



Rialtas na hÉireann
Government of Ireland

Design Manual for Quality Housing



Prepared by the Department of Housing, Local Government and Heritage
gov.ie/housing



Design Manual for **Quality Housing**

Quality Housing Design Series

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Minister's Foreword

Context of Housing for All

The Government's Housing for All Plan has been prepared in the context of changing demographics and in light of the urgent need to address climate change through more sustainable settlement patterns. With the policy stability, funding certainty and delivery targets which that Plan sets out, we can now re-examine the appropriateness of housing typologies and their location. We must also continue to improve not only the quantity of housing output across all the various forms of tenure but also to maintain and improve on the quality of residential development, and to do so in an economic manner.

Climate Change Challenges and NPF

This manual sits firmly within the *Programme for Government* strategy to combat climate change, in accordance with the State's obligations as a signatory of the Paris Agreement. The principle of compact growth is one of the core elements of the *Project Ireland 2040 – National Planning Framework (NPF)*. This idea of the compact and walkable neighbourhood was already in place in our traditional towns and villages, and we can learn a lot from these traditional communities. This manual promotes compact settlement to foster sustainable communities by encouraging improved land usage through increased densities. It also seeks to promote reduced travel distances while delivering quality in the public realm, thereby making it both easier and more attractive to walk and cycle. All these measures reduce dependence on private car use and reduce carbon emissions in travel. Separately, Part L of the Building Regulations (2019) issued by my Department, seeks to reduce the energy demand of the running of individual buildings to nearly zero. The NPF outlines how improved land use will involve both greater building heights as well as increased density.

Changing Demographics

In recent years, household formation has seen a decrease in family size and a continued increase in one-, two- and three-person households. This manual provides guidance and examples of a range of housing options to better provide appropriate housing choices for the smaller sized households, for the increasing number of older people who want to remain in their community, and for persons with a disability who may have special housing needs.

Site Layouts to Illustrate Design Principles

The sample site layouts included in this Manual set out the urban design and placemaking priorities to help deliver a high-quality and sustainable development. These layouts are intended to illustrate the design principles and good practice that the Department, when evaluating the acceptability of scheme designs for funding approval, would expect to see implemented. Of course, it is also well understood that each scheme will have its own site-specific influences and particular requirements.

Housing Internal Layouts

The standard internal layouts provided in this Manual are considered to be fully consistent with the design principles set out in the documents *Quality Housing for Sustainable Communities* (2007) and *Design Standards for New Apartments* (2018). Accordingly, these layouts are considered to comply with good practice and to meet the Department's requirements for good-quality accommodation for the dwellings' future residents.

Improved Delivery

By using these design principles for site layouts and the standard internal layouts for houses, duplexes and apartments, in conjunction with the standards and recommendations set out in *Employer's Requirements for Detail Design of Quality Housing* (2020), and the increased certainty as to what is acceptable for funding, local authorities and Approved Housing Bodies will be facilitated to improve delivery times for residential developments.

Conclusion

I am pleased to welcome the extensive guidance provided in this manual, and I am confident that it will greatly assist local authorities, Approved Housing Bodies, their respective design teams and planners.

Darragh O'Brien T.D.

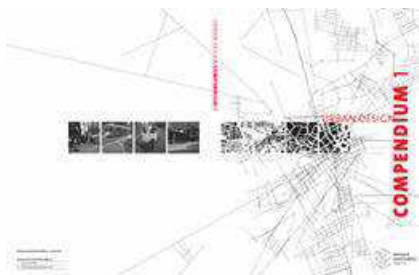
Minister of Housing,
Local Government & Heritage



Introduction

0.1 The intention of this manual is to give guidance on the design of residential site layouts, and on the design of internal layouts of new apartments and houses. The manual is predominantly aimed at local authorities, Approved Housing Bodies¹ and their consultants, who are involved with the design of social housing and with delivering individual social housing developments or larger mixed-tenure developments. The design principles should be equally applicable to any residential development, however.

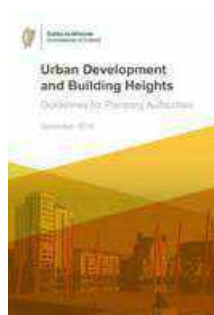
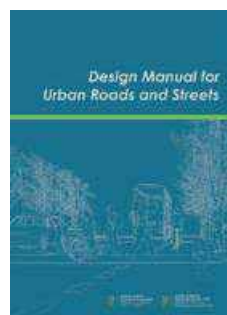
0.2 Consistent with Planning Policy set out in the *National Planning Framework - Ireland 2040*, (NPF), this manual follows on from and gives graphic representation to the Department's design guidelines as set out in *Quality Housing for Sustainable Communities* (2007) (QHfSC), and provides practical information on how these guidelines may be met. It also draws on the following suite of guidance documents, which have been published mainly by the Department and also includes international best practice.



0.3 This manual should therefore be read in conjunction with

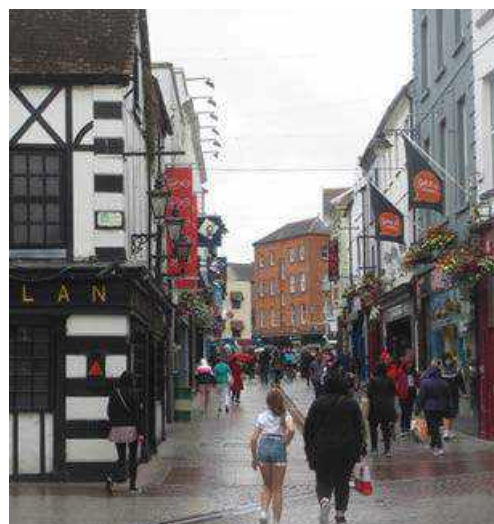
- *Quality Housing for Sustainable Communities* (QHfSC) (2007)
- *Design Manual for Urban Roads and Streets* (DMURS) (2019)
- *Sustainable Residential Development in Urban Areas* (SRDUA) (2009)
- *National Planning Framework - Ireland 2040 Our Plan* (NPF) (2018)
- *Design Standards for New Apartments* (DSfNA) (2018)
- *Urban Development and Building Height Guidelines* (UDBHG) (2018)
- *Employer's Requirements for Detail Design of Quality Housing* (ER) (2019)
- *Urban Design Compendium* (UDC) (2000)

In the unlikely event of conflict with anything in this manual, the above documents take precedence. Appendix 1 contains links to these documents, where available, while also listing other reference documents.



¹ All references to local authorities as commissioners and designers of housing in this manual shall also be understood to include Approved Housing Bodies (AHBs) and any other relevant bodies involved in the delivery of social or affordable housing.

- 0.4** *Rebuilding Ireland* identified the need to assist local authorities in the regeneration of run-down estates, by improving the layout to avoid the challenges of anti-social behaviour, and where possible addressing the issues of social exclusion. In promoting appropriate location and best urban design principles of site layout which attempt to avoid facilitating anti-social behaviour, this manual provides guidance on measures to minimise the need for such regeneration from the outset.
- 05** The need for this manual was also identified in *Social Housing Design, Approval and Delivery: Process and Procedures Review* (2017), which in Section 2.5 recommended that ‘the promotion of optional standard internal layout type templates should be advanced in order to realise potential benefits in terms of resourcing at design stage and the production of components and build packages at production stage’. However, the manual has precedent, as guidance documents and model layouts were first published by the Department almost 100 years ago, such as those in the house designs prescribed by the Minister for Local Government under the Housing Act 1924.
- 0.6** Although it adopts the five-chapter structure of QHfSC, this manual essentially comprises three major parts, which may be described as follows:
- 0.7** The first major part comprises the three introductory chapters, which deal respectively with site selection, design brief and urban design. In amplifying QHfSC and other guidance, this part of the manual outlines the Department’s vision for sustainable settlement and sustainable communities.



- 0.8** The second part comprises Chapter 4, which draws on national and international best practice to set out the most important design principles that should be prioritised in any site layout, with a view to delivering a permeable and robust urban structure and achieving quality in the public realm. Amongst other things, these design principles seek to improve feelings of security in public places and to deliver shorter travel distances, so that walking and cycling will be easier and more attractive. This chapter also includes diagrammatic examples of site and apartment building layouts. To demonstrate improved land use, Chapter 4 illustrates the combination of dwelling types in sample site layouts.
- 0.9** Chapter 5 contains the internal layouts for a wide variety of dwelling types. The internal layouts here address a number of important considerations. Principally they are consistent with achieving improved land use. This facilitates easier access to a wider level of facilities, makes public transport more commercially viable and will reduce the dependence on private cars. Coupled with dwellings designed to nZEB standards², this can significantly reduce the impact of new housing on climate change. Largely dependent on private car use, older low-density typologies have impacted more negatively on the environment, and potentially on human health and well-being, and are therefore becoming more unsustainable.
- 0.10** The internal layouts are also consistent with the intention of providing appropriate housing choices to better meet the demographical challenges of our growing population of older persons and our smaller household sizes.

² nZEB (Nearly Zero) – a building that has been designed to a very high energy performance in accordance with Annex 1 of the EU Energy Performance of Buildings Directive (EPBD Recast) 2010/31/EU of 19th May 2010.

- 0.11** Finally, the internal layouts proposed are economic in design. They achieve this by minimising circulation space and maximising useable space within compact layouts, and by generally meeting or only slightly exceeding the target floor areas in QHfSC and DSfNA. The use of economic layouts to reduce construction costs will provide better value for money and thus enable more housing to be funded. If we are to deliver better public places, appropriate housing choices, improved land use, reduced car dependency, and sustainable communities, it must be accepted that older typologies are becoming less appropriate.
- 0.12** While the site layouts, and to a lesser extent the housing types, generally presuppose a greenfield or reasonably large brownfield site, Department policy is to encourage town-centre brownfield housing, and various funding incentives have been established towards that end.³ Future design challenges will include densification of existing low-density housing developments and the delivery of dwellings in small, constrained brownfield or backlands sites, where the site constraints may preclude the use of some of these internal layouts. Because the issues arising in such locations will be particular to each site, specific guidance is beyond the scope of this manual. The Block layouts in Chapter 4 and the dwelling layouts included in Chapter 5 do, however, illustrate many design principles that can usefully inform development on such pocket sites. Nevertheless, it is encouraging to be able to include examples of such brownfield and urban infill development undertaken by local authorities.



*Infill Social Housing, Clones, Co. Monaghan.
Craft Studio Architects.*



*Infill Social Housing, Clones, Co. Monaghan.
Craft Studio Architects.*

- 0.13** Although the guidance in this manual focuses on new-build, local authorities are well aware of the need to take every opportunity to address underuse and dereliction in their town centres, by way of acquisition and renovation/rebuilding of town-centre properties. The Department supports such measures, for instance, by funding the Buy and Renew programme. Some local authorities have been very proactive in this regard. Guidance on the repurposing of existing town centre properties for residential use, or returning them to same, has already been published by the Department in the publication *Bringing Back Homes* (2018).

Upper Bridge Street, Callan, Kilkenny The Good Shepherd Centre

This project by CANICE Architects involved the complete refurbishment of an existing three storey town centre building which consisted of residential above derelict commercial units, in a protected structure, to create six new social housing one-bedroom apartments. As well as providing needed housing, the redevelopment has contributed to revitalising the street and enhancing the public realm.

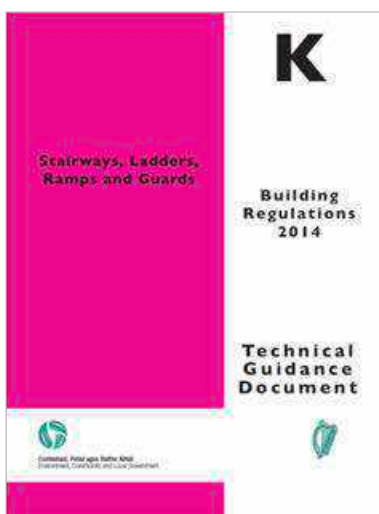


³ Reference ERDF and URDF funded town centre initiatives.



Infill Social Housing, Shandon Street reconstruction. Cork City Architects' Department & James Bourke Architects.

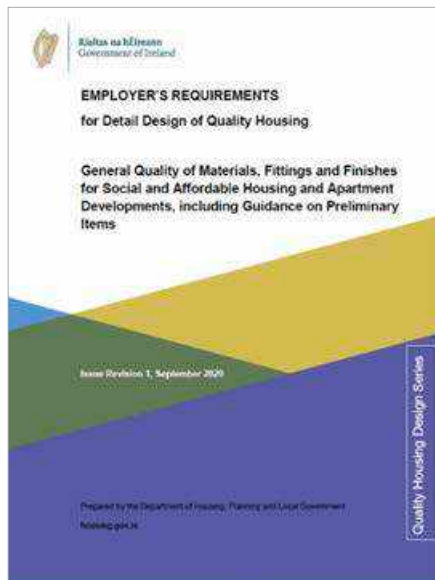
- 0.14** It is important to realise that the internal layouts in Chapter 5 are not for construction purposes. Neither are they intended to supplant the design skills of architects. Their purpose is to set out acceptable dwelling sizes, internal layouts, room sizes and configurations for new dwellings. Local authorities and their consultants are free to use these internal layouts to inform their own designs. However, they should understand that doing so does not relieve the local authority or consulting architects and other design team members, whether internal or externally procured, of their normal responsibilities for their own design, including, but not limited to, compliance with requirements under the Planning and Building Control Acts, achieving programme commitments and delivering value for money. Similar obligations arise in respect of the streets and site layouts in Chapters 3 and 4, which should be regarded as diagrammatic and not for construction, though they are intended to inform site-specific layouts and design.



- 0.15** In particular, the Building Control Acts mandate the designer to comply with the Building Regulations (and the Technical Guidance Documents [TGDs], which, where works are carried out in accordance with same, will prima facie indicate compliance), and provides for appropriate certification at the design stage and after the construction stage. In the unlikely event of anything in this manual being in conflict with the Building Regulations, compliance with the Building Regulations takes precedence.
- 0.16** Although use of these internal layouts is optional for Social Housing, they should be able to satisfy a wide range of housing needs, because they include a considerable range of types to suit a variety of circumstances. Of course, other dwelling types will sometimes need to be used, for instance to accommodate a particular site circumstance, to better meet site layout principles, or to respond to topography. However, any proposed alternative dwelling types will have to demonstrate consistency with the principles that have guided the design approach to apartments in Chapter 4 and the internal layouts in Chapter 5. Similarly, the inclusion of a particular internal layout in this manual places no obligation on a local authority to use that layout.
- 0.17** It is expected that local authorities will refer to this manual when undertaking social housing projects, particularly in respect of the guidance on site layouts and internal layouts, because consistency with the principles set out in this manual will be an important consideration in the evaluation of applications for funding by the Department. Adoption of any of these internal layout diagrams will be accepted by the Department as demonstrating consistency with the internal layout requirements of QHfSC. Diagrams shown here which feature a combination of dwellings will also be considered acceptable when such a combination is used. The Department does not preclude from funding any social housing proposal not adopting specific internal layouts, which demonstrates good practice and which is generally consistent with the design principles set out in this manual. Where a turnkey development relies on procurement derogation in respect of purchasing completed dwellings, mandating the use of this manual would not be appropriate where it would be inconsistent with the principle of not influencing the design, on which such derogation is dependent.

- 0.18** It is intended that this publication should be set out in a format in which it can be easily updated, should emerging policy need to be addressed, should further guidance on site layout become relevant or should additional dwelling types be identified. This manual is augmented by the document *Employer's Requirements for Detail Design of Quality Housing*.

The briefing of architects and consultants should refer to this document in respect of the quality of materials, fittings and finishes which the Department considers appropriate in the context of housing provision, whilst balancing initial cost with long-term maintenance and the need to deliver value for money. The *Employer's Requirements* also contains guidance on tender documentation towards encouraging a decrease in construction periods. This document should also be referenced at all the appropriate stages in the project.



- 0.19** It should be realised that the design and delivery of housing is a complex process, which requires an appropriate balance between often conflicting considerations. Among such considerations for instance are the need to balance barrier-free layouts with cellular accommodation; larger more flexible floor areas, with capital costs; improved land use and surface car parking. This manual attempts to indicate how an appropriate balance may be achieved.
- 0.20** As this manual provides examples of what the Department considers acceptable in terms of diagrammatic site layouts and internal dwelling layouts, it is theoretical and does not refer to any specific site, and as any development utilising the contents of this document will in itself be the subject of a specific application for permission under the Planning Acts, it was not considered necessary to carry out any screening report or strategic environmental assessment.

Acknowledgements

- 0.21** Many thanks to the skill and expertise of O'Briain Beary Architects who prepared all uncredited diagrams and designed all internal dwelling layouts on the basis of diagrams and internal layout sketches developed by the Architect Advisors in the Department. Many thanks also to all the local authorities, Approved Housing Bodies, the CEUD, Planning, Building Standards and Quantity Surveying colleagues in the Department, and other stakeholders who took the time to draw on their considerable experience and provide welcome comments on the consultation draft of this manual. These included suggestions on the text and insights on individual internal layouts. Some alternative layouts and improvements on the block layouts were also proposed. All of these comments were carefully considered, and many have been incorporated into this edition. Many thanks also to those local authorities and other contributors who kindly provided photographs for inclusion in the manual. Finally many thanks to Power Design Associates for graphic design of the Manual. Additional credits are set out in Appendix 2.



Infill Social Housing, Frascati Road, Blackrock. Dun Laoghaire-Rathdown Co Co Architects' Department.

1

Chapter 1
Site Selection

The guidance document **Quality Housing for Sustainable Communities (QHfSC)** sets out in a comprehensive manner the key considerations regarding site selection, and these are updated and summarised in this chapter. It is accepted that there may be legacy sites already in the ownership of local authorities, but when considering a particular site for potential purchase a local authority will need to properly and fully evaluate its potential for successful development. The evaluation of the site should include, but is not limited to, the considerations discussed below.

1.1 Sustainable Community Proofing

1.1.1 Proximity to Facilities/Amenities

In addition to having an appropriate zoning for residential development, the site should be located close to as wide a range of facilities as possible, with the general minimum proximity to a school, shop and means of public transport.⁴ It is normally accepted that a ten-minute walk's distance, or about one kilometre, is the standard for what is considered proximate.⁵ Out-of-sequence development at a remove from the existing town or village built fabric, so called 'leapfrogging', is not consistent with planning policy⁶ and should be avoided.

From these requirements, it can be seen that peripheral locations are not generally supported, as their development is inconsistent with planning guidance

and can place an unreasonable burden on residents who may not have access to private transport. Consistent with the *Project Ireland 2040 - National Planning Framework (NPF)*, town centres, brownfield sites and other locations with easy access to facilities are favoured.

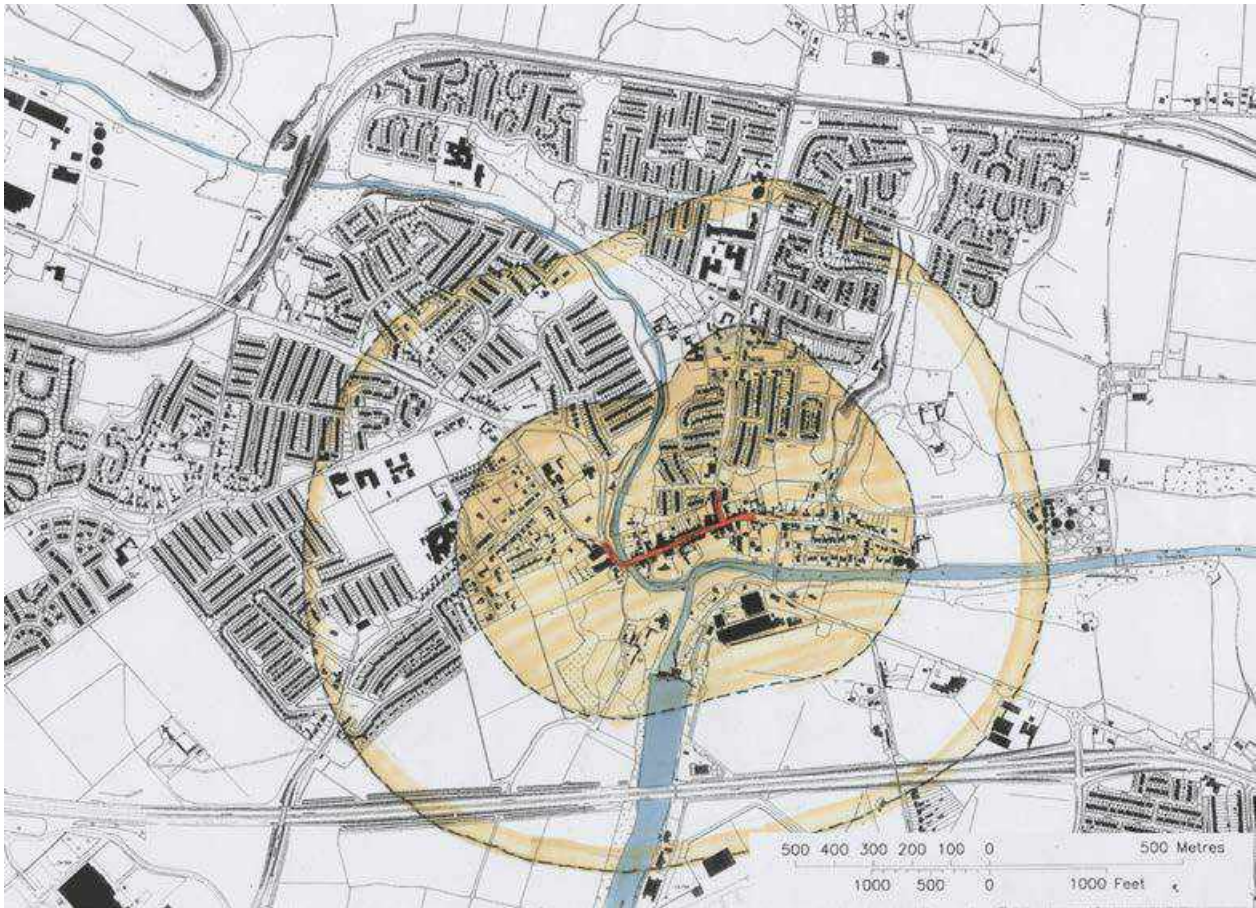
When considering the development of social housing in a small town or village, in addition to need, the local authority should be mindful of the extent to which facilities are available for tenants who may not have access to private transport. This is an even more important consideration in respect of housing for older people⁷, who need easy access to a wide range of facilities.

4 QHfSC Page 31

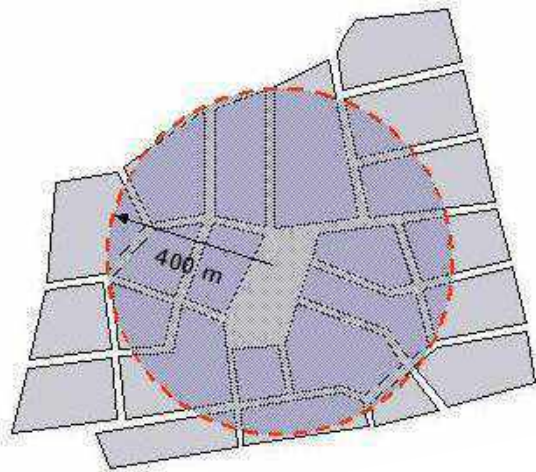
5 For instance, *Design Standards for New Apartments* characterises 1.5 km as an acceptable walking distance to city centres but sets the boundary for a reasonable walking distance as 1.0 km, the standard adopted here. In larger cities a walking distance of 1.5 km is acceptable consistent with the concept of the 15-minute city.

6 Sustainable Residential Development in Urban Areas page 52

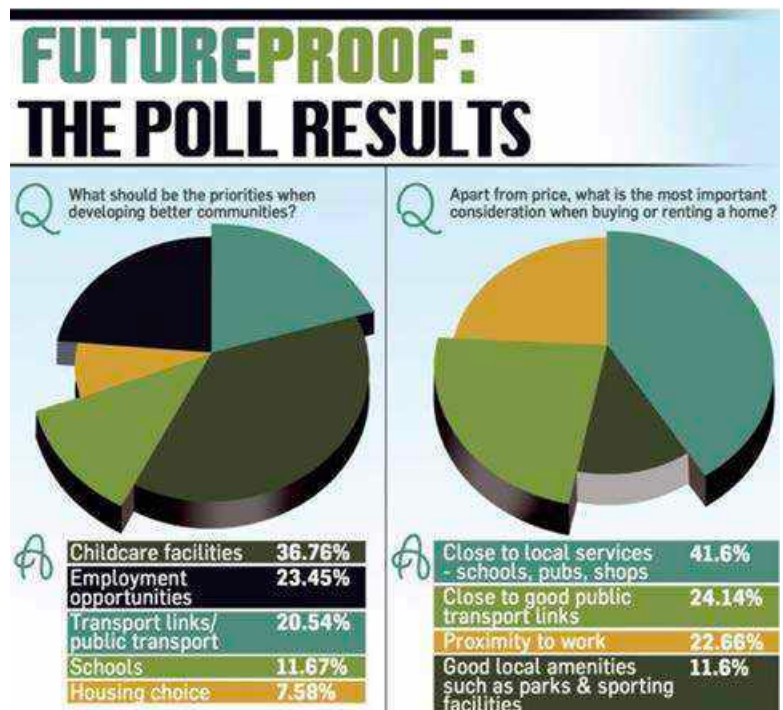
7 Age Friendly Ireland's guidance on access to facilities for older tenants is discussed in Section 5.2.3 below



Leixlip Walkband, courtesy Ordnance Survey



Walk Band, courtesy UDC.



Survey results 86% identified Proximity as the next important consideration after price. Courtesy Irish Independent.

1.1.2 Tenure Diversity

Research indicates that residents in large social housing developments can experience social isolation and other difficulties. This contrasts with the improved life choices which are reported to result from mixed-tenure developments.⁸ Mixed-tenure residential developments are preferred for larger sites (subject to the housing needs of the area) and guidance as to various delivery mechanisms, including joint ventures (JVs) and development under licence, have previously been issued. The suitability of sites immediately adjacent existing social housing should be carefully assessed to avoid creating an overconcentration of social housing.⁹ For a mono-tenure social housing development, the previously published guidance table reproduced at the beginning of Chapter 2 below should be followed.

1.1.3 Mixed Tenure

As new variations of tenure evolve, it is difficult at present to give firm guidance as to an ideal or even appropriate tenure mix for mixed-tenure developments. External contextual factors such as the prevailing tenure mix in the neighbourhood and the degree of integration of the new development with the neighbourhood are important considerations. Examples of tenure mixes approved by the Department includes a number of developments where the tenure mix was 30% social rental, 20% affordable purchase and 50% private. In respect of mixed-tenure developments, local authorities should carefully consider the likely demand for, and saleability of, affordable dwellings, in particular in the context of delivering a well-balanced tenure mix.

1.2 Economic Considerations

1.2.1 Serviced

The site should have all service connections immediately available to it. It is recognised that from time to time an otherwise acceptably located site may need to rely, at least initially, on an on-site waste water treatment plant, and this will not in itself invalidate social housing development on such a site. Apart from environmental and planning policy, QHfSC does note that before deciding on the location of social housing, careful consideration should be given to both the cost and the practicality of providing sewage and water supply. Normally, any proposal to develop such an unserviced location would need to be specifically justified, by way, for instance, of a very high need for social housing in the locality.

1.2.2 Topography

The site should preferably be relatively flat or have slopes which will allow development without the need for extensive earthworks or substantial retaining walls. Favourable considerations such as an excellent location, proximity to a wide range of facilities and services, existence of a large housing need and consistency with planning policy may on occasions justify the additional construction costs and override the general presumption against development of such sites.



Topography - Too great a slope for easy development.

⁸ See for instance the Fitzgerald report *Addressing issues of Social Exclusion in Moyross and other disadvantaged areas of Limerick* (2007) and *Changing Perceptions, Stigma and Social Housing in Ireland*, (2017) a study commissioned by Cluid Housing.

⁹ See QHfSC page 10 The existence of private, rented HAP dwellings, or Part V socially rented housing in adjoining private housing developments would ordinarily not be a concern.

Where appropriate to develop, opportunities for both innovative design and the use of design strategies for dealing with level differences should be explored to minimise the need for expensive large retaining structures. This is considered more fully in Section 3.6.9 below. Sites with very poor soil-bearing capacity should also ordinarily not be prioritised for development, unless such favourable considerations exist.

1.2.3 Flooding

Residential development on lands prone to flooding should not be considered unless the lands in question are located in a prime central town or city location and the justification and appropriate risk reduction requirements set out in the guidance document the *Planning System and Flood Risk Management* (2009) and subsequent guidance (i.e. Circular PL 2/2014) are met.

1.2.4 Other Factors

Other factors to be considered in assessing site suitability include site contamination; existing services that would need to be relocated, in particular on brownfield sites; the presence of invasive species; and the bearing capacity of the soil, as previously noted. A full due diligence needs to be carried out on all sites prior to purchase, and at the very least a detailed walk-through inspection needs to be made, which may well trigger further and more in-depth investigations. Again, this is not to say that such factors would prohibit purchase of a particular site, especially where the site is otherwise favourably located, but an outline of the additional costs necessary to overcome such shortcomings should be established and factored in when determining what is a reasonable price for the lands. This may also help decide between alternative sites that have in other respects been assessed as relatively equal in terms of their suitability.



