BADMUS R.A
ARC/14/8343

Multilevel parking complex

Introduction

land for housing and other developments in Akure is becoming highly problematic due to rapid population growth and informal land delivery system. The peculiarity of Arakale, Akure, Ondo State in terms of shortage of land for expansion purposes cannot be overlooked, hence the congestion in terms of commercial shops and markets, traffic and other land uses competing for limited land space.

Parking spaces have traditionally been an overlooked element of development projects by governmental oversight and the recent trend has been to provide alternatives to general parking lots that are becoming insufficient in the city Centre with the introduction of vertical parking structures that can accommodate more automobiles on a number of levels in a relative size of land.

Definition

A multi-storey or multi-level car park is a building that is specifically designed for parking in which there a number of levels or floors on which parking takes place. It is essentially a stacked parking lot.

A multi storey car park is essentially a stacked parking. It should have multiple exit and entrance system to avoid traffic congestion when going in Or out

Design brief

Oja-oba Akure is a major in the city of Akure which is adjoining to Arakale area of the city. There is influx of crowd in and out of the market everyday with low capacity existing car park.

In response to this issues of Congestion and automobile litter in the Arakale market region of Akure, a multilevel car park will be proposed with a pedestrian bridge to link the car park and Oja-oba without having to move on the ground in other to cure the imbalance and the disorder look of the urban environment. Efficient urban land-use and space management through vertical automobile parking."

Brief Development...

The following are the spaced to be provided to have an efficient parking:

- Parking spaces
- Pedestrian bridge
- ATM Gallery
- Car wash
- Lube bay
- Towing services
- Offices
- Conveniences
- Mini mart
- Tyre services

Aim...

The aim of this project is to design a safe and comfortable multi level parking complex in this high density central core of Akure so as to curb the automobile litter in the area and to manage what is left of the spaces in the urban centre.

Objectives

- To provide a parking structure that will enhance the effective movement of automobile and the users.
- To design an economical viable structure with will also ensure safety of automobiles and the users.
- To develop a befitting scheme for the internal revenue of the state.

Design Considerations

➢ Safety and security

It is recommended that all doorways be of clear glass so that patrons can see through the obstacle. Lift doors should be of glass. Stairways accessible to the public should be wide and bright. All pedestrian routes should be clearly signposted in both directions and levels should be clearly numbered.

➢ Accessibility

The car park should be easy to find in the street network. The entrances would be located by main road where they can be more easily utilized.

➢ Aesthetics

Aesthetics is a major consideration for this project as this is a structure that is supposed to add beauty to the city scape and lift the urban image of the region in general, it will therefore not be neglected as it is a critical part of Architecture

➢ Functionality

➢ Sustainability

➢ Pedestrian Circulation

Pedestrian routes, walkways, stairways, lobbies, lifts (min. 2 x 13 person)should all be easy to follow and use

Design Proposal

- **Sustainable car station Design:**

Can generate up to 60% of its own electric power

- **Anti-Vandalism capability**

Easy to maintain

- **Light weight and friendly design**
- **Procreative space for users and operators**
- **Organized Kiosk and seating area**
- **Digital Displace Boards**
- **Public Toilets**
- **Car Parking**

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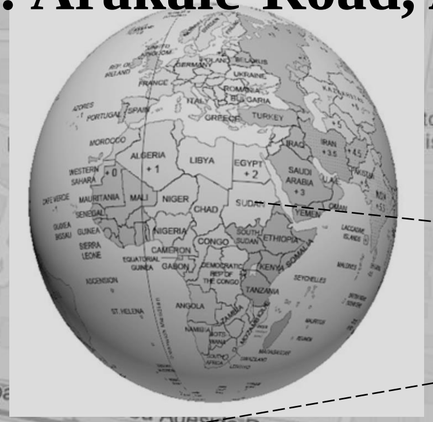
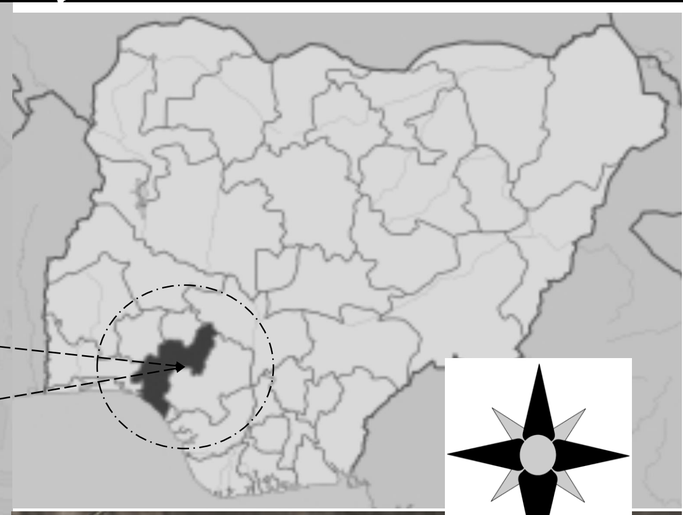
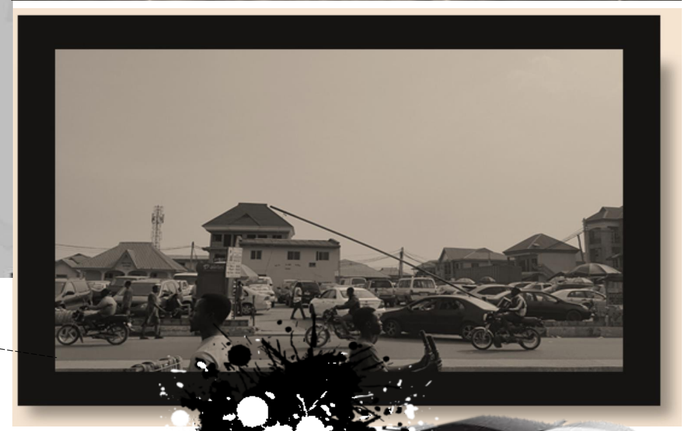
Site Location : Arakale-Road, Akure

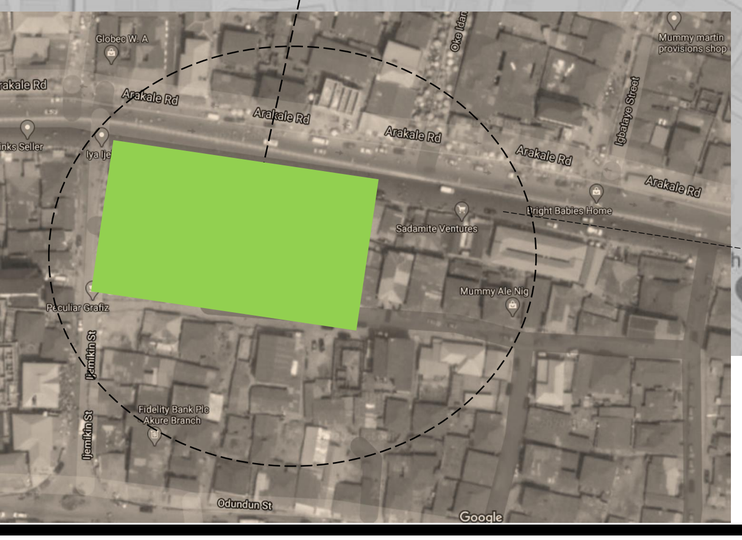
PERIMETER
AREA: 8700 SQUARE METRES







Arakale road is the major access road is just in front of the site.



