AL-DUQM INDUSTRIAL MASTERPLAN
INVESTOR DESIGN GUIDELINES

JANUARY 2017

Duqm الدقم
هيئة المنطقة الاقتصادية الخاصة
Special Economic Zone Authority

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GLOSSARY

Access Drive:	That portion of a vehicular use area that provides vehicular access from the public street to more than one dwelling unit or more than one non-residential building.
Accessory Building or Structure:	A building or structure that is subordinate in area, extent and purpose to the principal use and building on the lot and that is customarily used or occupied in conjunction with a permitted accessory use.
Accessory Parking:	Parking provided to comply with minimum off-street parking requirements and non-required parking that is provided exclusively to serve occupants and visitors to a particular use, rather than the public at-large. See “non-accessory parking,”
Accessory Use	A use that is subordinate in area, extent and purpose to the principal use and that is customarily found in conjunction with a permitted principal use.
Awning	A roof-like structure of fabric or similar non-rigid material attached to a rigid frame that is supported completely or partially by either an exterior building wall or wall exterior to an individual tenant space.
Awning Sign	A sign incorporated into or attached to an awning.
Banner or Banner Sign	A sign made of fabric or other similar non-rigid material with no enclosing framework or electrical components that is supported or anchored on two or more edges or at all four corners. Banners also include non-rigid signs anchored along one edge, or two corners, with weights installed that reduce the reaction of the sign to wind. See also “flag.”
Basement	The portion of any structure whose height measured from the floor to the underside of ceiling joists is located more than 50% below grade. Basement floor area does not count towards Floor Area Ratio (FAR).
Building:	Any structure that is permanently affixed to the land and built for the support, shelter, or enclosure of persons, animals, channels, or movable property of any kind.
Building Height	The dimension from grade to the highest point of the roof or parapet of a building, excluding roof top mechanical equipment, access stair enclosures, and rooftop shading devices.
Bulk	The general term used to refer to the size of a building or the building features allowed on a plot. Provisions that control bulk include the following: plot area, setbacks, open space, floor area, floor area ratio, building coverage, and building height.
Canopy	A roof like structure of a permanent nature that projects from the wall of a building and overhangs the public way.
Changing-image Sign	Any sign that, through the use of moving structural elements, sequential lights, lighting elements, or other automated method, results in movement, the appearance of movement or change of sign image or message. Changing-image signs do not include otherwise static signs where illumination is turned off and back on not more than once every 24 hours.
Commercial Establishment	A business in which, the ownership, management and physical location are separate and distinct from those of any other place of business located on the same zoning plot, as partly evidenced by maintaining separate and distinct doors and access points.
Commercial Message or Commercial Message Sign	Any sign, wording, logo or other representation that, directly or indirectly, names, advertises or calls attention to a business, product, service or other commercial activity.
Density	The general term used to refer to the number of building units allowed per unit of land area. It is controlled in these regulations by the maximum number of building units allowed on a lot and implies a number of building units per acre or hectare
Drive-Thru Facility	Any service window, automated device or other facility that provides goods or services to individuals in motor vehicles.
Driveway	That portion of a vehicular use area that provides vehicular access from the public street to a single dwelling unit or factory building.

Electric Sign	Any sign containing electrical wiring, lighting or other electrical components, but not including signs illuminated by a detached exterior light source.
Facade	The exterior plane or “face” of a building.
FAR	An abbreviation for “floor area ratio.”
Flag	A sign made of fabric or other similar non-rigid material supported or anchored along only one edge or supported or anchored at only two corners. If any dimension of a flag is more than 3 metres as long as any other dimension, it is classified and regulated as a banner regardless of how it is anchored or supported. See also “banner”.
Flashing Sign	Any sign or portion of a sign that contains an intermittent or flashing light source or that changes light intensity in sudden transitory bursts. Example of flashing signs include signs that contain or use strobe lights, or rotating lights; signs with blinking or flashing features that are designed to merely to attract attention rather than convey a message; and changing-image signs that do not comply with applicable standards.
Floor Area Ratio (FAR)	The ratio of the gross floor area of all principal buildings to the total area of the plot upon which such buildings are located. Floor area ratio is calculated by dividing the gross floor area by the gross plot area. Standards for floor area ratio in these provisions are stated as the maximum permitted.
Free Standing Sign	A sign on a frame, pole, or other support structure that is not attached to any building.
Front Property Line	That property line that abuts or is along an existing or dedicated public street, or when no public street exists, is along a public way.
Grade	The curb level adjacent to the front property line or the mean elevation of the finished lot, as measured along exterior building walls of the principal building, whichever is higher.
Gross Floor Area	Gross floor area, for the purpose of calculating floor area ratio, is defined as the gross horizontal areas of several floors of the building measured from the exterior walls. Gross floor area shall include elevator and stairwells at each floor; floor space used for mechanical equipment except equipment open or enclosed, located on the roof;; interior balconies or mezzanines; enclosed porches; and floor area devoted to accessory uses. Below grade accessory parking and exterior balconies and/or porches are excluded from gross floor area."
Gross Plot Area	The entire land area within the boundaries of a plot.
Incidental Sign	A sign that contains no commercial message and that is exclusively used to convey directions or other information for the convenience of the public. Included are signs designating rest rooms, address numbers, hours of operation, entrances to buildings, help wanted, public telephone, etc. Also included are signs on private property designed to guide or direct pedestrians or vehicular traffic, such as “entrance” and “exit” signs.
Individual Letter Sign	A wall sign or high-rise building sign consisting of raised individual letters, script or symbols. The background of an individual letter sign is either the exterior building wall surface or another opaque, non-illuminated surface.
Land Leasee	The investor of land from SEZAD which seeks to develop the land for Industrial use purposes.
Landscaped Area	Substantially covered with turf, ground cover, shrubs, trees or other living plant material. m: Meter (30m = 30 meters). (See also Shelterbelt).

GLOSSARY

Marquee	A roof-like structure of a permanent nature that projects from the wall of a building and overhangs the public way.
Marquee Sign	A sign incorporated into or attached to a marquee or permanent canopy.
Motor Vehicle	Any passenger vehicle, truck, truck-trailer, trailer or semi-trailer propelled or drawn by mechanical power.
Non-Accessory Parking	Parking spaces (and the drive aisles and circulation area associated with such parking spaces) that are provided to serve the general public rather than being reserved exclusively for occupants of and visitors to a particular use (e.g., public parking garages).
Off Premise Sign	A sign that directs attention to a business, commodity, service, or entertainment conducted, sold, or offered elsewhere than upon the plot upon which it is located or to which it is affixed.
On-Premise Sign	A sign that directs attention to a business or profession conducted or to a commodity, service, or entertainment sold or offered upon the premises where the sign is located.
Ornamental Fencing	A decorative fence, including wrought iron or fencing that gives the appearance of wrought-iron fencing, but expressly excluding chain-link, barbed wire and similar non-decorative fences.
Painted Wall Sign	A sign applied to a building wall with paint or a thin layer of vinyl, paper or similar material adhered directly to the building surface and that has no sign structure.
Permanent Sign	Any sign not classified as a temporary sign.
Permitted Use	A use permitted by-right in the subject district in accordance with the applicable use regulations of this document.
Plot Coverage	The area of a plot covered by principal and accessory buildings, as measured along the exterior building wall at ground level, and including all building projections other than those expressly allowed encroaching into required setback areas.
Podium	The portion of a building encompassing the ground floor or the ground and several additional floors or mezzanine serving as a base for a tower above.
Portable Sign	Any sign not permanently attached to the ground or other permanent structure or a sign designed to be transported, including, but not limited to, signs designed to be transported by means of wheels and signs made as A-frames or T-frames.
Principal Building	A building or combination of buildings of chief importance or function on a lot. In general, the principal use is carried out in a principal building. The difference between a principal building and an accessory building or structure is determined by comparing the size, placement, similarity of design, use of common building materials, and the orientation of the structures on the plot.
Principal Use	An activity or combination of activities of chief importance on the lot. One of the main purposes for which the land, buildings or structures are intended, designed, or ordinarily used.
Product Display Window	An illuminated window display area in which products and goods are displayed to pedestrians but do not generally allow visibility into the interior of the building.
Projecting Sign	A sign attached to and projecting out from a building face or wall, generally at right angles to the building. Projecting signs include signs that are totally in the right-of-way, partially in the right-of-way, or fully on private property.
Public Open Space	Any publicly-owned open area, including, but not limited to parks, playgrounds, beaches, waterways, parkways and streets.
Public Way	Any sidewalk, pedestrian path or trail, street, alley, highway, or other public thoroughfare.

Roof Line	The peak of a roof or top edge of a parapet, whichever is higher.
Roof Sign	A sign or any portion of a sign that is erected upon or projects more than 24 inches above the roof line of any building whether the principal support for the sign is on the roof, wall or any other structural element of the building.
Satellite Dish Antenna	A device designed or used for the reception or the transmission of television or other electric communication signal broadcast or, relayed from a satellite. It may be a solid, open mesh, or bar configured structure in the shape of a shallow dish or parabola.
Setback	An open, unobstructed area that is required by these regulations to be provided from the furthermost projection of a structure to the line of the plot on which the building is located.
Shelterbelt	A major landscape strip of land dedicated to mitigate the strong winds from the South-West across the Duqm Industrial area.
Special Economic Zone Authority Duqm (SEZAD)	The authority appointed by the government of Oman, to monitor and regulate Al Duqm Industrial City.
Sign	Materials placed or constructed, or light projected, that: (1) conveys a message or image and (2) is used to inform or attract the attention of the public. Some examples of “signs” are materials or lights meeting the definition of the preceding sentence and that are commonly referred to as signs, placards, A-boards, posters, billboards, murals, diagrams, banners, flags, or projected slides, images or holograms. When not qualified with the terms “on-premise” or “off -premise,” the term “sign” refers to all signs, whether on or off premise in nature.
Story	That portion of a building included between the surface of any floor and the surface of the floor next above, or if there is no floor above, the space between the floor and the ceiling next above. A basement or below-grade floor will be counted as a story when more than one-half of the clear floor height is above grade.
Street	Any public road, communal street, private street, right-of-way or other shared access way that provides the pincipal frontage to a dwelling but does not include an access leg to a single battleaxe lot.
Street Frontage	Any portion of a lot that abuts a street (also plot Frontage).
Temporary Sign	A sign that is designed to be used only temporarily and not permanently mounted to a structure or permanently installed in the ground.
Use	The purpose or activity for which the land, or building thereon, is designed, arranged or intended, or for which it is occupied or maintained. Unless otherwise expressly indicated, the term “use” means principal use.
Vehicular Access Point	Any area of the plot not located within any enclosed or partially enclosed structure and that is devoted to a use by or for motor vehicles including parking (accessory or non-accessory); storage of automobiles, trucks or other vehicles; gasoline stations; car washes; motor vehicle repair shops; loading areas; service areas and drives; and access drives and driveways.
Video Display Sign	A sign capable of displaying full-motion imagery of television quality or higher.
Wall Sign	A single-faced sign attached flush to a building or other structure or a sign consisting of light projected onto a building or other structure. Wall signs do not include signs that are attached to sign structures.
Window Display Sign	A single-faced sign attached flush to a product display window or other window or glazed surface.

PREAMBLE

PREFACE

PURPOSE

The purpose of this document is to provide developers and future plot owners' in Duqm Northern and Central Industrial zones with clear planning framework, design guidelines and plot regulations.

This document provides a simple and straightforward summary of the design guidelines, development control regulations and planning requirements to be followed in the Duqm Industrial Zones.

HOW, WHY & WHO

How to use this document?

The document provides straightforward information to guide the development of Duqm Northern, Central and Southern Industrial zones supported by illustrative charts, diagrams and the different development guidelines adopted by the Duqm Special Economic Zone Authority (SEZAD).

Why is this document needed?

This handbook will provide answers to many plot owners/developers' questions and queries. It will also establish a set of rules and urban guidelines that will ensure creating well designed spaces with integrated building forms and characters.

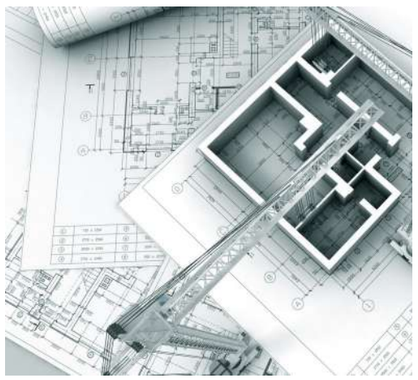
Who should use this document?

This handbook is essential for plot owners of industrial plots and future developers of Duqm Northern and Central Industrial zones. It is also beneficial for consultants, designers and engineers commissioned by plot owners/developers to perform design/construction services for industrial plots, however, Plot Sheets should be referred to for specific plot guidelines.

DOCUMENT STRUCTURE

This document is broken into the following sections:

1. Preamble
2. Introduction
3. Duqm Master plan
4. Light Industry Regulation
5. Medium Industry Regulation
6. Heavy Industry Regulation
7. Renewable Energy Industry Regulations
8. General Architectural Guidelines
9. Utility Regulations
10. Environmental Regulations



1. INTRODUCTION

10

DUQM INDUSTRIAL PROJECT

PROJECT DESCRIPTION

As part of the new industrial port city at Duqm, SEZAD is developing a substantial industrial zone featuring a wide array of industries and logistical uses.

The Duqm Industrial Master plan project is a significant element of national and economic development for the Sultanate of Oman. The development of the Industrial master plan and the Port of Duqm should enhance and significantly improve the capacity of exports of petrochemicals, minerals, and key manufactured goods, which will act to benefit the Omani people.

The subject land is known as Northern, Central and Southern Industrial Zones of Duqm and is shaped like a right-angled triangle located to the north and west of the port of Duqm, inland to the north-west of the existing airport. It is predominately desert landscape with very sparse areas of plants and trees, and is traversed by a series of large wadis, or natural water channels. The proposed area for development is approximately 244 square kilometres.

The project boundary covers the central and northern parts of Duqm industrial area masterplan. The area includes the main highway, internal roads, train route and other facilities that support the industrial area. Currently it is estimated that the public facilities will be a total of 10% of the area (this will be confirmed when further information is available). The industrial area will be considered as 244 km^2 (inclusive of the 10% public facilities area).

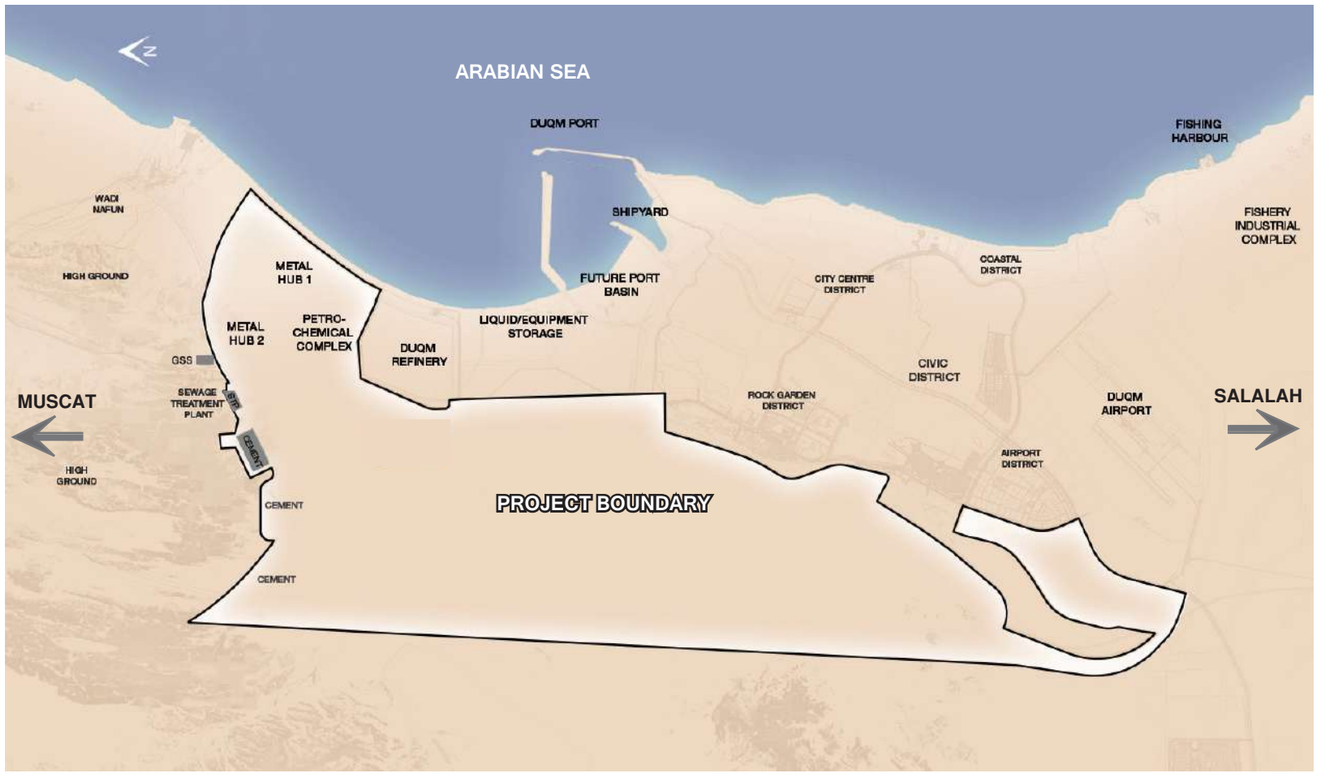


Figure 1 Project Boundary

11

DUQM INDUSTRIAL PROJECT

SEZAD VISION

The following is the vision for the Special Economic Zone at Duqm:

To create a bustling activity zone featuring a wide spectrum of economic activities that have an economic appeal; an attractive business and investment core; an efficient industrial hub for heavy, medium and light industries; an integrated model of economic development; and creates a sustainable economic industrial park

SEZAD OBJECTIVES

The objectives for the Special Economic Zone at Duqm are as follows:

- To facilitate the establishment of a diverse range of industries within the industrial clusters;
- To ensure orderly, economical and beneficial use and development of industrial land;
- To maintain and improve the quality of the built environment;
- To ensure development decisions, now and in the future, reflect the values and needs, wants and desires of the SEZAD and reduce the likelihood of land use conflicts;
- To preserve the natural environment and to reduces and/or mitigates impacts associated with industrial development.

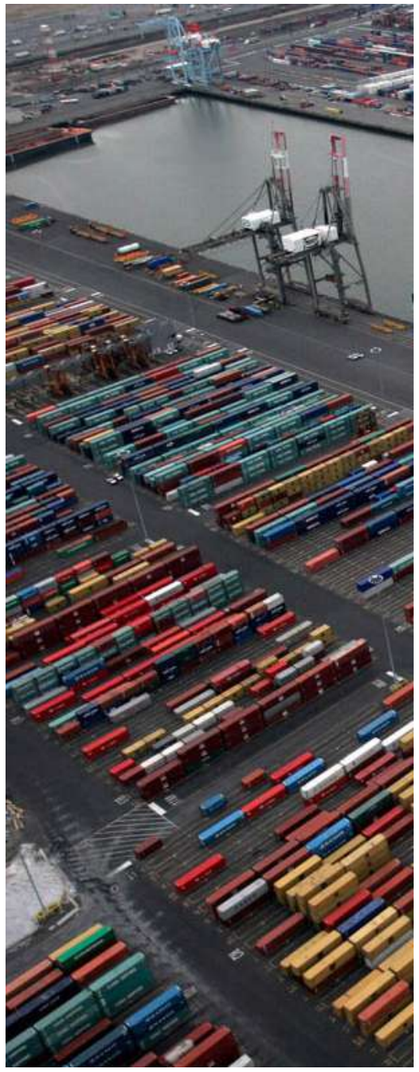
The Al Duqm Industrial Master plan Design Guidelines have been prepared to guide development to achieve the SEZAD Vision and achieve the specified objectives.

DUQM SPECIAL ECONOMIC ZONE AUTHORITY

SEZAD VISION

Inspired to create a world reknowned industrial hub, the Special Economic Zone Authority Duqm (SEZAD) vision for Duqm Industrial City can be summarized by the following:

- A bustling activity zone featuring a wide spectrum of economic activities
- An appealing economic hub
- An attractive business and investment core
- An efficient industrial hub for heavy, medium and light industries
- An integrated model of economic development
- A sustainable economic industrial park



SEZAD

Established by a Royal Decree in 2011, the Duqm Special Economic Zone Authority (SEZAD) is the sole government entity responsible for managing the economic zone. Fundamentally, SEZAD will run, regulate, manage and oversee all economic activities and operations within the Special Economic Zone and will be referred to as the “Authority” in this document.

Furthermore, the role of SEZAD expands beyond the daily complex operations of the economic zone to provide insightful strategic planning for the development of the modern Duqm City. Committed to creating livable spaces, establishing an economically efficient hub and protecting the environment, SEZAD envisions Duqm City to become a popular regional destination offering residential, recreational and investment opportunities.

Under the wise supervision of SEZAD, the Special Economic Zone is set to develop into an attractive business hub, with a wide-ranging economic center and advanced industrial sector appealing to many investors through offering great incentives, simple business transactions and one-stop shop dealings.

13

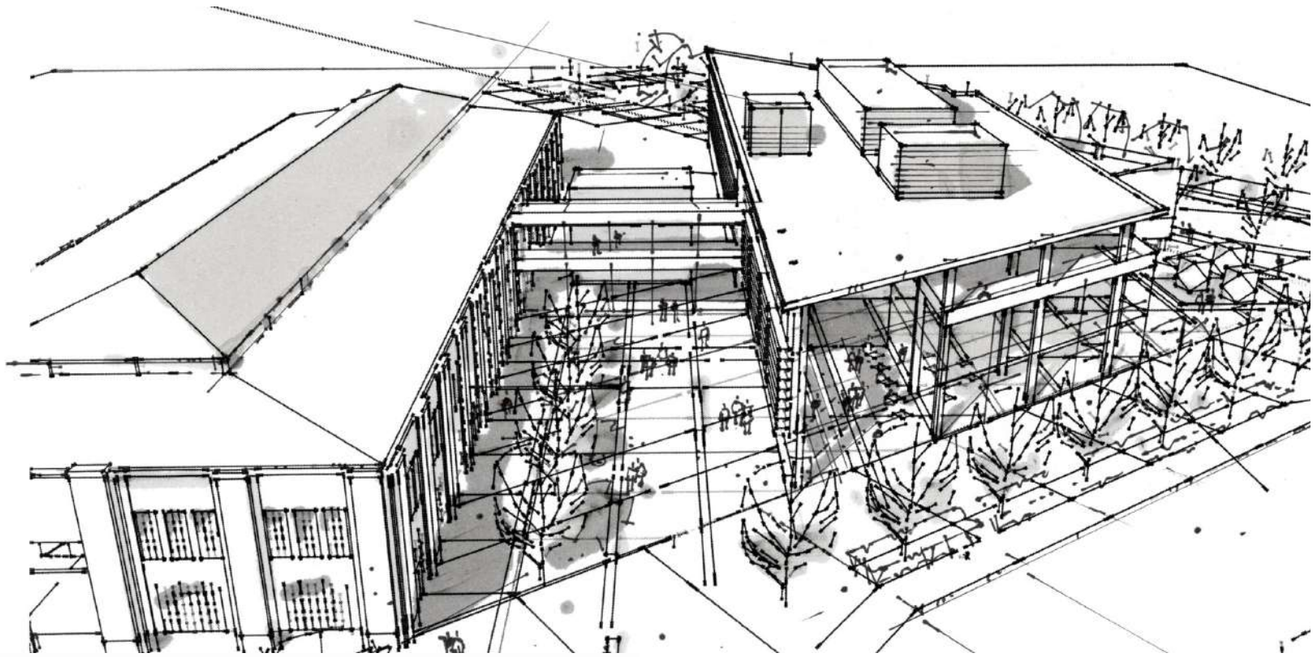
DUQM INDUSTRIAL IDENTITY

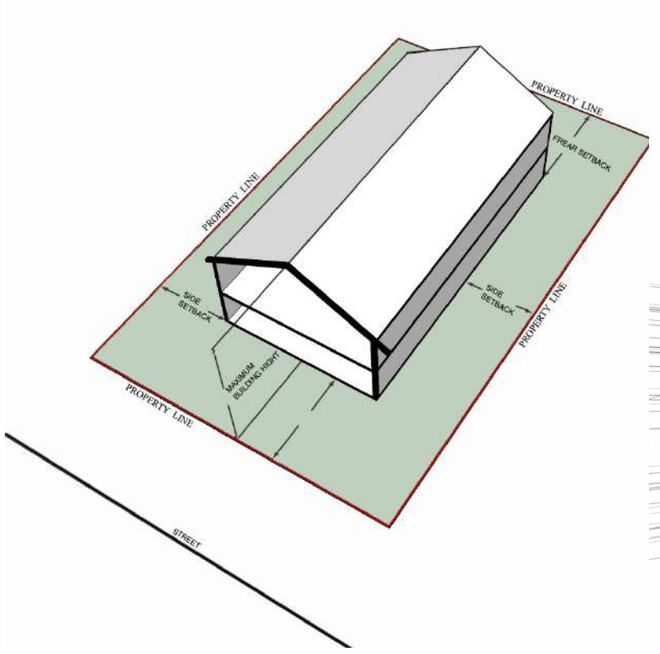
DEVELOPMENT CONTROL REGULATIONS INTENT

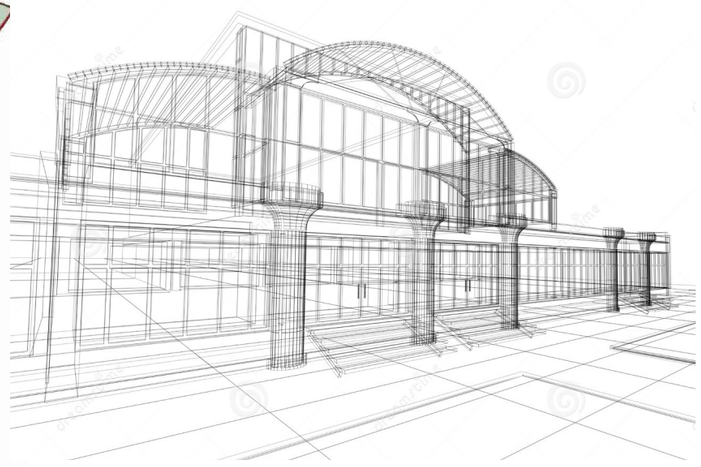
The Duqm Development Regulations are intended to create a well-integrated industrial development with a unified and synchronized urban form to achieve the desirable business image, the bustling industrial vibe and the appealing investment environment sought by SEZAD. Creating an urban identity compatible with the operational nature of the Duqm industrial site and realizing a well-coordinated business environment are the ultimate goals behind these development regulations.

DISCLAIMER

The development control regulations provided within this document provide minimum regulations and shall not be considered as a substitute for internationally accepted codes and standards. Future plot owners, developers and consultants shall refer to internationally recognized building codes, fire, life and safety codes, environmental codes and disability codes.



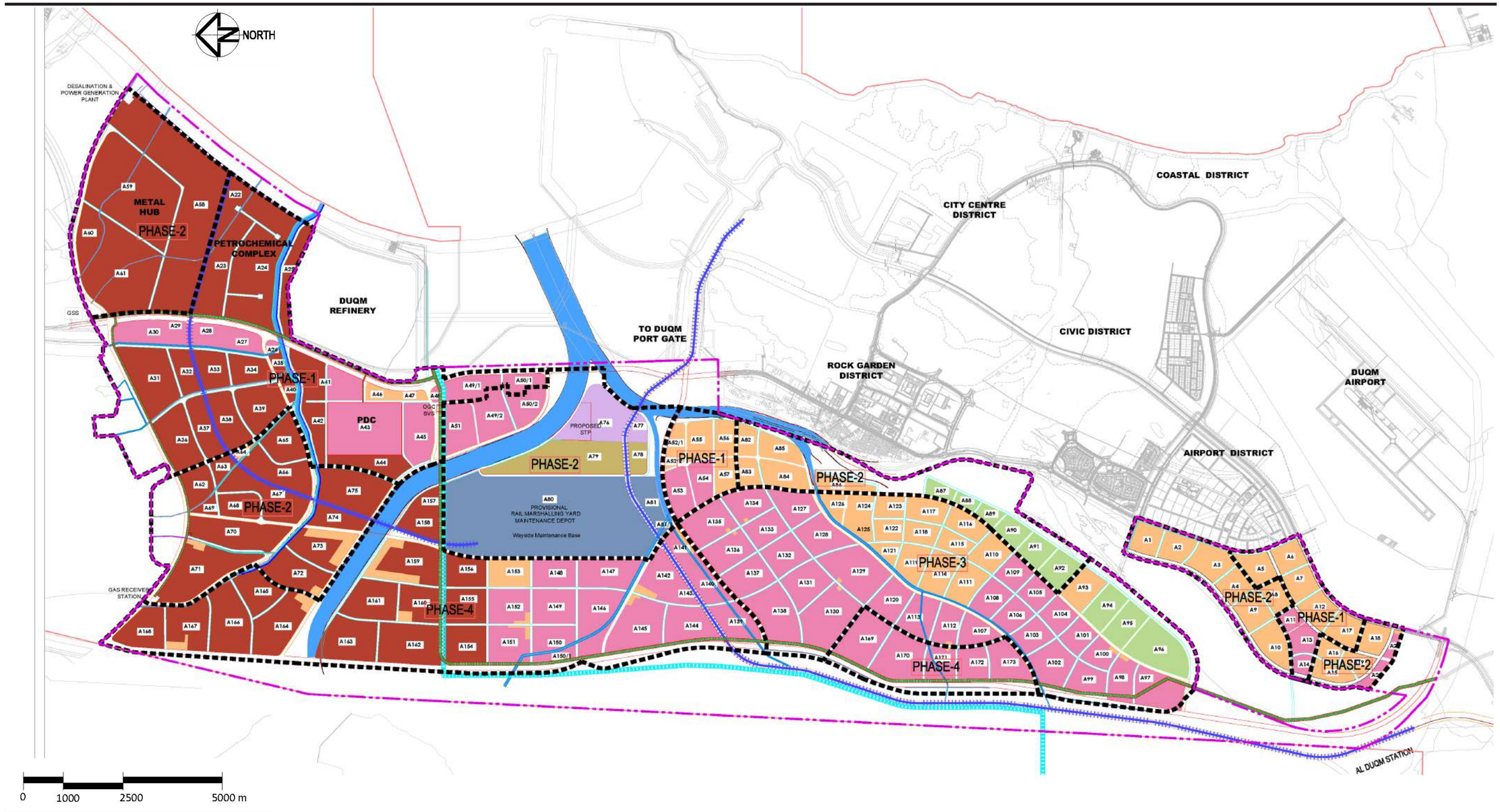




2. DUQM MASTERPLAN

DUQM INDUSTRIAL MASTERPLAN

LAND USE PLAN



DUQM INDUSTRIAL MASTERPLAN

LAND USE BREAKDOWN

Following the feasibility study and the current Duqm Industrial Area Masterplan, Table 1 below summarizes the areas of the various land uses within the project boundary:

PHASE	HEAVY INDUSTRY	MEDIUM INDUSTRY	LIGHT INDUSTRY	SABKHA MED. INDUSTRY	RENEWABLE ENERGY IND.	RAILWAY YARD	UTILITIES HUB	Total Area (km²)
PHASE-1	15.267	8.326	3.710	-	-	-	-	**27.303**
PHASE-2	24.366	2.189	6.349	2.770	2.232	10.576	2.001	**50.483**
PHASE-3	-	20.252	5.365	-	-	-	-	**25.617**
PHASE-4	14.333	13.359	1.328	-	-	-	-	**29.020**
Total Area (km²)	**53.966**	**41.354**	**16.752**	**2.770**	**5.004**	**10.576**	**2.001**	**132.423**

TABLE 1 Area by Land Use and Phase

3. LIGHT INDUSTRY DESIGN GUIDELINES

OVERVIEW

DEFINITION

Light Industry is defined as a zone accommodating a range of light industrial, storage and warehouse land uses which do not create any appreciable nuisance or generate heavy traffic. Light Industry is also more consumer-oriented than business-oriented, since most products are aimed for end use rather than for other industrial uses. The activity and function of the Light Industry typically produce items that are higher in value per unit weight than that of Heavy or Medium Industry.

The requirement for area, the usage of power and the supply and types of raw materials are lesser in Light Industry than in Medium and Heavy Industry.

Clothes, shoes, furniture, consumer electronics and home appliances are examples of Light Industry outputs.

Generally, facilities associated with Light Industry have less of an environmental impact than those associated with Medium and Heavy Industry, hence, are more likely to be zoned closer to residential areas than Medium or Heavy Industries tend. Light Industries are mostly known to have temporary and localized environmental impacts.

PERMITTED USES

PERMITTED USE

WAREHOUSING
- Truck storage
- Warehousing
- Construction storage yard
- Electronic storage center
- Vehicular storage and towing

AGRIBUSINESS
- Food processing
- Trade of agricultural goods and farm inputs
- Offices related to agribusiness
- Wholesale and trade of processed food

MANUFACTURING
- Shoe manufacturing
- Building materials sales
- Cable and wire manufacturing
- Electronic assembly
- Glass cutting and glazing
- Heavy equipment sales and rental
- Jewelry manufacturing
- Laundry facilities
- Light machinery manufacturing
- Machine shops
- Medical and pharmaceutical laboratories
- Metal stamping and extrusion
- Optical goods manufacturing
- Package manufacturing
- Pottery and ceramic manufacturing
- Printing and publishing
- Scientific and precision instrument production
- Sheet metal shops
- Sign painting
- Stone cutting and grinding
- Tool and die shops
- Woodworking and furniture manufacturing

LOGISTICS
- Intermodel freight transport facilities
- Offices related to industrial uses
- Weigh stations
- Accessory uses

OTHER
- Bakery
- Catering establishments
- High technology office
- Light equipment sales and rental
- Offices related to light industrial uses
- Recycling facilities
- Research facilities
- Accessory uses

LIGHT INDUSTRY AREA

Industries and industrial activity is not only the major function, but also, the most prominent in the entire Light Industrial zone. However, other activities and functions such as warehouses, commercial uses, office buildings, retail and community facilities providing service to the entire district may also be located within the Light Industrial Zone. Hence, design guidelines will be provided for all components.

