DMURS Statement of Consistency

Proposed Residential Development at Ballycullen, Dublin 16, Co. Dublin

April 2025

Waterman Moylan Consulting Engineers Limited
Block S, Eastpoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
www.waterman-moylan.ie

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015)

Issue	Date	Prepared by	Checked by	Approved by
No. 1	15 April 2025	Phiona Mwangi	Fernando J. De Maio	Emma Caulwell

Comments

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1. Introduction

1.1 Context

This Design Statement based on the Design Manual for Urban Roads and Streets (DMURS) has been prepared by Waterman Moylan on behalf of Lagan Homes Ballycullen Limited intend to make a planning application for planning permission for a Large Scale Residential Development (LRD) in the townland of Woodtown, Ballycullen, Dublin 16. The lands are located to the east of Abbots Grove Park, south-east of Abbots Grove Avenue, south of Stocking Avenue and Stocking Wood estate, and west of White Pines Park.

The proposed development will consist of 502 no. residential units (108no. 1-bed, 170no. 2-bed, 162 no. 3-bed; 62 no. 4-bed) comprising 197no. 2 storey houses (terraced/semi-detached/detached) (19no. 2-bed, 116no. 3-bed; 62no. 4-bed) and 28no. 3 and 4 storey simplex/duplex apartment blocks providing 305no. apartments (108no. 1-bed apartments, 151no. 2-bed apartments, 46no. 3-bed apartments). The proposed development also includes a crèche (c.475sq.m), public open space, car parking (surface/undercroft), bicycle parking, bicycle storage structures and lockers, bin stores, and 8no. ESB substations. Vehicular access to be provided from the existing spur road connection to Stocking Avenue to the west of the site, and via Stocking Wood Drive to the east of the site (with relocation of existing ESB substation and associated works to the existing hammerhead). Additional pedestrian only routes will be provided into Abbot's Grove Park and Stocking Wood Copse with future connections provided for into Stocking Wood Manor, White Pines Park and the future school site to the north of the application site. The proposed development includes all associated site development works (including site reprofiling, retaining structures and downing of ESB overhead lines), landscaping, boundary treatments and services provision.

The accommodation schedule is shown in **Table 1** below:

Description	1-bed	2-bed	3-bed	4-bed	Total	GFA (Sqm)
Houses		19	116	62	197	
Apartments	108	151	46		305	
Childcare Facility						474.8
Total	**108**	**170**	**162**	**62**	**502**	**474.8**

Table 1 | *Schedule of Accommodation*

The project also encompasses the construction of roads, footpaths, car parking spaces, bicycle parking areas, storage facilities, and utility infrastructure. Furthermore, it includes the implementation of landscaping, boundary treatments, and public lighting.

The site is currently a greenfield site, bounded to the east, north and west by existing residential areas and to the south by greenfield lands.

1.2 Scope

The scope of this report is to identify the specific design features that have been incorporated within the proposed residential scheme with the intention of delivering a design that is consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS).

1.3 Standards

This Design Statement has been prepared in accordance with the Design Manual for Urban Roads and Streets (May 2019, Version 1.1).

1.4 Site Location

The subject site is situated in Woodtown, in the South Dublin County Council Area, to the south-west of junction number 12 of the M50 motorway.

The site is currently a greenfield site, bounded to the east, north and west by existing residential areas and to the south by greenfield lands.

Figure 1 | *Site Location*

1.5 Contents of the DMURS Statement of Consistency

This document presents a review of the main section within both Chapters 3 'Street Networks' and 4 'Street Design' of the Design Manual Urban Roads and Streets. It examines how these chapters were implemented during the design phases, with the aim of providing a statement of the coherence of the subject development.

2. Street Networks

2.1 Integrate Street Network

Design Manual Urban Roads and Streets approach encourages the integration of land use and transportation, allowing the consolidation of development along strategic connections and around nodes. According to the Design Manual, the strategic connections represent the principal routes for public transport, whereas the nodes constitute the primary destinations. This results in improved accessibility to services and encourages more sustainable modes of transportation, which in turn reduces reliance on the automobile.

The subject site is located to the south of the Stocking Avenue and east of Ballycullen Road, as seen in **Figure 2** below. Driving via Ballycullen Road northbound provides access to Kilinniny Road, which eastbound provides access to the M50 motorway via junction 12.

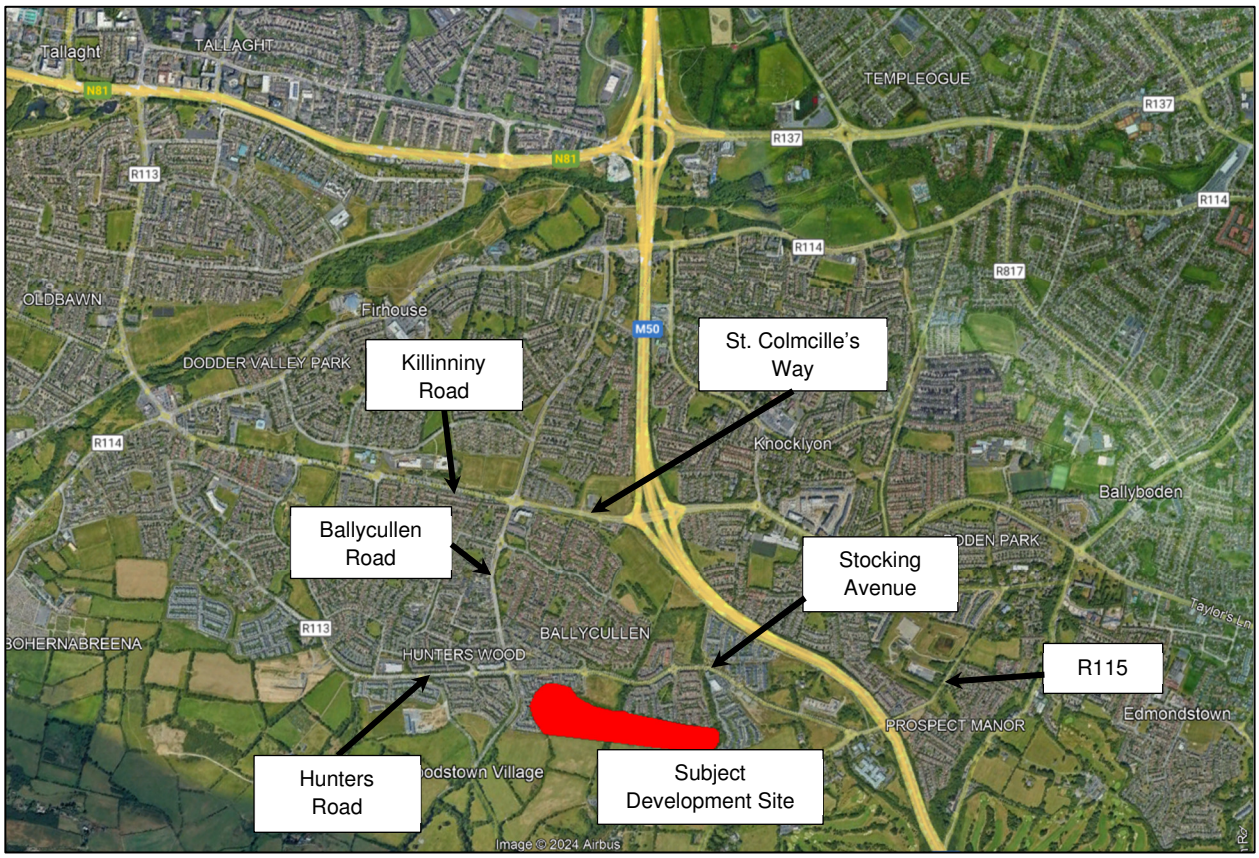

Figure 2 | *Existing Local Roads (Source: Google Earth)*

Stocking Avenue is a two-way single carriageway road which starts at a three-arm, and runs in the east direction c. 1.5km to end at a four-arm roundabout. Stocking Avenue has a speed limit of 50km/h, a width of 7.5m and includes footpaths and cycle lanes either side of the road. The avenue also has bus stops in both directions.

