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Diyar
AL MUHARRAQ

BOOKLET 2

DEVELOPMENT REGULATIONS & GUIDELINES

AL NASEEM GATED COMMUNITY (VILLAS)

Asset 13B

Project	Diyar Al Muharraq	
Document	13B - BOOKLET 2, Al Naseem Gated Community (Villas)	
Revision No.	**Date Issued**	**Summary of Revision**
00	01.04.2021	
01	02.01.2023	Updates to section 2.5 - Marine Regulations & Guidelines Revision 006
02	04.04.2023	Updates to Permitted Modification - section for Safety Railing Height
03	30.04.2024	Al Naseem Inner Villas & 2 No. Villa Types (Aseel 2 & Layl 2) incorporated. Updates to the following sections: Boundary Wall, Architectural Facade Type, Permitted Modifications, Prohibited Modifications, Structure, Electrical Services, ELV System, & Public Health Services

***Note**:

Third Party Developer (TPD) must confirm the Booklet 2 Development Regulations & Guidelines for Asset 13B - Al Naseem Gated Community (Villas) with the Technical Interface Office (TIO) prior to initiating design process.

This document will remain as a live document, where Diyar Al Muharraq (DAM) may amend from time to time to revise and/or include additional regulations as they see fit. The latest revisions of this document shall be provided to the Villa Owners once amended.

Contents

النسيم
AL NASEEM

ديار المحرق
Diyar Al Muharraq

2.1 Introduction

Diyar Al Muharraq is envisioned as an entire city with various housing options and business opportunities specifically for the people of Bahrain. The project is planned as an eclectic mix of residential and commercial developments, consisting of up to 30,000 individual housing units that will be home to over 100,000 people. Diyar Al Muharraq comprises an array of beaches, parks, and publicly accessible amenities and facilities including: schools, medical centres, sports facilities, shopping malls and hotels.

Unlike any other project of such scale in the Kingdom, Diyar Al Muharraq will be home to residents from every strata of society. With the blend of traditional & modern architectural designs, Diyar Al Muharraq represents Bahrain's golden past and bright future.

2.2 Urban Planning Framework

Illustrated Masterplan

Asset 13B is a mid-high income residential canal-front development, located at the heart of Diyar Al Muharraq. The Asset provides a mix of residential villas.

The development parcel 13B is located at the west of an arterial loop road and adjacent to the North harbour, and has a frontage of 200 meters wide canal which runs through the master community of Diyar Al Muharraq.

The residential area of the development is a Gated Community, a premier residential marine lifestyle development; all villas have a waterfront and can be accessed by boats and having their own mooring facility.

Apartment blocks clustered around water bodies and having views of main canal and sea, are being planned as part of the gated community. Retail side of the development includes leisure amenities like Beach, Promenade, Retail, a Hotel and Marina Club.

Figure 1: Illustrative Masterplan of Al Naseem Gated Community identifying the various built components

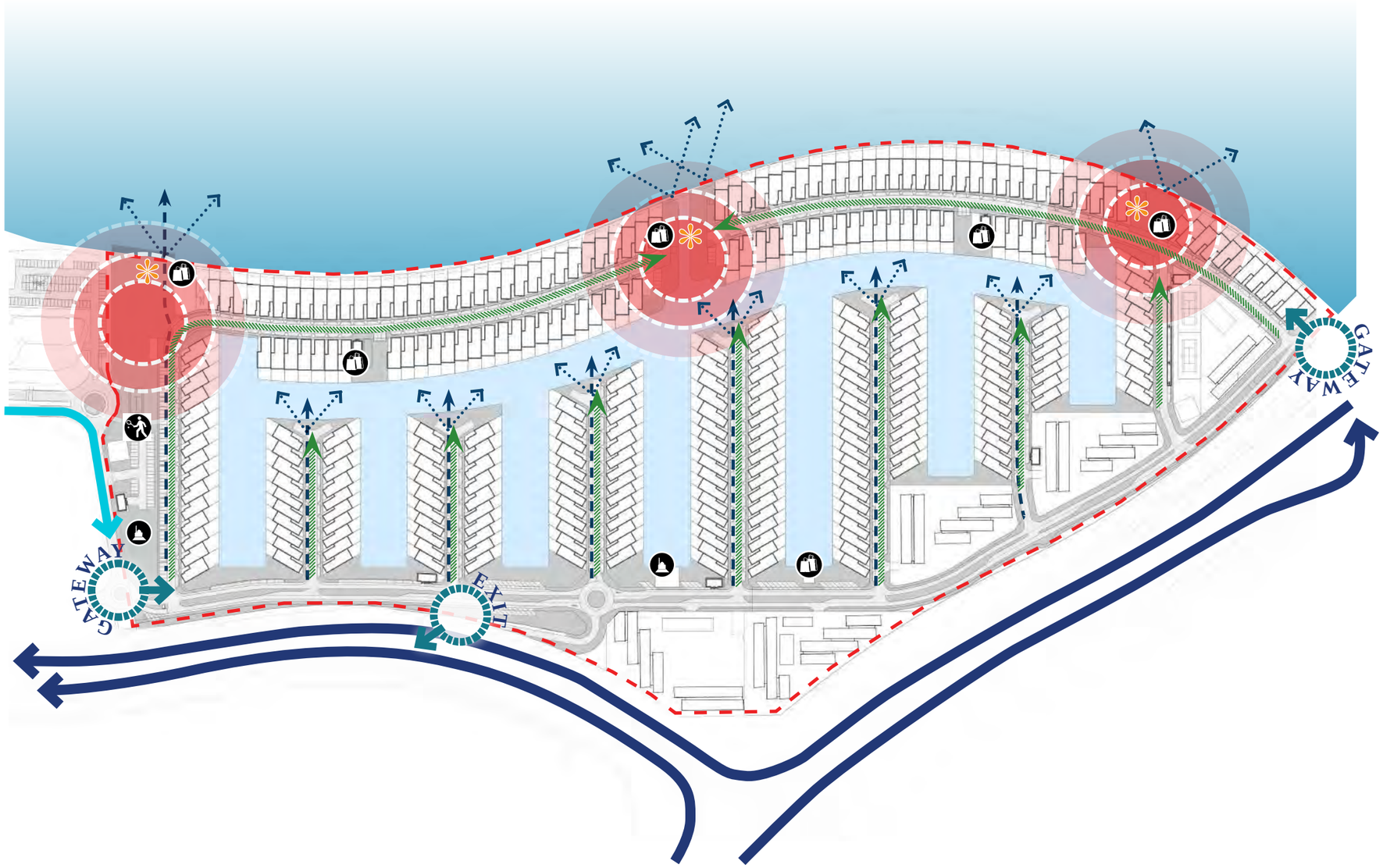
Urban Design Framework

The distribution of the street network has been designed to maximise connectivity, allowing for ease of movement across the Asset within a legible built environment, prioritizing pedestrian movement.

Asset 13B can be accessed from the main entrance of Diyar Al Muharraq Island through Rd 3469 passing by both Asset 13A and 13B (on the left), then entering the roundabout (to the left) and reaching Asset 23B (on the right) as presented in Figure 3.

The Gated Community of Asset 13B is planned to have two access points (security gates), one is at the east side of the development opposite to Asset 14, and another access point at the West of the Asset adjacent to Asset 23A.

The internal traffic circulation in Asset 13B is on a 1x1 lane single carriageway, the traffic arrives to the site and travels on the local roads as it reaches the destination. There are two access points as mentioned above and both will serve as an entry and exit point to the development with gates and guards office. An additional exit road is located at the middle south side of the community.



Legend

- Asset Boundary
- Arterial road
- Collector Road
- Open Space / Park
- Key Centres / Activity Nodes
- Focal Point / Landmark
- Main Viewing Corridors
- Waterfront Views
- Key Pedestrian Routes
- Retail Destination
- Food and Beverage Outlets
- Mosque
- Gateway
- Sports and Recreation

Figure 2: Spatial Planning Structure for Al Naseem Gated Community

Figure 3: Asset 13B Illustrative Masterplan

2.3 Development Regulations

Plot Regulations & Guidelines

This project covers six types of villa plots within the Al Naseem Gated Community. The Gated Community is proposed to be predominantly a Residential Area and aims to provide water-front lifestyle and maximizes the opportunity for direct access for individual residences. The six types of villas form a neighbourhood theming within this development. This typology is defined as attached villas. The following schematic drawings represent the villas as purchased by the Villa Owner. Detailed architectural and engineering drawings are available from TIO upon request. As per the Sales Agreement and in order to maintain the high standards of the neighbourhood for the benefit of the Villa Owner, the following regulations must be adhered to by the Villa Owner.

- No modifications to the villas are permitted except those described in this document under the Permitted Modifications section (refer page 25).
- Approvals need to be obtained prior to undertaking any/all permanent or temporary modifications. Please refer to the process described in Booklet 1, provided separately.
- The plot size distribution for various villa types across the development, are as shown in the table below:

	Standard / Average Plot size (sq.m) *
3.3 / Sabaah	323.7
3.4 / Duha	322.0
4.2 / Aseel	322.0
5.4 / Layl	257.6
4.3 / Aseel 2	322.0
5.5 / Layl 2	322.0

Table 1: Plot Size Distribution Chart for various Villa Types.

*Note: The Plot Sizes vary based on villa type mix and the actual Plot size information should be referred to on the Villa Plot Details provided along with the Sales Agreement.

- **Gross Floor Area (GFA) Definition**

The sum of the total area of buildings to be constructed on a Plot or Parcel, measured from the exterior faces of the external walls or from the center-line of common walls of adjoining areas.

- **GFA will include all of the following:**
  - All lobby spaces and public corridors;
  - Mezzanines;
  - Basement;
  - Attic space with a headroom of 2.15m (7 feet) or more;
  - Internal / enclosed balconies (enclosed on more than 3 no. sides);
  - Enclosed porches (enclosed on more than 3 no. sides);
  - Floor area devoted to access and stairwells; and
  - All corridors accessing spaces falling outside the foregoing limbs of this definition.

- **GFA will NOT include the following:**
  - Mechanical, electrical, plumbing, gas, telecommunication and similar services;
  - Storage spaces for mechanical, electrical, plumbing, gas and telecommunication equipment;
  - Garbage collection rooms;
  - All service ducts or shafts (including for running electrical, plumbing, gas and telecommunication equipment);
  - Elevator shafts;
  - All parking areas including loading and unloading bays;
  - External balconies;
  - External arcades;
  - Covered walkways;
  - External roofed over areas which are open on all sides;
  - Open porch; and
  - Roof overhangs.

Summary of Key Development Control

This section mentions certain general regulations regarding areas, setbacks, heights and parking for each villa type.

Villa Type 3.3 / SABAAH

a. **Setbacks**

- Front 5.8m – 6.4m
- Side No setback
- Rear 5.5m – 11.5m

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA)**: approx. 304.5 m²

e. **Maximum Height:** 10.5m

Figure 4a: Plot Regulations Layout

*Note:

a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.

Disclaimer: These Photographs / Images are for indicative only and the actual villa interiors may vary on site.

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Villa Type 3.4 / DUHA

a. **Setbacks**

- Front 5.8m – 6.4m (for Outer Canal Villas); 4.9m (for Inner Canal Villas)
- Side 1.2m on one side (service corridor provided at ground floor)
- Rear 5.9m – 11.5m (for Outer Canal Villas); 5.2m (for Inner Canal Villas)

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA):** approx. 292.3 m²

e. **Maximum Height:** 10.3m

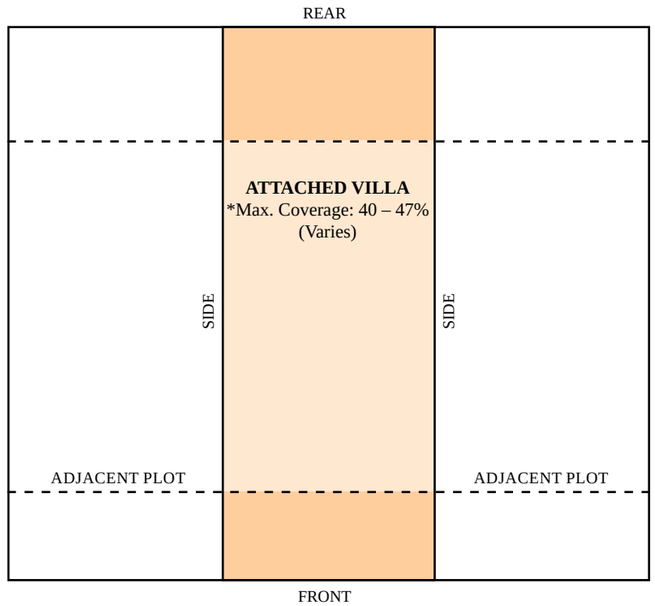


Figure 4b: Plot Regulations Layout

*Note:

a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.

Villa Type 4.2 / ASEEL

a. **Setbacks**

- Front 5.6m (for Outer Canal Villas); 4.9m (for Inner Canal Villas)
- Side 1.2m on one side (service corridor provided at ground floor)
- Rear 10.4m (for Outer Canal Villas); 7.0m (for Inner Canal Villas)

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA):** approx. 258.9 m²

e. **Maximum Height:** 10.5m

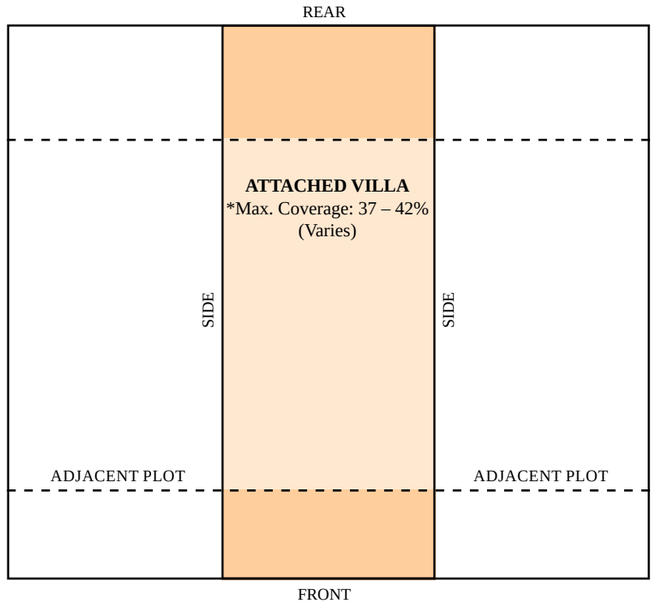
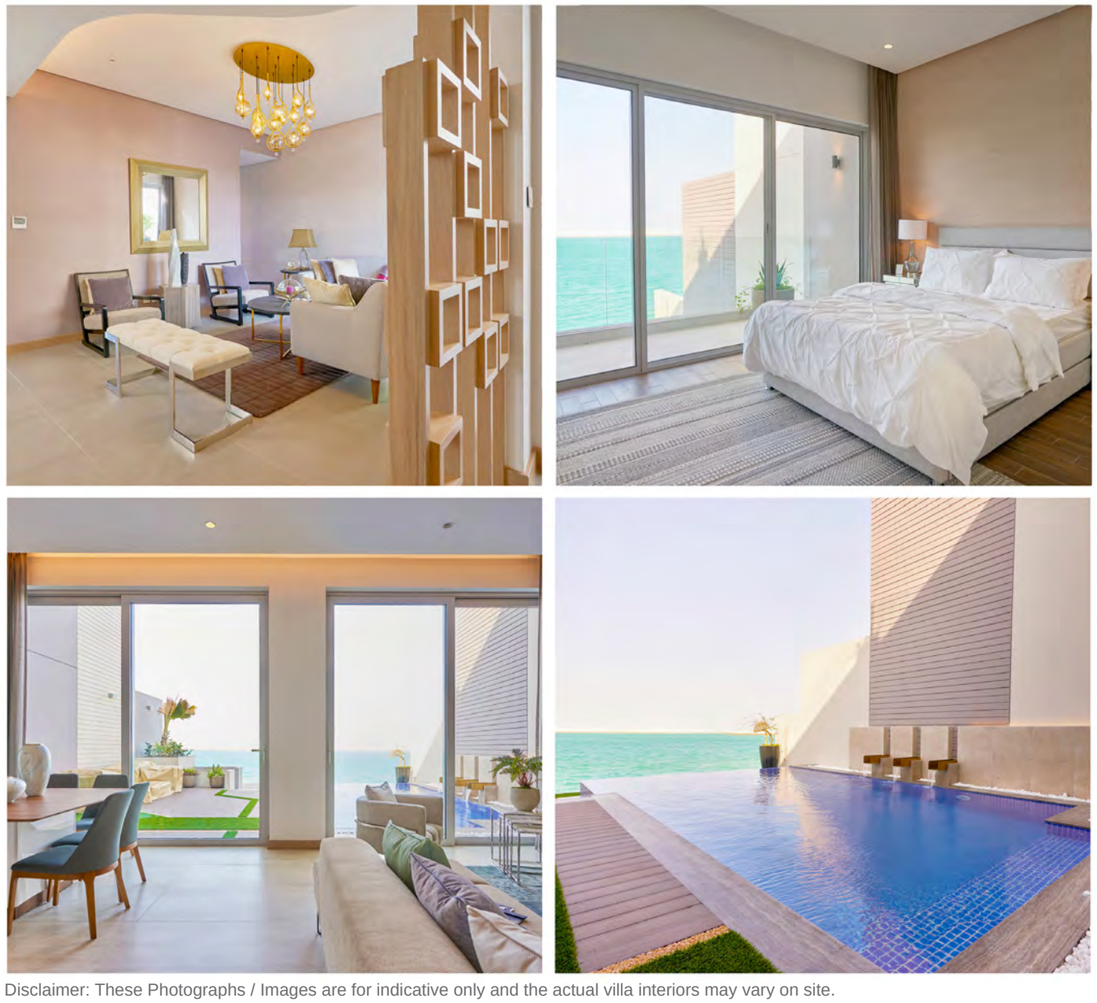


Figure 4c: Plot Regulations Layout

*Note:

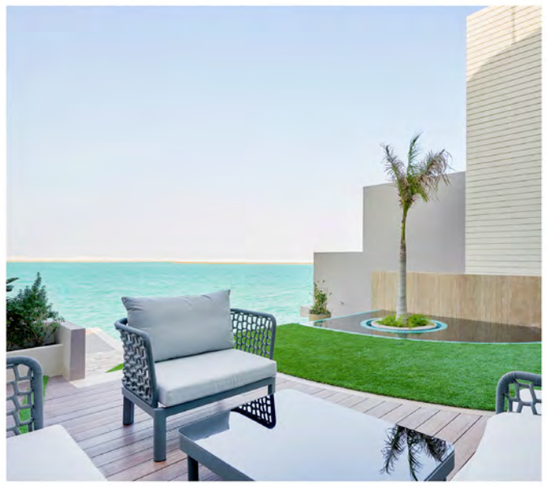
a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.



Disclaimer: These Photographs / Images are for indicative only and the actual villa interiors may vary on site.



Disclaimer: These Photographs / Images are for indicative only and the actual villa interiors may vary on site.

Villa Type 5.4 / LAYL

a. **Setbacks**

- Front 5.3m
- Side No setback
- Rear 5.6m

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA):** approx. 245.4 m²

e. **Maximum Height:** 10.3m

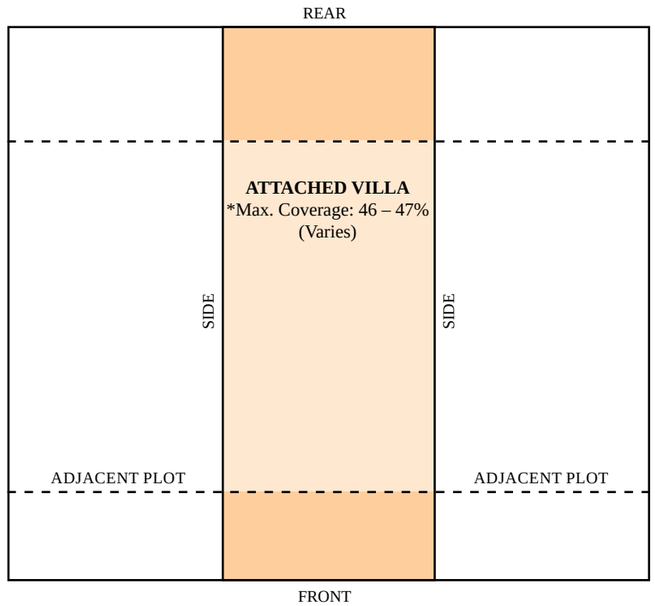


Figure 4d: Plot Regulations Layout

*Note:

a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.

Summary of Key Development Control

Villa Type 4.3 / ASEEL 2

a. **Setbacks**

- Front 4.9m
- Side 1.2m on one side (service corridor provided at ground floor)
- Rear 7.0m

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA):** approx. 262.3 m²

e. **Maximum Height:** 10.5m

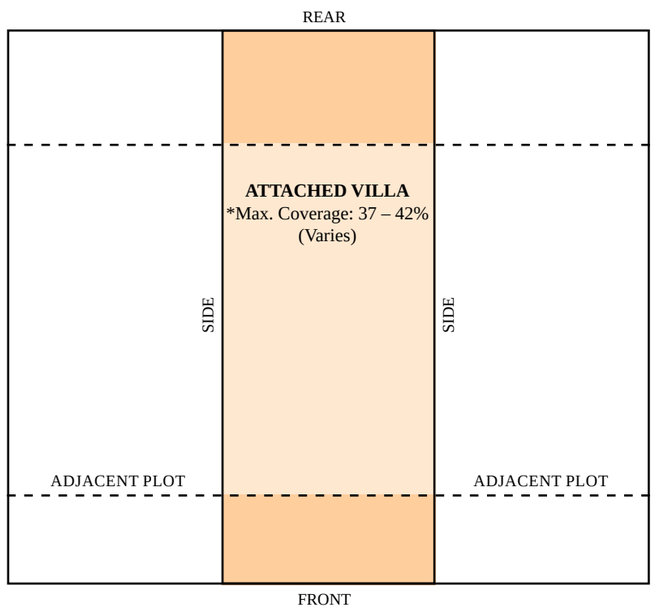


Figure 4e: Plot Regulations Layout

*Note:

a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.

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Villa Type 5.5 / LAYL 2

a. **Setbacks**

- Front 5.3m
- Side 2.0m on one side (service corridor provided at ground floor)
- Rear 5.6m

b. **Car Parking**: 2 spaces per plot

c. **Garden Area**: Must remain permeable (minimum 30%); subject to any permitted modification installed by the Villa Owner in accordance with the Permitted Modifications section mentioned in this document (refer page 25).

d. **As-built Gross Floor Area (GFA):** approx. 275.2 m²

e. **Maximum Height:** 10.3m

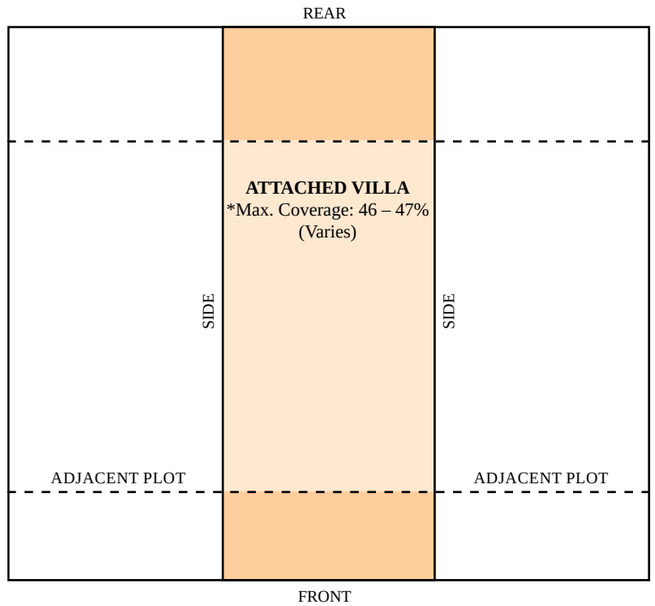


Figure 4f: Plot Regulations Layout

*Note:

a. Maximum Coverage, Front Setback, and Rear Setback vary for each plot. Actual figure corresponding to the respective plot should be taken from the corresponding Villa Plot details and the As-built drawings.

b. Plot areas and GFA's may vary based on actual site conditions.

Boundary Wall

The front boundary wall forms the street facing façade and is meant to add to the public realm. It is designed as a continuation of the building façade theme to add interest to the streetscape. Any exposed cable boxes for lighting or utilities have been concealed within a covered unit, integrated into the wall.

	Outer Canal Villas Wall heights (meters)[1]			
Villa types	**Boundary Wall**	**Garage Front wall**	**Garage Side wall**	**Rear Privacy wall[1]**
3.3 / Sabaah	2.0	4.6	5.4	9.8 / 6.8 / 3.6 / 1.9
3.4 / Duha	2.0	4.6	5.4	9.8 / 6.8 / 3.6 / 1.9
4.2 / Aseel	2.0	4.6	5.4	9.8 / 6.8 / 3.6 / 1.9
5.4 / Layl	2.0	4.6	5.4	9.8 / 6.8 / 3.6 / 1.9

Table 2: Boundary Height for Various Outer Canal Villa Types

	Inner Canal Villas Wall heights (meters)[1]			
Villa types	**Boundary Wall**	**Garage Front wall**	**Garage Side wall**	**Rear Privacy wall[1]**
3.3 / Sabaah	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9
3.4 / Duha	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9
4.2 / Aseel	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9
5.4 / Layl	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9
4.3 / Aseel 2	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9
5.5 / Layl 2	2.0	4.6	5.4	8.6 / 5.4 / 3.3 / 1.9

Table 2a: Boundary Height for Various Inner Canal Villa Types

Note:

- Rear privacy wall profile is staggered. (Please refer to Figure 8, 8a, 11, 11a, 14, 14a, 17, 17a, 20, 23)
- The Extent / Length of the Rear Privacy Wall vary as per Plot Size and Villa Types. Refer to As-built drawings for Plot specific dimensions
- Please refer to Figure 5 for general illustrative purposes.
- Disclaimer: May not be applicable based on actual site conditions.