Flooding - Use OPW data to assess flood risk.

2

Chapter 2
Design Brief

QHfSC sets out guidance on the formulation of the design brief and on cost control and public procurement. For additional background, overviews and updated references to subsequent publications, the following should also be considered.

2.1 Design Brief

QHfSC sets out the requirements for the design brief¹, which is also a requirement of the Capital Works Management Framework (CWMF) and the Public Spending Code. In compiling same, the local authority should have due regard for the following considerations.

- 2.1.1** A sustainable community includes neighbourhoods with residents from a variety of socio-economic backgrounds. Ideally, mixed tenure is preferable on schemes in excess of 75 - 100 dwellings in cities. The approach in relation to proportionally smaller schemes in smaller towns will be guided by housing need. The table shown on the following page is an updated version of what was previously published by the Department to provide guidance on the maximum number of dwellings in a mono-tenure social housing development.

This is consistent with the requirement that the local authority's housing strategy must take into account, as required under the Planning Act, *'the need to counteract undue segregation in housing between persons of different social backgrounds.'*² For instance, the QHfSC advises: *'If the proposed site is adjoining an existing social housing scheme, consideration should be given to suitability and mix of tenure.'*

¹ Pages 15–18.

² Planning and Development Act 2000, section 94 (3) (d).

2.1.2 It is stressed that these numbers should not be taken as an absolute maximum, and that some flexibility is possible where mitigating circumstances exist. For example, these could include instances in which an AHB or a local authority has an active estate-management programme in place, with a resident caretaker, or where the development is well integrated into the neighbourhood (i.e. not isolated in a separate estate) or where the area, as recorded on the Pobal Deprivation Index for small areas is not significantly disadvantaged. <https://maps.pobal.ie/WebApps/DeprivationIndices/index.html>

Type of Area	Number of houses comprising a single scheme
Towns and village with populations up to 1,000	20
Towns and their environs with:	
populations between 1,000 and 5,000	30
populations between 5,000 and 15,000	40
populations over 15,000	50
Cities and their environs	75 - 100

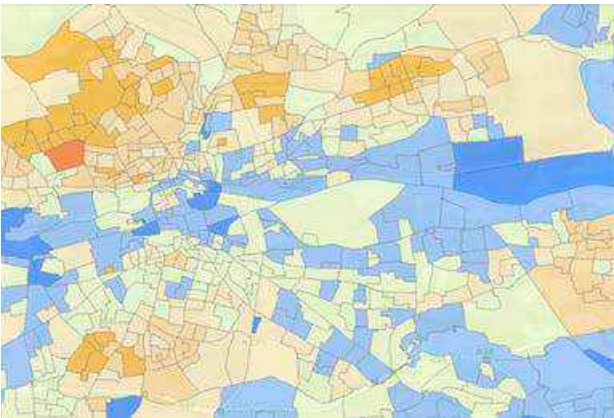
Recommended Maximum number of social housing dwelling in a mono tenure development.

2.1.3 When considering the purchase of a site to meet a social housing need, local authorities should generally ensure that the site is in a small area on the Pobal Deprivation Index Map with a minimum rating of ‘marginally below average’, though if other factors are favourable (e.g., if the site is immediately adjacent to an ‘affluent’ rated area) or for very small developments, (up to 9 dwellings, say) a minimum rating of ‘disadvantaged’ may from time to time be acceptable, in particular when it can be demonstrated that a high level of estate management will be provided.

2.1.4 Limiting the number of social housing dwellings should not however be seen to encourage low-density development. Where the site area is larger than required, the social housing development should only occupy part of the site, consistent with achieving a sustainable density, so as to preserve the remainder of the site for later social, or concurrent private and affordable-purchase, housing or other development. Alternatively, on larger sites, a joint-venture development with a private developer may be appropriate.



Boarded up shop negatively impacting on streetscape



Pobal Index Blue as “Affluent” Red as “Very Disadvantaged” .

2.1.5 A mix of uses is encouraged and where feasible should be facilitated. However, with the projected reduction in high-street retail, indiscriminate provision of ground-floor retail on all town centre developments, without careful consideration of need, will not be economically viable. This could well result in boarded-up shops negatively impacting on streetscape, which can in turn encourage anti-social behaviour, a potential problem that the provision of ground-floor retail was initially intended to address. This is emerging as a considerable concern for some local authorities, especially in smaller towns. Accordingly, in town centre areas where there is not currently a significant demand for retail, the ground-floor residential units in new builds on main streets should be designed to facilitate future conversion to ground-floor retail. In this regard, the apartment guidelines recommend a much higher ceiling height³ for the ground floor to facilitate such a future eventuality.

2.1.6 The 2000 Planning & Development Act⁴ requires the local authority to prepare a Housing Strategy which should identify the specific housing needs in its area. On all but the smallest schemes, there should be a mix of house/apartment types in order to provide for a range of households. In larger schemes in particular, it would be expected that some element of housing or apartments specifically for older people,⁵ for persons with disability,⁶ and for single-person households should be included. Local authorities should try to ensure that the mix of dwelling sizes in any development responds approximately, on a proportional basis, to the mix of house types to meet the requirements of households on its housing list for that location. For instance, delivering a development comprising exclusively of four-bedroom houses when 50% of the housing list is made up of single-person households may not best meet need or represent the best use of resources.



Over provision of retail – where need not confirmed, preferable to design initially as ground floor apartments for later conversion to retail.

3 Paragraph 2.23 of DSfNA recommends 3.5 to 4.0 meters floor-to-ceiling heights for ground-floor apartments with potential for conversion to retail.

4 Section 94 (3) (c) refers to 'the need to ensure that a mixture of house types and sizes is developed to reasonably match the requirements of the different categories of households, as may be determined by the planning authority, and including the special requirements of elderly persons and persons with disabilities'.

5 Reference also the policy statement *Housing Options for Our Ageing Population* (2019)

6 Where such need exists, local authorities will establish the extent of such need under their obligations under the National Strategy for People with a Disability. See Section 5.2.2.3 below for further consideration.

2.1.7 The CSO reports that in the 2016 Census, the average household size in Ireland was 2.75 persons⁷. The 2016 Census indicates that 1-2 person households now comprise more than 50% of households, and this trend is set to continue. Analysis of urban housing need indicates that into the future a majority of households will comprise 1-2 persons, and approximately half of the remainder will be three-person households. Only about 25% of households will comprise 4 or more persons⁸, though some individual locations may differ. The need for single-bedroom social housing is corroborated by the Housing Agency's 2019 Housing Needs Assessment, which reported that of the 68,693 applicants on housing waiting lists, 32,607 were for single-person households, or 47.5% of all applicants.

2.1.8 The housing density should generally be the maximum permitted under the Development Plan or Local Area Plan. Planning Guidelines⁹ and international best practice¹⁰ suggest a minimum target of 50 dwellings per hectare (dph) or at least 150 persons per hectare (pph) in city and town-centre locations and along transport corridors, and 35–50 dph (with the higher figure favoured where appropriate) on all other developable lands except in small towns and villages. The indicative block layouts in Chapter 4 illustrate that it is possible to achieve within this range with a mixture of two-, three- and four-storey development comprising a mix of housing, duplexes and walk-up apartments. However, achieving densities exceeding 50 dph in town and city centres and along transport corridors will necessitate developments comprising a high proportion, if not entirely comprising, of apartments. Relatively high densities, well exceeding 50 dph, can be achieved in four- to six-storey apartment buildings in a non-pavilion arrangement, which creates streetscape. (See also 3.5.3.3 below).

2.1.9 As noted in QHfSC, the brief should also set out the general standards to be met and an indicative budget. In this regard, the Department, with the assistance of local authorities, has compiled the guidance document, *Employer's Requirements for Detail Design of Quality Housing* (2020), which sets out the quality of materials, fittings and finishes that the Department considers appropriate and which will also deliver value for money. The Department also compiles, generally on an annual basis, the Unit Cost Ceilings (UCCs), both for construction and for all-in costs for a variety of dwelling types for each local authority as a benchmark/guidance to the appropriate cost for delivering social housing. The value for money of a particular scheme can be evaluated by means of comparison with these UCCs. Similar costs ceilings are also published for guidance in respect of dwellings for acquisition.



Increasing the density limited the footprint of the AHB Housing to the right hand portion of the site, leaving the remainder, outlined in red for future development. Caroline Dixon Architects.



A mixture of two three and four storey development, comprising a mix of housing, duplexes and walk up apartments. DDA Architects.

⁷ <https://www.cso.ie/en/releasesandpublications/ep/p-cp4hf/cp4hf/hhlds/> (Accessed 28/05/2020). This records a marginal increase from 2.73 in 2011, following fifty years of continuously decreasing household sizes.

⁸ All these household statistics are from DSfNA Sections 2.6 – 2.8, page 7.

⁹ Ref SRDUA, summarised in the table in section 3.5.3 below.

¹⁰ See for instance *Towards an Urban Renaissance* (1999), a report by the committee chaired by the leading UK architect Richard Rogers.

2.2 Cost and Programme Control

QHfSC sets out important considerations in relation to cost control.¹¹ These should be read in conjunction with DPER's *Planning and Control of Capital Costs* (Guidance Note GN 2.2) as well as relevant Department circulars, including SHIP 2010/12 *SHIP Management of Project Budgets*. In respect of programme control, the Capital Works Management Framework (CWMF) *Project Execution Plan* (PEP) may also be of assistance.

2.2.1 Among the key considerations for cost control are:

- appropriate choice of site
- site investigations (level survey, soils survey, site services, preliminary archaeology etc.) should be undertaken before design commences
- quality and standard of materials and construction (ref Employer's Requirements)
- avoidance of late change to the design, particularly after the grant of approval under the planning act
- robust and complete tender documentation



2.2.2 Making changes after planning, and in particular when construction has commenced, will almost certainly lead to significantly increased costs, (which may not be at tendered rates and may therefore be more expensive than it would have been if originally included in the scope of works). This is not consistent with the cost certainty sought under the CWMF, or with good project management, and can thus undermine value for money. Accordingly, post-planning design changes are not supported, and significant cost increases resulting from such late changes, may indeed be ineligible in whole or in part, for reimbursement by the Department, unless exceptional circumstances apply.

2.2.3 As design-team leader, the architect¹², assisted by the quantity surveyor, is central to achieving a successful project. The architect is responsible for proposing an economic design, exercising proper cost control and as team leader, for ensuring that all team members play their part within their own disciplines so as to deliver the project within budget. It is the responsibility of the local authority to ensure that both external consultants and in-house professional staff are fully briefed, and that the approved budget, design standards and project programme are fully understood by all and appropriately monitored.



¹¹ See QHfSC, pp. 18–19.

¹² Although a quantity surveyor or an engineer might be the team leader, and indeed the GCCC Forms of Public Works Contracts define the Employer's Representative as 'the architect, engineer, quantity surveyor or other person appointed by the Employer as its representative in accordance with the Contract' however because housing is normally a building project (in contrast to a road, bridge or electrical engineering project where an engineer would be an appropriate team leader or Employer's Representative), it is anticipated that an architect will ordinarily be the team leader and the Employer's Representative on housing projects, and this convention is used throughout this manual.

2.2.4 With the County and City Management Association (CCMA), the Department has prepared an indicative pre-contract programme, where with paralleling of operations a programme of 59 weeks can be achieved or bettered.¹³ This is intended for non-complex developments, and it is acknowledged that this time frame can be challenging unless all time-saving opportunities are taken, including paralleling certain operations; using design and build, where feasible; and using relevant frameworks, for instance those set up by the OGP,¹⁴ to reduce time spent on procurement. This will allow the local authority to determine dates for the pre-contract milestones. The local authority should ensure that the architect is tasked with achieving the earliest delivery of the project by ensuring that these pre-contract milestone dates are met. Programme overruns can incur additional inflation-related costs, and therefore programme control can assist with cost control. To assist local authorities and to avoid delays, the Department has issued guidance under Circulars 2/2018 and 28/2020 setting out the documentation to be submitted (including a model Stage 1 submission) at the various Department approval stages.

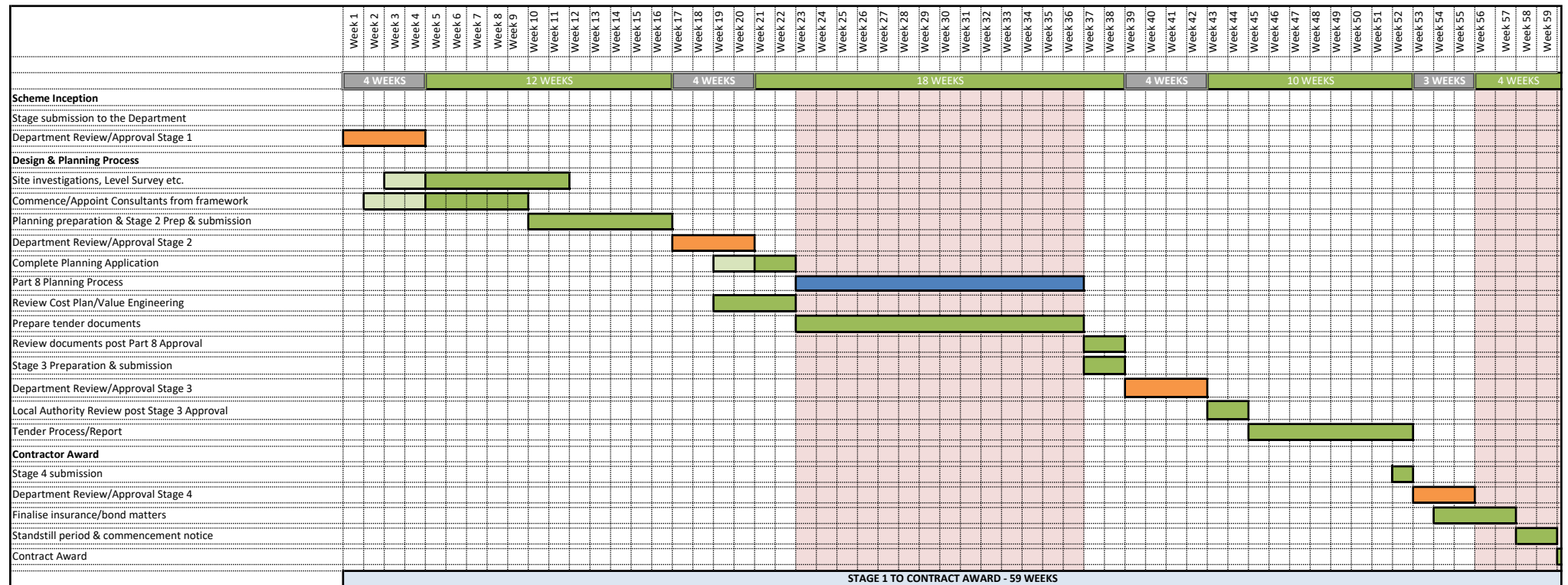
2.2.5 In relation to reducing construction times, tender documents should ensure that programme considerations are well flagged to the tenderers. The *Employer's Requirements for Detail Design of Quality Housing* sets out guidance in this regard. This includes guidance on how liquidated and ascertained damages should be set. Other measures that can be taken to highlight the importance to tenderers of delivering on the construction programme, include making the contractor's programme part of the award criteria under a MEAT process. During construction, the architect, when in the contractual role of Employer's Representative, should monitor and report on progress against programme while also overseeing necessary cost control.¹⁵

13 One LA on a design-and-build project for 34 Social Houses reports a pre-contract programme of 43 weeks, a 16-week saving on the 59-week pre-contract target programme.

14 For example, the OGP architect-led design-team framework, launched in October 2021, available for use by local authorities and AHBs.

15 See Circular SHIP 2010/12 for guidance.

TARGET PROGRAMME - STAGE 1 TO SITE
TYPICAL SOCIAL HOUSING SCHEME



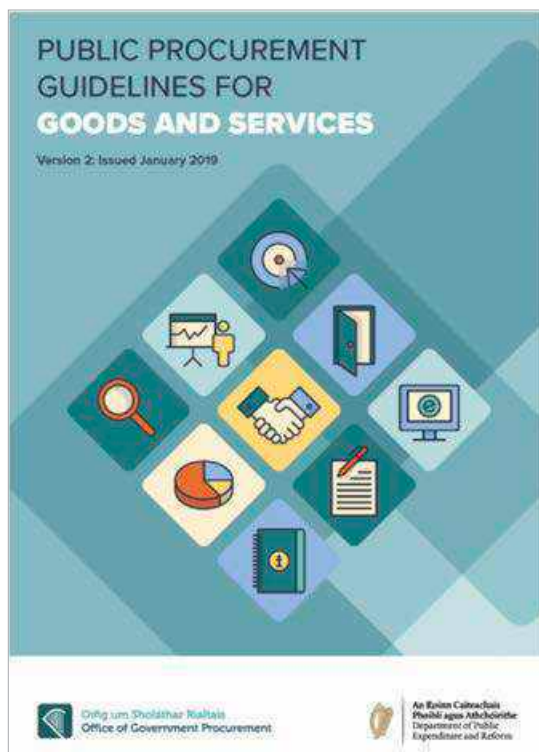
Qualifications/notes

1. Programme assumes that frameworks are utilised - reduction can be achieved where in-house resources utilised
2. Fire Certificate & DAC excluded but capable of running in tandem with Part 8
3. Target programme assumes minimum risk vis-à-vis planning, a positive and robust tender process and successful contractor insurance and bond clearance within reasonable timelines
4. Contract award (i.e. issue of letter of acceptance)
5. Pre-stage 1 engagement strongly encouraged to assist with project progression to programme

Third party risk indicator

2.3 Public Procurement

- 2.3.1 All publicly funded services, including the appointment of consultants and the construction of dwellings are subject to public procurement requirements. DPER's website <https://constructionprocurement.gov.ie/> is the repository of all guidance material, including the mandatory Conditions of Engagement of Consultants and the mandatory GCCC Conditions of Construction Contract. The Public Spending Code is also applicable.
- 2.3.2 Essentially, for consultancies or construction projects over a certain cost threshold, EU procurement rules as transposed into Irish law in S.I. No. 284 of 2016 European Union (Award of Public Authority Contracts) Regulations, 2014 will apply. This sets a requirement for EU advertisement of a consultancy or construction contract. Otherwise, National Procurement requirements as set out on DPER's website, apply.
- 2.3.3 DPER's publication *Public Procurement Guidelines for Goods and Services* (Version 2, 2019) provides useful guidance.



3 Chapter 3 Urban Design and Master Planning

3.1 Background

NESC Housing Report 2004

3.1.1 The NESC report *Housing in Ireland: Performance and Policy* (2004) describes the difficulties with the then common form of suburban sprawl featuring detached and semi-detached housing at the periphery of towns and villages, and identifies the features of sustainable development. Because that 2004 report is highly relevant to the rationale underlying previously issued guidance such as DMURS, as well as to this manual, it is worth quoting at length the text, starting at page 124, in which it identified the following as unsustainable patterns of settlement:



- Housing arranged in pods involving a like-tree¹ pattern;
- Shopping centres which are places exclusively for shopping;
- Civic institutions—schools, churches, town halls—separate from each other and each with its own parking area;
- Office parks and business parks, as places only for work;
- Road ways—miles of roads and pavements necessary to connect the other four disassociated components.



Civic institutions, separate from each other, and each with its own parking areas.

¹ Presumably a typo, and 'tree-like', used in a subsequent paragraph, is intended.



Having identified these undesirable settlement patterns, the report went on to comment in more detail on the problems associated with suburban sprawl:

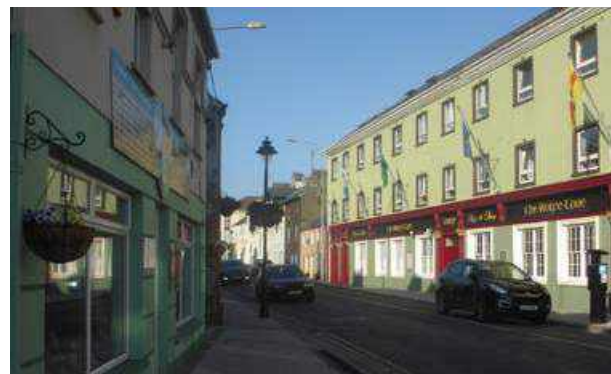
This pattern of development has a range of implications for the way people deal with their daily needs. The most important is the quite remarkable level of car dependence that necessarily follows from this pattern of development. Houses are at unwalkable distances from almost all amenities, so people have no alternative but to drive to schools, churches, shops and clubs. Not only is car dependence high, but traffic congestion per hundred cars is high, because all traffic feeds into a small number of 'collector roads'. A remarkable feature of suburban sprawl is that traffic congestion is often as bad at the edges of cities as at their centre.

This pattern also explains the much greater use of the scarce factor, land. Not only is the density of housing low, but large amounts of land are devoted to roads per head of population and each public amenity (school, church, pub), has a separate car park. Another feature of sprawling development is that things which are physically adjacent are frequently far away by road. This is true mainly because of the tree-like layout of streets and separate housing estates.

The NESR report contrasted this problematic settlement pattern with 'The Sustainable Neighbourhood', which it advised must be centred, diverse and walkable. Again, it is worthwhile quoting from the report at some length as it explains in greater detail what constitutes this sustainable neighbourhood:

The alternative to suburban sprawl advocated in the National Spatial Strategy and other guidelines, is the sustainable, integrated neighbourhood. Sustainable neighbourhoods have six characteristics that distinguish them from sprawl:

- **The centre:** each neighbourhood has a clear centre focused on common activities such as commerce, culture and public governance;
- **The five minute walk:** residences are rarely more than five minutes' walk² from the ordinary means of daily life;
- **The street network:** the street pattern takes the form of a continuous web or grid³;
- **High amenity green spaces;**
- **Mixed use, including residential, commercial and other activities;** and
- **Narrow versatile streets**⁴



Sustainable, mixed use and narrow versatile streets.

² Five minutes' walk equates to about 500 metres, but in practice ten minutes' walk (about 1.0 km) is more achievable and generally acceptable, with fifteen minutes (1.5 km) acceptable in cities. Hence the strategy of the '15 Minute City' as formulated in Paris.

³ Further expanded on in DMURS and a guidance in Chapter 4 below

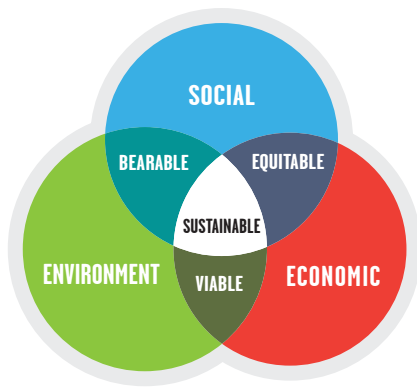
⁴ Ref DMURS on street width ratio and the section on 'Good Sense of Enclosure' below.

The 2004 NESC report then usefully summarised the main advantages of the sustainable neighbourhood:

It is clear that the sustainable neighbourhood is, in many respects, based on traditional urban neighbourhoods common in cities over many centuries. The pattern has numerous advantages over that of suburban sprawl. It involves much less car dependence for daily tasks and can much more easily be served by effective public transport. It is more convenient in numerous ways. It contains many high amenity green spaces and playgrounds, rather than large tracts of green space at a distance from housing. International research confirms that the level of walking and cycling is higher in more compact neighbourhoods (Ewing et al, 2002). It allows much greater independence to both young people and the elderly⁵. It is more easily able to support the social integration of different income groups which is now a core element of Irish housing policy. Diversity prevents the demise of services, as density does not fall due to population ageing to the same extent as in homogeneous estates. The Regional Planning Guidelines for the Greater Dublin Area recognise 'that services in denser and more compact settlements are more affordable because their cost relates more to the overall area covered than it does to population', therefore implying that higher density development yields an overall lower per household cost (RPG, 2004). There is growing international interest in the role of urban design in crime prevention and the sustainable neighbourhood approach seen as a significant improvement (Katyal, 2002).



5 If written today, this would most likely be phrased as 'It allows greater independence to the young, persons with disability and older people.'



Sustainability has three components:
environmental, economic and social

3.2 Sustainable Development Overview

3.2.1 Sustainability has three components: environmental, economic and social. Among the improvements afforded by sustainable development in each of these components are the following:

3.2.2 Environmental

All of the following aspects will result in reduced carbon emissions by reducing the need for and use of private transport:

- More compact settlement makes public transport more commercially viable .
- More compact settlement also means that more facilities become viable within walking distance
- Improved permeability provides easier access to more facilities within walking distance.
- The quality of the public realm is improved when the perception of improved safety makes walking and cycling more attractive.⁶

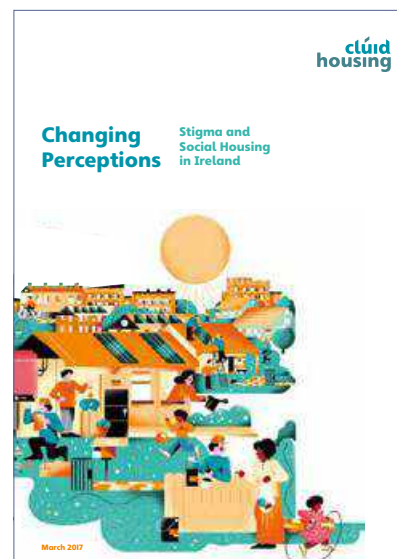


3.2.3 Economic

- More compact settlement makes more local business viable.
- Improved permeability generates increased footfall, which boosts local business.
- More compact settlement reduces land grab and keeps more land in agricultural use, reducing the need for imports.
- Mixed house types facilitates older people to live longer within their communities, thereby reducing the need for full time care.

3.2.4 Social

- Mixed tenure facilitates integration, and the resulting lack of social isolation provides better educational and employment opportunities for all income groups.⁷



⁶ Page 22 of DMURS refers to research identifying lack of surveillance and activity as amongst the key factors that discourages walking.

⁷ Refer, for instance, to Cluid Report "Changing Perceptions – Stigma & Social Housing in Ireland" (2017).

3.3 Sustainable Communities

- 3.3.1** The concept of sustainable communities was formulated by applying the principles of sustainable development to residential development and settlements.
- 3.3.2** The EU's Bristol Accord on Sustainable Communities in Europe was agreed in 2005. In Ireland, this was adopted in the policy document *Delivering Homes, Sustaining Communities* (2007). *Delivering Homes* identified that the physical environment for sustainable communities would be delivered in sustainable neighbourhoods. It went on to identify some key features and advantages of sustainable neighbourhoods:

NESC set out a clear definition of sustainable, integrated neighbourhoods, which are much less car-dependent and more easily served by effective public transport. This pattern of development is essential to underpin the longer-term success of the substantial investment in public transport under Transport 21.

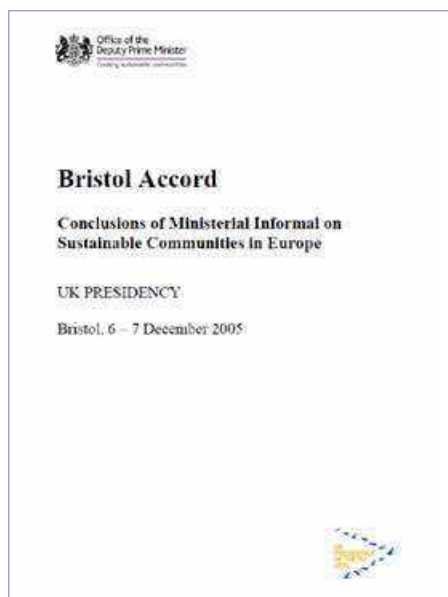
Sustainable neighbourhoods are areas where an efficient use of land, high quality urban design and effective integration in the provision of physical and social infrastructure such as public transport, schools, amenities and other facilities combine to create places people want to live in.

Additional features of sustainable neighbourhoods include:

- compact, energy efficient and high quality urban development;
- accessibility via public transport networks and also meeting the needs of the pedestrian and cyclist; and
- provision of a good range of amenities and services within easy and safe walking distance of homes.

The development plan process is a key instrument in putting the policies in place to create sustainable neighbourhoods.

- 3.3.3** The qualities of the built environment that promote sustainable communities, including the placemaking principles of urban design, are considered in more detail below. This allows a check list to be developed at the end of this chapter, against which the quality of a development can be assessed.





The success of any housing development is primarily delivered through the success of its public spaces, that is the roads, streets, open spaces and generally the spaces between buildings.

Social Housing, Tooting Meadow, Drogheda. McKeivitt King Architects.

3.4 Urban Design

3.4.1 The success of any housing development is primarily delivered through the success of its public spaces, that is the roads, streets, open spaces and generally the spaces between buildings. If this is animated, well used, actively fronted, and well landscaped, it will contribute to the attractiveness and feeling of security of the development, and to the development's connection to the neighbourhood. If neighbourhoods are compact and easy to move around, people will be encouraged to travel on foot and by bicycle, which will lessen car dependency and provide a much better and healthier environment.

3.4.2 The public spaces between buildings are collectively known as 'the public realm'. For any successful housing developments, careful consideration of the public realm will guide the design of the layout of the development. The design of an attractive public realm is called 'placemaking', and this concept underpins the guidance in this manual.



An important element of placemaking, which contributes to the sense of enclosure, is the closure of the vista (although the street may continue) thus feeling like a public square or piazza. Social Housing, George's Place. Dun Laoghaire-Rathdown Architects' Department & A2 Architects.