The main land uses within the area zoned as Light Industry:

1- Industries

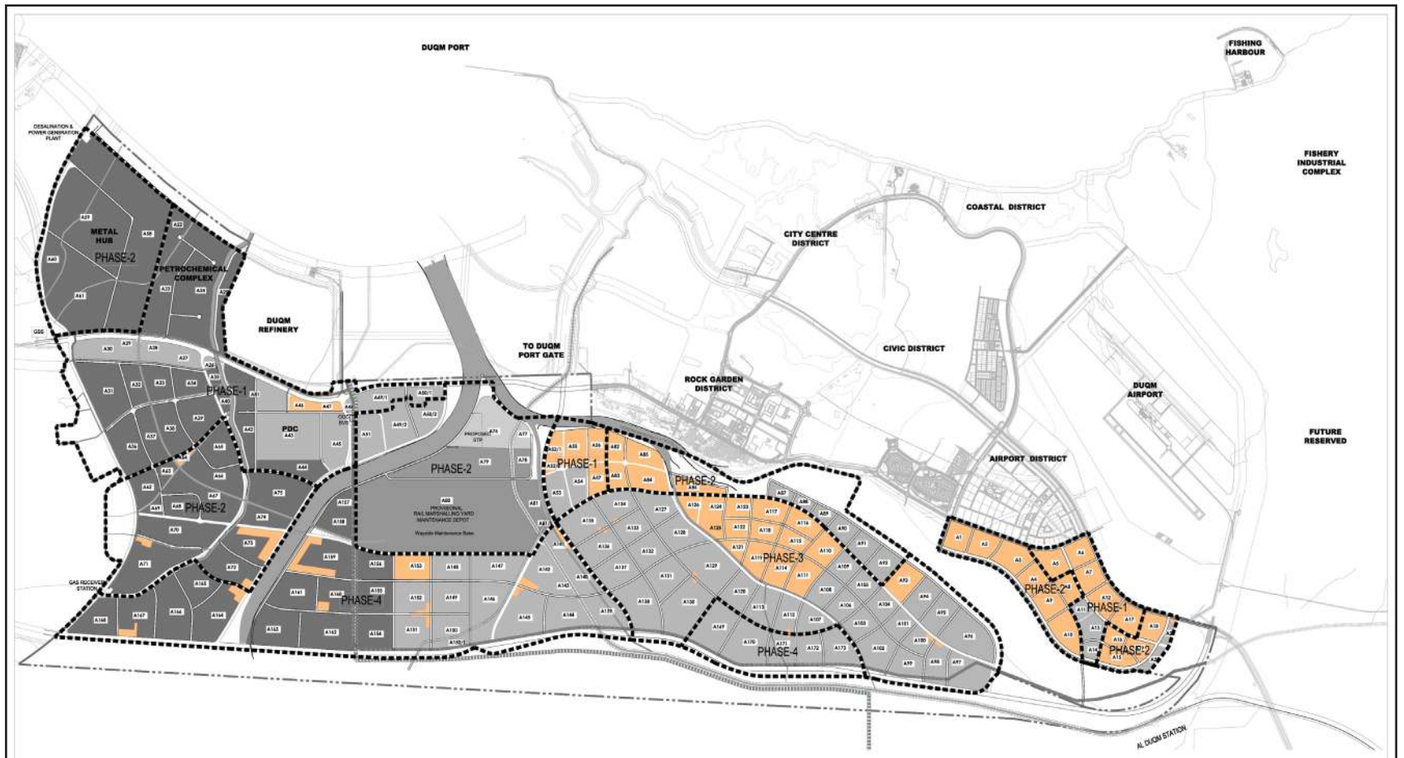
2- Warehousing and logistics

3- Ancillary uses

LAND USE PLAN

The land use plan (Figure 2) indicates the zone designated for the Light Industrial Area. The total area reserved is estimated to be 16.75 km^2, with the largest area concentrated in the far south and the south east of the industrial area while smaller Light Industry zones are scattered throughout the entire industrial development area.

In addition to Light Industrial functions, the Light Industrial Zone covers supporting and ancillary functions, such as office buildings, retail functions, community facilities, warehouses and logistics, which are required to be provided throughout all zones within the Industrial Area, hence the scattering of smaller Light Industrial Zones.



PHASE	HEAVY INDUSTRY	MEDIUM INDUSTRY	LIGHT INDUSTRY	SABKHA MED. INDUSTRY	RENEWABLE ENERGY IND.	RAILWAY YARD	UTILITIES HUB	Total Area (km^2)
PHASE-1	15.267	8.326	3.710	-	-	-	-	27.303
PHASE-2	24.366	2.189	6.349	2.770	2.232	10.576	2.001	50.483
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PHASE-4	14.333	13.359	1.328	-	-	-	-	29.020
Total Area (km^2)	53.966	41.354	16.752	2.770	5.004	10.576	2.001	132.423

LEGEND :
PROJECT BOUNDARY
RAILWAY LINE
PHASING BOUNDARY
DRAINAGE CHANNEL
OGC CORRIDOR
RAECO 132KV CORRIDOR
SEAWATER COOLING CORRIDOR
Date : 12 May 2016

LAND USE
HEAVY INDUSTRY
MEDIUM INDUSTRY
SABKHA MEDIUM INDUSTRY
RAILWAY YARD
LIGHT INDUSTRY
LIGHT INDUSTRY - UNCLEAN
RENEWABLE ENERGY INDUSTRY
UTILITIES HUB

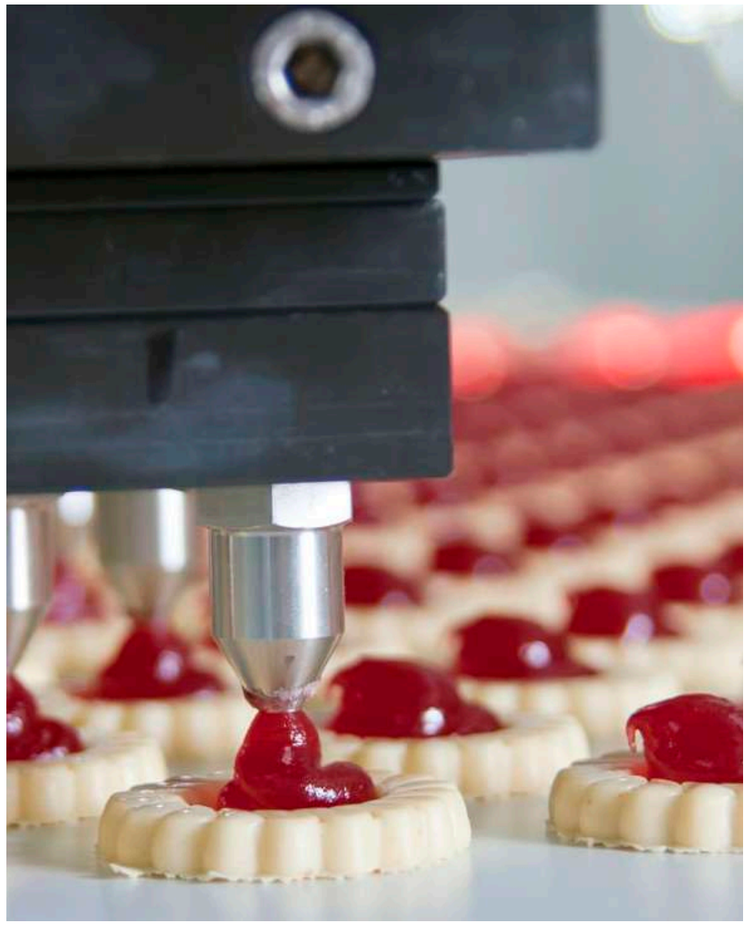
DUQM - LANDUSE & PHASING PLAN

0 1000 2500 5000 m
NORTH

Figure 2 Light Industry

DEVELOPMENT STATISTICS

The Design Statistics section is yet to be completed as it is reliant on information from the final plot sheets. Much of the information that would be contained in the Design Statistics section is included in the overall Design Guidelines. SEZAD to determine whether to include the Design Statistics section in the final Design Guidelines document.



DESIGN GUIDELINES

PLOT ENVELOPE

ACCESS AND CIRCULATION

Vehicle Access:

The location of ingress and egress points for vehicles to and from the plots, the circulation within the plot and the implications of these on public traffic are considered while setting the access and circulation design guidelines. The following parameters shall be followed for car and truck access and circulation within the plot in the Light Industrial Zone:

- Where applicable, access to all plots shall only be from an internal street within a Super Block
- Accesses points and internal roads within each plot shall be paved with hard surfaced material that will sustain heavy vehicle movements
- All buildings on the plots, including all building components, shall be accessible by civil defense and fire department vehicles
- Vehicle driveways within the plot shall be located so as to minimize conflict with pedestrian circulation. Minimum width for one way driveways shall be 4m or 7.3m for two way, while parking ramps and egress and ingress points shall be determined taking into consideration the type of trucks and vehicles required to service the nature of industry on each specific plot given that approvals are granted by SEZAD for the dimensions of these access points
- Ornamental entrance structures, pylons and gateways for vehicle driveways are permitted on plots
- Vehicle driveways shall be located a minimum of 2.0m from fire hydrants, a minimum of 1.0m from street lights and adjacent plot lines while egress and ingress points to be located away from street intersections
- Exits and entrances to the plots shall be adequately provided so as not to create congestion at the entry point or generate queuing or safety issues at public roads. Location of the exits and entrances to the plots are shown in plot sheets and shall be followed
- Truck access and circulation within the plot shall be separated from the passenger car access and circulation
- The minimum lane width is 3.65m with a minimum radii of 10m

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Pedestrian Access:

Pedestrian access points, safety and relationship to the vehicle circulation and the buildings within the plot are considered while scripting the design guidelines so that the vision of a specially designated, clearly defined and well connected pedestrian network is achieved. The following parameters shall be followed for pedestrian circulation within the plots in the Light Industrial Zone:

- Paving material and dimensions of primary pedestrian connections shall differ from those of secondary pedestrian connections
- Pedestrian entrances to buildings shall be clearly defined, visibly marked and easily accessed
- Minimum width of the sidewalk shall be 1.5m in all ROWs and 1.2m within plots.
- Pedestrian connections and walkways shall be safely buffered and protected from vehicular traffic and circulation on plot
- A pedestrian connection shall continuously run from the public pedestrian sidewalk through the parking area pedestrian walkways to the main building pedestrian entrances
- Bicycle racks, if provided, shall be located close to main building pedestrian entrances, however need to be placed so as not to hamper pedestrian traffic

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

SETBACKS

SETBACKS

BACK TO BACK	WITH 50M ROW	WITH 80M ROW
FRONT: **6m** SIDE: **3m** REAR: **4m**	FRONT: **6m** SIDE: **3m** REAR: **7.5m**	FRONT: **6m** SIDE: **3m** REAR: **10m**

Setbacks are specified distances required between the plot boundary and the external face of a building or boundary wall. The purpose of setbacks is to provide privacy for the individual plot owners and provide room for emergency vehicle access. Below are requirements to be followed for the Light Industrial Area plots:

- The setbacks for back to back plots in the Light Industrial Zone with a 30m ROW along the front boundary are shown in the graphic above and in Figure 3
  - The front setback shall be equal to 6m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 3m
  - The rear setback shall be equal to 4m
- The setbacks for plots in the Light Industrial Zone with a 50m ROW along the rear boundary are shown in the graphic above and in Figure 4
  - The front setback shall be equal to 6m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 3m
  - The rear setback shall be equal to 7.5m and shall incorporate a 3m landscape buffer
- The setbacks for plots in the Light Industrial Zone with a 80m ROW along the rear boundary are shown in the graphic above and in Figure 5
  - The front setback shall be equal to 6m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 3m
  - The rear setback shall be equal to 10m and shall incorporate a 3m landscape buffer
- The green buffer is the section of the setback area closest to the plot boundary where only trees may be planted and landscaping applied. On plot storm water drainage strategies that utilize landscape areas, these may be adopted and applied to the buffer section
- The green buffer area along the 30m, 50m, and 80m Right of Way must commence at the plot boundary and continue into the plot
- In case of corner plots (Figure 6) the setbacks shall be applicable on both the sides as per the street hierarchy. Landscape buffer shall also need to be provided on both the edges fronting the road.

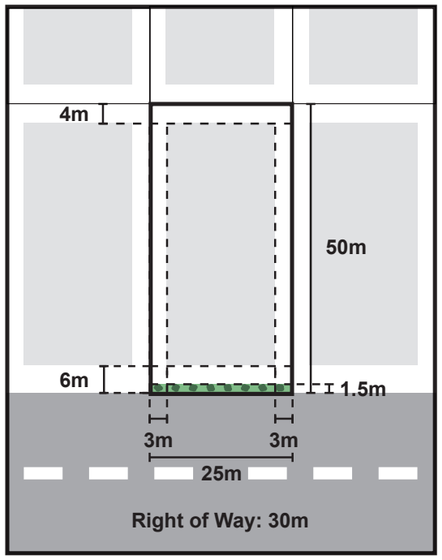


Figure 3 Setback dimensions for Back to Back plot

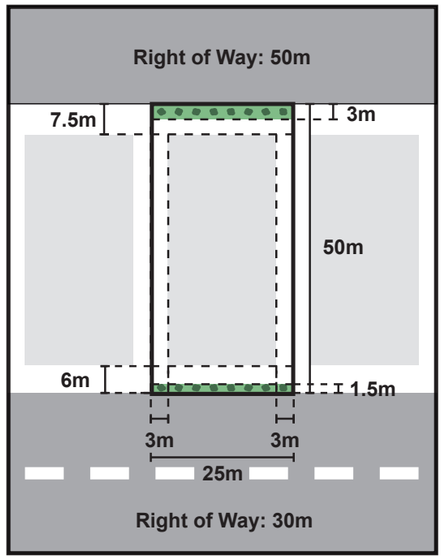


Figure 4 Setback dimensions for plot with 50m ROW

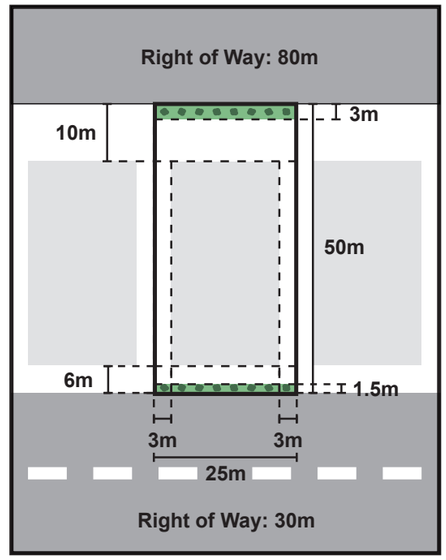


Figure 5 Setback dimensions for plot with 80m ROW

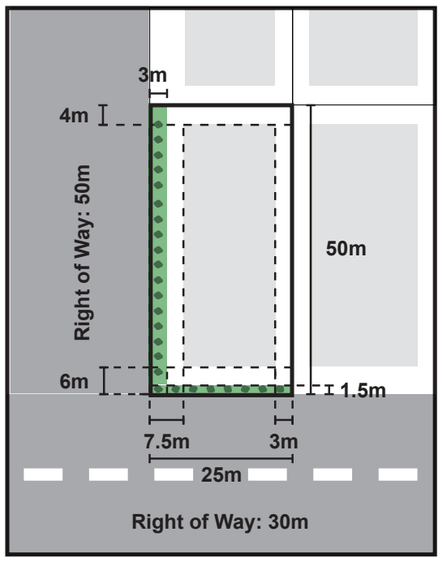


Figure 6 Setback dimensions for corner plots

- The setbacks for corner plots in the Heavy Industrial Zone with a 30m ROW and 100m ROW are shown in the graphic above and Figure 6
  - All setbacks are to follow respective ROW setbacks in previous figures

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Justifiable setback variations may include:

- **Additional landscaping planted to screen development from the street**
- **A landmark architectural development that addresses the street is to be constructed**
- **Parking and major industrial activities are to be located to the rear of the plot**
- **Parking is to located below ground or at ground level with G+1 above**

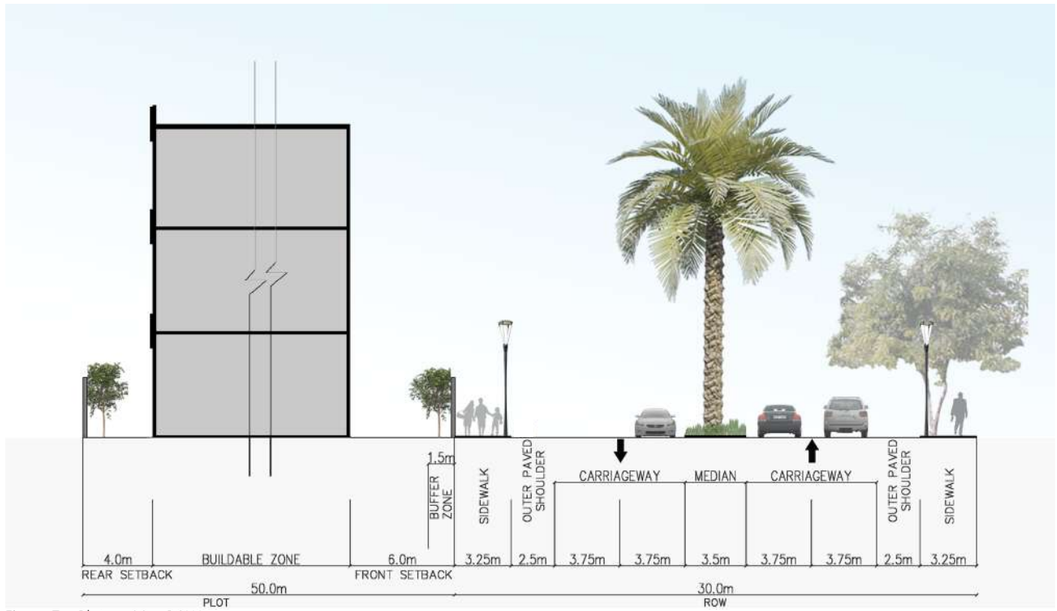


Figure 7 Plot on 30m ROW

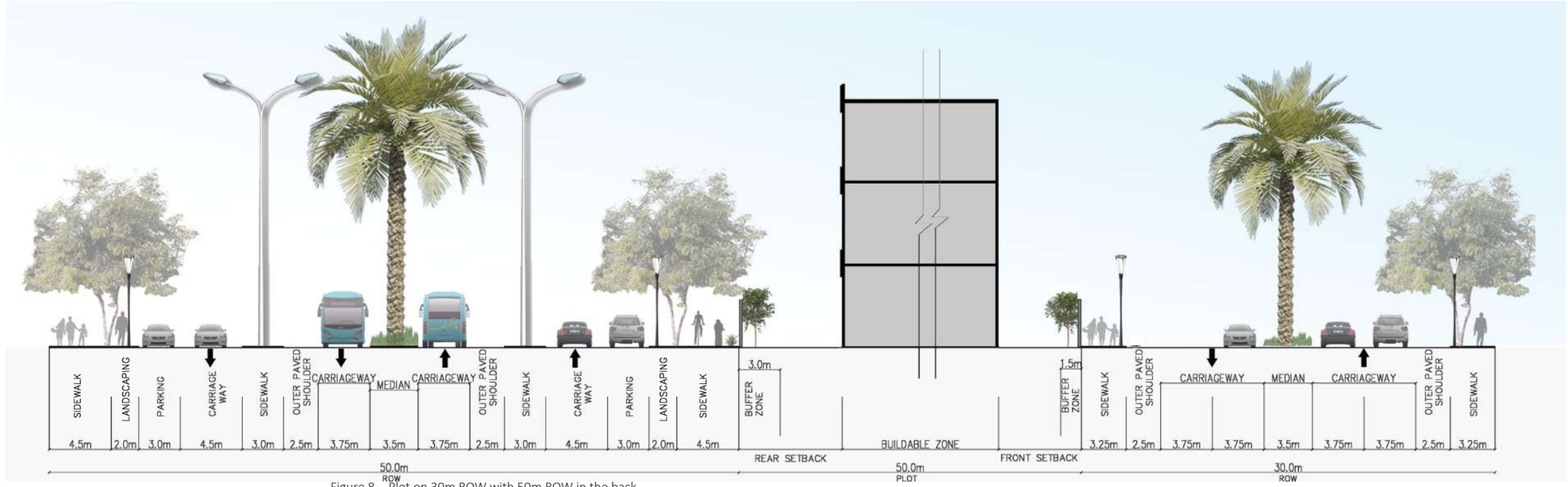


Figure 8 Plot on 30m ROW with 50m ROW in the back

Figure 9 Plot on 30m ROW with 80m ROW in the back

PLOT COVERAGE

PLOT COVERAGE

Building area is not to exceed **60%** of the Plot Area

Plot coverage is the maximum percentage of the plot area permitted to be covered by buildings or structures and is applied to ensure that the built environment within the area is not compromised. The following clarifies the purpose of plot coverage and its value within the area:

- Plot coverage guarantees that no structure abuts the boundary of the plot for lighting, fire prevention and ventilation purposes
- Plot coverage percentage contributes to increasing the height of buildings by limiting the single floor area in order to achieve an appealing urban environment
- Plot coverage percentage is enforced and applied in order to allow for space within the plot for car and truck entering, circulating, loading, parking and exiting
- Plot coverage shall allow for open space, landscaped areas and green buffers as required on plots
- Plot coverage shall allow for civil defense vehicles to enter and access all parts of all structures built on the plots
- Plot coverage for plots within the Light Industrial Zone is not to exceed 60% of the plot area
- The percentage mentioned above includes all buildings within the plot boundaries. Examples include: electrical rooms, substations, guard and storage facilities as well as any light ancillary buildings that may be located within the premises

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

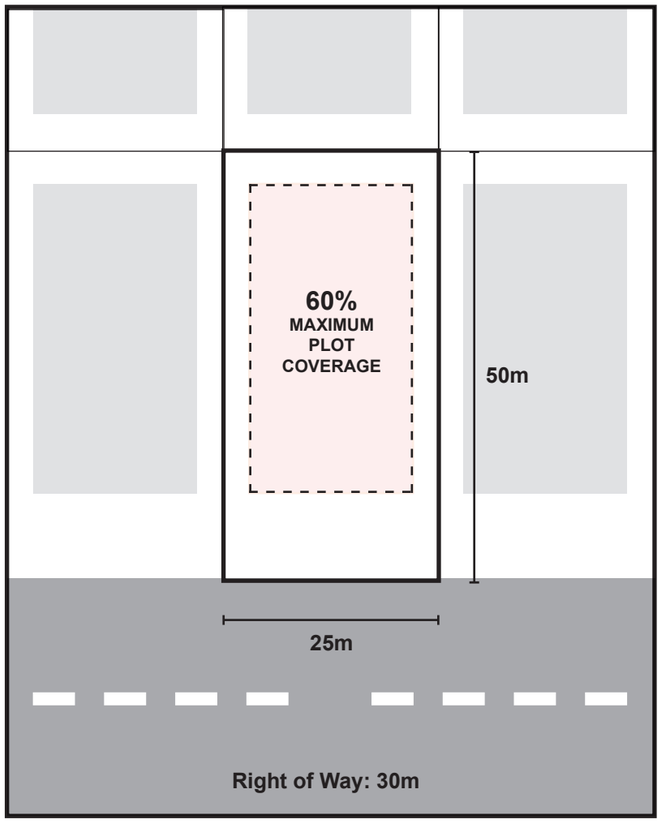


Figure 10 Plot Coverage Representation for Medium Industry

FAR (FLOOR AREA RATIO)

FLOOR AREA RATIO

0.60

The FAR in
Light Industrial Zone
is equal to **0.60**

The Floor Area Ratio directs the intensity of usage and construction on a specific plot. It is related to the volume of all principal built structures on the plot, the plot coverage percentage, the number of floors and the GFA. The Floor Area Ratio is the total area of all floors divided by the total area of the plot.

- The purpose behind applying an FAR is to ensure that the land is optimally utilized while still enabling an attractive built environment to be developed
- The FAR for plots in the Light Industrial Zone is equal to 0.60

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

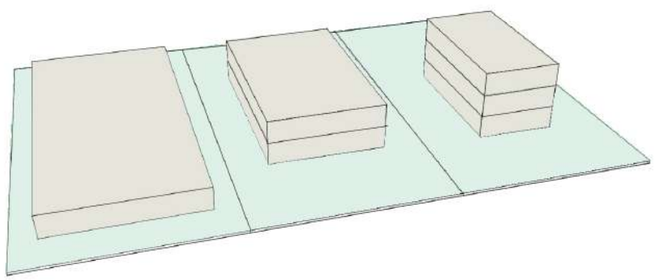


Figure 11 Plot Coverage = 60%, Plot FAR = 0.6, Number of Floors = 1

Figure 12 Plot Coverage = 30%, Plot FAR = 0.6, Number of Floors = 2

Figure 13 Plot Coverage = 20%, Plot FAR = 0.6, Number of Floors = 3

BUILDING HEIGHT

BUILDING HEIGHT

Building Height is equal to **3 floors** maximum height of **18m**

The building height within the Light Industrial Area is to follow the guidelines below in order to create a harmonious, well balanced urban fabric that conveys the character and the vision of the area:

- The total building height allowed on plots located within the Light Industrial Zone is equal to 3 floors measuring a maximum sum of 18m in height
- For specific operational necessities that require exceeding the set height limit, an exception may be made subject to approval. Building heights equal to 50% of the building setback from the property boundary may be filed for approval
- Examples on structures that may be exempt from height limit (upon approval) are chimneys and wind towers
- It is encouraged to express the excess height of the exempt elements in a creative architectural style that would enrich and enhance the character of the area rather than attempting to conceal it
- The ground floor of light industrial development may be raised by 1.2m (maximum) for loading and unloading purposes. The loading docks can be covered but should not be closed on the sides as we do not want this to appear like a building.
- The maximum height for industrial development shall also be 18m. However, the maximum height of each floor shall correspond to the production requirements along with the dimensions of the machinery and the end product.
- Minimum floor to floor height 3.2m with a maximum height of 5.6m for administration buildings

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

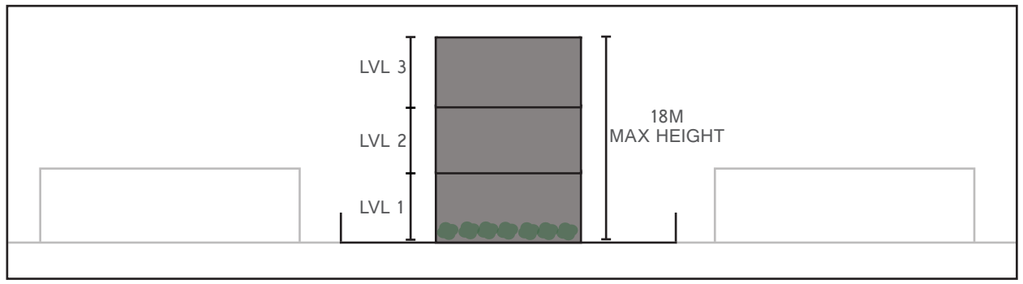


Figure 14 Maximum Building Height for Light Industrial

PLOT SUBDIVISION / AMALGAMATION

PLOT AMALGAMATION

In cases where investors are willing to amalgamate 2 or more plots within the Light Industrial Zone, the following shall be taken into consideration:

- All Light Industrial Zone guidelines shall apply to the amalgamated plots
- The resulting plot shall maintain all external setbacks of the amalgamated boundary so as to preserve the character of the area
- The total GFA allocated for the amalgamated plot shall not exceed the sum GFA of all plots separately
- Accesses and connections to the amalgamated plot shall be based on the approved connections and entrances for the separate plots
- The amalgamation request is subject to the approval of SEZAD

PLOT SUBDIVISION

In cases where investors are willing to subdivide a plot within the Light Industrial Zone, the following shall be taken into consideration:

- All Light Industrial Zone guidelines shall apply to the subdivided plot
- The resulting plot shall maintain all external setbacks of the new boundary as well as additional setbacks from neighboring plots so as to preserve the character of the area and provide sufficient space within the plot for vehicle entrance, circulation and civil defense vehicle accessibility
- The total GFA allocated for the subdivided plot shall not exceed the maximum GFA based on 0.6 FAR
- Accesses and connections to the subdivided plots shall be based on the approved connections and entrances plan
- The resulting plot shall not be less than 1,250m^2 in area with dimensions not less than 25mX50m
- The subdivision request is subject to the approval of SEZAD

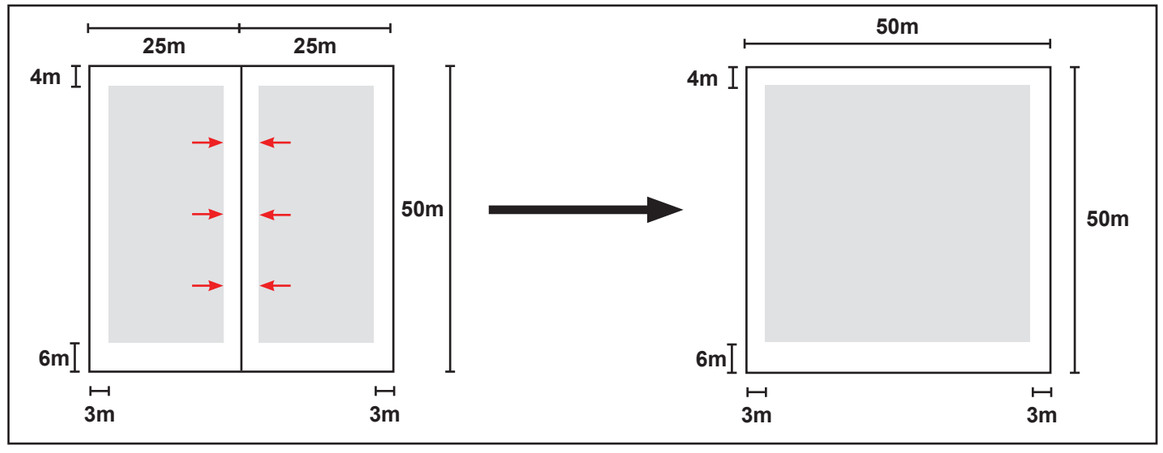


Figure 15 Plot Amalgamation

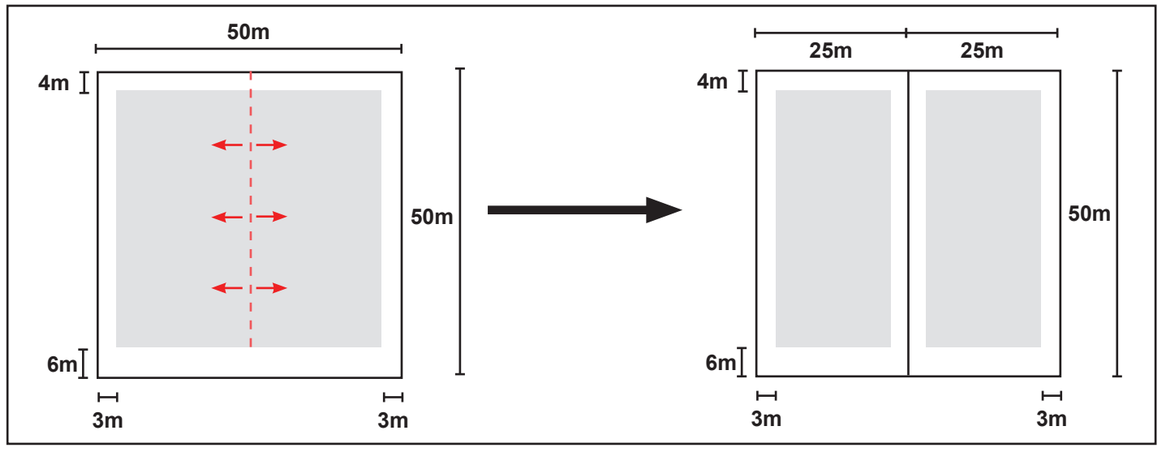


Figure 16 Plot Subdivision

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

PARKING REQUIREMENTS

PARKING REQUIREMENTS

RETAIL

SHOPS & RETAIL
1 SPACE
per 45sqm GFA

SUPERMARKET
1 SPACE
per 25sqm GFA

OFFICE
1 SPACE
per 60sqm GFA

INDUSTRIAL

FACTORIES
1 SPACE
per 250sqm GFA

WAREHOUSES
1 SPACE
per 250sqm GFA

LIGHT INDUSTRIES
1 SPACE
per 250sqm GFA

Plot parking for vehicles within the entire industrial area is to be provided either within enclosed buildings or on designated areas. Parking shall be consistent with the parking standards and requirements and shall follow the guidelines below:

- On street parking is provided for cars only
- All parking areas are to be at least 1.5m setback from the edge of any building, so as to allow for open space, walkways and overhangs
- Car parking and circulation shall be separate from truck parking and circulation
- Plot access and distance from junctions shall be designed in agreement with SEZAD highway design standards taking into account visibility and other safety issues
- No parking spaces shall be located near natural ventilation or air intake on the plot
- It is recommended to locate the primary parking area to the side or the rear of the plot
- If the plot is located on more than one road, the access to the plot shall be provided from the minor road (30m ROW) maintaining that all accesses shall be from within the super block
- One tree for every six parking bays shall be provided within the parking areas to provide shade
- Parking areas shall be screened from the public view
- Entrances and exits to and from parking and loading facilities shall be appropriately marked with clear directional signs
- If community facility plots have more than one road frontage, then vehicular and pedestrian access shall be provided from each road
- Disabled Parking Bays to be located to the closest point of access to the main administration building via the car park at a rate of 1 bay for every 25 standard bays
- For truck parking requirements, it is the responsibility of the developer to provide what they need and for the Authority to review and approve
- Ramps must comply with Oman Highway Design

