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Proposed Student Accommodation Development, Ballybeg, Waterford,
Frisby Construction Ltd.
DMURS Compliance Statement

Coakley Consulting Engineers
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DOCUMENT CONTROL SHEET

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1 DMURS Compliance Statement

1.1 General

Coakley Consulting Engineers (CCE) have been commissioned by Noel Frisby Construction Ltd. to prepare a DMURS Compliance Statement to support the Large-Scale Residential Development (LRD) application for a proposed Student Village Development, Cork Road, Waterford.

Coakley Consulting Engineers (CCE) are traffic and transport consultants based in Tralee, Co. Kerry. This report should be read in conjunction with all other documents and information submitted as part of this planning application. Brian Coakley of CCE is a TII approved Road Safety Audit team member. The project scope and proposed site access has been discussed with a Waterford City and County Council Roads Department Engineers prior to submission.

This document provides a review of the proposed development with regard to compliance with guidelines in the Design Manual for Urban Roads and Streets (DMURS). The overarching principals of DMURS are addressed initially and followed by compliance with specific DMURS design elements.

As outlined below, Coakley Consulting Engineers has reviewed and made reference to several drawings and documents in preparation of this report. In particular, this report is complemented by the *independent* DMURS Quality Audit (QA) report prepared as part of the design process. Therefore, is it critical that this report be read in conjunction with Quality Audit (QA) report submitted as part of this planning application submission, in addition to the site layout and other drawings at original scale.

A Quality Audit (QA) is a defined process, independent of, but involving, the design team that provides a check that high quality places are delivered and maintained by all relevant parties, for the benefit of all end users. The QA systematically reviews a project design by undertaking a series of individual but overlapping audit assessments to develop high-quality places where objectives of place, functionality, maintenance and safety are achieved. These audits include:

1. Visual Quality
2. Audit of How Street may be Used
3. Place Check Audit
4. Community Street Audit (in existing streets)
5. *Road Safety Audit (RSA) to formal TII standards*
6. Access Audit
7. Walking Audit
8. Non-Motorised User Audit
9. Cycle Audit

The DMURS Quality Audit (QA) report was undertaken by 2no. Transport Infrastructure Ireland (TII) approved independent auditors (audit team). The audit comprised a formal site visit by the audit team, a detailed review of design drawings and the preparation of a Quality Audit (QA) report. The recommendations made by both the Road Safety Audit and Quality Audit report have been reviewed and accepted in full by the design team and these recommendations will be addressed and incorporated into the final site layout drawings at application stage.

1.1 DMURS Objectives

DMURS seeks to balance the needs of all users, creating well-designed streets at the heart of communities. It states that 'Well designed streets can create connected physical, social and transport networks that promote real alternatives to car journeys, namely walking, cycling or public transport'.

DMURS also seeks to create sustainable neighbourhoods: 'compact and energy efficient development … prioritising sustainable modes of transport … [and] provision of a good range of amenities and services within easy and safe walking distance of homes'.

1.2 Interaction between People and Vehicles

DMURS outlines four distinct models for interaction between cars and people, where:

1 Traffic and people are segregated, and the car is dominant.

2 The car and people are segregated from each other.

3 Traffic and people mix, although on a more equitable basis; and,

4 The car is excluded altogether.

In the proposed development, the second and third model predominates, with all roads having shared surfaces except the east-west road from the site access and the north-south central spine road.

1.3 The DMURS User Hierarchy

As outlined below, DMURS outlines a user hierarchy that designers must follow when preparing schemes. The site layout is considered consistent with applying a user hierarchy.

1.4 DMURS Design Principals

DMURS includes four overarching design principals which are implemented through adherence to recommendations in relation to individual design elements. Compliance with these elements is summarised in the table below.

The DMURS four overarching design principals are as follows:

1. To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and in particular more sustainable forms of transport.
2. The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment.
3. The quality of the street is measured by the quality of the pedestrian environment; and,
4. Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

1.5 DMURS Compliance and Key Design Elements

It is CCE's opinion that the proposed development is DMURS compliant and was designed to take into account the overarching guidelines and principles of DMURS, placing greater importance on the safe movement of vulnerable road users (VRU's) throughout the development also introducing measures to reduce traffic flows, vehicle speeds and turning movements within the site.