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MULTI-LEVEL PARKING COMPLEX

Site Inventory

Entrance to the existing car park

Existing Bus Stop just at the front of the existing site

Adjoining commercial complexes bordering the existing site

ADJOINING ROAD
Minor neighborhood road at the western section of the existing site

ELECTRICITY LINES
Electricity lines are Located along adjoining roads

ADJOINING ROAD
Minor neighborhood road at the southern section of the existing site

Existing Parking situation on the site

ADJOINING ROAD
Arakale Road in the Northern art of the road

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MULTI-LEVEL PARKING COMPLEX

Site Analysis

PERIMETER: 418 METRES
AREA: 8700 SQUARE METRES

ELECTRICITY LINES

Electricity lines are Located along adjoining roads

MID DAY SUN

- Experienced at about 12:00PM
- Gives off Hot Solar Radiation
- Good Source of Illumination but could cause Glare

NORTH EAST TRADE WIND

- Blows from the Sahara Desert
- Dominant October and February
- Responsible for Harmattan
- Cold, Dry and Dusty in Nature

ADJOINING BUILDINGS

The site is surrounded by various Commercial shops and major Institutional buildings such as banks and agencies

SUNRISE

- The SUn rises in the East at about 7:00 AM daily
- It has no adverse effect on man and Building.
- It is afair source of Lighting.
- Efforts will be made to harness the sunrise

SUNRIS

- The Sun sets in the west at about 6:30 PM daily
- It is a poor source of Natural Illumination
- It has no advere effect o Man and Buildings

SOUTH WEST TRADE WIND

- Blows from the Atlantic Ocean
- Dominant Between March and October
- Brings Rainfall
- Moist and comforting
- Efforts would be made to

ACCESSIBILITY

The means of Access to into the site is from the roads bordering the site all around and the major access would be from the Dual-laned Arakale road which is right at the northern part of the site

CLIMATIC DATA

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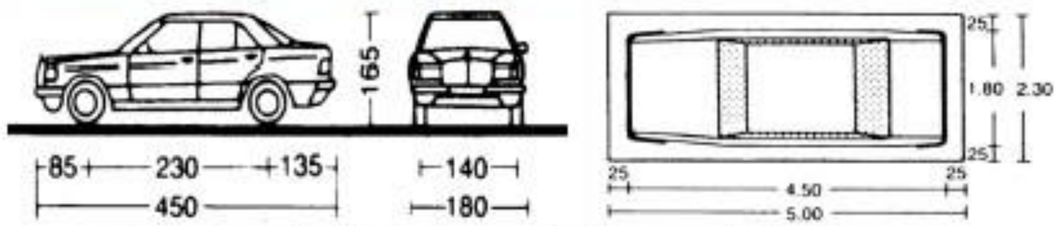
MULTI-LEVEL PARKING COMPLEX

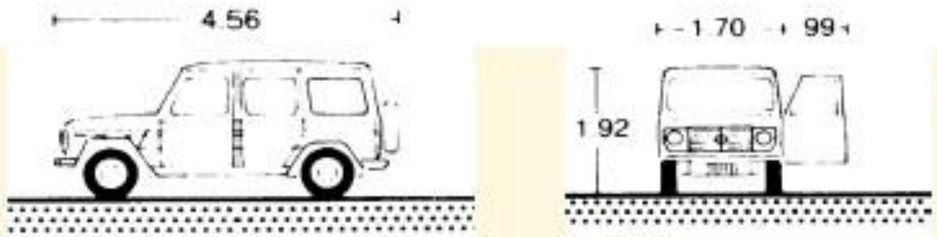
Analysis

The Parking Stall

Parking stall should be built to accommodate the larger cars frequently used, although not necessarily the very largest.

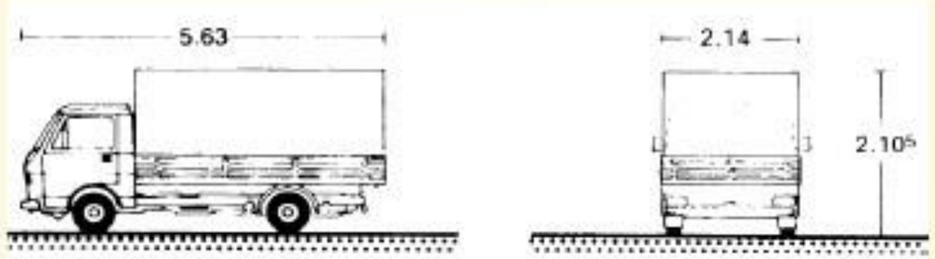


Dimensions of a Standard car and minimum spatial requirement



Dimensions of an SUV car

Dimensions of a pick up van



Dimensions of a fixed bed truck

The larger cars have an over-all length of 5.8m, over-all width of 2.0mwith a wide open door projecting 1.9m beyond the over-all width. The minimum space requirement for a standard vehicle to move is 5.0*2.3m. Using this space requirement for a vehicle, we can then analyze the various forms of parking that are possible.

In-line parking

30° Oblique spaces

45° Oblique or echelon parking

60° Oblique echelon parking

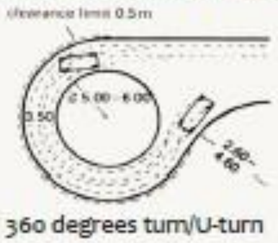
90° Head-on to parking

Circulation Paths

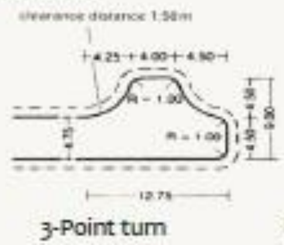
Since space management is of paramount importance in this project, it is then necessary to properly analyse the circulation of the vehicles and users within the building.