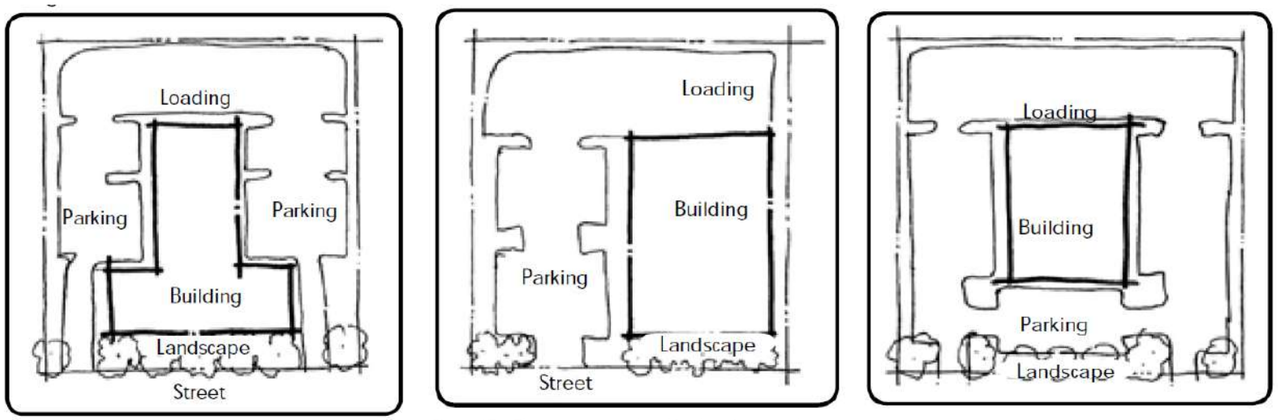


Figure 17 Three encouraged parking location samples

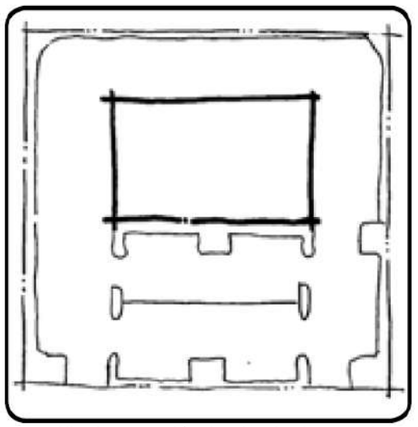


Figure 18 Discouraged front parking location sample

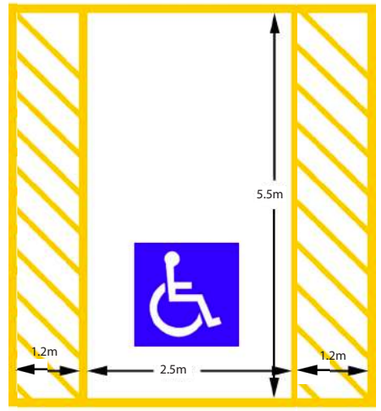


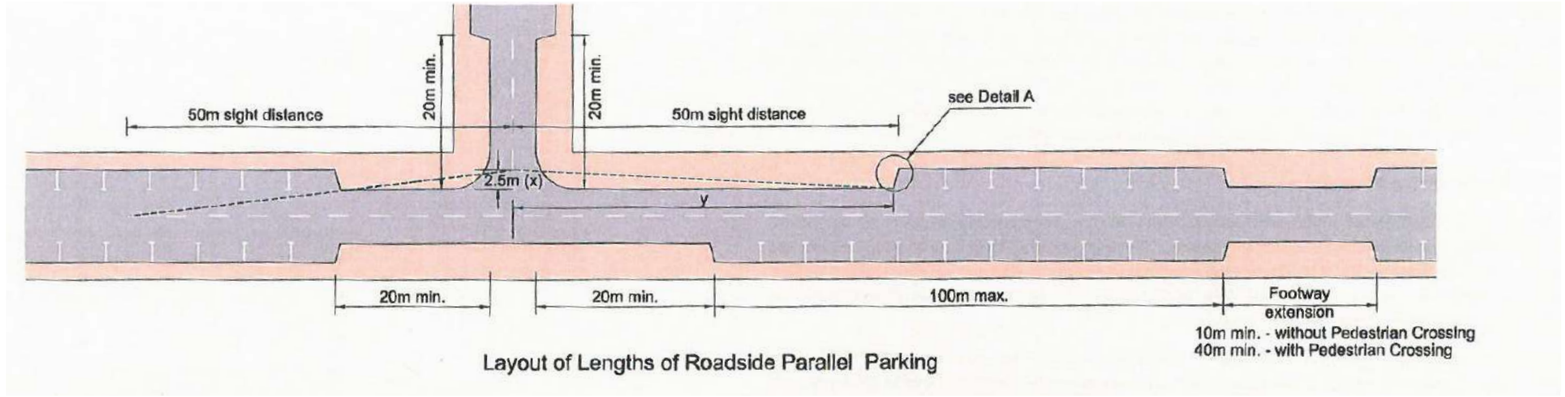
Figure 19 Disabled Parking Bays dimensions

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Exemptions/reductions in parking may be considered if:

- **Premises are to be semi or fully automated and therefore will have a reduced number of employees**
- **Employees are transferred to and from the site via communal transport vehicles such as buses**

PARKING REQUIREMENTS



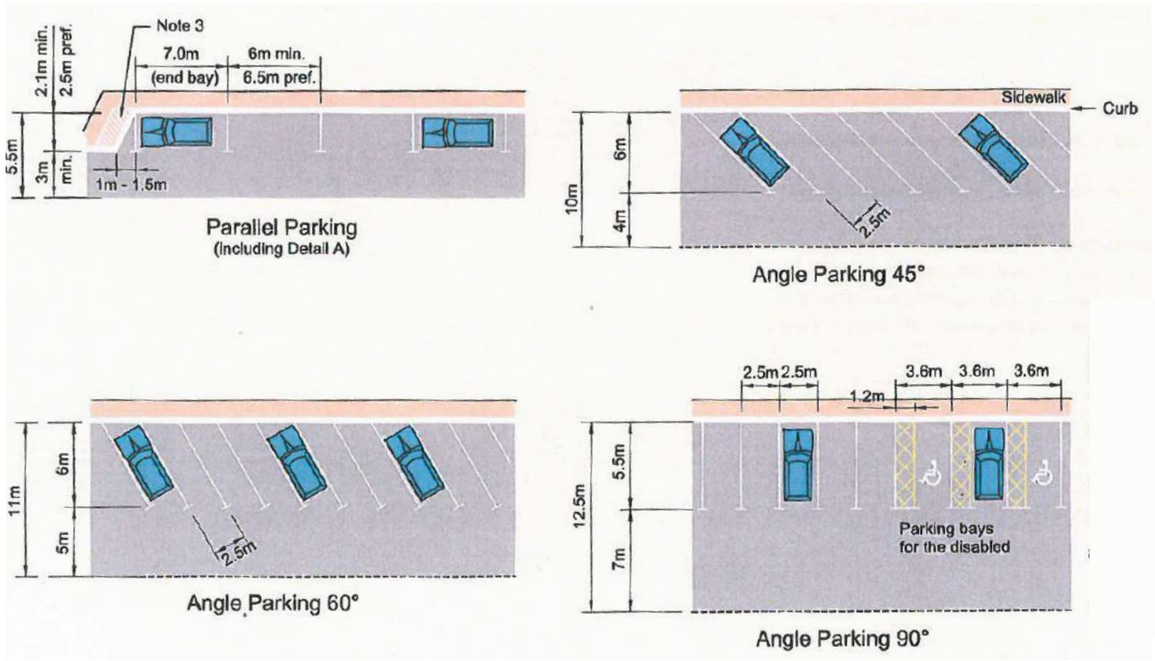
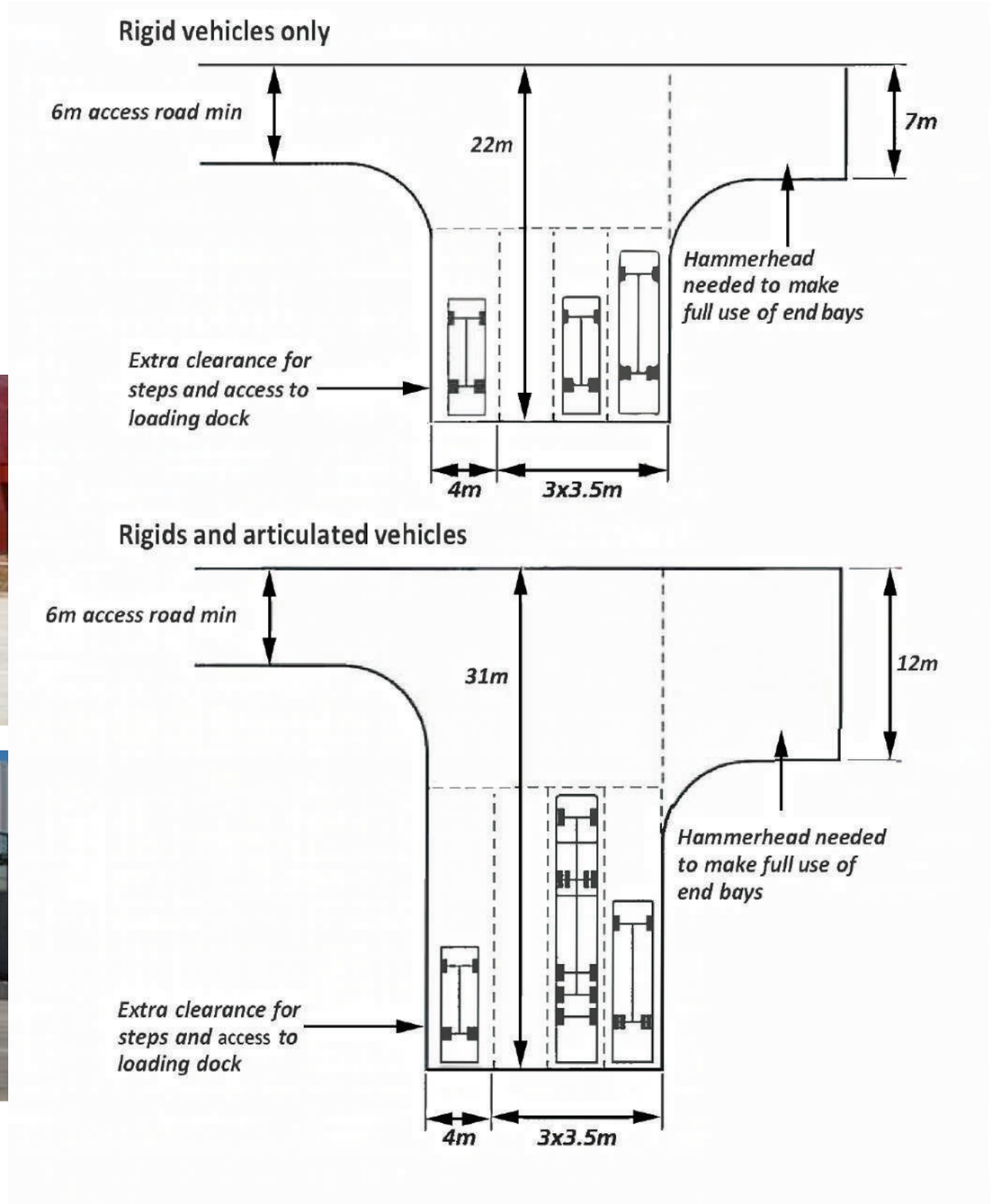


Figure 20 Standards for different types of parking

LOADING/UNLOADING

- In order to avoid traffic congestion in between buildings and to achieve a smooth circulation system within the plot, loading docks and facilities shall be located at the rear of the building and not the front or the sides
- Loading areas shall be screened from public view
- Loading areas shall be offset from vehicle driveways into the plot
- Loading areas are to be designed to accommodate the maximum sized vehicle that will utilize the facility
- Loading areas shall provide sufficient internal turning space to enable vehicles to exit the plot in forward gear
- Vehicles shall enter and exit the plot in forward gear
- Maximum height to raised loading bay is 1.2m



BOUNDARY WALLS

BOUNDARY WALLS

Min height: **3m**
Max height: **4.5m**

Boundary walls serve several purposes within industrial areas; they act as screening to loading/unloading areas, vehicles and utility functions on the plot while also acting as a security element where needed.

- Boundary walls shall surround all plots within the Light Industrial Zone
- Boundary wall structure and foundation to reamin within the respective plots
- Walls are to be of a solid material on the sides and the rear of the plots while a 2m wrought iron simple linear element in black matt finish shall be installed along the frontage of the plot on top of a 1m solid wall base
- The minimum height of a perimeter wall is 3m
- The maximum height of a perimeter wall is 4.5m
- For the frontage of the plots, the solid bottom of the perimeter wall is 1m high while the remainder is reserved for open fencing
- The use of barbed wire fencing is prohibited
- Boundary walls shall be constructed out of durable materials that reflect the architectural character of the area and complement the surrounding walls, buildings and structures
- In case of expanses of boundary walls longer than 30m, articulation and architectural elements shall be applied in order to prevent monotony

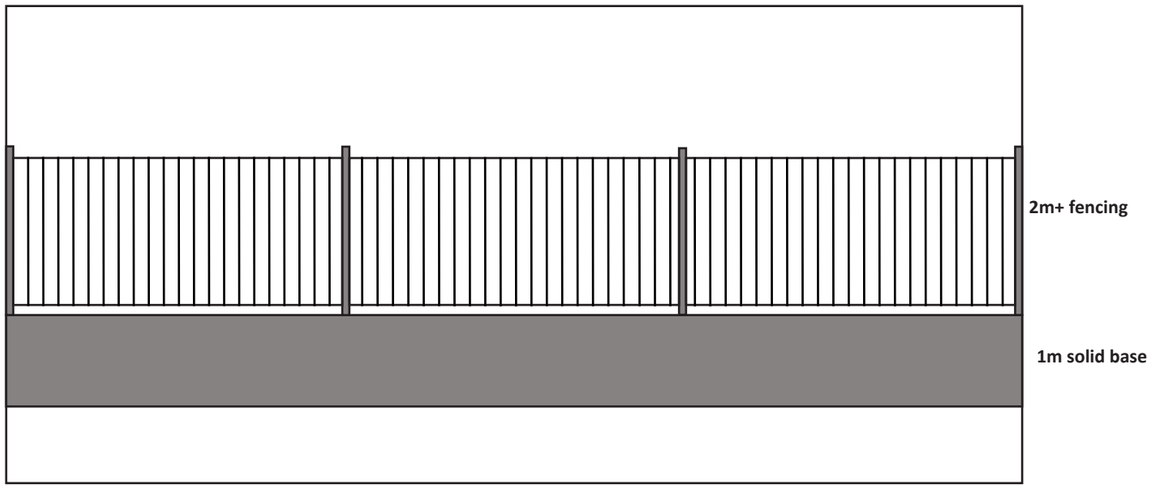


Figure 21 Frontage boundary wall facade

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

A landowner can only build boundary walls on their own property, unless an agreement is reached with an adjoining landowner. Landowners are encouraged to prevent two walls being built adjoining each other and thus are recommended to agree to a cost sharing agreement with neighbors and build half on each other's land. If an adjoining landowner is not available then the first owner is required to build a boundary wall on their own land.

LANDSCAPING

LANDSCAPE

Minimum of **10%** of plot area to be landscaped

A specific percentage of each plot within the Industrial Area is to be allocated for landscaping for the purpose of providing a visual amenity that will contribute to the environmental quality and lend a unified and embracing character to the area. In order to achieve this, the following shall be undertaken:

- A minimum of 10% of the plot area shall be reserved for landscaping
- Planting materials shall consist of native or 'adapted to the local climate' species
- Turf areas shall be limited to 10% of the total on plot landscaped area
- Sustainable irrigation methods and technologies such as drip irrigation, moisture sensors and centralized programming and monitoring shall be considered for all planting areas
- A minimum of 25% of the total setback area facing the 30m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 25% of the total setback area facing the 50m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 25% of the total setback area facing the 80m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- Should retention ponds be required, a design that complements the landscaping theme shall be adopted
- The design of the landscape shall take into consideration the type of areas to be landscaped by providing visual appeal to key areas (e.g. entrances, walkways) while aiming to use cost effective design solutions to secondary areas (e.g. loading area)
- Shade trees shall be incorporated within vehicle parking areas to provide shade and visual appeal at a rate of one tree for every six bays minimum
- Shade trees shall be incorporated into buffer areas, close to the street in order to contribute to creating a harmonious and appealing streetscape while also providing shade to pedestrians

STORMWATER MANAGEMENT AND DRAINAGE

Plot owners are responsible for storm water management. An on site strategy shall be adopted for retaining and managing stormwater for reuse in buildings or for landscaping purposes.

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

4. MEDIUM INDUSTRY DESIGN GUIDELINES

OVERVIEW

DEFINITION

Medium Industry has the physical characteristics of requiring medium-sized infrastructure, with space customized for medium to large scale plants. It involves the processing of minerals or other material on a smaller scale than Heavy Industry, and producing smaller sized, rather than heavy products. Large equipment and facilities, (such as heavy equipment, large machine tools, and huge buildings), are still characteristic, but less than what is typical of Heavy Industry.

Examples of Medium Industry includes refinement and production of steel, polymers, and other processed products.

Medium scale industries are more often less polluting than heavy industries. However, this is not always the case and hence it is important that each industry (even if classified as medium) be assessed on a case by case basis. Impacts from medium scale industries are usually limited to the project boundaries only and could range from temporary to permanent adverse impacts. Mitigation measures are industry specific and require some level of environmental assessment prior to authorising approval of such industries.

The location for medium manufacturing generally accommodates industrial development with minimal on-site air emissions. This level of industrial use can potentially impact areas in close proximity, but not beyond.

Medium Industry “Sabkha” is the land predominately of poor stability and complicated construction problems such as large concentration of salts, increasing compressibility, reducing shear strength, and other associated problems.

Land with ‘Sabkha’ soil characteristics shall have industries with limited or zero vibration activities.

PERMITTED USES

Permitted uses are functions and operations that are authorized and approved to be located on a plot within the Medium Industry Area and that are considered suitable within the context and correspond to the vision of the area.

The following uses are permitted in areas designated by land use as a medium industrial plot. All other uses are prohibited.

PERMITTED USE

MANUFACTURING USE
- Food and Beverages
- Base Metals
- Logistics
- Transport Equipment
- Minerals
- Chemicals
- Workshops/Showrooms
- Motor Vehicles, Trailers, Parts
- Other Transport Equipment
- Electric Machinery
- Machinery, Equipment, Appliances
- Rubber and Plastic Products
- Fabricated Metal Products
- Printing and Publishing

MANUFACTURING AND STORAGE USE
- To transform materials into products.

TRANSPORT AND STORAGE USE
- Storage Warehouse, Storage Yard,
- Bus Terminal, Truck Terminal or Courier
- Depot, Weighing/Inspection Station and Workshops
- Storage Warehouse
- Storage Yard
- Bus Terminal
- Truck Terminal or Courier Depot
- Weighing or Inspection Station
- Workshops

SERVICE USE
- Base Metals
- Food and Beverages
- Logistics

OTHER USES
- Showrooms
- Ancillary Office
- Cafeteria
- Prayer Room
- Meeting Room

LAND USE PLAN

To guide land use planning and help industrialists select suitable industrial premises, industries are classified under 3 categories, namely light, medium and heavy industries based on the impact of residual emissions of fumes, dust and noise on surrounding land uses.

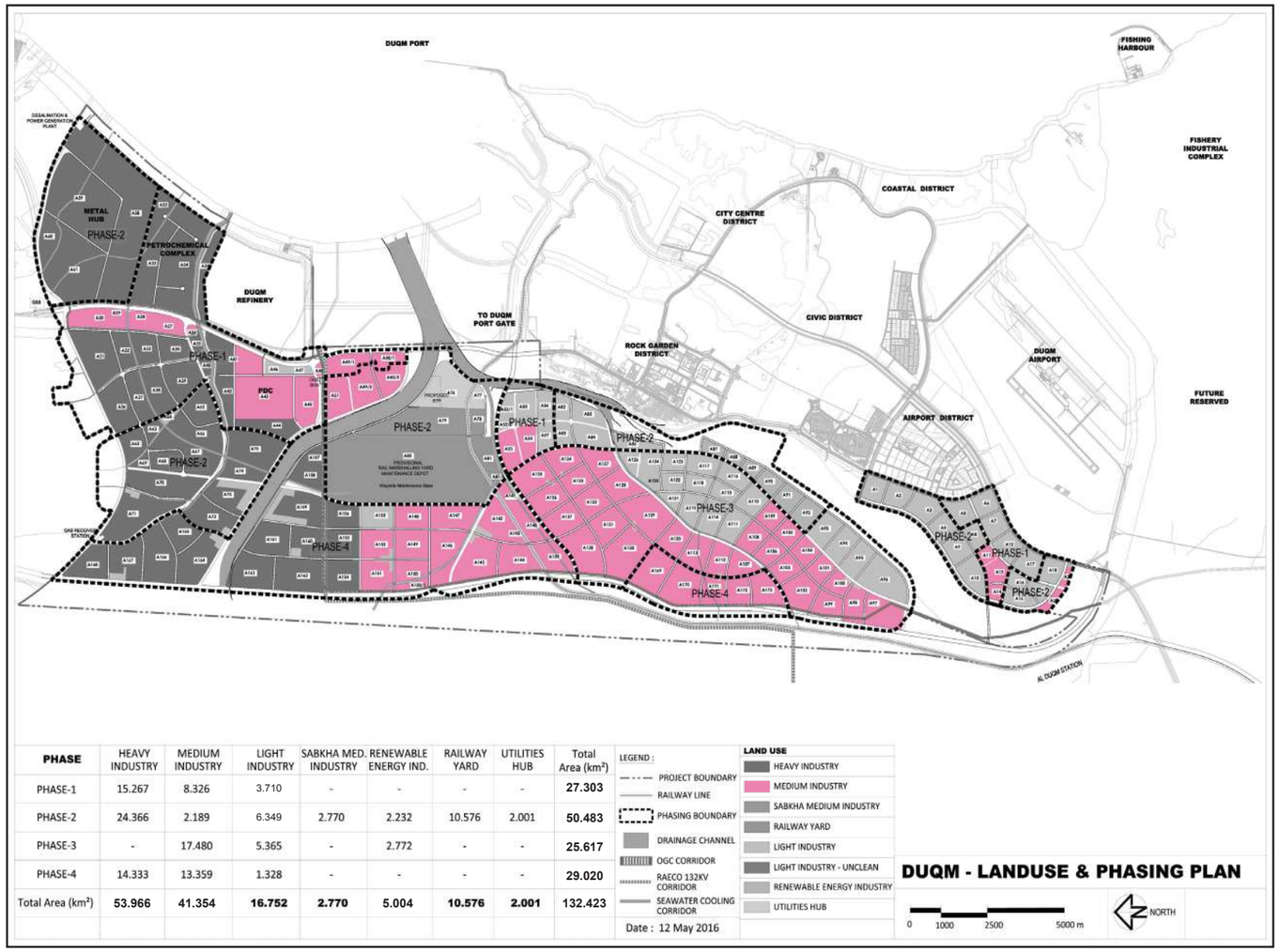
Depending on their scale of operations, food industries are also classified into light, medium or heavy category. However, in order to prevent cross contamination due to residual emissions from neighboring premises, food industries shall be sited in industrial premises in areas designated as 'food zones' or in areas with compatible industrial uses.

Industries are not homogeneous and are traditionally classified on the basis of their potential for pollution i.e. residual emissions of fumes, dust, and noise on surrounding land use.

The Land Use Plan shows the zones designated for the Medium Industry Uses. The total area reserved is estimated to be 41.36 km^2.

The largest medium industry zones are concentrated in the central areas, while smaller medium industry quarters are spread at both the northern and far southern areas of the industrial zone.

In addition to Medium Industry functions, the general layout of the project covers supporting and ancillary functions, such as (office buildings, retail functions, community facilities, warehouses and logistics) which are necessary throughout all zones within the Industrial Area.



PHASE	HEAVY INDUSTRY	MEDIUM INDUSTRY	LIGHT INDUSTRY	SABKHA MED. INDUSTRY	RENEWABLE ENERGY IND.	RAILWAY YARD	UTILITIES HUB	Total Area (km^2)
PHASE-1	15.267	8.326	3.710	-	-	-	-	27.303
PHASE-2	24.366	2.189	6.349	2.770	2.232	10.576	2.001	50.483
PHASE-3	-	17.480	5.365	-	2.772	-	-	25.617
PHASE-4	14.333	13.359	1.328	-	-	-	-	29.020
Total Area (km^2)	**53.966**	**41.354**	**16.752**	**2.770**	**5.004**	**10.576**	**2.001**	132.423

LEGEND :
PROJECT BOUNDARY
RAILWAY LINE
PHASING BOUNDARY
DRAINAGE CHANNEL
OGC CORRIDOR
RAECO 132KV CORRIDOR
SEAWATER COOLING CORRIDOR
Date : 12 May 2016

LAND USE
HEAVY INDUSTRY
MEDIUM INDUSTRY
SABKHA MEDIUM INDUSTRY
RAILWAY YARD
LIGHT INDUSTRY
LIGHT INDUSTRY - UNCLEAN
RENEWABLE ENERGY INDUSTRY
UTILITIES HUB

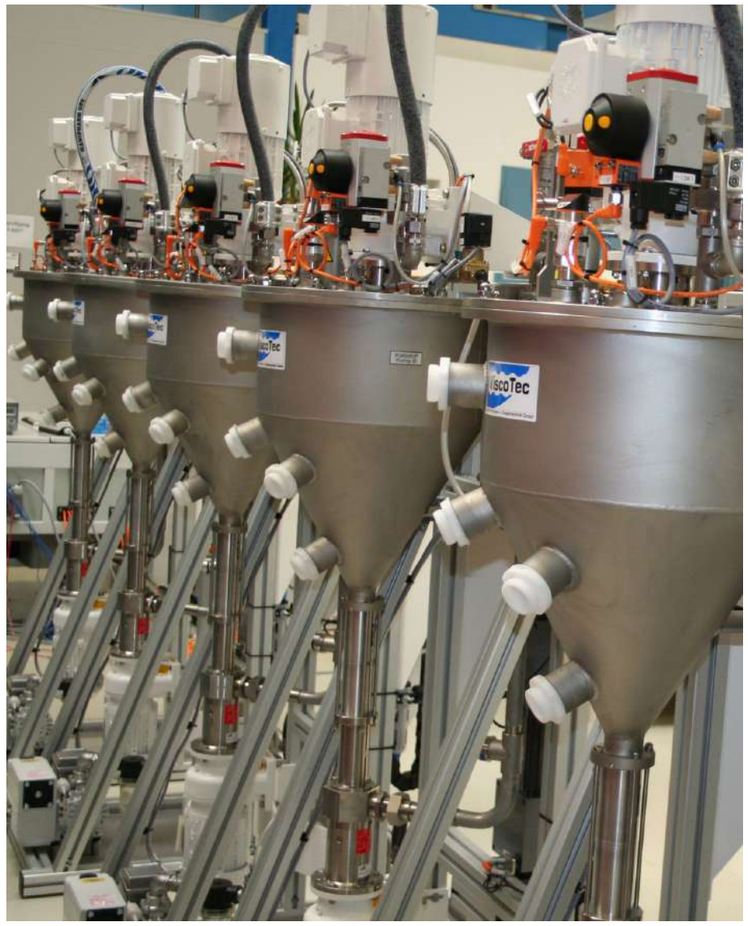
DUQM - LANDUSE & PHASING PLAN

0 1000 2500 5000 m
NORTH

Figure 22 Medium Industry

DEVELOPMENT STATISTICS

The Design Statistics section is yet to be completed as it is reliant on information from the final plot sheets. Much of the information that would be contained in the Design Statistics section is included in the overall Design Guidelines. SEZAD to determine whether to include the Design Statistics section in the final Design Guidelines document.



DESIGN GUIDELINES

PLOT ENVELOPE

ACCESS AND CIRCULATION

Vehicle Access:

The location of ingress and egress point of vehicles to and from the plots, the circulation within the plot and the implications of those on public traffic are considered while setting the access and circulation design guidelines. The following parameters shall be followed for car and truck access and circulation within the plot in the Medium Industrial Zone:

- Access to all plots shall only be from an internal street within a Super Block
- Access points and internal roads within each plot shall be paved with hard surfaced material suitable for heavy vehicle use
- All buildings on the plots including all building parts shall be accessible by civil defense and fire department vehicles
- Vehicle driveways within the plot shall be located so as to minimize conflict with pedestrian circulation. Minimum width for driveways shall be 4m for a one way driveway and 7.3m for a two way, while parking ramps and egress and ingress points shall be determined taking into consideration the type of trucks and vehicles required to service the nature of industry on each specific plot given that approvals are granted by SEZAD for the dimensions of these access points
- Ornamental entrance structures, pylons and gateways for vehicle driveways are permitted on plots
- Vehicle driveways shall be located a minimum of 2.0m from fire hydrants, a minimum of 1.0m from street lights and adjacent plot lines while egress and ingress points to be located away from street intersections
- Exits and entrances to the plots shall be adequately provided so as not to create congestion at the entry point or generate queuing or safety issues at public roads. Location of the exits and entrances to the plots are shown in plot sheets and shall be followed
- Truck access and circulation within the plot shall be separated than the passenger car access and circulation
- It is recommended within the Medium Industrial Zone to secure the perimeter and regulate entry by providing controlled guarded entrances and checks at all plot accesses
- The minimum lane width is 3.65m with a minimum radii of 10m

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

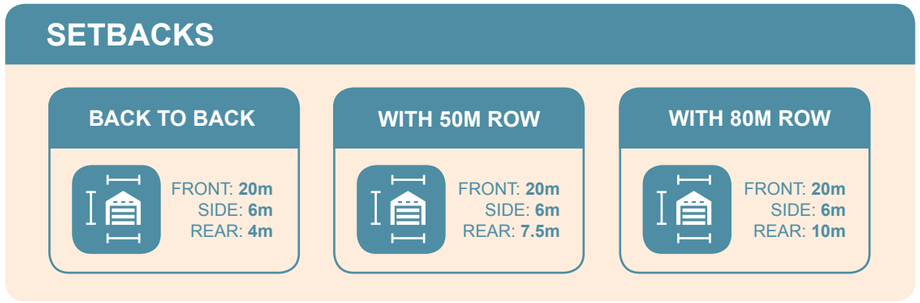
Pedestrian Access:

Pedestrian access points, safety and relationship to the vehicle circulation and the buildings within the plot are considered while scripting the design guidelines so that the vision of a specially designated, clearly defined and well connected pedestrian network is achieved. The following parameters shall be followed for pedestrian circulation within the plots in the Medium Industrial Zone:

- Paving material and dimensions of primary pedestrian connections shall differ from those of secondary pedestrian connections and shall be of a material catered for pedestrian use
- Pedestrian entrances to buildings shall be clearly defined, visibly marked and easily accessed
- Pedestrian connections and walkways shall be safely buffered and protected from vehicular traffic and circulation on plot
- A pedestrian connection shall continuously run from the public pedestrian sidewalk through the parking area to the main building pedestrian entrances
- Minimum width of the sidewalk shall be 1.5m in all ROWs and 1.2m within plots.
- Bicycle racks, if provided, shall be located close to the main building pedestrian entrances, however need to be placed in a way so as not to hamper pedestrian traffic

DESIGN GUIDELINES

SETBACKS



Setbacks are specified distances required between the plot boundary and the external face of a building or boundary wall. The purpose of setbacks is to provide privacy for the individual plot owners and provide room for emergency vehicle access. Below are requirements to be followed for the Medium Industrial Area plots:

- The setbacks for back to back plots in the Medium Industrial Zone are shown in the graphic above and in Figure 23
  - The front setback shall be equal to 20m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 6m
  - The rear setback shall be equal to 4m
- The setbacks for plots in the Medium Industrial Zone with a 50m ROW along the rear are shown in the graphic above and in Figure 24
  - The front setback shall be equal to 20m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 6m
  - The rear setback shall be equal to 7.5m and shall incorporate a 2m landscape buffer
- The setbacks for plots in the Medium Industrial Zone with a 80m ROW along the back are shown in the graphic above and in Figure 25
  - The front setback shall be equal to 20m and shall incorporate a 1.5m landscape buffer
  - The side setback shall be equal to 6m
  - The rear setback shall be equal to 10m and shall incorporate a 3m landscape buffer
- The green buffer is the section of the setback area closest to the plot boundary where only trees could be planted and landscaping applied. Plot storm water drainage strategies that utilize landscape areas could be adopted and applied within the buffer section
- The green buffer area along the 30m, 50m, and 80m Right of Way must start at the plot boundary and continue into the plot

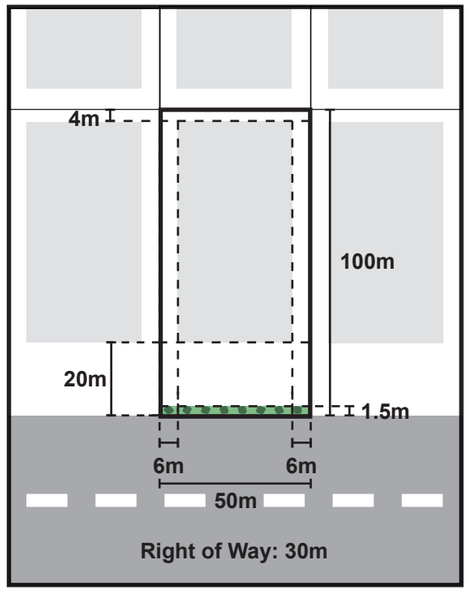


Figure 23 Setbacks for Back to Back plot

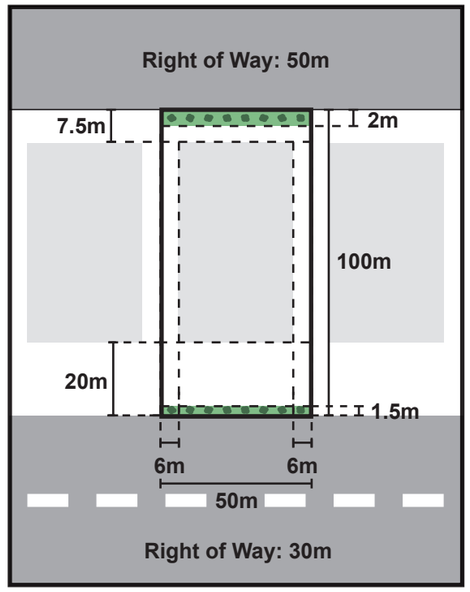


Figure 24 Setbacks for plot with 50m ROW

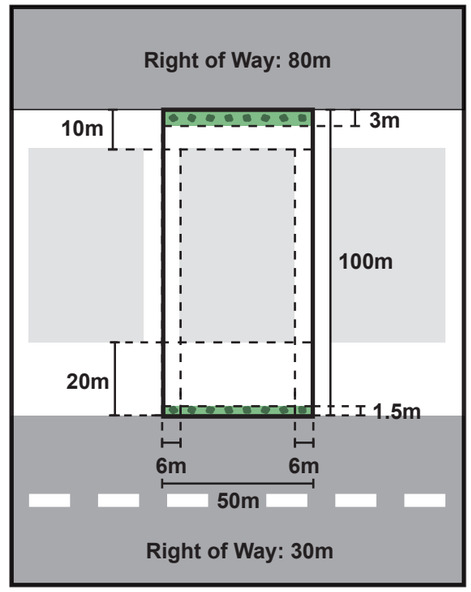


Figure 25 Setbacks for plot with 80m ROW

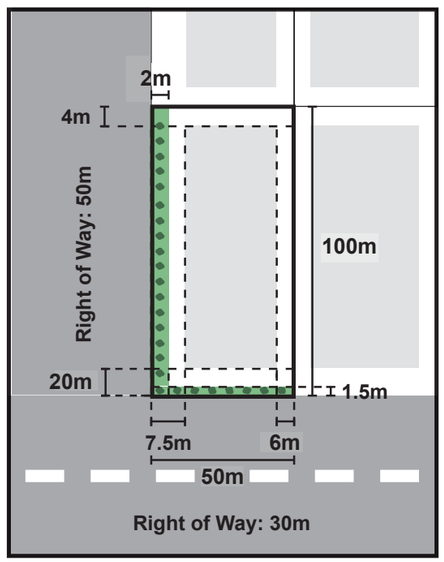


Figure 26 Setbacks for corner Plots

- The setbacks for corner plots in the Heavy Industrial Zone with a 30m ROW and 100m ROW are shown in the graphic above and Figure 26
  - All setbacks are to follow respective ROW setbacks in previous figures

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Justifiable setback variations may include:

- **Additional landscaping planted to screen development from the street**
- **A landmark architectural development that addresses the street is to be constructed**
- **Parking and major industrial activities are to be located to the rear of the plot**
- **Parking is to located below ground or at ground level with G+1 above**

