

# Architectural Design Statement

DOCUMENT: 3586-EML-XX-XX-RP-A-9002

**DEVELOPMENT:** Housing Development at Dunleer, Co. Louth

**CLIENT:** Louth County Council

**DATE:** April 2024

**PREPARED BY:** eml architects 37 Fitzwilliam Place Dublin 2

Prepared on behalf of Comhairle Contae Lú Louth County Council



# TABLE OF CONTENTS

### **1 INTRODUCTION**

- 1.1 LOCATION
- 1.2 SITE DESCRIPTION AND FEATURES
- 1.3 PLANNING CONTEXT

#### 2 PROPOSED DEVELOPMENT

- 2.1 OVERVIEW
- 2.2 CONTEXT
- 2.3 CONNECTIONS
- 2.4 INCLUSIVITY
- 2.5 VARIETY
- 2.6 EFFICIENCY & LIGHT
- 2.7 DISTINCTIVENESS
- 2.8 LAYOUT
- 2.9 ADAPTABILITY
- 2.10 PRIVACY AND AMENITY
- 2.11 PUBLIC REALM
- 2.12 PARKING
- 2.13 DETAILED DESIGN

**3 CONCLUSION** 

APPENDIX A: DRAWING REGISTER

APPENDIX B: ACOUSTIC STATEMENT

COVER IMAGE: CGI VIEW OF HOUSES ALONG THE ESTATE ROAD, LOOKING EAST (HOUSES 23-28). FINAL SELECTION OF BRICK AND RENDER AND EXTENTS OF SAME TO BE AGREED WITH LOUTH COUNTY COUNCIL.



This proposed development is one of five sites within County Louth identified for accelerated delivery as part of the government's Housing for All plan. It proposes to deliver high quality homes and sustainable communities, while utilising accelerated delivery routes and technologies available to assist its rapid programme.

The development will include the construction of 70no. houses including 9no. 2-bed bungalows, 24no. two storey 2-bed houses, 18no. two storey 3bed houses, 5no. two storey 4-bed houses, and 2no. 3-bed bungalows, and 12no. sheltered accommodation 2-bed bungalows on a site of 3.17 hectares in the townland of Ravel, Dunleer, Co. Louth.

The development will also include the construction of new connections to the existing estate road; provision of new cycleway, footpath, and public lighting along the boundary with the R170; new estate roads and homezones within the site; 123no. car parking spaces including both onstreet and in-curtilage parking; cycle parking; hard and soft landscaping including public open spaces, playground, and private gardens; boundary treatments; ESB substation; lighting; laying of underground sewers, mains and pipes; underground pump station and attenuation tank; and all associated works. This Design Statement is structured to demonstrate accordance with the 12 criteria set out in the *Urban Design Manual*.

This document should be read in conjunction with the suite of drawings, reports, and forms accompanying it, including:

- All drawings listed on the eml architects Drawing Register & Distribution Sheet (Appendix A)

- All reports and input from the wider design team listed below:

Hayes Higgins Partnership Engineering Consultants

Hughes Planning & Development Consultants

Áit Urbanism and Landscape

Flynn Furney Environmental Consultants

Thornton O'Connor Town Planning



#### **1.1 SITE LOCATION & DESCRIPTION**

This site is located on the edge of Dunleer town in Louth, adjacent to a recent social housing development called Ravel Grange (to the east). In developing this adjacent site, access roads, footpaths and fencing have already been put in place, such that the proposed site extents are clearly defined.

To the south is Scoil Bhride NS and the Ardee Road which leads to Dunleer Main Street; farmland lies to the north and west. The site is bordered by the R170 road along the west, as well as two singlestorey detached houses at the north-western corner.

The site is approximately a 5-10 minute walk from Dunleer Main Street to the south which offers a range of amenities and services including convenience stores, cafes and coffee shops, takeaways, pharmacies, a library, and a post office.

The National Inventory of Architectural Heritage (NIAH) has no records of historic structures on the site. In the wider area, the nearest structures of note include several houses in the town, Dunleer Church of Ireland, and the Market House on Main Street.

Bus Eireann routes 100 (Dundalk-Drogheda) and 100X (Dundalk-Dublin) stop in the town, with services typically hourly during weekdays 9-6.