Hunters Road is the continuation of the Stocking Av. to the west of the junction 3. The road continues in a westerly direction for c. 300m, and it terminates at a priority T-Junction with the R113 to the west of the

site. The road has a speed limit of 50km/h, a width of 7m and includes footpaths and cycle lanes on both sides of the road. However, there are no bus routes currently using the road.

Ballycullen Road is a two-way single carriageway road which starts at a priority T-Junction on the R113 to the south of the site and runs with north direction for c. 2.3km to end at a priority T-Junction with the R114 to the north of the site. Ballycullen Rd. has a speed limit of 50km/h, a width of 10m, and, from the junction with Stocking Av., has a footpath on both sides and a cycle lane on the northbound side. In addition, the road has a priority bus lane on northbound and bus stops in both directions.

Killinniny Road is a two-way single carriageway road. It starts at signalised crossroad with Ballycullen Road and runs westerly direction for c. 1.3km to ends at a priority T-Junction with the R113. Ballycullen Rd. has a speed limit of 50km/h, a width of 10m, and includes footpaths either side of the road. In addition, the road has bus stops in both directions.

St. Colmcille's Way is a is a two-way single carriageway road which starts at the interchange with the M50 motorway at its Junction 12, and runs with west direction for c. 1.0km to ends at a signalised crossroad with Ballycullen Road St. Colmcille's Way has a speed limit of 50km/h, a width of 10m and 15m, and includes footpaths and cycle lanes either side of the road. In addition, the road has bus stops in both directions.

The **R113** road is a regional road which forms a semi-orbital route around the south of the city. It starts at the N31 at Temple Hill in Blackrock and ends at a junction with the N4 at Palmerstown.

The **R114** road is a regional road which runs from the city centre to Brittas in southwest County Dublin via Rathmines, Rathgar, Rathfarnham, Knocklyon, Firhouse and the mountainous area of Boharnabreena. The final stretch of the road runs just north of the border between County Dublin and County Wicklow, parallel to the Brittas River and a canal to the River Camac, which rises just to the north.

The **R115** road is a regional road in counties Dublin and Wicklow. It follows the Military Road. The R115 is 40.5 km long. The road runs between its junction with R114 at Butterfield Avenue Rathfarnham in the county of Dublin and its junction with R755 at Laragh in the county of Wicklow via Grange Road, Willbrook Road, Ballyboden Road, Scholarstown Road, Stocking Lane and Military Road in the county of Dublin: Glencree, Liffey Head Bridge, Sally Gap and Drummin in the county of Wicklow.

The **M50 Motorway** is an important orbital motorway around Dublin which is subject to a speed limit of 100kph. It is a 40km, C-shaped ring around Dublin that connects all the National Primary Roads and carries more than 115,000 vehicles per day.

The **N81** road is a national secondary road in Ireland, from the M50 motorway to Tullow, County Carlow, north to south. The N81 continues past Tullow for another 8 km to terminate at the village of Closh, County Carlow, where it intersects the N80. The road is a dual carriageway between M50 motorway and west of Tallaght, known as the Tallaght Bypass or Blessington Road. It intersects with the M50 motorway at Junction 11.

2.2 Movement and place

2.2.1 Movement Function

DMURS establishes that a hierarchy of streets encourages residents to use sustainable modes of transport. The manual classifies streets into three categories: Arterial Streets, Link Streets and Local Streets. In accordance with the Design Manual, Arterial streets are the major routes via which major centres / nodes are connected. Arterial streets may include orbital or cross metropolitan routes within larger cities and larger towns. Link Streets provides the link to arterial streets or between centres, neighbourhoods, and/or suburbs. Finally, local streets are the streets that provide access within communities and to arterial and link streets.

As a reference, the Design Manual provides a table which shows the terminology used within this Manual compared with other key publications. The table is presented below.

DMURS Description	Roads Act/ DN-GEO-03031	Traffic Management Guidelines	National Cycle Manual
Arterial	National	Primary Distributor Roads	Distributor
Link	Regional (see note 1)	District Distributor Local Collector (see Notes 1 and 2)	Local Collector
Local	Local	Access	Access

Notes

Note 1: Larger Regional/District Distributors may fall into the category of *Arterial* where they are the main links between major centres (i.e. towns) or have an orbital function.

Note 2: Local Distributors may fall into the category of *Local* street where they are relatively short in length and simply link a neighbourhood to the broader street network.

Figure 3 | *Terminology used within DMURS compared with other key publications (source: Table 3.1 - DMURS)*

The development will be served by the existing road infrastructure with two access points from Stocking Avenue, a link road. One via an existing spur road from Stocking Avenue to the east of Abbots Grove and the other along Stocking Wood Drive. The access roads are shown in detail in **Figure 4** below.

The internal road layout consists of two circular roads, one in the western half of the development and one in the eastern half. Both are linked by a single road which crosses a wooded area dividing the development in two.

The road hierarchy of the estate is predominantly local roads.