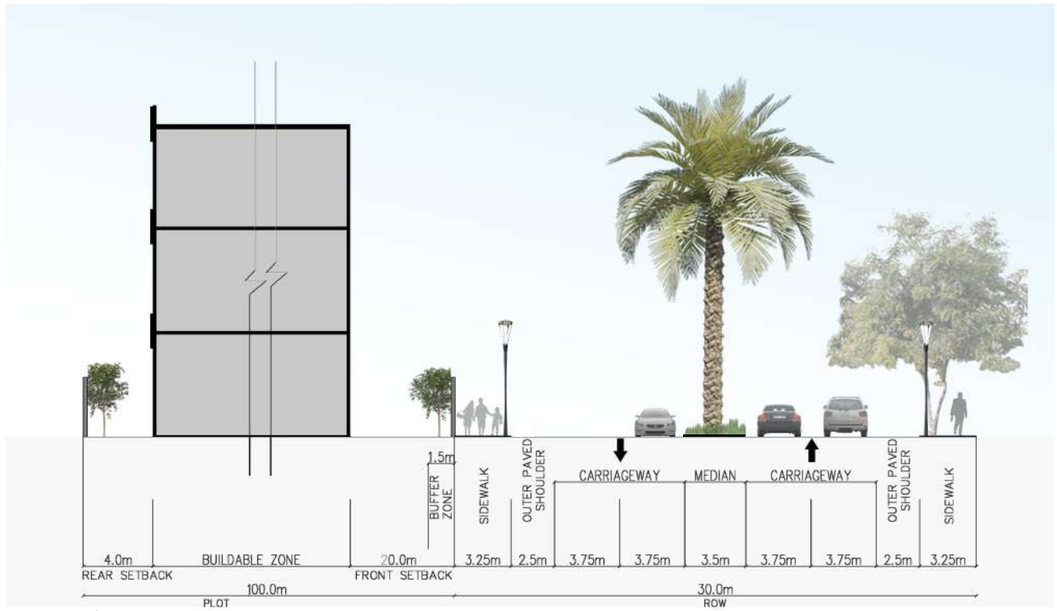


Figure 27 Plot on 30m ROW

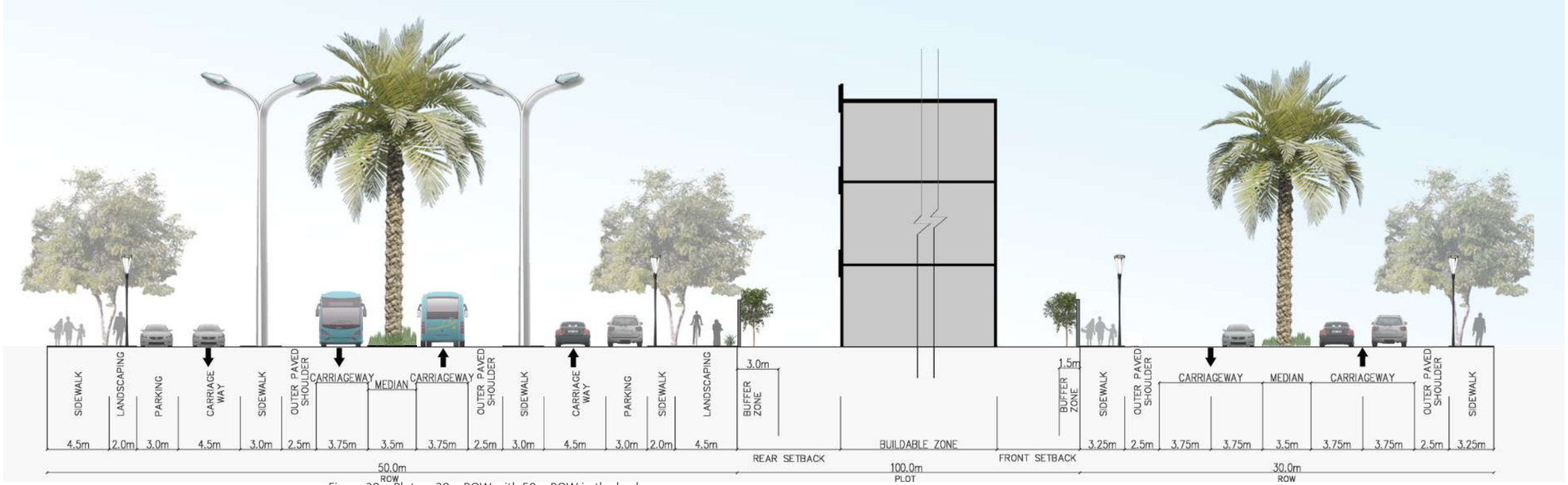


Figure 28 Plot on 30m ROW with 50m ROW in the back

Figure 29 Plot on 30m ROW with 80m ROW in the back

PLOT COVERAGE

PLOT COVERAGE

50%

Building Area
is not to exceed **50%**
of the Plot Area

Plot coverage is the maximum percentage of the plot area permitted to be covered by the buildings or structures applied to ensure that the built environment within the area is not compromised. The following clarifies the purpose of plot coverage and its value within the area:

- Plot coverage guarantees that no structure abuts the boundary of the plot for lighting, fire protection and ventilation purposes
- Plot coverage parameter contributes to increasing the height of buildings by limiting the single floor area in order to achieve an appealing urban environment
- Plot coverage percentage is enforced and applied in order to allow for space within the plot for car and truck entering, circulating, loading and parking
- Plot coverage shall allow for open space, landscaped areas and green buffers reserves required on plot
- Plot coverage shall allow for the civil defense vehicles to enter and reach all parts of all structures built on plot
- Plot coverage for plots within the Medium Industrial Zone is not to exceed 50% of the site area
- The percentage mentioned above includes all buildings within the plot boundaries. Examples of such include; electrical rooms, substations, guard and storage facilities as well as any light ancillary buildings that might be located within the premises

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

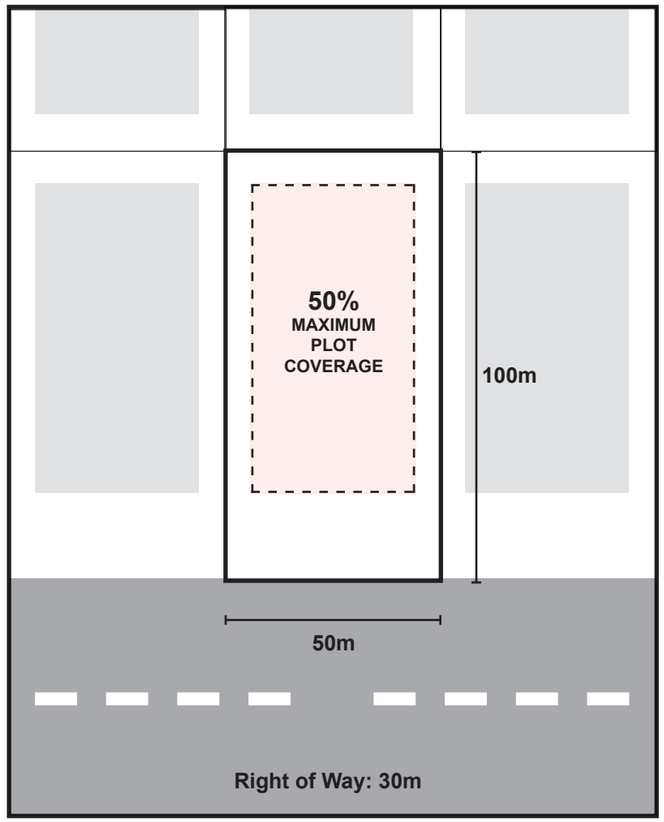


Figure 30 Plot Coverage Representation for Medium Industry

FLOOR AREA RATIO (FAR)

FLOOR AREA RATIO

0.50

The FAR in Medium Industrial Zone is equal to **0.50**

The Floor Area Ratio directs the intensity of usage and of building on a specific plot. It is related to the volume of all principle built structures on the plot, the plot coverage percentage, the number of floors and the GFA. The Floor Area Ratio is the total area of all floors divided by the total area of the plot.

- The purpose behind applying an FAR is to ensure that the land is optimally utilized while still enabling an attractive built environment to be developed
- The FAR for plots in the Medium Industrial Zone is equal to 0.50

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

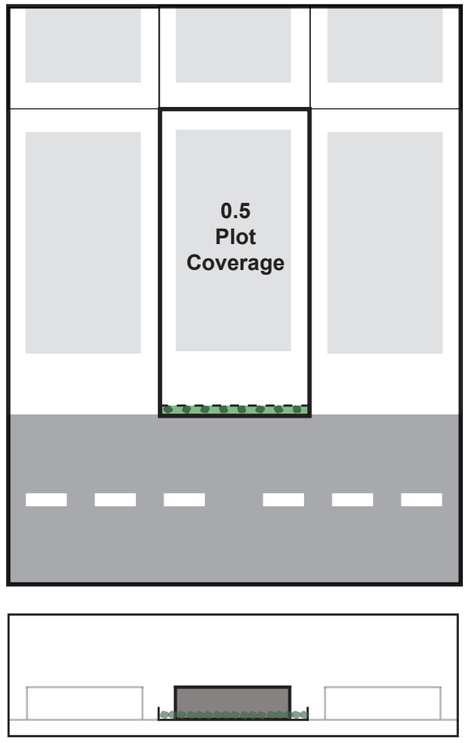


Figure 31 Plot Coverage = 50%, Plot FAR = 0.5, Number of Floors = 1

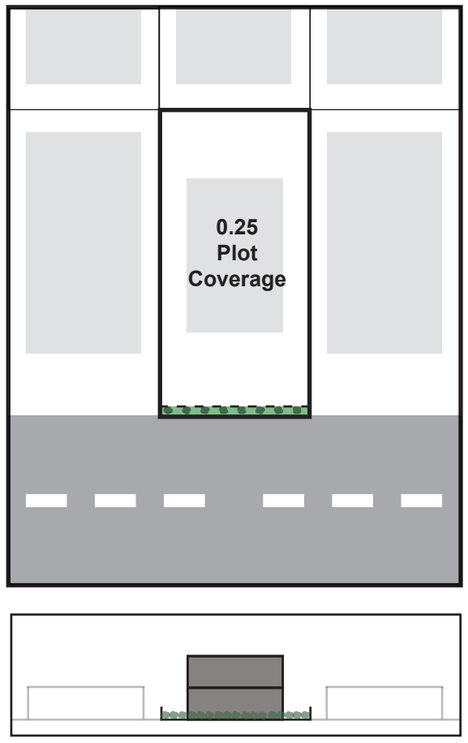


Figure 32 Plot Coverage = 25%, Plot FAR = 0.5, Number of Floors = 2

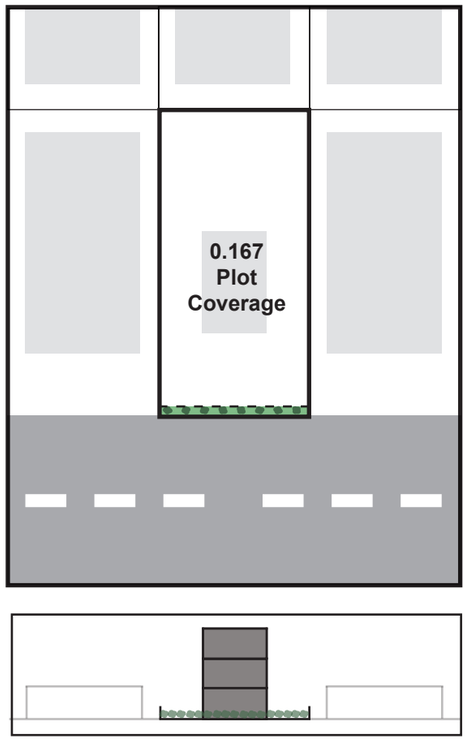


Figure 33 Plot Coverage = 16.7%, Plot FAR = 0.5, Number of Floors = 3

BUILDING HEIGHT

BUILDING HEIGHT

Building Height
is equal to **3 floors**
maximum height of **18m**

The building height within the Medium Industrial Area is to follow the guidelines below in order to create a harmonious, well balanced urban fabric that conveys the character and the vision of the area:

- Total allowable floors is G+2 (3 floors)
- Total allowable building height is 18m
- For a multi-storey industrial development a clear height (finish to finish) will be allowed up to 6m
- For single storey detached factories, the clear height control may be relaxed to reflect the operational needs of the industry
- An extension to the maximum permitted height can only be given if it is necessarily required for the manufacturing process
- Height control – Where there is a need for a tall structure like chimneys etc; this has to be cleared with SEZAD. Building heights equal to 50% of the building setback from the property boundary could be filed for approval
- The ground floor of industrial development may be raised by 1.2m (maximum) for loading and unloading purposes
- The maximum height for industrial development shall also be 18m. However, the maximum height of each floor shall correspond to the production requirements along with the dimensions of the machinery and the end product.
- Minimum floor to floor height 3.2m with a maximum height of 5.6m for administration buildings

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

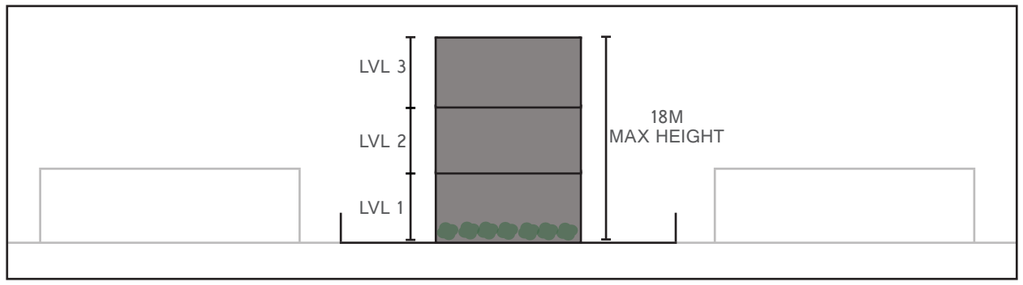


Figure 34 Maximum Height for Medium Industry

PLOT SUBDIVISION/AMALGAMATION

PLOT AMALGAMATION

In cases where investors are willing to merge 2 or more plots within the Medium Industrial Zone, the following shall be taken into consideration:

- All Zone guidelines shall apply to the amalgamated plots
- The resulting plot shall maintain all external setbacks of the amalgamated boundary so as to preserve the harmony and identity of the given area
- The total GFA allocated for the amalgamated plot shall not exceed the total GFA of all plots separately
- Access and connectivity to the amalgamated plot shall be based on the approved connections and points of ingress and egress of the separate plots
- The amalgamation request is subject to the approval of SEZAD

PLOT SUBDIVISION

In cases where investors are willing to subdivide a plot within the Medium Industrial Zone, the following shall be taken into consideration:

- All Medium Industrial Zone guidelines shall apply to the subdivided plot
- The resulting plot shall maintain all external setbacks of the new boundary as well as additional setbacks from neighboring plots so as to preserve the identity of the area and provide sufficient space within the plot for vehicle entrance, circulation and civil defense vehicle accessibility
- The total GFA allocated for the subdivided plot shall not exceed the maximum GFA based on 0.5 FAR
- Accesses and connectivity to the subdivided plots shall be based on the approved connections and entrances plan
- The resulting plot shall not be less than 5000m^2 in area with dimensions not less than 50mX100m
- The subdivision request is subject to the approval of SEZAD

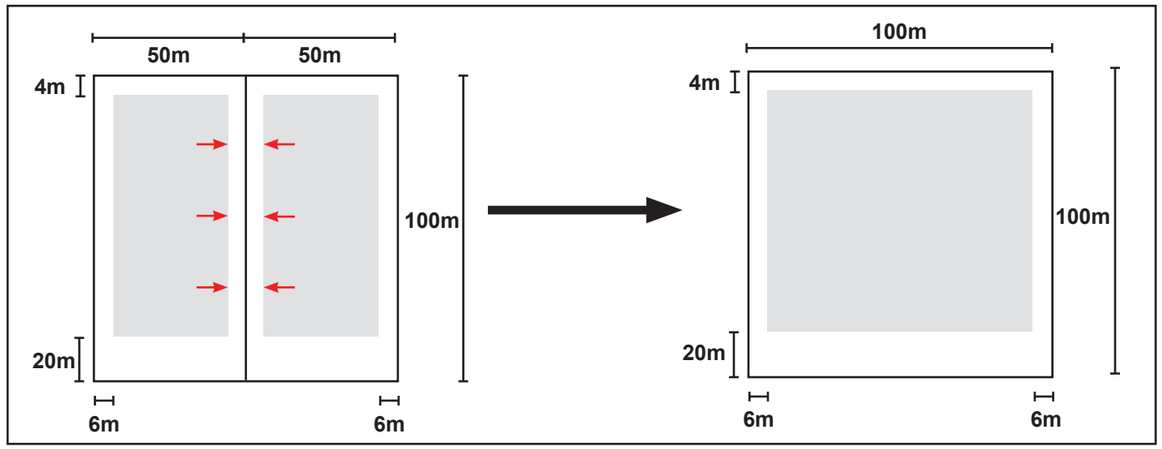


Figure 35 Plot Amalgamation

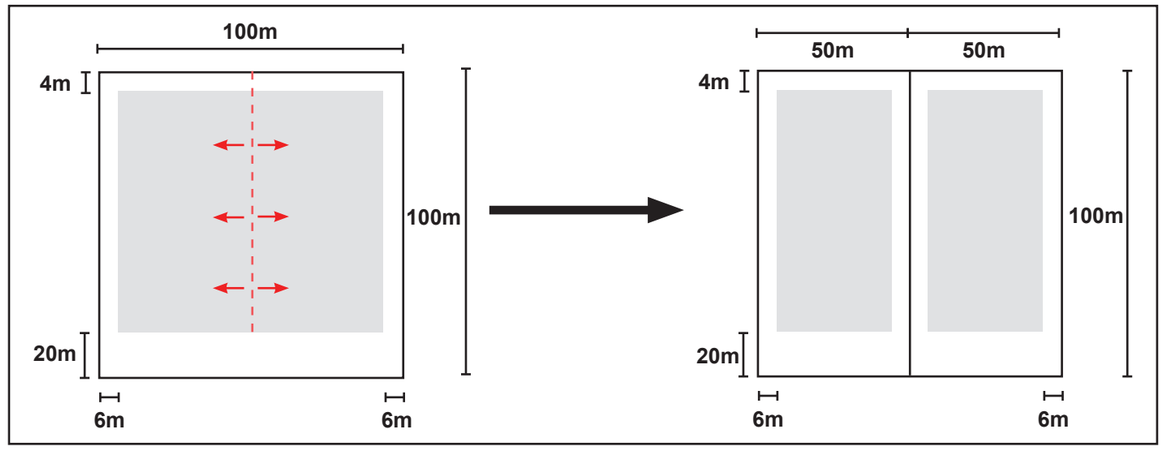


Figure 36 Plot Subdivision

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

PARKING REQUIREMENTS

PARKING REQUIREMENTS

MEDIUM INDUSTRIES
1 SPACE
per 250sqm GFA

FACTORIES
1 SPACE
per 250sqm GFA

OFFICES
1 SPACE
per 60sqm GFA

Plot parking for vehicles within the entire industrial area is to be provided either within enclosed buildings or designated areas. Parking shall be consistent with the parking standards and shall follow the guidelines below:

- On street parking is provided for cars only
- All parking areas are to be at least 1.5m setback from the edge of any building, so as to allow for open space, walkways and overhangs
- Car parking and circulation shall be separate from truck parking and circulation
- Plot access and distance from junctions shall be designed in agreement with SEZAD highway design standards taking into account visibility and other safety issues
- No parking spaces shall be located near natural ventilation or air intakes on the plot
- It is recommended to locate the primary parking area to the side of the back of the plot
- If the plot is located on more than one road, the access to the plot shall be provided from the minor road (30m ROW) maintaining that all accesses shall be from within the super block
- One tree for every six parking bays shall be provided within the parking areas to provide shade
- Parking areas shall be screened from the public view
- Entrances and exits to and from parking and loading facilities shall be appropriately marked with clear directional signs
- If community facility plots have more than one road frontage, then vehicular and pedestrian access shall be provided from each road
- For truck parking requirements, it is the responsibility of the developer to provide what they need and for the Authority to review and approve
- Ramps must comply with Oman Highway Design
- Disabled Parking Bays to be located to the closest point of access to the main administration building via the car park at a rate of 1 bay for every 25 standard bays

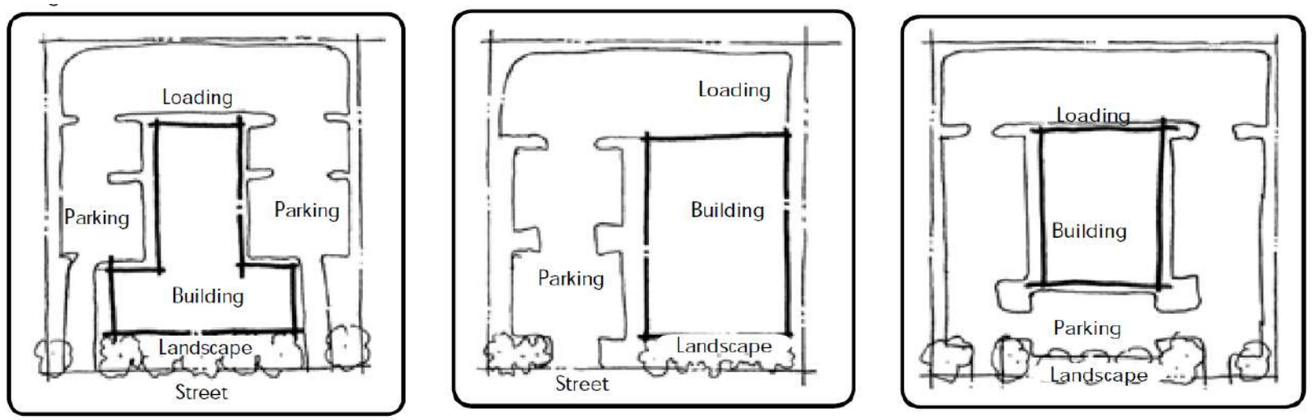


Figure 37 Three encouraged parking location samples

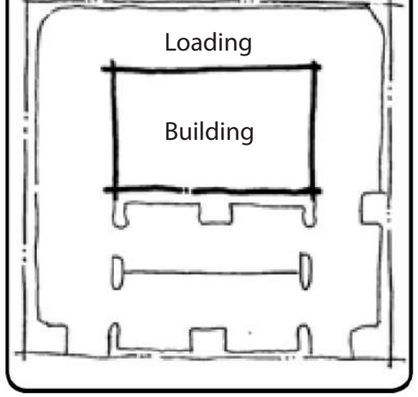


Figure 38 Discouraged front parking location sample

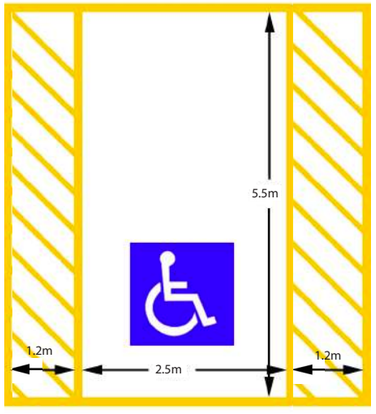


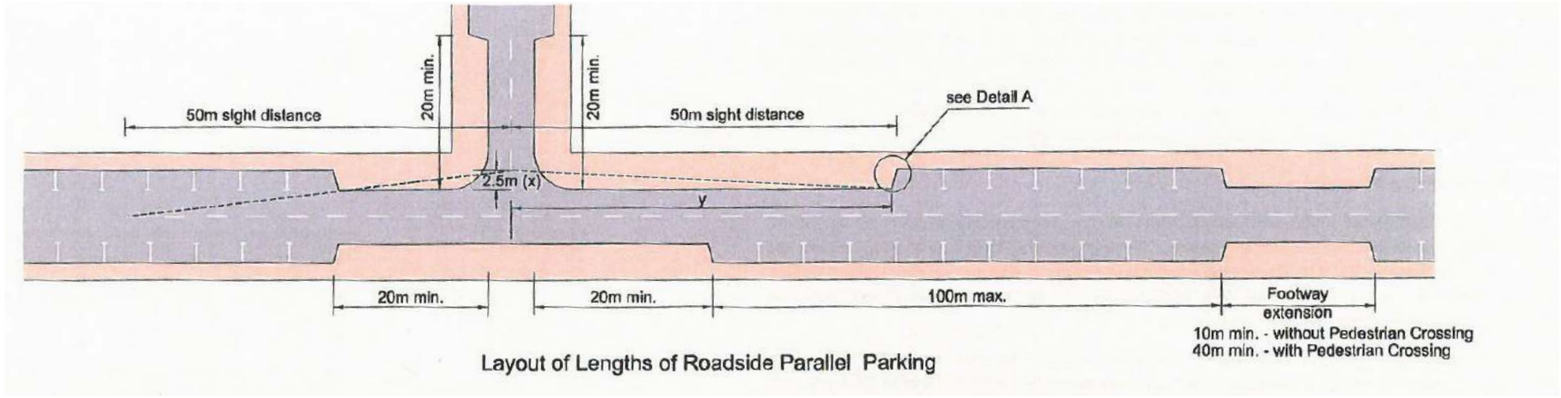
Figure 39 Disabled Parking Bays dimensions

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

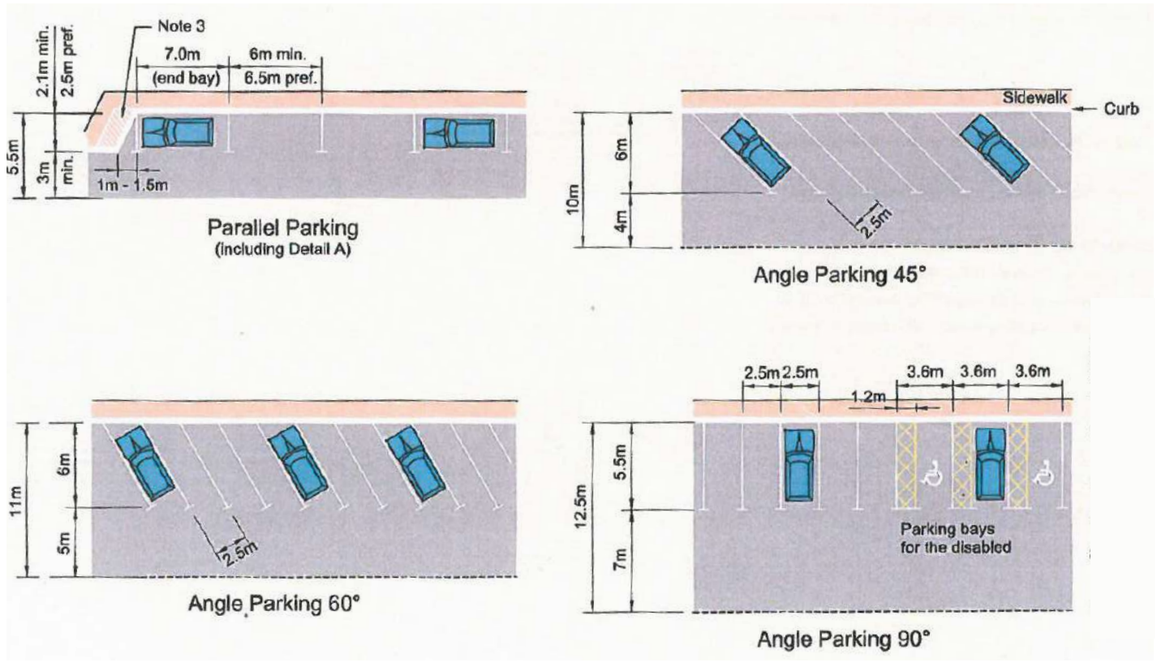
Exemptions/reductions in parking may be considered if:

- **Premises are to be semi or fully automated and therefore will have a reduced number of employees**
- **Employees are transferred to and from the site via communal transport vehicles such as buses**

PARKING REQUIREMENTS

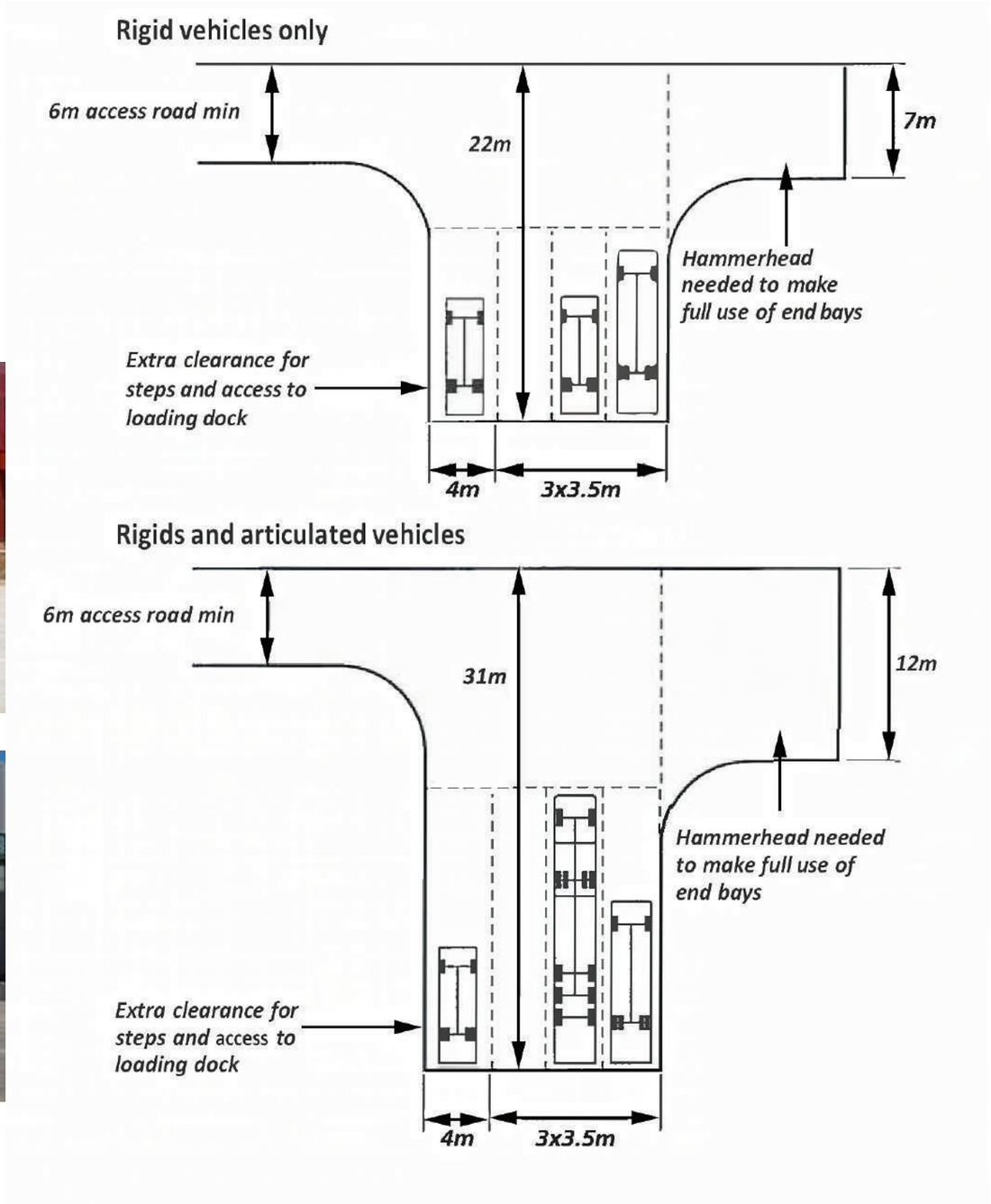


Layout of Lengths of Roadside Parallel Parking



LOADING/UNLOADING

- In order to avoid traffic congestion in between buildings and to achieve a smooth circulation system within the plot, loading docks and facilities shall be located at the rear of the building and not the front or the sides
- Loading areas shall be screened from public view
- Loading areas shall be offset from vehicle driveways into the plot
- Loading areas are to be designed to accommodate the maximum sized vehicle that will utilize the facility
- Loading areas shall provide sufficient internal turning space to enable vehicles to exit the plot in forward gear
- Vehicles shall enter and exit the plot in forward gear
- Maximum height to raised loading bay is 1.2m



BOUNDARY WALLS

BOUNDARY WALLS

3m+

Min height: **3m**
Max height: **4.5m**

Boundary fences serve several purposes within industrial areas; they act as screening to the loading/unloading areas, vehicles and utility functions on the plot while also acting as a security element where needed.

- Boundary walls shall surround all plots within the Medium Industrial Zone
- The boundary wall structure and foundation shall be within the respective plot boundary.
- Is may be wire fencing on the sides, rear and front of the plots with the option of a 3m wrought iron simple linear elements in black matte finish. 1m solid base along front boundary could be incorporated for added security, but is not mandatory.
- The minimum height of a perimeter wall/fence is 3m
- The maximum height of a perimeter wall/fence is 4.5m
- The use of barbed wire fencing is prohibited
- Boundary walls shall be constructed out of durable materials that complement the architectural character of the area and blend with the surrounding walls, buildings and structures
- In case of expanses of boundary walls longer than 30m, some articulation and architectural elements shall be applied in order to prevent monotony
- Access control to plots within the Medium Industrial Zone is recommended as well as incorporating security elements within the boundary walls

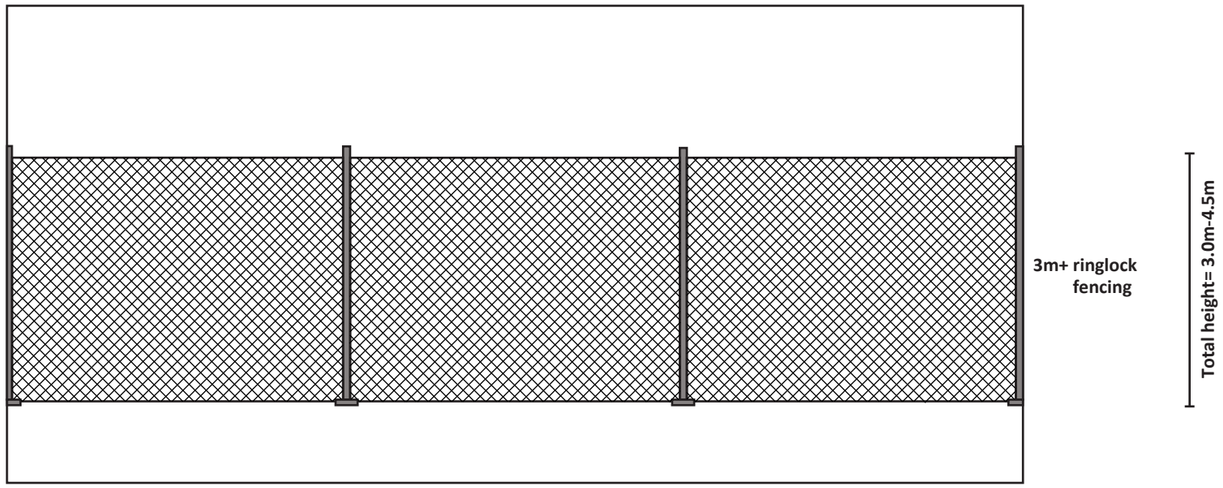


Figure 40 Frontage boundary wall facade

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

A landowner can only build boundary walls on their own property, unless an agreement is reached with an adjoining landowner. Landowners are encouraged to prevent two walls being built adjoining each other and thus are recommended to agree to a cost sharing agreement with neighbors and build half on each other's land. If an adjoining landowner is not available then the first owner is required to build a boundary wall on their own land.