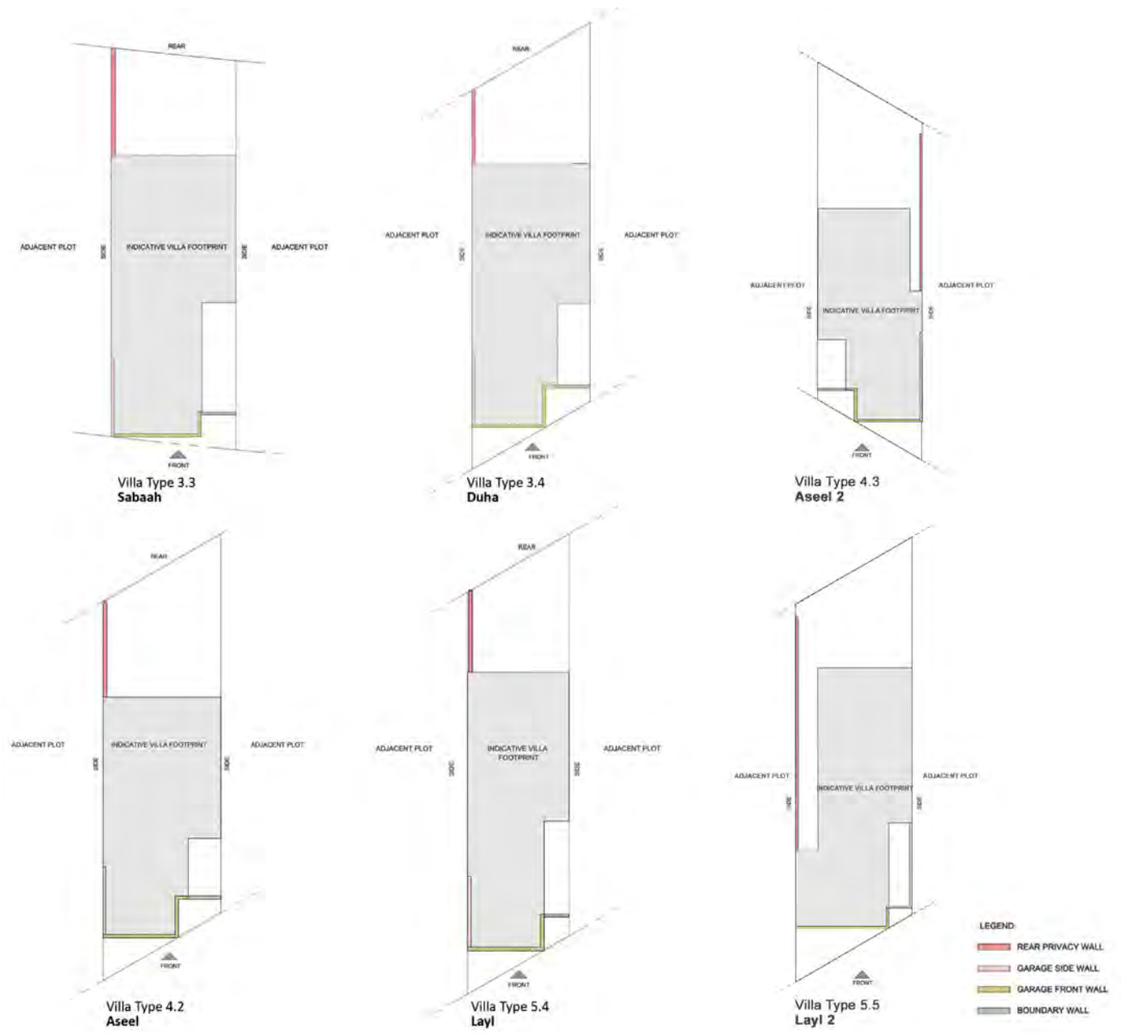


Figure 5: Boundary wall Key Plan for Various Villa Types.

Boundary Wall

On the front side, a vehicular entrance to the garage and a pedestrian gate has been provided. The boundary wall and garage may not be changed as these reflect the desired theme.

Villa Type 3.3 / SABAAH

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 6 shown below indicates the same.

Figure 6: Front Elevation showing boundary wall and entrance for Villa 3.3 / Sabaah

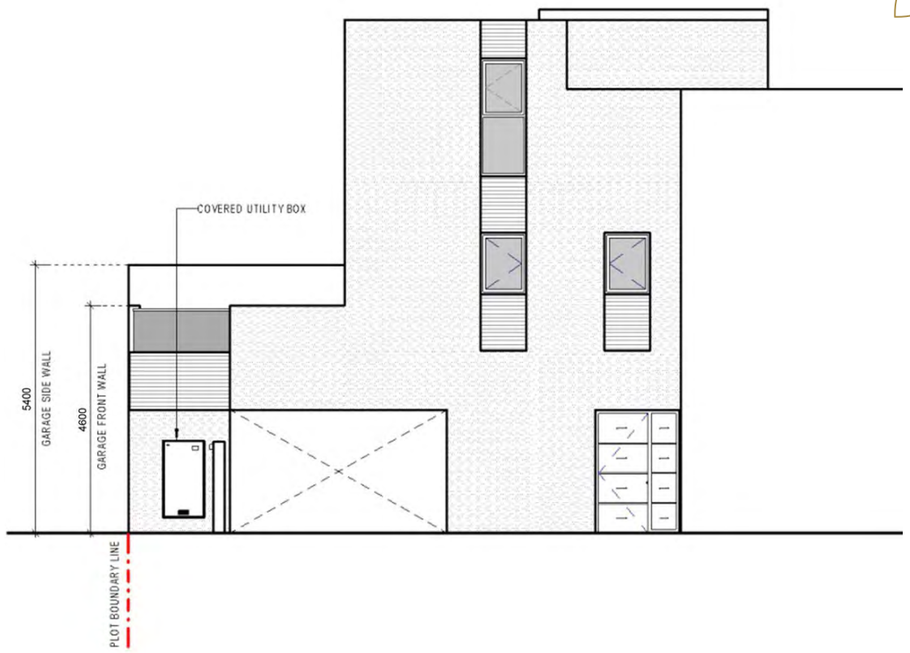


Figure 7: Right Elevation (Roadside) showing boundary wall and entrance for Villa 3.3 / Sabaah

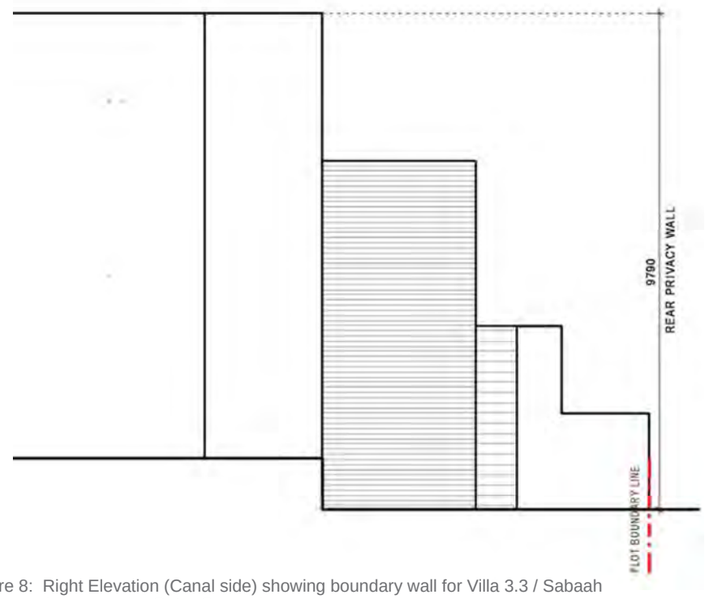


Figure 8: Right Elevation (Canal side) showing boundary wall for Villa 3.3 / Sabaah Applicable for Outer Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

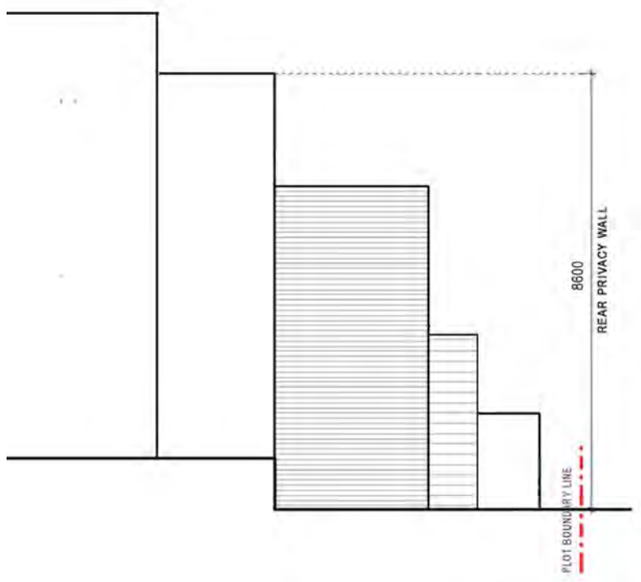


Figure 8a: Right Elevation (Canal side) showing boundary wall for Villa 3.3 / Sabaah Applicable for Inner Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

Boundary Wall

Villa Type 3.4 / DUHA

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 9 shown below indicates the same.

Figure 9: Front Elevation showing boundary wall and entrance for 3.4 / Duha

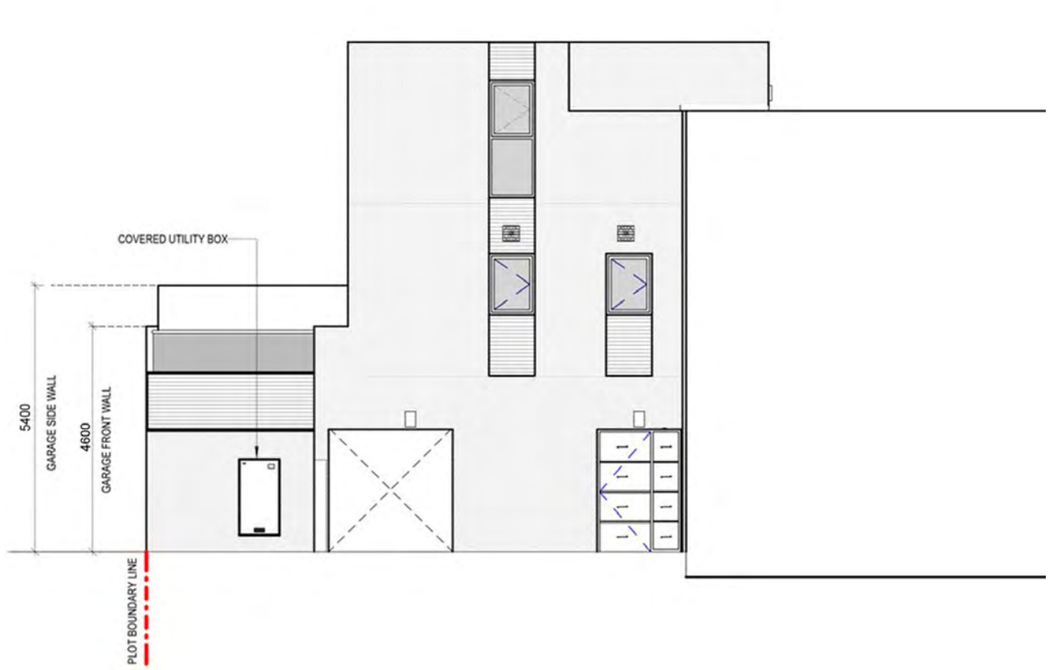


Figure 10: Right Elevation (Road side) showing boundary wall and entrance for 3.4 / Duha

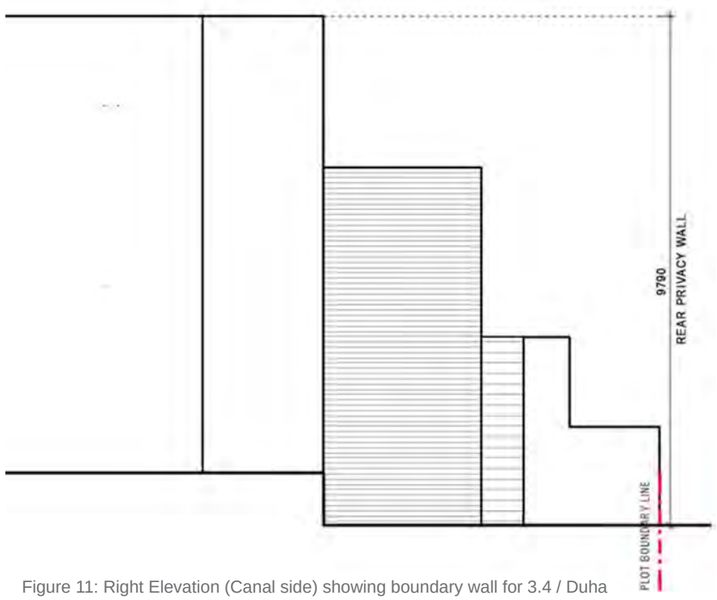


Figure 11: Right Elevation (Canal side) showing boundary wall for 3.4 / Duha Applicable for Outer Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

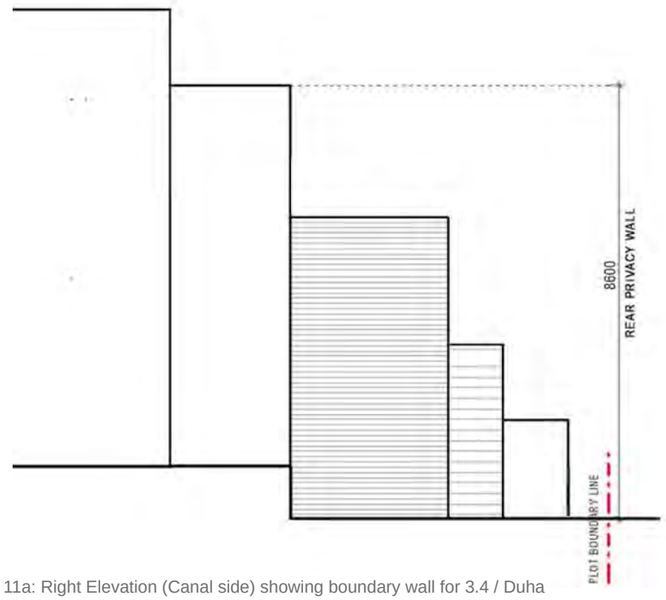


Figure 11a: Right Elevation (Canal side) showing boundary wall for 3.4 / Duha Applicable for Inner Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

Boundary Wall

Villa Type 4.2 / ASEEL

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 12 shown below indicates the same.

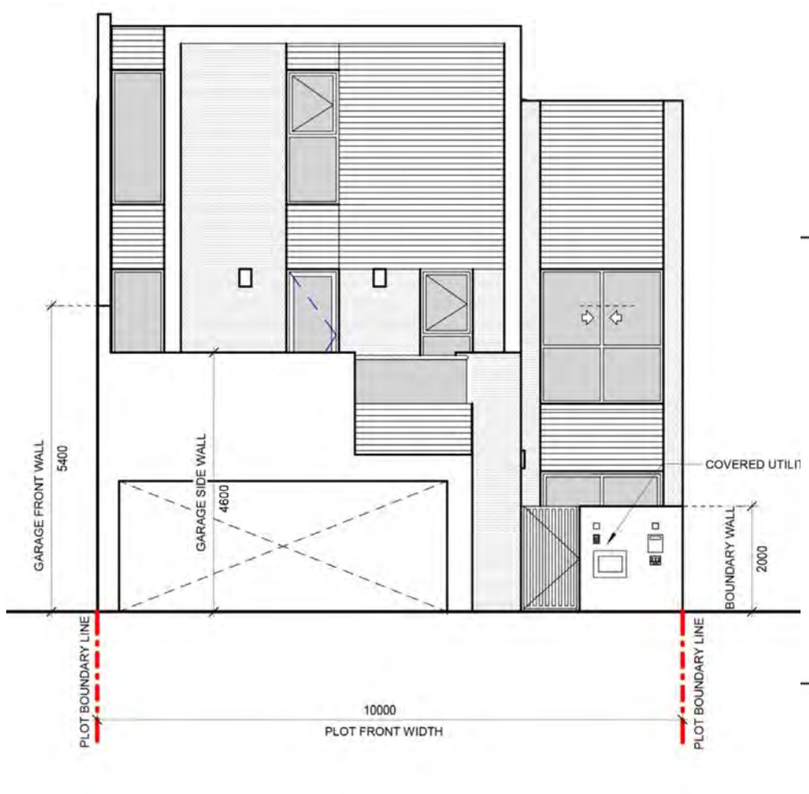


Figure 12: Front Elevation showing boundary wall and entrance for 4.2 / Aseel

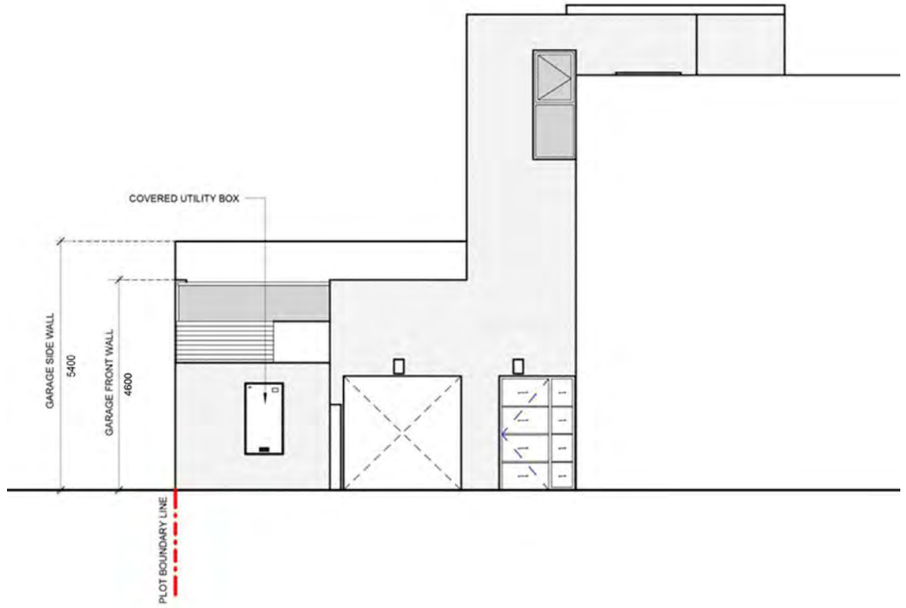


Figure 13: Right Elevation (Roadside) showing boundary wall and entrance for 4.2 / Aseel

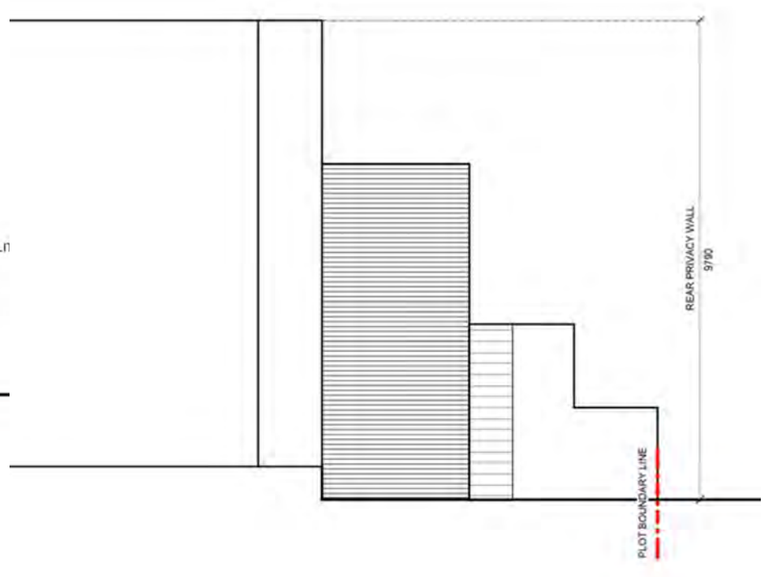


Figure 14: Right Elevation (Canal side) showing boundary wall for 4.2 / Aseel Applicable for Outer Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

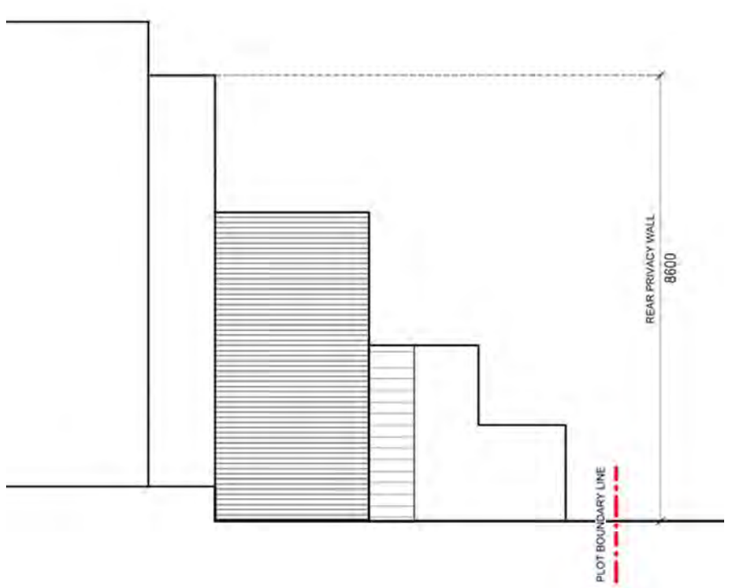


Figure 14a: Right Elevation (Canal side) showing boundary wall for 4.2 / Aseel Applicable for Inner Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

Boundary Wall

Villa Type 5.4 / LAYL

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 15 shown below indicates the same.

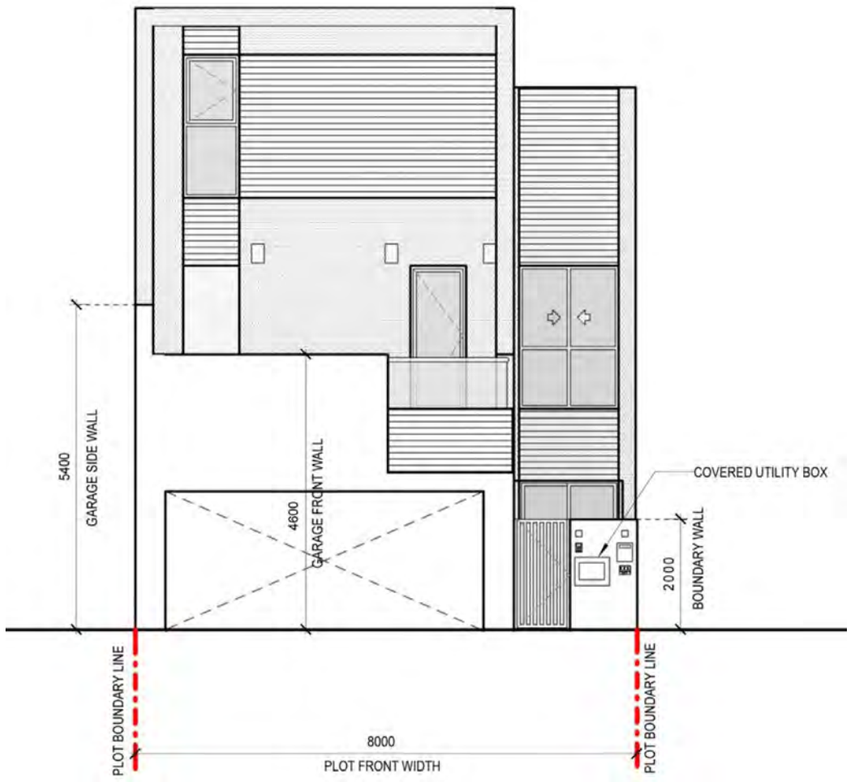


Figure 15: Front Elevation showing boundary wall and entrance for 5.4 / Layl

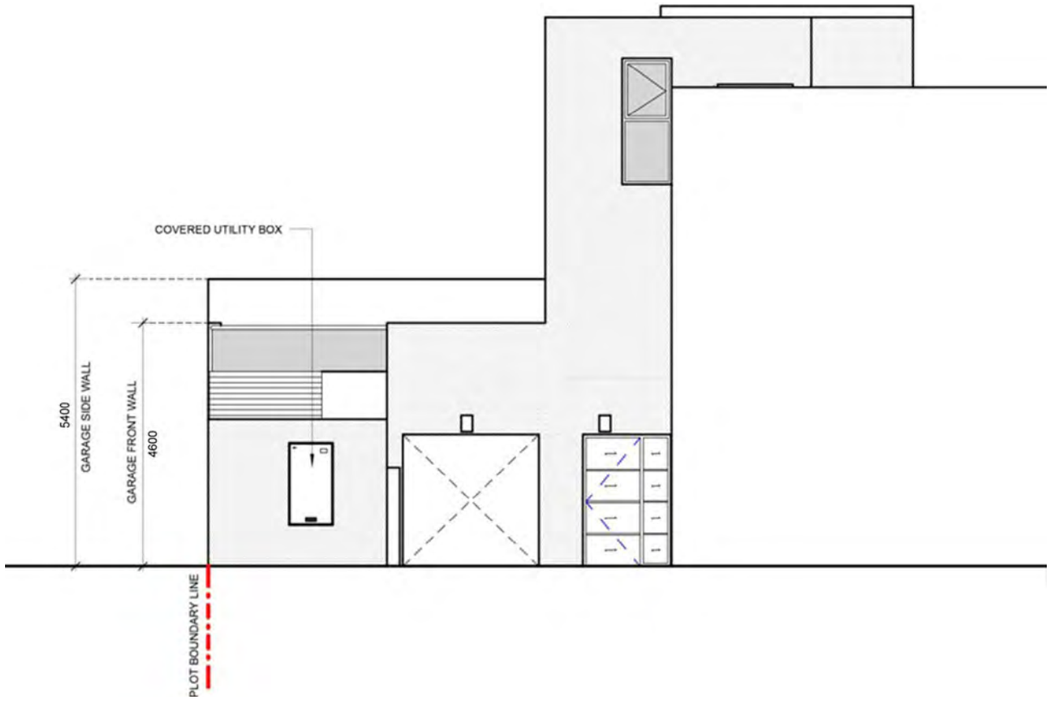


Figure 16: Right Elevation (Roadside) showing boundary wall and entrance for 5.4 / Layl

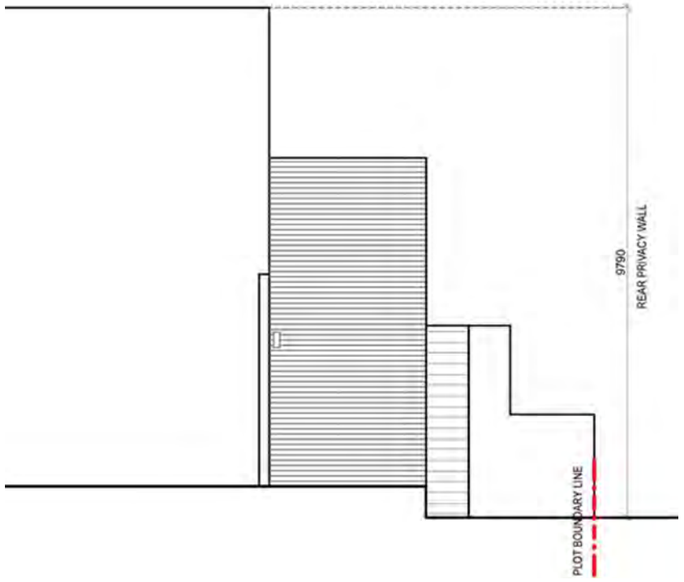


Figure 17: Right Elevation (Canal side) showing boundary wall for 5.4 / Layl
Applicable for Outer Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

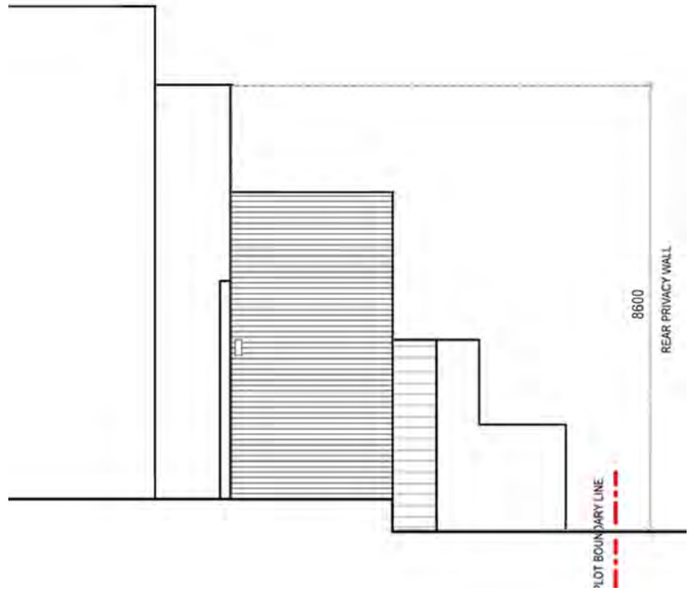


Figure 17a: Right Elevation (Canal side) showing boundary wall for 5.4 / Layl
Applicable for Inner Canal Villas

(*Note: Rear Privacy Wall length will vary as per plot size)

Villa Type 4.3 / ASEEL 2

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 18 shown below indicates the same.