SITE PHOTOS, CLOCKWISE FROM TOP LEFT: LOOKING WEST TOWARDS DETACHED HOUSES; VIEW OF DITCH ALONG NORTHERN BOUNDARY WITH NEW FENCING INSTALLED DURING WORKS ON ADJACENT DEVELOPMENT; RAVEL GRANGE DEVELOPMENT; EXISTING ACCESS ROAD AND FENCING THROUGH THE SITE.



### **1.1 SITE LOCATION**



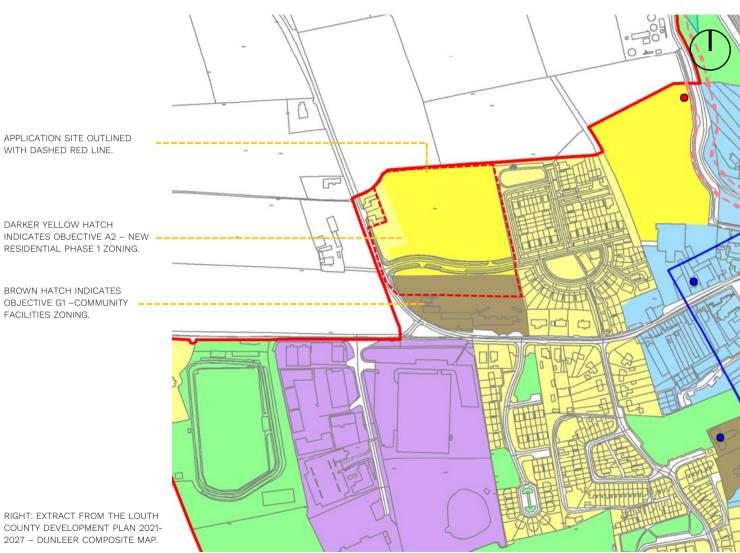


#### **1.2 PLANNING CONTEXT**

For a detailed analysis of the planning context please refer to the separate report from Hughes Planning & Development Consultants. A brief summary of some items is presented here for context and ease of reference

The majority of the site is zoned A2 – New Residential Phase 1, where the objective is "provide for new residential to neighbourhoods and supporting community facilities."

A portion of the site to the south is zoned G2 - Community Facilities, the objective of which is "to provide for and protect civic, religious, community, education, health care and social infrastructure." Housing for older persons/sheltered accommodation is proposed for this part of the site to cater for this need within Louth. This type of use is open for consideration within this zoning.



COUNTY DEVELOPMENT PLAN 2021-2027 - DUNLEER COMPOSITE MAP.



#### 2.1 OVERVIEW

The approach to the site layout is to adopt a form that's consistent with the adjoining, recently completed Ravel Grange development. Therefore, it proposes two perimeter blocks typically with privacy zones to the front and on-street parking. A mix of semi-detached and terraced housing is proposed which also follows the precedent set by Ravel Grange.

At the west side of the site, houses back onto two existing houses that adjoin the site.

The site falls (by approximately 1.5 metres) to the north and there is a drainage ditch/stream forming the northern boundary. For those reasons (and similar to the adjoining Ravel Grange development), the primary public open space is positioned here. There will be a high level of natural surveillance over the public open space provided by the adjoining housing. Smaller public open spaces are indicated the south-west corner of the site (adjacent to the estate entrance). Seating and social spaces are provided at both locations.

Sheltered or assisted living housing is proposed in the strip of lands to the south which is considered appropriate for the community zoning use here.



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#### 2.2 CONTEXT

The adjacent development at Ravel Grange from c.2020 sets a useful precedent for the proposed scheme which will lie directly to the west. The lands have been fenced and prepared for development with services available, and a local access road and footpaths already constructed along the edge of the lands. The development of the site will add further to the compact growth of Dunleer town.

The proposed design will add to the character of this new neighbourhood by introducing new houses of the same typology (low-rise, medium density, semi-detached and terraces), albeit with their own distinct appearance and a variety of open spaces. The scheme also follows the form of the adjacent development in proposing perimeter blocks with privacy zones to the front, and some on-street parking.