LANDSCAPING

LANDSCAPE

Minimum of **10%** of plot area to be landscaped

A specific percentage of each plot within the Industrial Area is to be allocated for landscaping for the purpose of providing a visual amenity that will contribute to the environmental quality and lend a unified and embracing character to the area. In order to achieve this, the following shall be undertaken:

- A minimum of 10% of the plot area is reserved for landscaping
- Planting materials shall consist of native or 'adapted to the local climate' species
- Turf areas shall be limited to 10% of the total on plot landscaped area
- Sustainable irrigation methods and technologies such as drip irrigation, moisture sensors and centralized programming and monitoring shall be considered for all planting areas
- A minimum of 25% of the total setback area facing the 30m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 25% of the total setback area facing the 50m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 30% of the total setback area facing the 80m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- Should retention ponds be required, a design that complements the landscaping theme shall be adopted
- The design of the landscape shall takes into consideration the type of areas to be landscaped by providing visual appeal to key areas (e.g. entrances, walkways) while aiming to use cost effective design solutions to secondary areas (e.g. loading area)
- Shade trees shall be incorporated within vehicle parking areas to provide shade and visual appeal at a rate of one tree for every six bays minimum
- Shade trees shall be incorporated into buffer areas, close to the street in order to contribute to creating a harmonious and appealing streetscape while also providing shade to pedestrians

STORMWATER MANAGEMENT AND DRAINAGE

Plot owners are responsible for storm water management. An on site strategy shall be adopted for retaining and managing stormwater for reuse in buildings or for landscaping purposes.

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

5. HEAVY INDUSTRY GUIDELINES

OVERVIEW

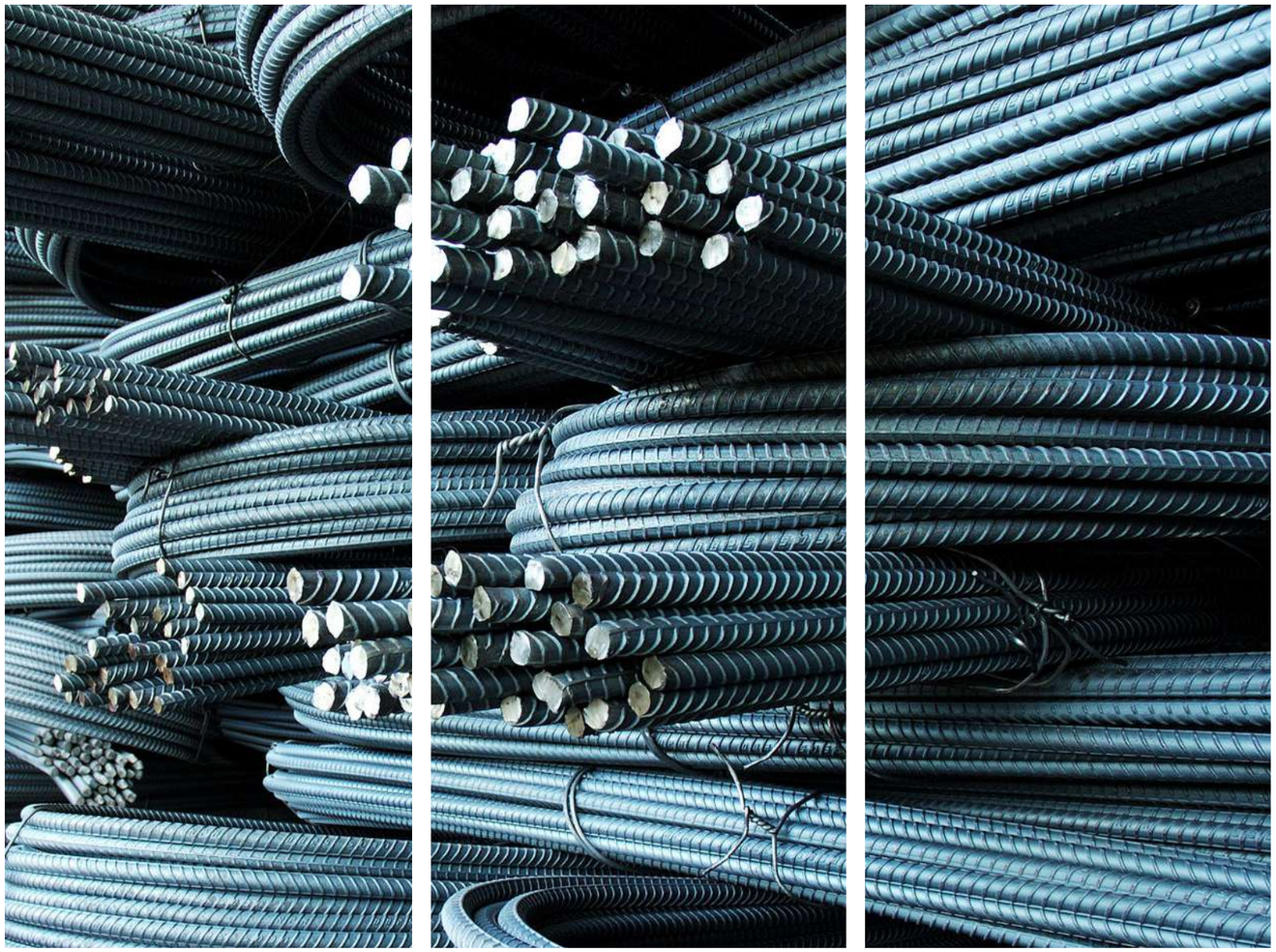
DEFINITION

Heavy Industry is associated with a high capital cost (capital-intensive), high barriers to entry and low transportability. The term “heavy” refers to the fact that the items produced by “heavy industry” used to be products such as iron, coal, oil, ships, etc.

Heavy industry has the physical characteristics that require significant infrastructure, with space customized for large scale plants. It involves one or more characteristics such as large and heavy products; large and heavy equipment and facilities (such as heavy equipment, large machine tools, and huge buildings); or complex or numerous processes. The major constraint of Heavy Industry is its high capital and energy costs. In terms of provision of location, there are area limitations and restrictions due to potential environmental impact. There is little to no transportability over the short to medium term. Examples of Heavy Industry include: ship building; major extractive industry along with refinement of petroleum, coke, or nuclear uranium, or the production of primary minerals into steel.

Depending on the type and scale of heavy industries, adverse environmental impacts from such land uses can frequently extend beyond the project boundaries. Because heavy industrial operations often cause environmental impacts related to noise, dust and heavy vehicle traffic and since they generally can be hazardous, they are required to be separated from other more subtle land uses such as residential and community uses.

Mitigation measures required to limit impacts from these industries are usually detailed and generally require modelling and frequent monitoring. Authorization for operation of heavy industries requires in depth environmental impact assessments and mitigation and management plans to be undertaken prior to operation.



PERMITTED USES

Permitted uses are functions and operations that are authorized and approved to be located on a plot within the Heavy Industry Area and that are considered suitable within the context and correspond to the vision of the area.

The following uses are permitted in areas designated by land use as heavy industrial. All other uses are prohibited or subject to approval:

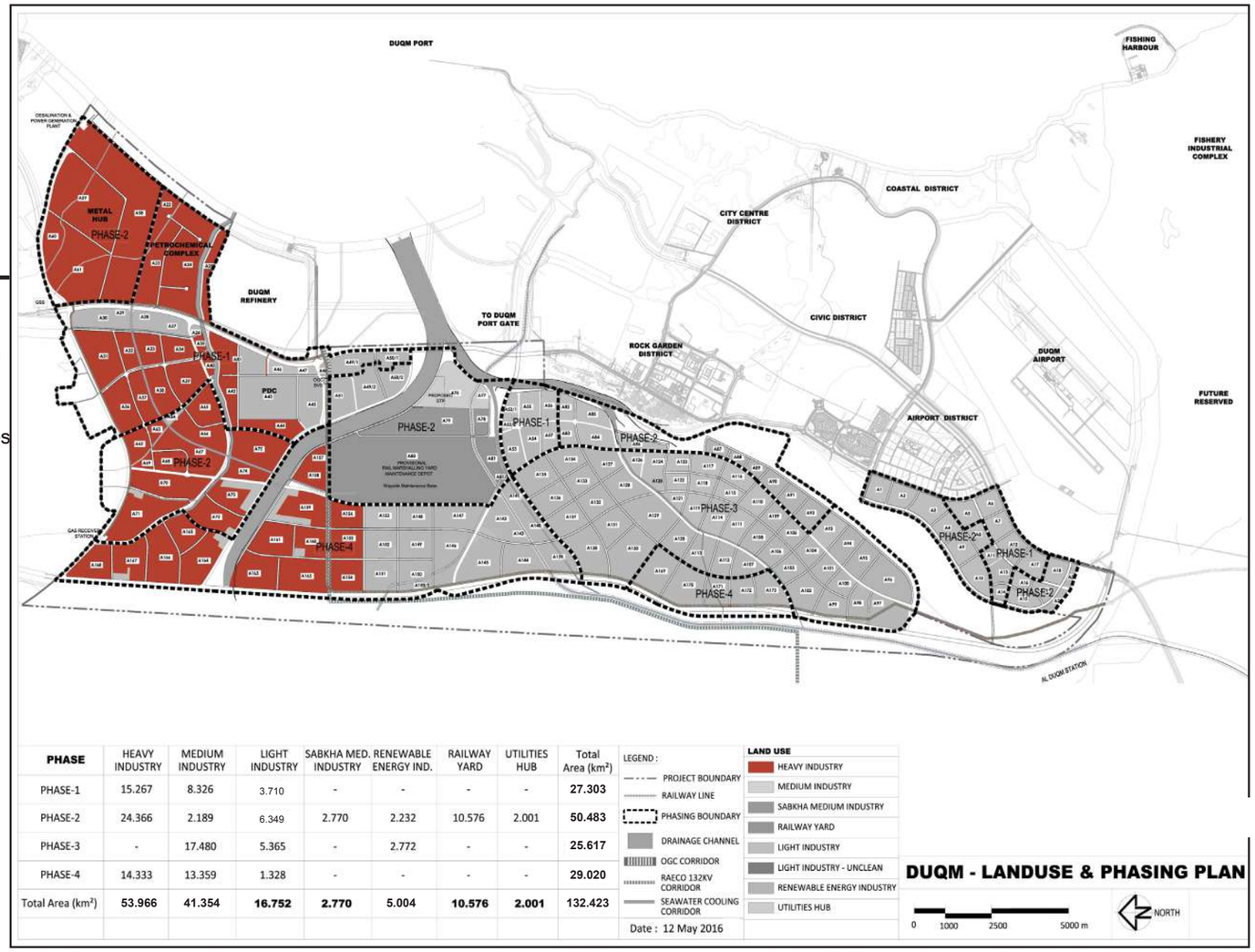
- Chemical Production
- Refined petroleum, coke production, nuclear
- Paper and pulp production
- Mineral-based product production
- Basic metals production
- Brick, tile, terra-cotta, masonry manufacture
- Cement products and ready mix concrete manufacturing
- Iron or steel casting or fabrication. The fabrication process involves the cutting process, the bending process and the assembly of raw materials into the construction of machines and structures
- Abattoirs and animal rendering plants

LAND USE PLAN

The land use plan in Figure 40 shows the zone designated for the Heavy Industrial Area. The total area reserved is estimated to be 53.96 km^2, where the largest component is concentrated in the far north area of the project site while smaller Light industry zones are scattered throughout the heavy industrial zone.

HEAVY INDUSTRY AREA

Heavy industries are the major functions and the most prominent in the heavy industrial zone, however, smaller clusters of light industrial uses are scattered within the Heavy Industrial Zone. The reason behind this distribution pattern is to satisfy some required services and facilities in the area, such as warehouses, commercial uses, office buildings, retail and community facilities since such services and facilities are permitted to be located within the Light Industrial Zone only.



PHASE	HEAVY INDUSTRY	MEDIUM INDUSTRY	LIGHT INDUSTRY	SABKHA MED. INDUSTRY	RENEWABLE ENERGY IND.	RAILWAY YARD	UTILITIES HUB	Total Area (km^2)
PHASE-1	15.267	8.326	3.710	-	-	-	-	27.303
PHASE-2	24.366	2.189	6.349	2.770	2.232	10.576	2.001	50.483
PHASE-3	-	17.480	5.365	-	2.772	-	-	25.617
PHASE-4	14.333	13.359	1.328	-	-	-	-	29.020
Total Area (km^2)	53.966	41.354	16.752	2.770	5.004	10.576	2.001	132.423

LEGEND :
- PROJECT BOUNDARY
- RAILWAY LINE
- PHASING BOUNDARY
- DRAINAGE CHANNEL
- OGC CORRIDOR
- RAECO 132KV CORRIDOR
- SEAWATER COOLING CORRIDOR

Date : 12 May 2016

LAND USE
- HEAVY INDUSTRY
- MEDIUM INDUSTRY
- SABKHA MEDIUM INDUSTRY
- RAILWAY YARD
- LIGHT INDUSTRY
- LIGHT INDUSTRY - UNCLEAN
- RENEWABLE ENERGY INDUSTRY
- UTILITIES HUB

DUQM - LANDUSE & PHASING PLAN

0 1000 2500 5000 m

NORTH

Figure 41 Heavy Industry Land Use Plan

DEVELOPMENT STATISTICS

The Design Statistics section is yet to be completed as it is reliant on information from the final plot sheets. Much of the information that would be contained in the Design Statistics section is included in the overall Design Guidelines. SEZAD to determine whether to include the Design Statistics section in the final Design Guidelines document.

DESIGN GUIDELINES

PLOT ENVELOPE

ACCESS AND CIRCULATION

Vehicle Access:

The location of ingress and egress points for vehicles to the plots, the circulation within the plot and the implications of those on public traffic are considered while setting the access and circulation design guidelines. The following parameters shall be followed for car and truck access and circulation within the plot in the Heavy Industrial Zone:

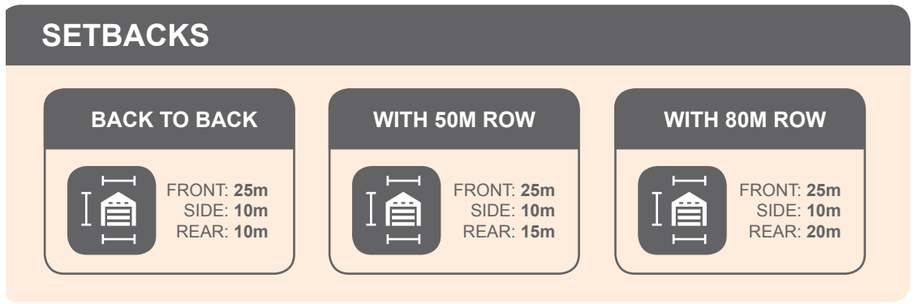
- Access to all plots shall only be from an internal street within a Super Block
- Accesses points and internal roads within each plot shall be paved with hard surfaced material suitable for heavy vehicle use
- All buildings on the plots including all building components shall be accessible by civil defense and fire department vehicles
- Vehicle driveways within the plot shall be located so as to minimize conflict with pedestrian circulation. Minimum width for driveways shall be 4m for one way and 7.3m for two way, while parking ramps and egress and ingress points shall be determined taking into consideration the type of trucks and vehicles required to service the nature of industry on each specific plot given that approvals are granted by SEZAD for the dimensions of these access points
- Ornamental entrance structures, pylons and gateways for vehicle driveways are permitted on plots
- Vehicle driveways shall be located a minimum of 2.0m from fire hydrants, a minimum of 1.0m from street lights and adjacent plot lines while egress and ingress points to be located away from street intersections
- Exits and entrances to the plots shall be adequately provided so as not to create congestion at the entry point or generate queuing or safety issues at public roads. Location of the exits and entrances to the plots are shown in plot sheets and shall be followed
- Truck access and circulation within the plot shall be separated from the passenger car access and circulation
- It is mandatory within the Heavy Industry Zone to secure the parameter and regulate entry by providing controlled guarded entrances and checks at all plot accesses
- The minimum lane width is 3.65m with a minimum radii of 10m

Pedestrian Access:

Pedestrian access points, safety and relationship to the vehicle circulation and the buildings within the plot are considered while scripting the design guidelines so that the vision of a specially designated, clearly defined and well connected pedestrian network is achieved. The following parameters shall be followed for pedestrian circulation within the plots in the Heavy Industrial Zone:

- Paving material and dimensions of primary pedestrian connections shall differ from those of secondary pedestrian connections and shall be of a material catered for pedestrian use
- Pedestrian entrances to buildings shall be clearly defined, visibly marked and easily accessed
- Pedestrian connections and walkways shall be safely buffered and protected from vehicular traffic and circulation on the plot
- A pedestrian connection shall continuously run from the public pedestrian sidewalk through the parking area pedestrian walkways to the main building pedestrian entrances
- Bicycle racks if provided shall be located close to main building pedestrian entrances, however need to be placed in a way so as not to hamper pedestrian traffic

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.



Setbacks are the horizontal distances from the plot boundary to any part of the structure built on plot. The purpose of setbacks is to provide privacy for the individual plot owners and provide room for emergency vehicles' access. Below are requirements to be followed for the Heavy Industrial Area plots:

- The setbacks for back to back plots in the Heavy Industrial Zone with a 30m ROW are shown in the graphic above and Figure 41
  - The front setback shall be equal to 25m and shall incorporate a 3m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 10m
- The setbacks for plots in the Heavy Industrial Zone with a 50m ROW along the rear are shown in the graphic above and Figure 42
  - The front setback shall be equal to 25m and shall incorporate a 3m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 15m and shall incorporate a 3m landscape buffer
- The setbacks for plots in the Heavy Industrial Zone with a 80m ROW along the rear are shown in the graphic above and Figure 43
  - The front setback shall be equal to 25m and shall incorporate a 3m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 20m and shall incorporate a 3m landscape buffer
- The green buffer is the section of the setback area closest to the plot boundary where only trees may be planted and landscaping applied. On plot storm water drainage strategies that utilize landscape areas could be adopted and applied within the buffer section
- The green buffer area along the 30m, 50m, and 80m Right of Way must start at the plot boundary and continue into the plot

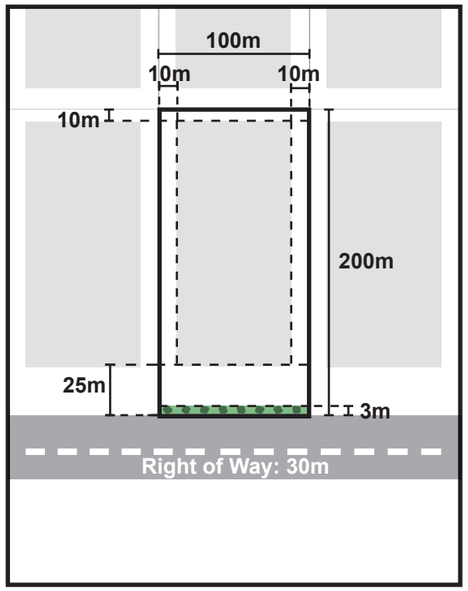


Figure 42 Setback Value for Back to Back Plots

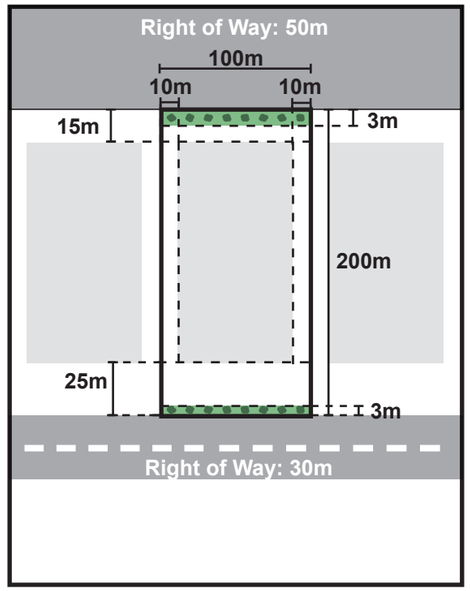


Figure 43 Setback Value for Plots with 50m ROW Along the Rear

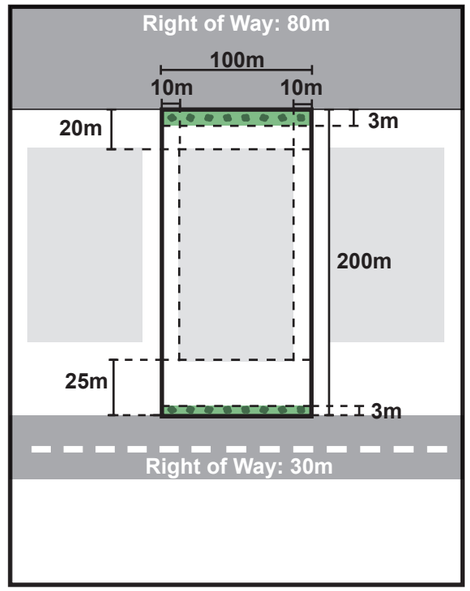


Figure 44 Setback Value for Plots with 80m ROW Along the Rear

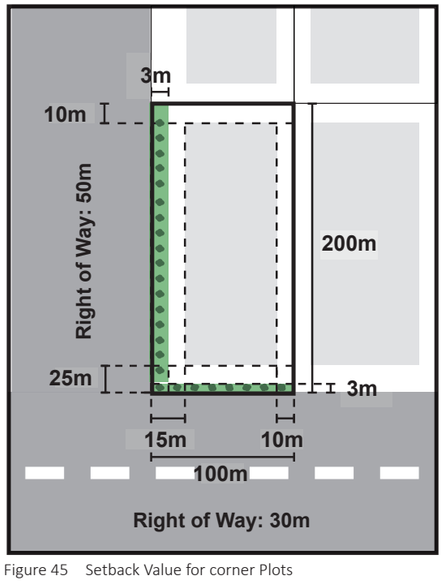


Figure 45 Setback Value for corner Plots

- The setbacks for corner plots in the Heavy Industrial Zone with a 30m ROW and 100m ROW are shown in the graphic above and Figure 45
  - All setbacks are to follow respective ROW setbacks in previous figures

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Justifiable setback variations may include:

- **Additional landscaping planted to screen development from the street**
- **A landmark architectural development that addresses the street is to be constructed**
- **Parking and major industrial activities are to be located to the rear of the plot**
- **Parking is to located below ground or at ground level with G+1 above**

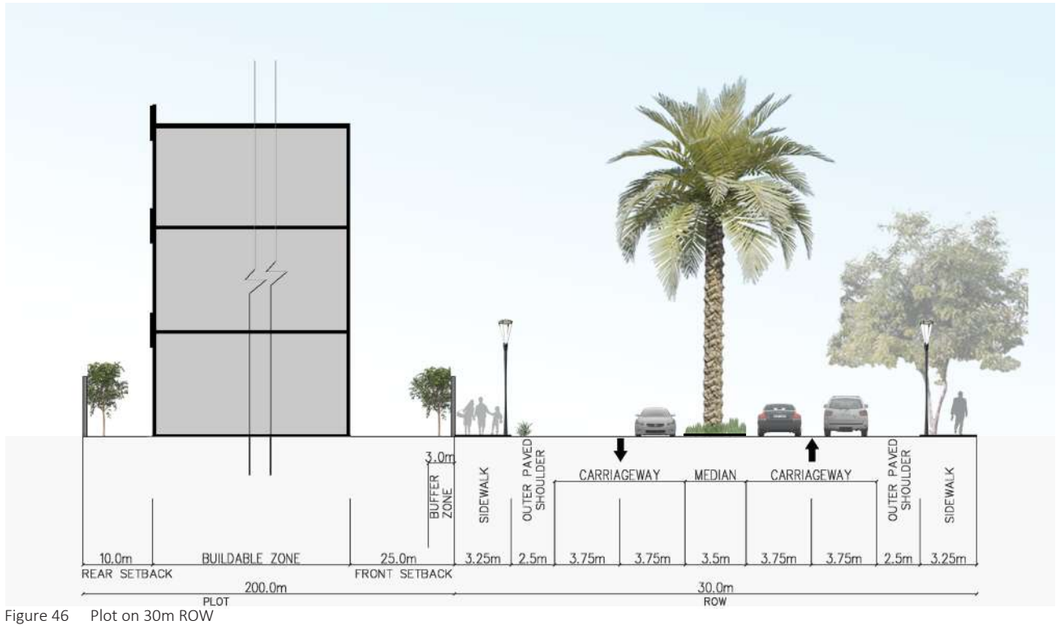


Figure 46 Plot on 30m ROW

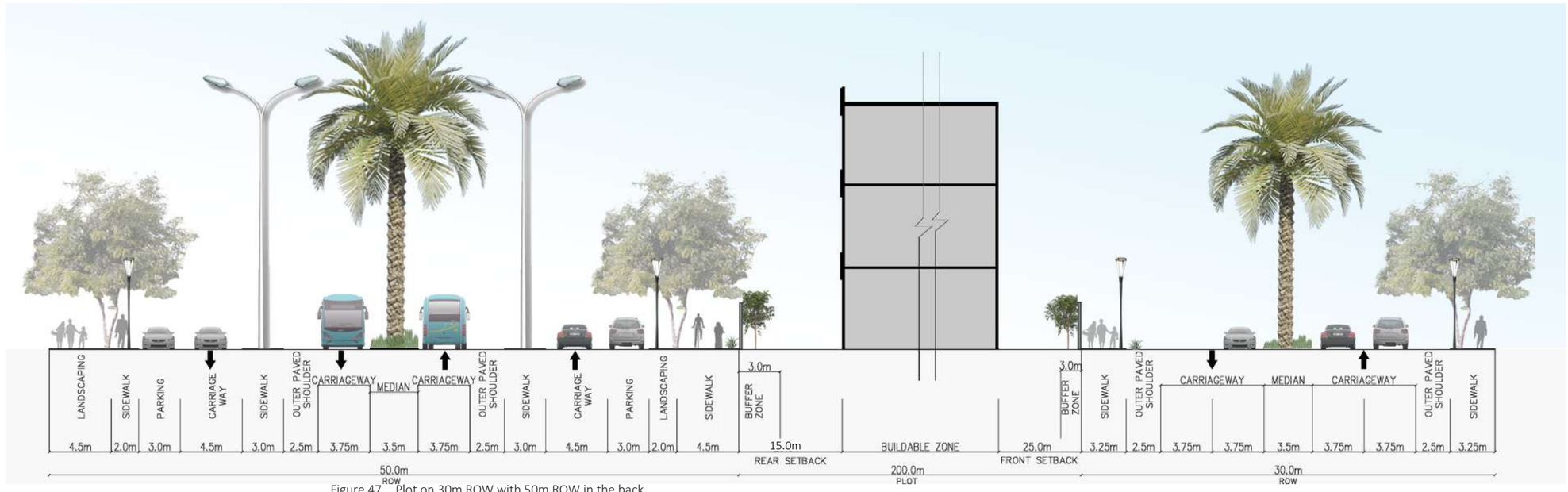


Figure 47 Plot on 30m ROW with 50m ROW in the back

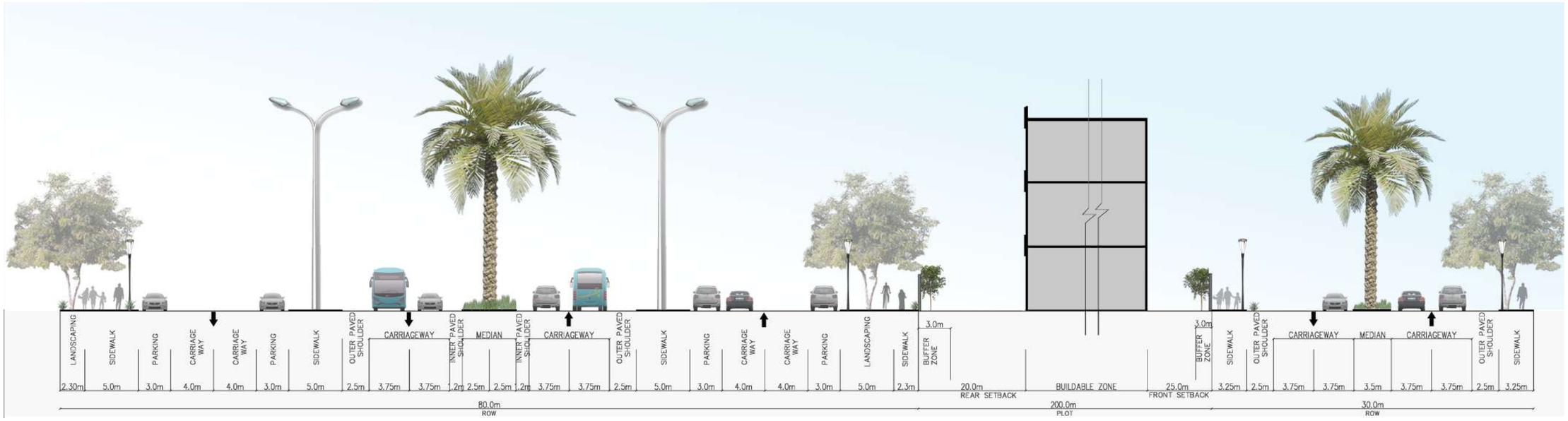


Figure 48 Plot on 30m ROW with 80m ROW in the rear

PLOT COVERAGE

PLOT COVERAGE

Building Area
is not to exceed **40%**
of the Plot Area

Plot coverage is the maximum percentage of the plot area permitted to be covered by the buildings or structures applied to ensure that the built environment within the area is not compromised. The following clarifies the purpose of plot coverage and its value within the area:

- Plot coverage guarantees that no structure abuts the boundary of the plot for lighting, fire protection and ventilation purposes.
- Plot coverage parameter contributes to increasing the height of buildings by limiting the single floor area in order to achieve an appealing urban environment
- Plot coverage percentage is enforced and applied in order to allow for space within the plot for car and truck entering, circulating, loading and parking
- Plot coverage shall allow for open space, landscaped areas and green buffers required on plot
- Plot coverage shall allow for the Civil Defense vehicles to enter and reach all parts of all structures built on plot
- Plot coverage for plots within the Heavy Industrial Zone is not to exceed 40% of the site area
- The percentage mentioned above includes all buildings within the plot boundaries. Examples of such include; electric rooms, substations, guard and storage facilities as well as any light ancillary buildings that might be located within the premises

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

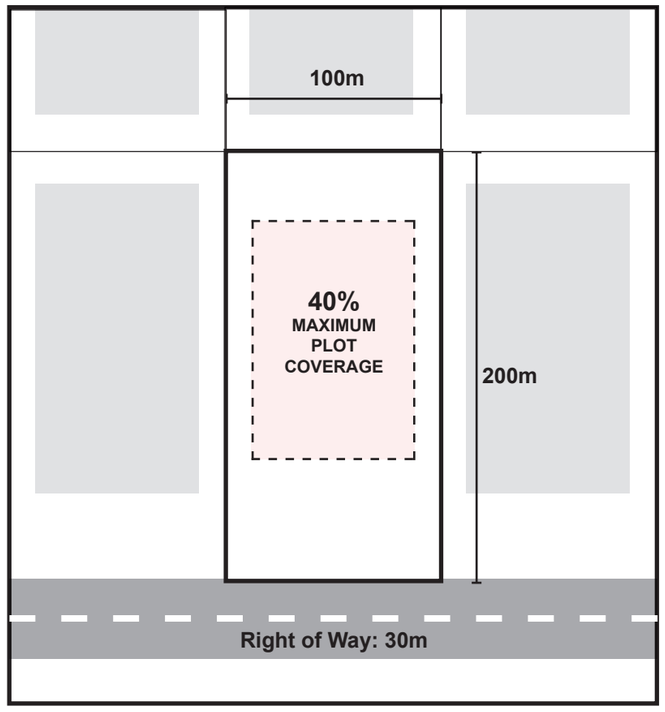


Figure 49 Plot coverage within the Heavy Industrial Zone

FAR (FLOOR AREA RATIO)

FLOOR AREA RATIO

0.40

The FAR in Heavy Industrial Zone is equal to **0.40**

The Floor Area Ratio directs the intensity of usage and of building on a specific plot. It is related to the volume of all principle built structures on the plot, the plot coverage percentage, the number of floors and the GFA. The Floor Area Ratio is the total area of all floors divided by the total area of the plot.