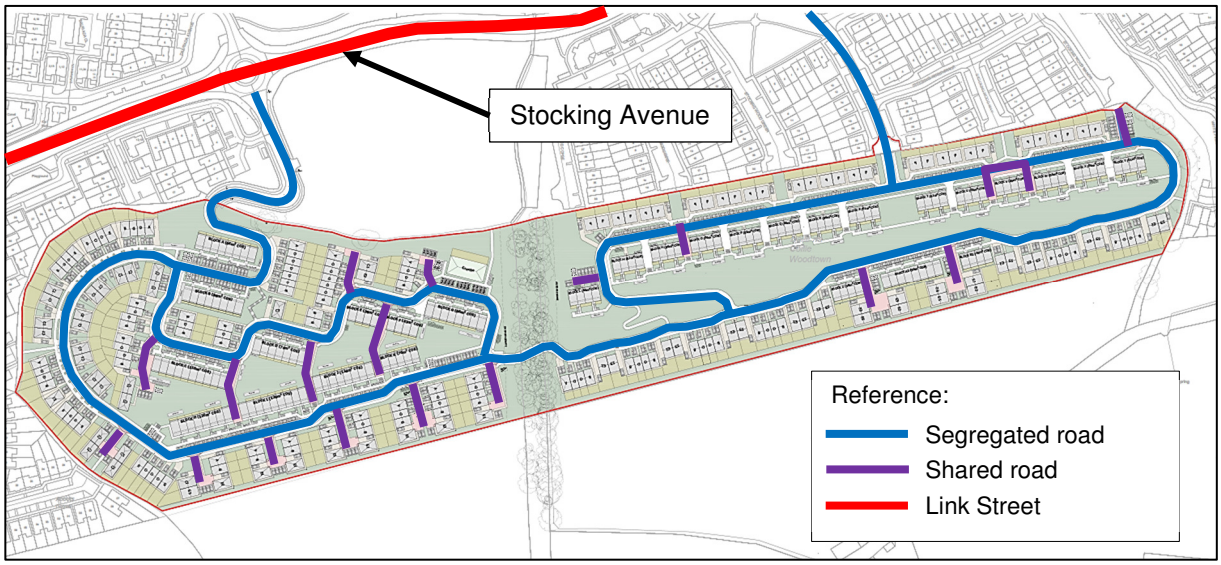

Figure 4 | *Subject Development – Road Hierarchy*

The figure above shows the internal roads of the Subject Development. The figure shows the segregated roads and the shared roads. In general, the internal roads are designated as Local Street. These have been further categorised into Primary Local and Secondary Local, reflecting the different levels of segregation between motorised and non-motorised traffic.

2.2.2 Place Context

DMURS recognises that urban roads and streets pass through a variety of areas with different characteristics, requiring different design solutions in each of these different contexts. Consequently, based on the Irish urban landscape, the Design Manual has divided urban areas according to their collective similarities, defining the following categories: Centre, Neighbourhood, Suburb and Business Park/Industrial Estate.

Centre urban areas include areas that are the focus of economic and cultural activity, where pedestrian activity is highest, and contain a concentration of retail and commercial frontages that open directly onto the street. Neighbourhoods include new and existing areas that are intensively developed with medium to high density housing and/or a broad mix of uses. Suburbs consist mainly of existing lower density housing developed over large areas. Business parks / industrial estates are areas primarily focused on providing areas of commercial and industrial activity outside of centres.

The subject site is in a Neighbourhood area. *South Dublin County Development Plan 2022-2028* indicates that the subject site falls within the objective RES-N, as can be seen in **Figure 5** below.

The objective RES-N is defined as "*To provide for new residential communities in accordance with approved area plans*", which is destined to: "*Childcare Facilities, Community Centre, Cultural Use, Doctor/Dentist, Education, Enterprise Centre, Funeral Home, Garden Centre, Guest House, Health Centre, Housing for Older People, Industry-Light, Nursing Home, Offices less than 100sqm, Open Space, Primary Health Care Centre, Public House, Public Services, Recreational Facility, Recycling Facility, Residential Institution, Residential, Restaurant/Café, Retirement Home, Shop-Local, Shop-Neighbourhood, Sports Club/Facility, Stadium, Traveller Accommodation, Veterinary Surgery*".

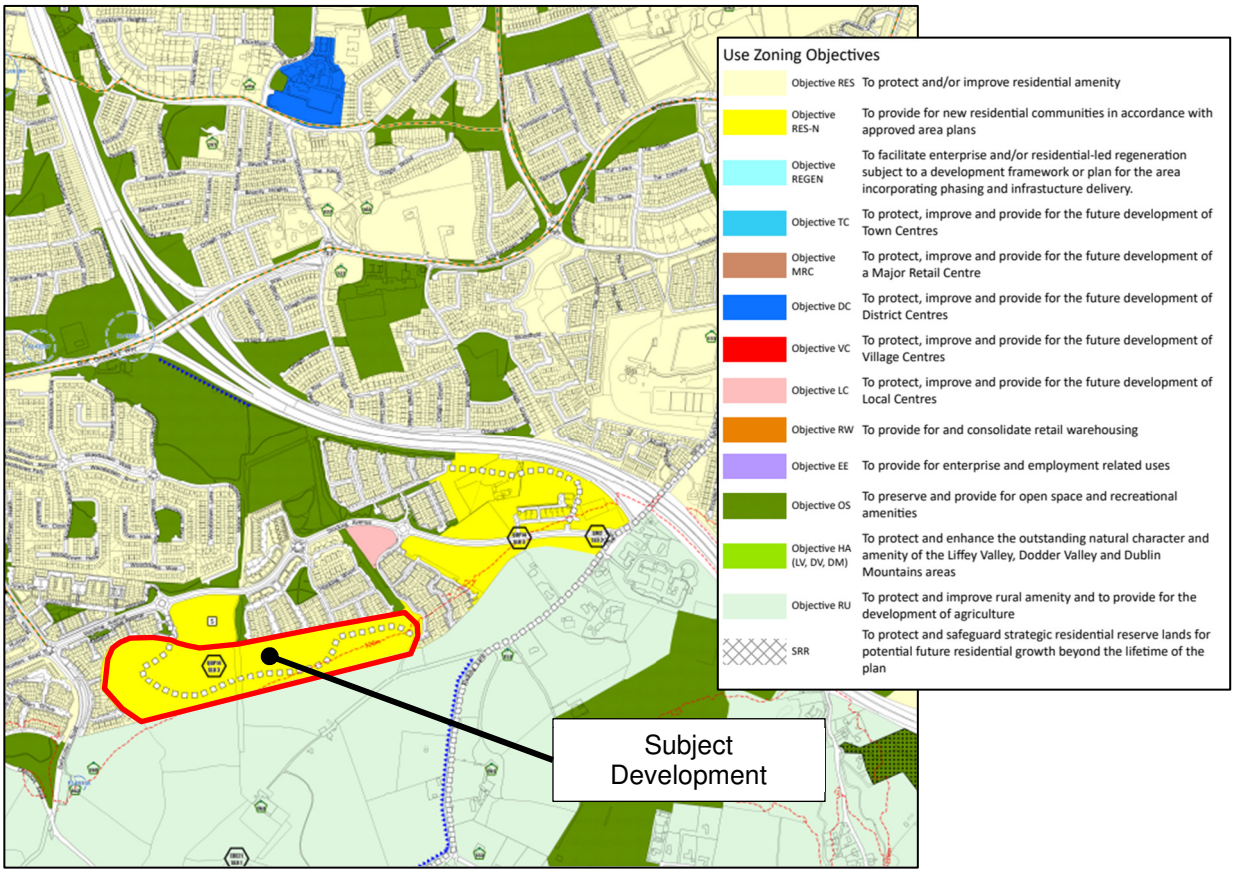

Figure 5 | *Land Use (Source: Map 10 - South Dublin County Development Plan 2022-2028)*

2.3 Permeability and Legibility

2.3.1 Street Layouts

DMURS indicates that the design of new road networks should incorporate solutions that facilitate the development of sustainable communities. The networks should be based on layouts that facilitate connectivity between streets and maximise the number of walkable and cyclable routes between destinations. The use of cul-de-sacs, which provide no through access, should be limited to areas where mid-block penetration is desirable.

To provide a baseline, the DMURS set out three possible network typologies that can be adapted to the needs of the place, as shown in **Figure 6** below.