The houses are set out on a back-to-back or back-to-boundary basis to ensure that private open space is defensible and that there is a high degree of natural surveillance over the public realm. The riparian area alongside the stream to the northern boundary will be retained and supplemented with a low maintenance buffer strip of tree and meadow planting. The trees will include natives such as Hazel, Hawthorn and Bird Cherry.

The landscaping of the proposed scheme will join naturally to the open space of the adjacent development, while having its own distinct character – this will include a mix of durable materials to the public realm, permeable paving, street trees, a mix of bulb and perennial planting, playgrounds and seating.



TOP: IMAGE OF ADJACENT RAVEL GRANGE DEVELOPMENT WITH A MIX OF HOUSING TYPES.

RIGHT: IMAGE FROM THE PROPOSED SITE WITH FENCING AND PERIMETER FOOTPATH IN PLACE, LOOKING EAST TOWARDS RAVEL GRANGE.





### 2.3 CONNECTIONS

The existing local street linking this development with Ravel Grange has provided a good quality connection from the regional road R170 (Ardee Road) towards the centre of Dunleer town. The design of the proposed scheme aims to:

- enhance the attractiveness of this route with quality landscaping
- ensure routes have passive surveillance for safety and comfort
- connect to existing routes along desire lines

Any new footpaths within the scheme are 2m wide (above DMURS guidelines), with homezone treatments applied to any cul-de-sacs to allow people to cross through the neighbourhood where convenient.

Future active travel routes have been allowed for along the regional road R170 with a 4.3m setback from the road edge (for footpath, cycleway and buffer).

The provision of 70 new houses on this site, in combination with the new houses in Ravel Grange, will ensure the creation of a vibrant neighbourhood and support network for the residents, in particular for older persons. This neighbourhood will be closely linked to the places people want to get to, including the services available on Dunleer Main Street (c. 5-10 minute walk away), and bus services to Dundalk, Drogheda, and Dublin.

> CREATING SPACE FOR FUTURE ACTIVE TRAVEL CONNECTIONS ALONG THE REGOINAL ROAD

NEW ROUTES FOLLOW LOGICAL DESIRE





#### 2.4 INCLUSIVITY

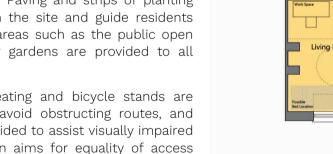
This development is designed to be inclusive and specifically address the housing needs of Louth, with a very high proportion of the houses (36%) designed to a standard beyond Part M requirements. This includes 23 houses designed to the "UD" standard and 2 houses designed to the "UD+" standard, following the requirements of the "Universal Desian Guidelines For Homes in Ireland" published by the Centre for Excellence in Universal Design.

A hierarchy of external spaces is proposed which will ensure accessibility for visitors while maintaining security and privacy for residents. Footpaths exceed 2m in width and slope gently, and internal streets reduce to 5.5m wide in line with DMURS guidance to ensure a comfortable environment for pedestrians. Paving and strips of planting delineate the routes through the site and guide residents and visitors towards public areas such as the public open spaces, while generous rear gardens are provided to all houses for private amenity.

Street furniture including seating and bicycle stands are grouped and positioned to avoid obstructing routes, and adequate lighting will be provided to assist visually impaired people. In general the design aims for equality of access with level surfaces, non-slip materials and resting places at key access points.

A mix of parking including disabled spaces, on-street and driveway/in-curtilage parking ensures that new homes meet the aspirations of a range of people and households.

ABOVE: EXTRACT FROM THE UNIVERSAL DESIGN GUIDELINES FOR HOMES IN IRELAND. SHOWING REOUIREMENTS WHICH WERE INCORPORATED INTO HOUSES TYPE E.





