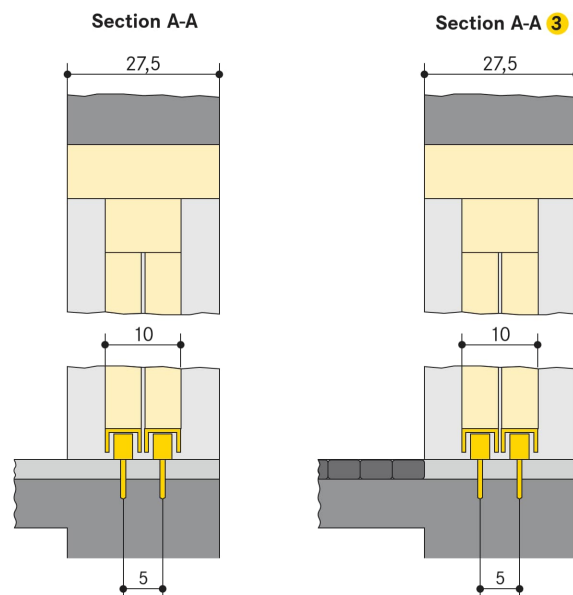
1 The driving aisle width must comply with local regulations



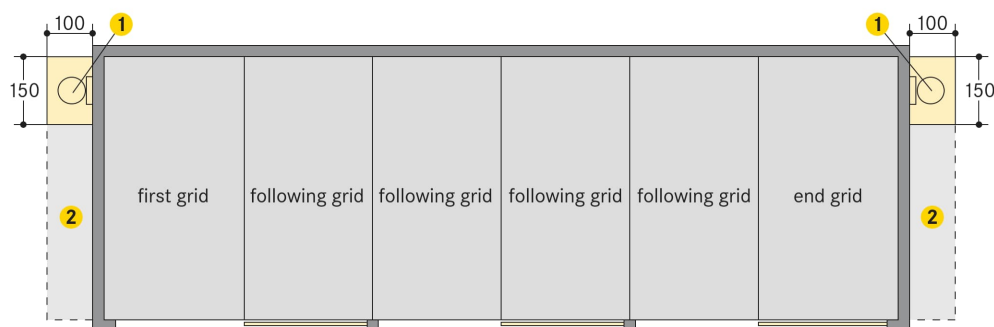
■ Sliding door floor guides



- 1 Finished floor:
 - compliant to DIN 18353,
 - floor evenness compliant to DIN 18202, table 3, line 3
- 2 Floor guide section:
 - base plate with plastic rollers
 - fixed on the floor with adhesive anchor (M8 internal screw thread)
 - borehole depth approx. 9 cm
 - in the event that floor filling needs to be laid into the door section to the purpose of reaching the required floor evenness, the borehole depth needs to be increased by the thickness of the floor fill (max. 4 cm)
- 3 If the driving aisle is made of concrete blocks, asphalt etc., the concrete slab of the pit edge in the door area must be min. 27.5 cm wide



■ Maintenance access



- 1 For maintenance of the system, a maintenance access with access via stairs or ladders to all levels must be provided on site/by the customer. Safeguard of access with a door to be performed by the customer.
Service and maintenance access preferably on both sides. Regional-specific prescriptions are to be observed for all on-site works.
- 2 Alternative position of the maintenance access

■ Static calculations and construction (height dimensions and forces see page 11–14)

Transfer of bearing forces to the floor:

- base plates (approx. 350 cm²)
- fixing with adhesive anchors
- drill hole depth 12–14 cm
- base plate in concrete
- floor slab thickness min. 18 cm

Transfer of the bearing forces to the walls:

- wall plates (approx. 30 cm²)
- fixing with adhesive anchors
- entry side and rear wall in concrete, perfectly even walls
- without protruding parts such as border edgings, edge trim, pipes, tubes, etc.
- walls min. 18 cm thick

Concrete quality:

- according to static requirements of the construction
- min. C20/25 grade (for dowel fastening)

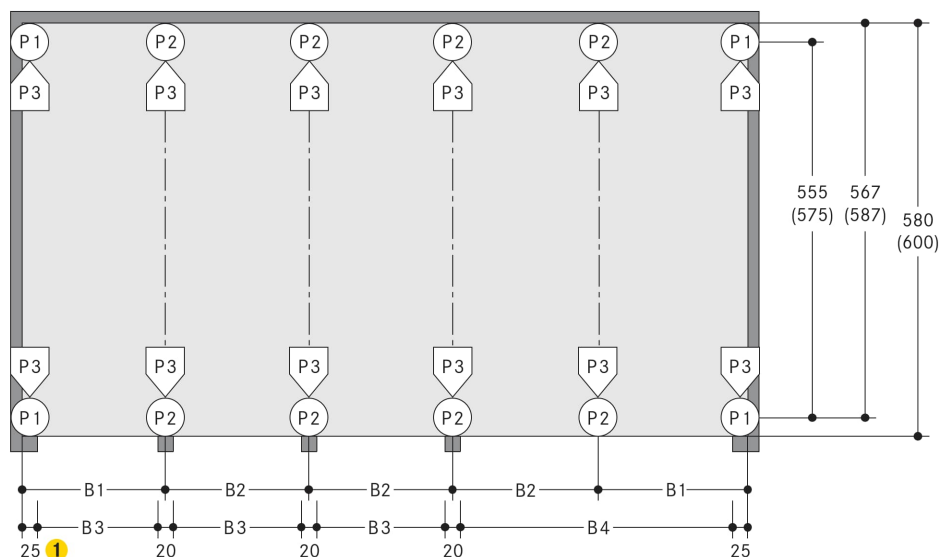
Support points:

- lengths are averaged

Door and widths of columns:

- coordinate with WÖHR
- axle dimensions (270/280/290) must be complied with

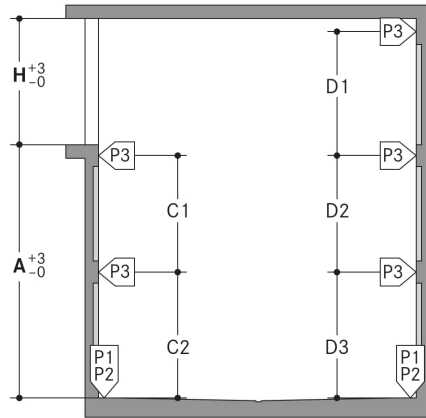
Ground plan



space requirements				clear platform width
B1	B2	B3	B4	
285	270	250	520	250
295	280	260	540	260
305	290	270	560	270

- 1 For column widths greater than 20/25 cm, the clear passage width is reduced accordingly. Coordination with WÖHR is required.

■ Static calculations and construction COMBIPARKER 560 (1 up | 2 down)



Combiparker 560 (1 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	415	425	435	445	455	465	475	485
Clear installation dimensions (forces on entry side)								
C1	190	195	200	205	210	215	220	225
C2	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	225	225	225	225	225	225	230	235
D2	190	195	200	205	210	215	220	225
D3	195	200	205	210	215	220	225	230

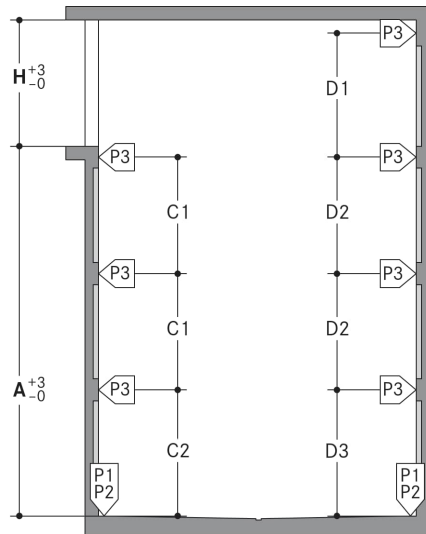
2000 kg	
P1	+ 23,0 kN*
P2	+ 46,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 28,0 kN*
P2	+ 55,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 30,5 kN*
P2	+ 61,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (1 up | 3 down)



Combiparker 560 (1 up 3 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	605	620	635	650	665	680	695	710
Clear installation dimensions (forces on entry side)								
C1	190	195	200	205	210	215	220	225
C2	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	225	225	225	225	225	225	230	235
D2	190	195	200	205	210	215	220	225
D3	195	200	205	210	215	220	225	230

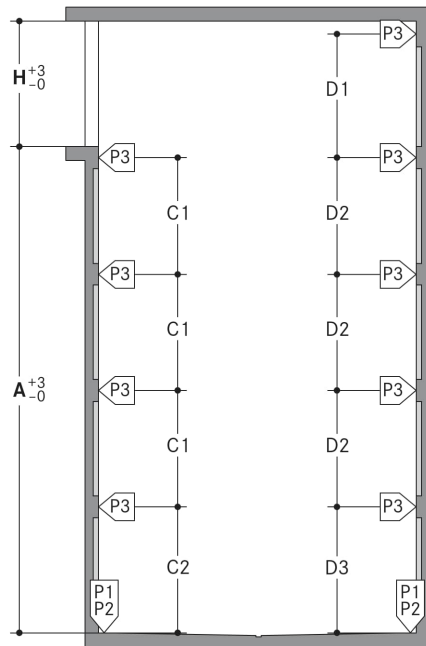
2000 kg	
P1	+ 30,0 kN*
P2	+ 60,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 35,5 kN*
P2	+ 71,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 37,0 kN*
P2	+ 73,5 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (1 up | 4 down)



Combiparker 560 (1 up 4 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	235	235	235	235	235	235	240	245
A	795	815	835	855	875	895	915	935
Clear installation dimensions (forces on entry side)								
C1	190	195	200	205	210	215	220	225
C2	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	225	225	225	225	225	225	230	235
D2	190	195	200	205	210	215	220	225
D3	195	200	205	210	215	220	225	230

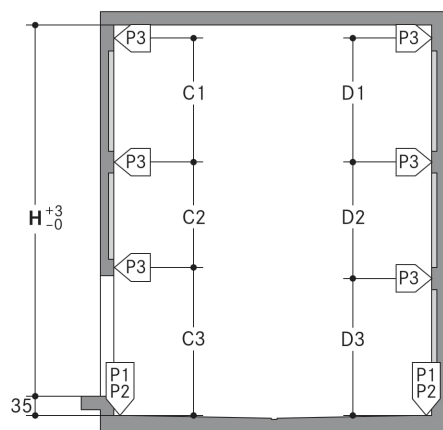
2000 kg	
P1	+ 36,0 kN*
P2	+ 71,5 kN
P3	± 5,0 kN

2600 kg	
P1	+ 43,5 kN*
P2	+ 87,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 46,5 kN*
P2	+ 93,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (3 up)



Combiparker 560 (3 up)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	610	625	640	655	670	685	700	715
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	135	145	155	165	175	185	190	195
C3	275	275	275	275	275	275	280	285
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	215	220	225	230	235	240	245	250