Figure 6 | *Permeable Street layouts (Source: Figure 3.8 – DMURS)*

DMURS highlight that an orthogonal layout is the most effective in terms of permeability. A curvilinear layout may also be highly effective, while streets with an organic layout have usually developed over time in a haphazard manner but can also offer high connectivity. Furthermore, it emphasises the importance of clearly defining the points of access to the development, which should be aligned with the major destinations and the hierarchy of the road network (refer to **Section 2.2.1**)

Figure 7 below illustrates the street layout of the Subject Development which, according to the classification above, corresponds to a "curvilinear layout".

For curvilinear layout, the DMURS indicates that street networks can also be highly effective in terms of permeability and legibility. The internal curvilinear layout facilitates the direct, efficient and safe movement of pedestrians and cyclists through the system, while simultaneously drawing people into the spaces and creating attractive curvilinear streetscapes. **Figure 7** below also shows the vehicular access point to the Subject Development and the location of the cul-de-sacs. In addition, **Figure 13** below shows the pedestrian infrastructure throughout the subject site and **Figure 10** set outs which cul-de-sacs have been designed with pedestrian permeability.

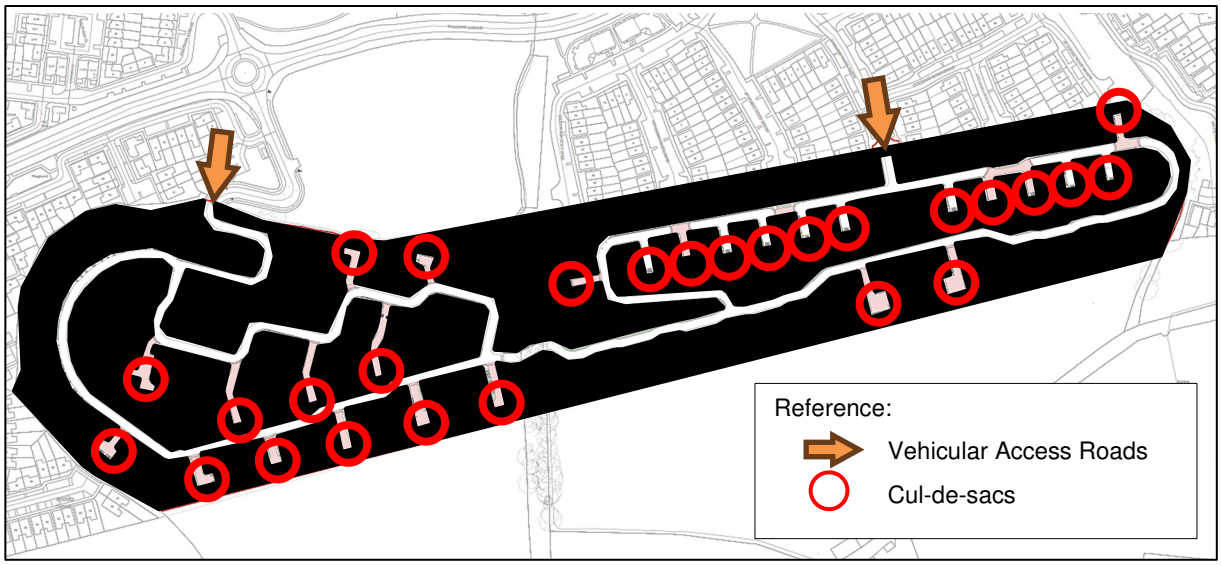

Figure 7 | *Subject Development – Street Layout*

The road layout has been designed with careful consideration of the existing ground levels to reduce soil movements beyond the site location. By incorporating curvilinear streetscapes, the design effectively reduces the gradient to a maximum of 8%, even in the most challenging sections. This approach not only ensures smoother transitions but also enhances safety and accessibility for all users. **Figure 8** below illustrates the maximum and minimum elevations along the centre line of the internal road network, providing a clear visual representation of the terrain variations.

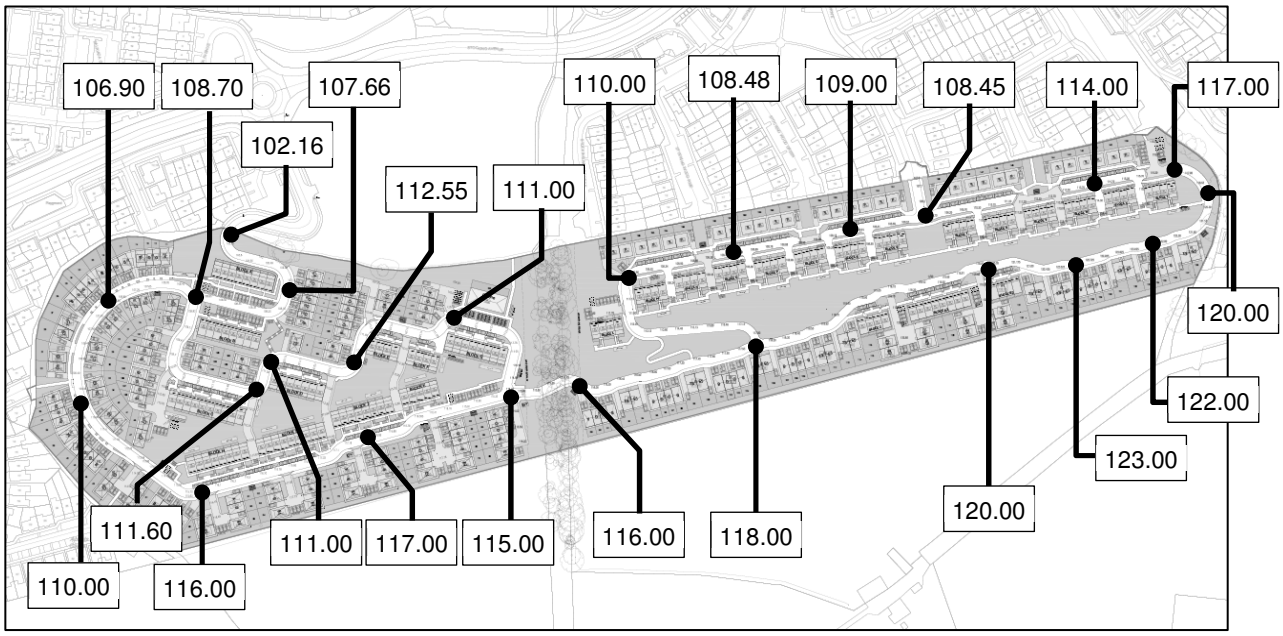

Figure 8 | *Maximum and minimum levels on the internal street layout.*

2.4 Management

2.4.1 Vehicle Permeability

DMURS has classified the degree of permeability provided for different transport modes into four categories, as outlined below.

- Dendritic Networks, which severely restrict the movement of all users, should be avoided by the designer as they severely restrict movement.
- Open networks that allow full permeability for all users are the best accessibility. This is desirable for all users, such as within town centres and business park / industrial areas. The latter to allow more efficient access for commercial vehicles.
- 3-way offset networks, which comprise a significant number of 3-way junctions, permit through movement for all modes. However, this results in slower speeds for faster modes, as vehicles are required to decelerate, stop and/or change direction on numerous occasions when traversing local streets. This configuration presents a number of advantages and disadvantages with regard to its overall effectiveness. The use of multiple junctions can reduce legibility and discourage walking and cycling, as the network becomes challenging to navigate, and the route becomes unclear.
- Filter permeability network may be employed to permit full permeability to some users while imposing greater restrictions on others. This may be applied in instances where designers seek to prioritise the movements of more sustainable modes over private vehicles.