Vehicular Circulation and turning requirements

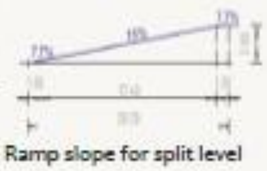
90 degrees turn



360 degrees turn/U-turn



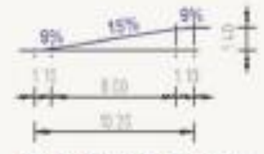
3-Point turn



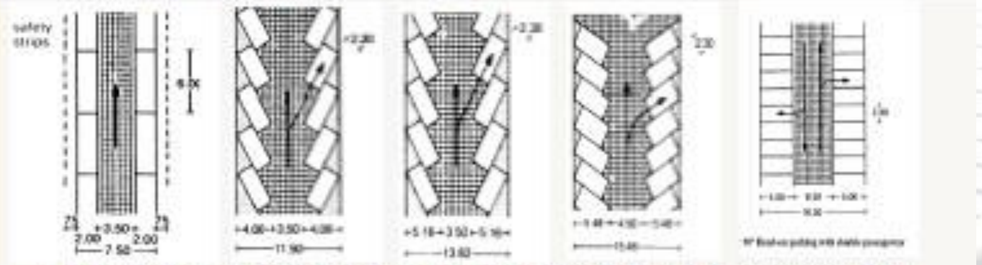
Ramp slope for split level

type of vehicle	length (m)	width (m)	height (m)	turning circle radius (m)
motorcycle	2.20	0.70	1.00[1]	1.00
car				
- standard	4.70	1.75	1.50	5.75
- small	3.60	1.60	1.50	5.00
- large	5.00	1.90	1.50	6.00

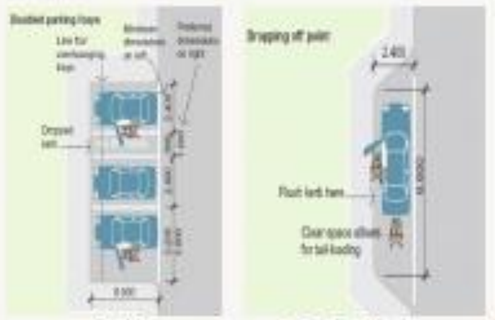
Turning radius for various vehicles



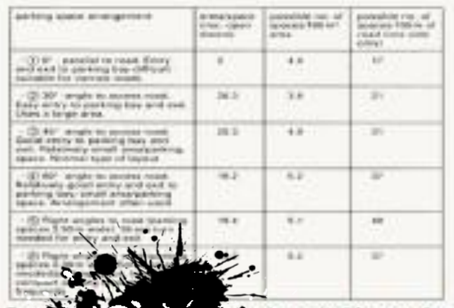
Ramp slope for full level



In-line Parking 30 deg Oblique 45 deg Oblique 60 deg Oblique 90 deg Oblique



Parking requirement for disabled



Spa...

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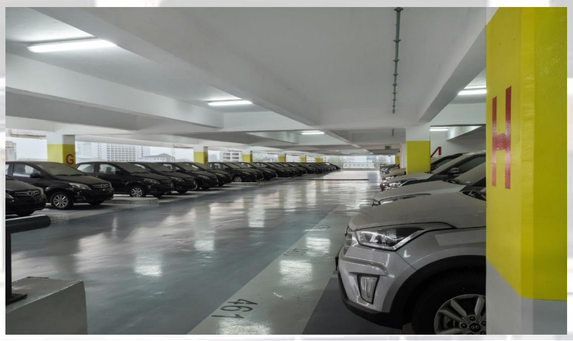
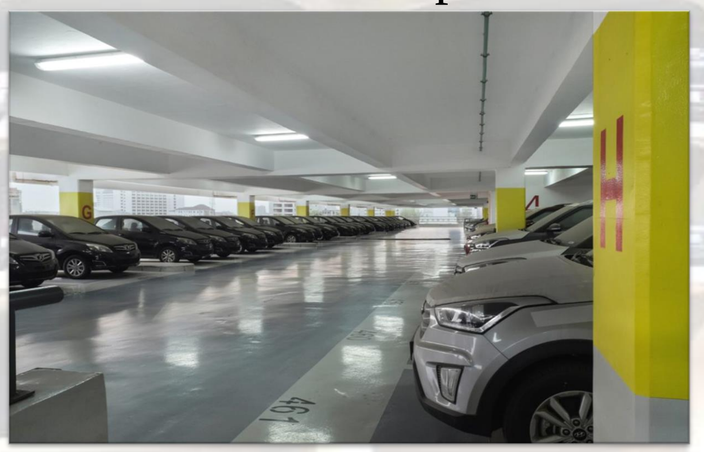
Case Study 1

ZENITH CAR PARK, 3-9 MOLADE OKOYA THOMAS STREET, VICTORIA ISLAND LAGOS

DESCRIPTION:

Zenith car park is a 600mmulti-storey car park, spread over 5 storeys with split levels. The purpose of the building is to provide parking for employees in multiple properties owned nearby. It is a built area of about 18,000sqm. It was designed by ELALAN and ACCL both as contractors and architect.it was completed in 2016.





REASON FOR STUDY:

- Use of contemporary and modern architecture as language
- Ability to solve the issue of inadequate perking facilities.
- Stopped the use of street curbs, unused land for parking for staffs.
- Good parking ratios for the offices

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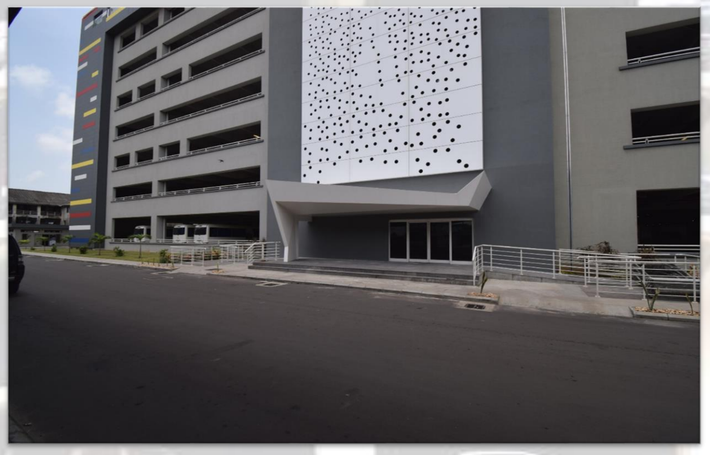
MULTI-LEVEL PARKING COMPLEX

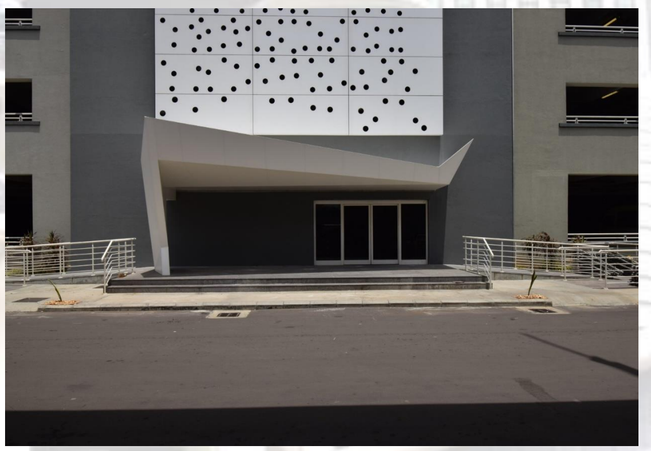
Case Study 2

MTN MULTI-STOREY CARPARK FALOMO, IKOYI LAGOS.

DESCRIPTION:

It is a seven storey parking facility bounded at the east side by Falomo bridge, north by Falomo police barracks and south by LASWA head office and jetty terminal building. It has 810 parking spaces from ground floor to 6th floor and a recreation zone on the 7th floor.