- The purpose behind applying a FAR is to ensure that the land is optimally utilized while still enabling an attractive built environment to be developed
- The FAR for plots in the Heavy Industrial Zone is equal to 0.40

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

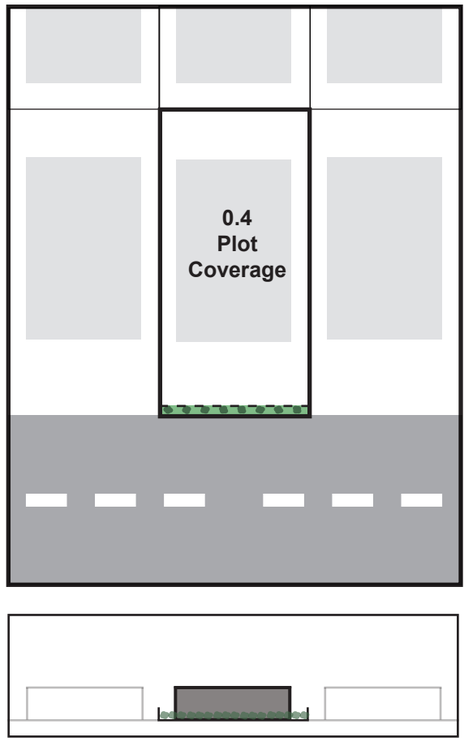


Figure 50 Plot Coverage = 40%, Plot FAR = 0.4, Number of Floors = 1

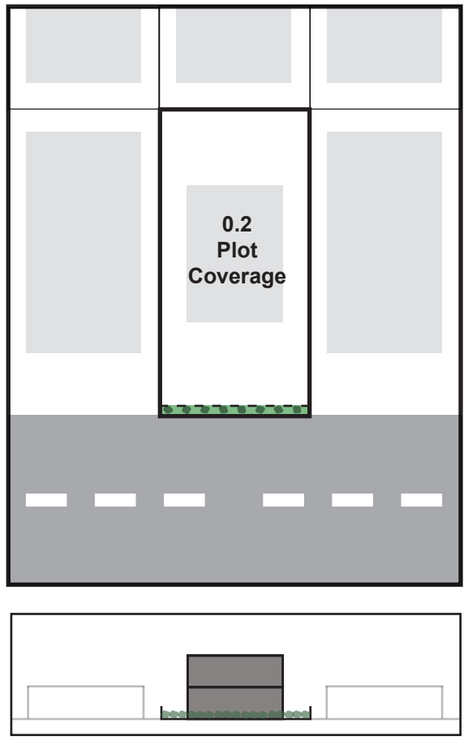


Figure 51 Plot Coverage = 20%, Plot FAR = 0.4, Number of Floors = 2

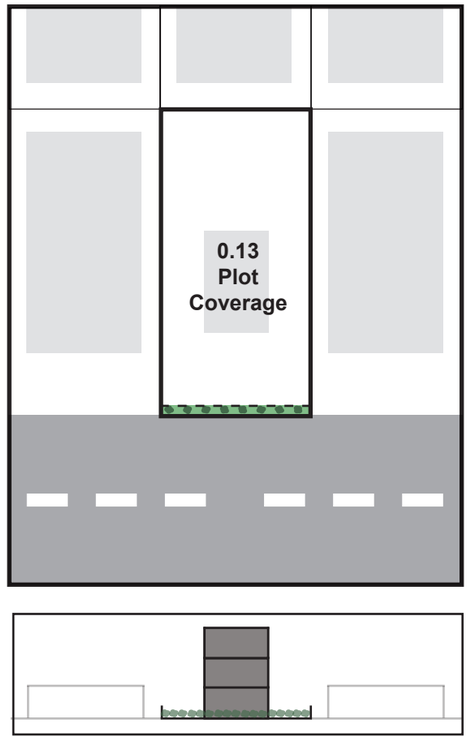


Figure 52 Plot Coverage = 13%, Plot FAR = 0.4, Number of Floors = 3

BUILDING HEIGHT

BUILDING HEIGHT

Building Height
is equal to **4 floors**
maximum height of **24m**

The building height within the industrial area is to follow the guidelines below in order to create a harmonious well balanced urban fabric that conveys the character and the vision of the area:

- The total building height allowed on plots located within the Heavy Industrial Zone is equal to 4 floors measuring a maximum sum of 24m
- For specific operational necessities that require exceeding the set height limit, an exception could be made subject to approval. Building heights equal to 50% of the building setback from the property boundary could be lodged for approval
- Examples on structures that might be exempt from height limit (upon approval) are chimneys and wind towers
- It is encouraged to express the excess height of the exempt elements in a creative architectural style that would enrich and enhance the character of the area rather than attempting to conceal it
- The ground floor of light industrial development may be raised by 1.2m (maximum) for loading and unloading purposes. The loading docks while covered need not be closed on the sides to look like a building.
- The maximum height for industrial development shall also be 24m. However, the maximum height of each floor shall correspond to the production requirements along with the dimensions of the machinery and the end product.
- Minimum floor to floor height 3.2m with a maximum height of 5.6m for administration buildings

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

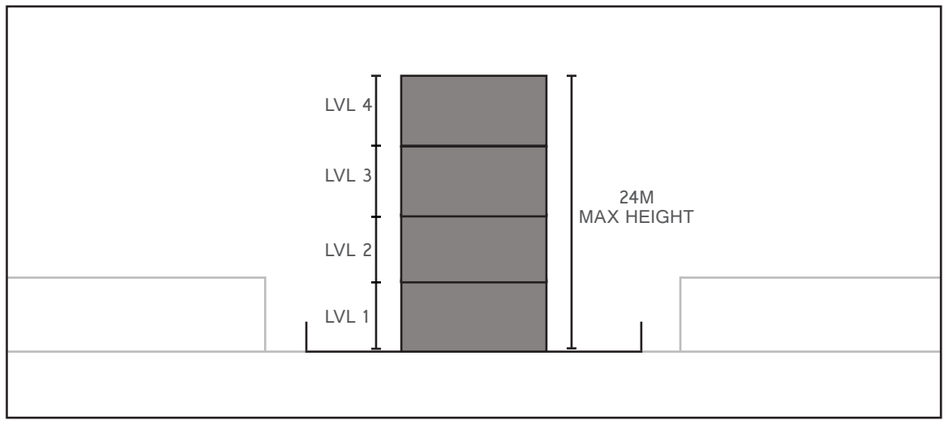


Figure 53 Building Height Allowance for Heavy Industry

PLOT SUBDIVISION / AMALGAMATION

PLOT AMALGAMATION

In cases where investors are willing to amalgamate 2 or more plots within the Heavy Industrial Zone, the following shall be taken into consideration:

- All Heavy Industrial Zone guidelines shall apply to the amalgamated plots
- The resulting plot shall maintain all external setbacks of the amalgamated boundary so as to preserve the character of the area
- The total GFA allocated for the amalgamated plot shall not exceed the sum GFA of all plots separately
- Accesses and connections to the amalgamated plot shall be based on the approved connections and entrances for the separate plots
- The amalgamation request is subject to the approval of SEZAD

PLOT SUBDIVISION

In cases where investors are willing to subdivide a plot within the Heavy Industrial Zone, the following shall be taken into consideration:

- All Heavy Industrial Zone guidelines shall apply to the subdivided plot
- The resulting plot shall maintain all external setbacks of the new boundary as well as additional setbacks from neighboring plots so as to preserve the character of the area and provide sufficient space within the plot for vehicle entrance, parking, circulation and civil defense vehicle accessibility
- The total GFA allocated for the subdivided plot shall not exceed the maximum GFA based on 0.4 FAR
- Accesses and connections to the subdivided plots shall be based on the approved connections and entrances plan
- The resulting plot shall not be less than 20,000m^2 in area with dimensions not less than 100mX200m
- The subdivision request is subject to the approval of SEZAD

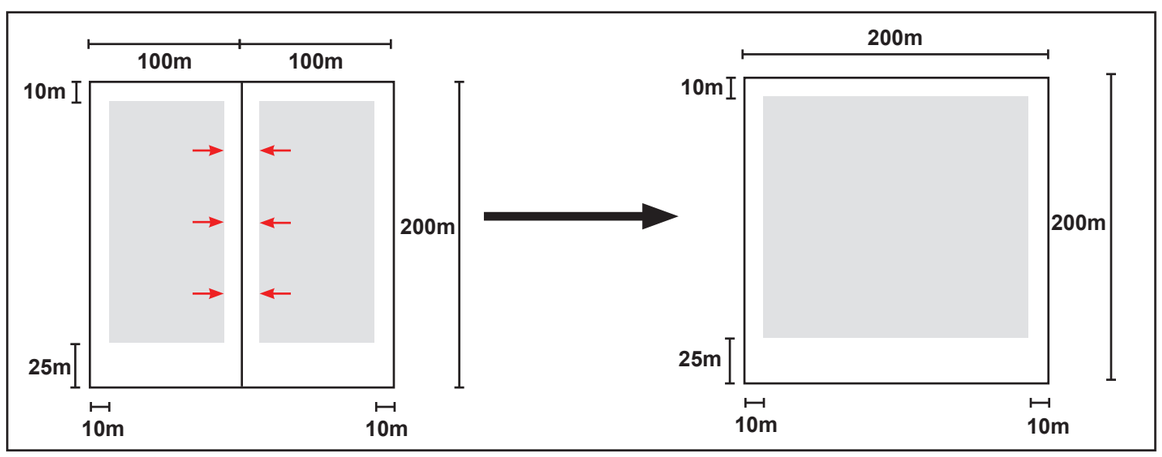


Figure 54 Plot Amalgamation

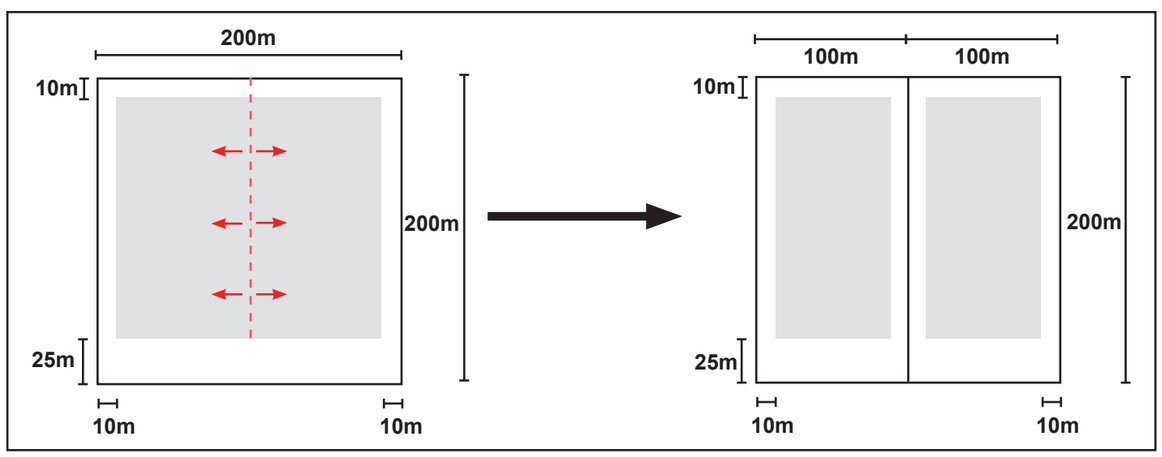


Figure 55 Plot Subdivision

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

PARKING REQUIREMENTS

P PARKING REQUIREMENTS

HEAVY INDUSTRIES
1 SPACE
per 250sqm GFA

FACTORIES
1 SPACE
per 250sqm GFA

OFFICES
1 SPACE
per 250sqm GFA

On plot parking for vehicles within the entire industrial area is to be provided either within enclosed buildings or on designated areas. Parking shall be consistent with the parking standards and shall follow the guidelines below:

- On street parking is provided for cars only
- All parking areas are to be at least 1.5m setback from the edge of any building, so as to allow for open space, walkways and overhangs
- Car parking and circulation shall be separate from truck parking and circulation
- Plot access and distance from junctions shall be designed in agreement with SEZAD highway design standards taking into account visibility and other safety issues
- No parking spaces shall be located near natural ventilation or air intakes on plot
- It is recommended to locate the primary parking area at the side or the rear of the plot
- If the plot is located on more than one road, the access to the plot shall be provided from the minor road (30m ROW) maintaining that all accesses shall be from within the super block
- A sufficient number of trees shall be provided within the parking areas to provide shade at a minimum of one tree for every six bays
- Parking areas shall be screened from the public view
- Entrances and exits to and from parking and loading facilities shall be appropriately marked with clear directional signs
- If community facility plots have more than one road road frontage, then vehicular and pedestrian access shall be provided from each road
- For truck parking requirements, it is the responsibility of the developer to provide what they need and for the Authority to review and approve
- Ramps must comply with Oman Highway Design
- Disabled Parking Bays to be located to the closest point of access to the main administration building via the car park at a rate of 1 bay for every 25 standard bays

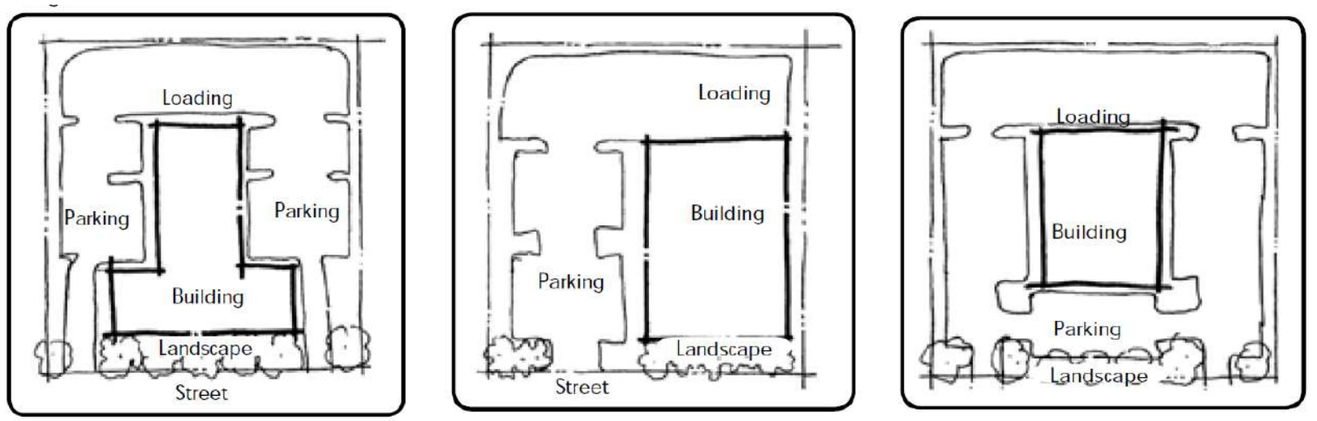


Figure 56 Three encouraged parking location samples

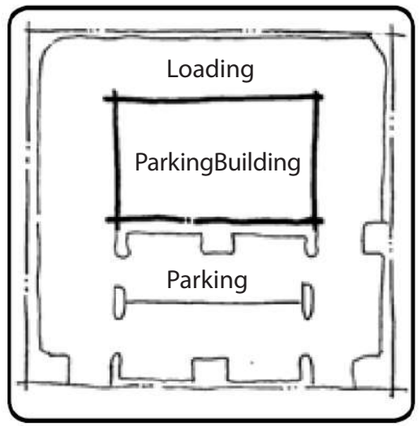


Figure 57 Discouraged front parking location sample

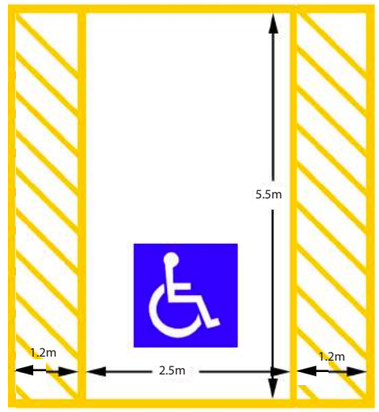


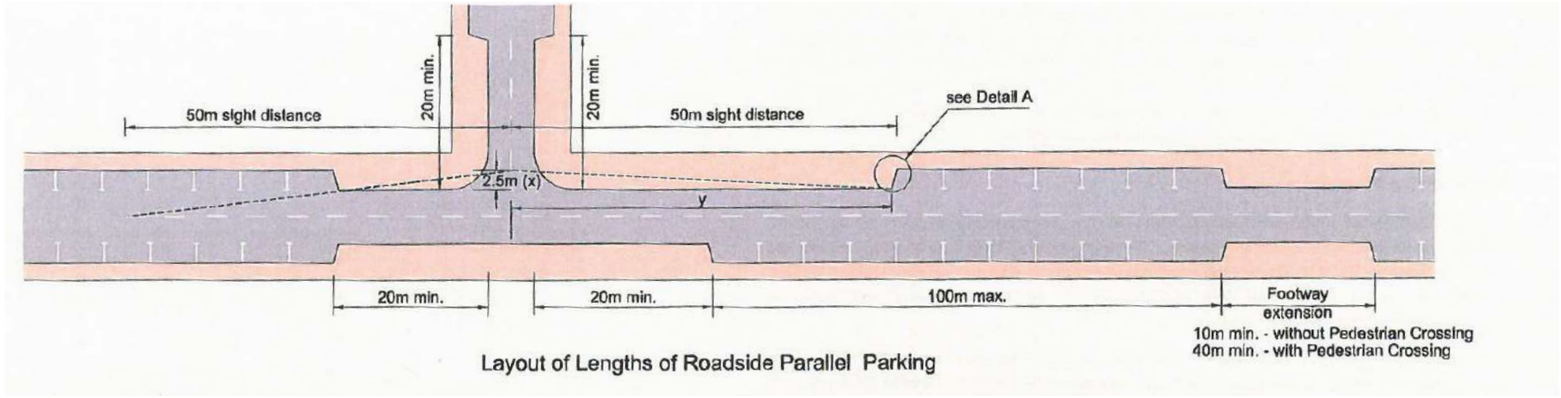
Figure 58 Disabled Parking Bays dimensions

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

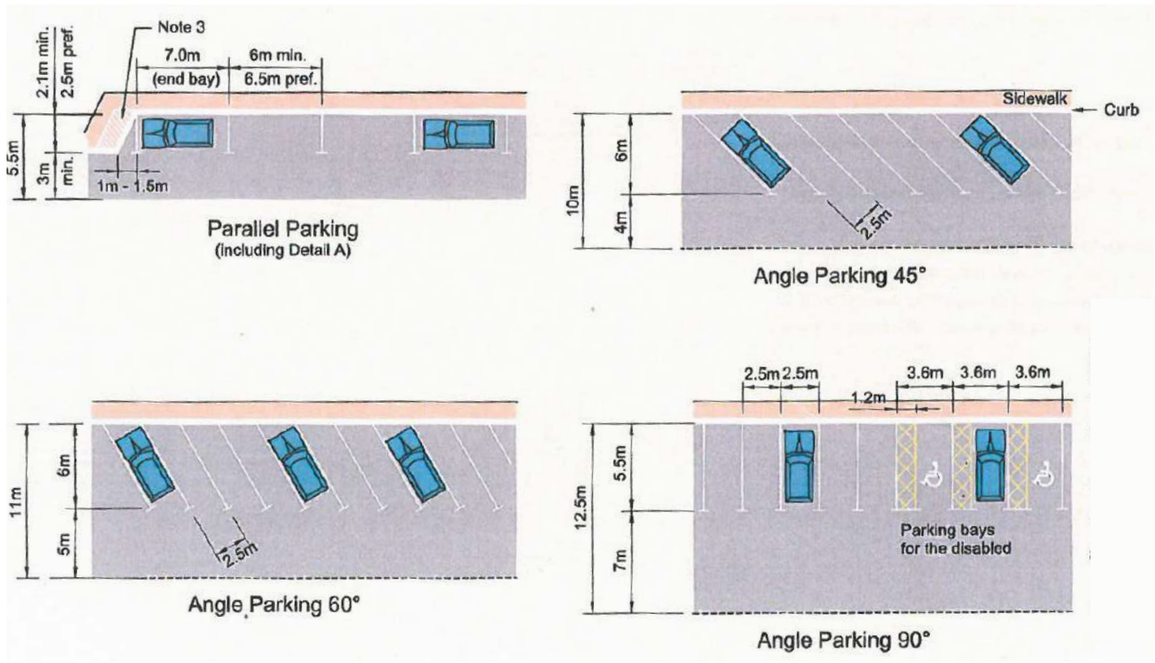
Exemptions/reductions in parking may be considered if:

- **Premises are to be semi or fully automated and therefore will have a reduced number of employees**
- **Employees are transferred to and from the site via communal transport vehicles such as buses**

PARKING REQUIREMENTS

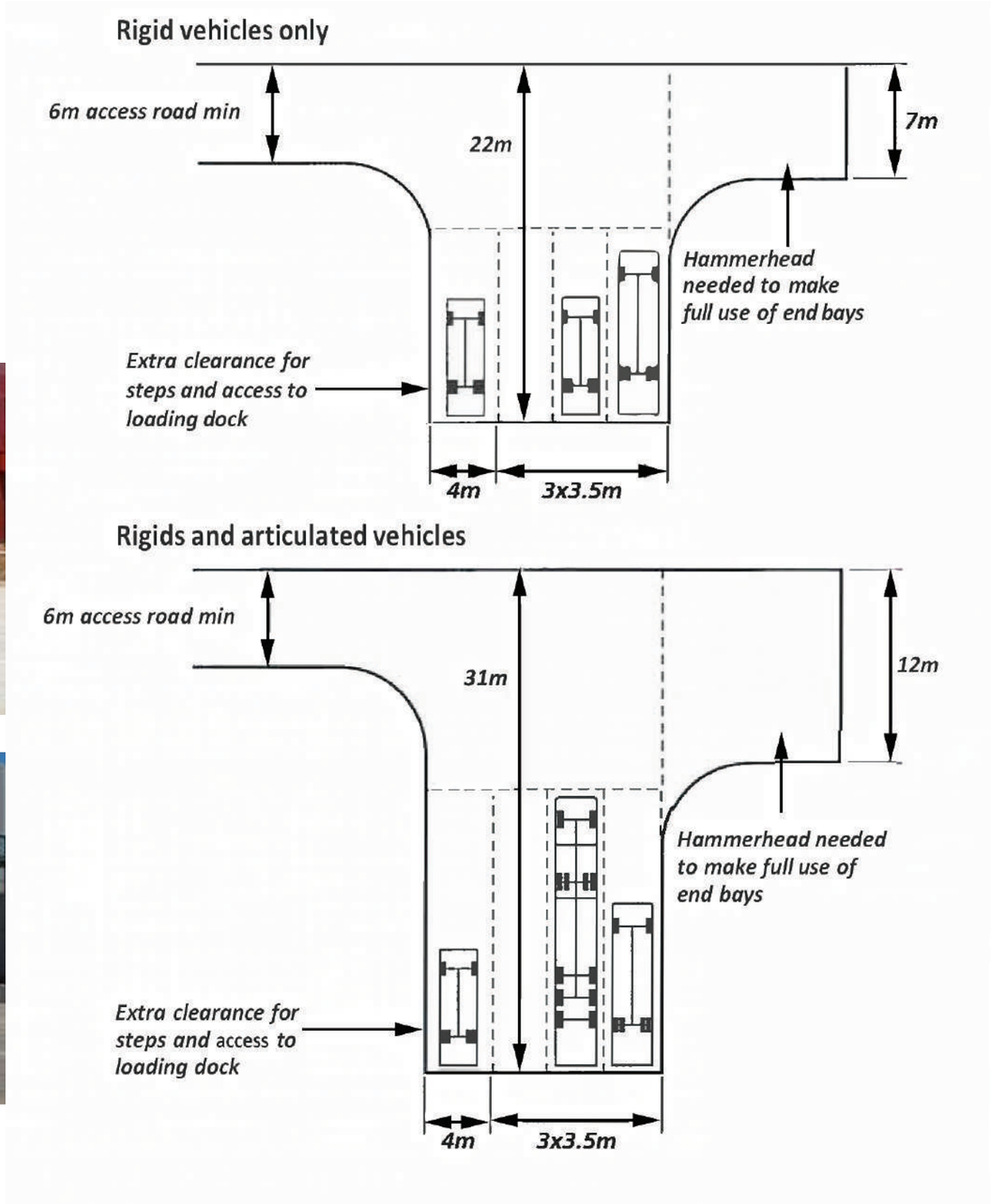


Layout of Lengths of Roadside Parallel Parking



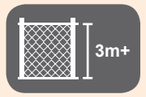
LOADING/UNLOADING

- In order to avoid traffic congestion in between buildings and to achieve a smooth circulation system within the plot, loading docks and facilities shall be located at the rear of the building and not the front or the sides
- Loading areas shall be screened from public view
- Loading areas shall be offset from vehicle driveways into the plot
- Loading areas are to be designed to accommodate the maximum sized vehicle that will utilize the facility
- Loading areas shall provide sufficient internal turning space to enable vehicles to exit the plot in forward gear
- Vehicles shall enter and exit the plot in forward gear
- Maximum height to raised loading bay is 1.2m



BOUNDARY WALLS

BOUNDARY WALLS



Min height: **3m**
Max height: **4.5m**

Boundary fences serve several purposes within industrial areas; they act as screening to the loading/unloading areas, vehicles and utility functions on the plot while also acting as a security element where needed.

- Boundary walls shall surround all plots within the Heavy Industrial Zone
- The boundary wall structure and foundation shall be within the respective plot boundary.
- Walls may be wire fencing on the sides, rear and front of the plots with the option of a 2m wrought iron simple linear elements in black matte finish and 1m solid base along front boundary could be incorporated for added security, but is not mandatory.
- The minimum height of a perimeter wall/fence is 3m
- The maximum height of a perimeter wall/fence is 4.5m
- The use of barbed wire fencing is prohibited
- Boundary walls shall be constructed out of durable materials that complement the architectural character of the area and blend with the surrounding walls, buildings and structures
- In case of expanses of boundary walls longer than 30m, some articulation and architectural elements shall be applied in order to prevent monotony
- Access control to plots within the Heavy Industrial Zone is recommended as well as incorporating security elements within the boundary walls

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

A landowner can only build boundary walls on their own property, unless an agreement is reached with an adjoining landowner. Landowners are encouraged to prevent two walls being built adjoining each other and thus are recommended to agree to a cost sharing agreement with neighbors and build half on each other's land. If an adjoining landowner is not available then the first owner is required to build a boundary wall on their own land.

If required, the landowner can also construct solid boundary walls at some locations to buffer against loud disturbing noises. and spreading of dust. This shall be allowed subject to approval from SEZAD.

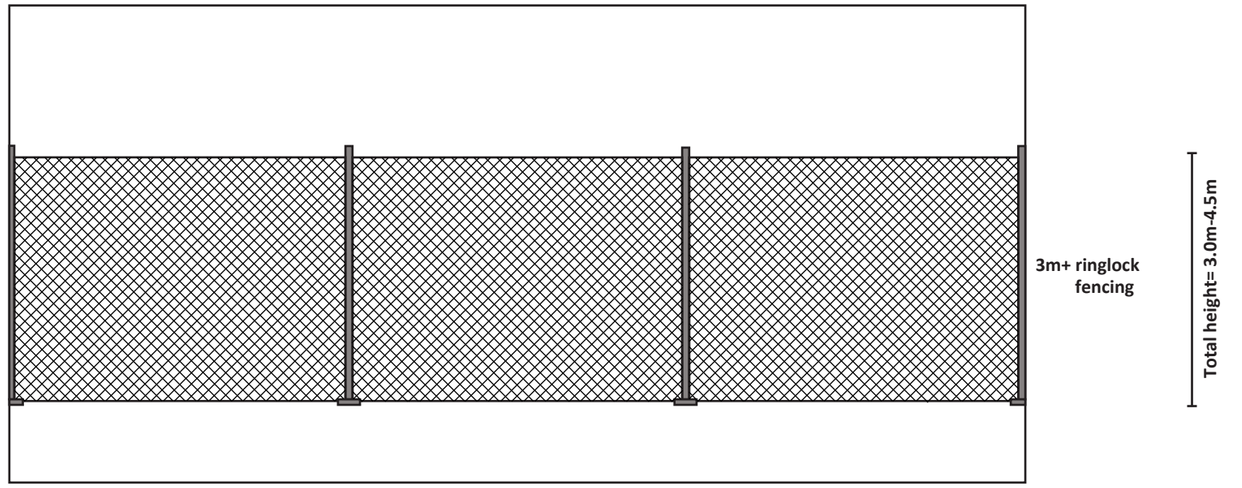


Figure 59 Frontage boundary wall facade

LANDSCAPING

LANDSCAPE

Boundary landscaping along the perimeter is compulsory

A specific percentage of each plot within the Industrial Area is to be allocated for landscaping for the purpose of providing for a visual amenity that would contribute to the environmental quality and lend a unified and embracing character to the area. In order to achieve this, the following shall be observed:

- A minimum of 10% of the plot area is reserved for landscaping
- Planting materials shall consist of native or adapted to the local climate species
- Turf areas shall be limited to 10% of the total on plot landscaped area
- Sustainable irrigation methods and technologies such as drip irrigation, moisture sensors and centralized programming and monitoring shall be considered for all planting areas
- A minimum of 12% of the total setback area facing the 30m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 15% of the total setback area facing the 50m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 15% of the total setback area facing the 80m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- Should retention ponds be required, a design that complements the landscaping theme shall be adopted
- The design of the landscape shall take into consideration the type of area by providing visual appeal to key areas (e.g. entrances, walkways) while aiming to use cost effective design solutions to secondary areas (e.g. loading area)
- Shade trees shall be incorporated within vehicle parking areas to provide shade and visual appeal at a rate of one tree for every six bays minimum
- Shade trees shall be incorporated into buffer areas, close to the street in order to contribute to creating a harmonious and appealing streetscape while also providing shade to pedestrians

STORMWATER MANAGEMENT AND DRAINAGE

Plot owners are responsible for storm water management. An on site strategy shall be adopted for retaining and managing stormwater for reuse in buildings or for landscaping purposes.

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

3. RENEWABLE ENERGY INDUSTRY GUIDELINES

OVERVIEW

DEFINITION

Renewable Energy is defined as energy from a source that is not depleted when used, such as wind or solar power, but is increasingly considered to include biomass and waste-to-energy practices. Renewables are vital to the long-term goals and objectives for SEZAD within the context of the Duqm project. The future use of natural and sustainable energy resources within Duqm is aligned with the core values of SEZAD which seeks the optimal use of both natural and environmental resources. This approach reflects the longer term economic and environmental objectives of the Sultanate as a whole. Whilst Oman's existing economy is predicated on an abundance of natural oil and gas reserves, the Authority for Electricity Regulation (AER) has recognized the future potential for renewable resources within the Sultanate.

Sources of renewable energy include Solar, Wind, Geothermal, Wave and Waste-to-Energy Plants. The Duqm Master plan does not include the coastal areas outside of Duqm Port, which precludes this report from including guidelines on wave energy developments which may occur outside SEZAD's boundary. The AER report has demonstrated that the potential for geothermal energy within the Duqm region is relatively limited. These energy types are therefore excluded from the scope of these guidelines.

These guidelines deal with the three likely contributors to the renewable energy sector in Duqm: Solar, Wind, and Waste-to-Energy. These industries will increasingly form a significant role within the local energy sector, and such developments, due to their potential impact, are required to be carefully managed within the context of the overall master planfor Duqm.

PERMITTED USES

Permitted uses are functions and operations that are authorized and approved to be located on a plot within the Renewable Energy Industry area and that are considered suitable within the context and correspond to the vision of the area.

The following uses are permitted in areas designated by land use as a renewable energy industrial plot. All other uses are prohibited.

- Solar-farm / Photovoltaic complex
- Wind farm
- Waste-to-Energy plants
- Any combination of the above uses
- Ancillary repair and maintenance facilities
- Ancillary office use, staff accommodation, prayer rooms

The accompanying sitemap demonstrates the location of sites which have been allocated for renewable energy industries in the Duqm masterplan.

RENEWABLE ENERGY INDUSTRY AREA COMPONENTS

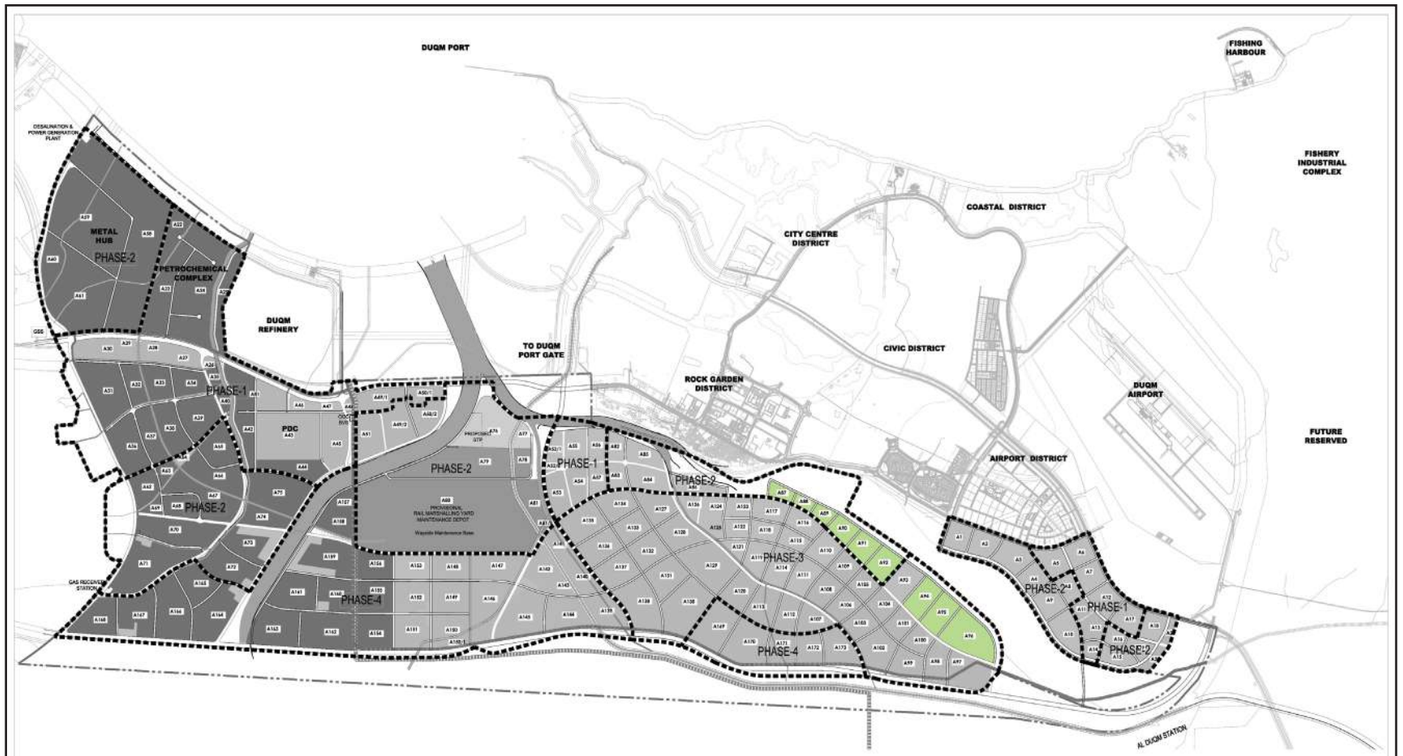
The masterplanning process has resulted in the allocation of lands on the periphery of Duqm for appropriate industrial uses. Some plots, due to their undulations and natural topography, are readily adaptable for commercial use. However, such sites may be more suited to uses within the renewable energy sector. Upland sites are traditionally associated with wind farming. Similarly, such sites also readily accommodate solar energy developments through the installation of photovoltaics.

Waste-to–Energy plants may be accommodated more easily within a traditional industrial setting given the nature of the practice, which involves significant trip generation, industrial processes, and more significant staffing numbers than both solar and wind farms.

In addition to Renewable Energy functions, the general layout of the project covers supporting and ancillary functions, such as office buildings and repair and maintenance buildings which may be necessary at some sites where renewable energy is produced.

LAND USE PLAN

The land use plan (Figure 58) shows the zone designated for the Renewable Energy Industrial Area. The total area reserved is estimated to be 5.01 km^2, where the largest area is concentrated in the far south and the south east areas while smaller Light Industry zones are scattered throughout the entire industrial zone.



PHASE	HEAVY INDUSTRY	MEDIUM INDUSTRY	LIGHT INDUSTRY	SABKHA MED. INDUSTRY	RENEWABLE ENERGY IND.	RAILWAY YARD	UTILITIES HUB	Total Area (km²)
PHASE-1	15.267	8.326	3.710	-	-	-	-	27.303
PHASE-2	24.366	2.189	6.349	2.770	2.232	10.576	2.001	50.483
PHASE-3	-	17.480	5.365	-	2.772	-	-	25.617
PHASE-4	14.333	13.359	1.328	-	-	-	-	29.020
Total Area (km²)	53.966	41.354	16.752	2.770	5.004	10.576	2.001	132.423

Figure 60 Renewable Energy Industry

DEVELOPMENT STATISTICS

The Design Statistics section is yet to be completed as it is reliant on information from the final plot sheets. Much of the information that would be contained in the Design Statistics section is included in the overall Design Guidelines. SEZAD to determine whether to include the Design Statistics section in the final Design Guidelines document.