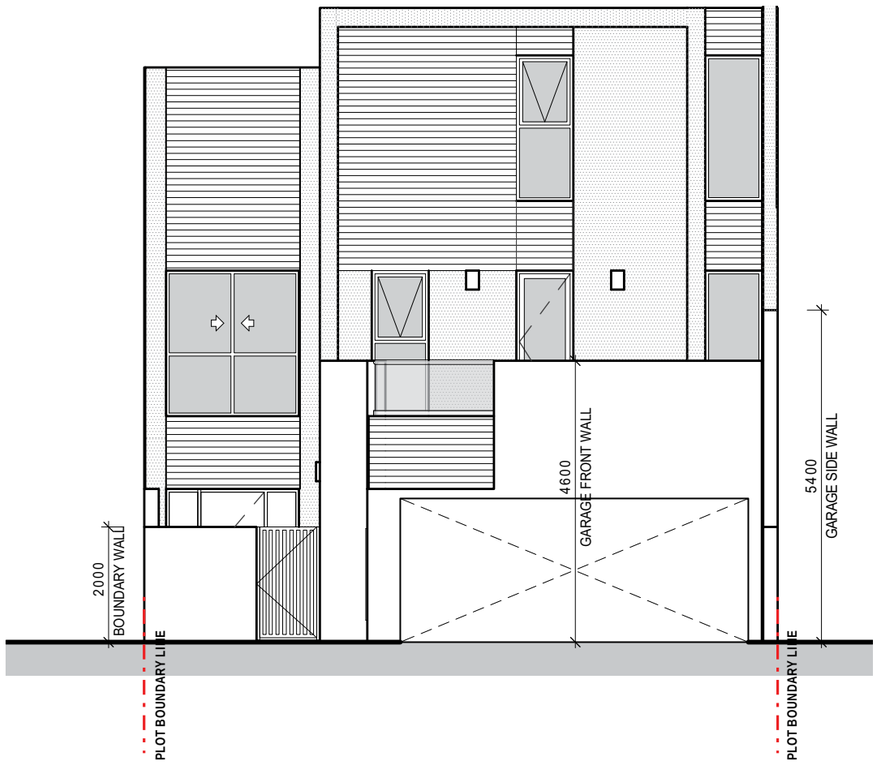


Figure 18: Front Elevation showing boundary wall and entrance for 4.3 / Aseel 2

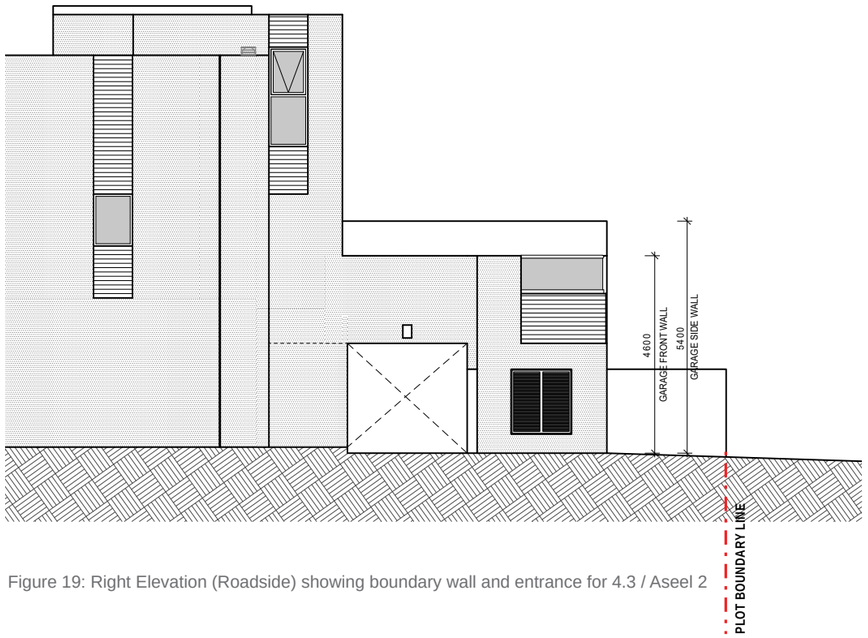


Figure 19: Right Elevation (Roadside) showing boundary wall and entrance for 4.3 / Aseel 2

Figure 20: Right Elevation (Canal side) showing boundary wall for 4.3 / Aseel 2

(*Note: Rear Privacy Wall length will vary as per plot size)

Boundary Wall

Villa Type 5.5 / LAYL 2

The maximum height of the boundary wall which accommodates the pedestrian gate is at 2.0 m and the Garage front wall is 4.6 m. The Garage side wall facing the adjacent villa is raised to a maximum height of 5.4 m. Figure 21 shown below indicates the same.

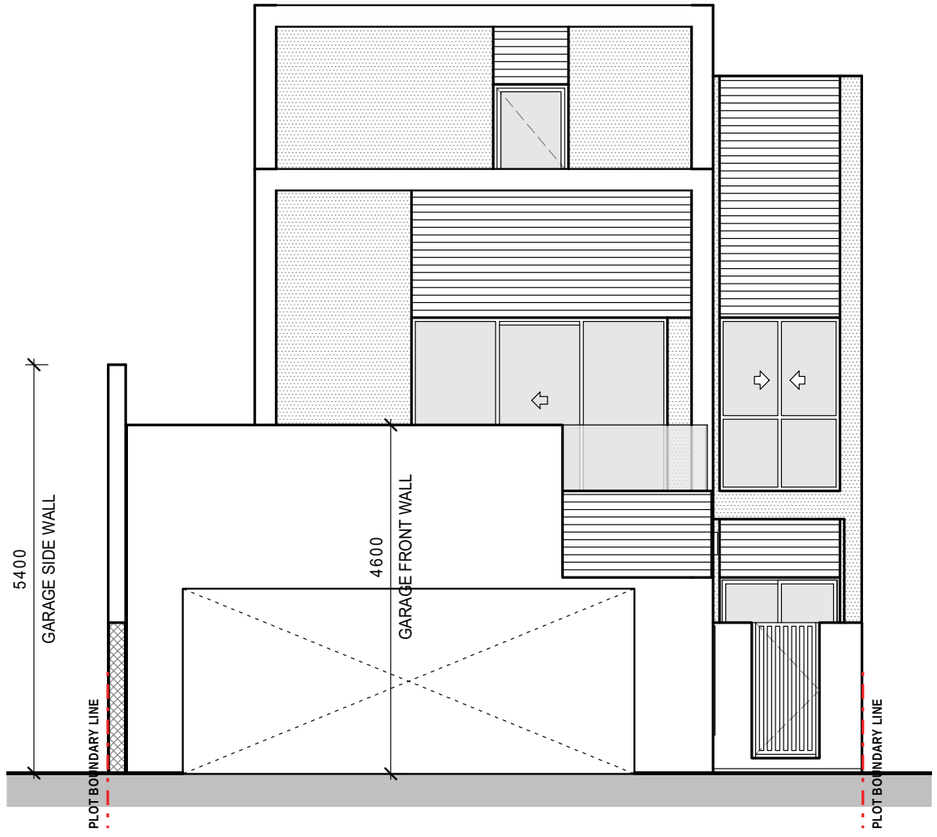


Figure 21: Front Elevation showing boundary wall and entrance for 5.5 / Layl 2

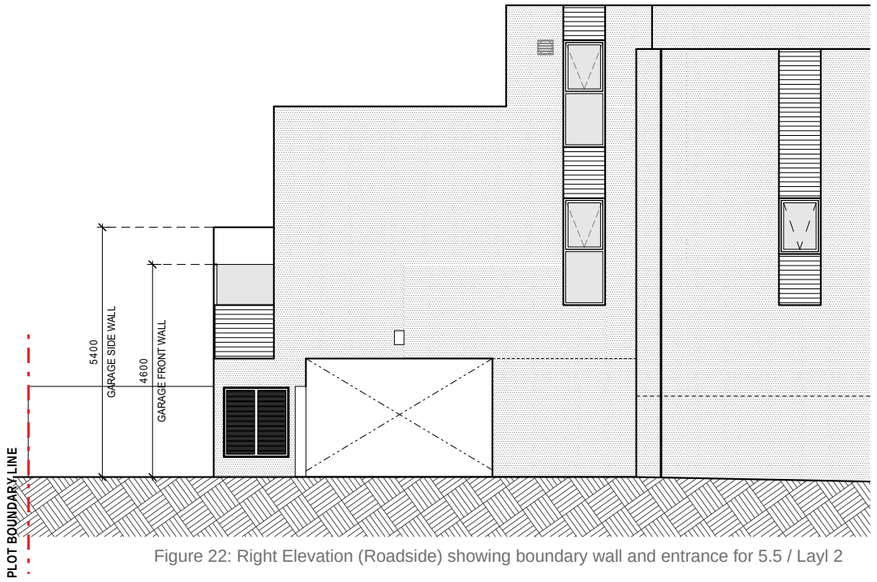


Figure 22: Right Elevation (Roadside) showing boundary wall and entrance for 5.5 / Layl 2

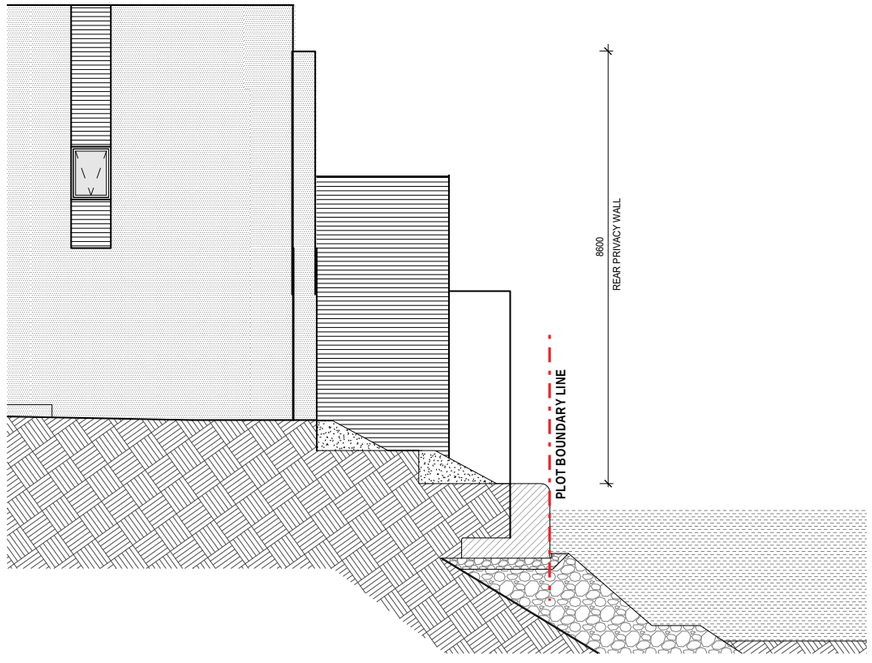
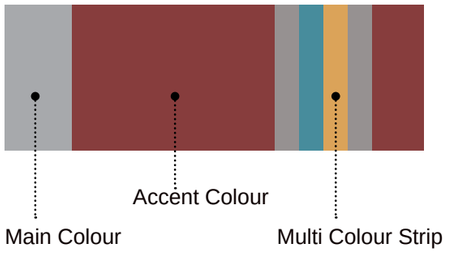


Figure 23: Right Elevation (Canal side) showing boundary wall for 5.5 / Layl 2
(*Note: Rear Privacy Wall length will vary as per plot size)

Colour Type Legend

- Type - A
- Type - B
- Type - C
- Type - D
- Type - E
- Type - F

Key Diagram



Colour Code

Architectural Facade Type - Villa Facade Colour Identification Layout

Figure 24: Masterplan showing the Villa Facade Colour type distribution

*Note: The layout shown here is the best representation and should only be referred for the purpose of Villa Facade Colour Type identification

Main Colour Wall Identification Diagram

Front Elevation

Rear Elevation

Accent Colour Wall Identification Diagram

Front Elevation

Rear Elevation

Villa Colour Type-wise Elevations

Type A

Front Elevation

Rear Elevation

Type B

Front Elevation

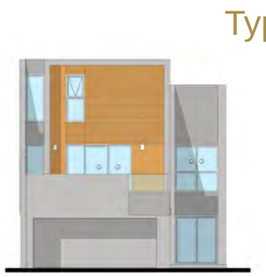
Rear Elevation

Type C

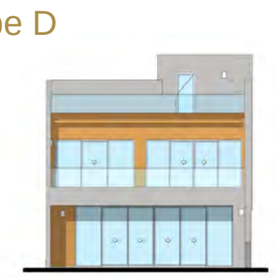
Front Elevation

Rear Elevation

Type D



Front Elevation



Rear Elevation

Type E

Front Elevation

Rear Elevation

Type F

Front Elevation

Rear Elevation

*Note:
a. Main colour alternates for every adjacent plots. Refer Master layout indicated (figure 24) for the respective main colours.
b. The final colour scheme is subject to the discretion of Diyar Al Muharraq.

Permitted Modifications

Permitted modification items in Villas to include the following:

a. Front Garden:

- Landscaping: Villa Owner is permitted to carry out soft-landscaping in the designated space provided alongside the passage leading from the pedestrian porch to the main door. Refer to As-built Drawings for details for the available space and levels. Irrigation shall be manual from the available garden tap (see reference images in figure 25).
- Shading / Screening: Villa Owner is not permitted to build a Gazebo or a Sunshade in the front garden.
- Service Corridor: Villa Owner is encouraged to install a Door for the Gas Bank located in the service corridor. The door shall be powder coated aluminium louvered door with RAL colour code 7047
- Villa Owner is not permitted to build planter boxes and to plant any kind of deep-rooted / large stem trees in the Front Garden.
- Villa Owner is permitted to replace the pavers in Front Garden passage only (garage and service corridor areas are not permitted). Also, Villa Owner to maintain existing levels and ensure not to cover the designated soft landscaped area.
- Feature Wall : The Villa Owner is permitted to install an independent feature wall along the side wall in the front garden passage, replacing low height toe wall, without disturbing the structural integrity of the existing structure of the shared wall. Feature wall shall not be higher than the front boundary wall height.

b. Rear Garden:

- Soft Landscaping: Villa Owner is permitted to carry out soft-landscaping in the planter box above the pump shelter. Also, the Villa Owner is permitted to carry-out limited soft-landscaping in the rear garden, subject to submitting the drawings to TIO for approval. Refer to As-built Drawings for details for the available space and levels. Irrigation shall be manual from the available garden tap. The existing soil levels at the Rear Garden levels range from +2.73 m lvl to +2.0 m lvl for the Outer Canal Villas and range from +2.73 m lvl to +1.35 m lvl for Inner Canal Villas (for reference to understanding relative levels, the Lower Ground Floor Finish level of the Villas are at +2.75m lvl).
- Hard Landscaping: Villa Owner is permitted to carry out hard landscaping in the rear garden subject to submitting the drawings to TIO for approval. See reference images in figure 26 for Rear Garden Landscape design at Show Villas.
- Water-Feature: Refer to attached images provided here in figure 27 for reference images, for indicative details of the water feature wall attached to the swimming pool. Water feature wall shall be independent of the adjacent boundary wall and shall not be higher than 1.8m. A representative Section of the Water Feature has been included as Figure 31c for Villa Owner's Reference Villa Owner to note that the water feature shall not be connected to the existing swimming pool pumping and filtrations system,As such, villa owner is required to replace the existing pump to higher capacity to accommodate the swimming pool and water feature. Accordingly Villa Owner can refer to As-built drawings and Operations and Maintenance Manual for Electromechanical and Civil provisions for the water feature.
- Shower Wall: Villa Owner to note that the Shower shall not be mounted directly on the existing Privacy Wall and an independent wall shall be constructed and shall not be higher than 1.8 m.
  A representative Section of the Shower Wall has been included as Figure 31b for Villa Owner's Reference
- Villa Owner to note that installation of any elements against the Privacy Wall such as bench, sink counter, planter box etc., shall be constructed independent to the Privacy Wall and not to be higher than 1.8 m.
- Refer to figure 28 and 29 showing a typical cross section of an Inner Canal and Outer Canal non-landscaped rear garden, for Villa Owners reference and understanding of general details and levels. Also, refer to Figure 31 showing a typical cross section of a landscaped rear garden, for Villa owners reference and understanding of general details and levels.
- Villa Owner shall follow the prescribed levels on the Rear Garden for particularly for placing the Shower, Sink etc. to allow Drainage to function without any mechanical intervention. Lowering the levels of Shower and Sink below the prescribed level will result in Villa Owner having to provide for lifting Pump for the Drainage.

Figure 25: Reference images for Front Garden (from Show Villas)

Figure 26: Reference images for Rear Garden (from Show Villas)

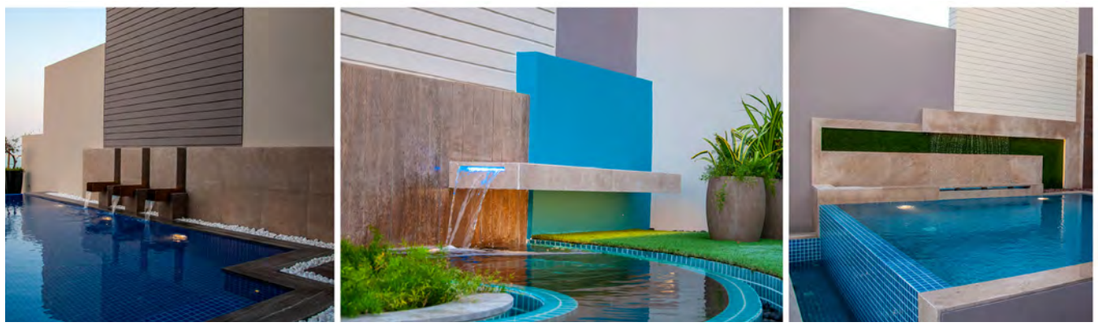


Figure 27: Reference images for Water Features from Show Villas.