3.4.3 In poorly designed places, the public spaces between buildings including that between dwellings, are mostly concerned with the movement of cars, street widths being determined almost exclusively by this consideration. In contrast, an urban design approach that promotes placemaking (as discussed in more detail below) would determine the most appropriate dimensions between buildings from evidence and best practice, and then allocate this space to the various movement functions, starting with pedestrians and public transport, the remainder being then allocated to the movement of private vehicles.⁸

There are many examples of reversing the over-allocation of street space to vehicle movements internationally⁹. In Ireland this includes the reallocation of street space from vehicles to pedestrian and cycle use, not least during the recent emergency health measures¹⁰.

3.4.4 To promote the place function in movement system design, thus improving consideration of pedestrian and cyclist in the design of streets and roads in urban areas, this Department, with the Department of Transport Tourism and Sport, in 2013 jointly published the *Design Manual for Urban Roads and Street* (DMURS), updated in 2019.

3.4.5 DMURS notes on page 28 that

placing private motor vehicles at the bottom of the user hierarchy should not be interpreted as an anti-car stance. People will always be attracted to cars where they are convenient and flexible option and for many users it is currently their only viable option for medium to longer distance journeys. The key issue is one of balance, and the needs of the car should no longer take priority over the needs of other users or the value of place.

3.4.6 Urban design comprises two key design concepts, the underlying urban structure and the quality of the public realm, which are considered respectively in Sections 3.5 and 3.6 below. It is evident that a number of considerations are interdependent, and improving one will positively impact on another in a form of virtuous cycle.



The closure of the vista (although the street may continue) contributes to the sense of enclosure, thus feeling like a public square or piazza. Belarmine. DDA Architects.

⁸ The town in Freiburg Germany pioneered prioritising the allocation of street space to pedestrians and sustainable means of transport under *The Freiburg Charter* to promote sustainable development <https://www.academyofurbanism.org.uk/freiburg-charter/>

⁹ For instance in the US the *Highways to Boulevards* initiative <https://www.cnu.org/our-projects/highways-boulevards>

¹⁰ See for instance *Increased pedestrianisation of several Cork streets to begin today* Cork Examiner 03 May 2021 <https://www.irishexaminer.com/news/munster/arid-40280696.html>

Principles of Successful Site Layout for Sustainable Communities

3.5 Underlying Form

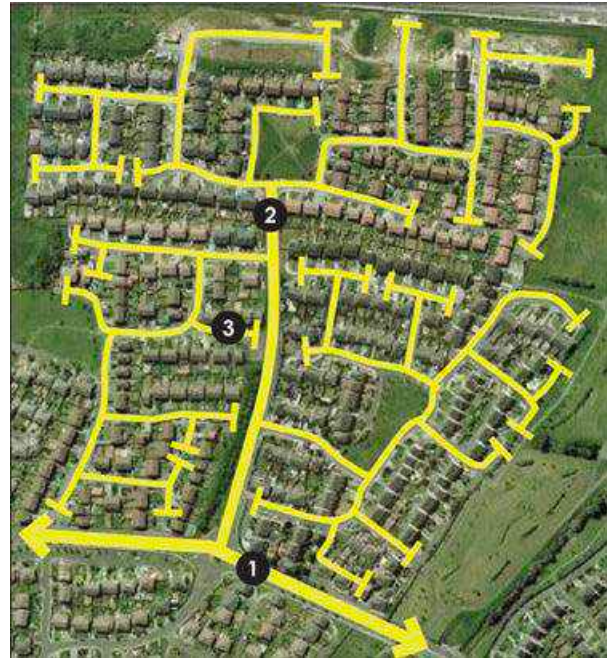
3.5.1 Urban Structure

- 3.5.1.1 DMURS sets out many of the following key considerations, but it is useful to examine each in the context of delivering sustainable communities because of the specific influence that these considerations have on the design of the layout of residential developments.
- 3.5.1.2 The urban structure is the pattern of movement systems or streets which surrounds blocks of developed or developable lands or open spaces. Traditionally, the movement system of towns and cities formed continuous street systems.



Traditional joined up movement system in central Limerick, Courtesy Ordnance Survey Ireland.

- 3.5.1.3 In the 1960s the separation of traffic from pedestrians was actively promoted, due to concerns about pedestrian safety.¹¹ This resulted in a system of road hierarchies, starting at the urban level with distributor roads on which vehicular movement was prioritised, with no vehicular access permitted to any properties fronting such distributor roads. These distributor roads surround what were called 'neighbourhood cells', in essence super blocks in which there were no through routes. Instead, the internal roads in a cell formed a dendritic (or tree-like) layout, which branched out into smaller streets, and eventually into cul-de-sacs.



Dendritic, branching, non joined up movement system.



Buchanan Report images showing segregation of vehicles and pedestrians.

¹¹ *Traffic in Towns* (The Buchanan Report) (1963) and *Roads in Urban Areas* (1966), both issued by the UK Ministry of Transport.

3.5.1.4 From the mid-1960s onwards, this had three main unintended consequences for residential developments. First, a lack of permeability meant that distances became so great that settlements were largely, if not entirely, car-dependent. Second, congestion increased significantly due to the concentration of the resulting traffic volume on only a few distributor routes, all as noted in NESC above.

Third, because of the lack of active frontage, the non-fronted distributor roads were found to be entirely pedestrian unfriendly, actively discouraging both walking and use of public transport.¹²



A typical example of a residential area constructed in accordance with the principles of segregation. Walking and cycling permeability is restricted to the point that two houses located back to back are up to 4 kms walking distance apart.



No active frontage, does this feel safe and secure for pedestrians?



Active frontage, sense of place, feels safe.



No active frontage, does this feel safe and secure for pedestrians?

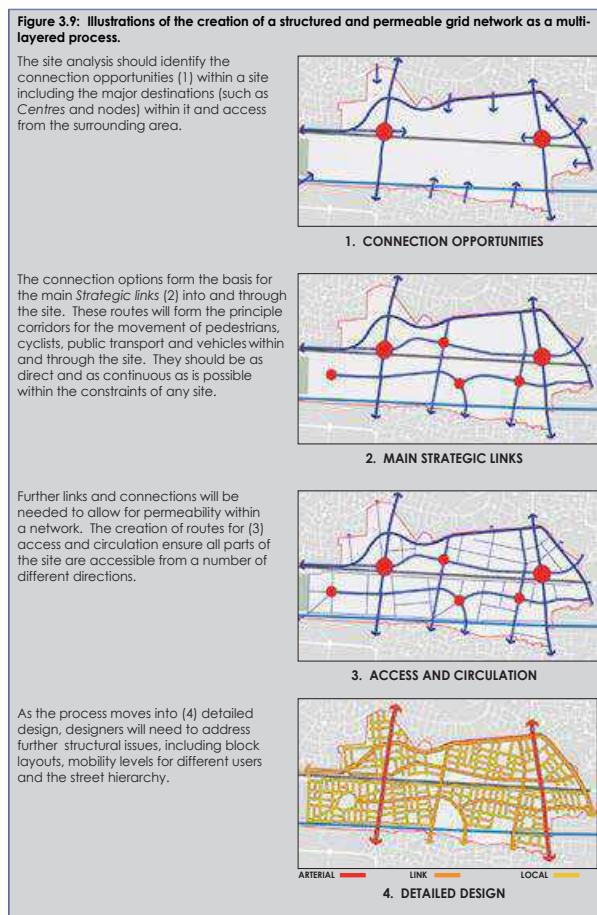


Active frontage, sense of place, feels safe "... which created our finest town and city environments".

¹² For a fuller consideration see DMURS, pp. 16-24

3.5.1.5 Further negative consequences also resulted. Among these were adverse impact on health, due both to the inadvertent promotion of a sedentary lifestyle and to significantly impaired air quality.¹³ Another negative consequence was the boosting of carbon emissions. Because of such negative consequences, settlement patterns without good permeability, cannot be considered sustainable.

The Department's *Urban Development and Building Heights* (2018, p. 16) therefore notes: 'Linked to the connective street pattern required under the *Design Manual for Urban Roads and Streets* (DMURS), planning policies and consideration of development proposals must move away from a 2-storey, cul-de-sac dominated approach, returning to traditional compact urban forms which created our finest town and city environments.'



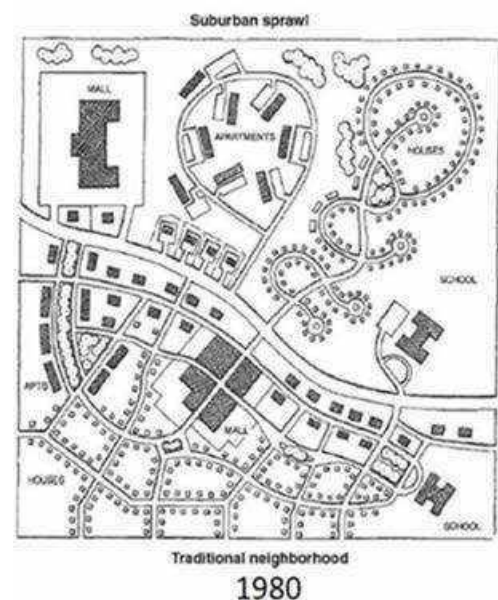
DMURS Masterplan Connectivity.

3.5.1.6 The urban structure should therefore be a continuous, joined-up movement system that prioritises connectivity for pedestrians and cyclists. The diagram from DMURS provides an example of how the joined-up movement system creates the urban structure.

3.5.1.7 Except on very large developments at the level of the Masterplan, the architect designing a residential development will not have any great opportunity to influence the urban structure, beyond reinforcing general permeability and sustainability. The architect's efforts will more likely be at the scale of an individual block or couple of blocks, or of parts thereof. The urban structure will already be in place, or will be determined by the Local Area Plan. The architect's skills will therefore be much more apparent in delivering quality in the public realm.

3.5.2 Pedestrian Permeability – A Joined-Up Movement System

3.5.2.1 In charting the way forward, DMURS, echoing NESc's emphasis on the sustainable neighbourhood, promotes the permeable, continuous-movement network where there is a maximum of route choices for pedestrians and cyclists.

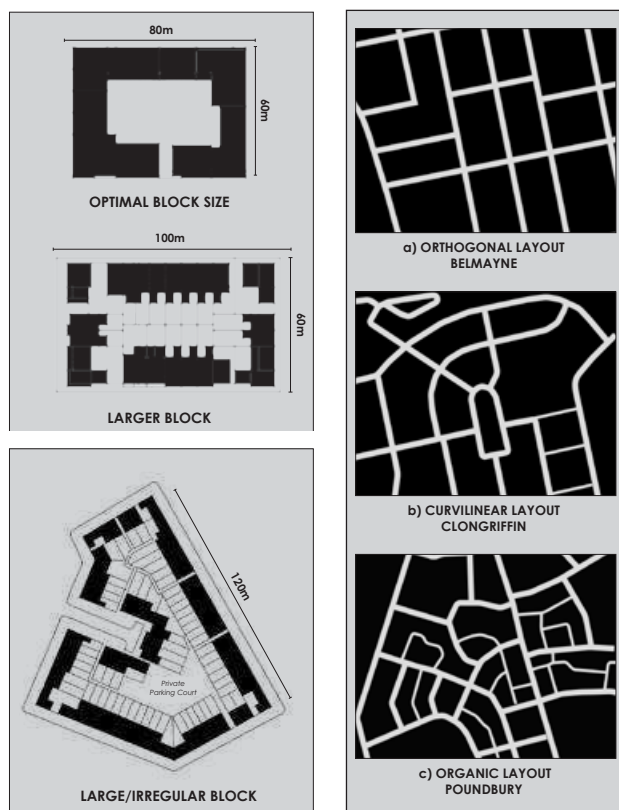


New Urbanists drawing contrasts traditional joined up neighbourhood with dendritic suburban sprawl.

13 See, for instance, EPA reports on air quality, including *Urban Environment Indicators: Nitrogen Dioxide Levels in Dublin* (2019)

- 3.5.2.2 To deliver on pedestrian permeability, the frequency of routes has to be considered, because large impenetrable blocks diminish easy pedestrian movement. DMURS gives recommendations on maximum block sizes in order to deliver pedestrian permeability. These range from 60 x 80 metres in city centre locations to a maximum of 120 metres in the longest direction in suburban locations, though a maximum of 100 metres in the longest direction is preferred as shown here on the diagrams from DMURS.

As will be seen, these dimensions are observed in the diagrammatic block layouts later in Chapter 4 of this manual, where the dimensions of the block, measured to the rear of footpaths, generally do not exceed 100 metres in the longest dimension. Further guidance on block dimensions is given in Section 3.7.2 of the *Urban Design Compendium* (UDC).



- 3.5.2.3 DMURS illustrates a variety of block layouts. These are taken from various developments, but they all feature continuous movement system, with few, if any, cul-de-sacs.

- 3.5.2.4 Concerns may sometimes be expressed as to whether the delivery of increased permeability might compromise security. However, the UK initiative 'Secured by Design' (SBD), which offers guidance on the building of homes to designs that help to reduce crime risk¹⁴, suggests that the matter is somewhat more nuanced when it notes:

Whilst it is accepted that through routes will be included within development layouts, the designer must ensure that the security of the development is not compromised by excessive permeability, for instance by allowing the criminal legitimate access to the rear or side boundaries of dwellings, or by providing too many or unnecessary segregated footpaths.

Thus, it is not permeability itself which is the concern, as increased activity and footfall are passive security measures, but the concern relates to a level of permeability which gives access to the sides and rear of dwelling boundaries, or unnecessarily segregated footpaths. Sections 3.6.4, 3.6.5 and 3.6.7 below endorse this approach and provide guidance on ensuring that the layouts avoid such compromises.

- 3.5.2.5 SBD suggests that segregated footpaths and cycleways should be used sparingly, and by implication only when provided with an active edge, or in locations likely to be well trafficked and well lit at night.

Generally limiting footpaths to those at the sides of streets or roads, thereby providing vehicular traffic with the same level of permeability, has further advantages in that it avoids loading vehicular traffic on to a small number of roads or streets, with the consequent high level of congestion identified in the NESC report above.

- 3.5.2.4 In new developments, street locations should be seamless extensions of existing street patterns, with additional streets, if required, to deliver block sizes which do not exceed the maximum dimensions. Every opportunity to form new pedestrian and vehicular connections should be taken, because this enables pedestrians, especially older people, to get around more easily.

¹⁴ Secured By Design Homes (Version 2, March 2019). See also Crime Prevention Through Environmental Design, a factsheet issued by An Garda Síochana.

3.5.3 Density

3.5.3.1 Among the many advantages of higher density¹⁵ are the following:

- Higher density makes the best use of a scarce commodity, namely, land, and in particular of serviced land, thus leaving more land for agriculture and recreational use.
- With a greater population within walking distance, more local shops and other services are financially viable.
- Higher density makes public transport more economically viable
- Having more people and increased activity on the street provides a better feeling of security.
- Higher density can result in more economic construction and more buildings per length of road and length of service run.
- More facilities are within walking distance or accessible by public transport.

There is a perception that higher density requires very high buildings, but this is not necessarily the case, because sustainable densities of greater than 50 dph can be delivered at four to six storeys. The layouts in Chapter 4 achieve 40–50 dph using two- to three-storey development.



More local shops are viable.

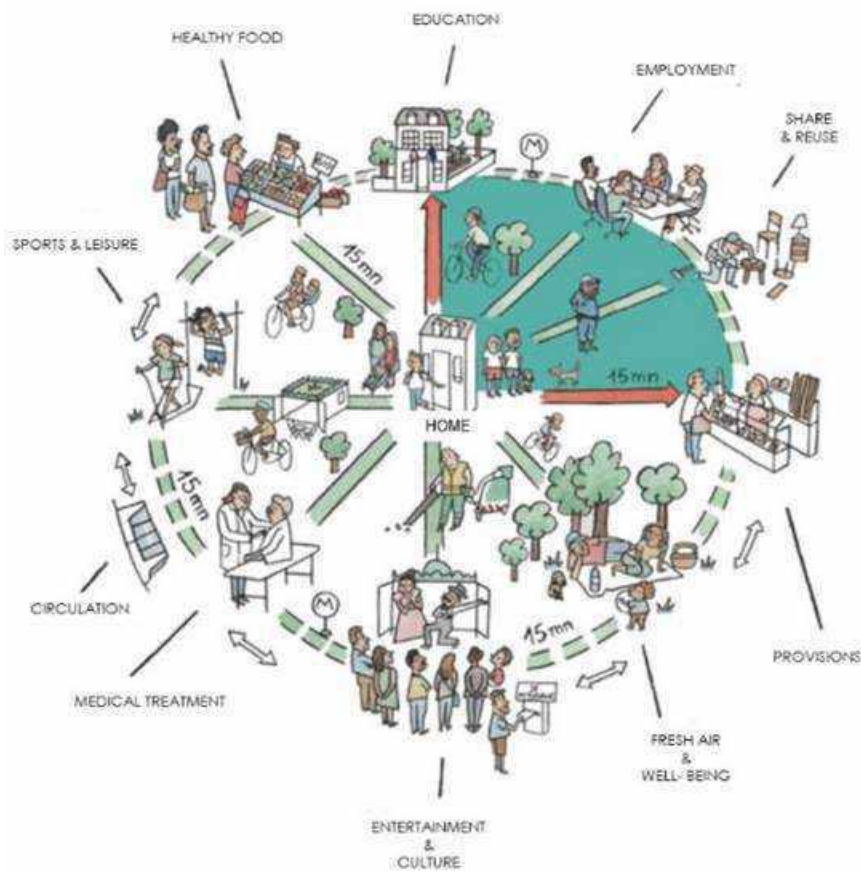


Increased activity on the street provides a better feeling of security.



Public transport is more economically viable.

¹⁵ As required by Policy Objective 35 in NPF Ireland 2040.



15 Minute City – Carlos Moreno Courtesy Georgia Pozoukidou, in *15-Minute City: Decomposing the New Urban Planning Eutopia*.



Lively town centre with mix of uses.



More economic construction and more buildings per length of road and service run. Tubberhill, Westport. Mayo Co Co Architects' Department.

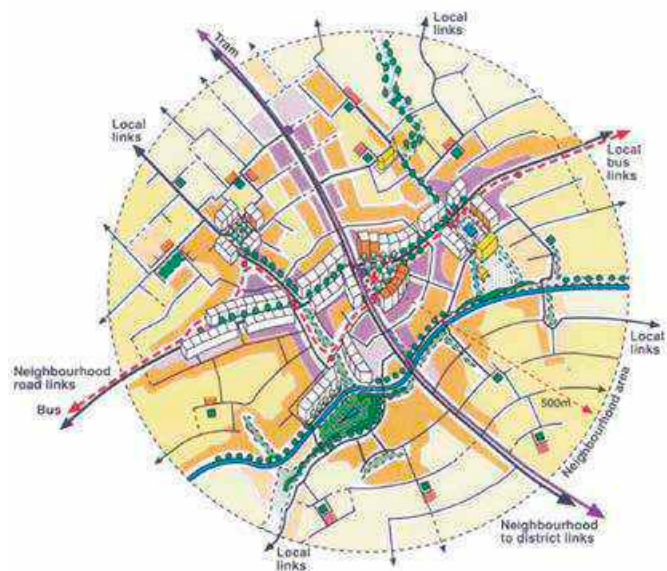
3.5.3.2 The guidelines set out in *Sustainable Residential Development in Urban Areas (SRDUA)*¹⁶ were issued under section 28 of the 2000 Planning Act in order that the local authorities should have due regard for these provisions when compiling their development plans. This table on the next page sets out the recommendations on density for the specific locations as defined in SRDUA, subject to meeting quality requirements.

¹⁶ It is to be expected that future updates of the SRDUA will at least endorse these densities. Any such updates and further refinements, such as the density matrix, anticipated to be provided as part of the Department's *Sustainable Settlement Guidelines* will of course supersede this table.

Settlement	Location	Range dph	Comments
Cities and Towns > 5,000 persons	Centre	No Limit	Mainly set by building heights and car-parking requirements.
	Public Transport Corridors	Minimum 50 dph	Within 500 m of bus stop and 1km of rail or Luas stop.
	Inner Suburban	LA to set in LAP	Balance of improvement and existing residential amenity, infill & sub division, presumably higher than the 35 -50 dph in outer suburban
	Institutional Lands	35 – 50 dph	Guidance indicates that density in certain parts may need to be higher to maintain the open character of the lands, while meeting overall density requirements.
	Outer Suburban	35 – 50 dph	General minimum of 30dph particularly site > 0.5 ha.
Small Towns & Villages 400 – 5,000 persons	Centres	30 – 40+ dph	Subsequent guidance in Circular 03/2021 clarifies NPF objectives in relation to proportionate and tailored approach to residential development.
	Edge of centre	20 – 35 dph	
	Edge of village	15 – 20 dph	
Village <400			Maximum development: 10–12 dwellings.

3.5.3.3 The DSfNA and UDBHG both discussed some refinements in respect of the Centre, and identified the Centre and Accessible locations as well as Intermediate Urban locations where density >45 dph is appropriate, and distinguished such locations from Peripheral/Less Accessible locations where density <45 dph is broadly appropriate.

3.5.3.4 In summary, in all except small towns and villages, at the very minimum, 35 dph should be provided, (unless otherwise required in the development plan). Higher densities should be encouraged, with a general expectation of 50 dph (or >45 dph) where permitted. In centres and along transport corridors, density should be considerably higher than 50 dph.



Centres form the 'hub' of sustainable urban development through the formation of connected compact communities.

- 3.5.3.5 SRDUA also requires local authorities to set minimum densities and maximum parking provisions in its development plans, reflecting evidence which suggests that limiting parking spaces encourages use of public transport.

The NPF advocates smart compact growth and requires that a minimum of 40% of new development occur within the built-up footprint of existing settlements on brownfield and infill sites.¹⁷

It might be noted that a similar requirement in the UK for 50% on such lands has already been surpassed, and the UK now delivers over 60% of new development on brownfield and infill lands: <http://www.sustainablebuild.co.uk/brownfieldsites.html>.

The NPF also advocates increased building heights as one means of increasing density, and guidance on same has been published in the Urban Development Building Height Guidelines (2018).

- 3.5.3.6 The Local Authority sets the densities for residential developments in its Development Plan, having due regard to the Section 28 SRDUA recommendations. Ordinarily, where a range of densities is specified in the Development Plan, the LA should encourage and facilitate at the high end. In smaller town and villages, where lower densities may be appropriate, local authorities should equally encourage housing in the town or village centres, which would otherwise be provided as one-off housing or at peripheral locations.

3.5.4 Orientation

- 3.5.4.1 The orientation of free-standing detached houses to best take advantage of passive solar gain undoubtedly has advantages in rural areas. In towns and cities, however, where frontage to the street is the first priority, the orientation of the street will determine the extent to which this is possible. Ideally, all streets should run either south-east to north-west or south-west to north-east, so that dual facing apartments and houses will get a good degree of solar gain on both facades. However, factors such as existing street patterns topography, and even individual land holdings may not permit such favourable orientation for new streets

- 3.5.4.2 Although adopting an orientation to avail of best passive solar gain may not be possible, houses and apartments in towns should avail of all other passive means of reducing energy consumption and carbon emissions. These include terraced form, where heat escapes only through two external facades; multi-storey developments; reduced roof area per enclosed floor area; and the increased micro-climate effects which result from higher density development, i.e. reduction in wind exposure and generally higher ambient temperatures than in lower density developments.

- 3.5.4.3 Any energy savings not achieved as a result of not adopting an ideal orientation should be more than offset by energy savings resulting from a compact urban development.

- 3.5.4.4 Sun penetration should be increased by the use of large windows, and by using deciduous trees for on-street planting. This will avoid blocking low level-winter sun, thereby minimising overshadowing of internal rooms. High levels of sun penetration can be achieved, even with a tight urban form.¹⁸

3.5.5 Proximity to Facilities

- 3.5.5.1 As discussed in Chapter 1, this is an important consideration in the choice of site. Unwalkable distances to facilities, services or public transport (as shown in the DMURS diagram) promote car dependence (with resulting carbon emissions) and discriminate against those who do not have ready access to private transport, in particular persons with disabilities, the young, older people and those who are economically less well off. Appropriate locations specifically for age- friendly housing are discussed in Section 5.2.3 below.

3.5.6 Tenure, Size and Use Mix

- 3.5.6.1 A mix of uses, along with frequent doorways, delivers vibrancy to the public realm, particularly near the neighbourhood centre and along major streets. Tenure diversity and a mix of dwelling sizes are discussed as objectives in Chapters 1 and 2.

¹⁷ NPF, p. 159.

¹⁸ UDC, p. 50.

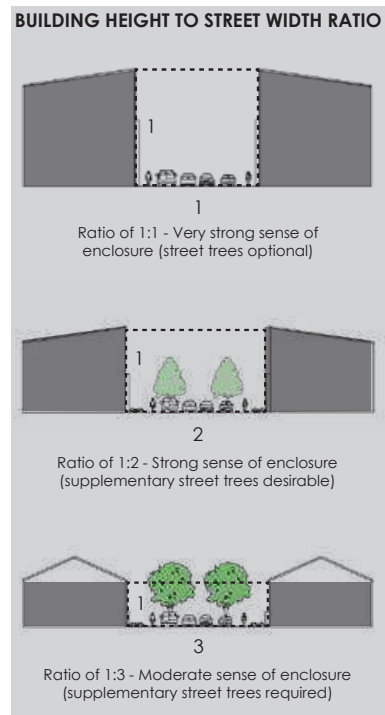
3.6 Public Realm Quality

3.6.1 Introduction

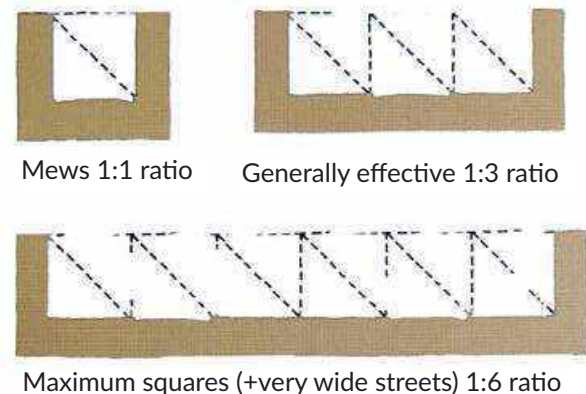
- 3.6.1.1 Having reviewed the contribution that a permeable urban structure can make to the delivery of sustainable communities, it is now appropriate to consider how the design and physical appearance of the space between buildings, the public streets and public spaces can contribute to quality in the public realm. The principal considerations are the sense of enclosure and active frontage, and most design guidance derives from a consideration of these key components.

3.6.2 Good Sense of Enclosure

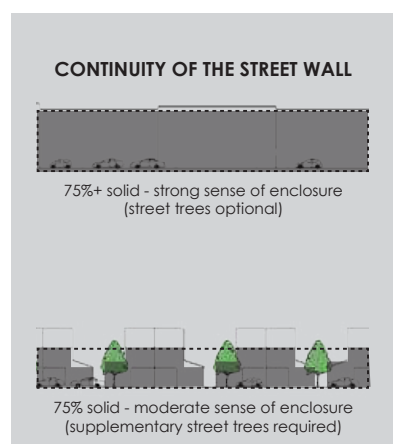
- 3.6.2.1 It has been suggested that the feeling of well-being and personal security when there is a good sense of enclosure is linked to the angle at which the eye perceives the skyline, i.e. where the roof meets the sky. In DMURS, as in many urban design guides,¹⁹ a good sense of enclosure is promoted by specifying recommended ratios of street width to street height. This is known as the street section ratio. Ensuring that the facades on either side of the street are as continuous as possible is also an important element of delivering a good sense of enclosure. DMURS notes that narrower streets not only benefit pedestrians by enhancing feelings of security (as also advocated by NESC) but also contribute to passive traffic calming. Both the UDC and DMURS in the diagrams show that, to deliver an acceptable level of enclosure, the sectional ratio should be between 1:2 and 1:3 in conjunction with nearly continuous facades. This has been adopted in the following site sections and in the site layouts in Chapter 4. Sectional ratios greater than 1:3 may be appropriate for squares or other public open spaces, and, as UDBHG identifies, such open spaces often provide an opportunity for higher dwellings.²⁰



DMURS, *Street Ratios*.



Street Ratios, courtesy UDC.



DMURS, *Continuity of Street Wall*.

¹⁹ For instance, UDC, p. 88, and Public Places, Urban Spaces, p. 147.

²⁰ Section 3.6.

3.6.2.2 The UDC notes²¹ that ‘continuous building lines along a block edge are more successful at providing good enclosure to a street or square and generating “active frontage” with frequent doors and windows animating the public realm’. In terms of continuous façade, DMURS recommends >75%, which supports the preference for terraced forms. Accordingly, semi-detached houses should be considered only in very limited circumstances, to meet a particular site condition, for example, and only where appropriate land usage and density is being delivered. Due to such considerations, and to considerations relating to economic construction and security concerns, QHfSC favours terraced forms.²² Semi-detached and detached dwellings will therefore not normally be supported unless unusual circumstances apply.