The figure below shows an elementary diagram of the types of road networks.

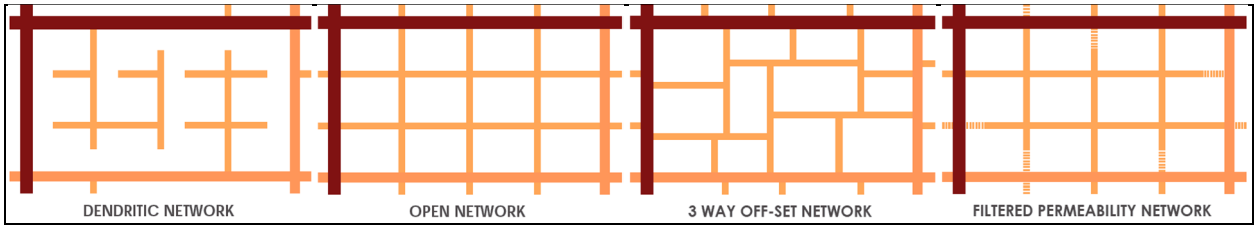

Figure 9 | *Type of Street Network (Source: Figure 3.22 – DMURS)*

The Design Manual outlines two final considerations regarding cul-de-sacs and one-way streets. For the former, DMURS considers that they should be used with caution to prevent the formation of dendritic networks. Regarding the one-way streets, the manual considers that the use of one-way streets can encourage faster car speeds and can be confusing for users if they divert people away from destinations. Nevertheless, the Design Manual also indicates that one-way streets may be beneficial in narrow carriageways in shared streets and where the implementation of this street type provides more space for pedestrian use.

The Subject Development is considered as filtered permeability network as can be seen in the figure below which highlight the main road within the development.

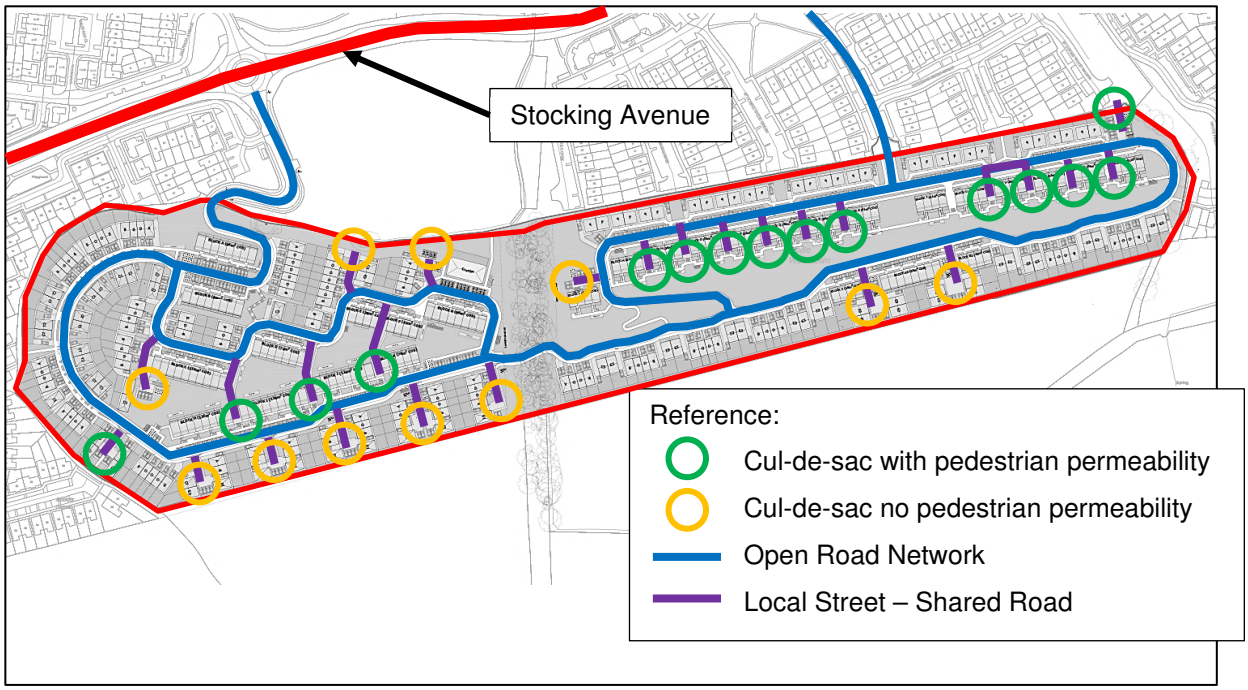

Figure 10 | *Subject Development – Street Network*

The developed has been designed with the following considerations:

- The subject site is located within an existing residential area, as illustrated in **Figure 2** above.
- The site is currently a greenfield site, bounded to the east, north and west by existing residential areas and to the south by greenfield lands.
- Most streets within the development are residential access roads as was indicated in **Section 2.2.1** above.
- The development is divided into two sectors by an existing wooded area, and a single link road is proposed to connect both sectors. The proposed internal road layout consists of two circular roads, one

in the western half of the development and one in the eastern half, connected by the aforementioned link road, as can be seen in **Figure 4** above.

It is reasonable to conclude that the configuration is appropriate and that drivers will not be inclined to travel at high speeds or experience any significant disruption to their journey times as a result of driving on the network roads.

3. Street Design

3.1 Movement, Place and Speed

3.1.1 A balanced Approach to Speed

In order to achieve an effective and balanced design solution, DMURS advises the designer to consider the management of speed, the values of place and the reasonable expectations of appropriate speed in accordance with the context and functions in question. In order to facilitate this, DMURS has outlined a matrix which allows for the selection of an appropriate design speed on the basis of the links between place, movement and speed. The aforementioned matrix is presented in the figure below.

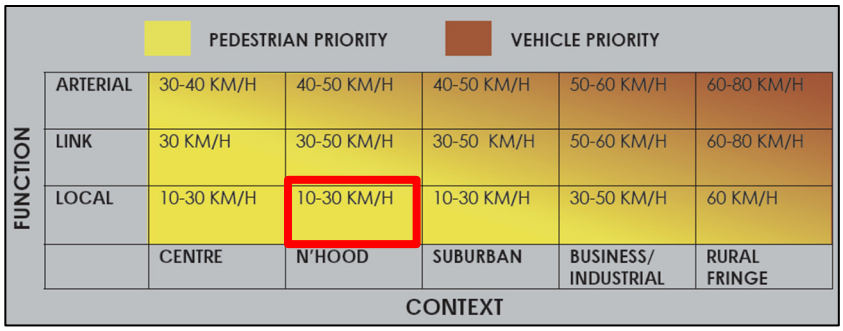

Figure 11 | *Design speed selection (Source: Table 4.1 – DMURS)*

The roads within the Subject Development were designed with a maximum speed of 20 km/h.