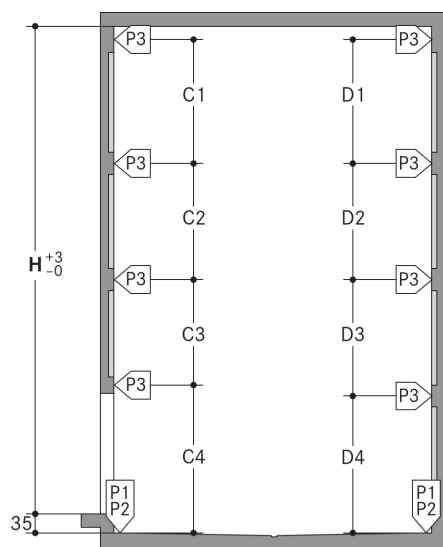
2000 kg	
P1	+ 23,0 kN*
P2	+ 46,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 28,0 kN*
P2	+ 55,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 30,5 kN*
P2	+ 61,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (4 up)



Combiparker 560 (4 up)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	800	820	840	860	880	900	920	940
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	195	200	205	210	215	220	225	230
C3	130	140	150	160	170	180	185	190
C4	275	275	275	275	275	275	280	285
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	190	195	200	205	210	215	220	225
D4	215	220	225	230	235	240	245	250

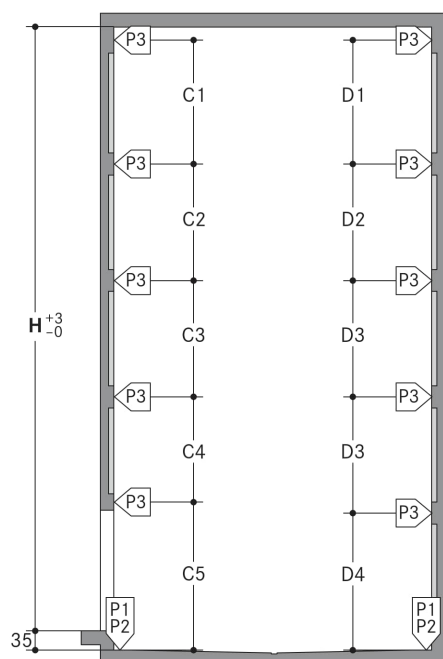
2000 kg	
P1	+ 30,0 kN*
P2	+ 60,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 35,5 kN*
P2	+ 71,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 37,0 kN*
P2	+ 73,5 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (5 up)



Combiparker 560 (5 up)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	990	1015	1040	1065	1090	1115	1140	1165
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	195	200	205	210	215	220	225	230
C3	190	195	200	205	210	215	220	225
C4	130	140	150	160	170	180	185	190
C5	275	275	275	275	275	275	280	285
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	190	195	200	205	210	215	220	225
D4	215	220	225	230	235	240	245	250

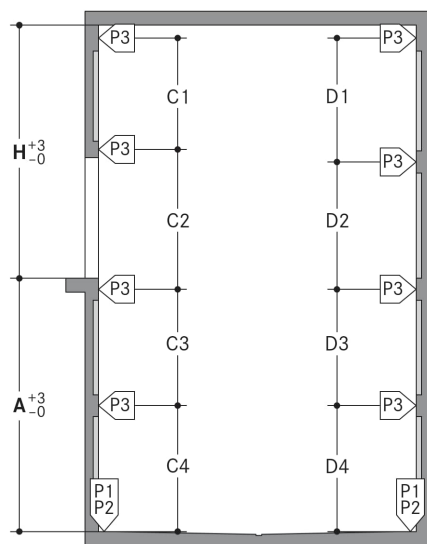
2000 kg	
P1	+ 36,0 kN*
P2	+ 71,5 kN
P3	± 5,0 kN

2600 kg	
P1	+ 43,5 kN*
P2	+ 87,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 46,5 kN*
P2	+ 93,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (2 up | 2 down)



Combiparker 560 (2 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	415	425	435	445	455	465	475	485
A	415	425	435	445	455	465	475	485
Clear installation dimensions (forces on entry side)								
C1	140	150	160	170	180	190	195	200
C2	270	270	270	270	270	270	275	280
C3	190	195	200	205	210	215	220	225
C4	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	210	215	220	225	230	235	240	245
D3	190	195	200	205	210	215	220	225
D4	195	200	205	210	215	220	225	230

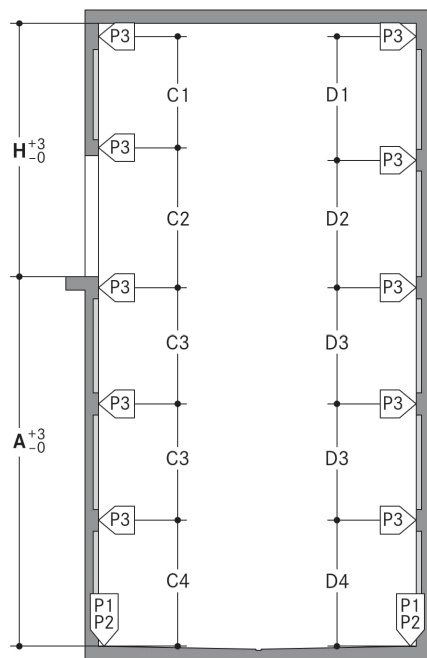
2000 kg	
P1	+ 30,0 kN*
P2	+ 60,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 35,5 kN*
P2	+ 71,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 37,0 kN*
P2	+ 73,5 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (2 up | 3 down)



Combiparker 560 (2 up 3 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	415	425	435	445	455	465	475	485
A	605	620	635	650	665	680	695	710
Clear installation dimensions (forces on entry side)								
C1	140	150	160	170	180	190	195	200
C2	270	270	270	270	270	270	275	280
C3	190	195	200	205	210	215	220	225
C4	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	210	215	220	225	230	235	240	245
D3	190	195	200	205	210	215	220	225
D4	195	200	205	210	215	220	225	230