3.6.2.3 DMURS identifies three types of streets. In increasing scale, these are local, link and arterial streets, as shown on the diagram. Although arterial streets should have fronting buildings, their width (particularly if more than two traffic lanes) can often be such that they are unlikely to accommodate smaller-scale individual dwellings if they are to meet the required street ratio. Instead, arterial streets will need to be fronted by multi-storey apartment or commercial developments. Accordingly only local and link streets are considered in the following street section diagrams, although the four-storey SS4B could in theory be designed as an arterial Street, limited to only two vehicular lanes

3.6.2.4 The following series of street section diagrams is included to illustrate the relationship between building height and the space between the dwellings which informs the sense of enclosure felt on the street. Adopting an acceptable street section ratio may however result in a competition for the available space, with the ideal width for some elements sometimes not being possible. However, the street sections (as well as the block layout diagrams in Chapter 4) always achieve the minimum dimensions for carriageways, footpaths, etc., from DMURS and other authorities, as set out on the following chart.

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.

Street types Table.



Competition for space for the ideal width for each element, here the pedestrian’s requirements won out.



To maintain footpath width, it is possible to integrate services furniture into the front privacy strip.

21 UDC, p. 64.
22 QHfSC, pp. 31, 37 and 55.

- 3.6.2.5 The first street section diagram SS1 illustrates that the low height of two-storey houses, even when provided with the absolute minimum width of setback, footpath, on-street parking and carriageway, will result in the street width exceeding the street ratio required to provide a good sense of enclosure. The street section diagrams SS2A – SS2B illustrate how the use of a monopitch roof to increase building height facing the street, allows an acceptable street ratio be delivered in two-storey developments. Subsequent diagrams also show how three and four storey developments can deliver an appropriate street ratio while potentially accommodating greater on-street parking. SS4A is intended to indicate the provision of bicycle lanes within the street width, which is required on link streets. However on link streets, the extent of orthogonal car parking may not be feasible in the context of the engineering design and may well necessitate a reconfiguration with a consequent reduction in the on street parking and the provision of supplementary off street parking.
- 3.6.2.6 As noted in 0.14 above, the street sections are only intended to be diagrammatic. Care will be needed in detail design, for instance to provide for appropriate demarcation of footpaths and parking spaces, appropriately detailed dropped kerbs, tactile paving, tree selection and spacing, surface water etc., and to cater for the anticipated traffic volume and design speed, and undertake all necessary quality and safety audits.
- 3.6.2.7 A joined-up movement system, which reduces the walking distance to facilities; a quality public realm which provides a good sense of security; and a good density, which promotes on street activity will all contribute to an age-friendly public realm. Further design considerations are set out in the Age Friendly Ireland publication *Being Age Friendly in the Public Realm* (2016).

3.6.2.8 Public Realm Dimensions

DMURS

Local Streets (p.102)	4.8 – 5.5 m
Link/Arterial (p.101)	5.5 - 7.0 m (Preferred 6.0 - 6.5 m) ²³
Footpath width (p.87)	1.8 – 4.0m
Parallel Parking (p.120/1)	6.0 x 2.4 m
Perpendicular Parking	Local 4.8 x 2.6 m for 5.0 m carriageway (+0.3 m overhang) Link/Arterial 4.8 x 2.4 m for 6.0 m carriageway (+0.3 m overhang)

National Cycling Manual 2011

Cycle Lane (section: 1.5.2 (Width))	2.5 m maximum on road width	Dun Laoghaire Rathdown actual 2.0 m
-------------------------------------	-----------------------------	-------------------------------------

Front Garden/Privacy Strip

Wheelie Bin = 585 mm say 600mm 3 bins = 1800 mm + 100 mm tolerance/manoeuvre + 250mm plastered wall = 2.15 m is minimum. DMURS p 72 recommends 0 – 3.0 m for strong street presence and on p118 quotes SDCC LAP guidance 1.0 – 2.0 m

External Dimensions: The general principle is that the dimension between opposing facades should not exceed three times the façade height (DMURS, p. 69) which gives a moderate sense of enclosure where the façade is 75% solid and where augmented by continuous street trees. Required traffic lanes, parking and footpaths need to fit within that dimension.

Accordingly, suggested dimensions are:

Front garden/Privacy strip	2.15 – 2.5 m (2.2 m optimal)
Footpath ²⁴	1.80 - 4.0 m (Depends on street type and use) (2.2 m optimal)
Cycle Lane (Link & Arterial Only)	2.00 – 2.50 m (2.10 optimal)
Parallel parking ²⁵	2.4 m (6.0 m long)
Perpendicular Parking	Local 2.6 x 4.8 m or 2.4 x 4.8m + overhangs, Arterial/Link 2.4 x 4.8 m +overhangs
Local Street Carriageway	2.50 – 2.75 m (2.6 m preferred)
Arterial Link carriageway	3.00 – 3.25 m (3.0 m preferred)

Assuming monopitch roofs (where shown) and façade height above footpath, as shown, the design distances between facades and the half street width (in all cases, design width < 3H are as follows):

	Façade Height	Distance between Facades	Half width
2 Storey	7.0 m	20.0 m	10.0 m
3 Storey	9.6 (9.9) m ²⁶	28.0 (29.6) m	14.0 (14.8) m
4 Storey	10.7 (12.3) m	31.4 (34.8) m	15.7 (17.4) m

These dimensions are used in the following street sections and in the block diagrams in Chapter 4.

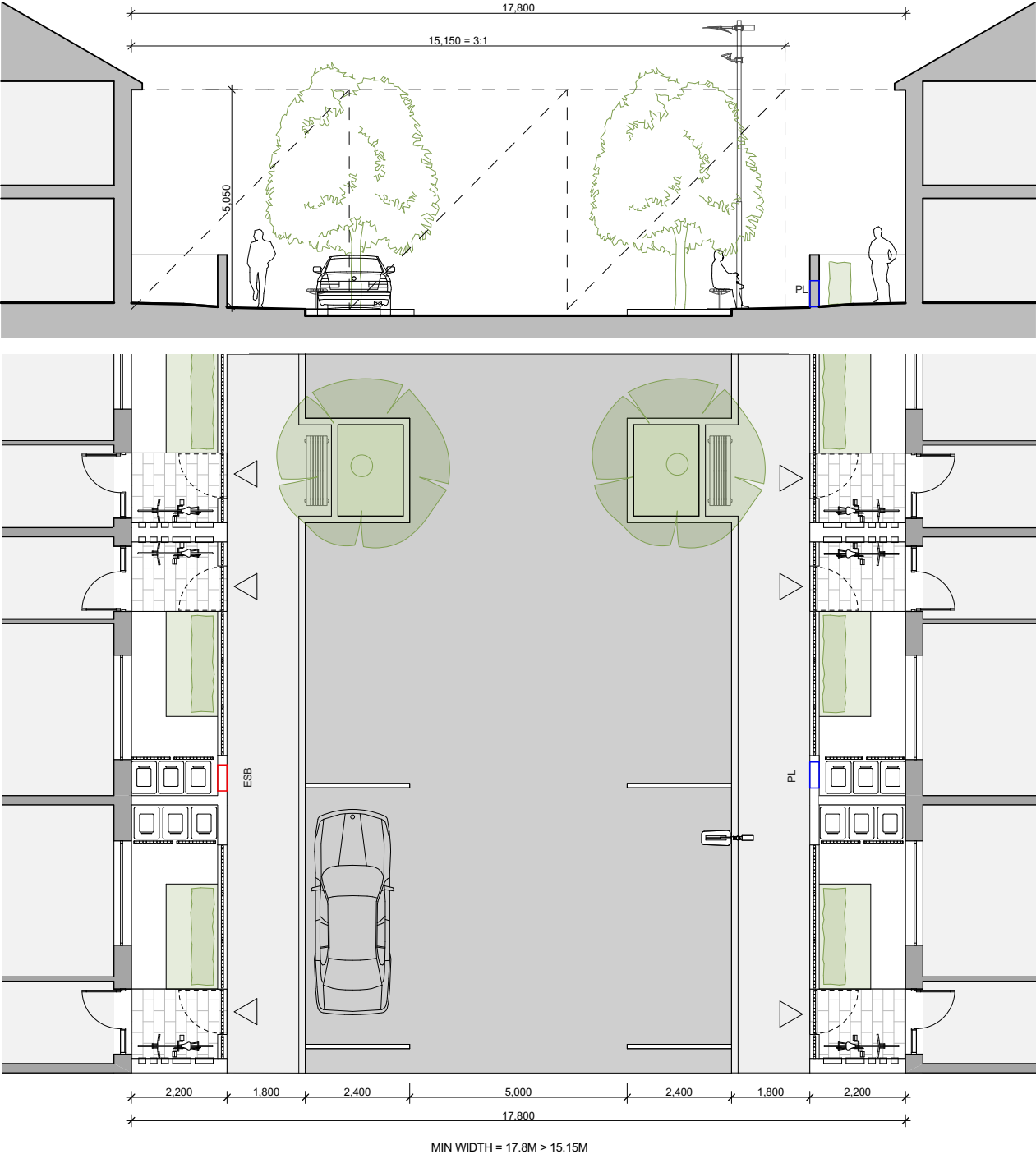
²³ DMURS notes that widths of 7.0 are appropriate only where it is anticipated that there will be a large movement of heavy goods vehicles, hence the preferred limit of 6.5m.

²⁴ Referred to in DMURS as 'footway' with width increasing dependent on anticipated level of use. Consistent with age-friendly and universal design principles, the width at pinch points should never be less than 1.8m which is why preferred footpath width should usually not be less than 2.2m. This allows for accommodation of streetlights or other small street furniture whilst maintaining the minimum width. Larger street furniture, such as electrical mini pillars, can be accommodated by way of indentation into the privacy strip.

²⁵ Ref DMURS section 4.4.9 for parking dimensions for different conditions. The frequency of provision and the dimensions and design of parking spaces for drivers with a disability should meet the requirements set out in TGD of Part M of the Building Regulations.

²⁶ (Dim) = Link Street or Arterial Street; otherwise, dimensions are for local street.

SS1



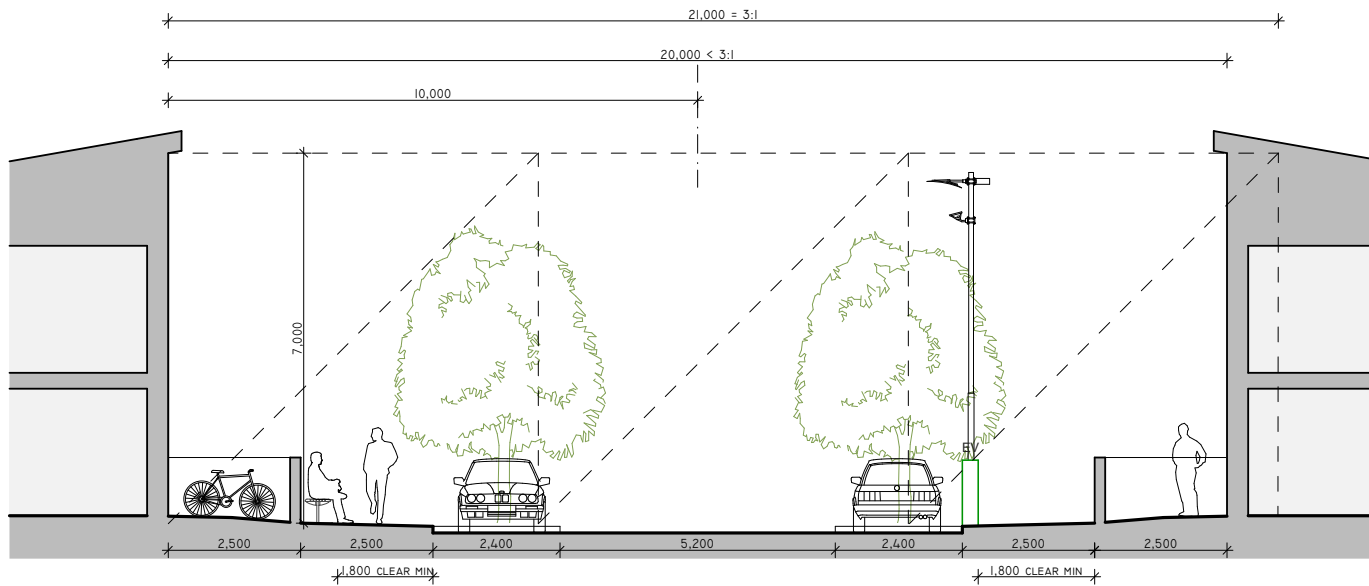
SS2A

Local Street

2 Sides Parallel Parking

20.0 < 20.97

Ratio 1 : 2.8

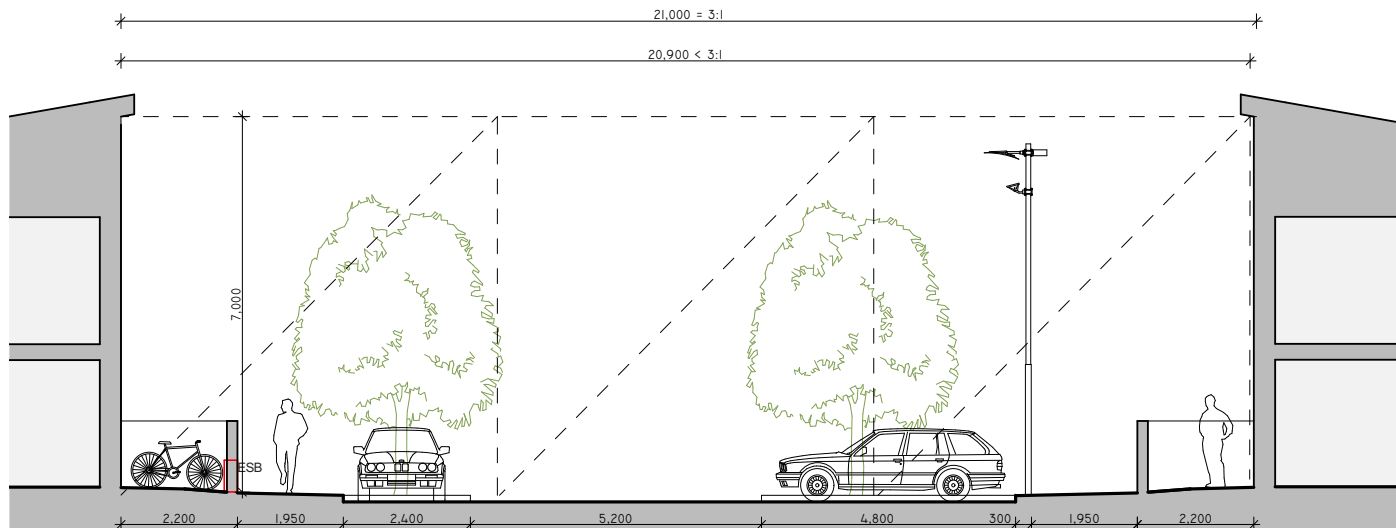


SS2B

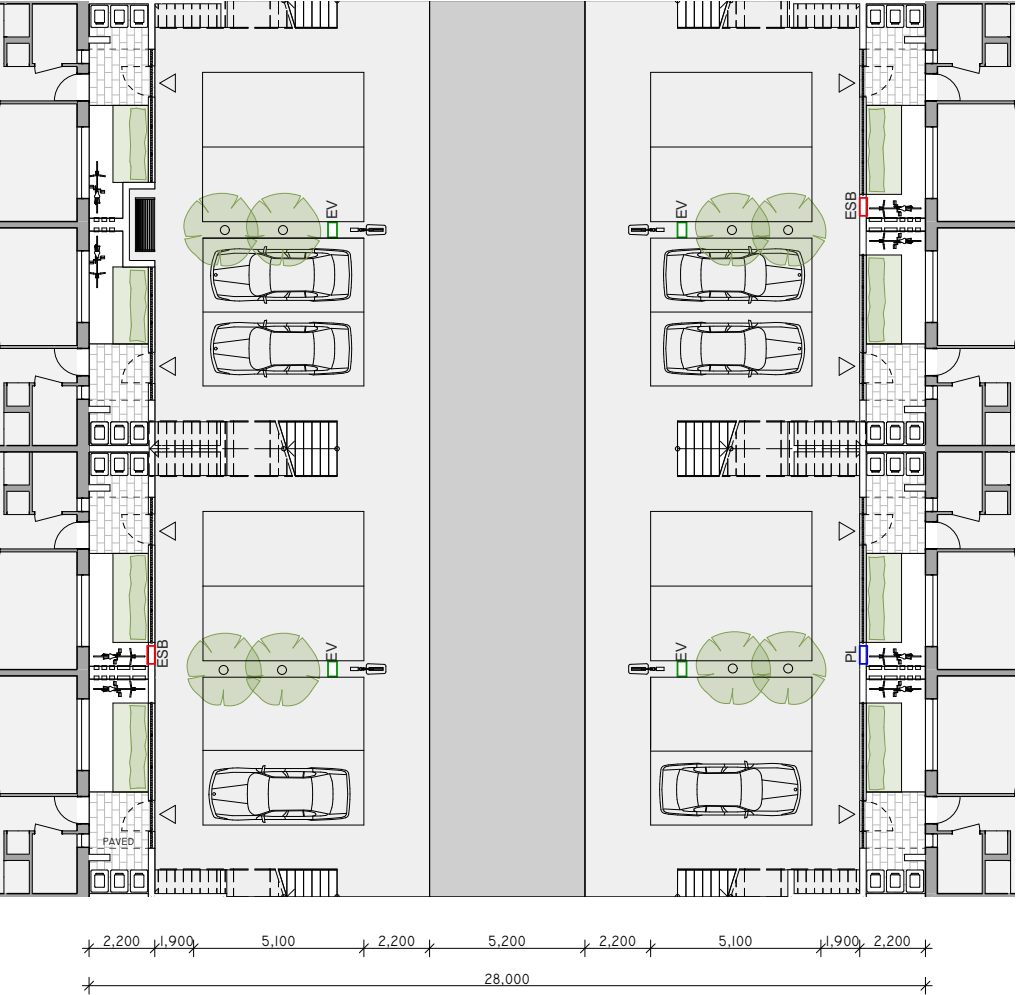
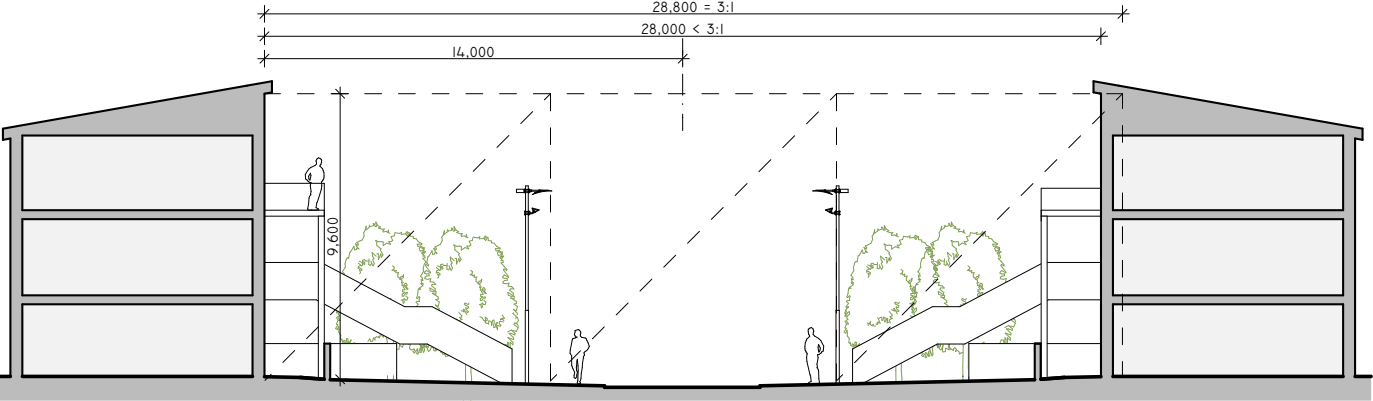
Local Street

1 Side Parallel Parking

1 Side Orthogonal Parking

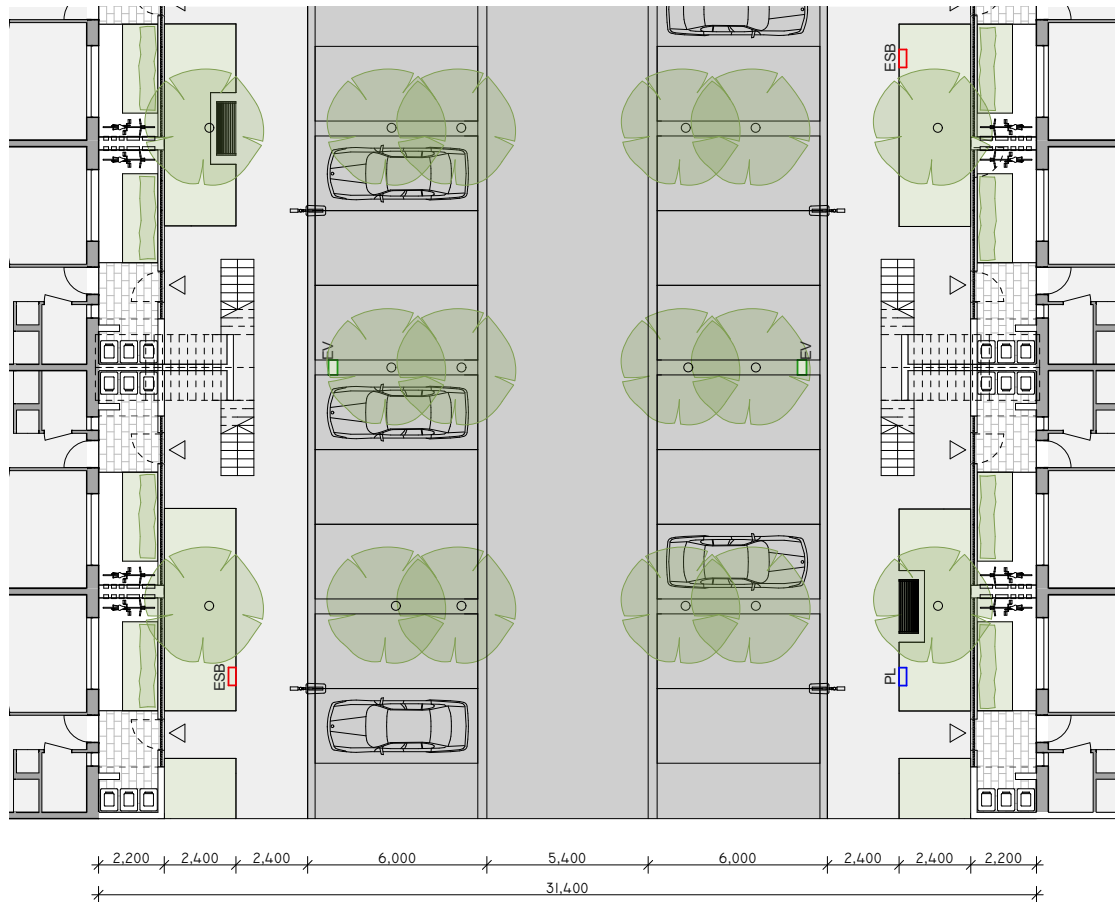
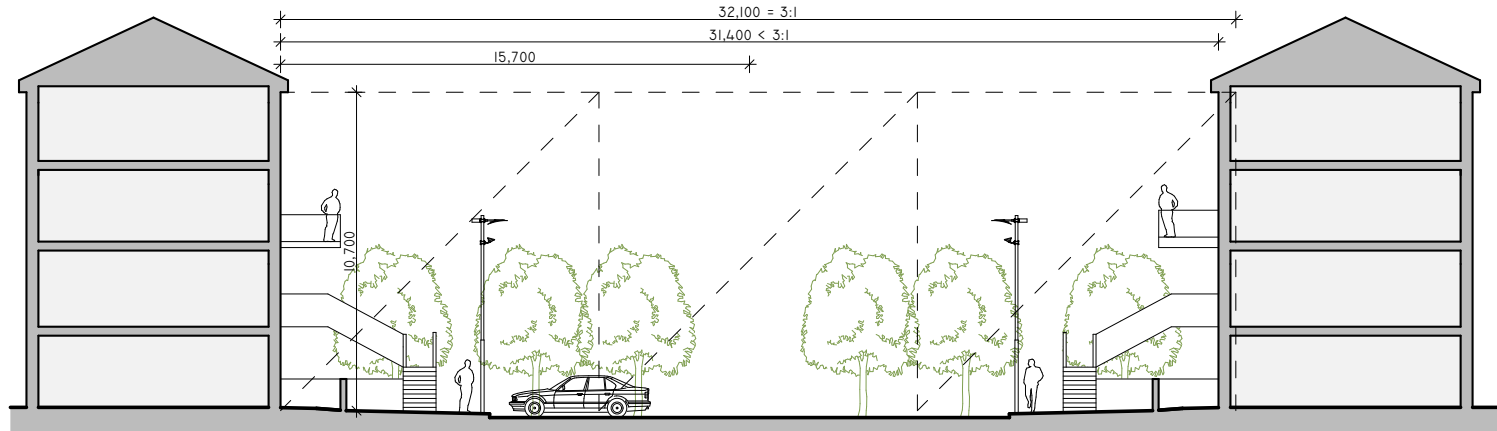


SS3A



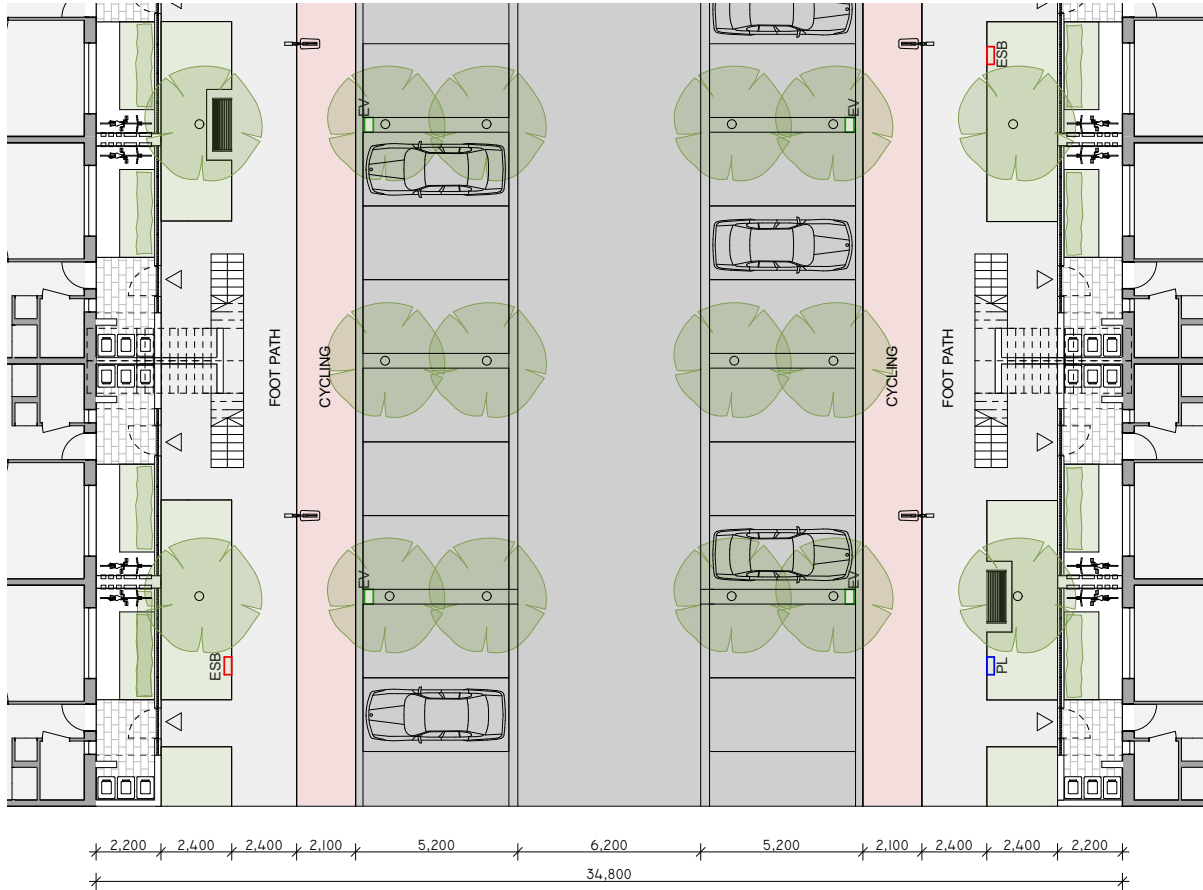
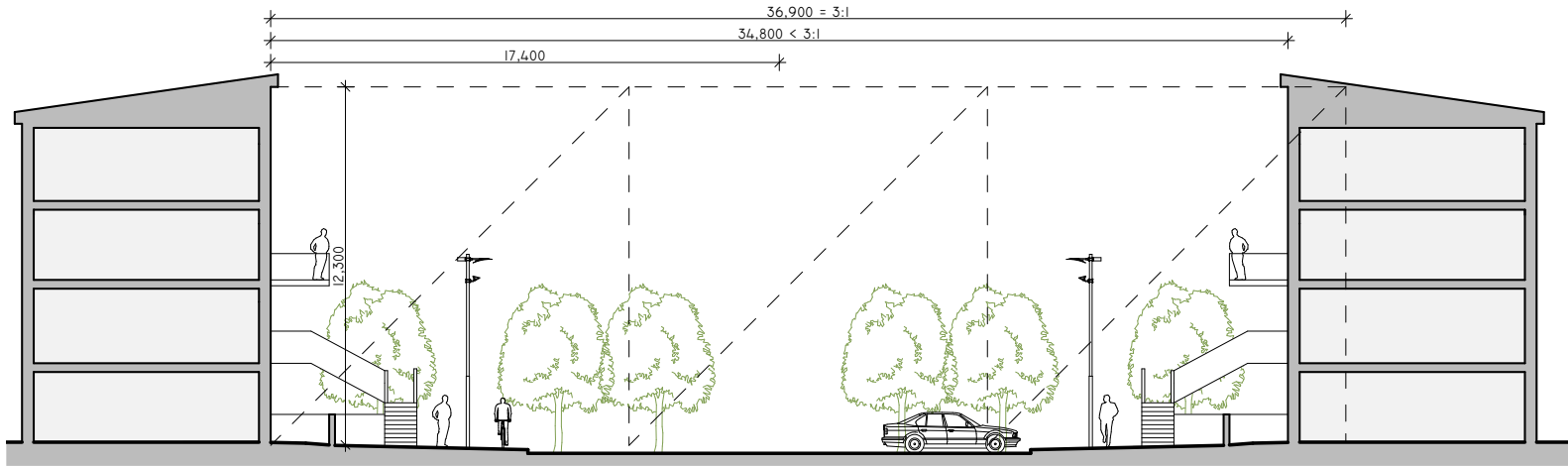
Local Street

SS4A



Local Street

SS4B



**Local / Link
Street**

2 cycle lanes

3.6.3 Active frontage

3.6.3.1 In addition to an acceptable sense of enclosure delivered through an appropriate street ratio, the second important consideration in delivering quality in the public realm is the concept of active frontage.