5.2 - 3 Bedroom 5 Person Semi-Detached House

Universal Design layout - Indicative Floor Plan Example



5.2 - 3 Bedroom 5 Person Semi-Detached House Universal Design layout - Indicative Floor Plan Example

Ground Floor

First Floor

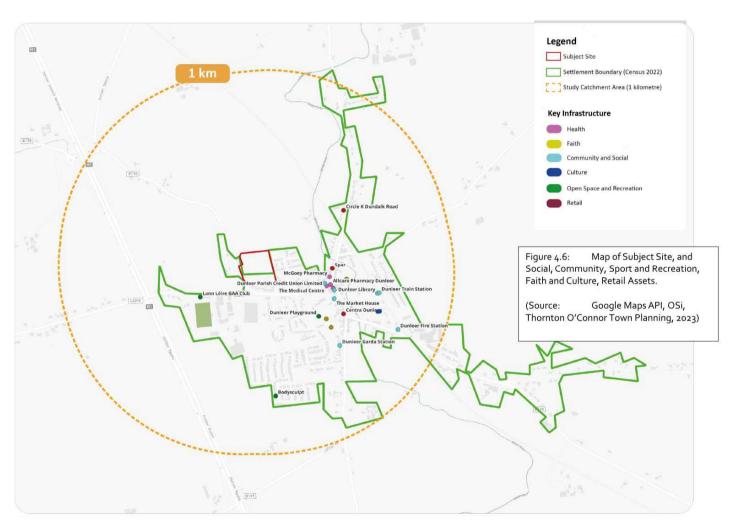
#### 2.5 VARIETY

The new houses provided by this proposal will incrementally enhance the vibrancy of life in Dunleer town and the locality by adding a diverse population of new residents who will avail of and contribute to local businesses and services.

The mix of housing includes 2-bed, 3-bed, and 4bed houses taking the form of detached, semidetached, and terraced housing. This variety of type will cater for small and large families, couples, and those with varied mobility needs across the lifetime of the scheme. In addition, the inclusion of housing for older people on the southern lands will ensure that the development remains multi-generational.

The landscaping design will also contribute a variety of quality open spaces to those already provided in the adjacent development. The Ravel Grange open spaces include a mix of formal fenced playspaces, gym equipment and a sports court, and the proposed development will complement this with informal seating and socialisation spaces, lawns for kickabout, and low-maintenance meadow planting.

RIGHT: MAP EXTRACT FROM SOCIAL INFRASTRUCTURE AUDIT BY THORNTON O'CONNOR, SHOWING THE VARIETY OF FACILITIES AVAILABLE IN THE LOCAL AREA.





#### 2.6 EFFICIENCY AND LIGHT

The low-rise nature of the scheme will ensure that the development provides quality of light for residents of the housing, their private amenity areas, and public spaces. As stated in the government's *Sustainable Residential Development and Compact Settlements Guidelines* released in early 2024,

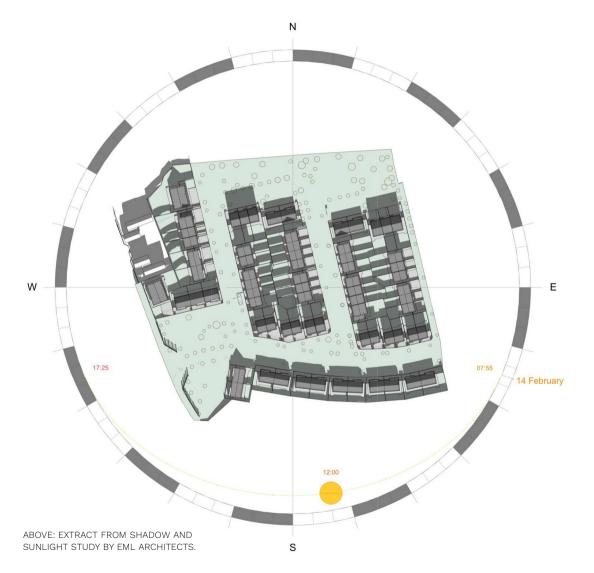
"it should be clear from the assessment of architectural drawings (including sections) in the case of low-rise housing with good separation from existing and proposed buildings that undue impact would not arise."

In the case of the proposed development, houses are at most twostoreys tall and maintain separation distances of 22m back-to-back in line with the Louth County Development Plan and typical precedents.

eml architects have also undertaken a high-level shadow study to check that no undue impacts will arise; this study (right) confirms that the proposal will have minimal impact on surrounding developments and similarly will not be significantly impacted by existing structures. The public open space along the stream to the north is separated from the housing on all sides and so will receive high levels of sunlight at all times of year.