DMURS uses a hierarchy system to classify the movement function of a street. This system classifies streets into the following categories:

- Arterial Streets
- Link Streets
- Local Streets (applies to the subject development)

The following section outlies the specific Local Street DMURS key design features that have been incorporated within the proposed residential scheme with the objective of delivering a design that is in compliance with DMURS.

- In terms of DMURS Movement Function, Place Function and Street Layout, the vehicular routes throughout the site align with the 'local streets' category in DMURS and strike the right balance between the different functions of the street for VRU's and vehicles. As DMURS looks to 'limiting the use of cul-de-sacs', the proposed development adopts a circular road layout which is easy to navigate and encourages low speeds and minimal turning movements.
- Vehicle Speed: In accordance with DMURS Table 4.1 below, the developments internal roads have been designed for a vehicular traffic speed of 10-30km/h, in order to prioritise the movement of pedestrians and other vulnerable road users. DMURS highlights that traffic calming features should be provided 'on longer straights where there is more than 70m between junctions'. No straight road section within the development exceeds 70m and therefore no formal traffic calming measures area required.

PEDESTRIAN PRIORITY VEHICLE PRIORITY

FUNCTION	CENTRE	N'HOOD	SUBURBAN	BUSINESS/ INDUSTRIAL	RURAL FRINGE
ARTERIAL	30-40 KM/H	40-50 KM/H	40-50 KM/H	50-60 KM/H	60-80 KM/H
LINK	30 KM/H	30-50 KM/H	30-50 KM/H	50-60 KM/H	60-80 KM/H
LOCAL	10-30 KM/H	10-30 KM/H	10-30 KM/H	30-50 KM/H	60 KM/H

CONTEXT

Table 4.1: Design speed selection matrix indicating the links between place, movement and speed that need to be taken into account in order to achieve effective and balanced design solutions.

- Taking on board the 'self-regulating street' approach outlined in Section 4.1.2 of the DMURS, the following contributing design elements impact and encourage lower speeds:
    - the small scale of the proposed site layout and internal road length
    - reduced horizontal road alignment and corner radii with short 'straight' road sections
    - reduced carriageway width of 5.5m and 6.0m where required.
    - on-street parking
    - landscaping

Design Element	**Compliance Review**
Movement Function	The proposed vehicular access and car park have been designed to ensure ease of access, slow vehicle speeds and minimal conflicts. The layout therefore aligns with the "local streets" category in DMURS, the main function of the routes being to provide access within the development. The "local streets" category is appropriate in terms of the shared-space and placemaking elements of the design strategy.
Place Function	The design of internal car park strikes the right balance between the different functions of the street, including a sense of place. The development has included measures to ensure satisfactory standards of personal safety and traffic safety. The recommendations made by both the Road Safety Audit and Quality Audit report have been reviewed and accepted in full by the design team and these recommendations are incorporated into the final site layout drawings. These include frequent and appropriately located crossing points matching key desire lines at junctions and more, vertical and horizontal deflections, narrow carriageways, minimised signage and road markings, reduced visibility splays, on-street parking, tighter corner radii and shared surfaces.
Street Layout	The proposed development layout adopts an orthogonal layout with ease of access, connectivity, permeability and legibility throughout which complies with DMURS where 'all streets lead to other streets, limiting the use of cul-de-sacs that provide no through access and maximise the number of walkable/cyclable routes between destinations'.
Block Sizes	To ensure compliance with DMURS, the proposed layout and size of accommodation blocks makes sure that the street network and pedestrian routes within the development provide permeability and connectivity with key locations within and outside the development whilst also ensuring overall security for the scheme.