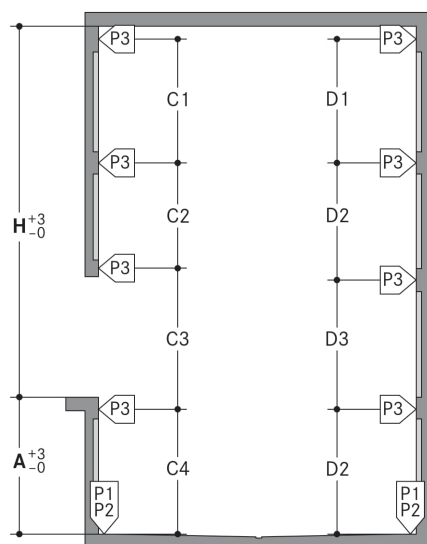
2000 kg	
P1	+ 36,0 kN*
P2	+ 71,5 kN
P3	± 5,0 kN

2600 kg	
P1	+ 43,5 kN*
P2	+ 87,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 46,5 kN*
P2	+ 93,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (3 up | 1 down)



Combiparker 560 (3 up 1 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	610	625	640	655	670	685	700	715
A	225	230	235	240	245	250	255	260
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	135	145	155	165	175	185	190	195
C3	270	270	270	270	270	270	275	280
C4	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	210	215	220	225	230	235	240	245

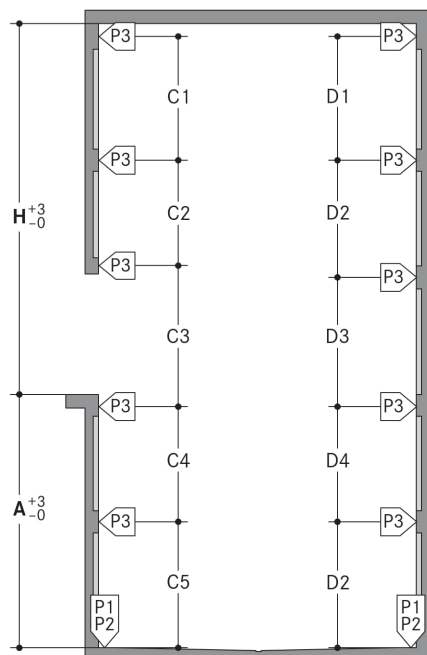
2000 kg	
P1	+ 30,0 kN*
P2	+ 60,0 kN
P3	± 5,0 kN

2600 kg	
P1	+ 35,5 kN*
P2	+ 71,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 37,0 kN*
P2	+ 73,5 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (3 up | 2 down)



Combiparker 560 (3 up 2 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	610	625	640	655	670	685	700	715
A	415	425	435	445	455	465	475	485
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	135	145	155	165	175	185	190	195
C3	270	270	270	270	270	270	275	280
C4	190	195	200	205	210	215	220	225
C5	195	200	205	210	215	220	225	230
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	210	215	220	225	230	235	240	245
D4	190	195	200	205	210	215	220	225

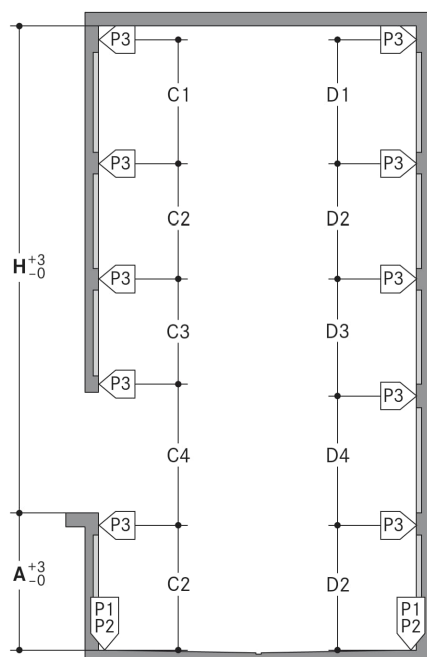
2000 kg	
P1	+ 36,0 kN*
P2	+ 71,5 kN
P3	± 5,0 kN

2600 kg	
P1	+ 43,5 kN*
P2	+ 87,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 46,5 kN*
P2	+ 93,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

■ Static calculations and construction COMBIPARKER 560 (4 up | 1 down)



Combiparker 560 (4 up 1 down)								
Typ	175	180	185	190	195	200	205	210
Clear installation dimensions								
H	800	820	840	860	880	900	920	940
A	225	230	235	240	245	250	255	260
Clear installation dimensions (forces on entry side)								
C1	200	205	210	215	220	225	230	235
C2	195	200	205	210	215	220	225	230
C3	130	140	150	160	170	180	185	190
C4	270	270	270	270	270	270	275	280
Clear installation dimensions (forces on rear wall)								
D1	200	205	210	215	220	225	230	235
D2	195	200	205	210	215	220	225	230
D3	190	195	200	205	210	215	220	225
D4	210	215	220	225	230	235	240	245