Project: Multi-Storey Car Park & LASWA Building
Location: Ikoyi, Lagos
Main Contractor: CAPPA & D'Alberto
Consultant: CA Consultants
Services: Mechanical & Electrical
Completion Date: December, 2015

REASON FOR STUDY:

- Use of contemporary and modern architecture as language
- Incorporation of recreation activities into the building.

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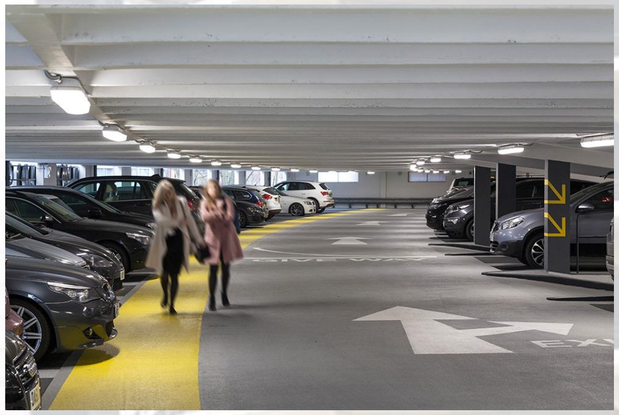
MULTI-LEVEL PARKING COMPLEX

Case Study 3

CROYDON MULTI LEVEL CAR PARK

DESCRIPTION:

The Croydon multi-deck carpark is currently being built on Council owned land in Devon Street which is centrally located behind Croydon Main street and adjacent to the Croydon Train station and bus depot. The facility will provide much needed additional commuter carparking and improved pedestrian access and amenity to the area. The carpark will also include a 1400sqm commercial tenancy.



REASON FOR STUDY:

The multi-level carpark project aims to deliver the following benefits to the community:
400 additional parking bays
dedicated accessible car parking with DDA compliant access
safe pedestrian access to and from local transport hubs including Croydon Station and bus depot
safe pedestrian access to and from Main Street, Town Square, and Croydon Community

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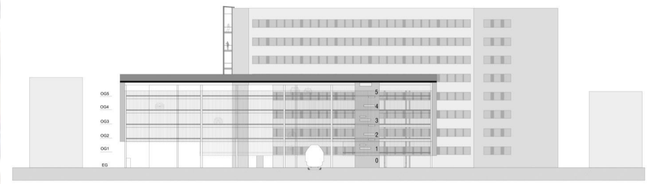
MULTI-LEVEL PARKING COMPLEX

Case Study 4

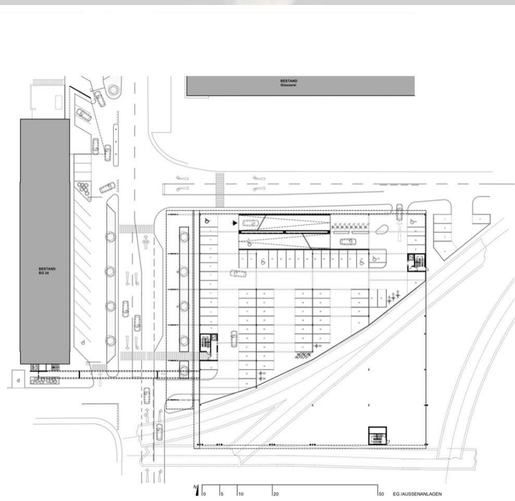
LINZ MULTI-LEVEL PARKING,AUSTRIA

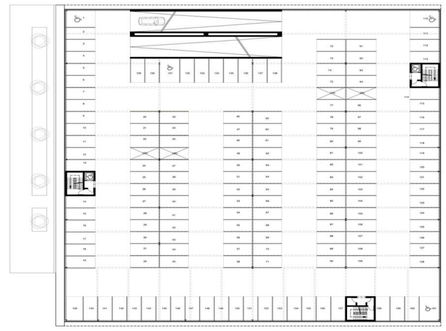


Ansicht Ost

DESCRIPTION:

Due to the location in the city of Linz and restrictions on the premise boundaries, the voestalpine steel company needs to pursue alternative growth strategies. An important method of achieving this is through the strategic concentration of facilities and processes on the premises. For this reason the idea developed to concentrate the existing scattered parking spaces, which use up a lot of space, to a centrally located car park.





REASON FOR STUDY:

- A central aspect of the parking level and the vertical elements is to give the car park users a feeling of safety and for them to be able to intuitively orientate themselves.
- Incorporation of recreation activities into the building.

PARKING • LINZ, AUSTRIA
Year: 2008
Area: 20700 rn ^{2}
Architects: x architekten
800 Packing spaces

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MULTI-LEVEL PARKING COMPLEX

Site Plan

Building Orientation

Parking

There is provision for over 400 cars spaces on the superstructure

Ingress and Egress

Site vehicular movement operates in one way policy, i.e. one way in and two ways out