As previously discussed in **Section 2.2.1**, the internal roads are local streets, and is situated in a neighbourhood area, as outlined in **Section 2.2.2**. Accordingly, the speed must be between 10 and 30 km/h, in accordance with the maximum speed considered. Therefore, the proposed speed limit of 20 km/h is appropriate for the subject site.

3.1.2 Self-Regulation Streets

DMURS recognises that self-regulating streets can be used to manage traffic flow, balancing the needs of residents, sense of place and vehicle speed in a way that does not rely on extensive regulatory controls and physically intrusive enforcement measures.

The Design Manual provides a number of examples that can assist designers in the creation of a safe road, including the incorporation of a continuous street-tree walls, pedestrian activity zones, horizontal and vertical deflection, narrow carriageways, on-street parking, tighter corner radii, and shared surfaces, among others

The Subject Development use several strategies in its design to manage movements:

- Streets with horizontal deflections in place of straight roads (see **Figure 4** above)
- Raised crossings at road intersections with ramps (refer to drawing Nos. BYCN-WM-ZZ-XX-DR-C-P1100, P1101 & P1191, which are included in the documentation package)
- On-street parking (refer to Traffic and Transport Assessment, Waterman-Moylan report No. *24-007r.003 Traffic and Transport Assessment*, Section 9, which is included in the documentation package)
- Shared surface (refer to **Section 3.3.3** below)
- Reduced corner radii to improve pedestrian crossing and reduce vehicle speed (refer to **Section 3.3.2** below).

As can be seen in the aforementioned strategies, the risks of high vehicle speeds developing within Subject Development is minimal.

3.2 Streetscape

3.2.1 Material and Finishes

DMURS emphasises that the use of materials and finishes is one of the most defining elements of a street, particularly where it is used to define the levels of segregation and integration within a street. The material range can define space, calm traffic and improve legibility, reducing the need for barriers, signage and line marking in favour of texture and colour. Materials can be used to enhance the value of place and produce more attractive and cost-effective streets.

The subject site comprises a variety of materials and finishes, which are used to delineate the different functional areas. The shared surface (see **Figure 4** above) is constructed with a different finish to the surrounding road surface and is designed to have the same elevation as the footpath (no kerb). Drawing details can be found in the Waterman Moylan Drawing No. *BYCN-WM-ZZ-XX-DR-C-P1191 - Proposed Road Construction Details (Sheet 1 of 2)*, which is included in the documentation package.

The internal junctions have been designed with raised tables with different surface material treatments. The intention is to alert drivers to a new condition and influence their behaviour and vehicle speeds.

In order to facilitate the crossing for pedestrians with visual limitations, it is proposed that tactile paving be integrated into the design, as can be seen in the Waterman Moylan Drawing No. *BYCN-WM-ZZ-XX-DR-C-P1191 - Proposed Road Construction Details (Sheet 1 of 2)*, which is included in the documentation package.

3.3 Pedestrian and Cyclist Environment

3.3.1 Footways, Verges and Strips

DMURS indicates that a strong sense of enclosure and active street edges contribute to pedestrians' and cyclists' sense of security and comfort. In addition, it suggests that the provision of wider and better-quality walking facilities may result in an increase in walking. Well-designed footpaths are free of obstacles and wider enough to allow pedestrians to pass each other comfortably. In this regard, the Design Manual presents a guideline for the design of each area thought of as the footpath:

- Footway: is the area along which people walk. The minimum width for a footway is 1.8 metres. In areas of high population density and along streets with high traffic volumes, additional width must be provided to facilitate the passage of people in larger groups. **Figure 12** below illustrates the requisite space for pedestrians to pass each other comfortably, with reference to the levels of activity within a street.
- Verges: serve to provide a buffer between pedestrians and the vehicle traffic. The verges wide depend on the function of the street and the presence of on-street parking. The Design Manual has established that on arterial and link streets without on-street parking, a verge of 1.5-2.0m should be provided. In contrast, there is no minimum verge requirement for local roads. Where on-street parking is provided, a verge (and change of kerb line) may be needed on approaches to junctions to enforce the visibility splay. In addition, a verge of a minimum of 0.3m should be provided in areas of perpendicular parking a verge should be provided. Finally, where cycle tracks are located adjacent to parking spaces, a verge should be provided.
- Strips: are spaces provided directly to the front of a building that may be occupied by activities generally associated with retail/commercial uses and may be incorporated into the private spaces of a dwelling.

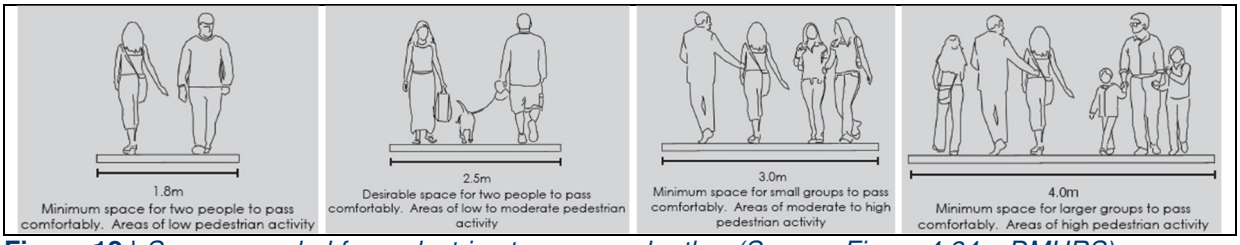

Figure 12 | *Spaces needed for pedestrian to pass each other (Source: Figure 4.34 – DMURS)*

The Subject Development is situated within a residential area (refer to **Section 2.2.2** above) with no presence of commercial areas. In addition, the subject site offers parking options both perpendicular and parallel to the street. Given the well-connected footpath (see **Figure 13** below), the characteristics of the surrounding area (refer to **Section 2.1** above), the location of the closest bus stop (refer to Traffic and Transport Assessment, Waterman Moylan Report No. *24-007r.003 Traffic and Transport Assessment*, which is included in the documentation package) and the future Travel Plan (refer to Waterman Moylan Report No. *24-007r.006 Travel Plan*, which is included in the documentation package), residents of the subject site will be encouraged to choose the more sustainable mode of transport, i.e. walking, before using the car to commute.

The subject site proposes a well-places pedestrian links through the development which result in significant benefits for residents, particularly in terms of reducing the distances that they must walk to access essential services. **Figure 13** below illustrates the proposed footpaths.