2000 kg	
P1	+ 36,0 kN*
P2	+ 71,5 kN
P3	± 5,0 kN

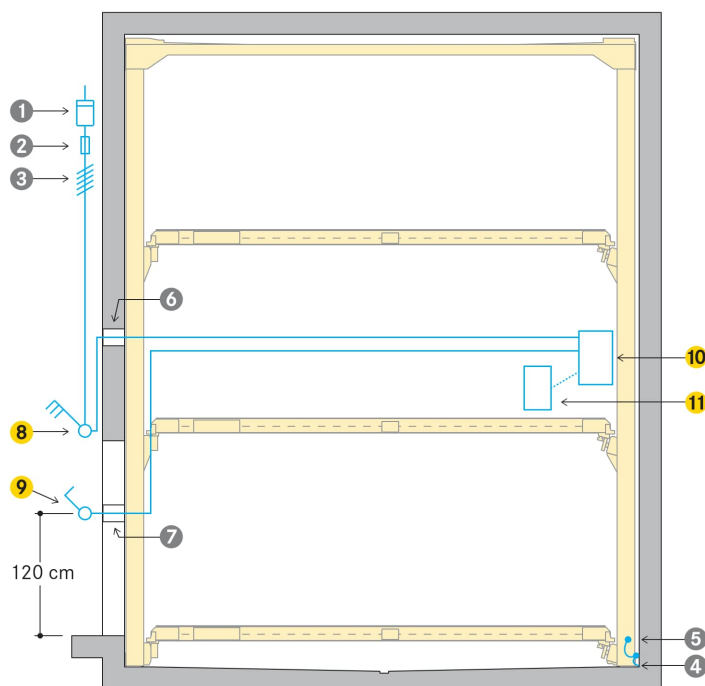
2600 kg	
P1	+ 43,5 kN*
P2	+ 87,0 kN
P3	± 5,0 kN

3000 kg	
P1	+ 46,5 kN*
P2	+ 93,0 kN
P3	± 5,0 kN

*all forces including vehicle weight

Electrical specifications

Installation diagram



Cabling preparation to be performed by the customer:

- up to the main switch to be in place prior to starting the installation operations
- connection to the main switch during installation
- system functional check testing can be performed by WÖHR together with the electrician provided by the customer
- if requested at a later date, functional check testing can be performed by WÖHR at extra-cost

Grounding and potential equalisation:

- to be performed by the customer compliant to DIN EN 60204
- connections required every 10 metres

To be performed by the customer

Item	Quantity	Description	Position	Recurrence
1	1 piece	power meter	in the feed cable	
2	1 piece	fuse protection or automatic circuit breaker compliant to DIN VDE 0100 part 430: - up to 20 parking spaces: 3 x 25 A slow blow - more than 20 parking spaces: 3 x 40 A slow blow - fault current fuse protection according to VDE 0160 for the connection of frequency converter	in the feed cable	1 x per system
3	based on site conditions	compliant to local power supply regulations 3 phases + N + PE* 230/400 V, 50 Hz	feed cables to main switch including connection	1 x per system
4	every 10 m	grounding and potential equalisation lead-out connection	along pit floor edges/rear wall	
5	1 piece	grounding and potential equalisation compliant to DIN EN 60204	from lead-out connection to system	1 x per system
6	1 piece	empty pipe M32	from the position of the main switch to the system area	1 x per system
7	1 piece	empty pipe M32	on a pillar in the middle area	1 x per system

* to DIN VDE 0100 sections 410 and 430 (no permanent load) 3 phases + N+ PE (three phase current)

Scope of delivery by WÖHR (unless otherwise specified in the order)

Item	Description
8	Lockable main switch
9	Operating device
10	Main switch cabinet (in the left grid)
11	Extra switch cabinet (1 x per grid)

Notes

Area of application

- suitable for residential buildings, office and commercial buildings, hotels
- only for instructed, constant, long-term users
- for frequently changing users (e.g. for office, hotel, commercial buildings or similar):
 - constructive adaptations of the system are necessary
 - please consult with WÖHR

Function

- one empty space per unit on entry level
- platforms on entry level are moved laterally
- if there is more than one upper (UL) or lower level (LL), one additional further empty space is required per each level
- platforms on the uppermost or lowermost upper level or underground level are raised or lowered to the empty space on the entry level
- if there is more than one upper and lower level, these levels are also shifted laterally as well

Parking space numbering

- empty space on the entry level on the left.
If there is more than one upper or lower level, one additional further empty space per level
- numbering (example):

EL	1	2	5	8	11
LL1		3	6	9	12
LL2		4	7	10	13

- each unit starts with the numbering at 1
- different bay numbering at an extra cost (software modification necessary)

Switch cabinet

Arrangement of the switch cabinet:
- within the unit

Noise protection

Basis is the German DIN 4109 "Noise protection in buildings".

With the following conditions required 30 dB (A) in rooms can be provided:

- noise protection package from our accessory
- insulation figure of the construction of min. $R'_w = 57$ dB
- walls which are bordering the parking systems must be done as single wall and deflection resistant with min. $m' = 300$ kg/m²
- solid ceiling above the parking systems with min. $m' = 400$ kg/m²

At differing constructional conditions additional sound absorbing measures are to be provided by the customer.

The best results are reached by separated sole plates from the construction.

Increased sound insulation (separate agreement):

It is based on VDI 4100 „Sound insulation in building construction“ Assessment and proposals for increased sound insulation.

Under the following conditions, 25 dB (A) can be complied with in living spaces and bedrooms:

- sound insulation package according to offer/order
- Sound insulation value of the building structure of min. $R'_w = 62$ dB (to be performed by the customer)

Note:

User noises are not subject to the requirements (see VDI 4100, Scope - Notes). User noises are basically noises that can be individually influenced by the user of the parking systems (e.g. driving on the platform, closing of vehicle doors, engine and brake noises).

Empty pipes

Empty pipe:

- recommended for the supply line to the control panel
- especially for above-ground garages
- on a pillar in the middle area
- height 120 cm above entry level
- consultation with WÖHR strongly recommended

Declaration of conformity



The parking systems correspond to:
- EC Machinery Directive 2006/42/EC
- DIN EN 14010

Lighting

- sufficient lighting of the driveways and parking spaces on site/by the customer
- In the system area at least 50 lux

Rails

If traffic routes are arranged directly next to or behind the Combiparker on-site barriers or guardrails according to DIN EN ISO 13857 / local regulations are required. This also applies during the construction phase.