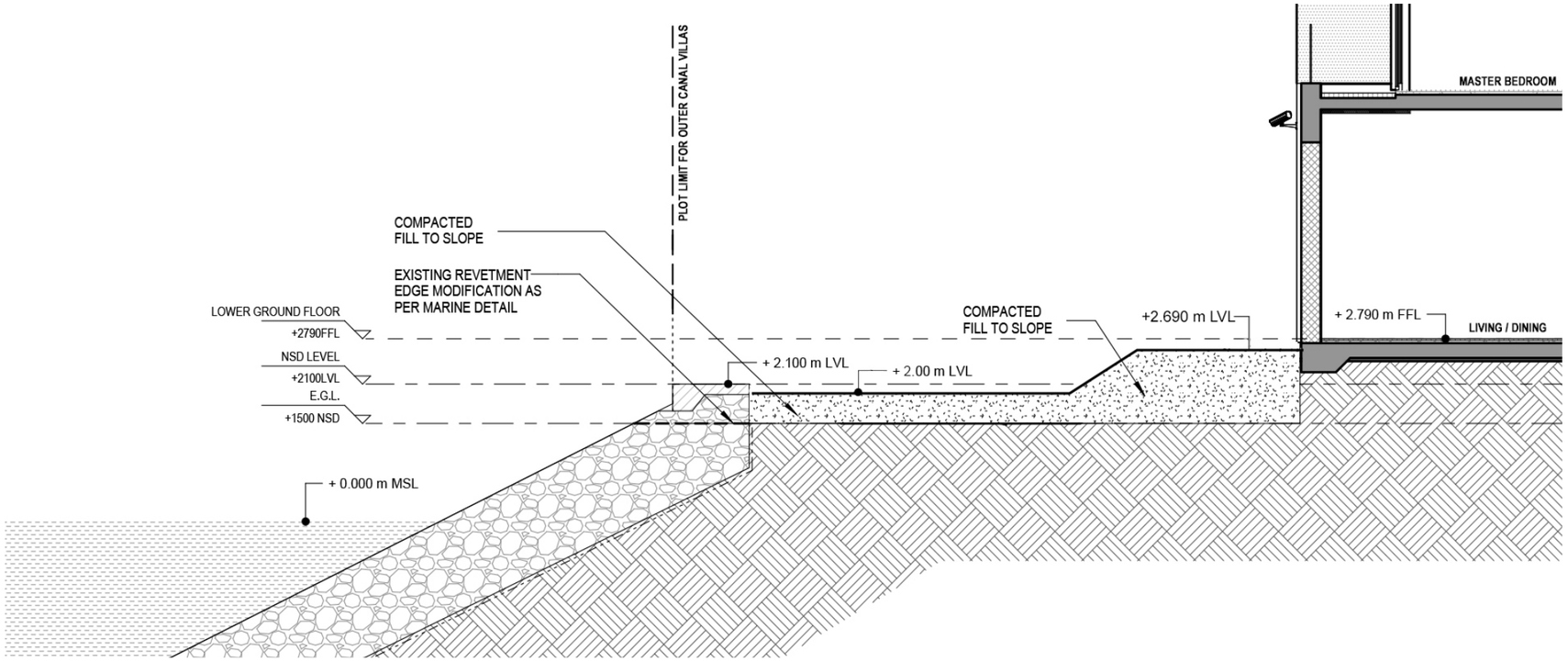


Figure 28: Typical Rear-side section of Outer Canal Villas without Landscape

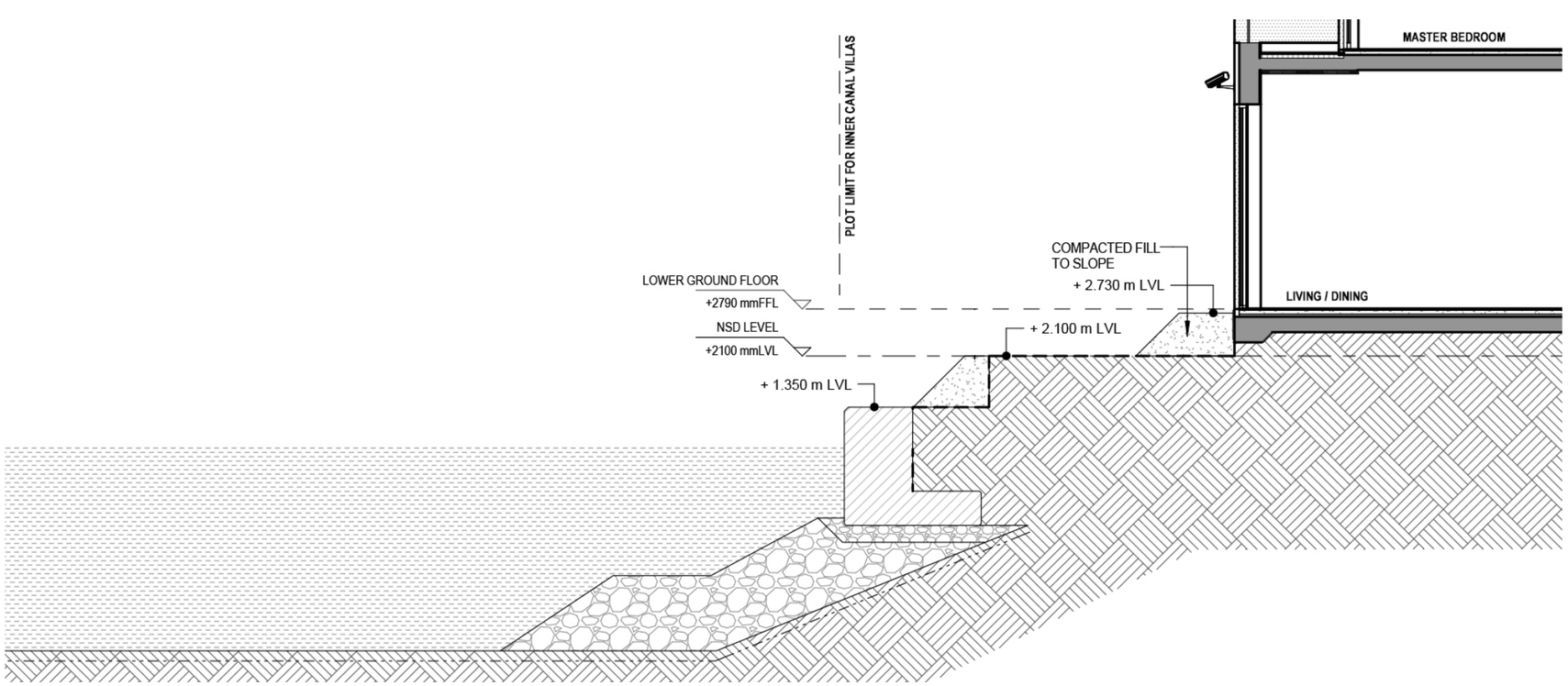


Figure 29: Typical Rear-side section of Inner Canal Villas without Landscape

Permitted Modifications

- Shading / Screening: The Villa Owner is permitted to build a Gazebo or a Sunshade in the rear side garden as per the approved permissible modification regulations and submitted to Diyar TIO for approval (see reference images in figure 30). The shading structure design and post profile to be minimal, rectilinear and matching Al Naseem overall villa design theme. Any shading structure to be independent from the existing structures including the privacy walls and should be anchored to the ground level. It could be placed in the lower or upper deck levels which are +2.10m and +2.75m lvl respectively for the Outer Canal Villas and +1.35m and +2.75m lvl for Inner Canal Villas. The maximum height should be kept at 3.8m from ground floor FFL, so that it remains below the first-floor balcony line. However, it's height shouldn't go higher than the adjacent privacy wall line to not make it visible from the neighbor's plot. Any shading or screening structure installed shouldn't be enclosed. For any modifications or additions of Shading and Screening, the details or drawings to be submitted and approved by Central OA and subsequent submittal to Diyar TIO for approval in accordance with the regulations.
- Safety Railing: Villa Owner is permitted to fix Safety Railing on the sea side Coping Block. Refer to Figure 31 & 31a shown below, showing a Reference Section of the Railing. Railing shall be free standing type, mounted on the Coping Block, 100mm from the quay wall outer edge. Safety railing shall be of 1.0m height and made of glass balustrades, the details or drawings to be submitted and approved by Central OA and subsequent submittal to Diyar TIO for approval in accordance with the regulations.
- Privacy Screen: Villa Owner is permitted to fix a Privacy Screen on the rear garden Coping Block (Outer Canal Villas) or Quay Wall (Inner Canal Villas). Privacy Screen shall be free standing type, mounted on the centreline of the Coping Block or Quay Wall and shall not be supported from Boundary Walls on either side. Privacy Screen design shall compliment the Villa façade theme in terms of colour, pattern and material selection, shall be a maximum of 1.8m height and not exceed a maximum loading of 1kN/m². **Design of proposed structure should take into consideration the uplift forces due to wind load. D**etails or drawings to be submitted and approved by Central OA and subsequent submittal to Diyar TIO for approval in accordance with the regulations
- Jetty / Pontoon: For guidelines on installation of Jetty/Pontoon refer to Section 2.5 Marine Regulations and Guidelines.
- Sundeck: Villa owner can choose any type of floor finishes(Marble, WPC, tiles, etc.) for the sundeck as long as the structural integrity of the sundeck is not compromised. Villa Owner is permitted to add LED type inground recessed spotlights to the sundeck or any lighting fixture type that ensures no disturbance to neighbors, and shall not puncture the slab of the sundeck.

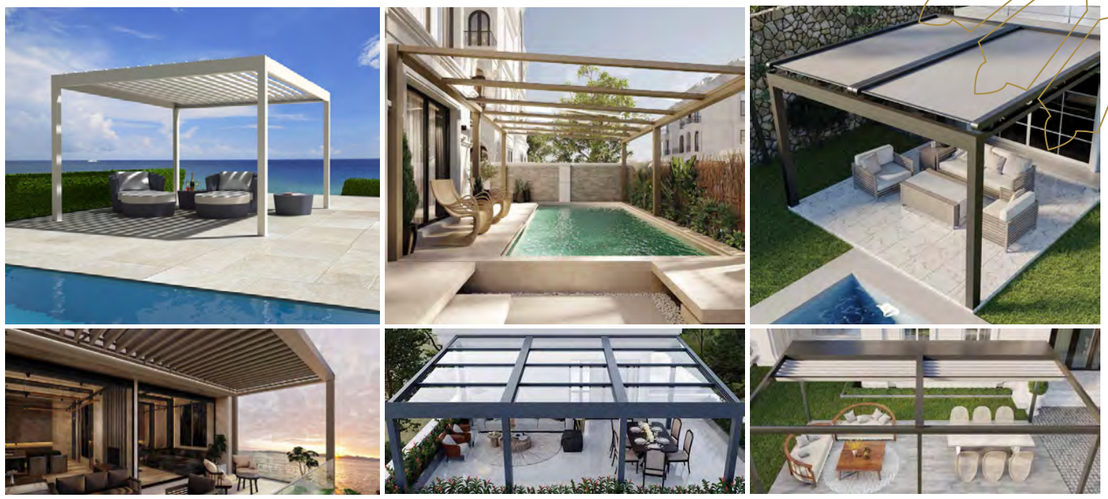


Figure 30: Reference images for Shaded Structures with Louver, Glass, and Fabric System

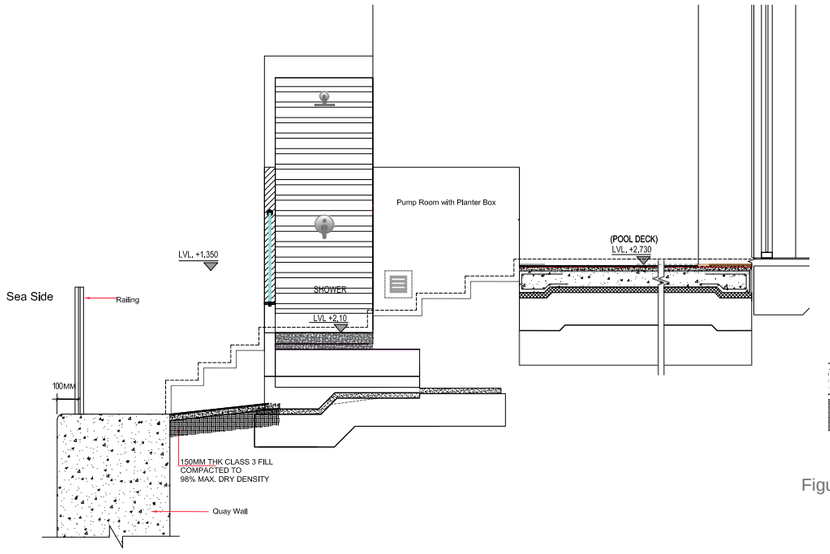


Figure 31a: Typical Rear-side section of Inner Canal Villas with Landscape

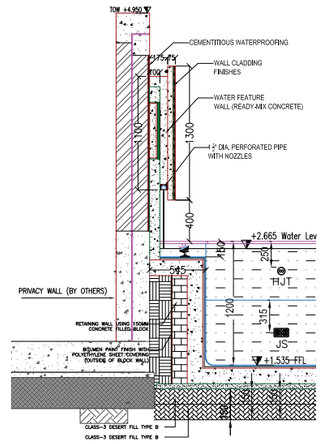


Figure 31c: Typical Water Feature Section

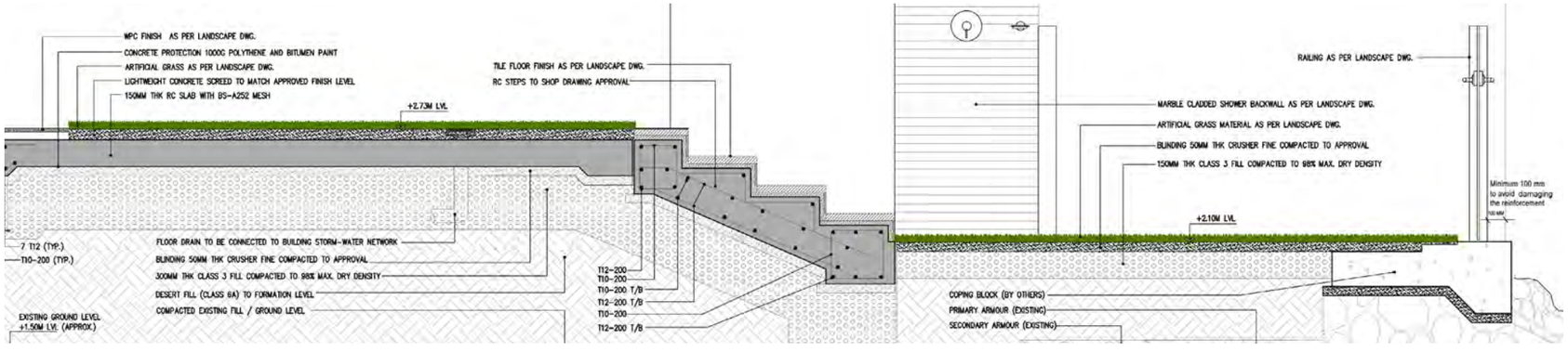


Figure 31: Typical Rear-side section of Outer Canal Villas with Landscape

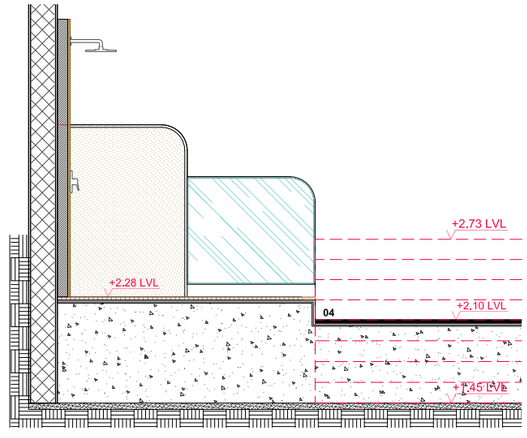


Figure 31b: Typical Shower Section

Permitted Modifications

- Sunken Seating:

  Extent of the Sunken seating area should respect the minimum setbacks (refer figure 31d and 31e) from the adjacent existing structures, like the Villa, Privacy wall, swimming pool and pump, coping beam/quay wall.

  Setbacks for sunken seating to be followed are 2.5m from the face of privacy wall (part of the villa), 2.0m from the Villa face, 1.5m from the coping beam back edge (1.0m in case of inner canal), 2.0m from the privacy wall (neighboring plot).

  Depth of excavation for the sunken slab should not go below the bottom of Privacy Wall footing, i.e.., 1.5m lvl. incase of Outer Canal villas (refer figure 31f) and 0.6m lvl. incase of Inner canal villas (refer figure 31g).

  Customer appointed third-party Consultant shall refer to the as-built drawings of villa rear garden for coordinating with the existing underground pipes and services, to provide necessary drainage considerations for the sunken seating area, and it is the Villa Owner and appointed Consultant responsibility to ensure avoiding any risk/damage to them and any of the existing structures such as swimming pool, pump room, privacy walls, etc.

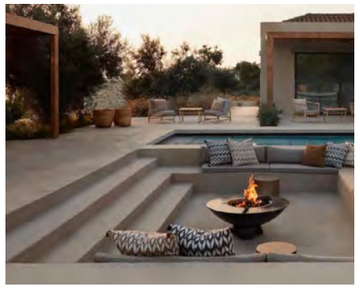


Figure 31h: Reference images for sunken seating.

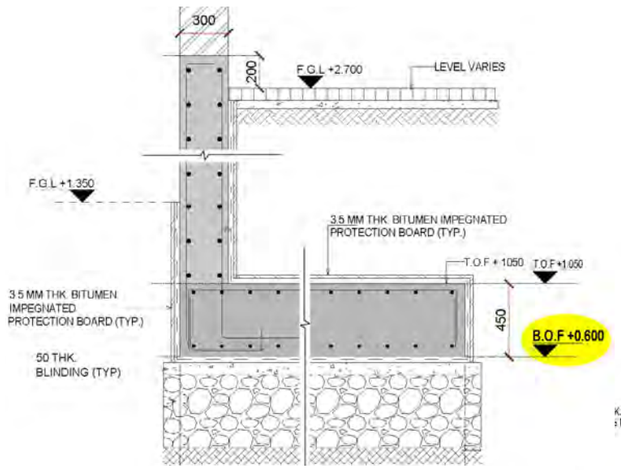


Figure 31g: Typical privacy wall footing detail highlighting bottom footing level at Inner canal.

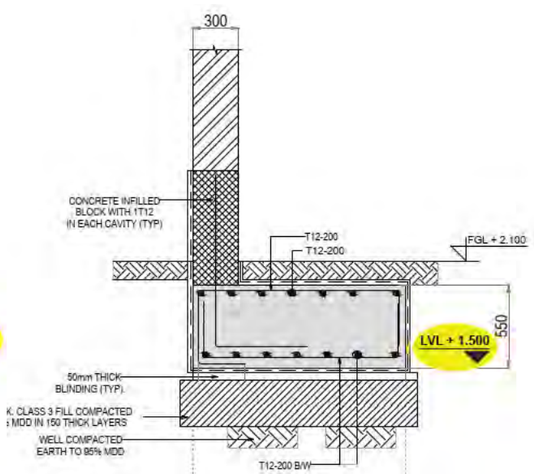


Figure 31f: Typical privacy wall footing detail highlighting bottom footing level at Outer canal.

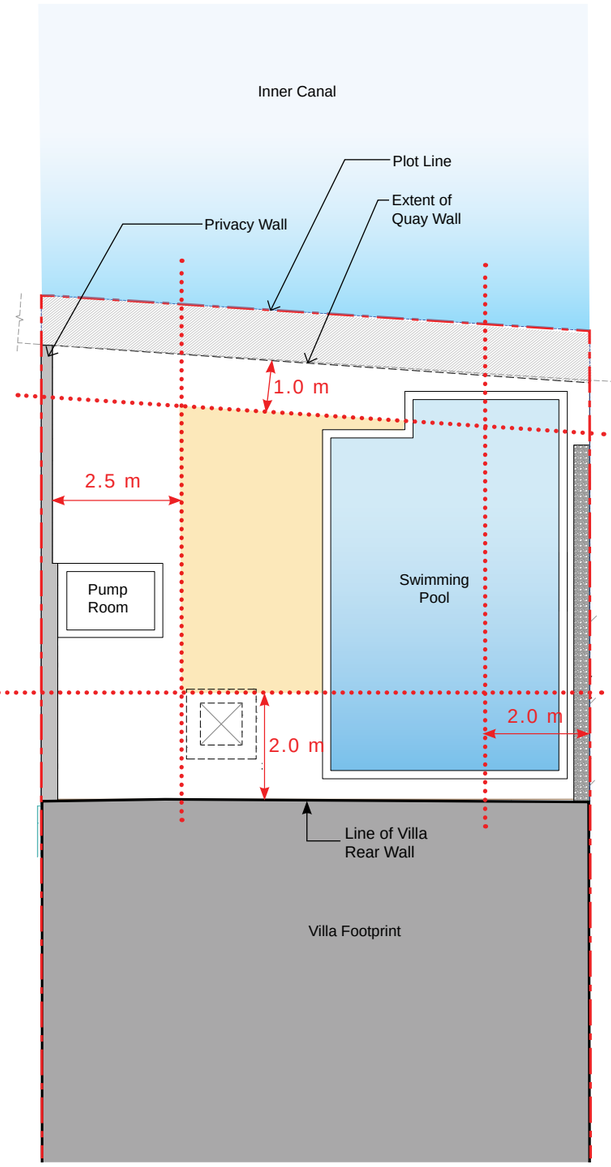


Figure 31e: Keyplan showing typical inner canal villa rear garden, demonstrating structral constraints / setback for sunken seating.

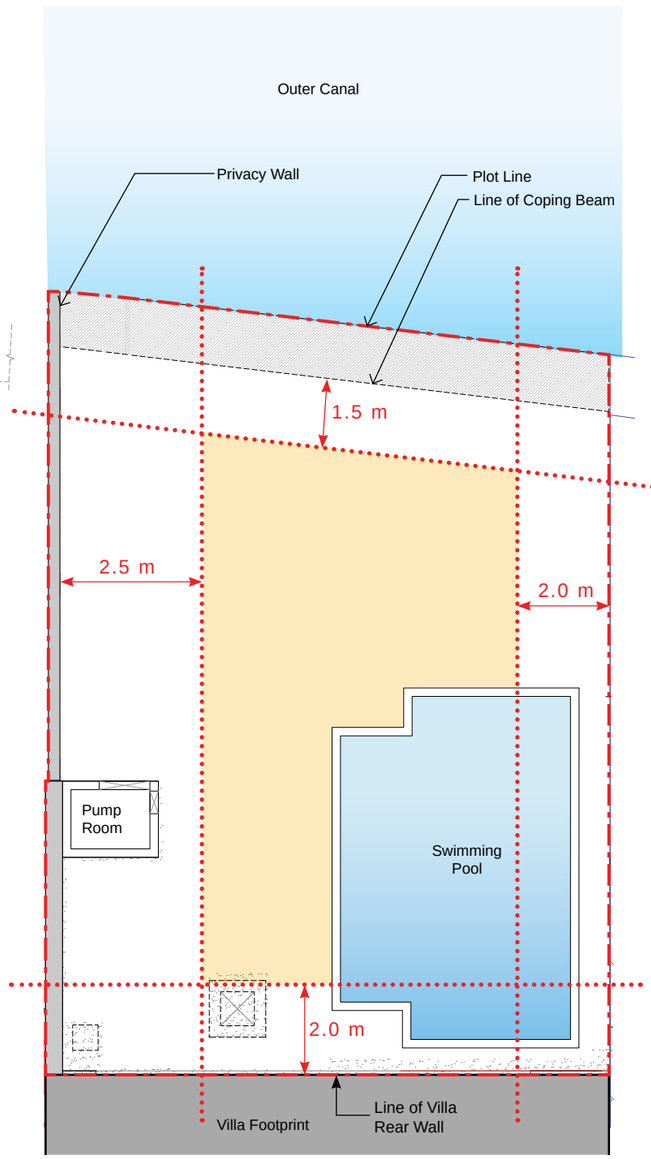


Figure 31d: Keyplan showing typical outer canal villa rear garden, demonstrating structral constraints / setback for sunken seating.

Permitted Modifications

c. First Floor Terrace:

- Landscaping: Villa Owner is permitted to construct planter boxes to carry-out soft-landscaping in-line with the reference images from Show Villas shown below. Irrigation shall be manual from the available garden tap (see reference images in figure 32 and reference section in figure 34).
- Live load considered for First Floor Terrace is 200 kg/m^2. Villa Owner is required to submit a drawing showing complete details to the TIO for their approval prior to carrying out any works related to planter box at site.
- **Shading / Screening: The Villa Owner is permitted to build a Gazebo or a Sunshade in the First floor terrace as per the approved permissible modification regulations and submitted to Diyar TIO for approval (see reference images in figure 30).** The shading structure design and post profile to be minimal, rectilinear and matching Al Naseem overall villa design theme.
  - **Proposed structure should be mounted on pedestals that are anchored and drilled into the existing RC slab (see figure 33a for typical base pedestal detail).**
  - **Proposed structure shall not be supported on the Parapet wall, due to risk of severe damage because of uplift forces.**
  - **Design of proposed structure should take into consideration the uplift forces due to wind load. Contractor carrying out the work should submit design drawings and calculation for TIO's review and approval, prior to commencement of any works at site.**
  - **Integrity of the Waterproofing system has to be ensured while the pedestals are being casted on the bare roof slab, that involves removal and reinstatement of the waterproofing system, by engaging a waterproofing contractor.**
  - **Maximum height for the proposed shading structure should be not more than 2.6m from first floor FFL.**
  - **Acceptable colour choices for the shading device are White, shades of Grey and shades of Beige to be in harmony with the villa facade colour theme.**

d. Second Floor Terrace:

- Landscaping: Villa Owner is permitted to carry-out landscaping in-line with the Show Villas design. Irrigation shall be manual from the available garden tap (see reference images in figure 33 and reference section in figure 35).
- Shading / Screening: The Villa Owner is permitted to build a Gazebo or a Sunshade in the Second floor terrace as per the approved permissible modification regulations and submitted to Diyar TIO for approval (see reference images in figure 30). The shading structure design and post profile to be minimal, rectilinear and matching Al Naseem overall villa design theme.
  - Proposed structure should be mounted on pedestals that are anchored and drilled into the existing RC slab (see figure 33a for typical base pedestal detail).
  - Proposed structure shall not be supported on the Parapet wall, due to risk of severe damage because of uplift forces.
  - Design of proposed structure should take into consideration the uplift forces due to wind load, contractor carrying out the work should submit design drawings and calculation for TIO's review and approval, prior to commencement of any works at site.
  - Integrity of the Waterproofing system has to be ensured while the pedestals are being casted on the bare roof slab, that involves removal and reinstatement of the waterproofing system, by engaging a waterproofing contractor.
  - **Maximum height for the proposed shading structure should be not more than 2.6m from second floor FFL.**
  - **Acceptable colour choices for the shading device are White, shades of Grey and shades of Beige to be in harmony with the villa facade colour theme.**

Figure 32: Reference images for First Floor Terrace (from Show Villas)

Figure 33: Reference image for Second Floor Terrace (from Show Villas)

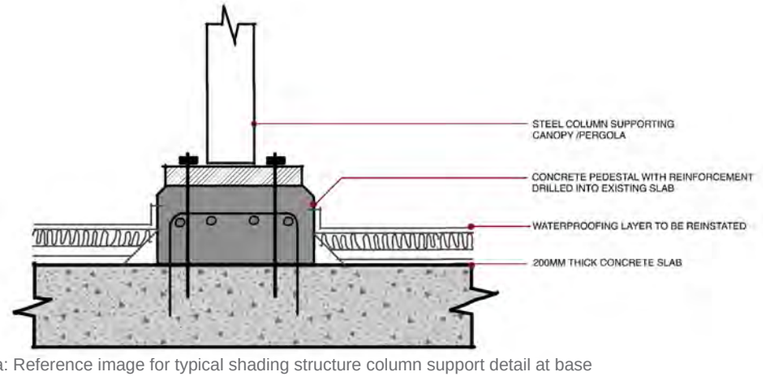


Figure 33a: Reference image for typical shading structure column support detail at base

e. Upper Roof Terrace:

- Villa Owner is not permitted to do any landscaping or to build / install a Gazebo or Sunshade in the Upper Roof Terrace.

f. Garage Door:

Villa Owner is permitted to install Garage Door at the designated garage opening provided. Electrical provision for installing the same has been provided. Permitted Colour Code for the Garage Door is RAL-9016. All relevant drawings to be submitted to Diyar TIO for approval, prior to carrying out any works.

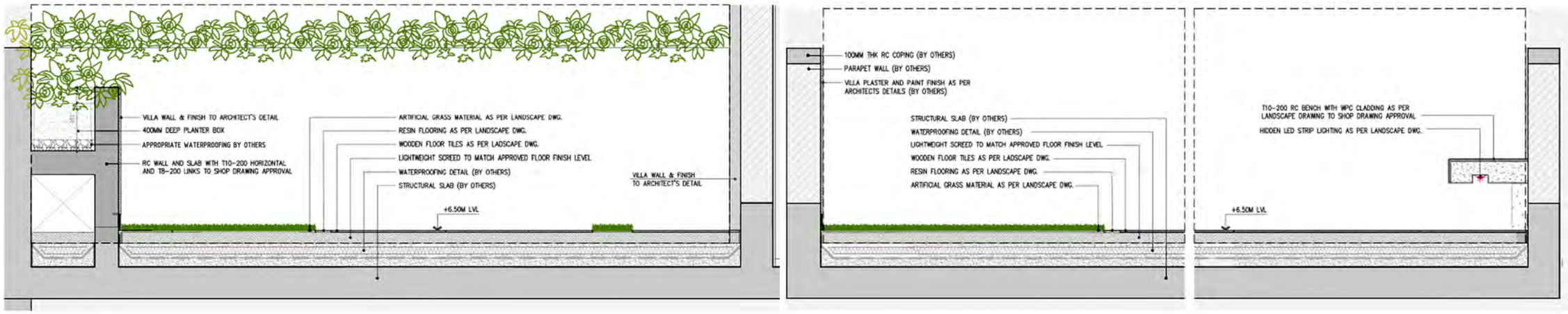


Figure 34: Reference section for Hard Landscaping at First Floor Terrace

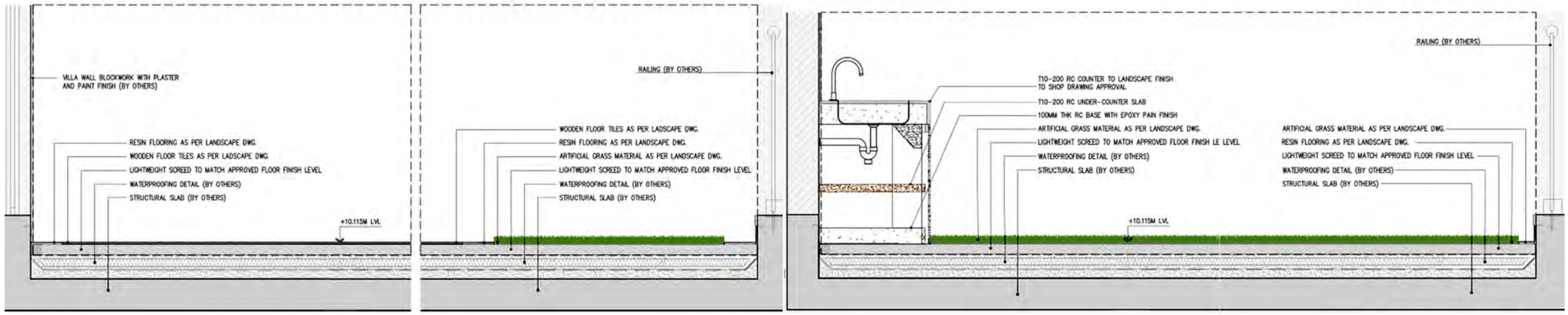


Figure 35: Reference section for Hard Landscaping at Second Floor Terrace

Permitted Modifications

g. Interior:

- Interior design modifications are permitted subject to case by case review. The Villa Owner to submit drawings and plans to TIO for approval prior to implementation. Generally those modifications shall be permitted that do not impact the structural members, services and/or aesthetics of the villa.