Pedestrian access

There is provision of pedestrian over head bridge

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MULTI-LEVEL PARKING COMPLEX

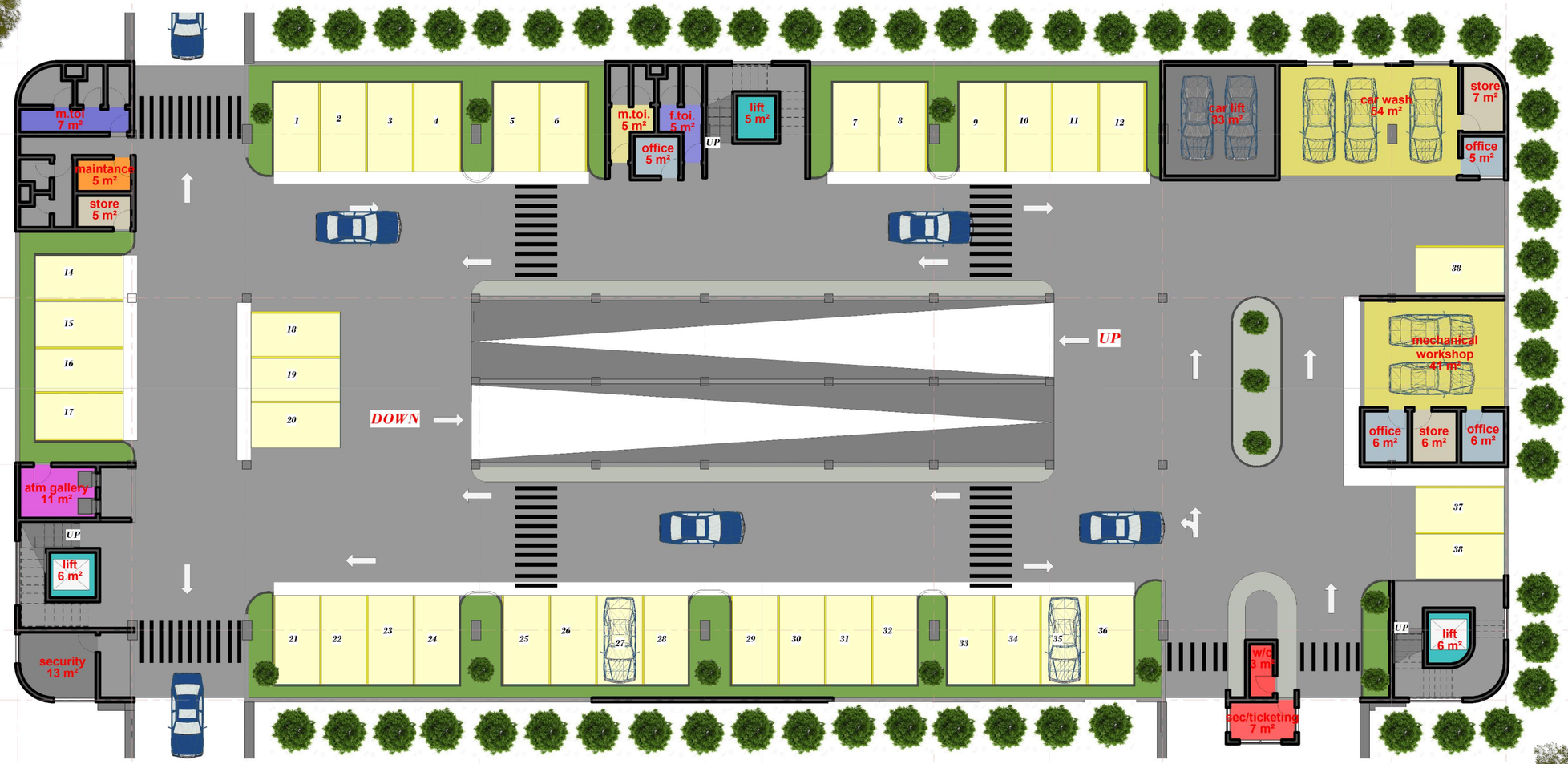
Floor plan

X

Z

Z

X



❖ **Ground floor plan**

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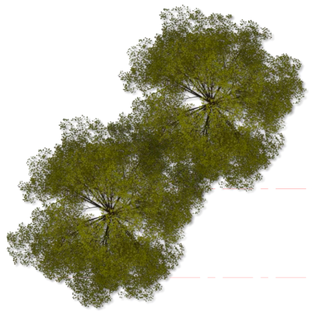
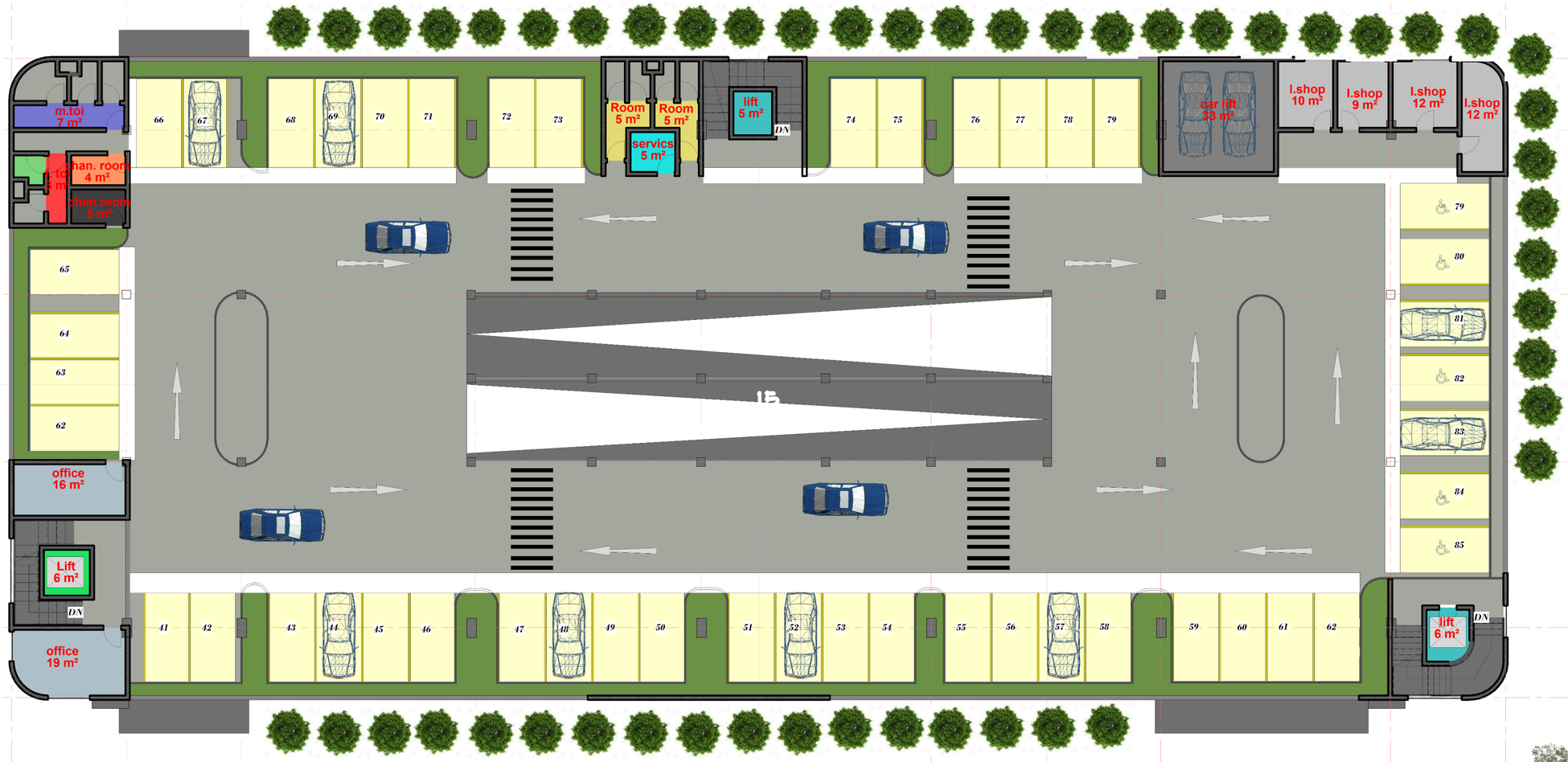
Floor plan