Drainage

Water leaks into the pit:

- in the winter, up to 40 litres of snow water can possibly come with the wheel housings in just one parking process

Drainage channels:

- along the middle section of the pit
- connecting to a floor drain or drainage pit (50 x 50 x 20 cm)
- with manual emptying out of the drainage pit
- alternatively installation of a pump or drainage channel into the sewerage system, to be performed by the customer

Sideways slope drainage:

- only into a gutter
- not possible in the remaining pit section

Lengthways slope drainage:

- provided according to specified construction dimensions

Environmental safety:

- coating of the pit flooring is recommended
- installation of an oil and/or petrol separator unit between the drainage connection and the main sewerage system is recommended

Temperature

- system operating range: +5° bis +40°C
- humidity: 50 % at +40° C
- if use in deviating temperature ranges is planned, constructive adjustments may be necessary (please consult with WÖHR)

Fire protection

- all fire protection requirements and all mandatory equipment (fire extinguishing system, fire alarm systems, etc.) to be carried out by the customer
- WÖHR will provide documents on attachment points and clearances for sprinklers on request
- consultation with WÖHR strongly recommended

Maintenance

- WÖHR and its foreign partners have an installation and customer service network
- regular, annual maintenance is provided conclusion of a maintenance contract
- the local requirements for commissioning, testing and annual maintenance and inspections on electric doors are not the subject of our delivery. These types of inspections and tests in accordance with local regulations are to be observed and carried out by the customer

Prevention of corrosion damage

- all operations listed in the WÖHR cleaning and maintenance instructions are to be carried out regularly (independent of maintenance)
- galvanised parts, components and platforms have to be cleaned from dirt, road-salt as well as any other debris (danger of corrosion)
- always keep the garage well ventilated and deaerated

Surface protection

- please refer to the information sheet on surface protection!

Tender specification

- please refer to the specifications!

■ Notes

■ Parking Space-Profile

- please refer to the product information on parking space-profile!



■ Electromobility

- please refer to the product information on e-charging!
- charging points possible per level or in the entire system
- depending on the position of the charging point on the electric vehicle, there may be points of collision with protruding plugs and charging cables
- consultation with WÖHR strongly recommended



■ Sliding doors and Operating concepts

- please refer to the product information on sliding doors and operating concepts!



■ Construction documents

- WÖHR can provide documentation for planning permission/building permit on request
- for projects abroad, the same documentation is available as for projects in Germany

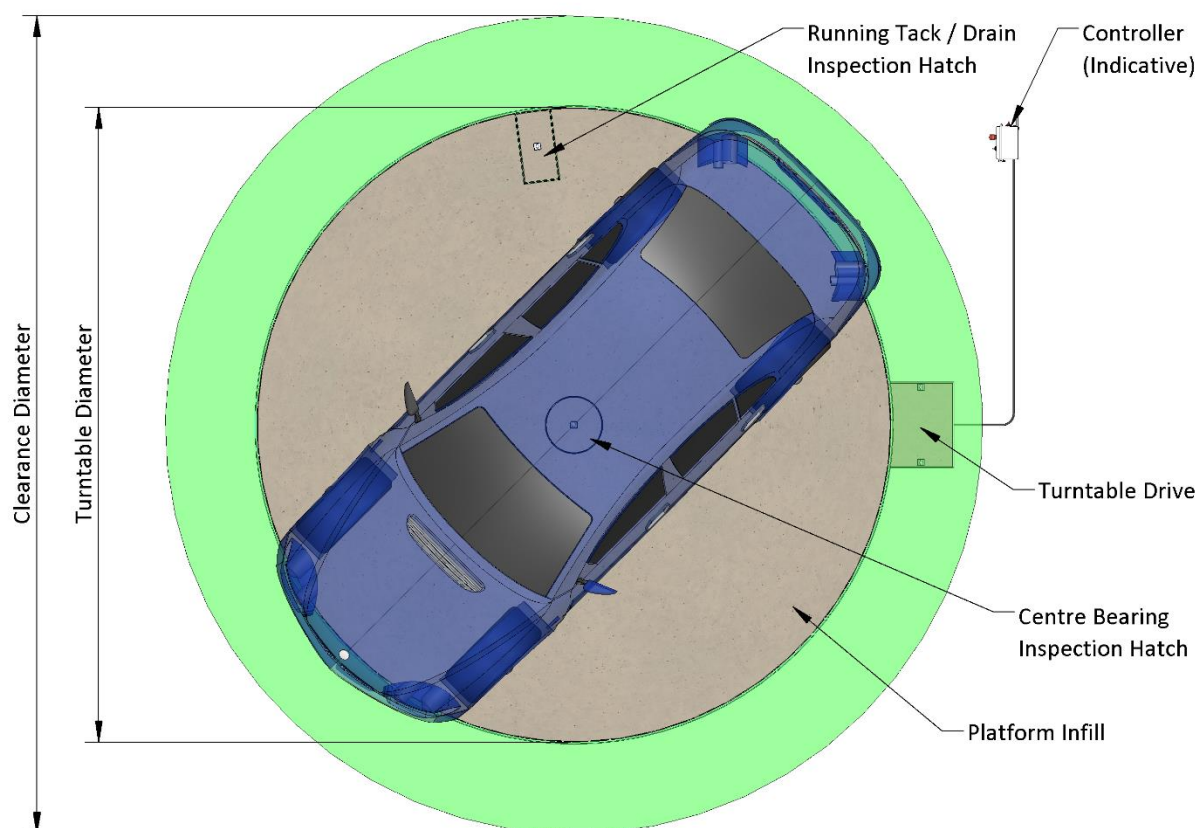
■ Design changes

- we reserve the right to make design changes and modifications
- we reserve the right to make changes to design details, procedures and standards due to technical progress and environmental requirements