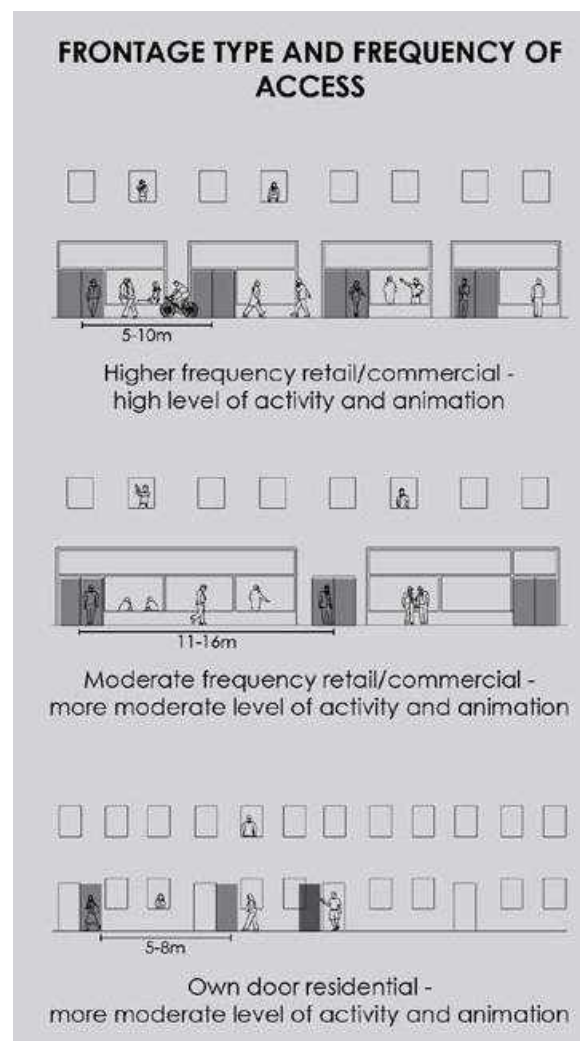
3.6.3.2 Consistent with QHfSC,²⁷ ('making buildings face the public realm and minimising exposed blank facades, avoiding blank walls and facades and maximising front door entrance'), active frontage is best delivered through the highest number of front doors as well as ground-floor windows facing the street. The diagram from DMURS illustrates the principle. The *Urban Design Compendium* further identifies gradations of active frontage from Grade A, with multiple ground-floor doors and windows at great frequency facing the street, with no blank facades down to Grade E, with few doors and windows and with frequent blank facades. The UDC recommends only Grade A, and occasionally Grade B, active frontage, and this is the standard which the Department expects in social housing. Some have interpreted 'active frontage' to mean the provision of large shop fronts on the street. This is not uniquely the case, however, and frequent front doors and windows provide an equally good active frontage, and possibly a better sense of security.



Poor place making, no active frontage, front doors distanced from footpath and hidden by railing, movement function predominates.

Table 5.3 Active frontage guidelines	
Grade A frontage	
• More than 15 premises every 100m	• No blind facades and few passive ones
• More than 25 doors and windows every 100m	• Much depth and relief in the building surface
• A large range of functions	• High quality materials and refined details
Grade B frontage	
• 10 to 15 premises every 100m	• A few blind or passive facades
• More than 15 doors and windows every 100m	• Some depth and modelling in the building surface
• A moderate range of functions	• Good quality materials and refined details
Grade C frontage	
• 6 to 10 premises every 100m	• Very little depth and modelling in the building surface
• Some range of functions	• Standard materials and few details
• Less than half blind or passive facades	
Grade D frontage	
• 3 to 5 premises every 100m	• Flat building surfaces
• Little or no range of functions	• Few or no details
• Predominantly blind or passive facades	
Grade E frontage	
• 1 or 2 premises every 100m	• Flat building surfaces
• No range of functions	• No details and nothing to look at
• Predominantly blind or passive facades	

Table Active frontage - Grades of Active Frontage, Grade A generally acceptable, Grade B only occasionally, courtesy of UDC original by Jan Gehl.



DMURS Active Frontage.

27 QHfSC, pp. 33 and 37.



It was a condition of the planning approval that front doors be retrofitted during the renovation of St Joseph's Mansions, to improve active frontage to the street.

3.6.3.3 The term 'passive surveillance' is sometimes used as a substitute for 'active frontage'. However, it should be apparent that the provision of one window, particularly at an upper level, in an otherwise blank wall, does not deliver any real measure of passive surveillance or enhanced feeling of security. These are achieved only through a feeling of ownership of the street, the actual level of activity on the street and an anticipation of residents appearing, which is delivered by active frontage comprising multiple front doors and ground-floor windows addressing the street. The omission of doors and windows from the ground floor with the aim of improving ground-floor privacy is not advocated, as it results in a loss of active frontage. Strategies for improving ground-floor privacy are discussed in Section 3.6.8 below.

3.6.3.4 Delivering active frontage results in a number of related design requirements in site layouts, which are considered more fully below. Among these interconnected requirements are:

- Use of the perimeter block (an ideal approach to site layouts at the large scale);
- The principle of back-to-back configuration of residences;
- Provision of animated facades and avoidance of blank facades;
- Use of special end-of-terrace dwellings which turn the corner;
- Provision of fine grain;

3.6.3.5 Consistent with DMURS and good urban-design practice, achieving quality in the public realm while also delivering the pedestrian connectivity discussed in 3.5.2 above will mean moving away from the traditional distributor road layouts. These are characterised by the provision of a wall or railings along the road, by having a single point of access to the development and by the unnecessary duplication that results from providing access to housing by means of secondary streets that parallel the distributor road. To emphasise the redundancy of such duplicate streets, it should be noted that there are examples of houses facing onto, and with vehicular access directly from, national primary routes (which would be expected to handle much greater traffic volumes than distributor roads), without any apparent concern or evidence of decreased safety.



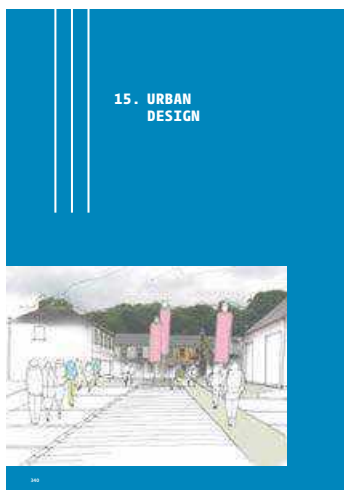
Houses fronting onto and directly accessed from a national primary road, the N3.

3.6.4 Perimeter Block

3.6.4.1 The concept of all residences facing outward, with front doors towards the street, achieves its most successful and economic layout in the perimeter block. Kildare County Council's *Development Plan* usefully summarises the perimeter block's advantages:

Residential layouts should generally utilise the perimeter block principle, as a departure from more recent cul-de-sac type layouts. This will increase pedestrian permeability and legibility of a new development area and will help to define streets and public spaces.²⁸

This form is the most ideal, which is why it has been so widely used in layouts as diverse as that of Limerick's Georgian city centre and that of Ildefons Cerdà's 19th century extension of Barcelona, known as 'Eixample'.



Kildare Co Co Development Plan.



Perimeter blocks in central Limerick.

3.6.4.2 In the perimeter block, the built fabric is disposed along the outer edges of the block, along all four sides in the case of an orthogonal block layout (Type a in the DMURS block types illustrated in Section 3.5.2.2 above). The UDC advises that

Lining the edges of blocks with a perimeter of buildings is the best way to accommodate a diversity of building types and uses, at medium – high densities, whilst ensuring the buildings relate positively to the public realm.⁵⁵

The public facade and front doors of dwellings face the public realm, thus providing active frontage to all four surrounding streets, and avoiding blank walls, but can result in a large open space in the block interior. Although this delivers back-garden privacy, a square perimeter block using individual dwellings (as opposed to apartments in the diagram shown) can result in a block interior with gardens that are too large, which represents uneconomic land use.



Barcelona extension: Cerda's layout of perimeter blocks with continuous movement.

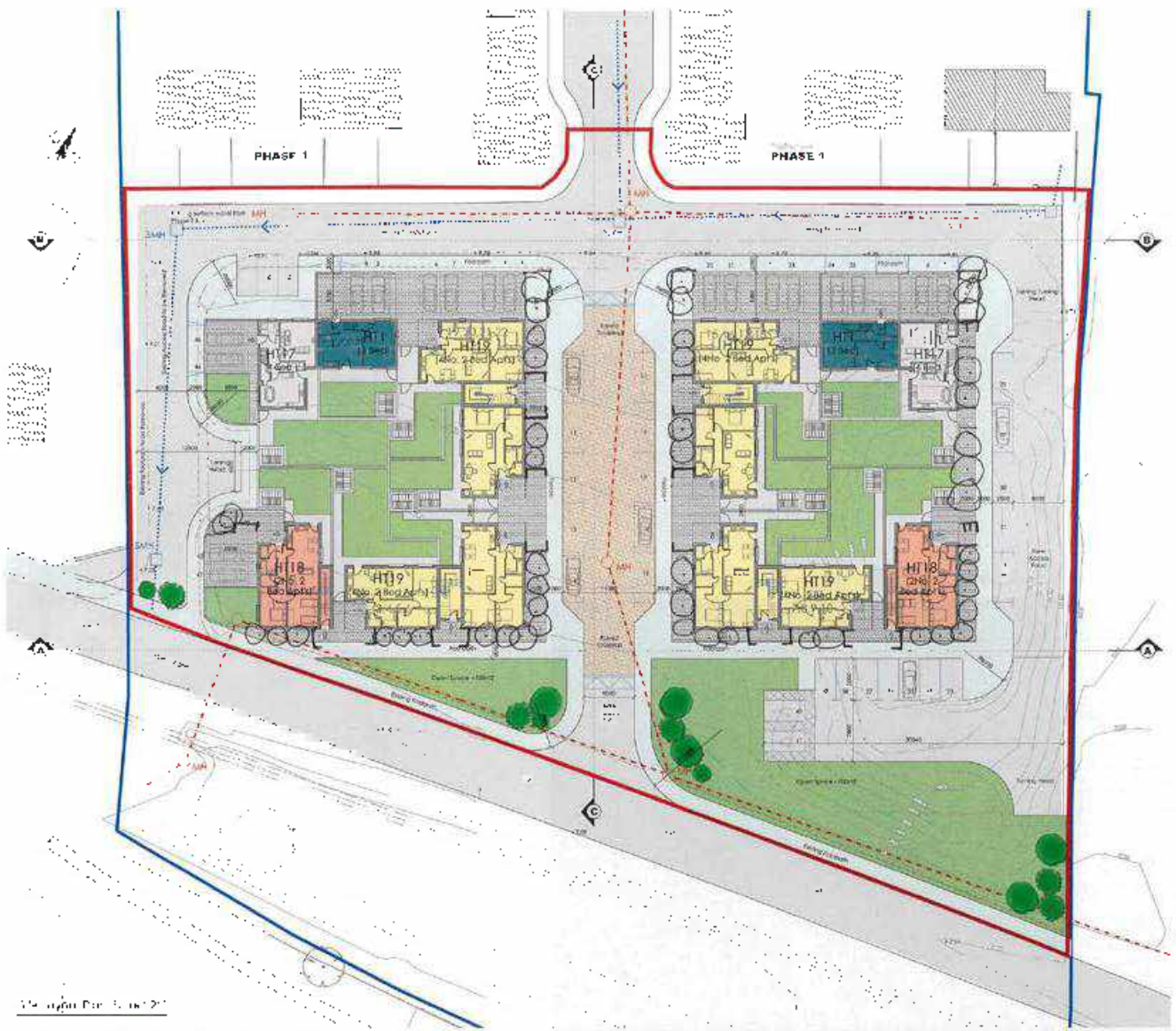


Perimeter Block example, St Joseph's Mansions, Dublin City Architects, Herbert Simms, renovated for Cluid AHB in 2002 by Reddy Architecture & Urbanism. The open space in the block centre is particularly generous and a smaller double block might have provided additional dwellings.

28 Kildare County Council Development Plan 2017–2023, Section 15.7.6.

55 UDC, p.64.

- 3.6.4.3 Although a development will sometimes not be of a size that requires a full urban block, it is important that the principles that the perimeter block illustrates — especially the principles of having front doors of dwellings facing the street and rear gardens backing onto other rear gardens — should be incorporated into site layouts. Some examples of perimeter block layouts used by local authorities in social housing developments are included here.



Perimeter block layout, social housing development Donegal Town, courtesy Donegal Co Co Architect's Department.



Perimeter block layout, PPP social housing development Blessington, Coady Architects, courtesy NDFA and Wicklow Co Co.

3.6.4.4 This block centre space can however be used as communal open space, perhaps incorporating a children's playground (to meet public open space requirements). When used exclusively with single houses, though, this may reduce the density to an unacceptable low level. Communal space at the block centre does have considerable merit when used with five- storey and taller apartment dwellings, which require greater setback between opposing windows for adequate sunlight penetration. By way of illustration, Chapter 4 provides a diagrammatic layout for a single-core development of up to 12 apartments, forming one quarter of a perimeter block of about 74 x 80 metres.



Communal space such as a playground can be provided at the block centre.



Industrial use in Block centres, Dublin 1901, courtesy Ordnance Survey Ireland.

3.6.4.5 The large space in the block core has the potential to be developed for other uses not requiring an active frontage. Historic examples from old maps of Dublin show these block centres being used for industrial purposes. With strict emission requirements, this might now be a more sustainable approach than such early attempts at block centre use would presumably have delivered. The *Urban Design Compendium*²⁹ gives various examples of such block centres (i.e. multi-storey car parks or supermarkets) being used in a way that provides dwellings along all the perimeter edges in order to deliver active frontage to the surrounding streets. (UDC refers to this approach as '*wrapping the box.*')

3.6.4.6 The block layout diagrams in Chapter 4 illustrate that the most economically sized perimeter blocks will be orthogonal in configuration. It can also be noted that the perimeter block, by presenting the public faces to the street, and avoiding public access to the side and rear boundaries, is fully consistent with the guidance quoted in 3.5.2.4 above from *Secured by Design*.

3.6.5 Turning Corners

3.6.5.1 Although perimeter blocks generally deliver active frontage to all the surrounding streets, a particular challenge is how to retain this active frontage at the end of a terrace when the use of a standard terraced dwelling would otherwise result in a blank party wall facing the other street. This has been addressed in various ways over the centuries.

3.6.5.2 Georgian architects responded by providing blank windows in the gable as a means of imitating active frontage. Early social houses in schemes in Dublin achieved this in a much more elegant way by using special house types that were designed to provide front doors onto each side. Turning a corner also presents a particular challenge, if the depth of the dwellings is considered not just as the built fabric but also, and more correctly, as the built fabric plus the private open space at the rear which serves the dwelling.



Georgian Blank Windows.



Dublin City social housing from the air, special corner units to turn the corner and maintain the perimeter block configuration.



Dublin City Architects social housing - elegant solution for turning corner and maintaining active frontage.



Limerick Regeneration social housing Moyross, turning corner and maintaining active frontage, NBA Architects.

- 3.6.5.3 Special house types are required to achieve this, and a number of appropriate types are included in Chapter 5, ranging from the simple end-of-terrace house, which is redesigned to present to the other side street its entrance facade rather than a blank façade, to more sophisticated interventions using duplex dwellings with private open space on different levels.



Turning corner whilst maintaining some active frontage on the gable.



Turning a corner also provides an opportunity for a higher element, to form a landmark or gateway.

3.6.6 Fine Grain

- 3.6.6.1 The *Urban Design Compendium* features a photo³⁰ of the Quays in Dublin to illustrate what it calls 'Trim and Slim'. This requires a plot (or dwelling) width of 5–7 metres, which is more attractive visually (urban buildings generally should be vertically proportioned) and delivers vertical rhythms with frequent front doors, thereby providing a good active frontage. Urban designers refer to an arrangement with such narrow plots³¹ as 'fine grain'. However, it may sometimes be a challenge to deliver this fine grain and multiplicity of front doors where, for instance, an apartment building is proposed. Chapter 4 includes an example of a typical arrangement for a single-core apartment building which would only achieve a shared front door every 30 meters or so. This would fall into the very undesirable and unacceptable Grade D, in the *Urban Design Compendium's* designation of active frontage, without specific design intervention.



The Urban Design Compendium identifies this as a good example of "slim and trim" providing necessary fine grain.

³⁰ UDC, p. 95.

³¹ Refer, for instance, to *The Plot: Designing Diversity in the Built Environment* (2012), by Jonathan Tarbatt

3.6.6.2 To address this, and also to provide properly usable and secure private open space to the rear of the ground floor apartments (i.e. not on the street side of the apartment), in some schemes, architects have designed the ground and first floors of apartment developments as two-storey duplex dwellings.³² This allows the duplexes to provide an adequate frequency of front doors to deliver active frontage to the street, and these dwellings then stretch to the inner block centre where the private open space for these duplexes is provided. Where the provision of private open amenity space to the block centre is for some reason not appropriate, another potential solution would be to provide this open space by way of a balcony on the upper floor of the duplex, which could be designed to best suit this arrangement. Alternatively narrow-fronted, single-storey apartments can be used on the ground floor, stretching from the street to the block centre where their private open space is located. Outline layouts to illustrate some of these approaches are provided in Chapter 4.

3.6.7 Back to Back

3.6.7.1 Part of the enjoyment of private open space is the fact that *it is private*. While privacy can be achieved by enclosing this space within walls, the need to deliver quality in the public realm with active frontage of a high quality, such as the previously referred to Grades A and B — and therefore to generally avoid blank walls — means that such garden walls should not face public streets or open space.

This is set out in the key guidance of QHfSC³³ that '*[r]ear gardens should never back onto roads or public open space*', i.e. the public realm. Instead, they should always back onto other rear gardens, or onto secured shared open space, as at a block centre. Avoiding back gardens facing the public realm, is also consistent with the guidance quoted above from *Secured by Design*.



Aerial view Ballymun, illustrating the principle of back gardens to back gardens.

³² Consistent with the guidance in DSfNA, section 3.42.

³³ QHfSC, p. 33.

3.6.7.2 This principle is often summarised by the phrase 'Front to Front and Back to Back' (as in front of dwelling facing front of dwelling, and back garden abutting back garden). This is a very important consideration when designing a scheme adjoining existing housing, as it may well determine the whole site layout strategy. Where the adjoining development has back gardens backing onto the site to be developed, the first decision should be to back the gardens of the new houses onto same, which may in fact determine how the remainder of the site comes to be laid out. Private open space should therefore be shielded from the public realm by the built fabric.



Where back walls face a public space opportunities arise for anti-social behaviour here, with an absence of a sense of place, without active frontage. This illustrates a lack of design priorities, which is not supported.

3.6.7.3 Some Development Plans are quite clear on this, as implied above, but for the avoidance of doubt, it should be clearly reiterated that private amenity open space to the front of the building line or the public face of the building at ground floor, such as a publicly facing ground floor garden or patio, is not generally considered to provide an adequate quality of private open space in social housing, or an adequate level of residential amenity.

3.6.7.4 Private amenity open space in the form of a patio fronting onto shared open space, with limited and controlled access at the block centre, can with careful design be acceptable without the need for full-height walls, as discussed above.



A patio facing a shared and controlled communal space in a block centre can be acceptable as a private open space.



Amenity space on the ground floor to the front of the building, does not provide an adequate quality of private open space, because it is not private.



Blank walls present an opportunity for anti-social behaviour

3.6.8 Privacy

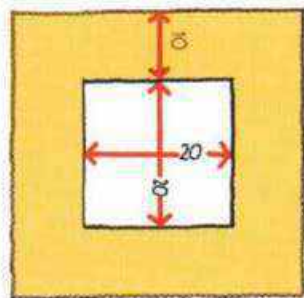
3.6.8.1 To address concerns regarding privacy, there are a number of measures that should be adopted. Early planning guidelines had a requirement for a minimum dimension between opposite upper floor bedroom windows which evolved into the requirement for a 20–22 metres distance between upper floor windows. This was mainly to preserve the privacy of the back gardens from overlooking, and does not appear to be as great a concern with windows facing each other across a public street. However, DSfNA³⁴ notes that the *National Planning Framework* (NPF) signals a move away from rigidly applied blanket planning standards, such as restrictions on building separation distances, towards greater emphasis on performance criteria related to location.

3.6.8.2 In the absence of such location-based criteria, this manual has generally adopted a minimum of 22 metres dimension between upper floor windows at the rear, in the diagrams of block layouts. By careful design, some local authorities have successfully delivered schemes with smaller separation distances to the rear.³⁵

3.6.8.3 Such setback requirements obviously impact on the dimension of the block depth. The block diagrams in Chapter 4 typically show the dimension from the centre line of one street to the centre line of the next street to be in the region of 60 metres. However, the use of wide-fronted houses with few or no windows to the rear of the first floor allows the setback dimension to be reduced, thereby reducing the depth of the block by up to 15 metres, (as shown on Block 02), while still achieving an acceptable quantity of private open space. Some examples of the internal layouts of such wide-fronted house types are provided in Chapter 5.



Wide fronted dwellings with minimal first floor windows allow reduced setbacks without loss of privacy or amenity. Social Housing, Cox's Demesne, Dundalk, Fingal Architects' Department, courtesy Louth Co Co.



20 metre setback at block centre considered adequate for privacy in six storey apartment block in Berlin. Courtesy UDC



By careful design with separation less than 20 metres. Social housing, George's Place, Dun Laoghaire-Rathdown Architects' Department and A2 Architects.

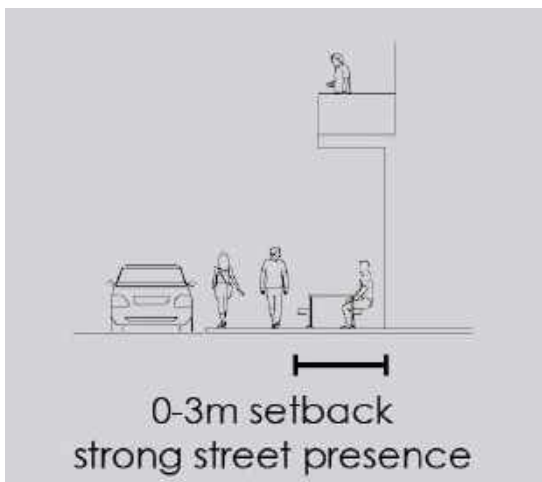
³⁴ DSfNA, Section 2.23.

³⁵ See for instance Dun Laoghaire-Rathdown's award-winning social housing development at George's Place, Dun Laoghaire, delivered through a prefabricated rapid process.

3.6.8.4 DMURS and QHfSC advocate the provision of on street parking, but this raises privacy considerations for the ground-floor rooms facing the street. The zero setback should be avoided except as an infill in existing city or town centre streets, to maintain existing building lines. In such cases, where zero setback is required, various design devices should be employed to distance pedestrians from ground-floor windows in order to improve privacy. Successful examples use a building setback for the front door to form an open porch, frequently containing the ground-floor window.



Examples of defensive measures in zero setback housing.



Setback to the Pedestrian Footway - DMURS.

3.6.8.5 DMURS recommends a privacy strip of 0–3 metres for a strong street presence, and this is the preferred solution, as shown in the street sections and block layouts. As terraced forms are advocated, in addition to forming a planted buffer, the front privacy strip can also contain a low-level store for wheelie bins and a facility for parking bicycles. Utility meter boxes can be accommodated on the side or 'gossip' walls. This is preferable to their being located on the front façade.



Private amenity space for ground floor apartments may, with careful design, be provided facing a controlled communal open space, private to the residents.



Privacy Strip.



Front privacy strip containing wheelie bin store.

- 3.6.8.6 Similar concerns arise in the case of apartments, and the privacy of ground-floor apartments should be achieved by similar measures. As noted, the private open space for such ground-floor apartments should not be delivered on the public street side, such as in a patio, as it unacceptably diminishes the privacy and usability of such open space. The use of duplex units on the ground and first floors of multi storey apartment developments was also discussed above, with the private open space facing onto the shared and controlled private open space at the block centre, or alternatively provided on the first floor of the duplex.



Lower floors own door duplexes, with apartments above. Provides active frontage with private open amenity space to rear. Horan Keogan Ryan Architects.



The ground floor apartment with a patio facing the street, does not have usable private open space.

- 3.6.8.7 To deliver quality in the public realm and to ensure that appropriate privacy and residential amenity is provided, in particular the provision of a useful private open space for ground floor residents, the use of linear or pavilion-type apartment blocks, or of houses or duplexes with two opposite public-realm-facing fronts, should generally be avoided in social housing.

3.6.9 Topography

- 3.6.9.1 While there is a general preference for avoiding steeply sloping sites, as noted there may be occasions, such as a very favorable town centre location, where it is found appropriate to develop a site with a considerable slope. There are a range of design strategies which can be employed without compromising the accessibility requirements set out in DMURS.
- 3.6.9.2 It should be realized that the provision of substantial reinforced concrete retaining walls and structures involves significant additional costs, and a design which minimises or where feasible entirely avoids the requirements for such structures will therefore be more economical.
- 3.6.9.3 Among the design strategies that can be implemented in order to minimise the need for retaining structures are the following:
- Where feasible, work with the slope. Layouts with terraces running along the same contour can reduce the need for retaining structures.
 - Take up level differences in private open spaces (in contrast to the flat open spaces shown in the sectional diagrams after Section 3.6.2 above). A sloping rear garden, or even a low blockwork retaining wall in the back garden, that divides the paved area from the planted area should be perfectly acceptable and will not unduly compromise residential amenity
 - Split-level dwellings or other innovative and more expensive layouts may be suitable in some situations. It is advisable however, that no internal part of the dwelling should be designed as a retaining structure, because experience has shown that waterproofing in such situations can be prone to failure, which is extremely difficult and expensive to remedy. The use of an outer basement area with an external retaining wall is a more prudent approach.

3.6.10 Small Towns and Villages

- 3.6.10.1 The principles of urban design, perimeter blocks and quality of the public realm are just as applicable to small towns and villages. These are defined in SRDUA as having populations of between 400 and 5,000 persons. Traditional buildings in Irish towns and villages generally follow the principle of public front and private back, and deliver active frontage to the public realm by way of front doors and windows facing the street. All new housing developments in these locations should follow these principles.
- 3.6.10.2 Small towns and villages are usually two-storey and sometimes three-storey in scale, and frequently comprise terraced forms. As need in such towns and villages is likely to be limited, social housing interventions in such locations are likely to be small-scale infill developments,³⁶ and such social housing would be expected to adopt the terraced form and building height of the surrounding buildings.
- 3.6.10.3 The principles of privacy and fine grain are equally applicable in small towns and villages, though it is accepted that street widths may be such that more reliance may need to be placed on street trees to achieve a good sense of enclosure.

- 3.6.10.4 It is also accepted that a small town or village, the typical 'sráidbhaile,' may not have developed much in locations other than its main street, and as such may not as yet have delivered perimeter blocks or even engaged with turning corners. Nevertheless, in order to best facilitate future development, infill developments in such locations must be mindful of the principles outlined above in this regard.
- 3.6.10.5 As discussed above, different considerations of density may apply in such locations, although SRDUA notes there may be some opportunities for improved densities. Similarly, consideration should be given to what might be an appropriate setback (if any) from the footpath, but local example may provide some guidance as to what is acceptable and in keeping with the context. Economic layout and design is still the most important consideration, however.
- 3.6.10.6 Some examples are provided here of local authority proposals for social housing in small towns that adopts these principles, in particular the use of a perimeter block arrangement.



Local authority social housing forming a perimeter block with back to back gardens in the block centre. Riverside Kells, Cooney Architects.

³⁶ Note that SRDUA also places limits on the size of any single residential development in such small towns and villages. For villages below 400 persons, SRDUA limits any one development to 10–12 new dwellings.