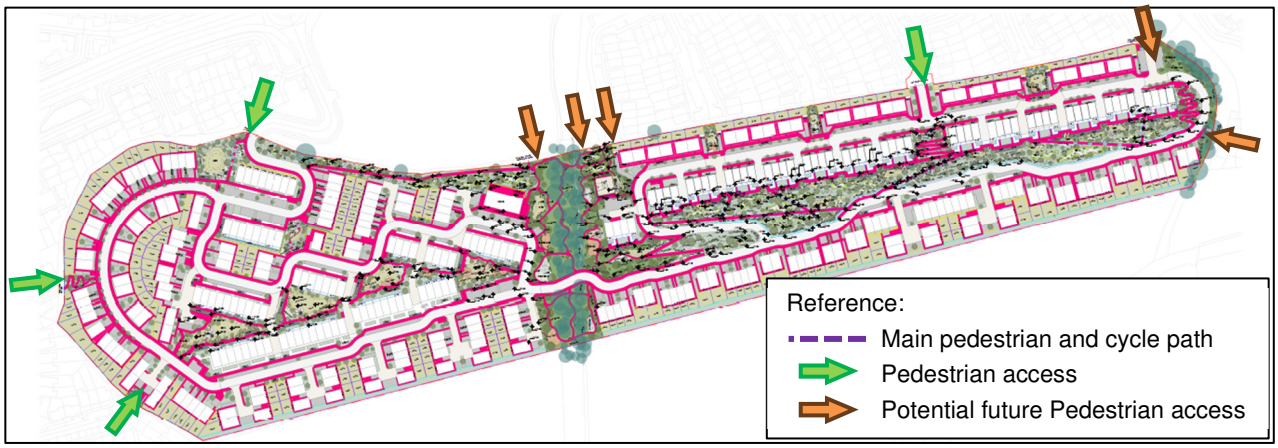

Figure 13 | *Subject Development – Link Path*

As indicated in **Section 2.3.1** above, the road layout has been designed with careful consideration of the existing ground levels to minimise soil movement beyond the site. The pedestrian links have been designed to reduce the gradient to a maximum of 5%, even in the most challenging sections.

However, due to the existing topography on site, it has not been possible to design all areas as “access for all”. The level difference in some areas is over 3m’s and as such steps have been provided to ensure these spaces are useable where studies demonstrated that ramps would not comply when tested. Alternative Part M compliant routes are available throughout the site for all users.

Additionally, stairways have been provided in the public open spaces to offer an alternative route, thereby reducing walkable distances. This thoughtful design ensures accessibility and convenience for all users while maintaining the integrity of the natural landscape.

3.3.2 Corner Radii

DMURS indicates that the reduction of corner radii will markedly enhance the safety of pedestrians and cyclists at junctions. This is achieved by reducing the speed at which vehicles can turn corners and by increasing inter-visibility between users. Furthermore, it is essential to verify the swept path of the main vehicles that will utilise the streets. In this regard, designers must consider the following:

- On junctions between arterial and / or link streets, a maximum corner radius of 6m should be applied.
- Where turning movements occur from an arterial or link street into a local street, corner radii may be reduced to 4.5m.
- Where design speeds are low and movements by larger vehicles are infrequent, a maximum corner radius of 1-3m should be applied.
- In circumstances where there are regular turning movements by articulated vehicles, the corner radii may be increased to 9m.
- In instances where designers find difficulties in applying the aforementioned radii, they should consider the following: (i) the implementation of setback vehicular stop lines at signalised junctions, which would permit turning vehicles to traverse the enter line of the intersection street without conflicting with oncoming movements, and (ii) the removal of obstacles from corners to facilitate the passage of emergency vehicles.

The Subject Development has been designed with several self-regulations measures which could provide low-speed streets, one of them is the use of 3.0 metres radius in junction between the segregated roads and the shared roads. In addition, it is proposed horizontal road deflections throughout the site designed with centre line radii of 11 metres to improve driver flow along the site. In addition, drivers are not expected to reach high speeds due to the self-regulating road measures implemented on the site (refer to **Section 3.1.2** above).

Furthermore, the subject site will be accessible to refuse vehicles and fire tenders, this has been verified by swept path analysis using AutoTrack analysis. Details of the AutoTrack layouts are shown on the Waterman Moylan Drawings No's *BYCN-WM-ZZ-XX-DR-C-P1150 & P1151 - Swept Path Analysis - Refuse Vehicle* and *BYCN-WM-ZZ-XX-DR-C-P1152 & P1153 - Swept Path Analysis - Fire Tender*, which are included in the documentation package.

3.3.3 Pedestrianised and Shared Surfaces

DMURS has identified the implementation of pedestrianisation and shared space as an effective way of promoting place and providing a more enjoyable experience for pedestrians and cyclists. The segregated footpaths entail the segregation of pedestrians and cyclists from the flow of motorised traffic, whereas the shared surface streets represent an integrated space where pedestrians, cyclists and vehicles share the main carriageway.

The Subject Development comprises streets with footpaths on both side, streets with footpaths on one side and shared streets, as illustrated in **Figure 14** above. The roads have been designed with the objective of generating a safer environment, incorporating a differentiated rolling surface (in texture and level) that is easily identifiable by the drivers.

Drawing details can be found in the Waterman Moylan Drawing No's. *BYCN-WM-ZZ-XX-DR-C-P1191 - Proposed Road Construction Details (Sheet 1 of 2)* and *BYCN-WM-ZZ-XX-DR-C-P1192 - Proposed Road Construction Details (Sheet 2 of 2)*, which are included in the documentation package.

3.3.4 Cycle Facilities

DMURS promotes cycling as a sustainable mode of transport and seeks to rebalance design priorities to promote a safer and more comfortable environment for cyclists. In this regard, the Design Manual follows the baseline described in the National Cycle Manual and refers to it in the design of cycle facilities.

DMURS highlights that on lightly trafficked / low speed streets, designers are generally directed to create shared streets where pedestrian, cyclist and motor vehicles share the carriageway. However, on busier / moderate speed streets, designers are generally directed to apply separate cycle lanes / cycle tracks.

The Subject Development incorporates the provision of cycle storage as shown figure below. Further information about the number of cycle parking spaces can be found in the Waterman-Moylan Report No. *24-007r.003 Traffic and Transport Assessment*, which are accompanying the documentation package.

Figure 14 | *Pedestrian and Cycle Facility*

The figure above shows the internal developments roads, and the location of the bike storage for the residential units.

3.4 Carriageway Conditions

3.4.1 Carriageway Widths

As indicated by DMURS, narrow carriageways represent one of the most effective design measures for calming traffic. This is measured from the kerb to the kerb, from the outside line of a cycle lane, or from the edges of parking spaces. The figure below, extracted from the design manual, illustrates various examples of width road.