  Home / Domestic Lift: Installation of floor mounted domestic type home lift is permitted in the designated area identified in the floor plans (refer to figure 36). For available space for lift installation refer to As-built drawings.

  For all Villa types except 5.4 / Layl and 5.5 / Layl 2, the recommended lift type is Screw or Electric Traction Motor with a built-in enclosure, preferably glass. The lift provisions installed in the villas are suitable for two specific lift models, from Aritco and SWIFT from Sweden, however the Customer can opt for similar Models available from other Manufacturers, considering the provisions made on site.

  Villa Owner is responsible for ensuring that the various requirements of the desired lift model/brand conform to the Civil, Architectural and MEP provisions available in the villa.

  TIO is not responsible to grant approval on lift specs, installation and its technical compliance. This falls under the Villa Owner's consultant liability. Refer to table 3 on page 34 for the electrical load provisions for the domestic home lifts. A connection point (Isolator) is provided on the ground floor adjacent to the space allocated.

  Installation of Domestic / Home Elevator:

  For all villa types except 5.4 / Layl and 5.5 / Layl 2, the Villa Owner shall take the following measures while installing the Domestic / Home Elevators in the designated location.

a. Remove the Glass Panel Railing installed along the Staircase leaving the first panel at the Ground Floor and last panel of the Railing on the Second Floor.
b. Remove the Wooden Rail running on the top of the glass panel and terminate it with the face of the Lift.
c. To install a handrail on the wall side with the bracket as necessary or required by the Customer.
d. A 120 mm deep removable flooring is provided to facilitate lift installation.

  For Villa type 5.4 / Layl and 5.5 / Layl 2, Villa Owner can install their domestic elevator in the shaft provided in the villa however lift type shall be screw or Electric Traction Motor.

a. The Villa owner is required to remove the removable platforms at first floor for the installation of lifts.
b. The lift pit depth of 200mm is provided.
c. Prior to installation full engineering drawings have to be provided to the TIO for approval.

h. Exterior

Painting: Villa Owner is permitted to change the accent colour of the villa only to a different accent colour type from the elevation types provided in this document. Refer to page 23 and 24.

Figure 36: Ground floor plan showing the designated areas for permissible modifications.

*Note: The diagram above is for indicative purpose only and the actual dimensions for the space available should be referred to from the respective As-Built drawings.

General Notes:

- Any submissions to the TIO should be preceded by obtaining the approval and consensus of the Central OA in accordance with the regulations.
- Any Plants or Shrubs that are to be planted in the permissible location within the property are to be placed respecting the existing building structures and also not causing any concerns to the neighbours.
- Permitted to make upgrades/improvements/modifications that are inline with the DRG as long as there is no demolition of any part of the villa that could impact the structural members, services and/or external aesthetics of the villa.
- Any external lighting fixtures to be replaced should be replaced with the same make and model as the existing until otherwise the existing make is not available in the local market; In such cases the Villa Owner must ensure to use the fixtures that best match with the existing fixture in terms of appearance.
- Villa Owner to ensure Rain Water Pipes are maintained and kept clear of obstruction while developing the terrace garden. The designs to be submitted to Diyar TIO for approval, prior to carrying out any works.
- Villa Owner to ensure at least 30% of the front and rear gardens are permeable to ensure rain water discharge into the natural ground.
- Villa Owner to ensure that any modifications or permitted works shall not affect the integrity of any underground buried services such as water supply pipes, electrical cables, drainage pipes, etc.

Prohibited Modifications

In general terms, any changes that affect the external appearance of the building are, unless specifically allowed in the Permitted Modifications section above are to be considered prohibited.

Prohibited modification items in Villas include the following:

a. Swimming pool construction works will not be permitted following construction of villas due to access restrictions.
b. Shading / Screening: The Villa Owner is not permitted to build a Gazebo or a Sunshade in the front garden.
c. Any work that exceeds the maximum building footprint, GFA or building height, or that acts to reduce the building footprint.
d. Enclosing the garage and altering the garage use.
e. Enclosing the balcony.
f. Enclosing the service shaft.
g. Building an enclosed structure like a shed, green-house, shelter or a cage on the roofs or on the ground floor.
h. Altering or increasing the height of the boundary wall, apart from the optional “non-structural” Privacy Screen extensions that are going to be included as part of Permitted Modifications on Page 27
i. Demolishing any part of the villa, that could impact the structural members, services and/or aesthetics of the villa.
j. Installing exposed piping, conduits or other services which are visible from outside the plot.
k. Any modifications or additions over the Exterior Insulating Finishing System (EIFS) Cladding, including that of neighbours wall that forms part of the entrance corridor to the front door. No fixings, penetrations or modifications can be made to these walls. Refer to As-built Drawings for the extent of EIFS Cladding on the Villa Facades.
l. The electrical panel and wiring within the home is designed with a spare breaker and has a spare connected load in reserve for any permitted modification as described in the Permitted Modifications section above. However major load additions such as chiller or heater for swimming pools and water chiller for water tank are not permitted.
m. Any modification or addition of structures including but not limited to shading devices and planter box beyond the plot limits.
n. Any modification to the external walls of the villas, including the privacy wall on the rear side.
o. Any modifications or additions to the Rock Revetment / Coping Block for Outer Canal villas and Quay Wall for the Inner Canal villas.
p. Any modifications or addition to the exterior structural beams of Villa type 5.5 / Layl 2.
q. Installing cat ladder.

Note:

- Installing additional equipment’s such as satellite dishes or other items outside the building or on the roof, unless this is screened to the approval of Central OA followed by the TIO before proceeding.
- For any modifications that affect the utility provisions to the villa such as electrical, water, sewer, telecom and storm water, will need to be designed to ensure it does not exceed the allowed utility provisions / Maximum Utility Demand (MUD) as specified in the DRG, and the design should be approved by the Central OA followed by the TIO before proceeding.
- The Villa Owner is not permitted to make any modifications or changes to the structural frame.

2.4 Structure and MEP

Structure

The six villa types have been designed as a Reinforced Concrete (RC) framed structure supported by a stitched raft foundation with local thickenings as required.

The structural elements include:

a. Reinforced concrete cast in situ stitched raft, columns, beams, lintels, slabs, walls.

b. Blockwork including hollow, solid as well as concrete filled.

c. External and internal render.

d. Parapet walls.

e. Floor finish with concrete screed.

f. Cast in-situ staircase.

g. Balcony to suit the individual façade type.

***The Villa Owner is not permitted to make any changes or modifications to the structural frame.**

Note:

- For heavy fixing and fixtures to the structural elements, the Villa Owner is to seek advice from a Third Party Consultant (TPC) appointed by the Villa Owner.

Villa roof is designed for the following loads

- Waterproofing and roof build-up load = 250kg/sqm (considering gravel finish)
- False Ceiling and Services =50kg/sqm
- Live Load for entire roof (MEP area as well as other area) = 400kg/sqm

Mechanical Services

Air Conditioning

- Air conditioning for the Villa is done by Air cooled DX units. Ducted split indoor units are envisaged for Living/Dining, Majlis and Entrance lobby at ground floor and bedrooms in first floor, however wall mounted indoor units for Drivers room and Maids Room.
- Outdoor units are placed at the roof level at strategic locations.
- Indoor units and outdoor units are connected with refrigerant pipes duly insulated and complete with weather protection.
- Fresh air required for the Villa under Dwelling units as per ASHRAE standard 62.1 2012 is substantial and can be compensated through infiltration from the undercuts.
- Refrigerant used in the units are environment friendly with low ozone depletion potential (ODP) and low global warming potential (GWP) in line with international standards.

Exhaust Fans

- Toilets are maintained at negative pressure with respect to the adjacent spaces by extracting air based on ASHRAE standard with ducted in line/roof mounted low noise fans with speed regulators.
- Wall mounted exhaust fans are provided for Drivers and Maid Toilet.
- Fry kitchen is provided with roof mounted ducted fan placed at the roof level.

Solar Powered Water Heater / Cooler

- Villa Owner is permitted to install Solar Water Heater / Coolers.
- Recommended locations for the same is second floor terrace while ensuring the panels are not visible from outside keeping in view aesthetical considerations.
- Drawings to be submitted to TIO for their approval prior to its installation.

Electrical Services

The Electrical Power supply provided to the villas is through three phase and neutral feeder distribution at 400/230V, 50 Hz and the final electrical distribution to various electrical amenities through single phase distribution.

There are three distribution boards provided i.e. at ground, first and second floors within the villa. Each distribution board is feeding the lighting, air-conditioning, socket outlets and fixed electrical amenities within the respective floor.
The electrical load design for the six different villa styles in the as-built and future provisions has been outlined in the table below.

Villa Type	Load Break Down								Total Load In KW	Total Demand Load in KVA
	Installed Load				Installed / Future Load		Future Load			
	Villa Lighting & Small Power	External Landscape Lighting	Sundeck	Water Pumps	Swimming Pool	Lifts	AC for Laundry Room	Chiller for Water Tank		
3.3 / Sabaah	65.75	0.8	0.5	2.4	1.5	4.0	2.0	2.0	78.95	47.5
3.4 / Duha	65.75	0.8	0.5	2.4	1.5	4.0	2.0	2.0	78.95	47.5
4.2 / Aseel	60.10	0.8	0.5	2.4	1.5	4.0	2.0	2.0	73.30	44.5
5.4 / Layl	55.10	0.8	0.5	2.4	1.5	4.0	2.0	2.0	68.30	41.7
4.3 / Aseel 2	60.10	0.8	0.5	2.4	1.5	4.0	2.0	2.0	73.30	44..5
5.5 / Layl 2	65.75	0.8	0.5	2.4	1.5	4.0	2.0	2.0	78.95	47.50

Table 3: Villa Electrical Load Breakdown
*Note: Maximum connected load mentioned here is based on full design and vary based on costumer selection of add-on and optional items.

Solar Photovoltaic Panels

- Villa Owner is permitted to install Solar PV panels.
- Recommended location for installation is second floor terrace and the upper roof above staircase, while ensuring the panels or any associated accessories are not visible from outside keeping in view aesthetical considerations.
- Villa Owner shall also ensure safety and accessibility for the routine maintenance of the solar panels due to low parapet level at the Upper Roof above Staircase.
- Drawings to be submitted to TIO for their approval prior to its installation.
- Live load for the installation of Solar Panels should not exceed 100 kg/m^2 including the pedestals.

Electric Vehicle Charging Point

- Villa Owner is permitted to install a low Wattage EV Charging Point.
- Preferred location is the Garage Wall towards the Neighbour.
- Load for a low Wattage Charging Point will be compensated only if the Villa Owner does not install the AC and Chiller Provisions allowed under Future Loads Category above (seen in the above Load Breakdown.
- Villa Owner to arrange necessary modification in the Electrical Panel to accommodate Cable connection for the EV Charger.

ELV System

Telephone

A system including cabling and outlets with 8 port Ethernet switch has been provided.
PVC conduits and wiring is provided to the outlets.

SMATV

A system including a dish antenna point, outlets and wiring has been provided (receivers/decoders, wiring and dish antenna are not provided). Decoders shall be installed separately by Villa Owners.

Video Doorcom

A system including colour video doorcom and indoor handsets at three locations has been provided.

CCTV

Conduits and pull wires for CCTV has been provided.

Home Automation System (HAS)

a. Home Automation System (HAS) is not provided however necessary provisions are provided to suit a partly wired cum partly wireless based IP protocol system. Necessary 'Conduits and Draw' Wires provisions are considered to ELV and CCTV Junction Box and Outdoor Air-Conditioning Units.

b. Villa Owner would need to install wireless controller modules behind each switch and dimmers locations, for controlling the lights remotely via HAS. Similarly, Villa Owner will need to install wireless controller compatible curtain motor system for the Window Curtains. IP Video doorcom system provided is compatible and can be connected to IP HAS controller.

c. HAS controller can be installed within the ELV / Electrical junction box.

d. Villa Owner to contact a qualified HAS vendor to install the system within the Villa.

e. Villa Owner can refer to As-built drawings for more details.

Public Health Services

Water Supply System

a. The water supply system for the villa has been provided to supply plumbing fixtures, with their demand for cold and hot water at the required flow rate and pressure with minimum noise, contamination and risk leakage.
b. The incoming domestic cold water supply will be provided from site infrastructure with a dedicated water meter.
c. The water is stored in above ground water storage tank and transferred to the overhead tank for human consumption.
d. The water velocity in cold and hot water piping network for mains and branches should not exceed of 1.8m/s and 1.2m/s respectively.
e. Bib taps will be provided in both rear and front garden areas. Hose pipes are not included.
f. Hot water shall be supplied through central electrical water heaters with circulation pump.
g. Water filter can be installed in the kitchen by connecting to the 20A DP switch connection unit provided under the sink. Water connection for the filter has to be tapped from the kitchen sink line.

Sanitary Drainage System

a. The foul water system for the villa has been provided as double stack pipe drainage system for collecting soil and waste and shall be discharged into dedicated external foul systems.
b. All sanitary fixtures are vented, connecting to the vent stack discharging to atmosphere at the roof level.
c. Adequate cleaning access for all drainage pipes has been provided.

Storm Water System:

The Storm Water / Rain Water from the First Floor Balcony on Front Side and Lower Roof (Terrace) and Upper Floor is conveyed by gravity pipes and free discharged to the road side, into the public storm water system. Rain Water from the Service Corridor on the Ground Floor, First Floor Balcony on the Rear Side, shall be discharged and disposed off in the Soak Pit System in the Rear Garden Area.

Villa Type	Load Break Down	
	Water Load (m^3/day)	Sewer Load (m^3/day)
3.3 / Sabaah	1.92	1.44
3.4 / Duha	1.92	1.44
4.2 / Aseel	1.92	1.44
5.4 / Layl	1.92	1.44
4.3 / Aseel 2	1.92	1.44
5.5 / Layl 2	1.92	1.44

Table 4: Villa Water and Sewer Load Breakdown

Swimming Pool Quick Fill Line (Applicable to Villa Types 3.3 / Sabaah and 5.4 / Layl)

- Quick fill line to be used for draining and filling the swimming pool in Villa Types 3.3 / Sabaah and 5.4 / Layl.
- To facilitate draining and filling, an underground pressure pipe having couplings at both ends within a small irrigation valve chamber between the front garage and rear garden is provided.
- The tanker will need to tie their flex hose to the coupler provided in the valve chamber, during emptying and filling of the Pool.
- On the Garden side, a similar arrangement as above is provided. The Villa Owner is required to arrange a portable pump and establish a connection with the fill line and swimming pool.
- Operation sequence for filling and draining the pool in Villa Types 3.3 / Sabaah and 5.4 / Layl shall be as described in the Villa Handover Package.
- Refer to As-built drawings for details related to the Quick Fill Line.

In case of Villa Types 3.4, 4.2, 4.3 and 5.5 the Villa Owners can use the service corridor provided for establishing the hose connection from the tanker for draining and filling of the swimming pool.

Gas Services

A designated space for placing the gas cylinders has been provided as part of contract.

Sleeve provision for gas cooking will be available in the fry kitchen. Gas line to be installed by the Villa Owner.

2.5 Marine Regulations and Guidelines

Marine Regulations and Guidelines

Refer to Appendix A.

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Diyar Al Muharraq

Al Naseem Gated Community

Development Regulations & Guidelines

Report No. C015-R007

16 Nov. 2022

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BYRNELOOBY

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001	20 January 2021	Issued for Review	AA	CM	JB
Disclaimer: All drawings presented within this document are indicative and are solely intended to present a visual illustration of the allowable mooring arrangements within the development.					

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Contents

1 Introduction

These Development Regulations & Guidelines have been developed as a guide within the Al Naseem Gated Community to ensure that:

1. Villa Owners are aware of the general rules and guidelines relating to the operation of the marine facilities within the development;
2. Villa Owners are aware of the berthing/mooring limitations and allowable modifications to the marine elements of their villa plots in order to maintain reasonable privacy protection and to maintain the continuity of the infrastructure and aesthetics of the development. Approvals need to be obtained prior to undertaking any/all permanent or temporary modifications. Please refer to the process described in Booklet 1, provided separately;
3. The designers of additional works are aware of the design parameters and constraints of the existing marine elements, and;
4. The existing marine elements' integrity is not compromised.

In order to safeguard the functionality, stability, structural integrity and durability of the existing marine elements, the Villa Owner and designers of future additional works shall use this document as a guide of potential constraints and limitations in and near the vicinity of marine elements (shore protection, navigation channels and reclamation, etc).

It is not the purpose of this document to be absolute in its specifications, but rather to highlighted potential constraints and certain explicit considerations Villa Owners, Suppliers and Designers need to adhere to. The Villa Owners, Suppliers and Designers need to ensure that they satisfy themselves that additional works do not compromise the functionality and stability of existing marine elements or structures and any works done in the development should be carefully considered and designed by a competent engineer using these guidelines and recognised codes, standards and engineering methods. Furthermore, the engineering, architectural and environmental parameters should be used by the professional designers, Contractors and management to manage and mitigate potential risks associated with the development. This applies to both temporary and permanent works.

This document will remain as a live document, where Diyar Al Muharraq (DAM) may amend (from time to time) to revise and/or include additional regulations as they see fit. The latest revisions of this document shall be provided to the Villa Owners once amended.

2 General Operation Rules and Guidelines

The following section provides the general operation rules and guidelines to be abided by all Villa Owners, and guests within the Al Naseem Gated Community Development:

1. No alteration of any kind is permitted to any area of the property without prior approval from Central OA and Diyar Al Muharraq (DAM) Technical Interface Office (TIO).

2. The Al Naseem Gated Community is considered a "No Wake Zone" as such watercraft speeds within the facility shall be restricted to a maximum of 5knots.

3. Parking of boats, trailers etc. outside of property lines are not permitted. Any boats/trailers found to parked outside of property lines shall be removed by security and shall be charged for their release.

4. Installation of jetties, sundecks and boat/ski floats require prior approval from Diyar Al Muharraq TIO. Installation of jetties, sundecks and boat/jetski floats shall satisfy the criteria set out within this document. Installation of an enclosed floating structure is not permitted.

5. Modified motorized watercraft which results in increased noise is not permitted within the development and may be removed from the waters by sea security. Such is an unnecessary hindrance to the Villa Owners of the development. Any such modified motor craft will be requested to vacate the water and not permitted access again until the modification has been corrected. In cases where an Villa Owner refuses to abide by any of the above guidelines, security has the right to remove the watercraft from the development waters.

6. Lighting installations around the jetty area shall be LED type lighting fixtures, complying to EWA regulations and suitable outdoor conditions. The details or drawings to be submitted and approved by Central OA and subsequent submittal to Diyar Al Muharraq TIO for approval in accordance with the regulations.

7. The safety and actions of watercraft users is the sole responsibility of the registered owner. All Villa Owners are to comply with the national laws governing the licensing, ownership and operation of marine vessels. Non-compliance with these regulations may result in security involvement and in extreme cases police/Coastguard escalation.

8. All watercrafts are to be anchored as per the rules stated within this document, in a safe manner, which does not interfere with the parking capabilities of the neighbouring property or passing watercraft.

9. All watercrafts are to be secured when not in use. In cases where any watercraft breaks free from its docking area and where security is requested/required to assist in the removal or control of a watercraft, Diyar Al Muharraq will not be held responsible for any damage that may occur to any of the watercraft owner's property or other Villa Owner's property during such assistance, in relation to the requested/required assistance. Where such is not accepted, the watercraft owner will be advised to contact the coastguard. Where a watercraft is found unsecured (drifting, partially restrained etc.), Diyar Al Muharraq will not be held liable for any damages that may occur to any Villa Owner's property during such the period of non-restraint or subsequent retrieval/storage etc.

10. Users of all watercrafts within the development limits are encouraged to wear life jackets at all times whilst on/near the water. Such is the sole responsibility of the person to whom the watercraft is registered.

11. Proprietary and purpose-built fenders and docking buoys are to be installed. Use of tires, drums etc. is not permitted.

12. There shall be no disorderly conduct by a watercraft owner, their crew or guests that might injure a person, cause damage to other property, disrupt the order of the development, or otherwise interfere with the quiet enjoyment or privacy of other watercraft owners or Villa Owners.

13. It shall be the responsibility of the watercraft owner to keep their vessel in such condition that they do not become unsightly, dilapidated, unsafe, or reflect unfavourably on the appearance standards of the development.

14. Entertaining on watercraft shall be conducted in an orderly manner, causing no disturbances to other Villa Owners. Noise shall be kept to a minimum at all times. Owners and/or his/her family, guests, employees, and licensees shall use discretion in operating engines, generators, power tools, radios, televisions, CD/tape players, musical instruments, or other noise producing apparatus.

15. Overboard discharge of sanitary or holding tanks is prohibited. No person shall sweep or throw or permit to be swept or thrown there from, any refuse, garbage or other substances overboard. All such items are to be correctly stored in suitable receptacles.

16. Sirens and Horns shall not be used except in emergencies.

17. To ensure safe manoeuvrability and to maintain privacy between plots, all jetties accessories including boats, boat lift, jet ski etc. must maintain a minimum offset of 1m from the adjacent plot.

18. All vessels shall be limited to a maximum air draft of 4.5m to allow safe navigation under the bridges located to the East and West of the Gated Community.

3 Guidelines for Berthing/Mooring

The following section provides guidelines for the mooring and berthing of vessels within the canal and along the outer perimeter of Al Naseem Development in the DAM channel. Each area permits a different type of mooring arrangement which is dependent on the plot size, navigation allowances, vessel characteristics and aesthetic requirements which is described herein.

Figure 3-1 below identifies the two discrete areas which allow for different berthing and mooring arrangements.

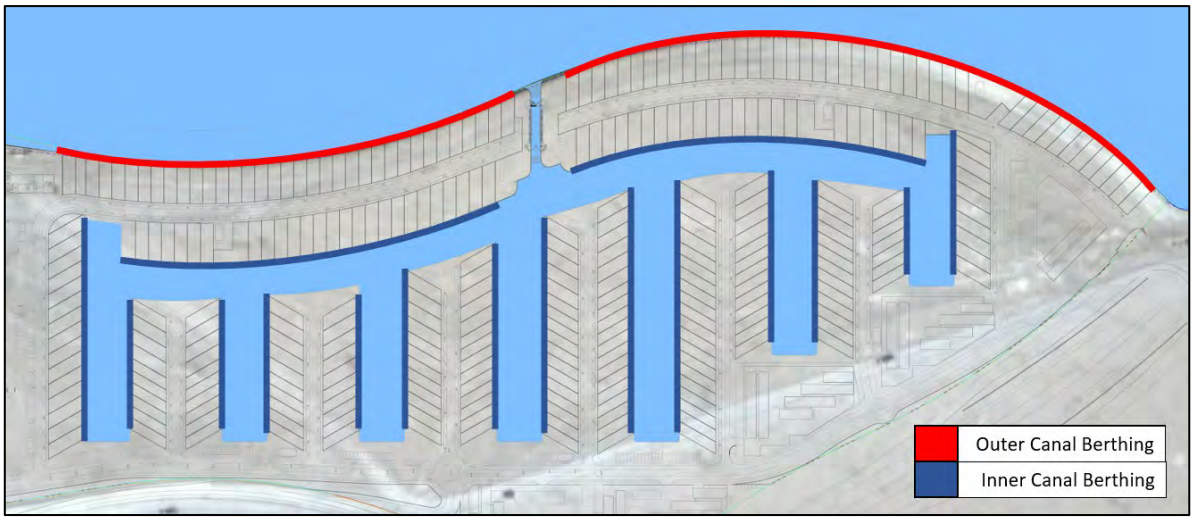


Figure 3-1 – Berthing Locations

3.1.1 Inner Canal

The inner canal consists of both 10m and 8m wide plots, with a hybrid wall edge as indicated in Figure 3-2 below.