3.6.11 Other Considerations

3.6.11.1 Other, site-specific, considerations are likely to arise, and the architects with the design team will ensure that these are appropriately addressed. It is somewhat difficult to generalise but among the additional design considerations which will probably need to be taken into account in any residential development, are:

- Existing building lines should generally be maintained.
- Building heights should be kept in line with those of immediately adjoining dwellings. Thereafter, opportunities to increase building heights in accordance with UDBHG, thereby achieving at least three to four storeys, should be explored.
- The quality of streets can be improved by having the same or similar development on either side, providing the street with a unitary expression of materials, colours and rhythm. Accordingly, when designing the site layout, the best result will normally be achieved when the line along the ends of the back gardens is located on the boundary, rather than the edge, of a street located on the boundary.
- Future development should be considered, particularly with a view to providing for future permeability. If a long, narrow site is being developed, for example, opportunities for connections to the next site should be considered, in particular where this will facilitate easier access in the long term to the town centre. The Local Area Plan may well highlight such opportunities.
- In the interests of privacy and residential amenity, as well as maintenance access, the external wall of one property should not front onto or form the boundary to the private open space of another property. One tenant (or more critically, the owner, in the event of tenant purchase) should not have to enter the private open space of another resident for maintenance purposes. By avoiding such a layout, nuisance from noise arising from the 'tennis ball effect' can also be prevented.

3.6.12 Summary:

The following is a list of quality indicators for site layouts and apartment layouts, against which applications for funding of social housing will be assessed. It can be seen that some provisions satisfy more than one item on the check list. Although generally intended for greenfield sites, the principles below are equally applicable to town-centre brownfield or backlands sites.



Local authority social housing forming a perimeter block with back to back gardens in the block centre. Plas Lorcain, Monaghan. J N P Architects.

Site Layout of Residential Developments: Ten Key Urban Design Quality Indicators

1. Movement system should ensure permeability in the form of a continuous web.
2. To best facilitate pedestrian permeability, layouts should follow perimeter block principles³⁷ and be appropriately sized (maximum 100 m).
3. The highest number of dwellings permissible should be delivered on the site.
4. A variety of tenures and dwelling types should be facilitated, in particular on larger schemes.
5. The public streets and spaces should have a good sense of enclosure:
 - The ratio of façade height to street width should preferably not exceed 1:3.
 - Almost continuous facades (>75%) and suitable street trees should be provided.
6. The quality of the public realm should be delivered by:
 - Providing Active frontage.
 - Ensuring that front doors face the street at close intervals, and that there are frequent ground floor windows.
 - Minimising or, if possible, avoiding blank walls, which means that back gardens should always back onto other back gardens and not onto public spaces, roads or footpaths.
 - Ensuring that built fabric forms as continuous an edge as possible around the perimeter of the block.
 - Providing fine grain, with property widths of 5–7 metres articulated.
 - Promoting security by maximising activity and maintaining active frontage.
7. Ensure streets are self-regulating in accordance with DMURS by providing:
 - Appropriate street ratio.
 - On-street parking.
 - On-street trees.
8. Improve residential privacy by ensuring that:
 - A minimum 20–22 meter separation between directly opposing rear-facing, upper-floor windows³⁸ is provided. Lower domestic buildings may, with good design, reduce this.
 - Overlooking of rear gardens by other properties is minimised.
 - A small privacy strip is provided to distance ground-floor windows from the public footpath.
9. Apartment layouts should avoid pavilion or linear-type blocks. The ground-floor apartments or duplexes should have their private open space either backing onto other back gardens or as patios fronting other fully secured and controlled shared open space, and not facing public streets or footpaths. Fine grain at street level must be achieved.
10. Public open space should ideally be provided by way of fully formed regular portions of land, an omitted block or portion of a block, and fully faced with active frontage, preferably taller than surrounding developments. It should not be formed of residual, irregular leftover spaces.



The external wall of one property should generally not front onto, or form the boundary to, the open space of another property.

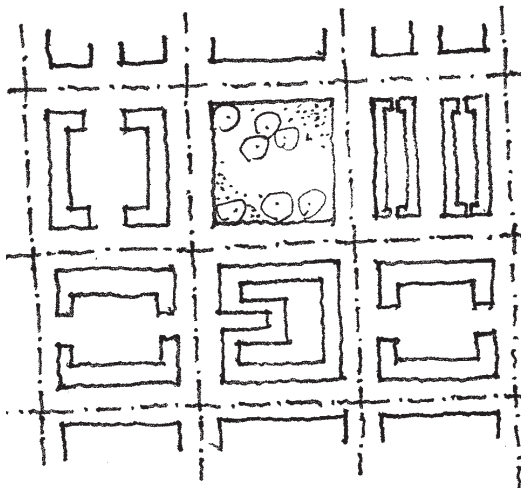
³⁷ In the sense of having all front doors face the street, and all back gardens back onto other back gardens (or a secured shared open space or undeveloped lands), and in the sense that the layout will facilitate the formation of perimeter blocks in subsequent development.

³⁸ Or as otherwise determined by the *performance requirements* set out in the development plan.

4 Chapter 4 Scheme Layout Diagrams

4.1 Introduction

4.1.1 In this chapter, the design principles discussed previously are applied to guide site layouts, dealing first with individual dwellings, duplexes and small apartments, and then with larger apartment buildings. Sample diagrammatic layouts for both are provided. It is important that the drawings are read in conjunction with the text.



Block sketch.

4.2 Scheme Layout Considerations

4.2.1 The layout of a scheme will largely be site-specific. Nevertheless, it is useful to examine diagrammatic site layouts to see how the specific urban design principles discussed in Chapter 3 might apply in practice.

4.2.2 The initial diagram is at a large scale and gives an idealised view of a portion of a neighbourhood, showing many of the block types which will later be explored in greater detail. This is large scale urban intervention on the scale of Cerdà in Barcelona or Haussmann in Paris.

4.2.3 Although the focus of this manual is on a smaller scale, the diagram does illustrate how a variety of block types can be combined within the continuous movement system. Following the historic examples of Eyre Square in Galway, Merrion and Mountjoy Squares in Dublin and the Crescent Gardens, Belfast, it also illustrates the best way of providing public open space or park, which is by means of an omitted block. This delivers quality open space, fronted on all sides and with a good sense of enclosure.

4.2.4 The following site layout diagrams explore a variety of block types that all try to minimise the extent of blank walls, provide the greatest extent of active frontage and, as far as possible, adopt a perimeter block approach, using special dwellings to turn the corner. It can be seen at the scale of the block that all possible key urban design quality indicators, as summarised in Chapter 3, are generally delivered. A few of these will be considered in greater detail below.

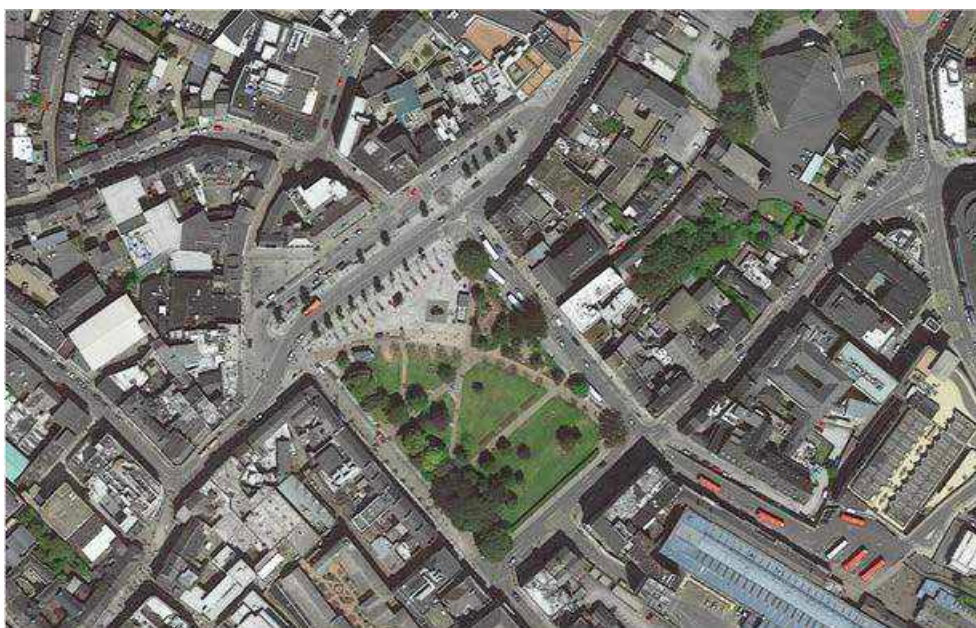


Social Housing Limerick, Paul Keogh Architects.



Provide the greatest extent of active frontage. Social Housing Moyross, Limerick. NBA Architects.

4.2.5 The dimensions for the external elements, such as roads footpaths etc., used on the block layout diagrams are generally as shown in Section 3.6.2.8 above. The overall block dimensions seek to achieve a balance between providing an economic layout that represents best land usage, on the one hand, and delivering permeability by adopting the maximum block sizes as guided by DMURS, on the other. The street widths are determined by fixing the dimension of front façade to front façade not to exceed the 3:1 width to height ratio as illustrated in the previous chapter. Such street widths vary on blocks with three and four storey dwellings, for instance on part of Block 3A.



Eyre Square, public open space formed by omitting a block, active frontage on all sides.

- 4.2.6** Although the following diagrams adopt an idealised orthogonal layout, it is fully expected that a received masterplan or Local Area Plan, or the existing movement patterns and street layouts as well as site conditions, may not allow for this, and more irregular block layouts will be required, such as the curvilinear and organic block layouts from DMURS, as shown in 3.5.2 above.
- 4.2.7** Whichever block configuration is appropriate, however, the overriding consideration is to deliver a continuous movement system of joined-up streets, with blocks appropriately sized to achieve ease of movement, with the dwellings arranged around the perimeter and adequate space between opposing rear facades for the purposes of privacy and quality of private open space in the back gardens.
- 4.2.8** In practice, and as previously referred to in 3.6.11.2 above, this may mean in one's own development, facilitating future movement systems for lands in other ownership that are yet to be developed. Where a Local Area Plan has been prepared, such future movement system should be indicated from the beginning, and all developments will provide for same. However, where no Local Area Plan exists, it will be expected that site layouts will anticipate the creation of blocks of no more than 100 x 100 meters, by setting up the location for future streets, which later development on adjoining sites will respect and extend. This is particularly applicable to the site layout of long narrow plots.
- 4.2.9** The orthogonal block layout does have the advantage of achieving best land use and accordingly should be favoured where possible. Where this layout is not possible, it may be necessary to rely on a larger proportion of apartments or duplex dwellings to deliver an acceptable density.
- 4.2.10** The urban design quality indicators also identified the provision of public open space as a key consideration, and it should be carefully designed and appropriately landscaped. Where feasible, consideration should be given to using a portion of the open space, and indeed any planted area, for a Sustainable Drainage System (SuDS). While Development Plans tend to focus on the quantum of open space, the quality of same is just as important a consideration. It is especially important that it be faced by active edges to enhance the feeling of security for its users.

4.3 Standard Dwelling Types

- 4.3.1** The block layout diagrams utilise a variety of standard house, duplex and apartment types, the internal layouts for which are shown in Chapter 5. The use of such standard types allows a site layout to be compiled comparatively quickly, so that alternatives can be evaluated at an early stage in terms of best site use and best meeting urban design placemaking principles.
- 4.3.2** The block layouts should be regarded as diagrammatic, and for illustrative purposes. As such, the dimensions of the standard dwelling types have been adopted with a dimensional allowance for party wall and external wall thicknesses. Accordingly the dimensions on the block layout diagrams are to a small extent approximate, as they will be determined by the actual dimensions of external and internal walls arising from the specific form of construction employed.

4.4 Improved Land Use

- 4.4.1** The previous chapter discussed the reasons for achieving higher densities, addressing the topic from both health and welfare perspectives while also taking account of economic considerations.
- 4.4.2** In these site diagrams, the convention adopted is to calculate the block area by multiplying the block length by breadth measured to the centreline of the surrounding streets. This block area is then inflated by a further 15% to make allowance for the area of public open space provided elsewhere, for additional car parking, for nature-based SUDS and for unavoidable inefficiencies in planning the layout. The number of dwellings in the block is then divided by the resulting site area in hectares, to give the number of dwellings per hectare¹ (dph).



Higher density in a walk up duplex over duplex, Adamstown. O'Mahony Pike Architects

¹ A more correct measure of density which speaks directly to the degree of activity on the street and the measure of support for local facilities is indicated by way of bedspaces per hectare (bph). For instance, 30 dph comprising four-bedroom dwellings will supply 210 customers for the local shop, whereas 30 dph of one-bedroom dwellings will deliver at most only 60 customers. However, as planning-guidance documents currently use the dph, this convention has been adopted in this manual.



Walk up duplexes, Ballincollig, Co Cork. Tony Dennehy Architects



Duplex and apartments at Dun Sli, Portmarnock, BKD Architects, Courtesy Cluid AHB

4.4.3 It can be seen from these diagrams that a combination of house types, duplexes and small walk-up apartments in the region of two to four storeys can achieve densities in the region of 40–50 dph, and this is the range that should be aimed for in appropriate locations, as summarised in the table in Section 3.5.3.2 above. As noted on that table, there are some locations, in particular in small towns and villages, where lower densities are considered acceptable.

In town, neighbourhood and city centres, and along public transport corridors, it is expected that densities higher than 50 dph will normally be required, but these necessitate purpose-designed apartment buildings, which will be considered later in this chapter.



Walk up Social Apartments, South Dublin Co Co. Sean Harrington Architects.

4.4.4 The diagrams also illustrate a number of factors, as advocated in both DMURS and QHfSC, that contribute to an economic layout, which in turn delivers an increase in density. These include:

- Using terraced forms.
- Ensuring that back gardens are sized so the setback between opposing windows at above ground level do not generally much exceed the required 20 - 22 meters.
- Ensuring that street widths do not generally exceed the 3–1 width-to-height ratio.
- Using integrated apartments and duplexes for variety and increased density.
- Providing on-street parking at a reasonable level (slightly > 1 per dwelling).
- Having a joined-up movement system that avoids the need for land-wasting turning circles.
- Ensuring that block dimensions arise from optimal dimensioning of each element, (i.e. garden, dwelling, privacy strip, street width, etc.), as set out in Section 3.6.2.8 above.



Terraced Forms, Social Housing, Riverside, Kells, Cooney Architects.



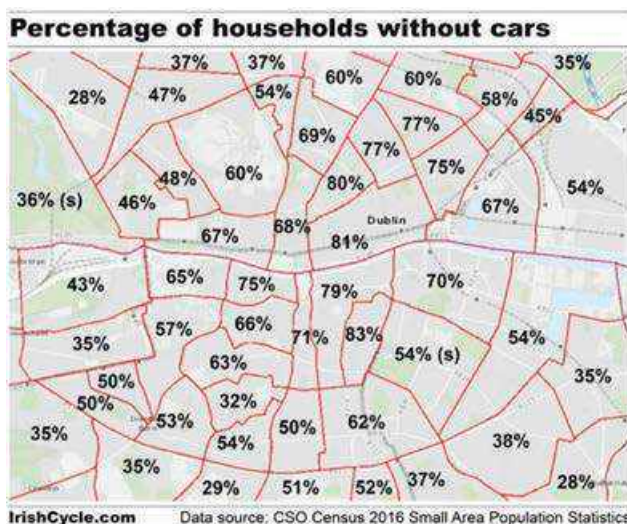
On street parking, Social Housing, Carrick. Donegal Co Co Architects' Department.



Joined up movement system - new street formed in central Buncranna, Co Donegal.

4.4.5 One of the greatest challenges in achieving compact development and meeting density targets in an economic manner is the extent to which the provision of surface car parking can negatively impact on this objective. Local authorities will have their own requirements, as set out in their Development Plans, but the level of proposed car parking provision should be carefully considered, and reviewed with planning colleagues, because the actual need may not be as great as the perceived need. For instance, some local authorities have advised that there are fewer car owners among their tenants. Other factors can also reduce the need for private car provision below what is anticipated in the Development Plan.

These include the degree of residential mix, particularly the number of one bedroom or smaller dwellings; the number of dwellings for older people; and most importantly the location's proximity to the facilities available in the centre of a town, neighbourhood or city. Although the diagram of car ownership shown is for Dublin, it is to be expected that car ownership in other major centres may similarly fall somewhat below what might have been expected.



Percentage of Households who don't own a car. CSO Survey, courtesy Irish Cycle.

4.5 Delivering Public Realm Quality

4.5.1 A key ingredient in creating public realm quality is the skill that an architect displays in designing façades which by their rhythms, proportions, openings and materials best contribute to enhancing the public realm, thereby delivering attractive streets and quality placemaking. At a macro level, the site layout diagrams illustrate how quality in the public realm is achieved by ensuring that the urban design principles are followed. Among other things, the diagrams illustrate the following:

- **Building facades** should be near-continuous.
- **Active frontage** should be maximised.
- **Special dwellings** should be used at corners to provide active frontage to both streets.
- There should be **fine grain**, with a maximum number of front doors facing the street.
- **On-street parking** should be provided to assist in passive traffic control.
- **On-street trees** should be provided to enhance the sense of enclosure.
- **Age-friendly street furniture**, particularly benches, should be provided.
- Opportunities to **increase building heights** should be taken, when facing public open spaces or at junctions.



Sense of Place, quality public realm, Social Housing, Dolphin House Regeneration, Dublin City Architects' Department.

4.6 Privacy and Access

4.6.1 The block layout drawings adopt the principle of a small front garden to act as a privacy strip to the front of the dwellings for purposes of residential amenity. The wheelie bin store can be located in this privacy strip, as can bicycle storage, thereby avoiding the main reasons for rear access. The low party walls to the side of the privacy strip also allow for the neat integration of utility meters, which avoids disfiguring the front wall of the dwelling. Where external stairs are located to access upper-floor duplexes and apartments, the space underneath these stairs can also be designed to serve these functions.

4.6.2 Although the block layout drawings show the wheelie bins stored at the front of dwellings, the diagrams also incorporate the optional provision of shared lanes in order to provide a measure of rear access. Experience indicates that such lanes should not be shared by more than four or five dwellings at most, and that they must be adequately secured by a locked access gate² onto the street.



Understairs for wheelie bin storage.



An example of a pend, a traditional means in social housing of accessing mid terrace gardens shared by two or more properties.

4.6.3 Some Local Authorities have found that some such lanes, in particular where they are not adequately secured, have been a source of anti-social behaviour. As most terraced houses function perfectly well without them, layouts without such lanes are fully supported. They have been shown on the block layouts, purely to illustrate that should some Local Authorities consider such rear access necessary, it can be provided, without detracting from the design principles. Other options include the traditional pend, where the continuity of the front façade is maintained by having the first floor extending over an access way to rear gardens, shared by a more limited number of properties.

4.7 Block Layouts

4.7.1 Block 01 is a diagram of a fairly traditional block layout using a mix of one, two and three-bedroom dwellings, mainly two-storey but with three-storey specials at each end to turn the corner and provide active frontage to both streets. Car parking is on-street at a rate greater than one space per dwelling, with disabled parking bays associated with the dwellings for persons with a disability, as well as occasional general provision.³ EV charging points are shown to indicate potential future locations. The overall block length of 94 metres (114 metres from centre line of street to centre line of street) is approaching the maximum length consistent with ease of pedestrian movement. The block width of 40 metres (60 metres from centre line of street to centre line of street), is a fairly typical block width, incorporates the preferred external dimension for the various elements shown in Section 3.6.2.8 above, (i.e. carriageway, on-street parking, footpath, privacy strip, building depth) as well as a 22 metre dimension from rear façade to rear façade. Block 01A is a variation on Block 01, but with a higher proportion of two-bedroom dwellings, which in many locations is expected to approximate more closely to the actual housing need.



Privacy strip with wheelie bin store, Social Housing, Waller's Well Limerick. Paul Keogh Architects.

² Employer's Requirements for Detail Design of Quality (2020) gives recommendations in this regard.

³ See Section 3.6.2.8 above.

4.7.2 Block 02 illustrates how the use of wide-fronted dwelling types can reduce the block width, as previously discussed. Here, while maintaining the street ratio with a two storey façade to the street, the dwellings are designed to the rear as single aspect with no windows on the upper floor and therefore do not overlook the opposite garden. This permits a reduction in the rear façade to rear façade dimension to about 13 metres, while still providing a good size and quality of private open space in the non-overlooked back gardens. These dwelling types, and the half block which results (17.5 metres from centre line of street to rear boundary), are very useful, for instance, where there is a need to provide active frontage and shield the back gardens of existing houses but where the available site dimension is limited.



Wide fronted dwellings with minimal first floor windows allow reduction of setbacks. Social Housing, George's Place, Dun Laoghaire-Rathdown Architects' Department and A2 Architects.

4.7.3 Block 03A utilises three storey dwellings along one street to achieve an appropriate street ratio on a wider street. Although the block width (from centre line of street to centre line of street) is greater than in the previous examples, and the site area is therefore larger, the use of the duplex dwellings slightly increases the overall density. The three storey duplexes and dwellings can be used on local streets. Consistent with published planning guidance on building heights, three and four storey residential streets will become more widespread (as was traditionally the case in the main street in many Irish towns) as we seek to improve site usage, in accordance with UDBHG.

4.7.4 Block 04 is a variation on Block 1 (with almost identical block dimensions) but with a different special dwelling type using a combination of walk up duplexes at each end to turn the corner, and achieve a similar density to 03A.

4.7.5 Block 05 utilises what are approximately the maximum dimensions for a block consistent with ease of pedestrian movement. It can be seen that Block 05 approximates the dimensions of two of the previous blocks. By arranging the dwellings along the periphery of each street, as the private open space only occupies a portion of the block, a block interior is formed. Here, the block interior is used for additional dwellings, but it could just as easily be used for non-residential uses, including retail, workshops or a crèche, while maintaining active frontage to all streets. This was covered in the discussion, in Section 3.6.4.3 above, of 'wrapping' a non-frontage building.

4.7.6 Block 06 is a variation on Block 05, but along with some alternative dwelling types, it introduces a multi-storey community dwelling as part of the site layout. Here, there is an example of some dwellings with two-storey rear windows, backing onto dwellings with no window on the first floor, and accordingly it is suggested that the setback between the two rear walls could be reduced from 22 metres to 17 metres and still deliver an acceptable level of privacy to each of the two dwellings.



Traditional three storey buildings in Irish town centres.



Traditional three and four storey buildings in Irish town and city centres.

BLOCK 01

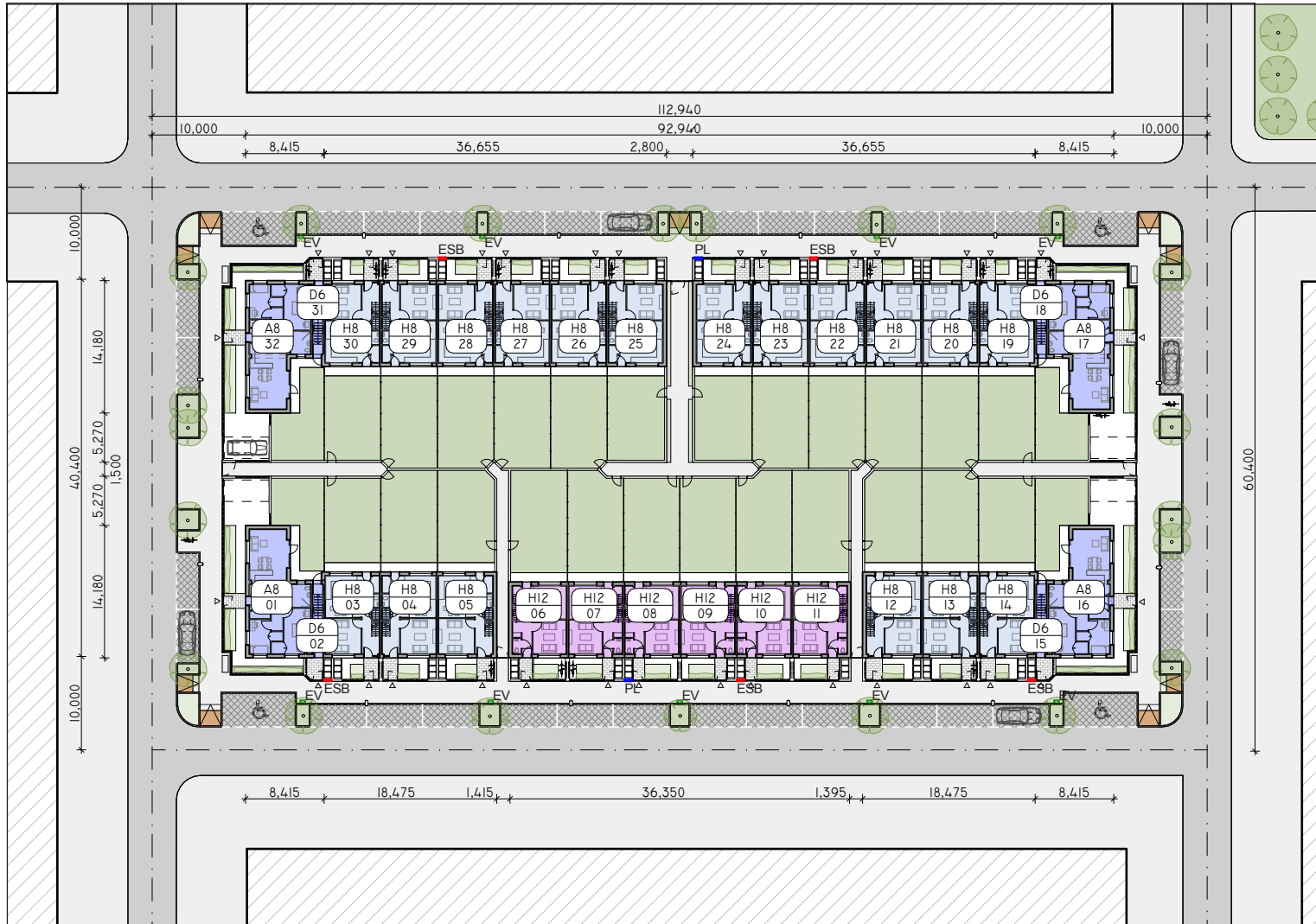
KEY

- HOUSETYPE H8
- HOUSETYPE H12
- HOUSETYPE A8/D6

- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
- ESB MINI-PILLAR
- EV ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

UNIT TYPES		NO
H8	3B/5P/2S	18
H12	2B/4P/2S	6
A8	2B/3P/1S UD	4
D6	3B/5P/2S	4
TOTAL		32
CAR PARKING		40
SITE AREA		0.682 HA
+15%		0.784 HA
DENSITY		41 UNITS/HA



BLOCK 01A

KEY

- HOUSETYPE H8
- HOUSETYPE H12
- HOUSETYPE A8/D6

- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
PL
- ESB MINI-PILLAR
ESB
- EV ELECTRIC VEHICLE CHARGING
POINT MINI-PILLAR
EV

UNIT TYPES NO

H8	3B/5P/2S	12
H12	2B/4P/2S	12
A8	2B/3P/1S UD	4
D6	3B/5P/2S	4

TOTAL 32

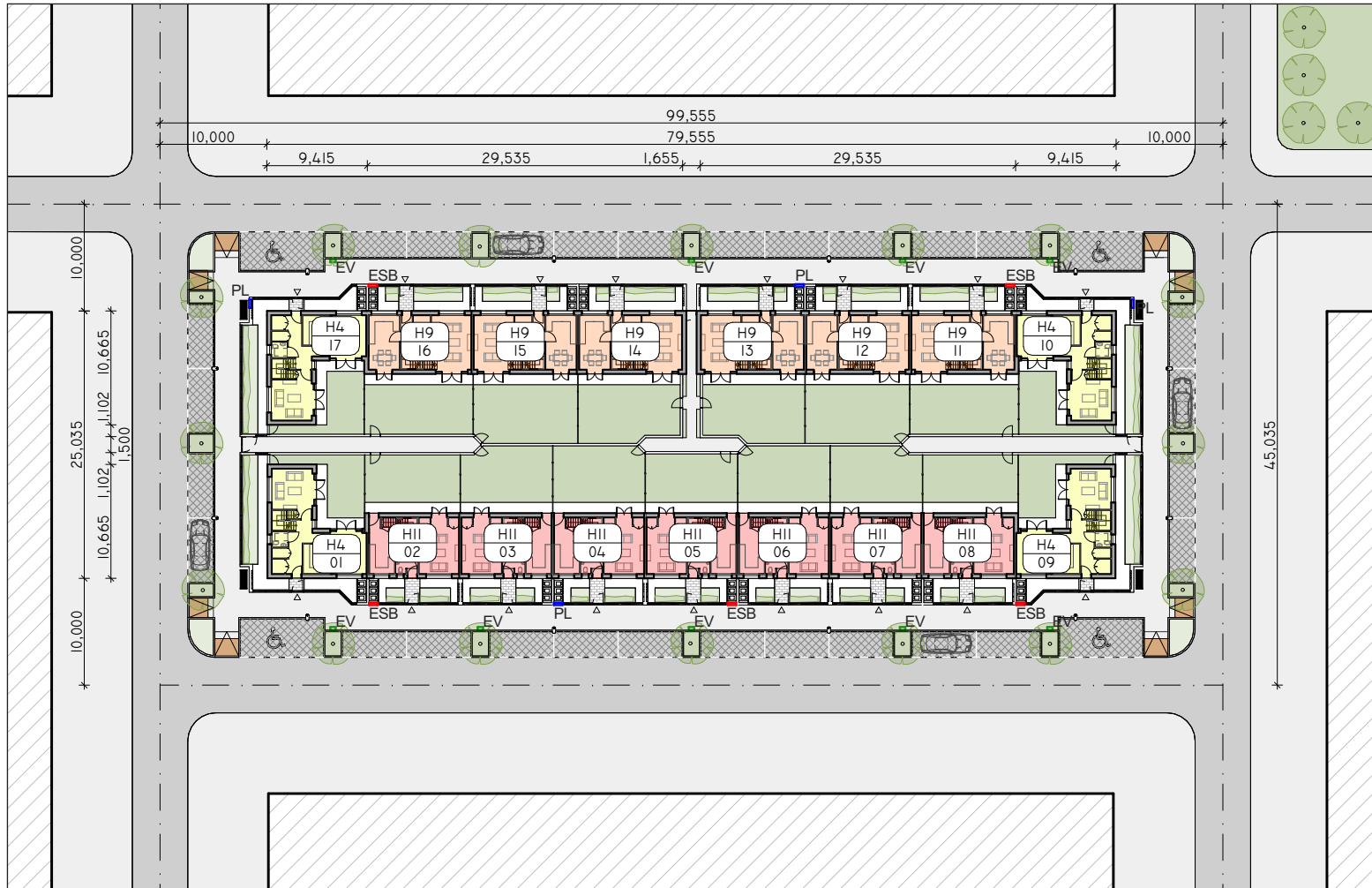
CAR PARKING 39

SITE AREA 0.677 HA
+15% 0.779 HA

DENSITY 41 UNITS/HA



BLOCK 02



KEY

- HOUSETYPE H9
- HOUSETYPE H4
- HOUSETYPE H11

- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
- ESB MINI-PILLAR
- ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