Site investigation works indicate that the ground on the site is impermeable, but new biodiverse planting including native tree species will improve the soil quality and aeration gradually, reducing the burden on built drainage systems.

In general the scheme takes into account appropriate accessibility by public transport and the objectives of good design, and aims for a density which matches the development plan standard of 25 units/ha to support the compact and sustainable expansion of Dunleer.



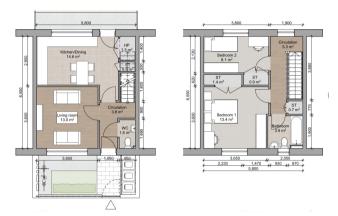


### 2.7 DISTINCTIVENESS

The proposal will create a sense of place through a number of design features:



The material palette will be similar to the adjacent Ravel Grange, used in its own unique way to create recognisable features.



The house layouts are based on those in the DHLGH's *Design Manual for Quality Housing*. Architectural variation is provided through window treatment, canopies, and materials which set them apart from the same house types in other locations.



The layout makes the most of the natural site features – the main public open space is located beside the stream along a riparian corridor to enhance biodiversity.



The entrance to the scheme from the R170 reinforces the visual identity of this new neighbourhood with brick piers and railings, and pockets of seating for socialisation as you enter.



The scheme is a positive addition to the identity of the locality, with the high proportion of UD units and housing for older people bringing a diverse cohort of new residents.



The public open spaces will form discernible focal points throughout the scheme, providing opportunities for socialisation, play, and exercise.



#### 2.8 LAYOUT

The proposal will create people-friendly streets and spaces through the use of best-practice department guidance, including *DMURS*, the *Design Manual for Quality Housing*, and *Quality Housing for Sustainable Communities*. This includes adopting key measures such as:

- clear street hierarchy: streets reduce to 5.5m wide off the existing local street, and cul-de-sacs are treated as homezones

- the approach to sizing privacy zones: approximately 2.2m setback for strong street frontage, which also allows for bin and bicycle storage

- layout of street parking: no more than 3 consecutive parallel parking spaces

In general the approach to the site layout is to adopt a form that's consistent with the adjoining, recently completed Ravel Grange development. Therefore, it proposes two perimeter blocks with privacy zones to the front and on-street parking. This new scheme will also aligns new routes with desire lines to create a permeable interconnected series of routes that are easy and logical to navigate around. This includes creating links between the new and existing public open spaces along the stream to the north, and allowing for pedestrian shortcuts through the development from the R170 (see also diagram in section 2.3).



PRECEDENT PHOTOS, TOP: DCC ARCHITECTS DIVISION – O'DEVANEY GARDENS REGENERATION PHASE 1. SHOWING PRIVATE CURTILAGE IN FRONT OF THE HOUSE WITH BIN STORAGE, PERMEABLE PAVING, AND INTEGRATED LANDSCAPING.

BOTTOM;

PRECEDENT IMAGES FROM ÁIT U+L SHOWING HOMEZONE TREATMENT.









#### 2.9 ADAPTABILITY

In setting out the brief for the project and in designing the buildings, the team have incorporated several best practice strategies to allow the development to cope with change.

The high proportion of UD houses in the scheme will provide for both current and changing mobility needs over time. The Type A house has an enlarged hall and turning space for standard wheelchairs or people with walking aids; the type E house caters for specific needs within Louth by providing a large family home with a wheelchair-accessible downstairs bedroom and adaptability of other rooms; the type G house is a fully accessible 3-bed bungalow with space allowance for bathroom hoists if needed in future.

In addition to these provisions for universal design, private outdoor spaces exceed the guidance in the *Sustainable Residential Development and Compact Settlements Guidelines* and homes are generally designed so that they can be extended to the rear where that becomes necessary. Similarly, all house types have been tested with furniture layouts to check that bedrooms can incorporate a desk, wardrobe and bedside lockers without conflicting with other building elements such as windows.

The scheme is targeting Home Performance Index (HPI) certification which goes beyond typical building regulation requirements to include targets on water efficiency, overheating and biodiversity. This will ensure that the homes are energy-efficient and equipped for the challenges anticipated from a changing climate.