Design Element	Compliance Review
Wayfinding	The proposed development layout ensures DMURS compliance in terms of wayfinding, whereby the proposed simple orthogonal street layout promotes straightforward legible routes where people can easily orientate themselves, find their way around and through the site and won't encounter any 'road blocks' (Cul de Sacs) on their journey through and within the site.
Permeability	The proposed development layout has been designed with a largely "open network" providing permeability and connectivity where required to ensure compliance with DMURS with only a few essential restrictions on permeability. As accepted by the independent DMURS Quality Audit team, one of the key requirements for successful student accommodation is the need for secure access and egress (i.e. everyone entering and leaving the site have to pass the reception/security desk). Therefore, the internal site within the blocks is limited in terms of accessibility and permeability.
Traffic	In terms of DMURS compliance, the traffic modelling contained within the Traffic and Transport Assessment (TTA) report clearly demonstrates that the application, in terms of roads, traffic and junction capacity, would operate in a safe and efficient manner, with minimal impact on other road users and on the capacity of local road network well into the future. The nature of the development will generate minimal traffic flows by private car and the layout will encourage traffic calming and slower vehicle speeds.
Speed	Adopting an approach in compliance with DMURS "where vehicle movement priorities are low, such as on local streets, lower speed limits should be applied (30km/h)", the proposed speed limit (design speed) within the proposed development will be 30km/h through the use of design measures such as reduce radii, raised tables, slow zone signage and more. This will place vulnerable road users and their needs over those of motorists, change driver behaviour and enhance quality of life within the development. These lower speed limits of 30km/h are a requirement of Action 16 of Smarter Travel (2009) within urban areas.
Street Trees, Planting & Street Furniture	A comprehensive landscape plan has been prepared by Cunnane Stratton Reynolds for the development which adopts a DMURS compliance approach whereby proposed landscaping and street furniture measures will complement the proposed geometric design of the internal roads and encourage lower speeds and more. The proposed layout including landscaping elements has also been subjected to an independent DMURS Quality Audit.

Design Element	Compliance Review
Active Street Edges	DMURS promotes the use of minimal setbacks between the edge of the carriageway (and car parking) and back of the footway and building line. The setbacks to the blocks have been reduced to increase a sense of urban enclosure and strengthen the block corners.
Signage/Road Marking	To ensure DMURS compliance, minimal signage is proposed and required on local streets (car park) due to the low-speed nature and low movement function. Signage and line markings have be raised in the independent Quality Audit and will be addressed in the final layout design.
Lighting	The lighting guidelines in DMURS have been superseded due to the rapid development of LED lighting technology. Appropriate lighting will be provided in accordance with the current Waterford City and County Council Public Lighting Specifications.
Materials/Finishes	Although DMURS provides limited guidance on the use of different materials and finishes for local streets, it does state that designers should use 'contrasting materials and textures to inform pedestrians of changes to the function of space (i.e. to demarcate verges, footway, strips, cycle paths) and in particular to guide the visually impaired'. As per the site layout design and landscaping drawings, the range of proposed materials and locations are compliant with the requirements of DMURS.
Footpaths	In compliance with DMURS, the typical footway width within the development is 2.0m and in certain areas up to 4m in width (around internal courtyard area).
Pedestrian Crossings	In compliance with DMURS, pedestrian crossing points including dropped kerbs and tactile paving are proposed at several locations throughout the development to match the likely desire lines of pedestrians. All pedestrian crossings have been subjected to an independent DMURS Quality Audit and Road Safety Audit, the recommendations of which have been accommodated into the final layout design. DMURS considers pedestrian crossings to be 'one of the most important aspects of street design as it is at this location that most interactions between pedestrians, cyclists and motor vehicles occur'. A 'Raised' Pedestrian / Cycle Combined Zebra crossing is proposed on Lacken Road to serve the proposed Green Corridor/Link. This controlled crossing has been designed taking into account the TL605 layout specification contained in the recently published Cycle Design Manual guidelines. Please refer to MORCE drawings for additional detail. In excess of