DESIGN GUIDELINES

PLOT ENVELOPE

ACCESS AND CIRCULATION

Vehicle Access:

The location of ingress and egress points for vehicles accessing the designated sites, circulation within the site itself, and the implications of those on public traffic, are all considered in setting the access and circulation design guidelines. The following parameters shall be followed for car and truck access and circulation within plots designated as Renewable Energy Industry sites:

- Access points and internal roads within each plot shall be paved with hard surfaced material with appropriate drainage.
- All building structures on the plots shall be accessible by civil defense and fire department vehicles
- Vehicle driveways within the plot shall be located so as to minimize conflict with pedestrian circulation. Minimum width for driveways shall be 4m, while parking ramps and egress and ingress points shall be determined taking into consideration the type of trucks and vehicles required to service the nature of industry on each specific plot given that approvals are granted by SEZAD for the dimensions of these access points
- Ornamental entrance structures, pylons and gateways for vehicle driveways are permitted on plots
- Vehicle driveways shall be located a minimum of 2.0m from fire hydrants, a minimum of 1.0m from street lights and adjacent plot lines while egress and ingress points to be located away from street intersections
- Exits and entrances to the plots shall be adequately provided so as not to create congestion at the entry point or generate queuing or safety issues at public roads. Location of the exits and entrances to the plots are shown in plot sheets and shall be followed
- Truck access and circulation within the plot shall be separated from passenger car access and circulation
- It is recommended within the Renewable Energy Industry sites to secure the perimeter and regulate entry by providing controlled guarded entrances and check points at all plot accesses
- The minimum lane width is 3.65m with a minimum radii of 10m

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

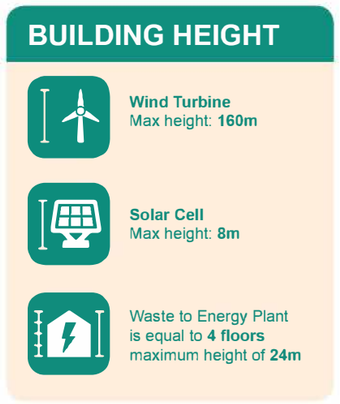
Pedestrian Access:

The following parameters shall be followed for pedestrian circulation within the plots in the Renewable Energy Industrial Zone:

- Paving material and dimensions of primary pedestrian connections shall differ from those of secondary pedestrian connections and shall be of a material suitable for pedestrian use around administration and maintenance buildings
- Access to solar power cells and wind turbines shall be provided in a manner that enables safe pedestrian access
- Pedestrian entrances to buildings shall be clearly defined, visibly marked and easily accessed
- Pedestrian connections and walkways shall be safely buffered and protected from vehicular traffic and circulation on plot
- Minimum width of the sidewalk shall be 1.5m in all ROWs and 1.2m within plots.
- A pedestrian connection shall run continuously from the public pedestrian sidewalk through the parking area pedestrian walkways to the main building pedestrian entrances, where applicable

PLOT ENVELOPE

BUILDING HEIGHTS



Structure height requirements will vary considerably between renewable energy industries. As a result, each industry use is treated with separate guidelines under each subject heading. The building height within the renewable energy sites is to follow the guidelines below in order to create a balance between the requirements of the renewable industry and the effect of the development on the character and the vision of the area. Notwithstanding the following guidelines, proposed solar / PV developments and proposed wind-farms will need to satisfy all Civil Aviation Authority requirements.

Wind:

- The total turbine structure height permitted on plots designated as renewable energy industry sites is 160m (including rotor blade) from natural ground level
- For specific operational necessities that require exceeding the set height limit, an exception may be made subject to approval. Building heights equal to 50% of the building setback from the property boundary could be filed for approval
- The total ancillary building height permitted on plots located within Renewable Energy Industry sites is equal to 3 floors measuring a maximum sum of 18m

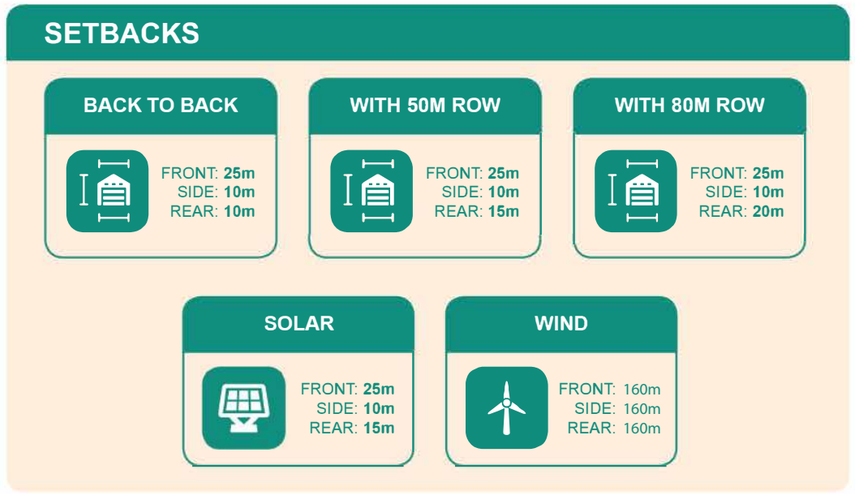
Solar / PV Cell:

- The PV cell structure height allowed on plots designated as renewable energy industry sites is 8m from natural ground level
- For specific operational necessities that require exceeding the set height limit, an exception may be made subject to approval. Building heights equal to 50% of the building setback from the property boundary may be filed for approval
- The total ancillary building height permitted on plots located within Renewable Energy Industry sites is equal to 3 floors measuring a maximum sum of 18m.

Waste to Energy:

- The total building height for waste-to-energy plants permitted on plots located within the Renewable Energy Industrial Zone is equal to 4 floors measuring a maximum sum of 24m
- For specific operational necessities that require exceeding the set height limit, an exception may be made subject to approval. Building heights equal to 50% of the building setback from the property boundary may be filed for approval
- Examples of structures that may be exempt from height limit restrictions (upon approval) are chimneys required for operational purposes
- The ground floor of industrial buildings may be raised by 1.2m (maximum) for loading and unloading purposes

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.



Setbacks are specified distances required between the plot boundary and the external face of a building or boundary wall. The purpose of setbacks is to provide a degree of separation between land uses and to provide room for emergency vehicles' access. Below are requirements to be followed for each of the Renewable Energy Industry types:

Wind:

- The setbacks for all wind turbines on Renewable Energy Industry plots are as follows:
  - **The front setback shall be equal to 160m**
  - **The side setback shall be equal to 160m**
  - **The rear setback shall be equal to 160m**

Solar:

- The setbacks for all PV / Solar cells on Renewable Energy Industry plots are as follows:
  - **The front setback shall be equal to 25m and shall incorporate a 10m landscape buffer**
  - **The side setback shall be equal to 10m**
  - **The rear setback shall be equal to 15m**

Ancillary Buildings or Wind and Solar Developments:

The setbacks for all ancillary buildings or Wind Energy and Solar Energy sites are as follows:

- Setbacks for back to back plots at Renewable Energy Industry plots are as follows:
  - The front setback shall be equal to 25m and shall incorporate a 10m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 10m
- Setbacks for sites with a 50m ROW along the rear are as follows:
  - The front setback shall be equal to 25m
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 15m and shall incorporate a 10m landscape buffer
- Setbacks for sites with an 80m ROW along the rear are as follows:
  - The front setback shall be equal to 25m and shall incorporate a 10m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 20m shall incorporate a 10m landscape buffer
- The green buffer is the section of the setback area closest to the plot boundary where only trees may be planted and landscaping applied. On plot storm water drainage strategies that utilize landscape areas may be adopted and applied within the buffer section
- The green buffer area along the 30m, 50m, and 80m Right of Way must commence at the plot boundary and continue into the plot

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

Justifiable setback variations may include:

- **Additional landscaping planted to screen development from the street**
- **A landmark architectural development that addresses the street is to be constructed**
- **Parking and major industrial activities are to be located to the rear of the plot**
- **Parking is to located below ground or at ground level with G+1 above**

Waste to Energy:

The setbacks for waste-to-energy developments at back to back plots are shown in the previous graphic:

- The front setback shall be equal to 25m and shall incorporate a 5m landscape buffer
- The side setback shall be equal to 10m
- The rear setback shall be equal to 10m

- The setbacks waste-to-energy developments at for plots with a 50m ROW along the back are shown in the previous graphic:
  - The front setback shall be equal to 25m and shall incorporate a 5m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 15m and shall incorporate a 3m landscape buffer
- The setbacks for waste-to-energy developments for plots with an 80m ROW along the back are shown in the previous graphic:
  - The front setback shall be equal to 25m and shall incorporate a 5m landscape buffer
  - The side setback shall be equal to 10m
  - The rear setback shall be equal to 20m and shall incorporate a 5m landscape buffer

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

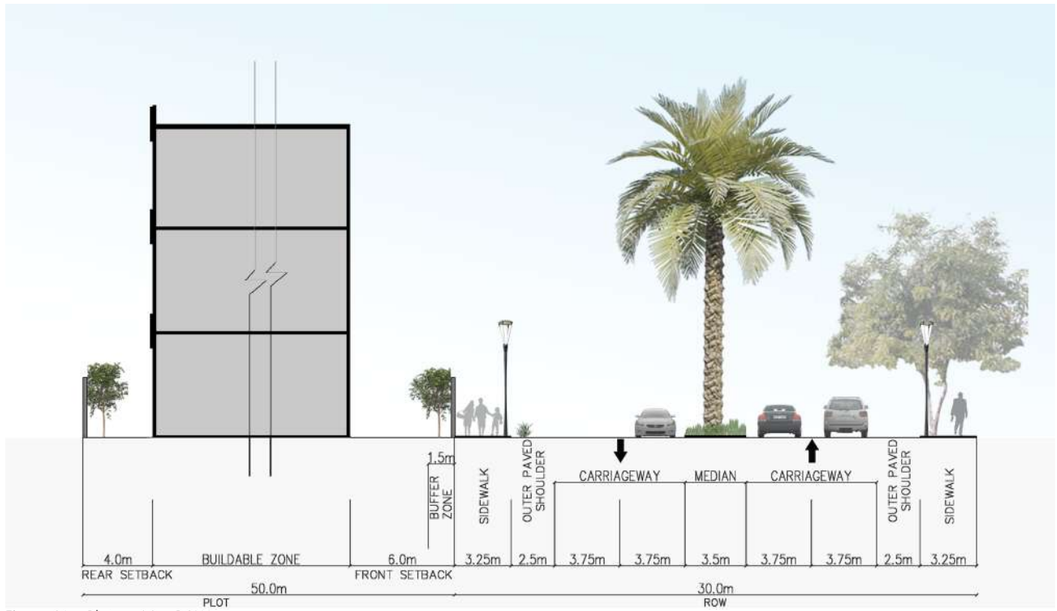


Figure 61 Plot on 30m ROW

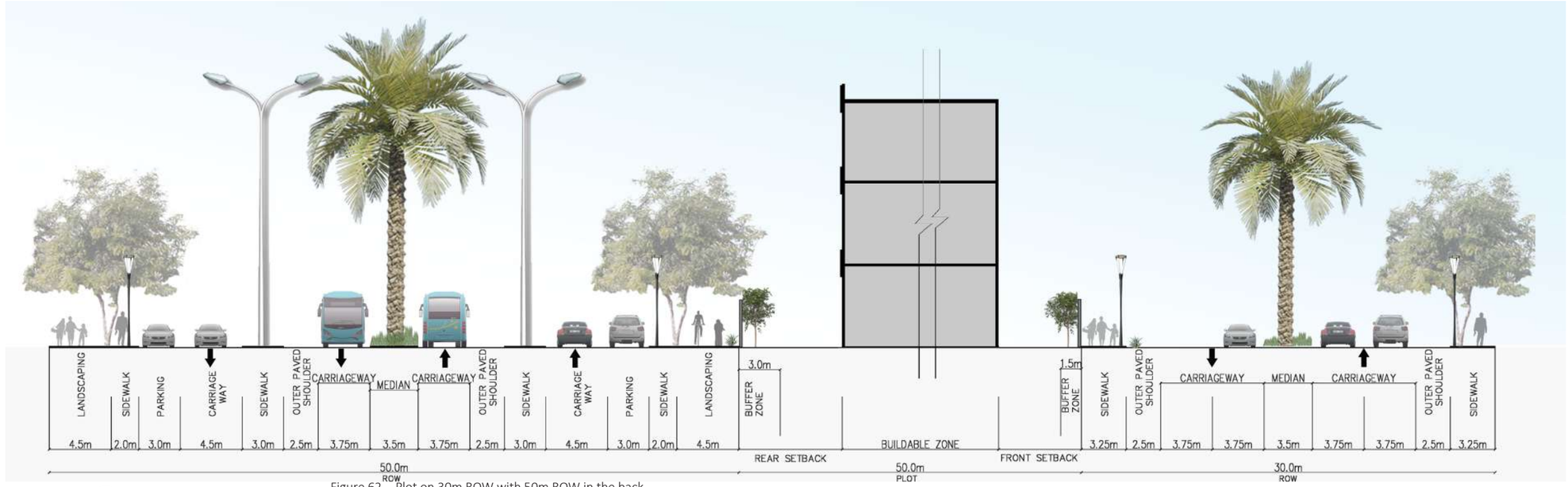


Figure 62 Plot on 30m ROW with 50m ROW in the back

Figure 63 Plot on 30m ROW with 80m ROW in the back

PLOT COVERAGE

Plot coverage is the maximum percentage of the plot area permitted to be covered by the buildings or structures applied to ensure that the built environment within the area is not compromised. The following clarifies the purpose of plot coverage and its value within the area:

- Plot coverage guarantees that no structure abuts the boundary of the plot for lighting, fire prevention and ventilation purposes
- Plot coverage controls contribute to increasing the height of buildings by limiting the single floor area in order to achieve an appealing urban environment
- Plot coverage percentage is enforced and applied in order to allow for space within the plot for car and truck entering, circulating, loading etc
- Plot coverage shall allow for open space, landscaped areas and green buffers reserves required on plot
- Plot coverage shall allow for the Civil Defense vehicles to enter and reach all parts of all structures built on plot
- Plot coverage for plots within the Renewable Energy Industry Zone is not to exceed 65% of the site area
- The percentage mentioned above includes all buildings within the plot boundaries. Examples of such include; electric rooms, substations, guard and storage facilities as well as any light ancillary buildings that may be located within the premises

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

FAR (FLOOR AREA RATIO)

FLOOR AREA RATIO

0.75

The FAR in Renewable Energy Industry is equal to **0.75**

The FAR in Waste to Energy Plant is equal to **0.60**

The Floor Area Ratio directs the intensity of usage of a building on a specific plot. It is related to the volume of all principle built structures on the plot, the plot coverage percentage, the number of floors and the GFA. The Floor Area Ratio is the total area of all floors divided by the total area of the plot.

- The purpose behind applying a FAR is to ensure that the land is optimally utilized while still enabling an attractive built environment to be developed
- The FAR for plots designated for Renewable Energy Industry uses is equal to 0.75, except in the case of Waste-to-Energy developments where the FAR is equal to 0.6

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

PLOT SUBDIVISION / AMALGAMATION

PLOT AMALGAMATION

In cases where investors are willing to amalgamate 2 or more plots within the Renewable Energy Industry Zone, the following shall be taken into consideration:

- All Renewable Energy Industry Zone guidelines shall apply to the amalgamated plots
- The resulting plot shall maintain all external setbacks of the amalgamated boundary so as to preserve the character of the area
- The total GFA allocated for the amalgamated plot shall not exceed the sum GFA of all plots separately
- Accesses and connections to the amalgamated plot shall be based on the approved connections and entrances for the separate plots
- The amalgamation request is subject to the approval of SEZAD

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

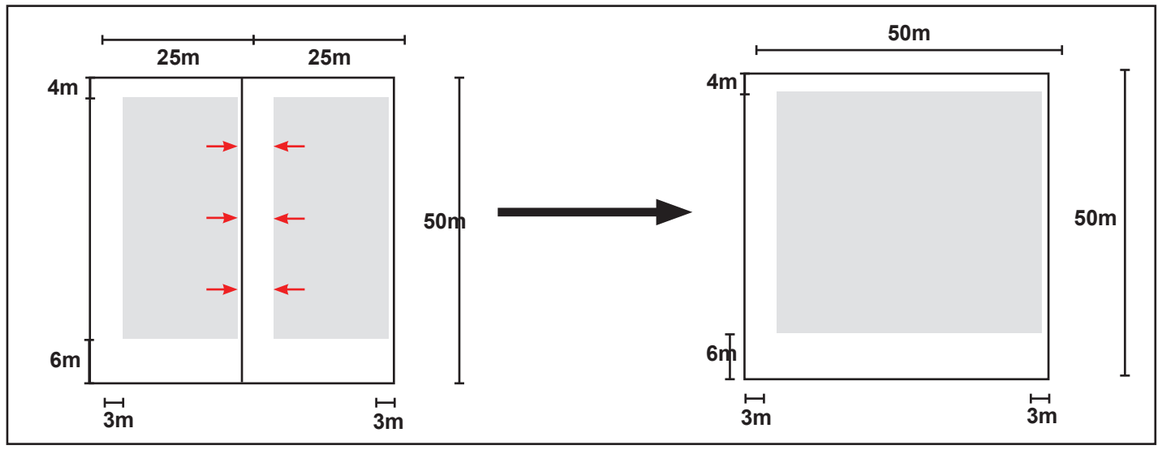


Figure 64 Plot Amalgamation

PLOT SUBDIVISION

In cases where investors are willing to subdivide a plot within the Renewable Energy Industry Zone, the following shall be taken into consideration:

- All Renewable Energy Industry Zone guidelines shall apply to the subdivided plot
- The resulting plot shall maintain all external setbacks of the new boundary as well as additional setbacks from neighboring plots so as to preserve the character of the area and provide sufficient space within the plot for vehicle entrance, circulation, parking and civil defense vehicle accessibility
- The total GFA allocated for the subdivided plot shall not exceed the maximum GFA based on 0.75 FAR for Solar and Wind Energy schemes, or 0.6 FAR for Waste-to-Energy schemes.
- Accesses and connections to the subdivided plots shall be based on the approved connections and entrances plan
- The subdivision request is subject to the approval of SEZAD

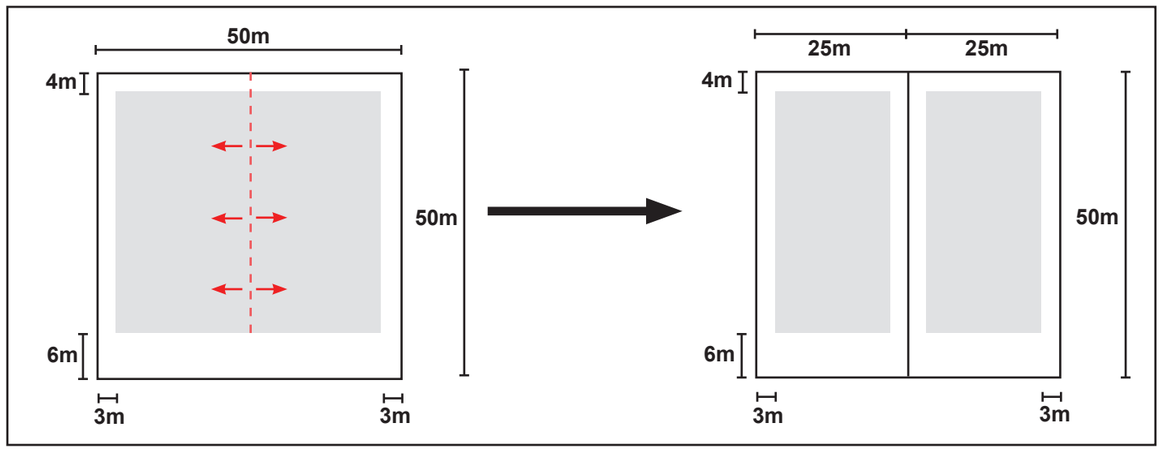


Figure 65 Plot Subdivision

PARKING REQUIREMENTS

PARKING REQUIREMENTS

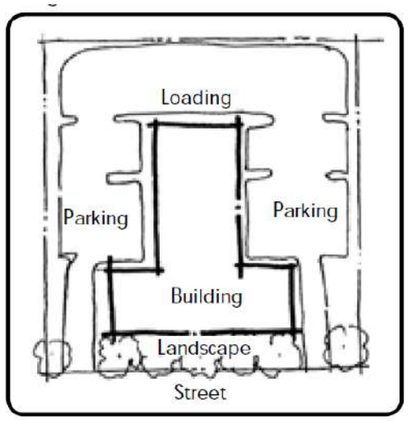
RENEWABLE ENERGY
1 SPACE
per 250sqm GFA
of building area

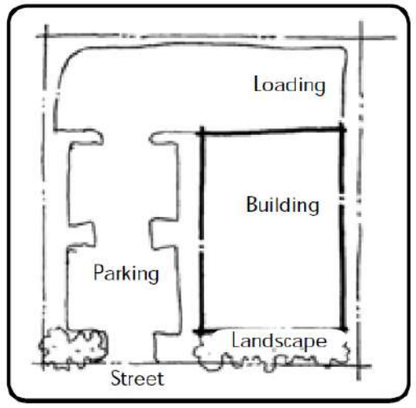
FACTORIES
1 SPACE
per 250sqm GFA

OFFICES
1 SPACE
per 80sqm GFA

On plot parking for vehicles within the entire industrial area is to be provided either within enclosed buildings or on designated areas. Parking shall be consistent with the parking standards and shall follow the guidelines below:

- All parking areas are to be at least 1.5m setback from the edge of any building, so as to allow for open space, walkways and overhangs
- Car parking and circulation shall be separate from truck parking and circulation
- Plot access and distance from junctions shall be designed in agreement with SEZAD highway design standards taking into account visibility and other safety issues
- No parking spaces shall be located near natural ventilation or air intakes on plot
- It is recommended to located the primary parking area at the side or the rear of the plot
- If the plot is located on more than one road, the access to the plot shall be provided from the minor road (30m ROW) maintaining that all accesses shall be from within the super block
- A sufficient number of trees shall be provided within the parking areas to provide shade at a rate of one tree for every six days
- Parking areas shall be screened from the public view
- Entrances and exits to and from parking and loading facilities shall be appropriately marked with clear directional signs
- For truck parking requirements, it is the responsibility of the developer to provide what they need and for the Authority to review and approve
- Ramps must comply with Oman Highway Design
- Disabled Parking Bays to be located to the closest point of access to the main administration building via the car park at a rate of 1 bay for every 25 standard bays





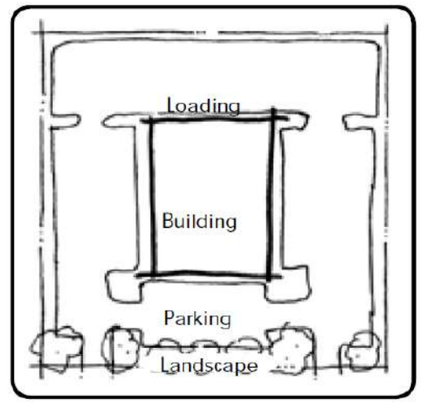


Figure 66 Three encouraged parking location samples

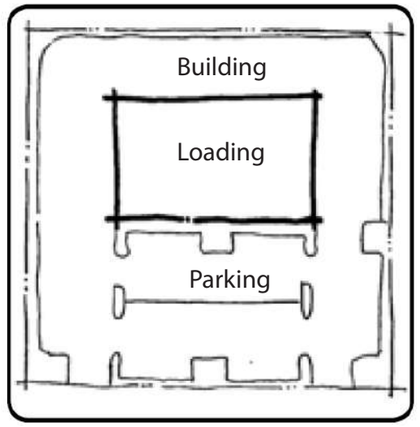


Figure 67 Discouraged front parking location sample

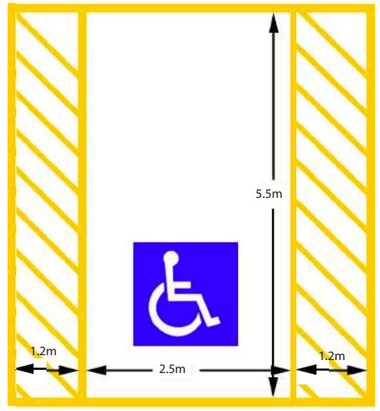
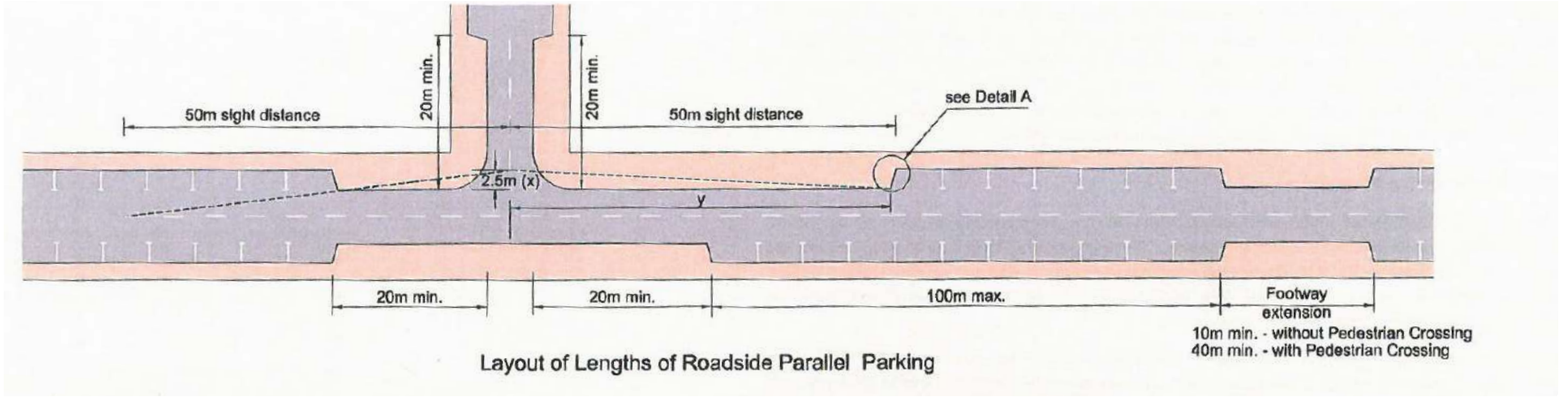


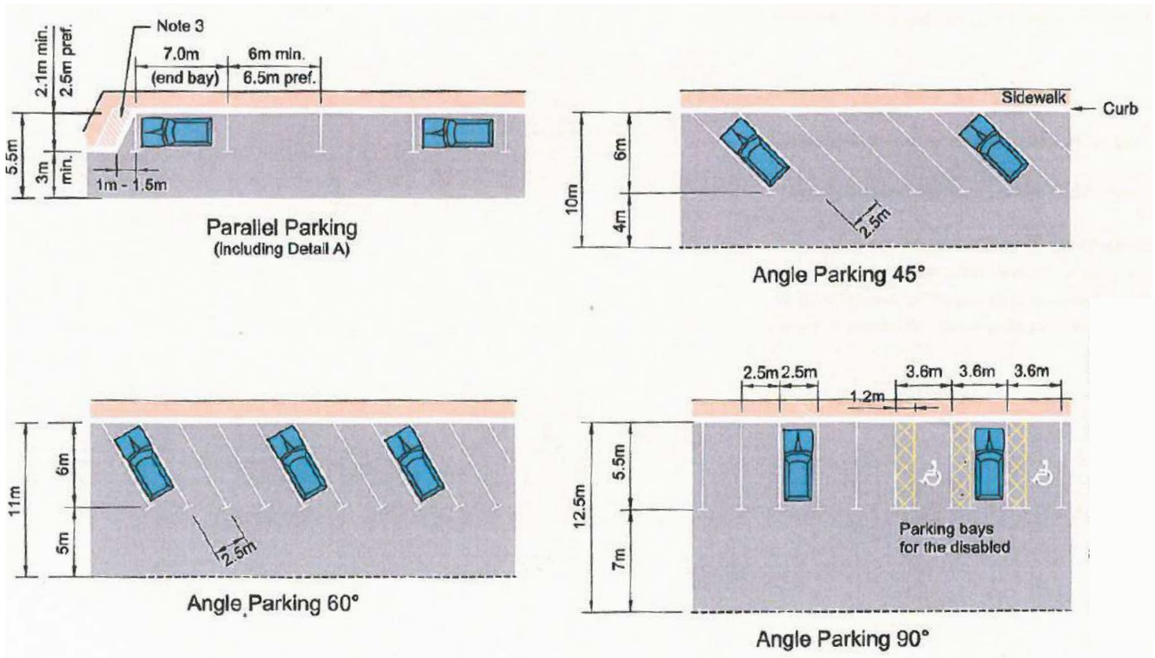
Figure 68 Disabled Parking Bays dimensions

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

PARKING REQUIREMENTS



Layout of Lengths of Roadside Parallel Parking



BOUNDARY WALLS

BOUNDARY WALLS

Min height: **3m**
Max height: **4.5m**

Boundary treatment acts as screening from the surrounding sites and surrounding land use types. Screening may obscure the loading/unloading areas, vehicles and utility functions on the plot while also acting as a security element where needed.

- Boundary treatment shall be employed at all plots within the Renewable Energy Industrial Zone
- The boundary wall structure and foundation shall be within the respective plot boundary.
- Boundary perimeter fencing shall be employed on all sites with a standard height of 3m.
- For the frontage of the plots, ringlock fencing between 3.0 - 4.5m is acceptable
- Plot owners may upgrade the frontage boundary to a 2m wrought iron simple linear elements in black matte finish and 1m solid base

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

A landowner can only build boundary walls on their own property, unless an agreement is reached with an adjoining landowner. Landowners are encouraged to prevent two walls being built adjoining each other and thus are recommended to agree to a cost sharing agreement with neighbors and build half on each other's land. If an adjoining landowner is not available then the first owner is required to build a boundary wall on their own land.

If required, the landowner can also construct solid boundary walls at some locations to buffer against loud disturbing noises. and spreading of dust. This shall be allowed subject to approval from SEZAD.

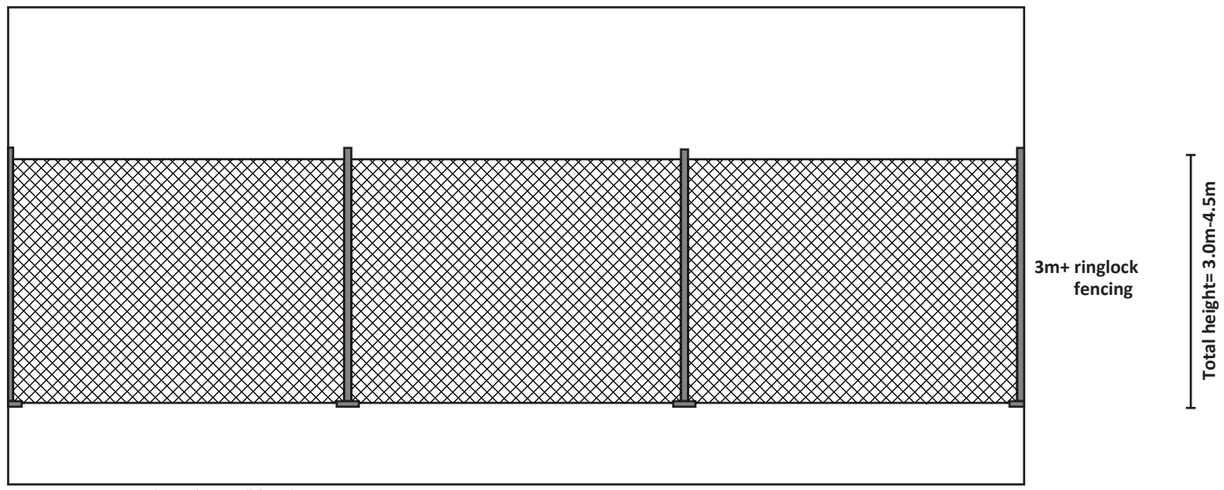


Figure 69 Frontage boundary wall facade

LANDSCAPING

LANDSCAPE

Boundary landscaping along the perimeter is compulsory

A portion of plots within the Renewable Energy Industrial Zone is to be allocated for landscaping for the purpose of providing for a visual amenity that will contribute to the environmental quality and lend a unified and embracing character to the area. In order to achieve this, the following shall be observed:

- Boundary landscaping along the entire perimeter of the site is compulsory, in order to preserve the environmental quality and visual amenity of the area.
- Planting materials shall consist of native or adapted to the local climate species
- Sustainable irrigation methods and technologies such as drip irrigation, moisture sensors and centralized programming and monitoring shall be considered for all planting areas
- A minimum of 25% of the total setback area facing the 30m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 25% of the total setback area facing the 50m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- A minimum of 30% of the total setback area facing the 80m ROW is to be soft landscape plantings (trees, shrubs, and groundcovers)
- Should retention ponds be required, a design that respects the landscaping theme shall be adopted
- The design of the landscape shall take into consideration the type of areas by providing visual appeal to key areas (e.g. entrances, walkways) while aiming to use cost effective design solutions to secondary areas (e.g. loading area)
- Shade trees shall be incorporated within vehicle parking areas to provide shade and visual appeal at a rate of one tree for every six bays
- Shade trees shall be incorporated into buffer areas, close to the street in order to contribute to creating a harmonious and appealing streetscape while also providing shade to pedestrians

STORMWATER MANAGEMENT AND DRAINAGE

Plot owners are responsible for storm water management. An on site strategy shall be adopted for retaining and managing storm water for reuse in buildings or for landscaping purposes.

Exemptions or slight deviations will only be allowed on a case by case basis depending on specific operational requirements and certain special requirements due to new business and technology. Cases as such have to be approved and permitted by the assessing authorities.

LANDSCAPE, COMMUNITY AND SAFETY CONSIDERATIONS

All solar and wind energy projects proposed will require the commission of a report which assesses the impact of the proposed development on the wider area. The visual impact of large scale renewable energy projects may be considerable on the wider Duqm area. The nature of wind turbine developments results in their visibility to large proportions of the population of the area in which they are sited. Potential impacts on the general population relate to adverse noise or visual impact on the natural environment. Solar / PV cells may also adversely impact upon the wider area through issues such as 'glint' and 'glare' which may have significant impacts upon local communities, and for road and traffic safety.

The report should demonstrate the proposed impact of the development on the wider Duqm area, including detailed assessments in terms of acoustic impact and visual impact. This report may be commissioned alongside any study necessary to be undertaken to satisfy the requirements of the Civil Aviation Authority.