ABOVE: KITCHEN LAYOUTS HAVE BEEN PLANNED TO AVOID CLASHES WITH WINDOWS OR UNCOORDINATED VENTS ON EXTERNAL FACADES. HOUSE TYPE LAYOUTS HAVE BEEN TESTED TO ENSURE FURNITURE CAN BE COMFORTABLY ACCOMMODATED, INCLUDING BEDROOMS WHICH INDICATE POSITIONS OF DESKS TO ALLOW FOR STUDENTS TO STUDY, OR FOR FLEXIBILITY FOR WORKING FROM HOME.



#### 2.10 PRIVACY AND AMENITY

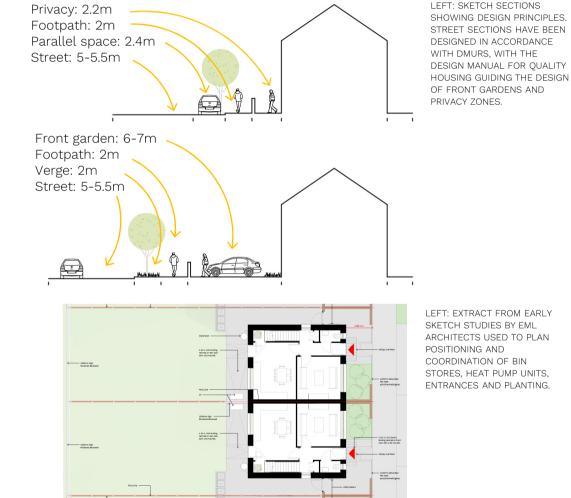
Each home has access to an area of useable, quality private outdoor space. These typically meet Louth Development Plan standards and are in excess of the *Sustainable Residential Development and Compact Settlements Guidelines*.

The units that address onto the main estate road are semi-detached so refuse bins, bicycles etc. can be stored to the rear of the houses. Where houses are in terraces there will be discrete bin enclosures within the privacy zones at the front. Bin enclosures, bike storage and external equipment such as heat pumps have been considered from the start so that their placement does not encroach on circulation spaces externally.

All homes are dual aspect, with semi-detached and detached houses also having windows to the side gables; this has the advantage of adding activation to the street edge and providing further passive surveillance.

Acoustic privacy will be ensured through rigorous oversight by the design team's acoustic consultants. iAcoustics have considerable experience in acoustic design and testing, and have submitted a supporting statement as part of this document (Appendix B) – the baseline testing undertaken on site confirms that standard window specifications and garden fences will mitigate any nearby sound pollution of note. The Home Performance Index (HPI) certification targeted by the scheme also asks for appropriate oversight and testing so that acoustic privacy is achieved in reality.

All homes are designed to provide adequate storage space in line with *Quality Housing for Sustainable Communities*. Calculated storage area values exclude areas required for heat pumps or hot water cylinders, and so reflect actual usable storage.





PRECEDENT PHOTOS, LEFT:

O'BRIAIN BEARY ARCHITECTS – BALLYMONEEN SOCIAL HOUSING, GALWAY CITY. CURTILAGES IN FRONT OF THE HOUSES WITH BIN STORAGE ARE SOFTENED WITH LANDSCAPING AND DIFFERENT GROUND SUBFACE FINISHES.

#### 2.11 PUBLIC REALM

eml architects have worked closely with Hayes Higgins Partnership and Áit U+L to design a public realm which is safe, secure and enjoyable for all to use.

All public open space is overlooked by surrounding homes so that this amenity is owned by the residents and safe to use – this includes pockets of seating space along the existing local road, as well as the main public open space along the stream. Play areas are centrally located within the open spaces so that they are safe.

The public realm is considered as a usable integrated element in the design of the development, evidenced by the smaller pockets of seating and social spaces designed in addition to the main open space. There is a clear definition between public and private space with low walls, estate railings, and changes in surface materials delineating privacy zones to houses.

The Department house types have been enhanced by the addition of gable windows at key corners in the development, which adds activation to the street edge and allows for further passive surveillance.

#### 2.12 PARKING

While the goal in new developments is to encourage a transition to more sustainable modes of transport, car parking has also been designed to be secure and attractive where provided. This includes spaces which are adequately dispersed through the development so that parking is within easy reach of the home's front door. Parked cars are overlooked by houses, pedestrians and traffic. Some houses have been provided with off-street parking for larger families, persons with adapted vehicles, or to allow for a proportion of off-street EV chargers.