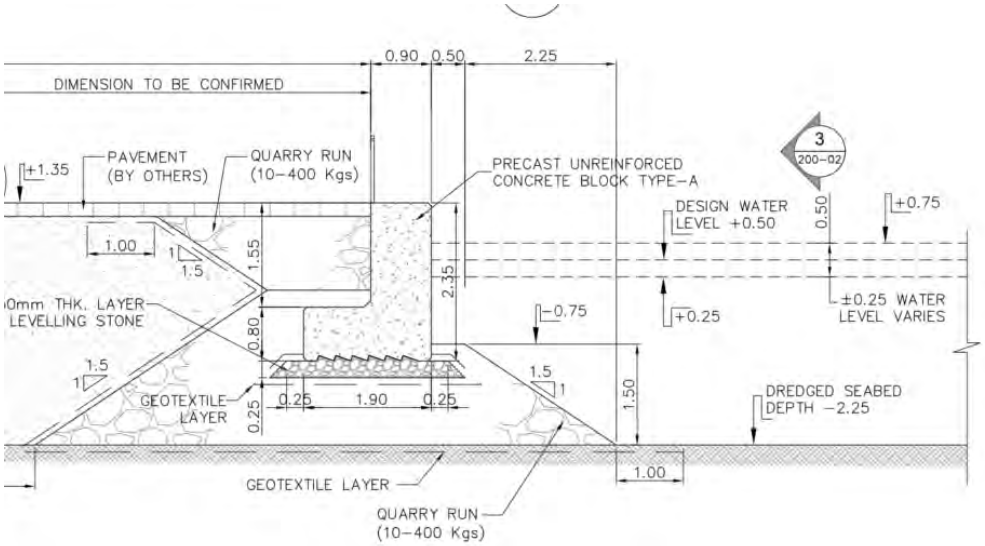


Figure 3-2 – Inner Canal Edge – As-Built

3.1.2 Outer Canal

The outer canal consists of 10m wide plots, with a rock revetment edge and a pre-installed sundeck as indicated in Figure 3-3 below.

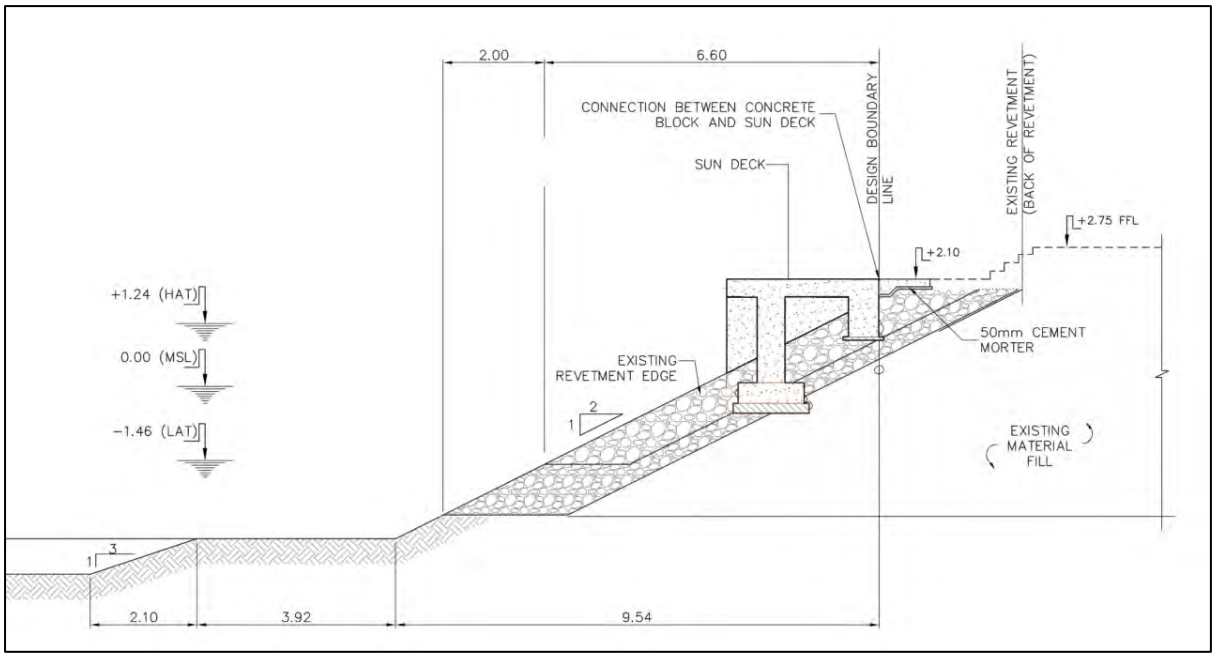


Figure 3-3 – Outer Canal Edge – As-Built

Prior to installation of a mooring/berthing equipment the Villa Owner is required to ensure the following:

a. The area is suitable for mooring as per the guidelines contained here within;

b. Detailed drawings are submitted to Central OA and Diyar Al Muharraq TIO for approval during the design/drawing approval process, and;

c. Permission is expressly granted by Central OA and Diyar Al Muharraq TIO.

It should be noted that the Villa Owners are prohibited from undertaking any modifications to the revetment, quay wall or sundeck that may compromise the functionality and stability of the shore protection structures as designed and constructed. The allowed modifications to the structures are limited to the arrangements and recommendations presented within this document. It should be noted that drawings presented within this document are indicative and are solely intended to present a visual illustration of the allowable mooring arrangements within the development.

3.2 Limitation to Vessel Sizes

Only monohull power boats shall be permitted within the gated community facility. The design vessels considered to ensure safe navigation within the inner canals and along the outer perimeter for the Gated Community, are provided in Table 3-1 below. However, the allowable vessel characteristics may vary depending on the mooring arrangement selected by the Villa Owner. Section 3.3 below describes the various berthing and mooring arrangements that may be

considered for both the inner and outer canal villas, while also highlighting any specific limitations to the vessel characteristics.

Table 3-1: Maximum Allowable Vessel Size

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Outer Channel	10	4.0	1.0
Inner Canal – 10m Plot	08	3.4	0.9
Inner Canal – 8m Plot			

3.3 Berthing and Mooring Arrangements

This section provides guidelines, definitions, and limitations to typical solutions for mooring structures. The Villa Owners are required to submit any plans for modification or installation of berthing and mooring equipment to Diyar Al Muharraq TIO for approval prior to installation. A summary of the general berthing arrangements presented within this section has been provided in Appendix 1.

3.3.1 Inner Canal

The inner canal of the gated community has a channel width of 35m. Each Villa Owner within the inner canal is limited to a 10m offset from the edge of the concrete wall. This is to ensure that a minimum clear fairway of 15m is maintained at all times for safe manoeuvrability and navigation through the canal. Villa Owners will not be permitted to encroach beyond the 10m limit under any circumstances.

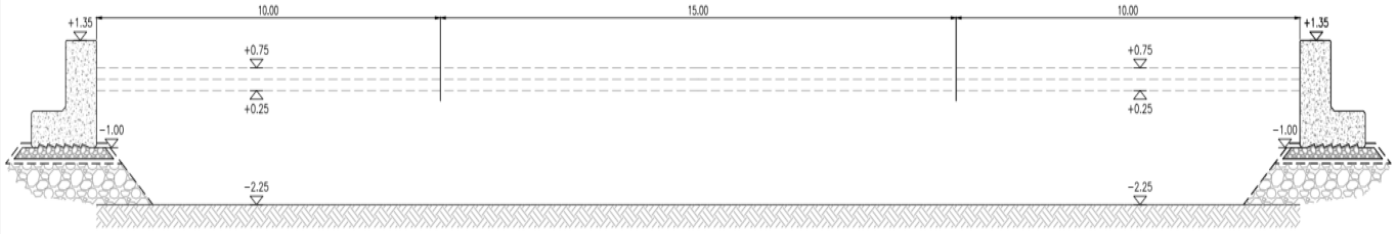


Figure 3-4 – Inner Canal - Alignment

The mooring arrangements allowed within the inner canal of the Al Naseem Gated Community development are presented below. It should be noted that a 3no. plots (plot no. 061, plot no. 280 and plot no. 271) within the gated community have restrictions to the allowed berth orientation and vessel characteristics due to limitations of the plot frontage. These restrictions are further elaborated on within Section 3.4.

1. Perpendicular Berths – Jetty/Floating Deck

This option allows for a perpendicular arrangement of a typical gangway and pontoon to be installed as illustrated in Figure 3-5 below or a direct anchoring of a floating deck onto the quay wall as illustrated in Figure 3-6 below.

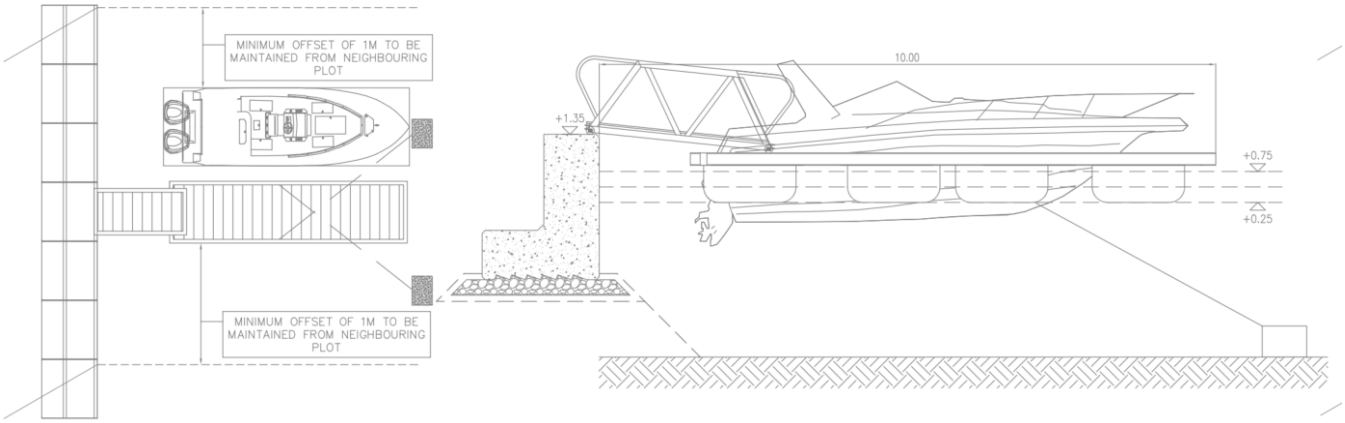


Figure 3-5 – Perpendicular Berthing - Jetty Arrangement

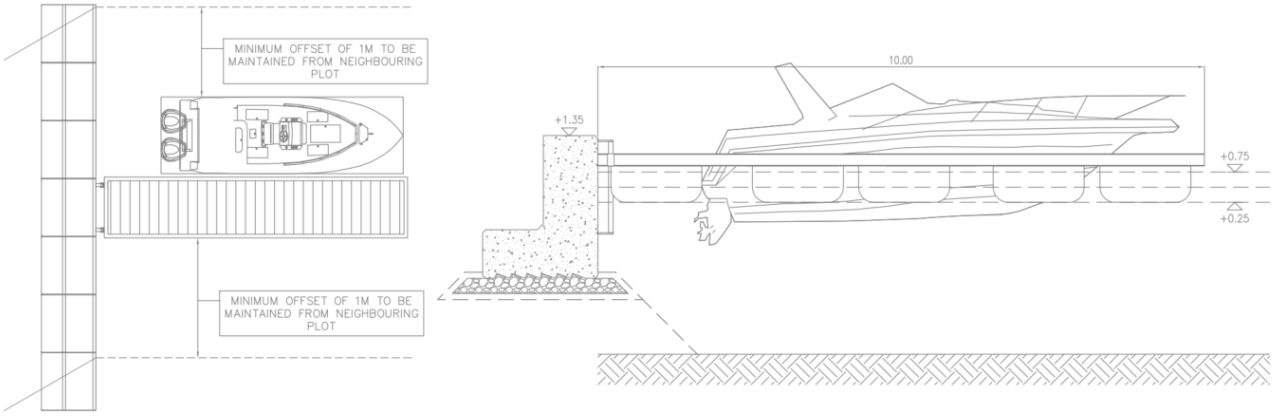


Figure 3-6 – Perpendicular Berthing – Anchored Deck Arrangement

The maximum allowable vessel for this berthing arrangement is presented in Table 3-2 below.

Table 3-2 – Perpendicular Berthing Jetty Arrangement – Max. Vessel Characteristics

Plot Width (m)	Vessel Characteristics		
	Length (m)	**Beam (m)	Draft (m)
08	8	3.4	0.9/0.5*
10			

*In case of mooring any part of the vessel directly adjacent to the quay wall, the vessel is limited to a maximum draft of 0.5m.

**Beam only becomes a limitation where the minimum adjacent property offset (1m) is encroached upon.

In either of the above arrangements the Villa Owners will not exceed the 10m limit from the edge of the quay, as this would interfere with the safe navigability of the canal.

2. Parallel Berths – Direct Mooring and Jetty/Floating Deck

This option allows for a parallel arrangement of a typical gangway and pontoon to be installed as illustrated in Figure 3-7 below or a direct anchoring of a floating deck onto the quay wall as illustrated in Figure 3-8 below.

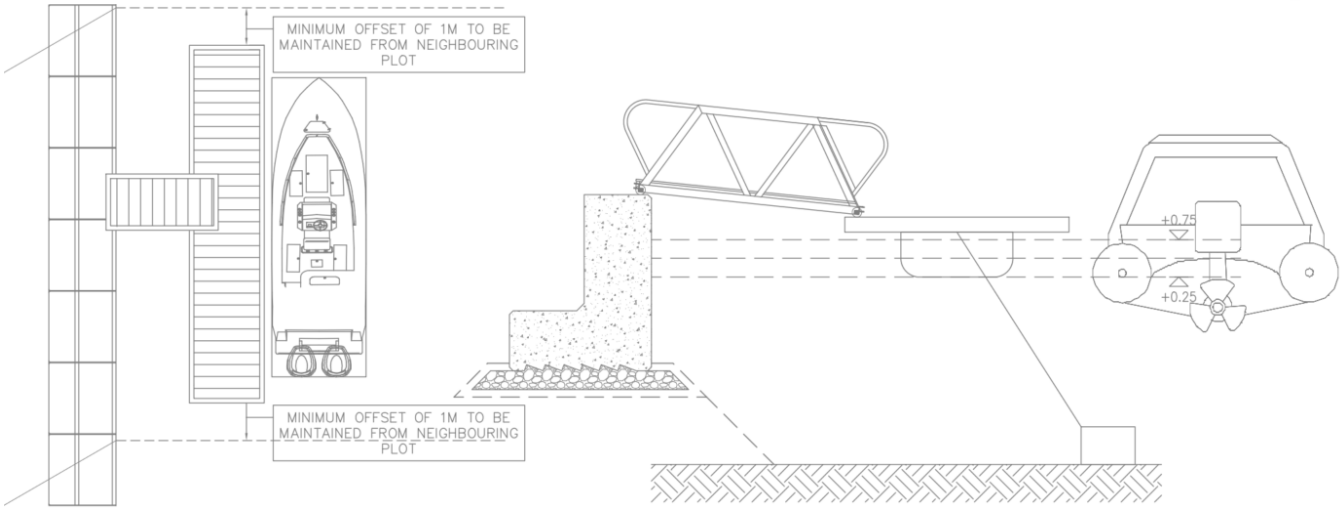


Figure 3-7 – Parallel Berthing - Jetty Arrangement

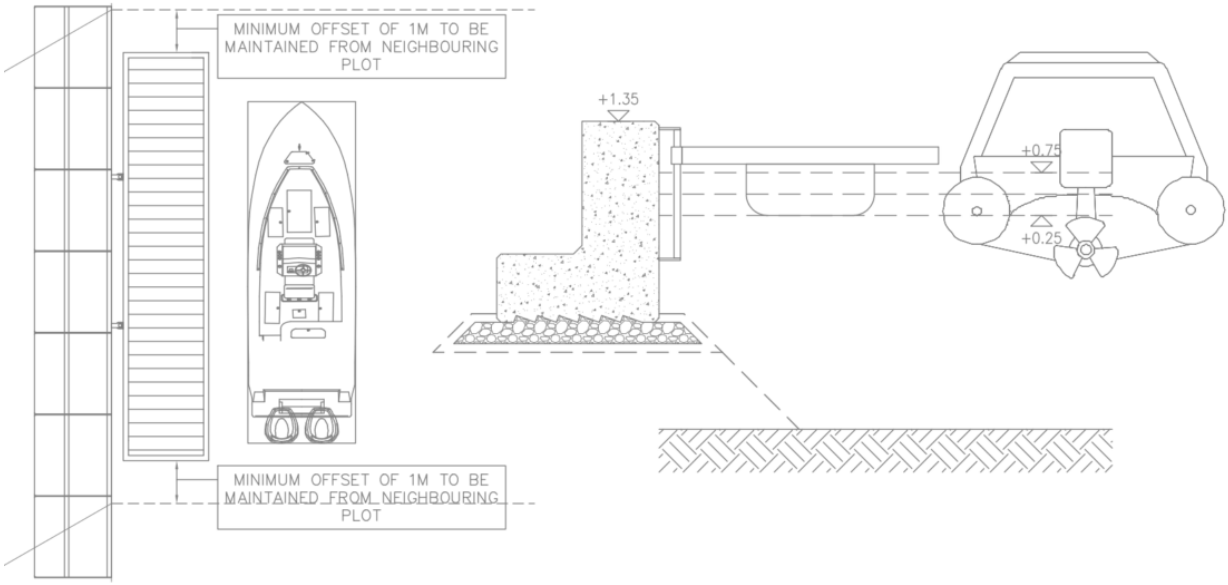


Figure 3-8 – Parallel Berthing – Anchored Deck Arrangement

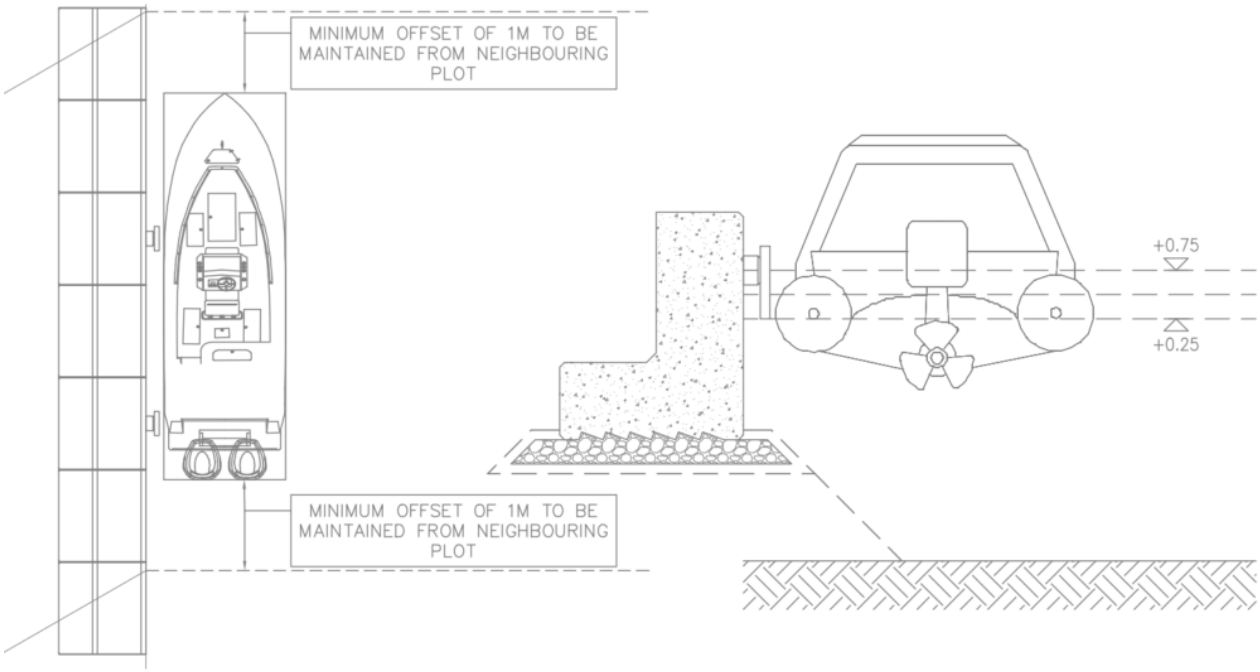


Figure 3-9 – Parallel Berthing – Direct Mooring Arrangement

The maximum allowable vessel for this berthing arrangement is presented in Table 3-3 below.

Table 3-3 – Parallel Berthing Jetty Arrangement – Max. Vessel Characteristics

Plot Width (m)	Vessel Characteristics		
	Length (m)	**Beam (m)	Draft (m)
10	8	3.4	0.9/0.5*
08	7	3.1	0.9 /0.5*

*In case of direct mooring adjacent to the quay wall, the vessel is limited to a maximum draft of 0.5m.

**Beam only becomes a limitation where the 10m main channel offset is encroached upon.

3.3.2 Outer Canal

The outer canals have a preinstalled sundeck at each villa. Villa Owners are permitted to install a perpendicular gangway and pontoon arrangement for plots located along the outer canal as illustrated in Figure 3-10 below. The Villa Owners of the outer canal are limited to a maximum perpendicular offset of 25m from the edge of the sundeck. Any permanent or temporary structures will not be permitted to encroach beyond this limit. Villa Owners are limited to installing a gangway with the maximum dimensions of 15m length and 1.5m width. The pontoon anchoring system shall be at the discretion of the supplier and is not specifically limited to a piled solution.

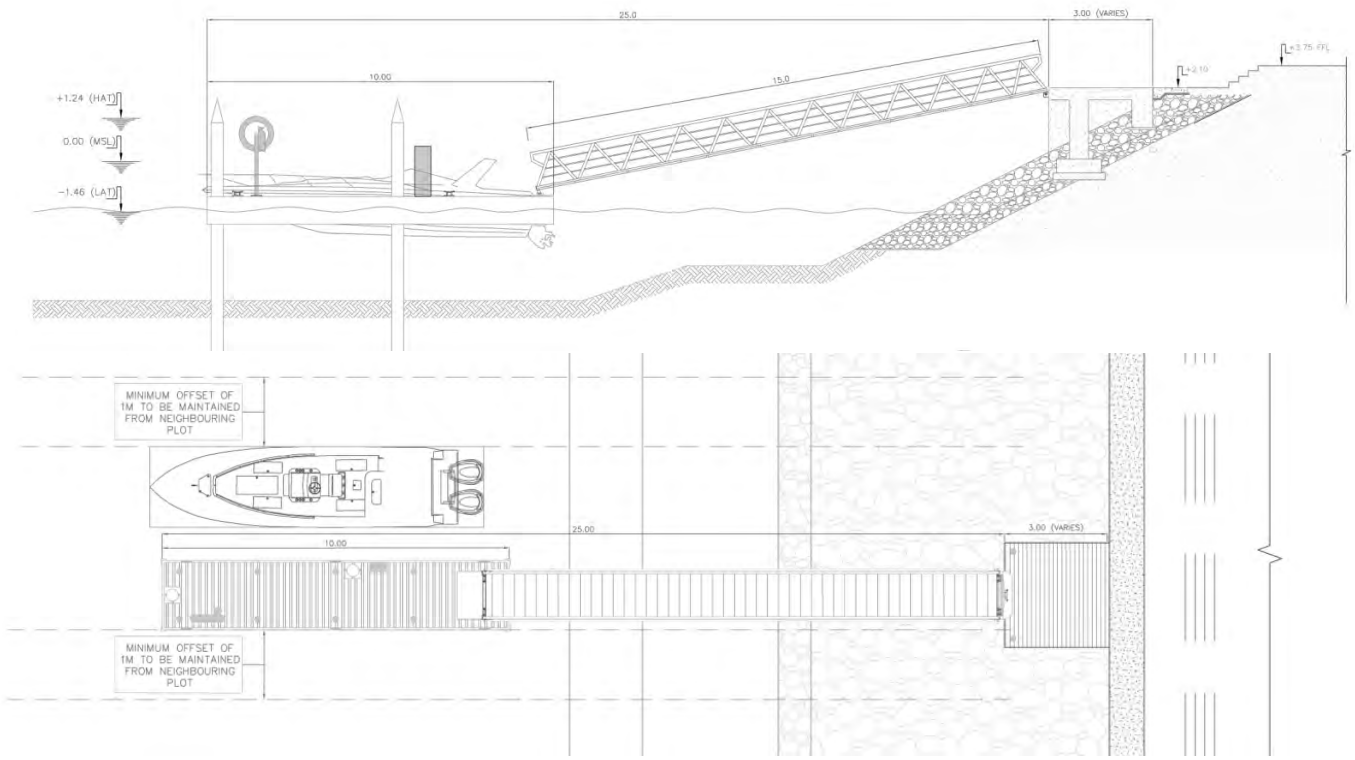


Figure 3-10 – Outer Canal – Mooring Arrangement

The maximum allowable vessel for this berthing arrangement is presented in Table 3-4 below.

Table 3-4 – Outer Canal – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Outer Canal	10	4.0	1.0

3.4 Berthing and Mooring Additional Recommendations

A select number of plots have unique restrictions on the berth orientation and vessel characteristics due to limitations of the plot frontage, these have been highlighted in red in the key plan presented below.