In order for the proposed development to gain consent, it will be required to demonstrate to the satisfaction of SEZAD that:

- **The proposal will not adversely impact the amenities of the local community**
- **The proposal will not compromise the use of surrounding sites for their designated uses under the Duqm Masterplan**
- **The proposal will not adversely impact the visual amenity of the Duqm landscape**
- **The proposal satisfies the safety requirements of the local Civil Aviation Authority**

7. ARCHITECTURAL GUIDELINES

GENERAL ARCHITECTURAL GUIDELINES

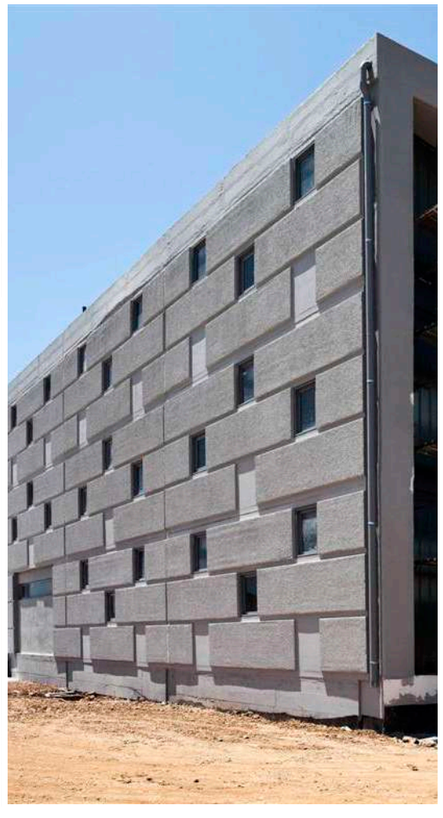
MASSING

The quality of building massing and the level of mass articulation contribute largely to the overall character and intended image of the area. In order to achieve the desired appearance and create a unified impression within the Duqm Industrial Area, the following guidelines shall be followed:

- Facades aligning with street frontages shall not be blank
- Monotonous, plain facades shall be avoided while creating visual interest by cutting out and adding elements for the purpose of articulation is encouraged. Facades shall not run continuously without articulation for more than 15m
- Façade fenestrations, architectural details (structural elements) and shading devices may be used to enrich the facades and create visual interest
- A 10% minimum of the facade area shall be reserved for openings. Openings shall relate to the scale of the facade
- Locating buildings as close as possible to the street (setback permitting) will enhance the street environment and enrich the urban fabric
- Most sun radiation in the area is concentrated along the East and South facades, hence, most openings are to be focused within the West and North Facades to avoid extreme sun radiation and glare
- In order to contribute to the articulation of a building, a variety of materials and colors conveying a level of contrast, yet visually and functionally harmonious, shall be used rather than defaulting to monotony and uniformity
- Building entrances shall be highlighted and emphasized with accent elements, complementary lighting and awnings (shading elements)
- Any accessory elements on plot (e.g. fences, walls, trash enclosures, shading elements and stairways) shall be designed in harmony with the main buildings on plot and the architectural theme of the area
- On plot services (e.g. waste enclosures, storage areas, utility boxes and loading docks) shall be screened from the public view



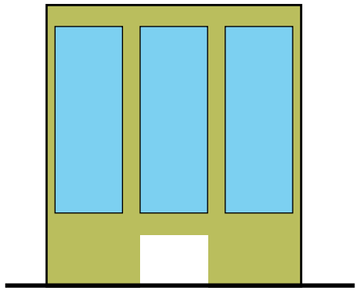


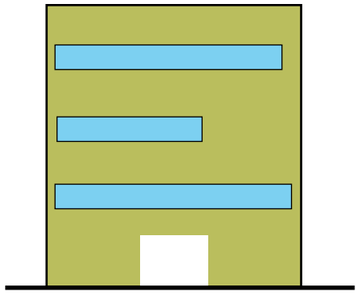

ORIENTATION

Building orientation shall follow the direction of the sun and generally avoid receiving a concentration of solar radiation. The common practice in the Gulf Region is to have buildings oriented to face north/ south if physically possible within the plot. However, given the region's hot and harsh climate, the design shall always take into consideration the wind direction and air and sand movement through the site.

- Building orientation shall take solar radiation into consideration and shall, when possible, orient the building in a way where longer sides face minimal solar exposure
- Building orientation shall take into consideration the orientation of other nearby buildings
- Design shall aim to concentrate and orient the openings along facades where less solar radiation takes place
- Shading elements shall be provided to reduce solar radiation and glare specifically along facades that receive most exposure. However, the use of adjustable shading elements is recommended in order to utilize sunlight when required



Good Design: Minor East-West Exposure



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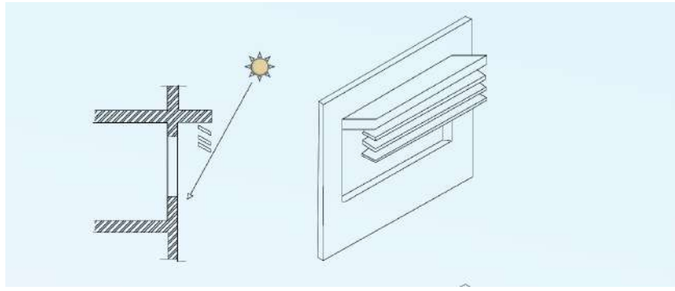
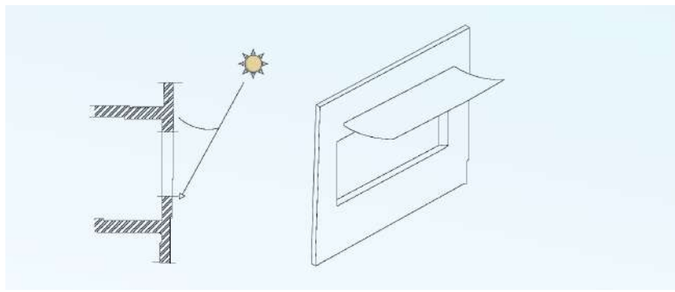
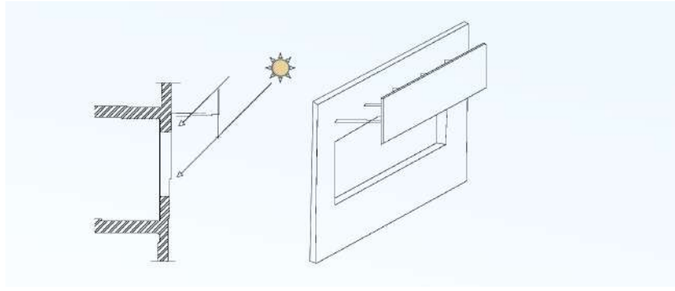
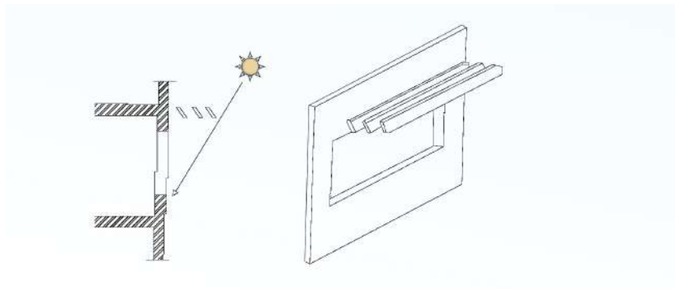








MATERIALS

The materials are chosen to achieve durability in addition to contributing to the desired vision and intended character:

- For external surfaces, the use of high quality materials that are appropriate to the climate of the region and the function of the building is required
- Materials used on parts and elements visible to the public shall be consistent with the overall character and materials within the area
- Materials shall convey a sense of originality and attention to design rather than functionality per se
- Examples of materials to be used are listed below:
  - Through-fixed metal insulated panels – Various colors , Thermocore panel is trapezoidal through-fixed insulated composite panel
  - Terracotta panel façade system/ EIFS/Natural stone/GRC panel cladding finished to replicate the appearance of natural stone/ Aluminum composite panel (depend ing on client's preference and budget)
  - Double glazed vision glass hermetically sealed
  - Spandrel panel
  - Aluminum composite panel system and louvers
  - Extruded aluminum mullions/fins/frames



Natural stone

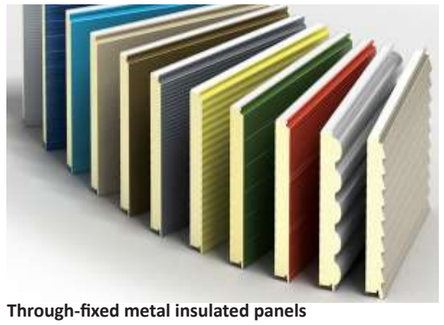
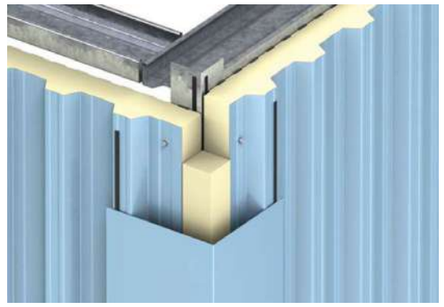


Glass reinforced concrete



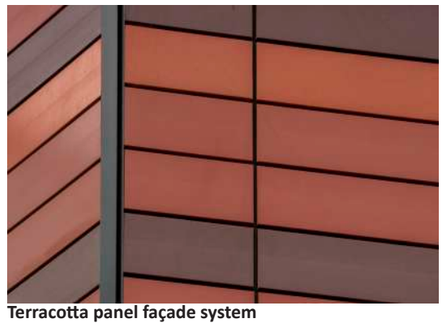

Exterior insulation finishing system





Through-fixed metal insulated panels

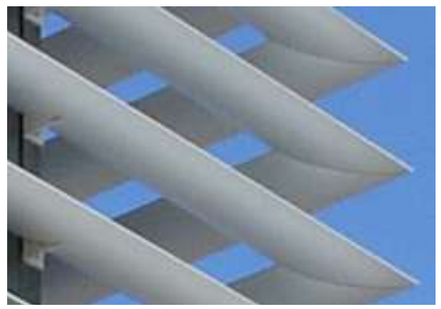




Terracotta panel façade system



Aluminum composite panels


Aluminum Louvers

COLORS

- Colors shall contribute to the visual character and the architectural style of the industrial area
- Figure 70 demonstrates a range of recommended colors
- Dominant colors shall be of an earth tone or a pastel shade
- Primary colors and ‘loud’ colors are to be used only as accent colors to complement the design and not as dominant colors
- Variation in color may be used to enhance the architectural quality and interest of the built form

Multiple materials and colors should be limited and need to be agreed with SEZAD. All buildings need to fit into the existing streetscape.

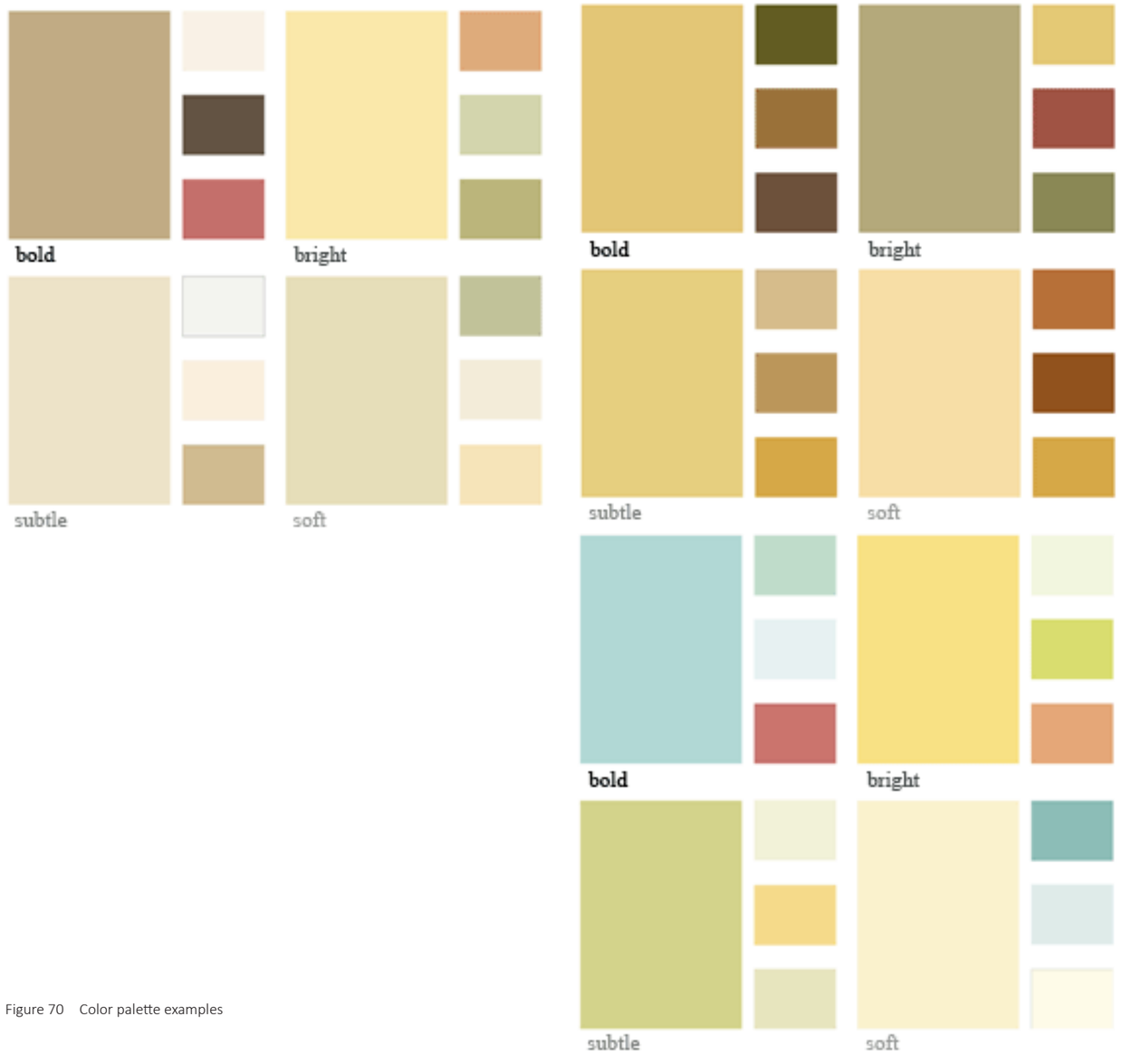


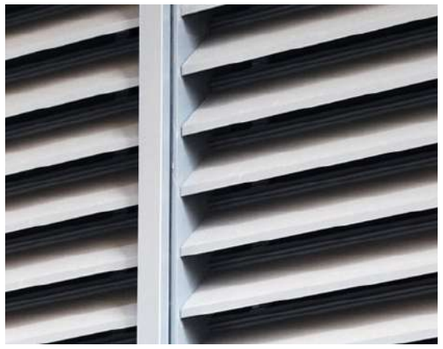
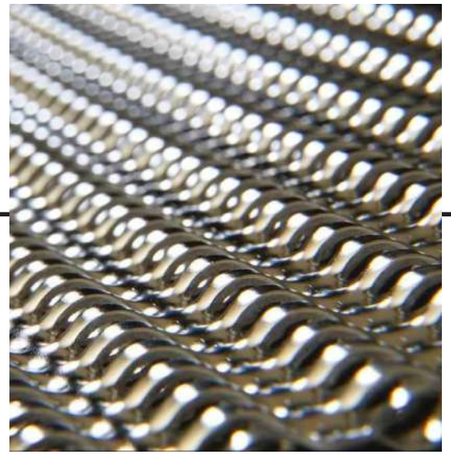
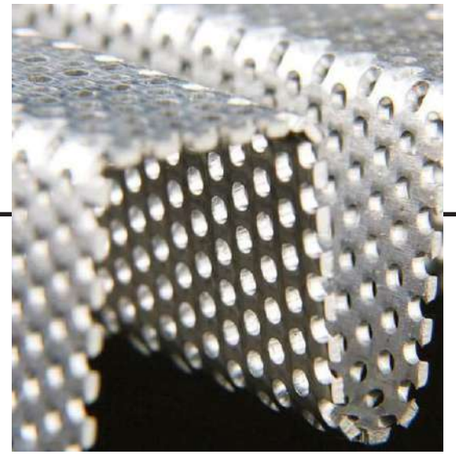
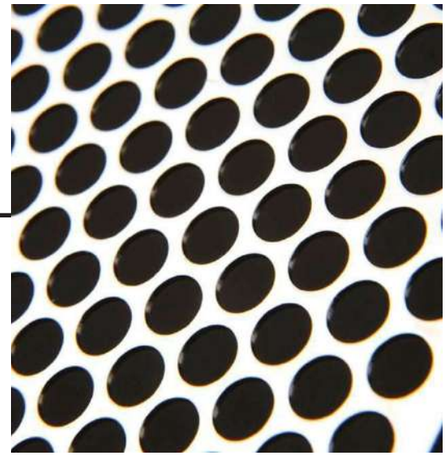
Figure 70 Color palette examples

SCREENING

Screens in Duqm industrial area are to be used to conceal some areas of activity such as loading docks or of visually unattractive utilities such as transformers and trash enclosures from public view. The following shall be complied with when planning to employ on plot screens;

- All outdoor mechanical equipment shall be screened from public view including trash enclosures, water tanks, antennas, and technical installations on rooftops
- All parking areas shall be screened from public view
- All loading/unloading areas and activity shall be screened from public view
- Perforated or ventilated screens shall be used for shielding equipment, while landscaping elements shall be used to veil parking and loading areas
- Screens shall be made of metallic perforated panels or metallic louvers
- Landscaping elements used to screen parking and loading areas shall not be less than 2m in height



ROOFS

- Roofs of industrial buildings and warehouses are encouraged to have a gentle pitch. In the case of flat roofs, a parapet no less than 1.5m shall be incorporated into the design in order to contribute to screening rooftop equipment
- The roof areas of the buildings shall be provided with a roof drain. The rain water pipes from the roof areas shall be drained by gravity and free by discharged to the ground. Storm water drainage on roofs shall be designed for a precipitation rate of 100mm per hour. Minimum 1% slope will be maintained for all rain water pipelines
- The use of corrugated metal and highly reflective materials for roofing is prohibited
- The roof shall be incorporated into the overall design and theme of the building
- In the case of flat roofs, rooftop equipment shall be screened from public view

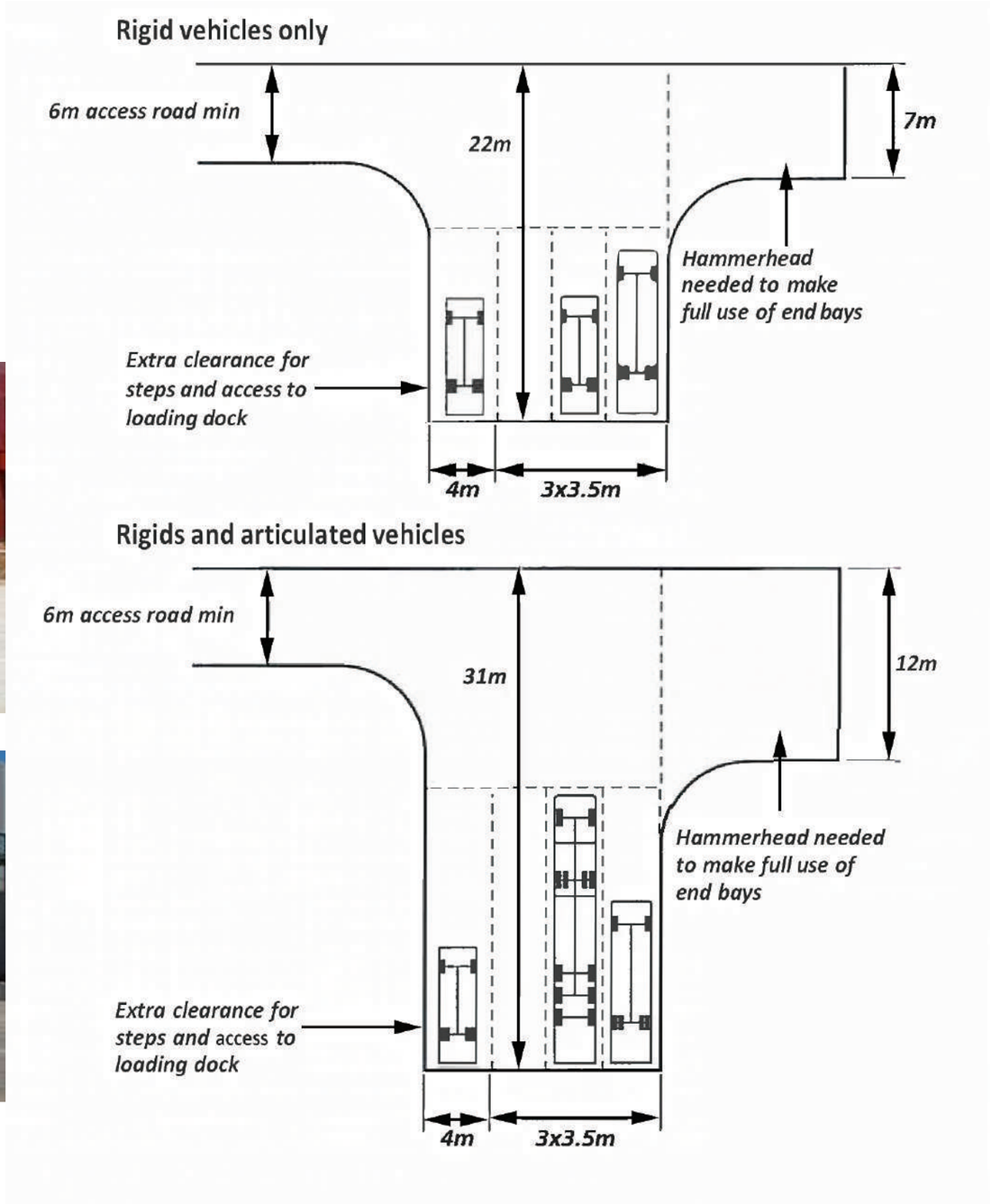
SHADING ELEMENTS

Shading elements may be part of the building, attached to its exterior walls or stand-alone structures to help shield the building and its inhabitants and contents from solar effect and rain. The following shall be complied with regarding shading elements;

- Shading elements contribute to the architectural character and visual appeal of the building, hence shall be incorporated into the design
- The materials and colors used for shading elements shall be durable and compatible with the architectural style of the Industrial Area
- Shade elements shall be applied to building facades mainly where most solar exposure occurs
- Shade elements shall not be of a reflective material so as not to reflect radiation into surrounding buildings and windows
- Shade elements design and location shall be considered and calculated in order to provide sufficient shade on plot

LOADING/UNLOADING

- In order to avoid traffic congestion in between buildings and to achieve a smooth circulation system within the plot, loading docks and facilities shall be located at the rear of the building and not the front or the sides
- Loading areas shall be screened from public view
- Loading areas shall be offset from vehicle driveways into the plot
- Loading areas are to be designed to accommodate the maximum sized vehicle that will utilize the facility
- Loading areas shall provide sufficient internal turning space to enable vehicles to exit the plot in forward gear
- Vehicles shall enter and exit the plot in forward gear
- Maximum height to raised loading bay is 1.2m



SUSTAINABILITY MEASURES

The following sustainability measures are encouraged for all zones.

Parking

- Allocate and designate 5% of parking spaces to 'preferred vehicles' such as low-emitting or fuel-efficient and carpool vehicles (in addition to specific parking bays for disabled people)
- Provide electric charging stations for 5% of parking spaces for to enable electric vehicles to charge
- Provide secure bicycle storage and shower facilities for at least 5% of employees
- Provide shading structures for parking bays with a SRI value of minimum 78, or cover the parking bays with structures with renewable energy systems (e.g. PV)
- Implement a sustainable transport plan that minimize private car use through public transport, company buses for staff commute, staff car-pooling schemes and bicycle use
- Provide electric vehicles to transport staff and goods around larger factory areas
- Sustainable materials should be utilized for the construction of parking areas
- Parking bays and areas should not be oversized

Reduction of Paper Waste in Toilets

- Hot air blowers should be used to replace the use of disposable towels/ or reusable towel dispensers
- If disposable paper towels are used, these towels should be suitably recycled
- In the office all Printers/Photocopiers ordered should be capable of Duplex (Double Sided) printing operation
- Office recycling points should be considered during the design of the office complex to allow for ease of use.

Reduction of Potable Water Consumption

- All new washroom facilities should be fitted with dual flush toilets - 2.6 litre short flush, and - 4.0 litre main flush
- All taps should be operated by infrared sensors and adjusted to a flow rate of 5 liters per minutes via aerator heads
- All bathroom and kitchen taps should be regularly inspected for leaks
- In the gents lavatories, urinals should be introduced reducing the amount of flush water. In addition, waterless urinal cubes can be used to eliminate water usage
- All new office facilities should, if possible, have separate gray and black water systems. Gray water is waste water from hand wash basins, showers, A/C condenser units and laundry facilities. Black water is generated from toilets and sinks

Consideration of Landscaping around Industrial Developments

- Appropriate planting of vegetation should be used around Industrial Developments. Native drought tolerant species should be used, reducing the amount of irrigation required
- Recycled brown water should be used for all irrigation works.

Reduction in Energy Usage

- Individual A/C units should be installed within the Office complex
- A/C units should be adjusted to conserve energy during the weekend/evening an holidays
- Optimize passive energy use (solar gains)
- Consideration to be given to combined heat and power and renewable energy sources
- Sub meters and intelligent building monitoring systems should be considered

Lighting

- Lights in corridors/toilets/kitchens should be fitted with motion sensors
- Low energy compact florescent tubes or low energy LED lighting shall be used instead of halogen incandescent bulbs. Dimmable ballasts are to be considered which allow for lower lighting levels and cut energy consumption when lights are not needed at their full brightness
- Occupancy switches should be considered for use in conference rooms and common areas
- Buildings with flat roof designs with corridors are to utilize natural lighting through incorporation of roof lights

Water Heaters

- Water boilers should be set on timer switches and turned off in the evenings, weekends and holidays
- If possible centralized solar water heaters and efficient hot water storage system shall be used

Recycling of Plastic/Metal

- Office recycling points should be considered during the design of the office complex to allow for ease of use

Use of Timber

- Ensure that all timber used is certified to be from well managed forests

7. INFRASTRUCTURE GUIDELINES

UTILITY SERVICES

SITE DRAINAGE AND RUNOFF

Any development or changing of grades within a plot is subject to obtain a DRAINAGE CONNECTION PERMIT from SEZAD. This will be obtained from SEZAD by submitting a Drainage Management Plan to SEZAD.

The developer must demonstrate in this Drainage Management Plan that there is no increase of run-off discharge to SEZAD's right of way from the proposed development or improvements. Therefore, the allowable discharge from the Developer's plot is based on the approach known as pre-development versus post-development.

SITE POWER

All applications for power should be made direct to SEZAD.

The Developer shall follow the Oman Electrical Standards available via the Authority of Electricity Regulation (AER) of Oman. All design documents should be submitted formally for approval to the service providers RAECO (Rural Areas Electrical Company) for power arrangements up to 33KV, or OETC (Oman Power Transmission Company) for power requirements of 132KV and above.

Each leased site will be provided with a terminal point by the relevant local service provider. Where applicable, provision of an appropriate gated reserved area within the Customer's plot boundary is required for locating the terminal point. The enclosure or the substation shall be recessed into and alongside of the property and its exact size and location shall be finalized by the local service provider.

Customers are required to provide their own Primary Substation depending upon their demand requirement, as per the table below. The voltage rating, major equipment, and layout of the Substation shall be further coordinated and approved by the relevant service provider.

Load	Voltage Rating	Provider
30MW and above	220/132KV or 132/33KV	OETC
Below 30 MW	132/11KV or 33/11KV	RAECO

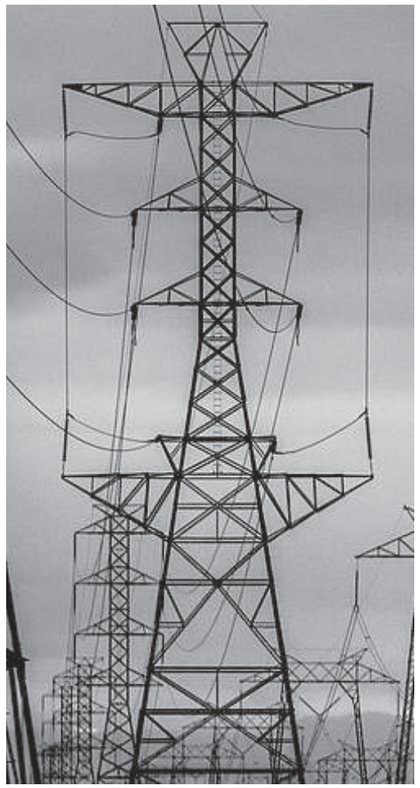
Electrical Supply will be provided at various voltage ratings depending on the loads. The voltage range will be ex: - 220KV, 132KV, 33KV, 11KV, 433 Volts and the Frequency will be at 50Hz. The voltage ratings will be at the discretion of the local service provider.

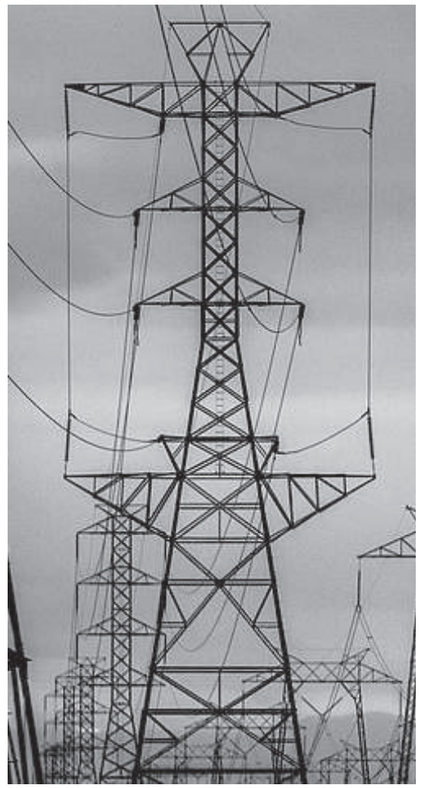
Tariff metering and the isolation facility will form part of the terminal point equipment and the access for these facilities will be strictly at the control of local service provider.

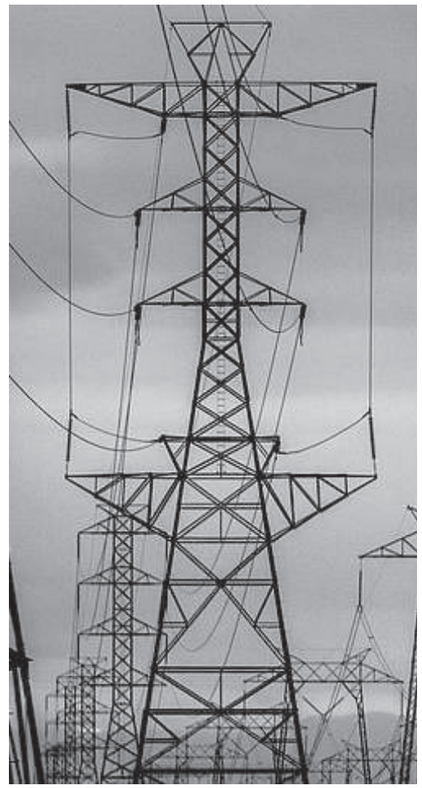
The Customer will be responsible for terminating all cables for power take off at the terminal locations. The developer is responsible for all the electrical works with in their property including statutory fee.

The developers will be provided with only one power connection per lease agreement unless approval granted by SEZAD, in coordination with the service provider.

Power demands more than 1000KVA are generally provided only through a dedicated 11KV feeder Loop in Loop out (LILO). However, special arrangements for the provision of dedicated feeders may be provided if agreed with local service provider in advance.







SITE POTABLE WATER SUPPLY

All applications for water connections should be made direct to SEZAD.

The Developer shall follow the PAEW (Public Authority for Electricity and Water) Design Standards. All design documents should be submitted formally for approval to the PAEW.

Each leased site shall be connected to the public potable supply network, unless an alternative proposal for water supply is presented to, and approved by SEZAD.

The Developer shall provide on site potable storage tanks sufficient to provide a minimum of twenty four hours supply. These tanks must be able to provide two hours coverage in the event of fire, and support the daily domestic demand of the plot. These tanks shall be located such that it can supply plot by gravity, and away from daily operations or potential sources of contamination.

The Developer will be responsible for implementing a compliant fire protection system for their plot, in accordance with the relevant design guidelines from the Directorate General of Civil Defense within the Royal Oman Police

SITE SEWERAGE

All applications for sewerage connections should be made direct SEZAD.

The Developer shall follow the Haya Water's 'Wastewater Design Manual' for all site design and installations. All design documents shall be submitted formally for approval to SEZAD.

Industrial wastewater should be treated and reused on the plot where possible. Any residual wastewater must be treated to the quality parameters outlined in the next table:

No form of waste/water, treated or untreated, is to be discharged to the local storm water network.

Site sewerage storage and network infrastructure must be of durable and impermeable materials. Storage tanks should be adequately vented.

Standards for Discharge of Non-household Wastewater into Sewerage System

Component	Units	Maximum Limits
pH	-	6 - 10
Colour	-	Raises no objection
B.O.D. (5 days @ 20°C)	mg/L	1000
Chemical oxygen demand (COD)	mg/L	1500
Temperature	°C	43
Suspended solids (SS)	mg/L	1000
Total dissolved solids (TDS)	mg/L	3000
Grease and Oil	mg/L	30
Sulphate (as SO_4)	mg/L	500
Sulphide (total as S)	mg/L	3
Phenols (total)	mg/L	5
Cyanide	mg/L	1
Detergents	mg/L	30
Toxic metals	mg/L	10
Aluminium (as Al)	mg/L	10
Arsenic (as As)	mg/L	1
Barium (as Ba)	mg/L	10
Beryllium (as Be)	mg/L	5
Cadmium (as Cd)	mg/L	2
Chromium (total as Cr)	mg/L	2
Copper (as Cu)	mg/L	1
Iron (total as Fe)	mg/L	5
Lead (as Pb)	mg/L	2
Mercury (as Hg)	mg/L	0.1
Nickel (as Ni)	mg/L	2
Silver	mg/L	0.1
Zinc (as Zn)	mg/L	2
Calcium Carbide	mg/L	Not seen
Radioactive substance	mg/L	Not seen
Yeast, sugar, raw tar, crude oil	mg/L	Not seen
Hydrogen sulphide and polysulphides	mg/L	Not seen
Petroleum spirit, flammable solvent or volatile noxious solvents, gases and solids	mg/L	Not seen
Unpolluted water (including condensation, cooling water and water drained from roof top)	mg/L	Not seen
Insecticides, herbicides, pesticides, fungicides	mg/L	Imperceptible
Any material that may render wastewater harmful or makes formal treatment of such waste difficult	mg/L	Imperceptible

SITE TELECOMMUNICATIONS

All applications for telecommunication connections shall be made direct to SEZAD.

The Developer shall ensure all design and installations are to the local service providers' standards. Local service providers are Ooredoo and Omantel.

Al Duqm Industrial Area

Design Guidelines

19-01-2017