X



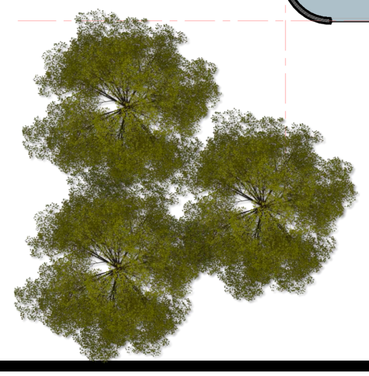


Z

Z

X

❖ first floor plan



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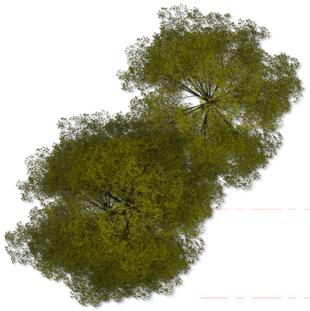
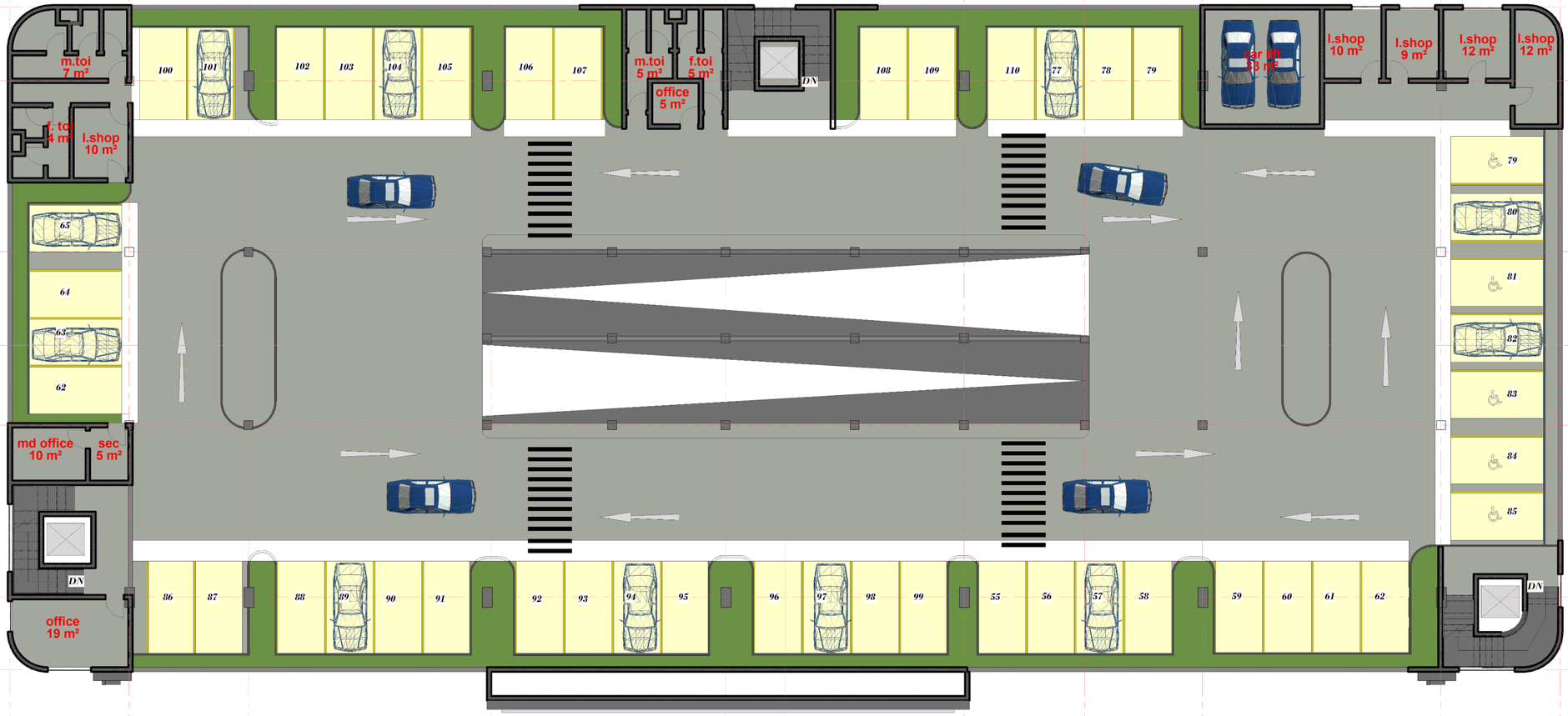
MULTI-LEVEL PARKING COMPLEX

Floor plan

X



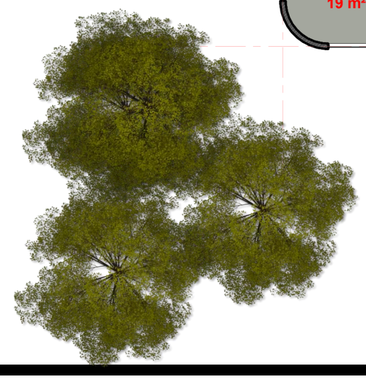


Z

Z

X

Typical second floor to seventh floor plan



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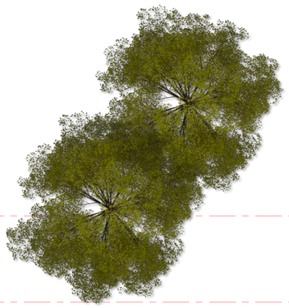
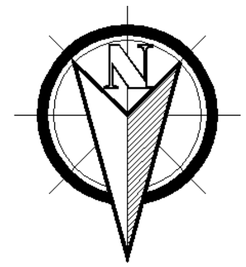
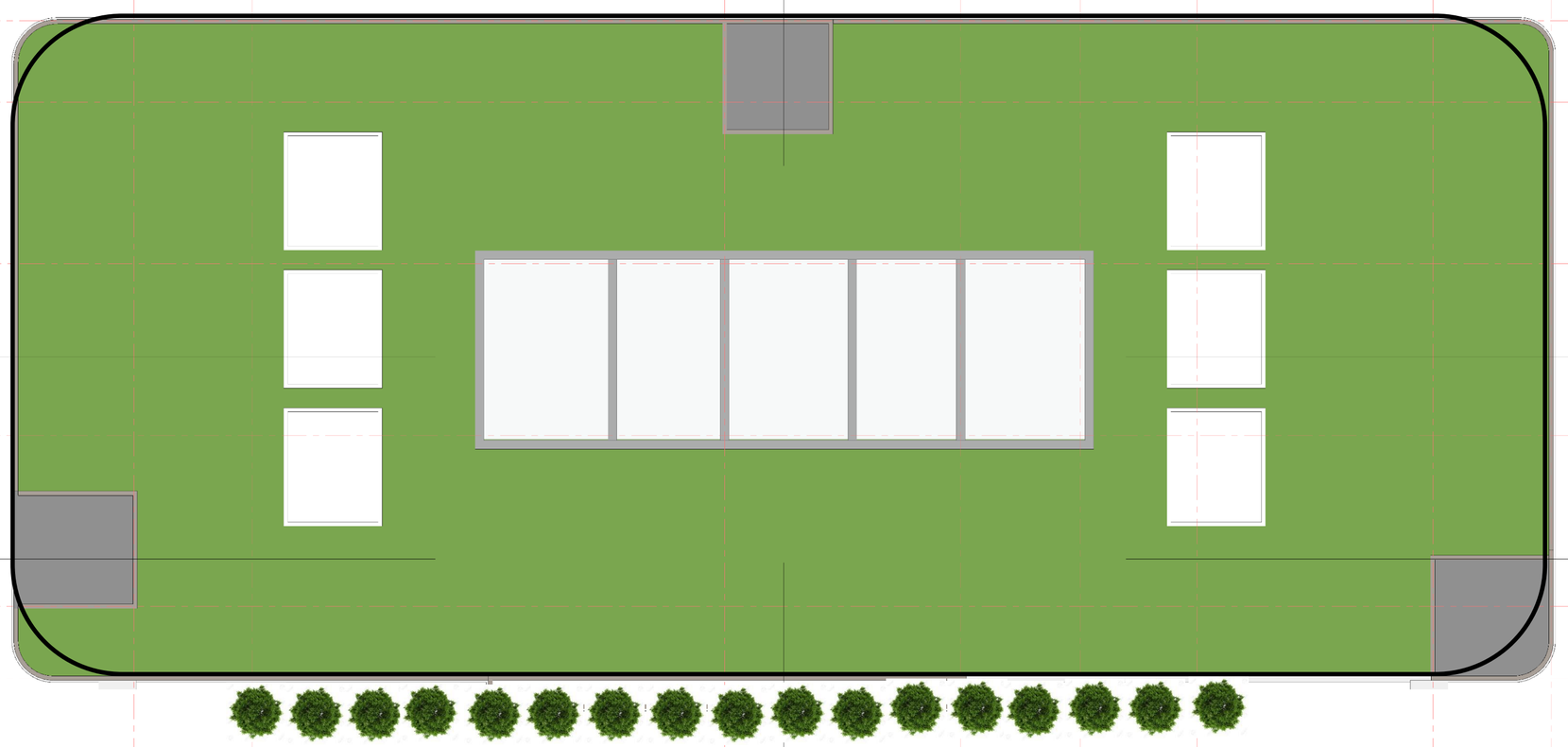
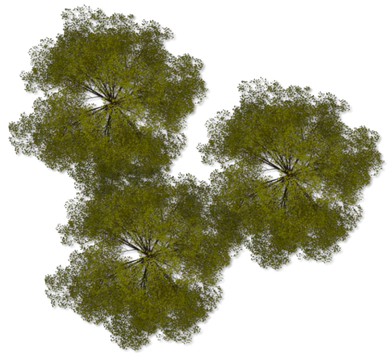
MULTI-LEVEL PARKING COMPLEX