Appendix C Turntable Specifications



CTX-PR Turntable Specification

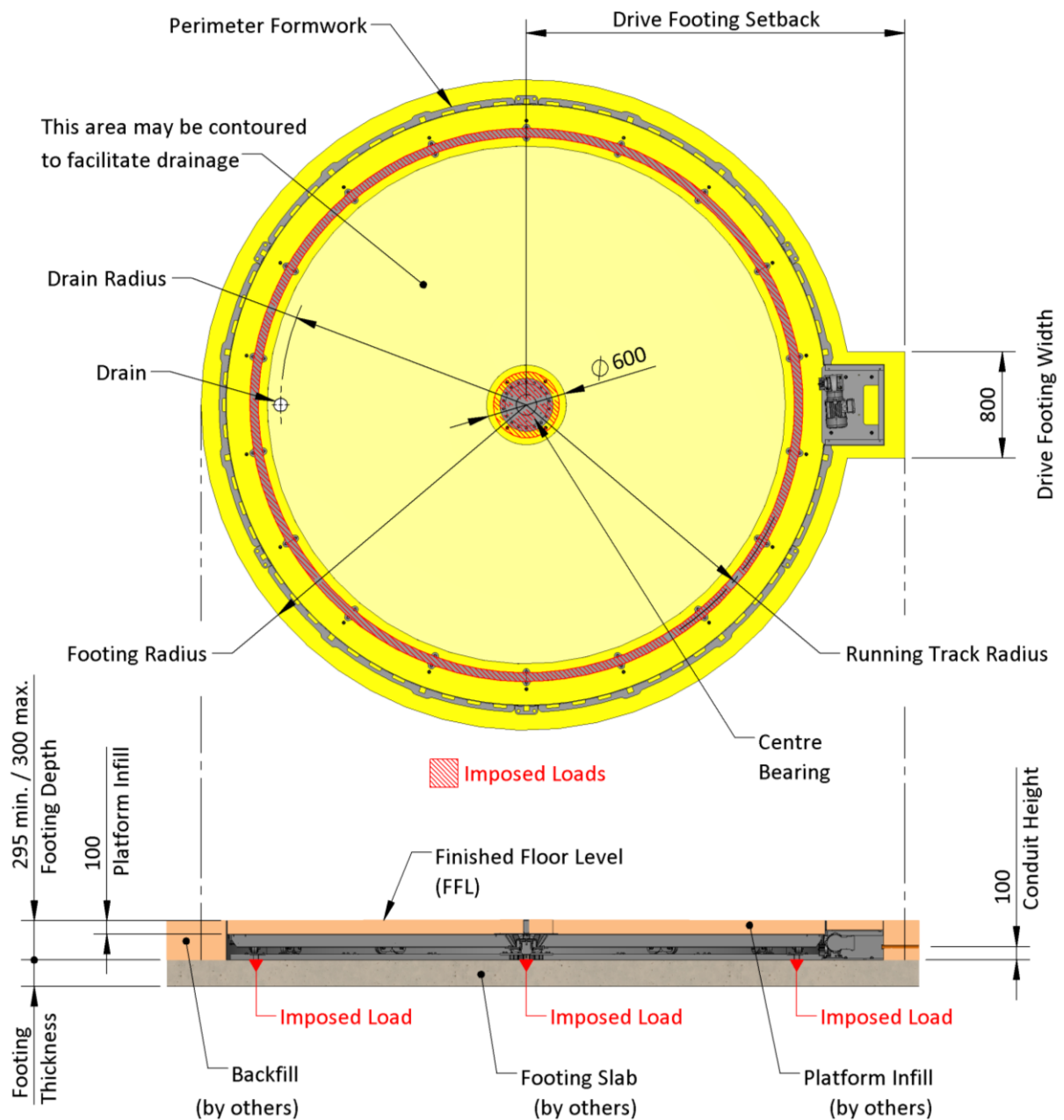


**See Specification table for dimensions*

Turntable Overview

Application:	Driveway, basement, car parking
Platform Finish:	PR series turntables include 100mm rebate to accommodate infill material finish (by customer), specified by Architect e.g. concrete, pavers, tiles, exposed aggregate etc.
Inspection Hatches:	Centre bearing, support track/drain and drive
Corrosion Protection:	Hot dipped galvanised, zinc coating
Drive Mechanism:	Gear driven powered by motor drive
Stainless Steel formwork: (Optional extra)	Recommended for projects where a polished concrete finish is specified. This allows the grinding process to be applied to the concrete and the steel formwork without risk of surface rust becoming visible.
Stainless Steel Upgrade: (Optional extra)	Stainless-steel upgrade for bearings, shafts and fixings recommended for projects exposed to a salty or corrosive environment.
Safety system: (Optional extra)	For projects where there is a chance of collision during rotation with people, building or other vehicles ATC can design and supply a system to reduce risk.
Positional or Home function: (Optional extra)	ATC can design and supply any requirements for positional stopping or for the turntable to return to a home position after use. The home position is commonly used on projects with tiled or paver finish.