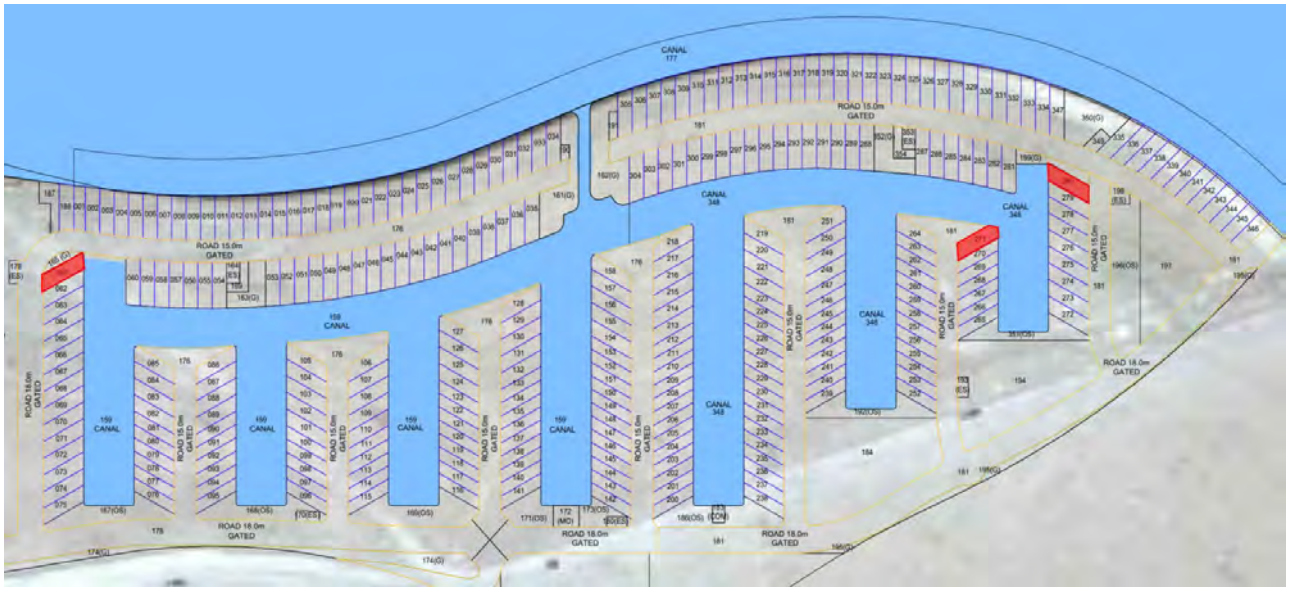


Figure 3-11 – Plot with Mooring/Berthing Restrictions – Key Plan

A summary of the limitations of these plots is provided in Table 3-5 below. These are further illustrated below.

Table 3-5 – Berthing Limitations

Plot No.	Recommendation	Commentary
061	Only direct perpendicular berthing allowed. Max. allowable vessel draft is 0.5m.	2no. mooring points along the hybrid wall and 1no floating mooring buoy in the canal without interfering with the min. 15m fairway requirement and without restricting inflow structures in the vicinity. See Figure 3-12.
280	Perpendicular and Parallel berthing allowed.	Structures must not interfere with the min. fairway requirement of 15m and shall not restrict the outfall structures in the vicinity of the plot.
271	Direct parallel berthing	Availability of reduced straight berthing face shall be considered prior to devising berthing/mooring configuration.

1. Plot 061– Plot no. 061 is restricted in terms of available water frontage, with an accessible plot width of 7.1m. As such, this plot is restricted to a direct perpendicular mooring arrangement, with a maximum allowable vessel draft of 0.5m. The recommended mooring arrangement is as illustrated in Figure 3-12 below, with 2 mooring points along the quay wall, and 1 no. floating mooring buoy placed in the canal. The Villa Owner must ensure that the mooring arrangement including the floating mooring buoy, does not impede on the min. 15m. fairway width, and shall not restrict the Inflow structure located adjacent to the plots. As mentioned in Section 2 of this document, the minimum offset from neighbouring plots shall be maintained.

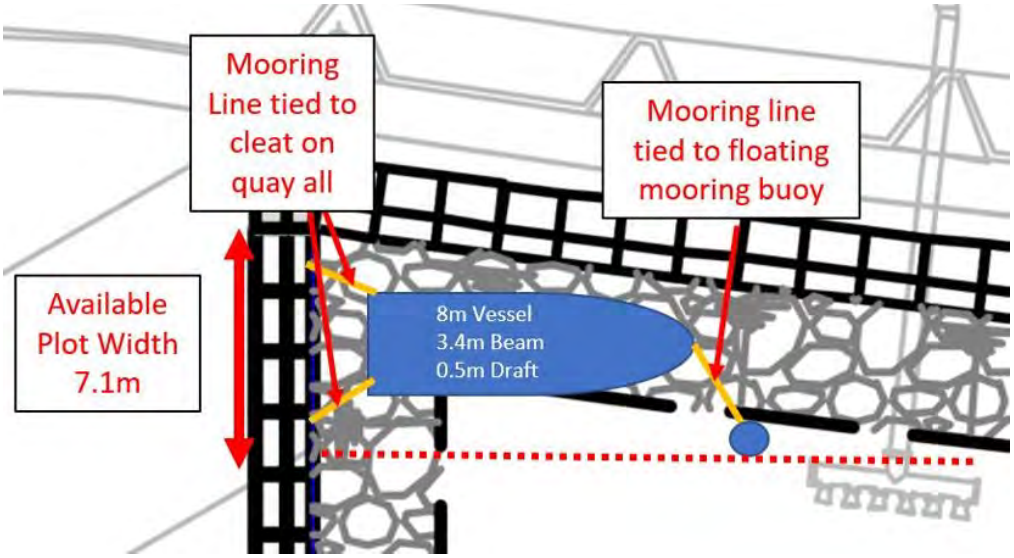


Figure 3-12 – Proposed Mooring Arrangement for Plot 061

The maximum allowable vessel for the proposed Plot 061 berthing arrangement is presented in Table 3-6 below.

Table 3-6 – Plot 061 – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Inner Canal – Plot 061	08	3.4	0.5

2. Plot 280 – The plot has an accessible waterfront that is 10.5m wide, and as such the Villa Owner is allowed both perpendicular and parallel berthing (as per Section 3.3 above). However, as the plot is located adjacent to the outfall station on the eastern section of the development, the Villa Owner must ensure that any permanent structure installed at the property does not restrict access to the outfall structure. The offset from the edge of the plot to the outfall structure is 6m; this has been illustrated in Figure 3-13 and Figure 3-14 below. As per the requirements stated within this document, the Villa Owner shall provide any plans for installation of mooring equipment to Diyar Al Muharraq TIO for approval prior to any installation.

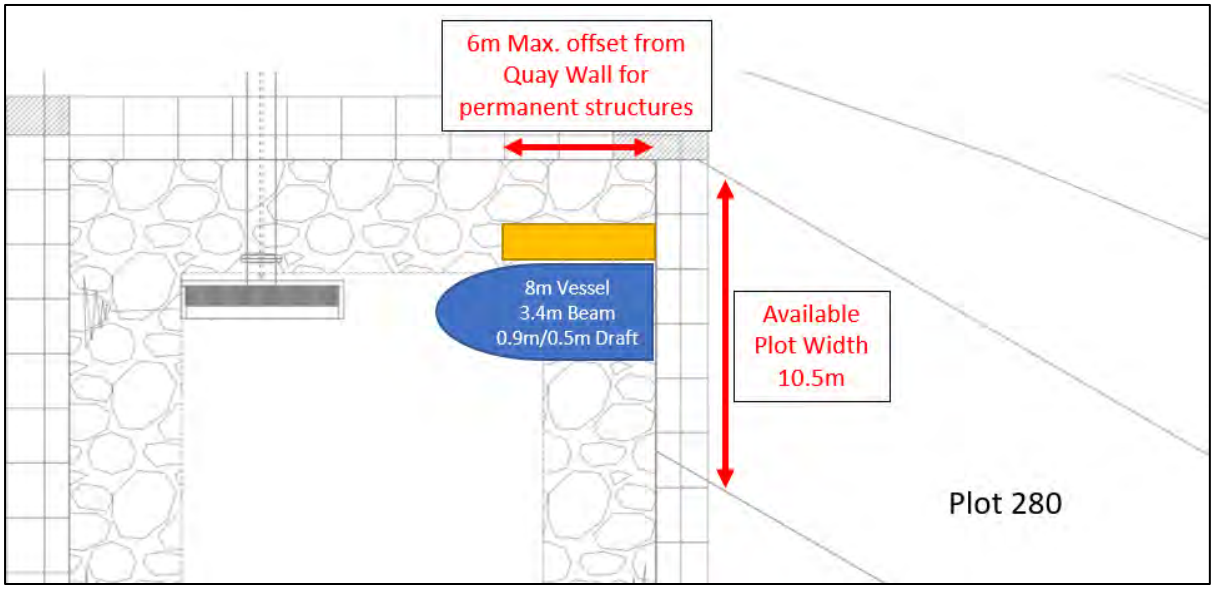


Figure 3-13 – Proposed Parallel Mooring Arrangement for Plot 280

Table 3-7 – Perpendicular Berthing Arrangement - Plot 280 – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Inner Canal – Plot 271	08	3.4	0.9/0.5*

*In case of mooring any part of the vessel directly adjacent to the quay wall, the vessel is limited to a maximum draft of 0.5m.

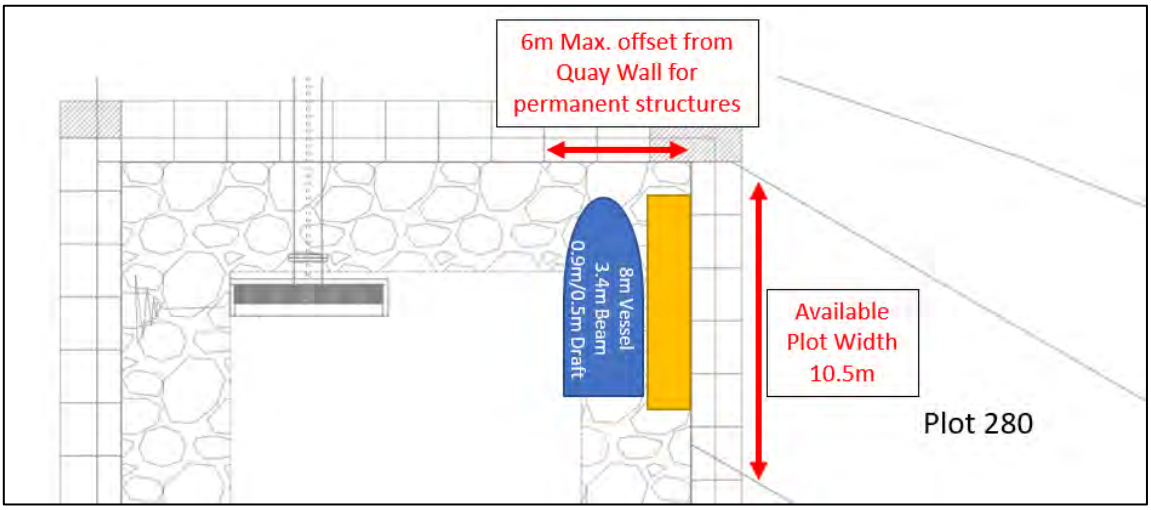


Figure 3-14 – Proposed Parallel Mooring Arrangement for Plot 280

Table 3-8 – Parallel Berthing Arrangement - Plot 280 – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Inner Canal – Plot 271	08	3.4	0.9/0.5*

*In case of mooring any part of the vessel directly adjacent to the quay wall, the vessel is limited to a maximum draft of 0.5m.

3. Plot 271 – This plot is restricted in terms of available waterfrontage available for berthing, having an accessible plot width of approximately 5m. As such, the possible berthing arrangement is limited to:

    a. Parallel Berth with a pontoon extension. The pontoon extension is limited to 5m, from the edge of the quay and shall not encroach into the main navigation channel.

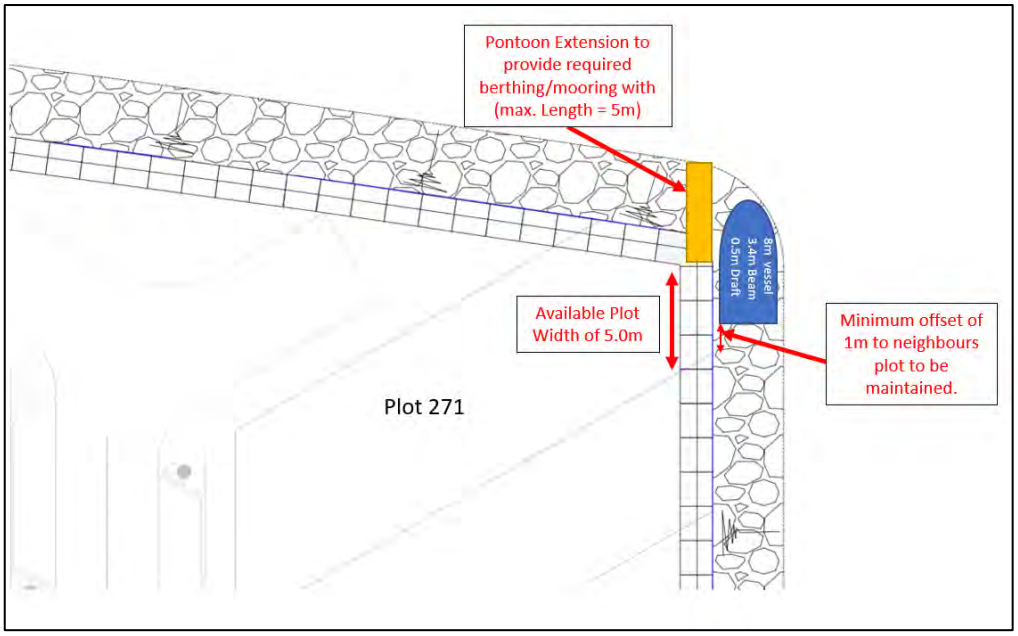


Figure 3-15 – Proposed Parallel Mooring Arrangement for Plot 271

The maximum allowable vessel for the proposed parallel berthing arrangement for Plot 271 is presented in Table 3-9 below.

Table 3-9 – Parallel Berthing Arrangement - Plot 271 – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Inner Canal – Plot 271	08	3.4	0.5

    b. Perpendicular berth with provision for a pontoon. The pontoon extension is limited to 10m, from the edge of the quay and shall not encroach into the 15m navigable fairway.

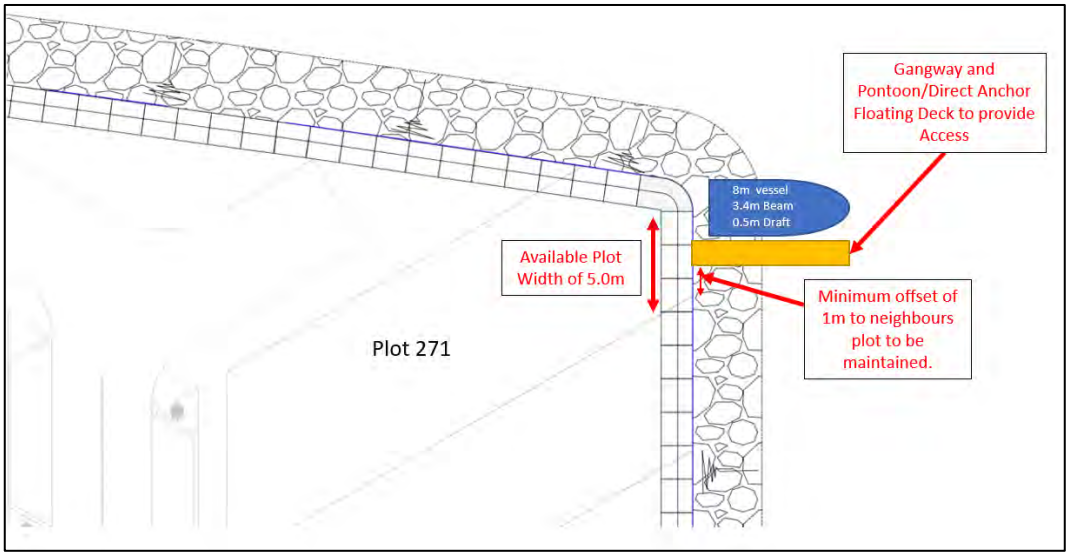


Figure 3-16 – Proposed Parallel Mooring Arrangement for Plot 271

The maximum allowable vessel for the proposed perpendicular berthing arrangement for Plot 271 is presented in Table 3-10 below.

Table 3-10 – Perpendicular Berthing Arrangement - Plot 271 – Max. Vessel Characteristics

Location	Vessel Characteristics		
	Length (m)	Beam (m)	Draft (m)
Inner Canal – Plot 271	08	3.4	0.9/0.5*

*In case of mooring any part of the vessel directly adjacent to the quay wall, the vessel is limited to a maximum draft of 0.5m.

3.5 Procurement

The procurement of the pontoons and mooring system is typically via a Design and Build route and it is the Contractor's responsibility to ensure that the system is designed and build in accordance with international recognised standards and takes into considerations the constraints in listed in this document.

The preferred designer/contractor should select the berthing/mooring system considering the following:

- Design vessel characteristics.
- Environmental parameters.
- Depth of water;
- Anchor system appropriate to the findings of soil and environmental investigations, i.e. properties of the seabed material;
- Drag potential;
- Performance records for the exposure conditions;
- Fire risk, and the spread of fire;

- Ease of replacement of components that can be damaged by vessel impact;
- Load magnitude and its character (e.g. static and cyclic).

Following are details of few recommended floating pontoon manufacturers for procurement purposes:

International Suppliers

- Sistema Walcon (http://www.sistemawalcon.com/)
- Marinetek (https://www.marinetek.fi/)
- Bellingham Marine (http://www.bellingham-marine.com/)
- Marine Designs Limited (http://www.marinedesigns.co.uk/)
- Ingemar (http://ingemar.it/)
- Metalu Marinas (http://www.metalu.com/)
- SF Marina (http://www.sfmarina.com/)
- Structurmarine (http://www.structurmarine.com/)
- Beaucraft (http://www.beaucraft.bh/)
- Majestic Marine Engineering (http://www.majesticjetties.ae/)
- New Island Contracting Company (http://www.nicbh.com/)
- Poralu Marine (http://www.poralumarine.com/)

Local Suppliers/Agents

- System and Technology Enterprises (http://www.STE.bh/)
- United Marine Trading (https://www.umtgulf.com/)

4 Designers Information and Considerations

The following section provides the required information to allow the pontoon designer to undertake the necessary assessments to provide complete design in accordance to the international standards, codes and guidelines.

4.1 Reclamation Levels

The Al Naseem Gated Community Villas is built on reclaimed land by the placement of dredged sand from offshore borrow areas. The Diyar Al Muharraq development generally adopted a nominal reclamation level of +2.1m NSD (+3.6m CD). The actual finished ground levels may vary within the site, following the completion of infrastructure and roadworks, etc.

The Villa Owners, Suppliers and Designers should obtain the latest Out-Survey/As-Built drawings from Central OA and Diyar Al Muharraq TIO to assess the existing ground surface levels within and near their individual plots.

4.2 Bathymetry

Figure 4-1 below provides the bathymetric data extracted from the Out-Survey/As-Built drawings available. The inner canal dredged level is -2.25mNSD. The depths shall be confirmed to ensure safe navigation. The outer canal has an existing seabed level of approximately -3.0m NSD, however, this is anticipated to be dredged to -4.0m NSD. This final level shall be verified with Central OA and Diyar Al Muharraq TIO prior to installation of structures.

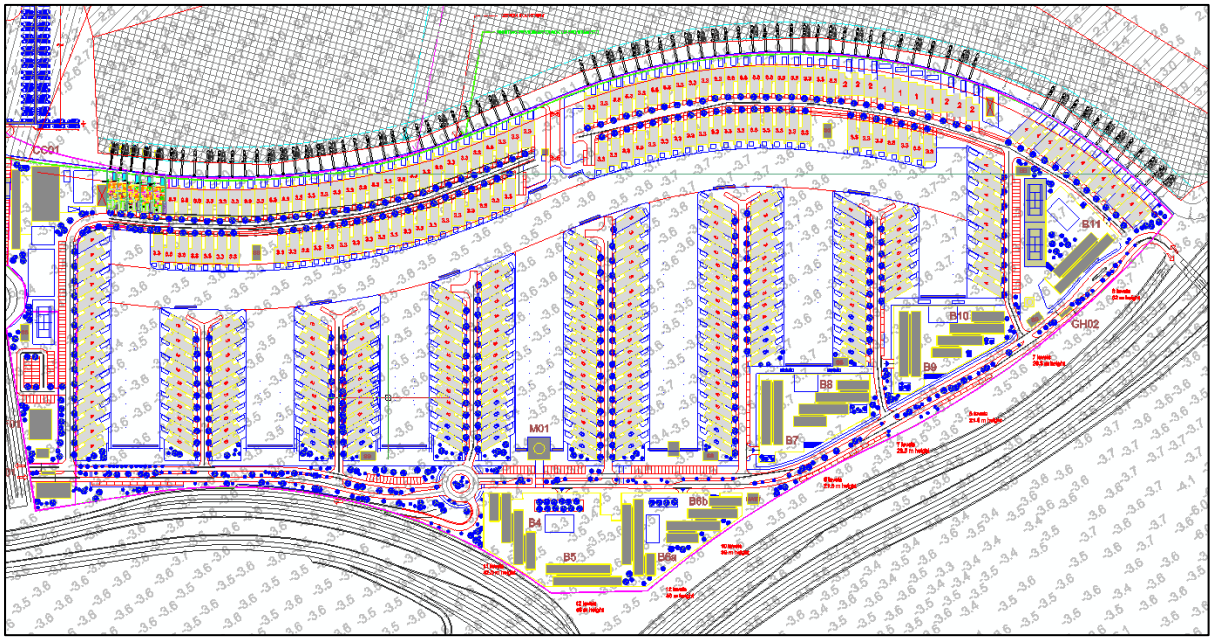


Figure 4-1 – Bathymetry Data

4.3 Geotechnical Data

A Geotechnical Investigation of the project area has been undertaken in 2017 by Al Hoty Analytical Services (according to Geotechnical Investigation (GI) Report no. G17-3889B, dated 4th July 2017). The geotechnical investigation undertaken by Al Hoty included the investigation for the Gated Community at the landside areas to cover the inner canals and residential plots (Hoty, 2017).

The extent of the geotechnical investigation within the development vicinity of the Gated Community is shown in Figure 4-2 below.

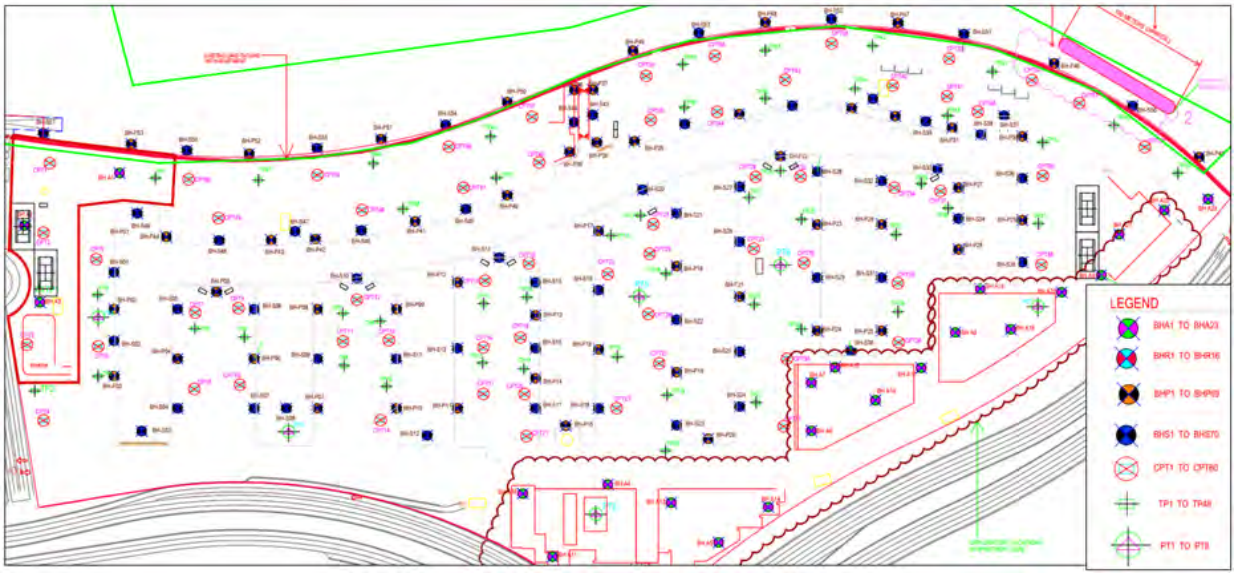


Figure 4-2 – Extent of Geotechnical Investigation for the Gated Community

From the GI, the following information has been obtained; each borehole was approximately 17.5m in depth, the soil properties in the project site vary in thickness/depth, however, generally consist of medium dense sand, to loose silty sand for the first 6-8m, followed by a layer of stiff silt or very weak calcilutite.

Cone penetration test (CPT) results showed similar properties of the existing soil, although depths generally varied depending on soil properties which ranged between 5.0m to 12.5m at separate locations. Additionally, trial pits provided a basic understanding of the surface layer, the trial pits were generally 1.5m to 2.0m deep, unless ground water levels were encountered.

4.3.1 Generalized Soil Stratigraphy

The investigation in the inner canal area indicates a typical layer of silty sand from +2.0m NSD to -4.0m NSD, overlaying a loose sand layer with silt. Underneath it, there exists a calcilutite and calcisiltite layer up to the termination of the investigation depth.

The proposed ground profile for the inner canal area is presented in Table 4-1 below. The layer descriptions are based on landside and offshore investigations undertaken by Al Hoty (Hoty, 2017).

Table 4-1 – Proposed Ground Profile for the Gated Community

Proposed Ground Profile	
Layer	**Elevation (m NSD)**
Medium Dense Silty Sand	+2 to -4.0
Loose Sand with Silt	-4.0 to -5.5
Calcilutite/Calcisiltite	-5.5 to termination

4.3.2 Summary of Geotechnical Parameters

A summary of the geotechnical parameters per material type is provided in Table 4-2 below, as provided in Section 8.2 of the Al-Hoty GI report (report no. G17-3889B) (Hoty, 2017).

Table 4-2 – Geotechnical Parameters

Layers	Elevation (m NSD)	Density (kN/m³)	Friction Angle (°)
Rock Armor	-	19.0	36
Medium Dense Silty Sand	+2 to -4.0	19.0	32
Loose Sand with Silt	-4.0 to -5.5	18.0	30
Calcilutite/Calcisiltite	-5.5 to termination	19.0	32

4.4 Water Levels

4.4.1 Outer Perimeter

The outer perimeter of the Gated Community is exposed and will experience tidal fluctuation. Any future design should take into consideration the effects of the tides. The tidal planes (refer. Table 4-3) at the site has been sourced from Amwaj Marina, accessed from the "Tidal Table 2020" published by the Survey & Land Registration Bureau of the Kingdom of Bahrain and the Reclamation Guidelines.