Roof plan









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MULTI-LEVEL PARKING COMPLEX

17

Section

SECTION Y-Y

SECTION Z-Z

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MULTI-LEVEL PARKING COMPLEX

18

Elevation

APPROACH VIEW

RIGTHT SIDE VIEW

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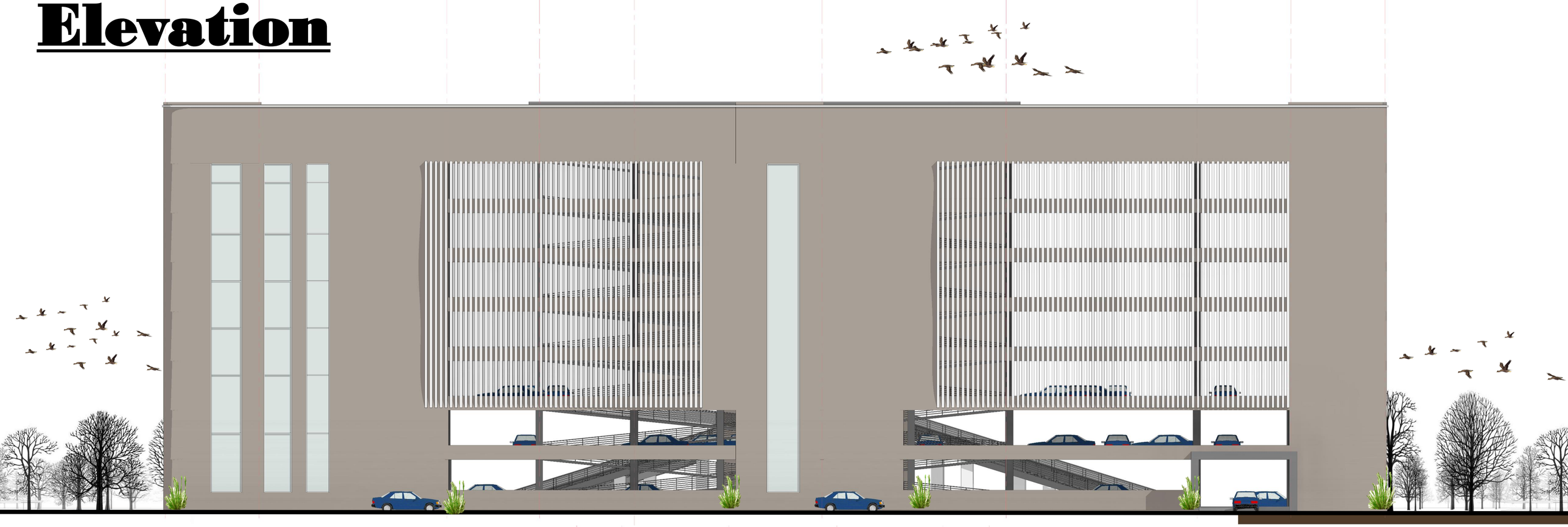
MULTI-LEVEL PARKING COMPLEX

19

Elevation



REAR
ELEVATION

RIGHT
SIDE VIEW

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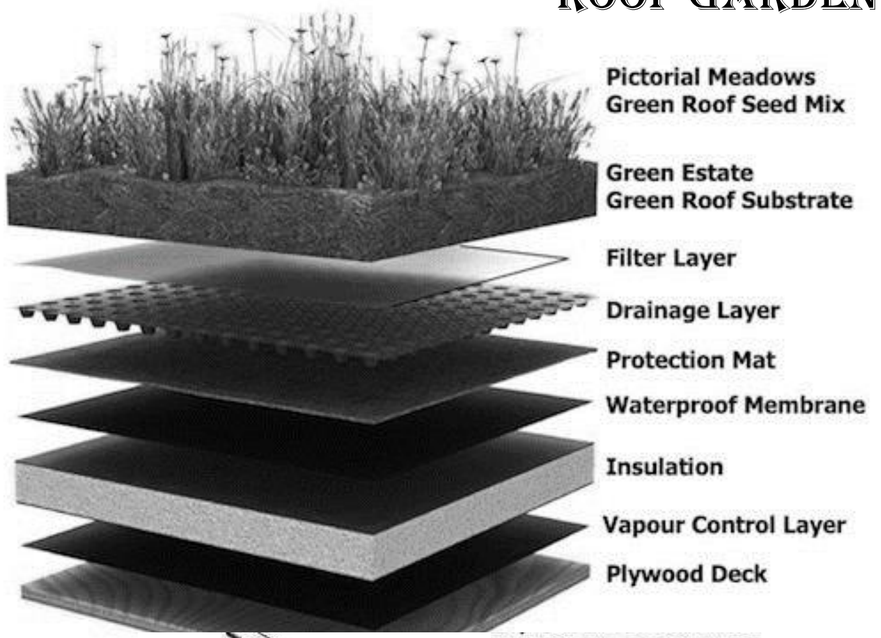
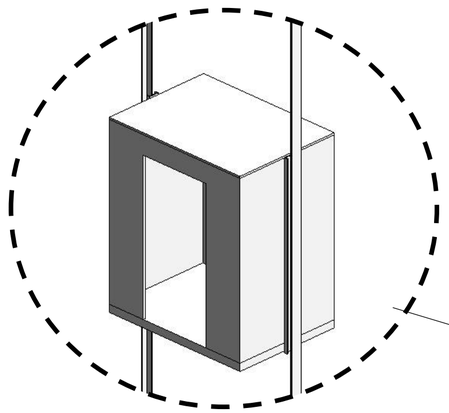
MULTI-LEVEL PARKING COMPLEX