For end-of-terrace or detached houses, side passages allow for bicycles to be stored safely to the rear of the house, while secure anchors are provided for mid-terrace units to lock bicycles to.

BELOW RIGHT: PHOTOS OF CHURCHFIELDS SOCIAL HOUSING BY EML ARCHITECTS FOR FINGAL COUNTY COUNCIL, SHOWING PERMEABLE PAVING USED FOR OFF-STREET PARKING.





#### 2.13 DETAILED DESIGN

The material palette has been developed with consideration for how changing seasons, weather conditions and light will affect the buildings over time and selected materials which are hard-wearing, will weather in a predictable and controlled fashion, or have been considered carefully in the context of long-term maintenance and appearance.

Our aim is to create architectural character and distinction through good design, a mixed palette of materials along with creativity applied to fenestration, canopies and elevational detail. An emphasis on gable treatments and curtilages will offer strong architectural character, natural surveillance and a sense of place.

Materials and finishes will be durable and sympathetic to the surrounding context, to include brick and render to complement the adjacent development, concrete roof tiles, zinc-clad canopies, and high-quality composite windows and rainwater goods. All to achieve a 60-year design life in line with the Building Regulations.

Care has been taken over the siting of rainwater pipes, vents, mechanical equipment and bin stores; these have been confined to the rear of houses where possible. Bin stores located to the front of houses in privacy zones are concealed with brick garden walls and face away from estate entrances. Kitchen and bathroom layouts have been tested to check positioning of extracts and vent pipes.

Design of both the buildings and the landscaping public space will facilitate easy and regular maintenance, with design details following best practice precedents and department guidance documents.



CLOCKWISE FROM TOP: EXAMPLE OF BUFF BRICK MIX PAIRED WITH METAL PROJECTING DETAILS AND AREAS OF RENDER (ROSEMOUNT COURT, DÚN LAOGHAIRE-RATHDOWN COUNTY COUNCIL); BUFF BRICK SAMPLE; TYPICAL OFF-WHITE ACCENT RENDER.





#### 2.13 DETAILED DESIGN - MATERIAL PRECEDENTS

ABK ARCHITECTS - LADYSWELL SQUARE, MULHUDDART, DUBLIN. FOR CLÚID HOUSING.

CLAY TILE ROOF FINISH PAIRED WITH RENDER AND BRICK TO THE HOUSES, BUFF COLOUR TO HOMEZONE ON STREET, INTEGRATED BIN STORES AND PLANTERS TO FRONT GARDENS.







EML ARCHITECTS - CHURCH AVENUE, RATHMINES, DUBLIN.

EXAMPLE SHOWING PRIVATE PARKING IN CURTILAGE WITH PERMEABLE PAVING, BIN STORAGE AND SMALL PRIVATE LANDSCAPING. HOUSES FINISHED IN BRICK WITH COLOUR CONTRASTING WINDOWS AND DETAILING.





### **3 CONCLUSION**

In the context of a pressing need for housing and a limited supply, and the government's housing delivery targets set out in Housing For All, this proposal for quality housing on a residential zoned site offers the opportunity to add a dense mix of house types to a well-serviced neighbourhood.

The designs integrate into the existing neighbourhood by referring to the local material and typological precedents, while having its own recognisable features.

In addition, the proposed scheme will create its own sense of community through the quality landscaping which offers opportunities for socialising and new connections.

It is envisaged that when complete, the proposed development will positively contribute to the sustainable development of the Dunleer town.