Design Element	Compliance Review
	the required DMURS forward stopping sight distances (sightlines) are available for drivers on Lacken Road approaching crossing and vice versa. DMURS clearly sets out that the provision of forward sightlines (stopping sight distances) in excess of the required sightlines for a specific design speed can be counterproductive and encourage increased vehicles speeds. Therefore, the design team have provided the required sightlines only where possible.
Corner Radii	In compliance with DMURS, the kerb radii within the proposed car park (at internal 'Local Street' junctions) have been restricted to a maximum of 4.5m. This serves to encourage lower vehicle speeds, while also allowing for the occasional circulation and turning of large vehicles such as refuse collection trucks, delivery vehicles and fire tenders.
Cycle Facilities	The scheme has also taken in account the recent publication of the Cycle Design Manual. In compliance with DMURS, which references the National Cycle Manual (NCM) in terms of the provision of cycling facilities, the proposed development includes a range of new cycle infrastructure and facilities matching key desire lines including new cycle lanes (both on and off-road) on Ballybeg Drive and Lacken Road, controlled crossing facilities, appropriate tactile paving, cycle parking (safe, secure, and sheltered) and connections with other existing cycle facilities.
Carriageway Width	In compliance with DMURS, the width of the road (local street) through the car park (approx. 120m long) has a required aisle width of 6.0m which facilitates safe movement into and out of the perpendicular car parking immediately adjacent to the street.
Carriageway Surface	As per the site layout design and landscaping drawings, the surfaces and materials used for the carriageway, footpath and pedestrian area are compliant with the requirements of DMURS whereby various surfaces will be contrasting colours and/or texture to encourage increased visibility and slower vehicle speeds.
Junction Design	In compliance with DMURS, the junctions within the development will be priority (stop) controlled consistent with the anticipated traffic flows for junctions between local streets, and between local streets with link streets.
Visibility / Sightlines	In compliance with DMURS, the required clear and unobstructed visibility splays and forward sight distances on both the horizontal and vertical planes have been provided for all junctions, crossings and other locations for a design speed of between 30-50km/h.

Design Element	Compliance Review
Traffic Calming	In compliance with DMURS, all road widths, horizontal alignment, corner radii, pedestrian and cyclist facilities, kerbs, boundary treatments, landscaping, forward sight distances and visibility splays have been designed to ensure maximum traffic calming within the site.
Kerbs	In compliance with DMURS, the proposed kerb height is 75mm. DMURS provides indicative kerbs heights of between 50-75mm or less for Local streets with lower design speeds.
Parking / Loading	In compliance with DMURS, the proposed car park includes a combination of perpendicular and parallel parking on both sides, mobility impaired spaces and a loading (set down) area to encourage lower speeds.
Vehicle Swept Path	In compliance with DMURS and in response to the Quality and Road Safety Audit, an assessment was undertaken during the site layout design process to ensure that multiple vehicle types including car, refuse, emergency, service and delivery vehicles can access, egress, park and safely negotiate the internal road layout.
Multi-disciplinary Design Team	In compliance with DMURS, the design of the development has been prepared by a multi-disciplinary design team, including but not limited to 1. Architects: Fewer Harrington and Partners Architects 2. Civil Engineers: Malone O'Regan Consulting Engineers 3. Traffic Engineers: Coakley Consulting Engineers 4. Road Safety Engineers: PMCE Consulting Engineers 5. Planners: McCutcheon Halley Planning Consultants 6. Landscape Architects: Cunnane Stratton Reynolds 7. Public Lighting: Lawler Consulting 8. NIS/Ecology: Russell Environmental 9. Others.
DMURS Quality Audit and Road Safety Audit	In compliance with DMURS, independent Quality Audit (QA) report of the proposed site layout was undertaken by a TII approved independent audit team and is contained in Appendix B of the Traffic and Transport Assessment (TTA) report submitted for planning. The Quality Audit Report combines a range of DMURS audit elements into one single report including a community street audit, formal Road Safety Audit

Design Element	Compliance Review
	(RSA) to TII standards, Access Audit, Walking Audit, Non-Motorised User Audit and Cycle Audit. The recommendations made by both the Road Safety Audit and Quality Audit report have been reviewed and accepted in full by the design team and these recommendations have been addressed and incorporated into the final site layout drawings submitted for planning.