Details

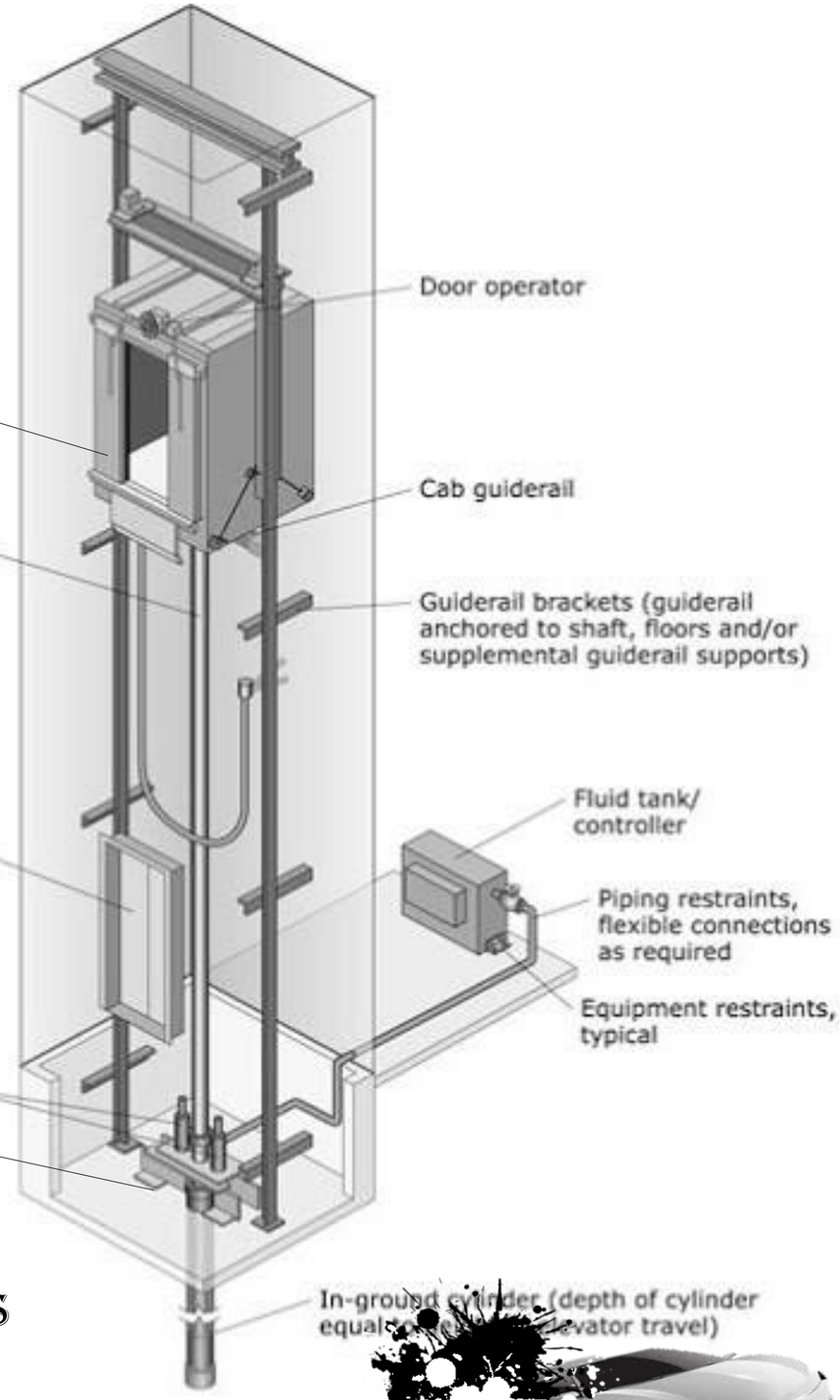
ROOF GARDEN

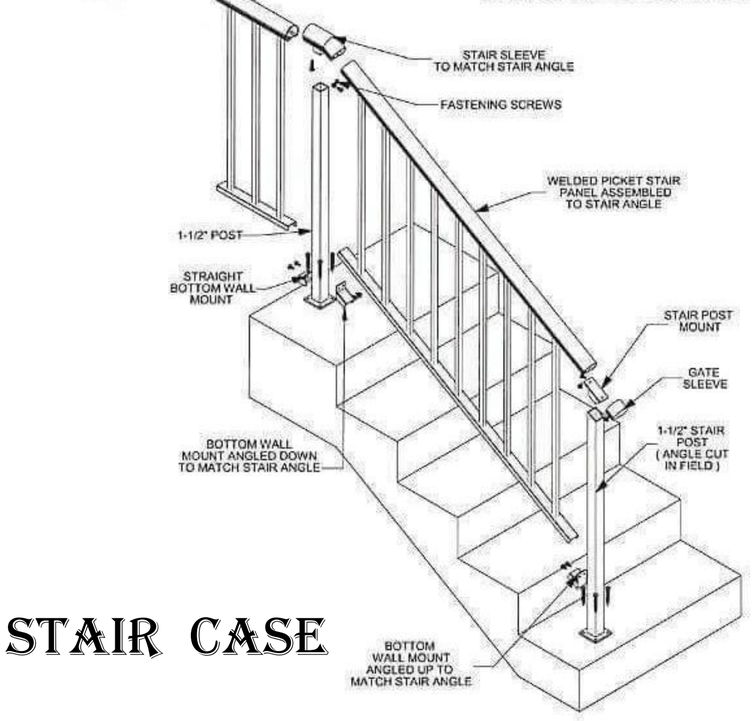




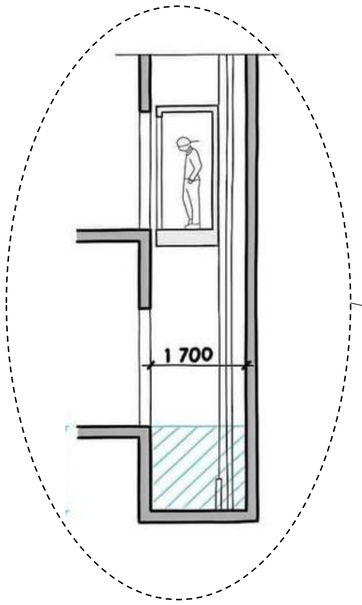
Lift car

The lift car tolerate a 630kg load which successful accommodate 10 people with average speed of 1m/s. it can transport 4 household





STAIR CASE



LIFT DETAILS

BADMUS RIDWANULLAH A
ARC/14/8343
ARC801
ADVANCED STUDIO DESIGN

3d View

BADMUS RIDWANULLAH A
ARC/14/8343
ARC801
ADVANCED STUDIO DESIGN

MULTI-LEVEL PARKING COMPLEX

3d View

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ARC/14/8343
ARC801
ADVANCED STUDIO DESIGN

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