UNIT TYPES	NO
H9 3B/5P/2S	6
H4 3B/6P/2S	4
H11 3B/4P/2S	7
TOTAL	17
CAR PARKING	32
SITE AREA	0.448 HA
+15%	0.515 HA
DENSITY	33 UNITS/HA

BLOCK 03A

KEY

- HOUSETYPE H8
- HOUSETYPE H12
- HOUSETYPE A8/D6
- HOUSETYPE D7/A15
- HOUSETYPE H2
- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
- ESB MINI-PILLAR
- EV ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

UNIT TYPES NO

H2	4B/7P/3S	2
H8	3B/5P/2S	10
H12	2B/4P/2S	2
A8	2B/3P/1S UD	4
D6	3B/5P/2S	4
D7	3B/5P/2S	8
A15	1B/2P/1S	8
TOTAL		38

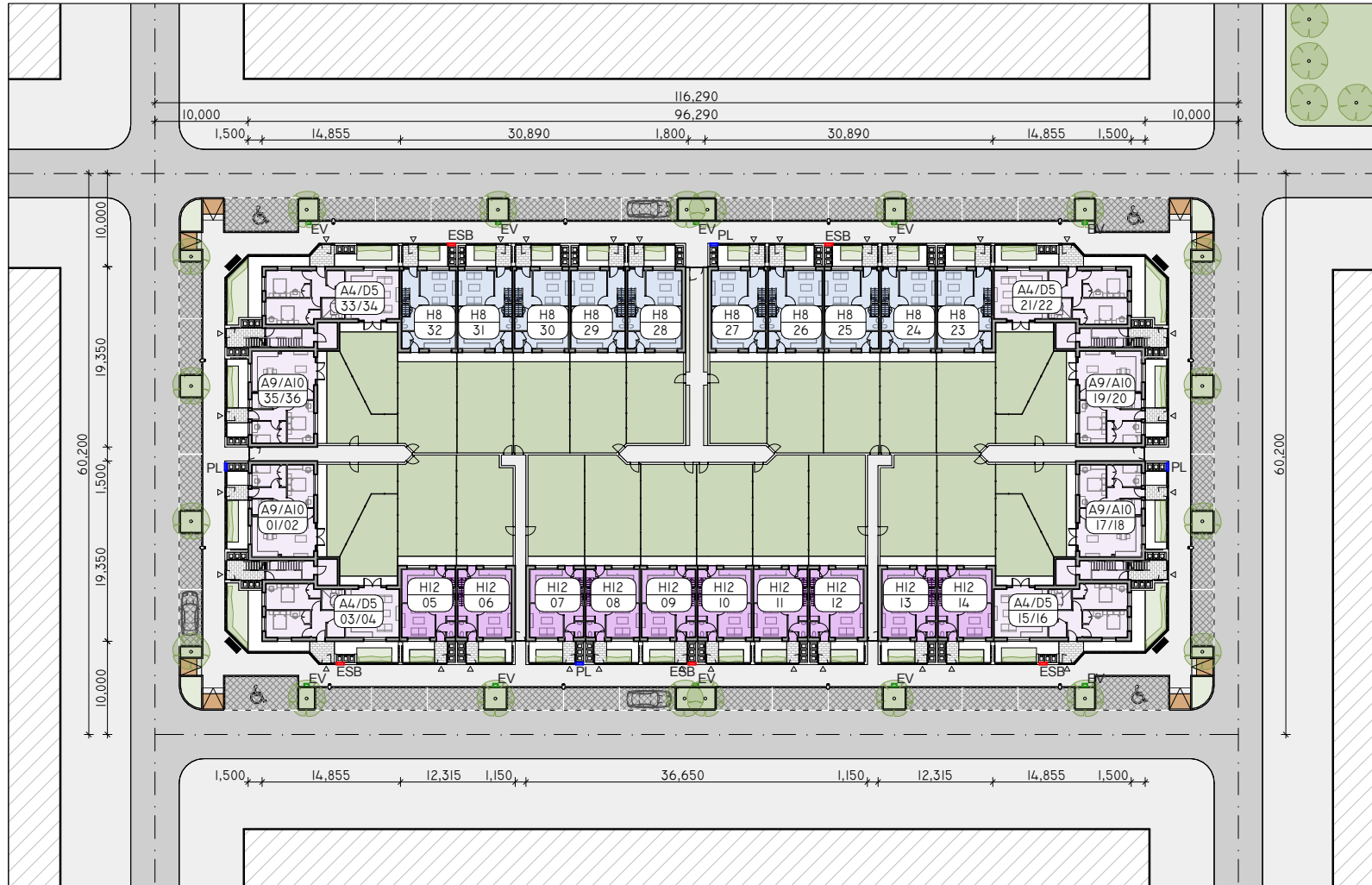
CAR PARKING

SITE AREA	0.725 HA
+15%	0.834 HA

DENSITY 46 UNITS/HA



BLOCK 04



KEY

- HOUSETYPE H8
- HOUSETYPE H12
- HOUSETYPE A9/A10 A4/D5

- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
- ESB MINI-PILLAR
- ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

UNIT TYPES	NO
H8 3B/5P/2S	10
H12 2B/4P/2S	10
A9 2B/3P/1S	4
A4 2B/4P/1S UD	4
A10 1B/2P/1S	4
D5 3B/5P/2S	4
TOTAL	36
CAR PARKING	40
SITE AREA	0.700 HA
+15%	0.805 HA
DENSITY	45 UNITS/HA

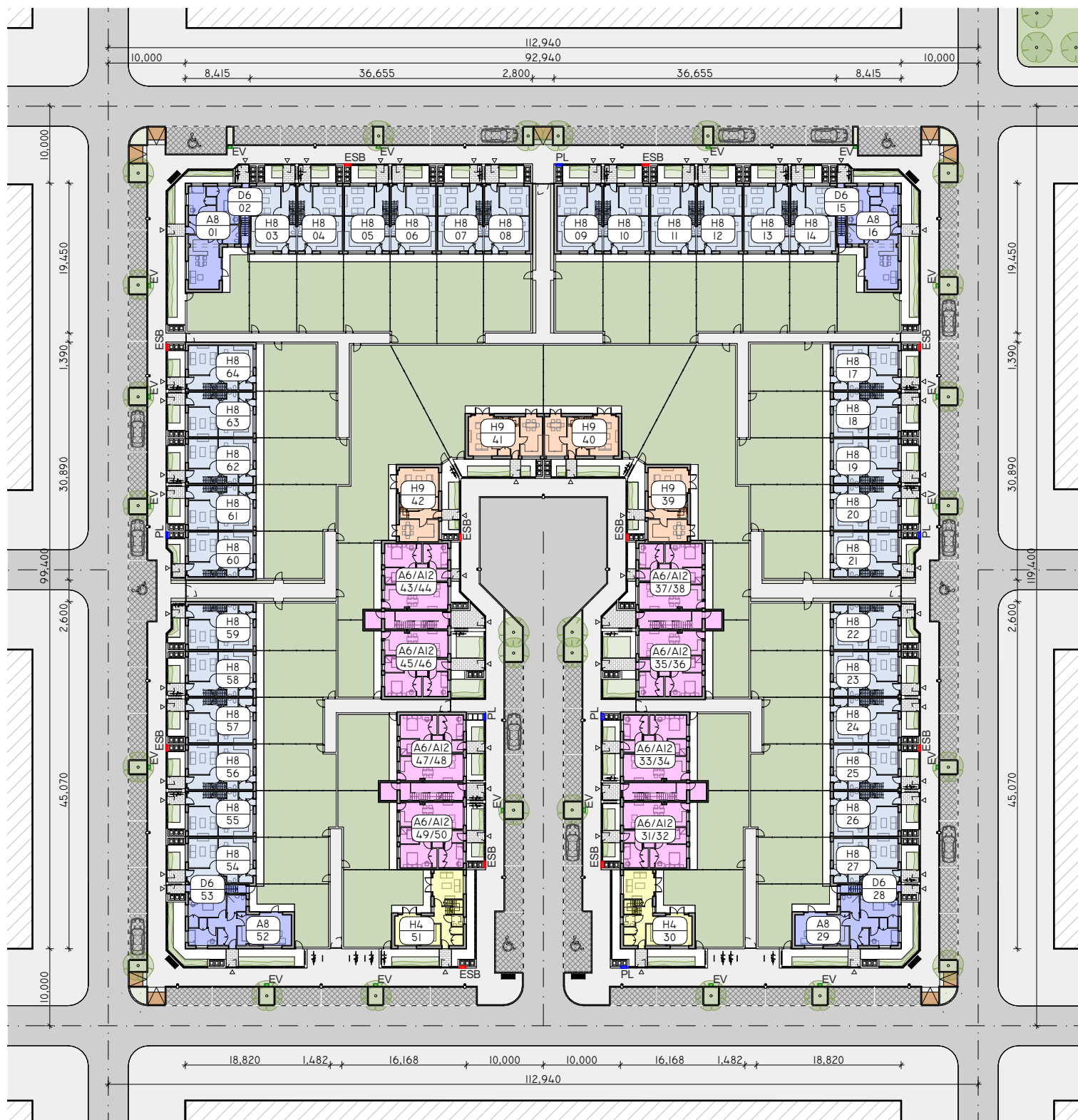
BLOCK 05

KEY

- HOUSETYPE H8
- HOUSETYPE A8/D6
- HOUSETYPE H9
- HOUSETYPE H4
- HOUSETYPE A6/A12
- TARMAC ROADS
- CONCRETE PATHS
- GRASSED/PLANTED AREAS
- PRIVATE OPEN SPACE
- TACTILE PAVING
- PERMEABLE SURFACE

- PUBLIC LIGHTING MINI-PILLAR
- ESB MINI-PILLAR
- EV ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

NIT TYPES		NO
8	3B/5P/2S	34
8	2B/3P/1S UD	4
6	3B/5P/2S	4
9	3B/5P/2S	4
4	3B/6P/2S	2
6	2B/3P/1S UD	8
12	1B/2P/1S	8
TOTAL		64
CAR PARKING		68
SITE AREA		1.3485 HA
15%		1.5507 HA
DENSITY		41 UNITS/HA



KEY

-  TARMAC ROADS
-  CONCRETE PATHS
-  GRASSED/PLANTED AREAS
-  PRIVATE OPEN SPACE
-  TACTILE PAVING
-  PERMEABLE SURFACE

-  PL PUBLIC LIGHTING MINI-PILLAR
-  ESB ESB MINI-PILLAR
-  EV ELECTRIC VEHICLE CHARGING POINT MINI-PILLAR

UNIT TYPES		NO
H8	3B/5P/2S	30
A8	2B/3P/1S UD	4
D6	3B/5P/2S	4
H9	3B/5P/2S	4
H4	3B/6P/2S	2
A6	2B/3P/1S UD	8
A12	1B/2P/1S	8
H15	5B/5P/1S	1
A18	2B/4P/1S	2
TOTAL		63

<u>CAR PARKING</u>	75
<u>SITE AREA</u>	1.3485 HA
+15%	1.5507 HA
<u>DENSITY</u>	41 UNITS/HA

4.8 Apartment Building General Layouts

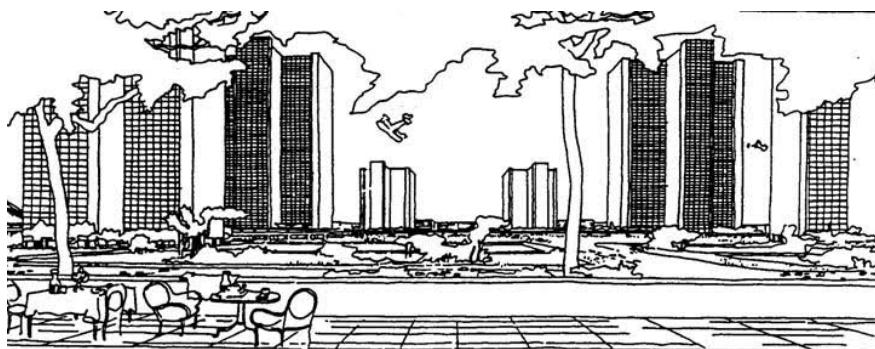
- 4.8.0.1 To conclude this chapter on scheme layouts, it is proposed to consider the general layout and design principles for apartment buildings. The internal layouts of individual apartments, will be more appropriately considered together with the internal layouts of houses in Chapter 5.

4.8.1 Form Streets, Not Pavilion Blocks

- 4.8.1.1 Chapter 3 discussed the need to move towards fronted streets, and this is equally applicable to apartment developments. Apartments designed as pavilion-type buildings sitting in poorly supervised open space do not represent an urban approach, do not deliver a secure public realm, can be wasteful of land and may be as car dependent as low density developments. Many of the apartment developments demolished under regeneration, such as those at Ballymun, were of this *'pavilion in the park'* type.



Demolition of Pavillion Block in Ballymun.



1920s Vision of pavillion blocks in parkland.

- 4.8.1.2 In order to deliver quality in the public realm, it is recommended that apartment developments should form streets ideally with front doors at frequent intervals onto the street. This would be similar to what is shown on the site layout diagrams of housing above. Even where high rise point blocks are considered appropriate, the design of such buildings should be such that the lowest four or so floors should form a plinth, designed to form a street, and provide active frontage, to as great an extent as possible, to the surrounding streets. Ideally this plinth should form a perimeter block, with the point block rising above this plinth.



Apartments forming streets.

- 4.8.1.3 In four to eight storey developments, apartment design should be such that in single core developments, the end apartments have a continuous end wall, (similar to the party wall of an individual dwelling) which can abut the next apartment to provide a continuous street frontage.
- 4.8.1.4 Typically, apartment developments comprise identical floor plates on each floor. However, as previously discussed, this may not be appropriate on the ground or lower floors, where particular considerations arise in order to deliver fine grain and adequate front doors onto the street as well as useable private open space for the ground floor apartments. As noted, to best meet DMURS guidance, the apartment layout should deliver a perimeter block, not exceeding 100 x 100 meters.

4.8.2 Economic Design

- 4.8.2.1 A significant contributor both to construction and to maintenance costs in apartments is the frequency of the stairs and lift cores serving each floor. An economic layout would therefore seek to provide the maximum number of apartments served from a single or from the smallest number of cores.
- 4.8.2.2 However, to avoid long, unattractive internal corridors serving single-aspect apartments, *Design Standards for New Apartments (DSfNA)* specifies a maximum of 12 apartments per core, and a minimum percentage of dual-aspect apartments per core, while also providing guidance on what is considered to be dual aspect.



The DSfNA seeks to avoid long dreary corridors.

- 4.8.2.3 The diagram in Section 4.8.4.1 below, illustrates one means of delivering the maximum permissible 12 dwellings per core. However, for a site of limited width in a terraced arrangement and with blank end walls (to permit future adjacent development), meeting the required percentage of dual-aspect apartments may in practice limit the number of apartments per floor served by a single core to about five or six. This then provides an achievable target for the minimum number of apartments per floor per core. In particular circumstances, such as a limited or poorly configured site, it may only be practical to deliver a smaller number per core, but even in such circumstances, the absolute minimum number of apartments per floor per core is considered to be three. If that cannot be achieved, the suitability of the site may need to be reassessed.

- 4.8.2.4 It is also the case that the provision of five or six apartments per floor per core, may result in the permissible travel distance being exceeded, which will set a requirement for appropriate compensatory measures to be taken as set out under regulation.⁴
- 4.8.2.5 It is important that all parts of a development meet the minimum requirements of dual-aspect apartments. An overprovision of dual-aspect apartments in one portion of the development to compensate for long continuous corridors with single-aspect apartments in another would not be consistent with the quality that the DSfNA seeks to promote.
- 4.8.2.7 The provision of appropriately located vertical and horizontal service runs, in particular gas and wet services, is integral to, and may impact on, the design of apartments. Horizontally, services cannot be run in the ceiling space of an apartment below. Vertical service runs must have adequate fire and sound insulation. While the Building Regulations are neutral on the choice of materials, experience suggests that the use of masonry vertical ducts is preferable, with all service penetrations carefully detailed to meet the requirements of the Building Regulations. Ducts should ideally be accessed from the common areas or corridors. Such ducts must be appropriately located, so that, for instance, the maximum permissible distance between the location of sanitary fittings and the soil stack is not exceeded.



Some apartments may need compensatory fire measures to achieve compliance.

4.8.3 Design Principles

- 4.8.3.1 The design of large apartment buildings can be greatly influenced by fire safety requirements, structural and services considerations, as well as site dimensions and configuration. The design of an actual apartment building will need to comply with all aspects of the Building Regulations.

While it is more difficult to provide diagrammatic layouts for apartments than it was to provide the block layout diagrams, because of the considerations outlined above, the following diagrams have been included to illustrate some aspects of the layout of apartment buildings.



4.8.4 High Density: Maximum Number of Apartments Per Core

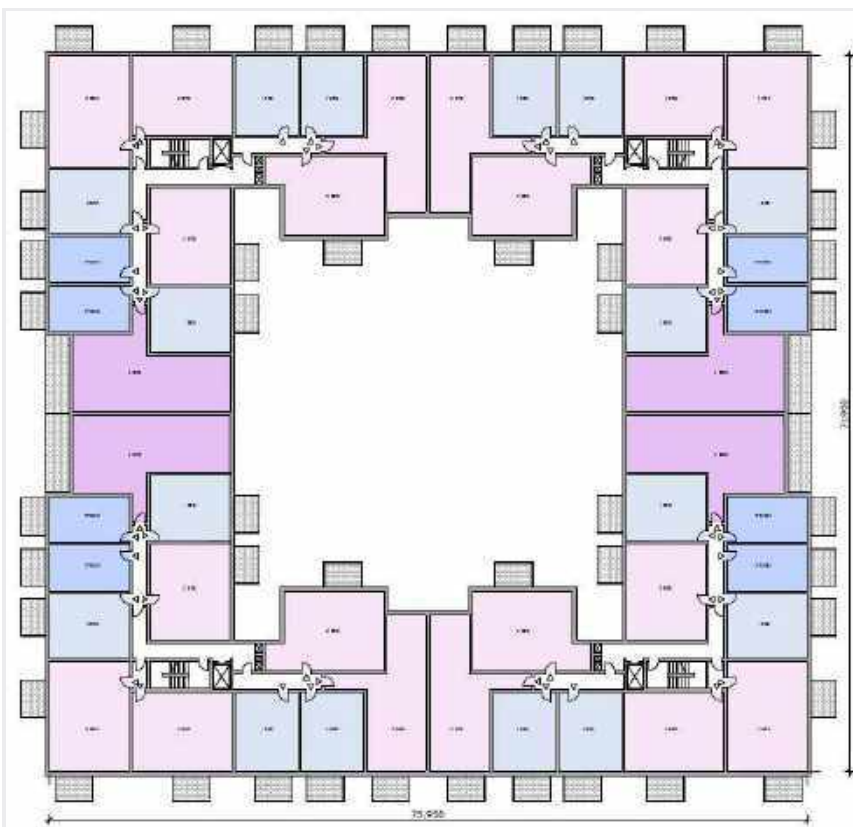
- 4.8.4.1 The first illustration is of a largely diagrammatic layout for a single-core apartment building serving 12 apartments per floor, the maximum permitted under the DSfNA, while achieving the minimum number of dual-aspect apartments required for a city centre location. The layout includes a variety of individual apartment sizes from studio to two-bedroom, to coincide with sustainability requirements.

The layout forms one quarter of a block, and with the other three portions will form a perimeter block. In the diagram, the face-to-face dimension of the inner courtyard that the four blocks will enclose is considerably larger than the 22 metres setback usually required in lower residential developments. This block is therefore suitable for a city centre location, and to achieve a viable density this apartment building could be five to eight storeys high.

⁴ As noted, the purpose of this manual is not to provide guidance on compliance with the Building Regulations, and consultants will know to reference the relevant TGD to ensure compliance. It is also appropriate to stress that the application of the Building Regulations is not a separate exercise to be carried out when the design has been completed (although a checking exercise at appropriate stages should be part of any quality assurance methodology) but is an integral and iterative part of the design process from the earliest stages.



Single core serving 12 Apartments per floor.



KEY

- STUDIO APARTMENT
- APARTMENT 1B
- APARTMENT 2B
- APARTMENT 3B
- PRIVATE AMENITY SPACE

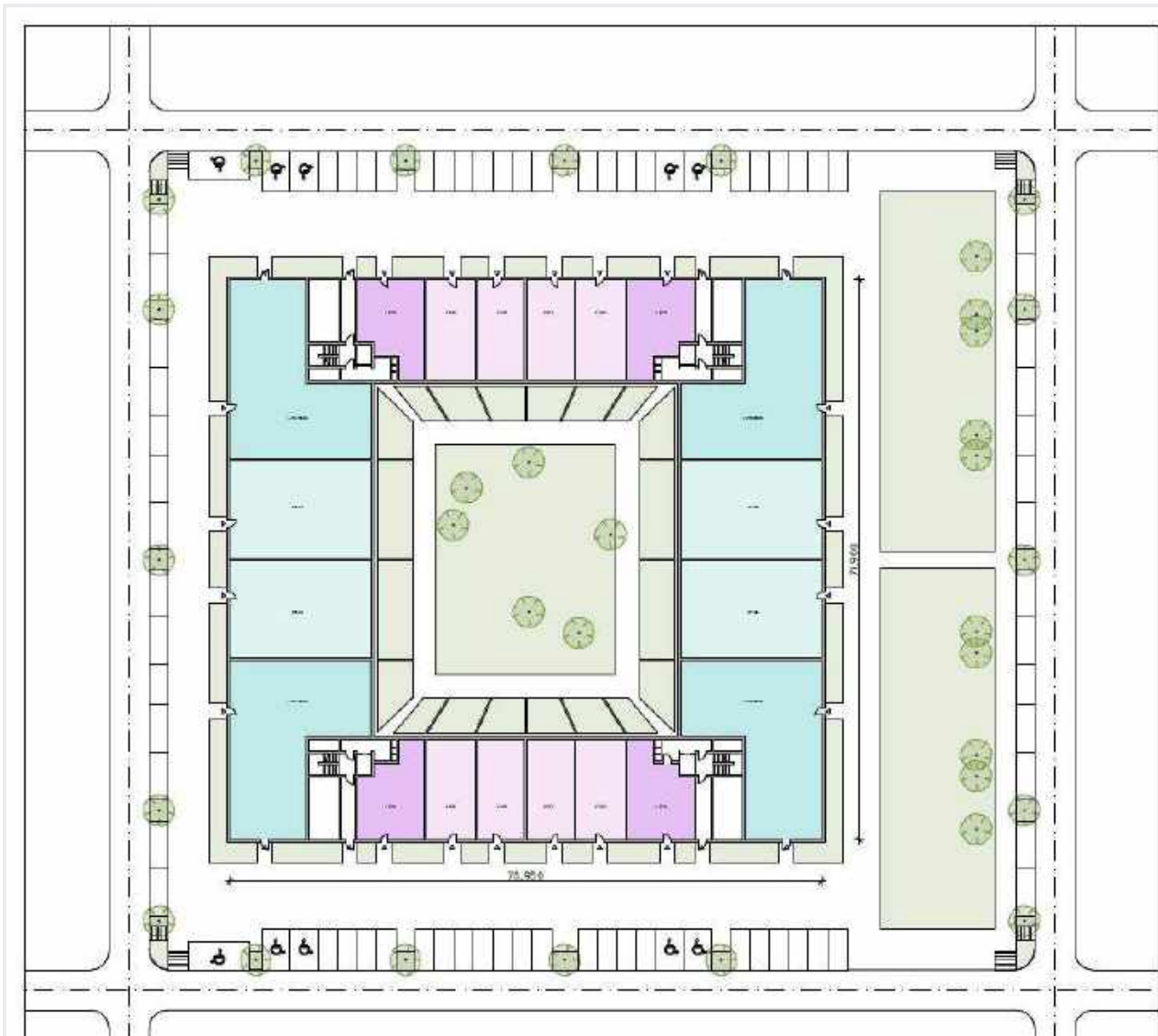
Four cores forming a perimeter block.

- 4.8.4.2 As previously noted, the provision of a single front door in this building length would not provide the required animation at street level to provide a good quality of active frontage. One means of overcoming this is to provide own-door single storey apartments which stretch from the street to the block centre. The diagram illustrates this arrangement. Alternatively two-storey duplex apartments can be provided on the lower two floors of the apartment building to give the required active frontage, and the photograph is of an apartment building so designed.

While fronting the street, these own-door duplexes (or alternatively own-door, single-storey apartments) can enjoy a semi-private open space at the rear, backing onto a controlled public open space at the block interior. For town and city centres where the commercial need is apparent, an appropriate means of providing the required animation at street level, can be by a ground floor comprising exclusively retail outlets or own door work/live units that front directly on to the public street.



Own door ground floor duplex with private open space at block centre, single storey apartments above. A small privacy strip might have assisted the ground floor dwellings. Horan Keogan Ryan Architects.



Ground floor dwellings stretch from street to block centre open space.



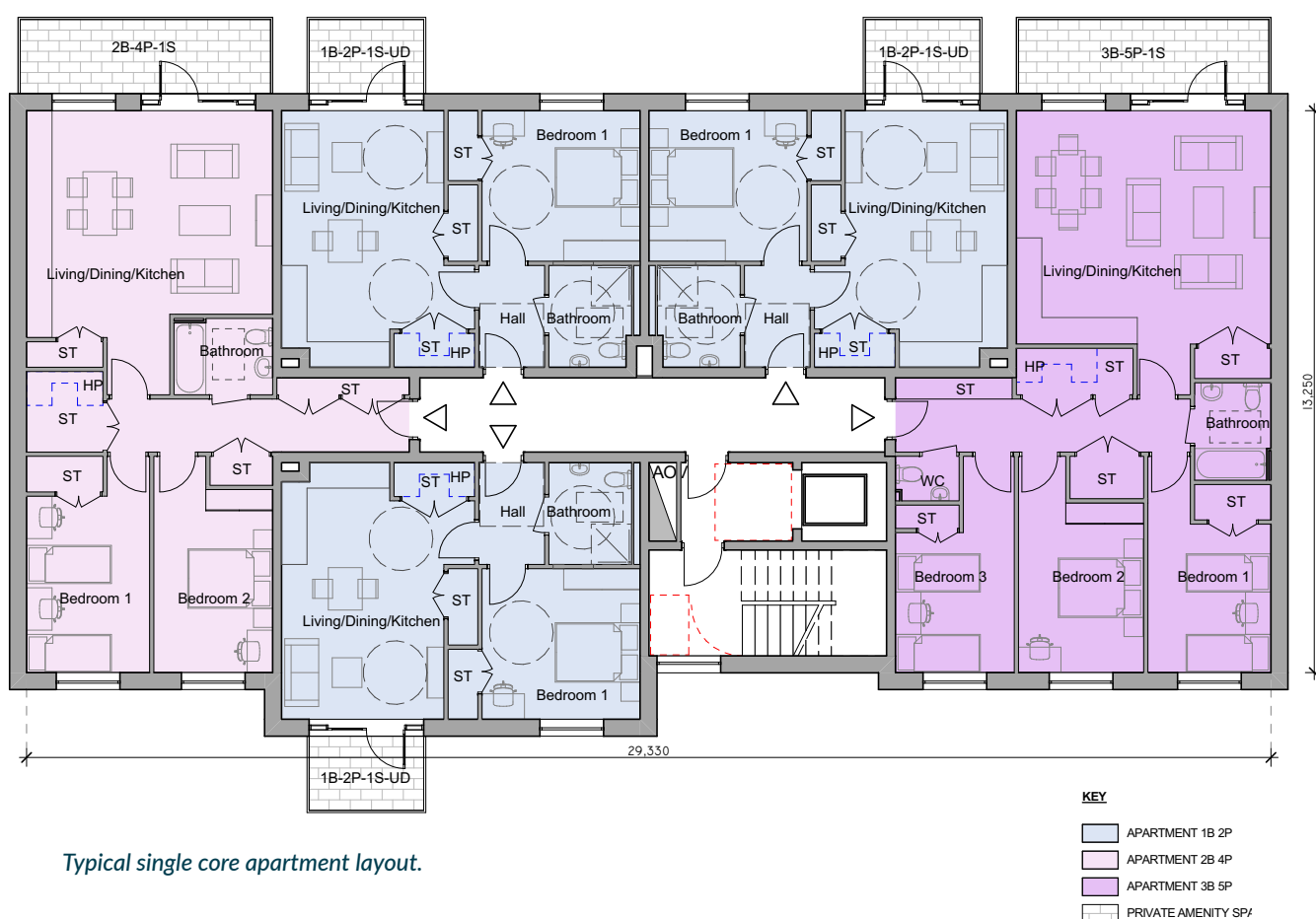
4.8.5 Typical Single-Core Apartment Design

4.8.5.1 The diagram below illustrates the design approach to a single-core apartment building, configured as a linear block along the street and with blank end walls to abut other developments.