Turntable Footing



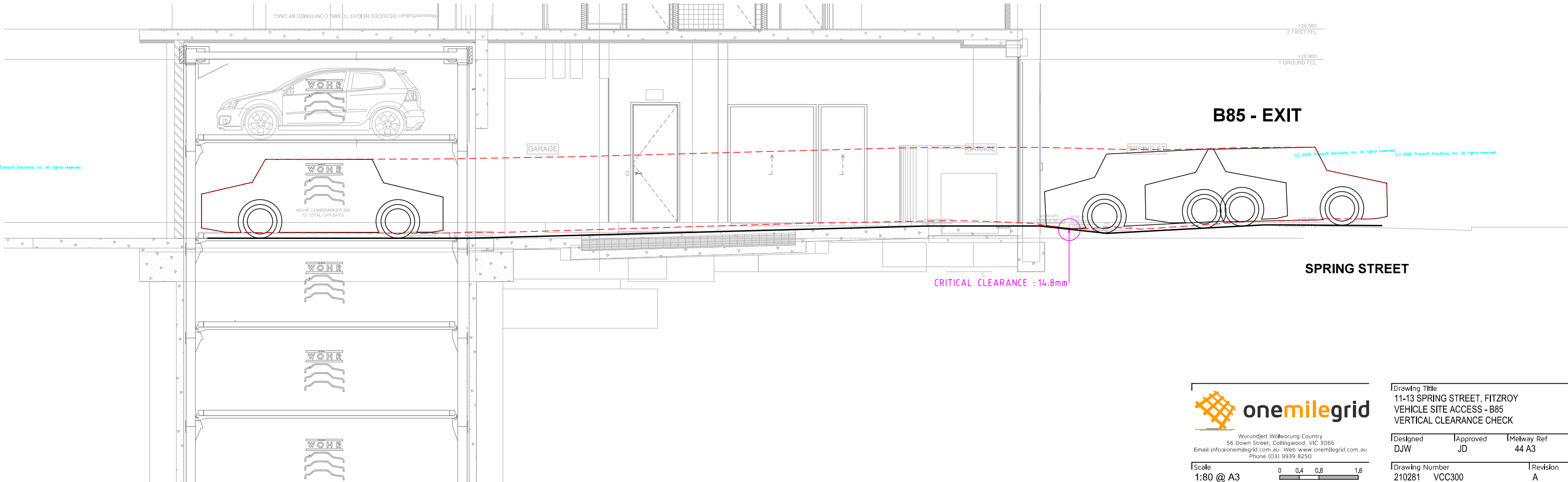
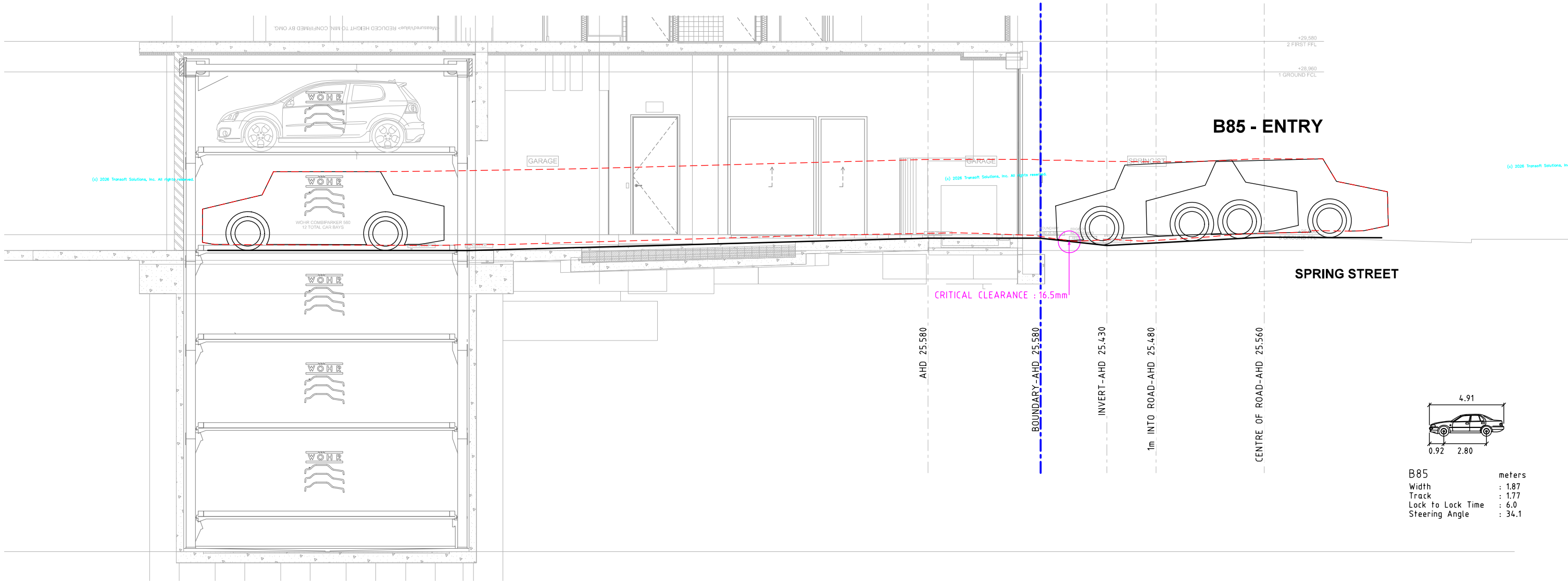
**See Specification table for dimensions*

Footing Overview

1. The turntable footing provides the surface which the turntable is secured to via mechanical fastenings of up to 100mm embedment.
2. The footing size is larger than the turntable to accommodate the perimeter formwork and fixtures.
3. The overall size and shape of the footing can be made to suit the installation site provided it can accommodate the minimum required footing sizes as indicated below.
4. Once the turntable has been installed, a concrete backfill is poured up to the perimeter formwork to encase the turntable into the finished floor.
5. The imposed loads on the footing are concentrated through the Centre Bearing area and the Running track.

Appendix D Vertical Clearance Check





CAD File: N:\Project\2021\20281\Drawings\210281VCC301.dgn

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