Table 4-3 – Tidal Levels at Amwaj Marina

Tidal Status	Amwaj Marina	
	m CD	m NSD
Lowest Astronomical Tide (LAT)	+0.4	-1.2
Mean Low Water Springs (MLWS)	+0.8	-0.8
Mean Low Water Neaps (MLWN)	+1.2	-0.4
Mean Sea Level (MSL)	+1.6	0.0
Mean High Water Neaps (MHWN)	+2.1	+0.5
Mean High Water Springs (MHWS)	+2.5	+0.9
Highest Astronomical Tide (HAT)	+2.9	+1.3

Extreme water levels should be considered to take into consideration the effects of storm surges in the waters surrounding Bahrain.

Table 4-4 – Design Water Levels

Return Periods	Extreme Water Level	Sea Level Rise**	Final Water Level	Final Water Level
years	m CD	m	m CD	m NSD
1 in 1*	+2.50	+0.4	+2.90	+1.30
1 in 10*	+2.63	+0.4	+3.03	+1.43
1 in 50	+3.00	+0.4	+3.40	+1.80
1 in 100	+3.10	+0.4	+3.50	+1.90

*1:1 and 1:10 values have been extrapolated.

** Assumes 50 years Sea Level Rise

4.4.2 Inner Channels

The water levels of the channels inside the Gated Community will be controlled and regulated by the lock gate and pumps. The design water level in the inner channel is +0.5m NSD and shall vary by +/- 0.25m.

4.5 Significant Wave Heights

4.5.1 Outer Perimeter

The outer perimeter villas are exposed to the DAM channel; however, the wave conditions are relatively benign. Waves are typically due to wind or vessel wake.

The wind fetch derived wave heights from two predominant directions estimated along the outer perimeter of the development is presented in the Table 4-5 below.

Table 4-5 – Extreme Wave Height

Wind Conditions	Wave Climate Estimation							
Wind Sector	1 year		20 year		50 year		100 year	
	Hs (m)	Tp (s)	Hs (m)	Tp (s)	Hs (m)	Tp (s)	Hs (m)	Tp (s)
NW	0.34	1.7	0.42	1.83	0.44	1.86	0.46	1.89
NE	0.22	1.35	0.28	1.49	0.30	1.53	0.32	1.56

It should be noted that the results are theoretically indicative and that there might be slight differences in the actual measured wave height on site due to various reasons. As such, a suitable Factor of Safety should be considered by the pontoon supplier when considering impact of wave heights on the selected support system for the pontoons.

4.5.2 Inner Channels

No significant waves are expected within the inner canal due to the sheltered nature and speed controls. However, for design purposes significant wave height of 0.5m and peak wave period of 1.4s shall be adopted.

4.6 Currents

For design purposes a current design speed of 1.0m/s shall be considered.

4.7 Loading Capacity

Installation of any structure near/on the edge of the shore protection structure shall consider the effects of the additional surcharge, and shall not exceed the following values:

- Directly Behind the Quay Walls to an offset of 6m: 10kN/m^2
- Mooring/Gangway Load on Quay Wall (Inner Canal): 5kN/m acting as a destabilising horizontal load acting at the structure crest level, toward the channel-side of the crest.
- Gangway Load on Sundeck (Outer Canal): Equivalent Horizontal and Vertical load of 17.37kN and 46.32kN respectively (As per a Typical 15m by 1.5m gangway).
- Handrail Loads: Handrails loads on the inner canal quay wall and outer canal sundeck shall be limited to a maximum of 1kN/m^2.

For technical details regarding safety handrails refer to the Architectural DRG report.

4.8 Mooring Piles/Anchor Blocks

The mooring piles/anchor blocks should be designed together with the mooring arrangement as a whole to ensure that, once installed, the distance that the mooring configuration that extends into the channel, adheres to the limitations of the required navigation width.

Mooring piles can be used to anchor the floating structures based on design conditions for the outer perimeter mooring structures. It is required that the mooring pile be installed beyond the revetment footprint in order not to compromise the functionality and stability of the shore protection structures as designed and constructed.

Concrete anchor blocks connected to the mooring structures via seaflex lines shall be adopted for the inner canal. No piles will be permitted within the inner canals.

Villa Owners to ensure that anchor systems installed are at a minimum offset of 1m from the edge of the revetment toe.

The technical constraints and environmental parameters should be fully understood by a competent and professional team of designers and contractors and that mitigation measures will be implemented as and when deemed necessary. This is recommended for structures in their final position as well as during the temporary construction stages. The mooring piles/anchor blocks, together with its connecting elements of the mooring structure need to be carefully considered and duly designed by competent engineers.

4.9 Mooring/Berthing Fixtures

The mooring/berthing design needs to include details of the fixings onto pontoons/hybrid walls and shall include fenders, bollards/cleats, service pedestals, joints between pontoon and piles.

The mooring design needs to include:

- Where (layout plan) the mooring points are to be located for the pontoons and gangways and the relevant connection details to the concrete wall;
- That the proposed mooring arrangement and choice of cleats satisfies (for the design vessels) the requirements of this document and the vessel requirements;
- Durability of the bollards/cleats (Material: Aluminum Alloy A356 or similar, designed for harsh marine conditions).
- Details of proposed fendering, specifically where these systems require permanent connection to the concrete wall.
- The minimum anchor depth required for fixings onto the hybrid wall (inner canal) or sundeck (outer canal) is to be confirmed by the relevant supplier. However, this shall not be less than 250mm.

4.10 Further information

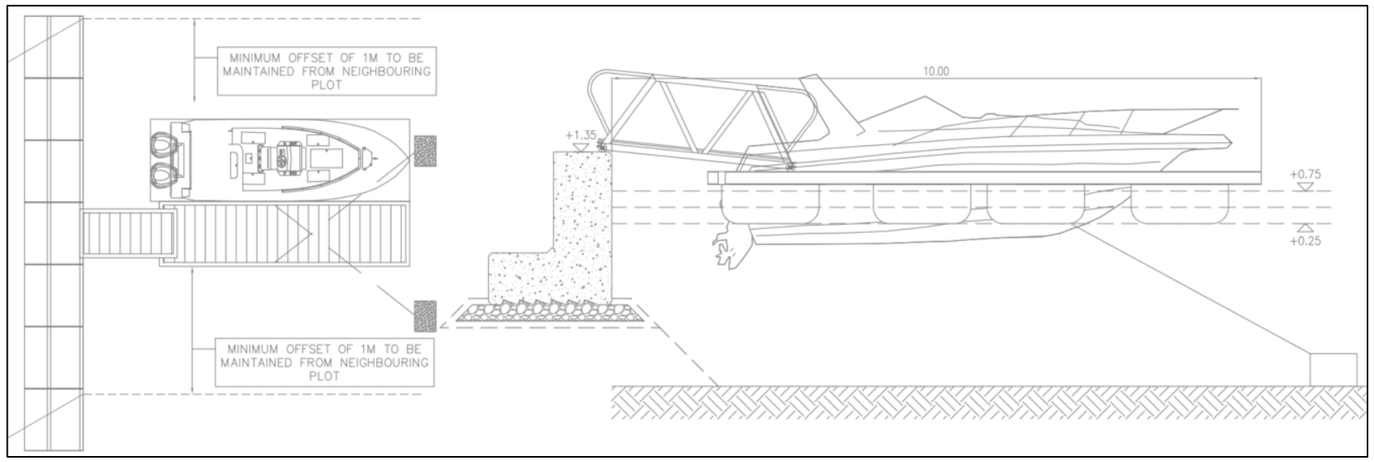
Further information regarding the As-Built and environmental conditions within the development may be requested and obtained from Diyar Al Muharraq TIO.

5 Appendix -1

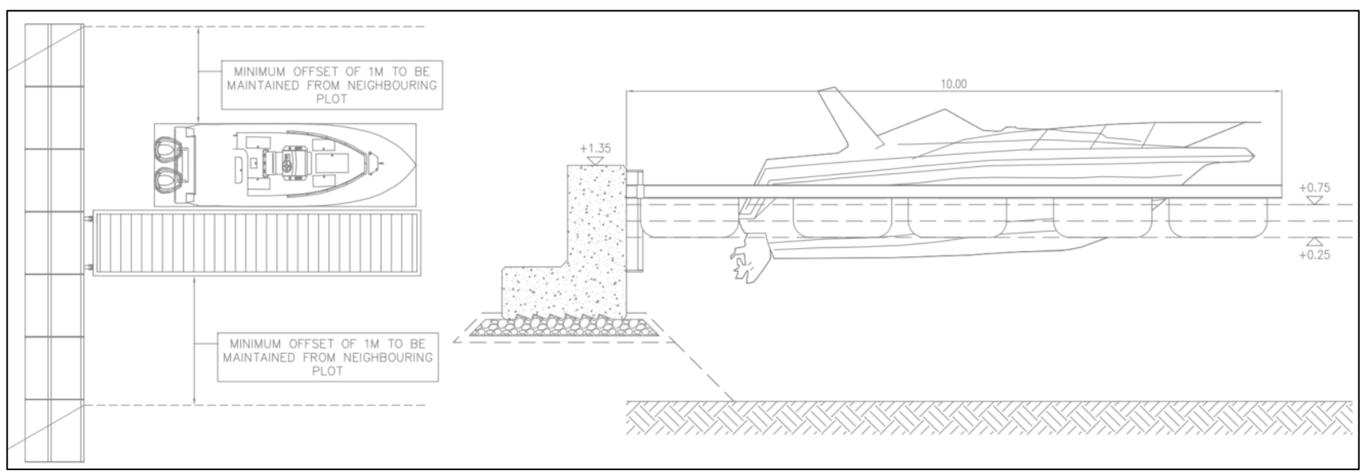
Allowable Berthing Arrangements

Al Naseem Gated Community – Mooring Guidelines
Inner Canal

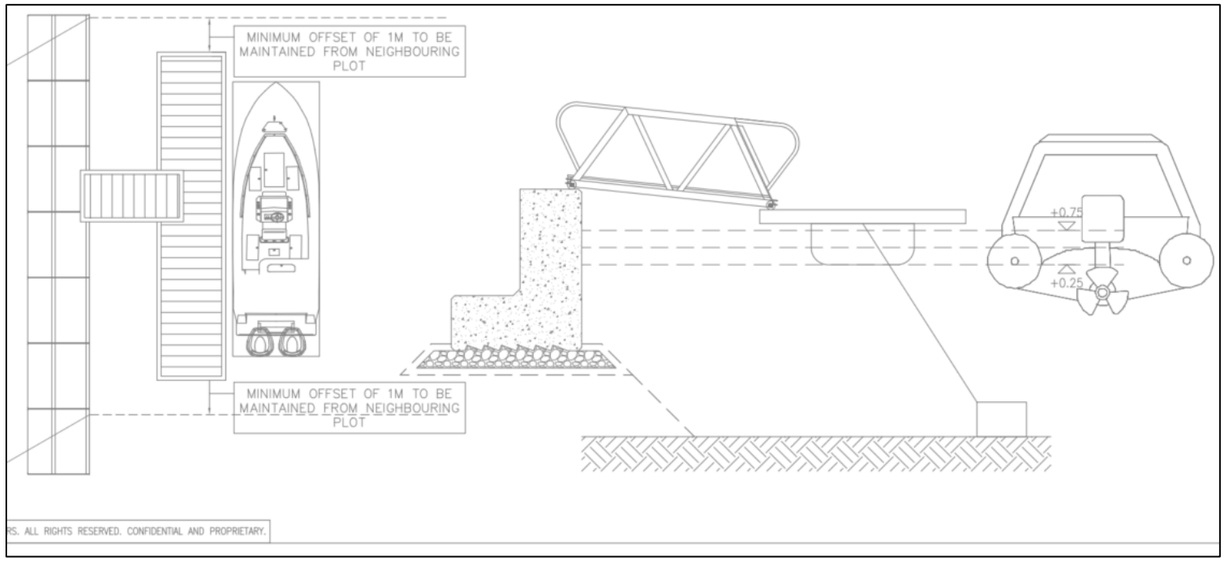
Arrangement No.	Berthing Arrangement	Direct Berthing/Floating Pontoon	Gangway	8m Plot				10m Plot			
				Max. Allowable Vessel Length (m)	Max. Allowable Beam (m)	Max. Allowable Draft (m)	Max. Air Draft (m)	Max. Allowable Vessel Length (m)	Max. Allowable Beam (m)	Max. Allowable Draft (m)	Max. Air Draft (m)
1	Perpendicular	Floating Pontoon	Required	8	3.4	0.9	4.5	8	3.4	0.9	4.5
2	Perpendicular	Floating Pontoon	No	8	3.4	0.5	4.5	8	3.4	0.5	4.5
3	Parallel	Floating Pontoon	Required	7	3.1	0.9	4.5	8	3.4	0.9	4.5
4	Parallel	Floating Pontoon	No	7	3.1	0.9	4.5	8	3.4	0.9	4.5
5	Parallel	Direct Berth	No	7	3.1	0.5	4.5	8	3.4	0.5	4.5



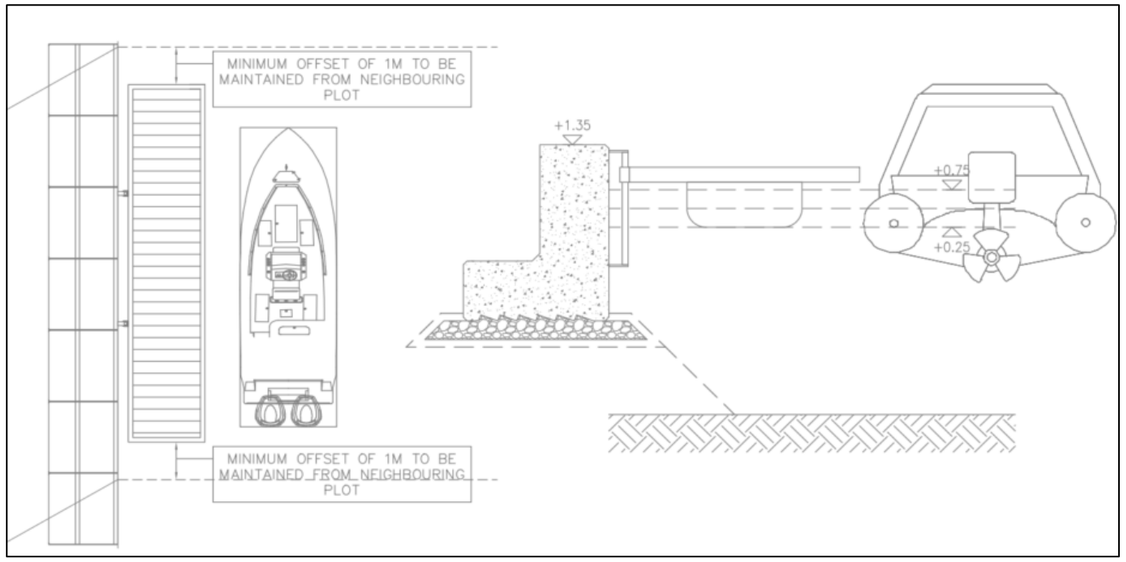
Arrangement – 1



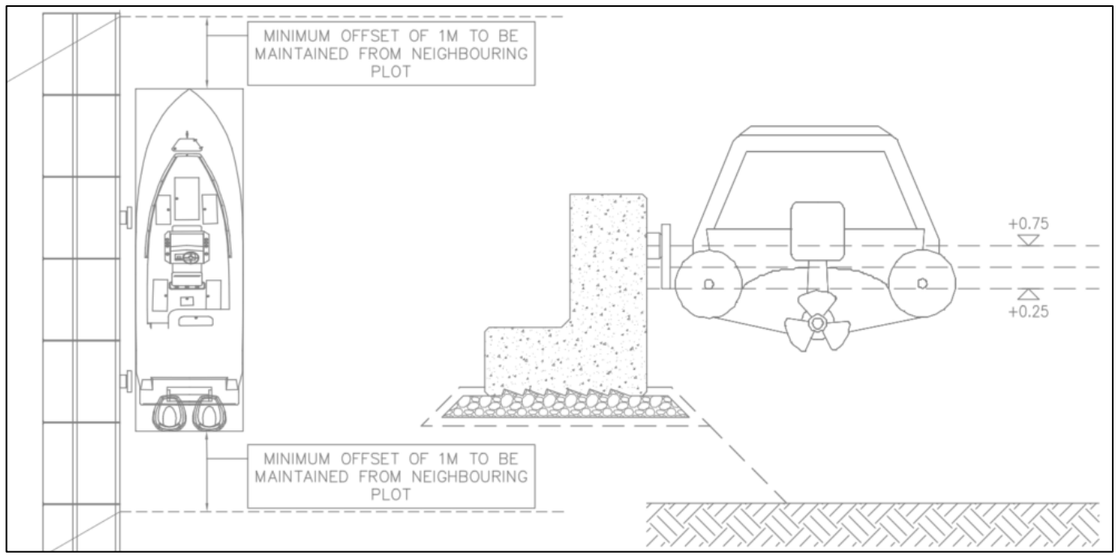
Arrangement – 2



Arrangement – 3



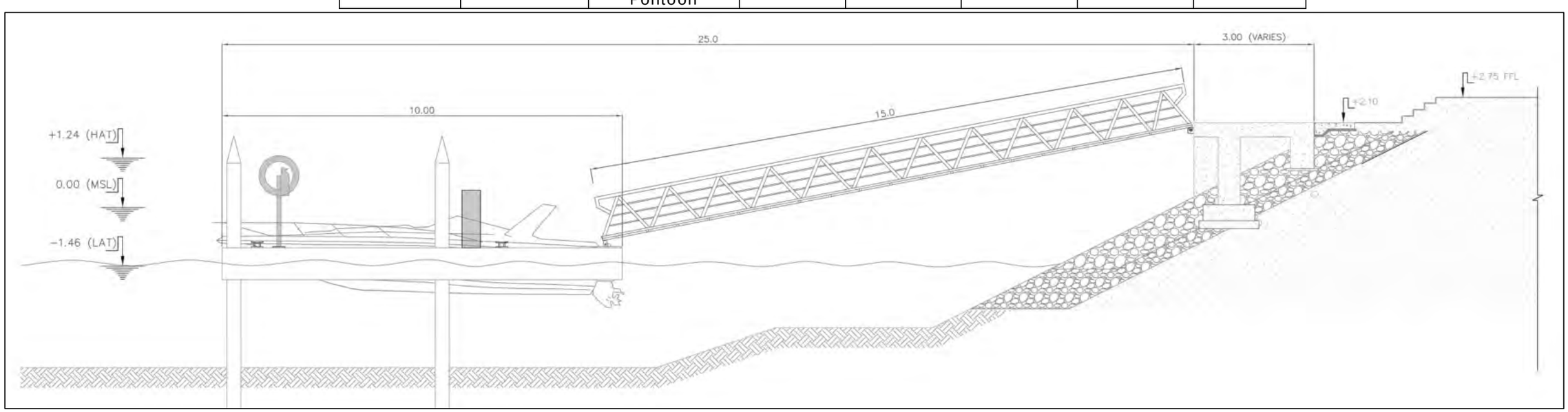
Arrangement – 4

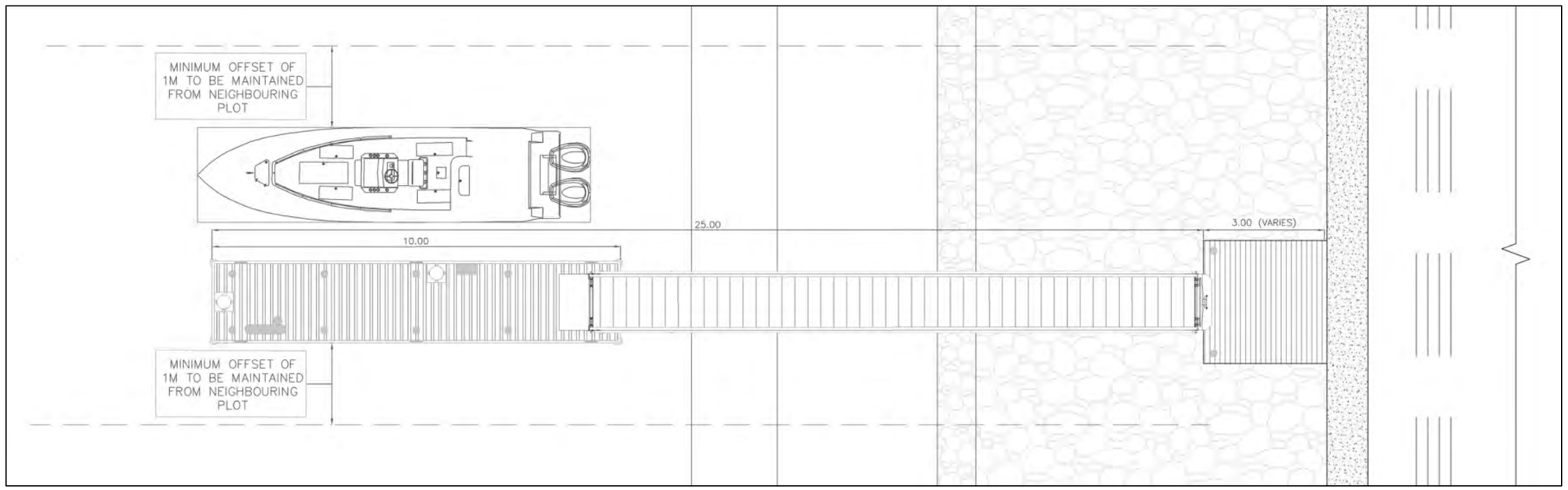


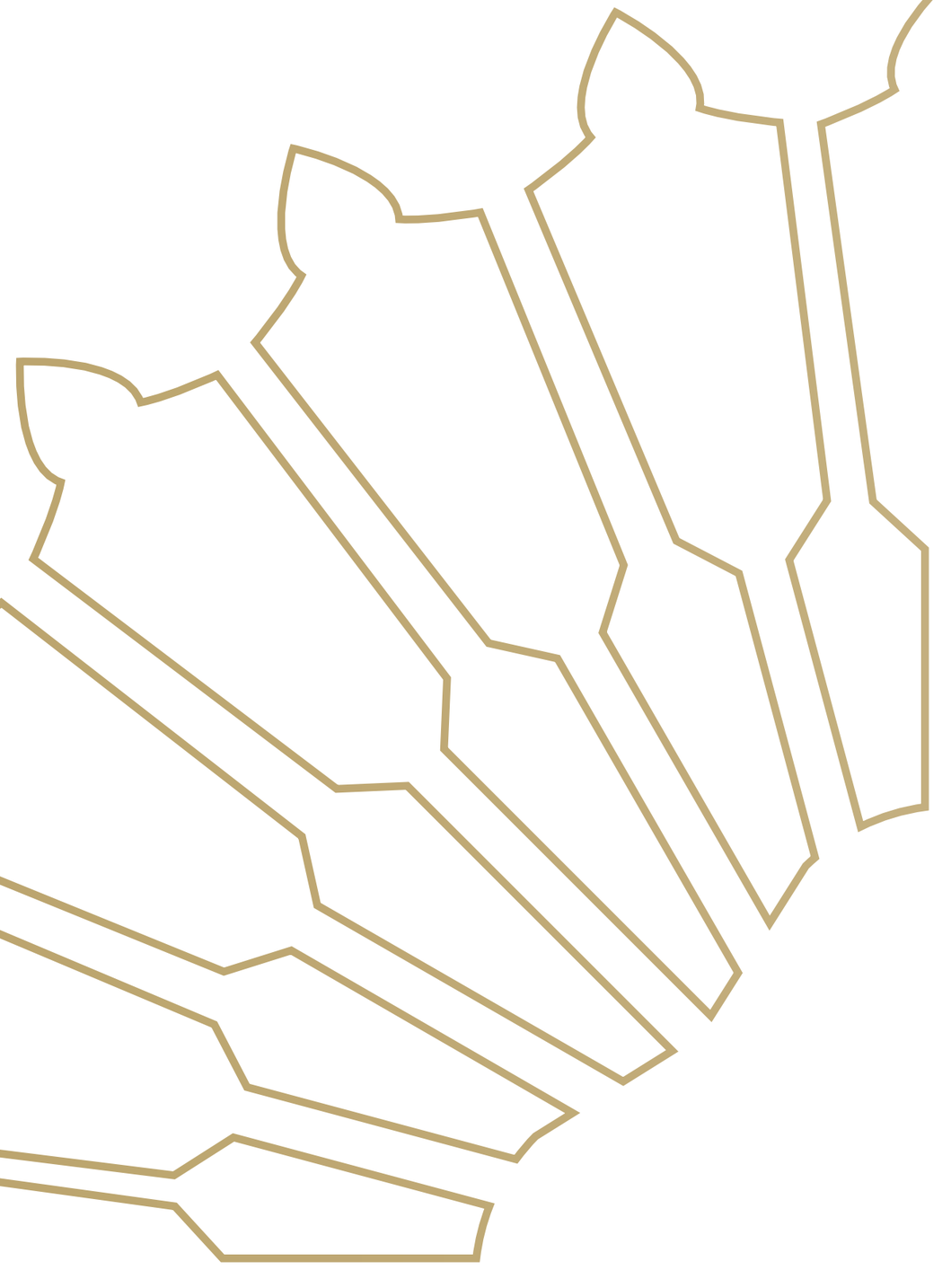
Arrangement – 5

Outer Canal

Arrangement No.	Berthing Arrangement	Direct Berthing/Floating Pontoon	Gangway	10m			
				Max. Allowable Vessel Length (m)	Max. Allowable Beam (m)	Max. Allowable Draft (m)	Max. Air Draft (m)
6	Perpendicular	Floating Pontoon	Required	10	4.0	1.0	4.5







Diyar
AL MUHARRAQ