# APPENDIX A: DRAWING REGISTER



### **DRAWING REGISTER & DISTRIBUTION SHEET**

DRAWING REGISTER & DISTRIBUTION SHEET												1
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Project:	Louth ADP Housing: Dunlee	er										
Issue:	179A										w	ww.eml.ie
Job. No.:	3586											
	Day Month Year				4							
Media Type					- ·							
Hard Copy												
Email/File Transfer					Х							
CD												
Distribution						 	Qu	antity		1		
Client/Contracting Authority					Х							
Design Team					Х							
Main Contractor												
BCMS												
Drawing Description	Drg. No.	Size	Scale	Latest	t		Rev	visions				
Site Location Map	3586-EML-XX-XX-DR-A-0001	A2	1:1000	Х	Х							
Existing Site Plan	3586-EML-XX-00-DR-A-0002	A1	1:500	х	X							
Proposed Site Key Plan	3586-EML-XX-02-DR-A-0003	A2	1:1000	X	X							
Proposed Site Layout	3586-EML-XX-02-DR-A-0004	A1	1:500	X	X							
Proposed Boundary Types	3586-EML-XX-02-DR-A-0005	A1	1:500	X	X							
Proposed Site Sections & Elevations 1	3586-EML-XX-ZZ-DR-A-2002	A1	1:200	Х	Х							
Proposed Site Sections & Elevations 2	3586-EML-XX-ZZ-DR-A-2003	A1	1:200	Х	Х							
Proposed Site Sections & Elevations 3	3586-EML-XX-ZZ-DR-A-2004	A1	1:200	Х	Х							
House Type A - 2b3p1s	3586-EML-ZZ-ZZ-DR-A-7001	A3	1:100	Х	Х							
House Type B - 2b4p2s	3586-EML-ZZ-ZZ-DR-A-7002	A3	1:100	Х	Х							
House Type C1 - 3b5p2s	3586-EML-ZZ-ZZ-DR-A-7003	A3	1:100	Х	Х							

Drawing Description	Drg. No.	Size	Scale	Latest	t Revisions									
House Type E - 4b7p2s-UD	3586-EML-ZZ-ZZ-DR-A-7006	A3	1:100	Х	Х									
House Type F - 4b7p2s	3586-EML-ZZ-ZZ-DR-A-7007	A3	1:100	Х	Х									
House Type G - 3b5p1s	3586-EML-ZZ-ZZ-DR-A-7008	A2	1:100	Х	Х									
Schedule of Accommodation	3586-EML-XX-XX-SH-A-9001	A4	N/A	Х	Х									
Design Statement	3586-EML-XX-XX-RP-A-9002	A4	N/A	Х	Х									

# APPENDIX B: ACOUSTIC STATEMENT





### <u>Dunleer</u>

iAcoustics

iAcoustics carried out a 1-hour baseline noise survey at the Dunleer site on 10<sup>th</sup> November 2023. All measurements were taken with calibrated precision grade, Type Approved (Class 1) sound level meters as per IEC 61672-1:2013. All equipment has calibration certificates traceable to the relevant standard. Measurements were captured in line with *ISO 1996-1:2016 Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures*. Road traffic from the M1 was observed to be the dominant noise source.

A summary of the noise measurements is presented below:

- $\lambda$  LAeq, 15mins = 60dB
- $\lambda$  LAFmax = 64dB
- $\lambda$  LAF10% = 52dB
- $\lambda$  LAF90% = 59dB

In the context of the Professional Practice Guidance on Planning & Noise: New Residential Developments 2017 (ProPG), these noise levels would be considered "Low to Medium Risk". Such noise levels warrant a good acoustic design in order to avoid any potential for a significant adverse noise impact in the finished development. The noise levels listed above are representative of the entire site. Numerous measurements were captured around the site and all measurements occurred within a tight margin. That is to say, distance from the M1 had little effect on the measurements.

To achieve appropriate indoor noise levels as per the World Health Organisation's Environmental Noise Guidelines 2018 and the Guidelines for Community Noise 1999, all dwellings on the proposed site are recommended to employ windows with an acoustic rating of 32dB Rw or higher for noise sensitive rooms. Ventilators to noise sensitive rooms are recommended to have an acoustic rating of 30dB D,n,e,w or higher.

Outdoor noise levels in amenable spaces would be addressed by relatively tall garden fences. A recommendation is made for 6 foot high fences, to act as noise barriers, creating a shadow area in the gardens. Such fencing in the gardens is calculated to attenuate traffic noise by 5dB. Including for the attenuation properties and showing effects of the houses themselves, noise levels are then calculated to occur below the thresholds for road traffic noise exposure and serious annoyance, as set out by the World Health Organization Environmental Noise Guidelines 2018 and the Guidelines for Community Noise 1999.