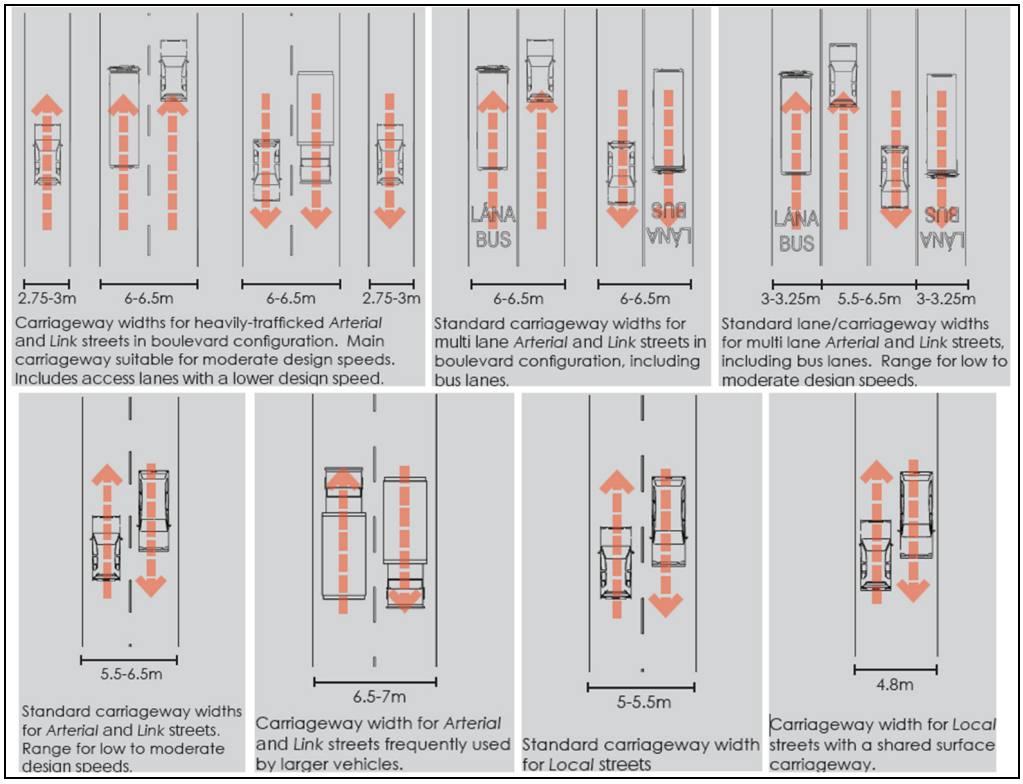

Figure 15 | *Carriageway widths (Source: Figure 4.55 – DMURS)*

The internal roads of the Subject Development are local streets, as previously described in **Section 2.2.1**. It should be noted that some of these roads are shared between pedestrians and vehicles, as illustrated in **Figure 4** above. The width of the road has been delineated as 5.5 metres in the case of segregated streets and 4.8 metres in the case of shared streets.

The aforementioned road is consistent with the width of road indicated in the DMURS. Furthermore, measurements are taken from kerb to kerb or from the edges of parking spaces.

As indicated before, the subject site will be accessible to refuse vehicles and fire tenders, this has been verified by swept path analysis using AutoTrack analysis. Details of the AutoTrack layouts are shown on the Waterman Moylan Drawings No's *BYCN-WM-ZZ-XX-DR-C-P1150 & P1151 - Swept Path Analysis - Refuse Vehicle* and *BYCN-WM-ZZ-XX-DR-C-P1152 & P1153 - Swept Path Analysis - Fire Tender*, which are included in the documentation package.

3.4.2 Forward Visibility

DMURS defines the term 'forward visibility' or 'forward sight distance' (FSD) as the distance along the street ahead which a driver of a vehicle can see. Furthermore, it is stated that the minimum level of forward visibility required for a driver to stop safely if an object enters their path is based on the Stopping Sight Distance (SSD), as illustrated in the figure below.

SSD STANDARDS

Design Speed (km/h)	SSD Standard (metres)
10	7
20	14
30	23
40	33
50	45
60	59

Forward Visibility

Design Speed (km/h)	SSD Standard (metres)
10	8
20	15
30	24
40	36
50	49
60	65

Forward Visibility on Bus Routes

Figure 16 | *Reduced SSD standards for application within cities towns and villages (Source: Table 4.2 – DMURS)*

The Subject Development has a good forward visibility along its internal streets. It has been verified that the requisite forward visibility has been met, given that the segregated roads are designed with a maximum speed of 20km/h, which, according to **Figure 16** above, require 14 metres of forward visibility.

3.4.3 Visibility Splays

It is emphasised by DMURS that visibility splays are applicable to junctions of particular importance, where drivers are required to exercise their own discretion in determining the optimal moment to enter the junction.

The junction visibility splay is composed of two elements: the X distance, which is the distance along the minor arm, and the Y distance, which is the distance a driver exiting from the minor road can see to the left and right along the major arm. The former is gotten from the stop line, and a distance of 2.4 metres should be considered in the major case, while a distance of 2.0 metres may be used where vehicle speeds are slow and flows on the minor arm are low. The Y distance should correspond to the Stopping Sight Distances set out in **Figure 16** above. The methodology for measuring distances is illustrated in **Figure 17** below.

The Design Manual indicates that visibility splay should be kept clear of obstructions. However, objects that would not be large enough to wholly obscure a vehicle, pedestrian, or cyclist may be acceptable, provided that their impact on the overall visibility envelope is not significant.

Finally, the DMURS indicates that designers may have reservations about reducing visibility splay at junctions that experience higher traffic volumes at relatively moderate speeds.

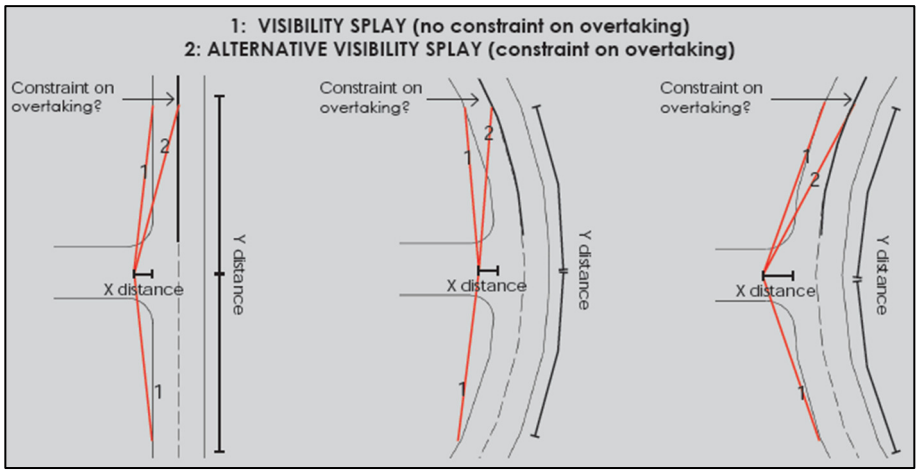

Figure 17 | *Visibility splay refer to an X and Y value (Source: Figure 4.63 – DMURS)*

The visibility splays have been verified at the junction of the subject site and the results can be found in the Waterman Moylan Drawing No. *BYCN-WM-ZZ-XX-DR-C-P1104 - Proposed Sightlines (Sheet 1 of 2)* and *BYCN-WM-ZZ-XX-DR-C-P1105 - Proposed Sightlines (Sheet 2 of 2)*, which are included in the documentation package.

In order to facilitate pedestrian movements and enhance the safety of pedestrians at internal junctions, raised tables have been designed with a change in the material surface and vertical deflection. It is anticipated that these uncontrolled junctions, situated in a low-speed street environment (as discussed in **Section 3.1.2** above), will function effectively without the need for further assessment.

4. Conclusion

This Design Statement based on the Design Manual for Urban Roads and Streets (DMURS) has been prepared by Waterman Moylan as part of the planning documentation for a proposed residential development on lands at Ballycullen, Dublin 16, Co. Dublin.

This report illustrates how the proposals align with the objective outlined in DMURS, which aims to enhance street design to encourage residents to opt for walking or public transportation over private vehicle use.

As conclusion, it is our assessment that the proposed development is aligned with the standards set out for the design of urban roads and streets as outlined in DMURS.

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