4.8.5.2 The diagram shows a typical layout of one of the upper floors, utilising a variety of apartment types and sizes. The layout complies with the guidance of Design Standards for New Apartments for central and accessible urban locations, in that in excess of 33% of the apartments have dual aspect.

4.8.5.3 Achieving the required percentage of dual-aspect apartments required by DSfNA, while keeping the two end walls blank, allows this layout to be repeated a number of times to form a continuous building edge along the street, as discussed in 3.6.2.2 and 3.6.4 above.

4.8.5.4 Similar considerations in respect of the design of the ground floor, or the lower two floors would apply, as discussed on the high density apartments in 4.8.4.1.



Typical single core apartment layout.

5

Chapter 5
Dwelling
Design

5.1 Introduction

5.1.1 The final chapter of this manual includes a series of internal layout diagrams for a wide variety of dwelling types, mainly comprising apartments (A) duplexes (D) and houses (H), though types that combine apartments and duplexes are also included.



Schemes which combine apartments and duplexes. Cusheen Road, Cork, O'Mahony Pike Architects.

5.1.2 As previously stated in section 0.14, it is important to realise that the internal layouts in Chapter 5 are not for construction purposes. Neither are they intended to supplant the design skills of architects. Their purpose is to set out acceptable dwelling sizes, internal layouts, room sizes and configurations for new dwellings. Adoption of any of these internal layout diagrams will be accepted by the Department as demonstrating consistency with the internal layout requirements of QHfSC. Diagrams shown here which feature a combination of dwellings will also be considered acceptable when such a combination is used, because in combination some cost efficiencies can be achieved, and some relaxation in meeting floor area targets is therefore acceptable.

- 5.1.3** However, as these are only internal layout diagrams, their inclusion here for adoption is on the clear understanding that responsibility for the design becomes that of the adoptee. Such responsibility will include, but is not limited to, that which arises under various legislation including the Building Control Act and Regulations.
- 5.1.4** The use of modern methods of construction is encouraged. While this should not necessarily impact on the specific layouts proposed, the acceptance of departures from the design intent, for instance in the case of standard dimensions to meet particular fabrication or erection methods or transport considerations, should be included in the tender documents.
- 5.1.5** The use of these internal layout diagrams is optional. The diagrams feature a wide range of dwelling types for which target floor areas and minimum room widths are provided on pages 48 and 49 in QHfSC, (which are reproduced below), and should generally satisfy most housing requirements, although as noted in 0.15 above, there will of course be a need to use other house types from time to time. Any proposed alternative dwelling types will have to demonstrate consistency with the principles that have guided the design approach to apartments in Chapter 4 and the internal layouts shown in this chapter.
- 5.1.6** By way of introduction, it appears appropriate to set out the influences that guided the design of the following internal layout diagrams.

5.2 | Design Influences

5.2.1 Quality Through Economic Design

5.2.1.1 The preceding chapters explored how various factors could influence economic design at the larger scale, including economic site layouts and delivering the largest practicable number of apartments per core in multi-occupancy buildings. It is now appropriate to consider those factors, which at the smaller scale, such as the internal layout of dwellings, can deliver on economic design.

5.2.1.2 The key factors which influence value for money at the scale of the individual dwelling include:

- Floor area.
- Compact form.
- Materials, fittings and finishes.

These factors will be examined separately, although each can to an extent affect the others.

5.2.2 Floor Area

5.2.2.1 The floor area is such an influence on the cost of any building that the cost per square metre is the most frequently used metric when evaluating the relative costs of various buildings or of many building components. Accordingly, designing dwellings that are appropriately sized to accommodate all the normal functions of daily life without being unnecessarily oversized is probably one of the most important cost-control measures in the design of housing.

5.2.2.2 Consequently, in respect of social housing, QHfSC sets out the overall target floor areas for a wide range of dwelling and apartment types, together with minimum floor areas and minimum room widths for the principal individual rooms. For the avoidance of doubt, the width is the smaller dimension in a room, the length being the larger dimension. By convention, and as followed in this manual, room widths and internal floor areas are calculated from the structural

dimensions (plaster thickness and that of skirting boards, additional floor area at doors, being thinner than structural walls, etc., is normally disregarded). However, in relation to compliance with the Building Regulations, the actual as built finished dimensions may be critical, as for instance clear stair widths in respect to Part K, finished dimensions in respect of bathrooms and clear door widths in relation to Part M, etc.

DWELLING TYPE	TARGET GROSS FLOOR AREA (m ²)	MINIMUM - MAIN LIVING ROOM (m ²)	AGGREGATE LIVING AREA (m ²)	AGGREGATE BEDROOM AREA (m ²)	STORAGE (m ²)
Family Dwellings - 3 or more persons					
4BED/7P House (3 storey)	120	15	40	43	6
4BED/7P House (2 storey)	110	15	40	43	6
4BED/7P House (1 storey)	100	15	40	43	6
4BED/7P Apartment	105	15	40	43	11
3BED/6P House (3 storey)	110	15	37	36	6
3BED/6P House (2 storey)	100	15	37	36	6
3BED/6P House (1 storey)	90	15	37	36	6
3BED/6P Apartment	94	15	37	36	10
3BED/5P House (3 storey)	102	13	34	32	5
3BED/5P House (2 storey)	92	13	34	32	5
3BED/5P House (1 storey)	82	13	34	32	5
3BED/5P Apartment	86	13	34	32	9
3BED/4P House (2 storey)	83	13	30	28	4
3BED/4P House (1 storey)	73	13	30	28	4
3BED/4P Apartment	76	13	30	28	7
2BED/4P House (2 storey)	80	13	30	25	4
2BED/4P House (1 storey)	70	13	30	25	4
2BED/4P Apartment	73	13	30	25	7
2BED/3P House (2 storey)	70	13	28	20	3
2BED/3P House (1 storey)	60	13	28	20	3
2BED/3P Apartment	63	13	28	20	5
1BED/2P House (1 storey)	44	11	23	11	2
1BED/2P Apartment	45	11	23	11	3

The table above indicates the target gross floor area and the minimum floor areas for living, bedroom and storage areas likely to be required to satisfy requirements of normal living. Dwelling types are defined in terms of the number of bedrooms, the number of intended occupants and the number of storeys. The area of a single bedroom should be at least **7.1m²** and that of a double bedroom at least **11.4m²**. The area of the main bedroom should be at least **13m²** in a dwelling designed to accommodate three or more persons.

The recommended minimum unobstructed living room widths are **3.3 metres** for one bedroom, **3.6 metres** for two bedroom and **3.8 metres** for three bedroom dwellings, and the minimum room widths for bedrooms are **2.8 metres** for double bedrooms and **2.1 metres** for single bedrooms.

5.2.2.3 Similarly, and more recently, DSfNA (2018) set out in respect of all apartments the overall target floor areas together with minimum floor areas and room widths as well as balcony sizes. With the exception of the three bedroom apartment, which differs slightly in overall floor area, DSfNA is almost completely consistent with QHfSC floor areas. As the more recent publication, DSfNA now sets the standard for floor areas, room widths, etc., for all apartments, including those for social housing. One addition made in DSfNA was that in developments of more than nine apartments, the majority of apartments should exceed the minimum floor area by at least 10%.

5.2.2.4 DSfNA (2018) also made a number of other additions, including appropriate standards for build-to-rent apartments, shared accommodation and studio apartments. It also introduced dimensional tolerance in the application of minimum room widths and individual room areas. This allows for the room widths and individual room floor areas to be up to 5% below the recommended minimum area, provided the minimum target area for the overall apartment is met or exceeded. This convention is now adopted for all social housing dwellings as well.



Fold AHB Housing, Inchicore. Reddy Arhitecture & Urbanism

Required Minimum Floor Areas and Standards

Minimum overall apartment floor areas

Studio	37 sq m (n/a)*
One bedroom	45 sq m (38 sq m)*
Two bedrooms (3 person)**	63 sq m (n/a)*
Two bedrooms (4 person)	73 sq m (55 sq m)*
Three bedrooms	90 sq m (70 sq m)*

* Figures in brackets refer to 1995 guidelines

**Permissible in limited circumstances

Minimum aggregate floor areas for living/dining/kitchen rooms, and minimum widths for the main living/dining rooms

Apartment type ***	Width of living/dining room	Aggregate floor area of living / dining / kitchen area*
Studio	4m**	30 sq m**
One bedroom	3.3 m	23 sq m
Two bedrooms (3 person)	3.6m	28 sq m
Two bedrooms (4 person)	3.6 m	30 sq m
Three bedrooms	3.8 m	34 sq m

* Note: An enclosed (separate) kitchen should have a minimum floor area of 6.5 sq. metres

**Note: Combined living/dining/bedspace, also includes circulation

*** Note: Variation of up to 5% can be applied to room areas and widths subject to overall compliance with required minimum overall apartment floor areas.

Minimum bedroom floor areas/widths***

Type	Minimum width	Minimum floor area
Studio	4m**	30 sq m**
Single bedroom	2.1 m	7.1 sq m
Double bedroom	2.8 m	11.4 sq m
Twin bedroom	2.8 m	13 sq m

* Note: Minimum floor areas exclude built-in storage presses that are contributing to storage space requirements

**Note: Combined living/dining/bedspace

Minimum aggregate bedroom floor areas

One bedroom	11.4 sq m
Two bedrooms (3 person)	13 + 7.1 sq m = 20.1 sq m
Two bedrooms (4 person)	11.4 + 13 sq m = 24.4 sq m
Three bedrooms	11.4 + 13 + 7.1 sq m = 31.5 sq m

Minimum storage space requirements

Studio	3 sq m
One bedroom	3 sq m
Two bedrooms (3 person)	5 sq m
Two bedrooms (4 person)	6 sq m
Three or more bedrooms	9 sq m

Minimum floor areas for private amenity space

Studio	4 sq m
One bedroom	5 sq m
Two bedrooms (3 person)	6 sq m
Two bedrooms (4 person)	7 sq m
Three bedrooms	9 sq m

Minimum floor areas for communal amenity space

Studio	4 sq m
One bedrooms	5 sq m
Two bedrooms (3 person)	6 sq m
Two bedrooms (4 person)	7 sq m
Three bedrooms	9 sq m

- 5.2.2.5 A further clarification introduced by DSfNA is that up to 50% of the floor area for storage may be provided outside the dwelling. Although QHfSC referred to external storage, it was not fully clear as to the extent, or how this met target areas. It is now confirmed that the option of locating some storage outside the dwelling is acceptable in respect of all social housing dwellings. Where storage external to the dwelling is provided, by way of garden sheds, or of basement storage in apartments, for instance, then a corresponding reduction in internal storage should be made in the dwelling. However, the minimum storage to be provided internally in the dwelling should never be less than 50% of the required floor area for storage in QHfSC or DSfNA as appropriate.



External Store

- 5.2.2.6 By adopting target floor areas, the Department seeks not only to deliver value for money but also to ensure that, in the interests of equality, dwellings of the same size are consistently delivered across the country, irrespective of location or of which local authority is involved.

- 5.2.2.7 The following internal layout diagrams, which are practical, convenient and well proportioned, are intended to illustrate that it is possible to meet the minimum room areas and widths, in general within, or acceptably close to, the overall target areas for dwellings in QHfSC or DSfNA. The diagrams illustrate that for simple layouts, when not used in vertical combination with other dwellings, it should normally not be necessary to exceed the overall target floor areas by more than about 5%.

- 5.2.2.8 While dimensional tolerances might be used, the following internal layout diagrams only utilise these on a limited basis, which is highlighted where it occurs. It will also be appreciated that the internal layout diagrams generally include the full area of storage within the dwellings, and the reduction in floor area when locating storage externally would in many cases reduce the overall floor area of the dwelling to within the target overall floor area stated in QHfSC or DSfNA.

- 5.2.2.9 Therefore, in the interests of value for money and equality of treatment, unless exceptional circumstances apply, or dwellings are used in vertical combination, or as one-off specials (appropriate for instance to turn corners), the use of dwelling types that appreciably exceed the overall target floor areas of the internal layout diagrams which follow is unlikely to be supported, in particular when alternative layouts have been provided in this manual. This does not of course apply in the case of dwellings for persons with a disability, which will be more fully considered below in Section 5.3.2

5.2.2.10 The recommended floor areas in community dwellings may vary depending on the nature of the disability of the residents, as confirmed by an occupational therapist's report. The layouts proposed generally include individual single bedrooms of about 14 m², with a shared living room and kitchen/dining room, both of about 20 m² each. The layouts shown all provide for an en-suite bathroom for each bedroom to allow for maximum flexibility, although some local authorities favour shared bathroom provision. This is at the local authority's discretion, provided the overall floor area for the community dwelling of four residents and one carer does not appreciably exceed 230 m².

5.2.2.11 Building types that combine dwellings in a vertical arrangement will give rise to some cost efficiencies in development and construction, where a requirement for consequent significant, abnormal cost items, such as lifts, does not arise. Accordingly, where such combinations are used, some flexibility in floor area will be appropriate, in particular because improved land usage is being achieved. Any such vertically combined dwellings must still be designed in a cost-effective manner. For instance, shared access stairs are best provided as external stairs, which should also reduce maintenance costs. However, any such specials or vertical combinations will be expected to otherwise adopt economic layouts and thereby to exceed overall target floor areas only by a modest amount, as shown on the internal layouts provided for such dwellings below.

5.2.2.12 Combined with appropriately sized fenestration to achieve bright interiors, the use of these internal layouts which feature well-proportioned rooms can, with design talent and experience, deliver very attractive and versatile living spaces in good-quality dwellings.



Appropriately sized fenestration to achieve bright interiors. Donegal Co Co Architects' Department.

5.2.3 Compact Form

5.2.3.1 The concept of compact form is somewhat analogous to the concept of minimising floor area to deliver economic design. What is sought is to enclose the maximum volume within the smallest external fabric, which is itself a high-cost component. This is also of benefit in reducing costs in off-site fabrication or modular construction.

5.2.3.2 In practical terms, this promotes the use of compact orthogonal layouts, enclosing the largest plan area for the smallest extent of external wall area, and it will be seen that (with the exception of individual special dwellings, which seek, for instance, to turn a corner) the internal layout diagrams meet this objective. Such an approach should minimise protrusions to the plan form, (with the possible exception, say, of a bay window, which contributes to the animation of the public realm). This would also exclude layouts where the external fabric encloses a depth of only one room.

5.2.3.3 As well as economies in construction, a compact form that reduces the extent of what is admittedly well-insulated external fabric, (and in particular the length of external wall), will actually reduce the escape of heat and provide the most economic arrangement in terms of heating costs for the residents.

5.2.3.4 Such considerations will promote the use of terraced forms, as highlighted both in QHfSC and in previous chapters. A duplex arrangement further reduces the cost of heating for residents, as it omits either a floor or roof for each dwelling, thereby further reducing the extent of the external fabric, through which heat can be lost.



A duplex further reduces the cost of heating for residents. Reddy Architecture + Urbanism.

5.2.3.5 A compact form also allows a reduction in circulation space, a central consideration in economic design. For instance, a non-compact dwelling with rooms arranged individually along a long linear plan, will require a long corridor to access all the rooms, with circulation space exceeding that needed in a compact plan form. Within an overall target floor area, minimising circulation space also maximises useable floor area in the habitable rooms. Generally, the internal layout diagrams seek to deliver an economic solution both in adapting compact plan forms and in minimising circulation space.

5.2.3.6 In summary, the use of compact form aims to:

- Minimise protrusions on floor plans.
- Minimise external-wall area.
- Minimise circulation space.

5.2.4 Materials, Finishes and Fittings

5.2.4.1 The Department's publication *Employer's Requirements for Detail Design* (2019) provides greater certainty and promotes consistency across the country as to the quality and nature of the materials, finishes and fittings that the Department in the context of delivering value for money considers appropriate, balancing initial capital costs, reasonable life expectancy and foreseeable maintenance costs during the lifetime of the dwelling.



5.3 Further Quality Considerations

5.3.1 Planning Considerations

5.3.1.1 The requirement to deliver more compact growth and higher density developments has been highlighted in previous chapters, and the quote in Section 3.5.1.4 above from UDBHG noted the need to move away from the two-storey, cul-de-sac arrangements.

5.3.1.2 In respect of individual building design, a critical consideration is building height, in particular where it facilitates acceptable and more sustainable densities and provides an appropriate street section. In respect of development patterns outside city centres and inner suburbs, UDBHG advises that:

Development should include an effective mix of 2, 3 and 4-storey development which integrates well into existing and historical neighbourhoods and 4 storeys or more can be accommodated alongside existing larger buildings, trees and parkland, river/sea frontage or along wider streets.



An effective mix of two, three and four storey development. Balgriffin, Dublin. McCrossan O'Rourke Manning Architects.

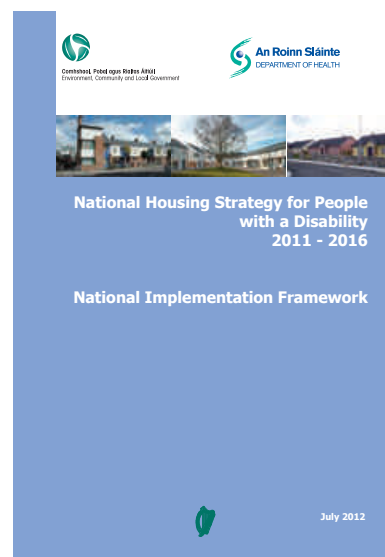
- 5.3.1.3 Accordingly, whenever possible and appropriate, four-storey (by way of two storey duplex over two storey duplex for instance) or higher multi-unit dwellings should be provided in the locations identified in UDBHG above, and three storey buildings — either single dwellings or in duplexes — will also be favoured. Two storey dwellings should generally only be provided where site considerations would indicate that they are appropriate, e.g., at junctions with existing two storey housing or as part of a mix with three storey housing. Except in exceptional situations, single storey dwellings should generally be avoided, consistent with UDBHG. However, as noted in 3.6.10.2 and 3.6.11.2 above, it may be acceptable to provide single storey dwellings, but only where this is required to match the height of the immediately adjoining single storey properties. To suit such situations, a sample layout is provided in type H16.
- 5.3.1.4 The internal layouts numbered H2, H3 and H7 illustrate typical three storey layouts for 4B/7P, 3B/6P, and 3B/5P. The need for these types, as reflected on the local authority's waiting list, may reduce as demographic trends evolve. Economically, and even from the perspective of practicality, it is difficult to justify arranging a single or two bedroom dwelling over three floors (which is not to say that for a very specific infill site condition, it might not be appropriate), and accordingly the increasing means of delivering three storey will be in vertical combinations with other small or three bedroom dwellings ordinarily referred to as duplexes. Various examples of such internal layouts are also provided below.



An effective mix of two and three storey development. The Maltings, Ballinacollig, Co. Cork. Tony Dennehy Architects

5.3.2 Housing for People with Disability

- 5.3.2.1 As noted in Section 5.2.2.7 above, the target floor areas do not apply in the case of dwellings for people with disability such as significantly reduced mobility impairment, which is the principal consideration of this section. To best meet the needs of people with other disabilities specific modifications may be required to existing dwellings, or appropriate design modification in respect of new build dwellings may be required, which may or may not influence the target floor area. Spatial and other required adaptations for a particular household will be set out in an occupational therapist's (OT's) report, which will provide the best guidance.
- 5.3.2.2 The Department's approach to the provision of social housing for people with a disability is generally informed by and supportive of the *National Housing Strategy for People with a Disability 2011- 2016* *National Implementation Framework* (NHSPWD), as extended to end 2020, jointly published by DHPLG and the Department of Health⁵. The mechanism set out in Priority Action 1.1 of NHSPWD requires the local authority to identify persons with disability, and to assess their individual need. *'Following each assessment of individual housing need, housing authorities will provide each person with a disability with a statement of their housing need'*, which should *'identify the most appropriate housing solution'* to meet the household's specific need. Strategic Aim 1 of the NHSPWD is to meet specific needs.



5 As of the time of writing, this was effectively still current.

5.3.2.3 Local Authorities are then encouraged to identify ‘specific strategies to meet the identified housing need of people with . . . disabilities, locally’. Local authorities are also encouraged to ‘consider reserving certain proportions of units to meet specific identified need within each disability strategy’.⁶ Ideally, this should translate into a number of dwellings in each social development that have been designed to meet the specific needs of individual households which have an identified need, as is the case in the typical block layouts set out in Chapter 4 above. Consistent with the guiding principles set out in NHSPWD, dwellings for persons with a disability should not be grouped or adjacent, but ‘will be dispersed throughout the development and will not constitute a clustering type o arrangement’.⁷



5.3.2.4 To ensure that an equitable approach is afforded to all local authorities in the provision of social housing, confirmation is sought by way of an occupational therapist’s (OT’s) report as to the specific identified needs which are being addressed for each household, so that the additional floor area or facilities to meet the specific disability can be approved. To streamline this process, the Department’s guidelines on Stage Approvals (issued under Circular 02/2018) requests that such OT reports be submitted at Stage 1, so that they can be approved as part of the project brief as required by the CWMF. As local authorities will, under their NHSPWD obligations, have already identified the specific needs of all persons with a disability on their waiting list for the area, this OT’s report should be readily available.

5.3.2.5 In respect of disability arising in residents in existing housing, the Department has in place programmes for extensions and renovations to cater for residents who develop a disability in existing dwellings,⁸ consistent with Strategic Aim 3 of NHSPWD. Such extensions and renovations will be specifically designed to meet the needs set out in the OT’s report.

5.3.2.6 In order to move away from institutional campus-style accommodation, where numerous residents live in what has been termed ‘congregated settings’, the community dwelling has been developed. These are mainly delivered by AHBs specifically to accommodate persons with a disability in the community. Accordingly the number of residents with a disability is strictly limited to four,⁹ with the option of an additional bedroom for a carer. A particular design consideration is the visual integration of the community dwellings into the surrounding neighbourhood so that they should not be seen as visually distinctive.

5.3.2.7 To this end, community dwellings will usually be the same height as adjoining dwellings. Single-storey community dwellings will only be appropriate when used as an infill amongst existing single-storey dwellings. Where located in two- and three-storey streets, the community dwelling will normally be provided on the ground floor of a multi-storey building,¹⁰ with other dwellings above, to better fit in with the adjoining dwellings. The internal layouts below provide examples of all such options (H15, H15A, H15B, and H15C). This does not, however, preclude the use of two-storey community dwellings, where a resident’s disability is not expected to include movement-impairment, and where access to the first floor therefore does not require the provision of a lift.



Community Dwelling Donegal Town. Donegal Co Co. Architect’s Department.

⁶ All of these quotations are from *National Strategy for People with a Disability 2011- 2016 National Implementation Framework Pages 18- 19*.

⁷ *Housing Circular 45/2015*.

⁸ Refer to *Housing Circular 3/2019* with any subsequent updates.

⁹ Recommendation number 9 on page 102 of *Time to Move on From Congregated Settings* as incorporated into *Housing Circular 45/2015*.

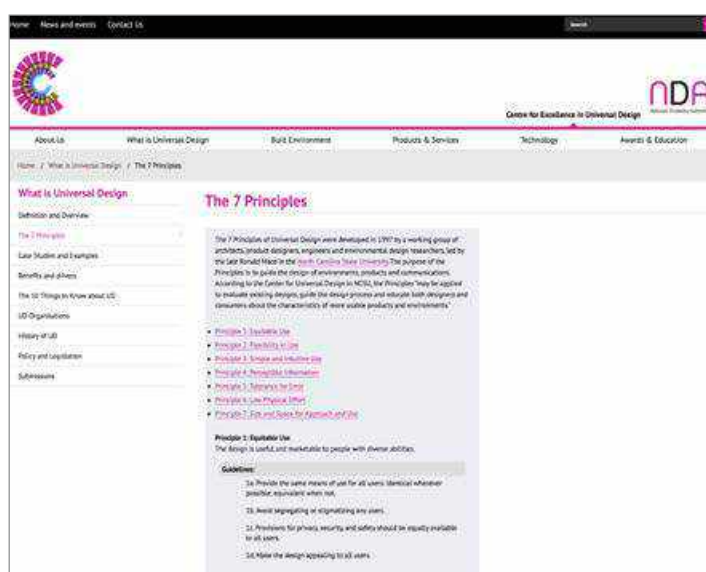
¹⁰ As envisaged, for instance, in *Guiding Principles*, bullet point 3, in *Housing Circular 45/2015* and in *Housing Circular 32/2019*.

5.3.3 Age-Friendly Housing

5.3.3.1 The provision of appropriate housing for older persons will become a bigger challenge, as demographic reports confirm that more people are living longer and with a legitimate expectation of remaining within their community. This will probably be a greater challenge for residents of private housing, whereas local authorities may have opportunities to facilitate rightsizing within the neighbourhood. This requires that a supply of appropriately designed housing is available for people who are looking for more suitable accommodation in their later years.

5.3.3.2 While initial responses sought to prioritise the provision of larger dwellings, with universal design to future proof against decreasing mobility, Age Friendly Ireland (AFI) has subsequently identified the significant importance of appropriate location, most especially proximity to the widest range of facilities, which facilitates shopping, visiting family and socialising.¹¹

Accordingly, AFI have developed a mapping tool to evaluate the suitability of any site for age-friendly housing, and any application to the Department for funding of social housing for older people will have to demonstrate the suitability of the proposed location. The provision of such well-located age-friendly housing in town centres complements and is entirely consistent with policies on regenerating our town centres and with the NPF.



5.3.3.3 The policy document *Housing Option for Our Aging Population* (2020) contains the following action:

In partnership with industry, introduce measures to ensure that over a five year period delivery is increased to ensure that 30% of all new dwellings are built to incorporate universal design principles to accommodate our ageing population.

Such measures are being developed, with some pilot projects¹² underway, but until these are developed and adopted, the sections below provide some guidance in the delivery of age-friendly social housing.

5.3.3.4 Compliance with Part M of the Building Regulations should ensure that all new housing will be reasonably accessible for older people with moderate mobility difficulties. Where age related, significantly reduced mobility impairment arises, it is likely to first affect older residents after their children have left home. As noted in 5.3.2.5, the Department will continue to fund the extension of social housing dwellings to cater for such eventualities, in a manner analogous to the adaptation grant available to private home owners.

There is also the case for rightsizing, however, and relocation within the neighbourhood to a suitably designed smaller dwelling may be a more convenient arrangement. This will require a degree of flexibility on the part of local authorities in their allocation policies and in communicating to tenants the advantages of rightsizing. The Department will continue to fund specific rightsizing social housing apartment/duplex developments, such as the scheme in Dun Laoghaire-Rathdown¹³, shown on the following page.



¹¹ A particular UK example suggests that even in specifically designed sheltered housing schemes, only a portion of the dwellings are designed for fully wheelchair liveability.

¹² Such as the CAS (and Department of Health) funded project for Housing with Supports in Inchicore

¹³ It is understood that Age Friendly Ireland are in liaison with some local authorities to develop a rightsizing policy document.



Rightsizing development to accomodate elderly residents which released larger social housing family homes back into stock. Dun Laoghaire-Rathdown Architects' Department.

5.3.3.5 Pending specific guidance, local authorities are encouraged to provide appropriately located and designed age-friendly housing, consistent with planning and value for money considerations, in particular to facilitate rightsizing or otherwise to address the needs of applicants on their housing waiting lists. By providing lift access and with all accommodation on a single floor, apartments are particularly suitable to best accommodate persons with age-related decreased mobility, and in particular can meet the first principle of universal design by providing equitable level access to all rooms, in a cost-efficient manner.



5.3.3.6 However, it is usually impossible to extend multi-storey apartments, in particular to provide bathrooms fully useable by persons with significantly decreased mobility. However DSfNA sets out the requirement that in developments with more than 9 apartments, a certain proportion, at least 50%, need to be provided with 10% additional floor area. Accordingly, the opportunity can be taken within the mandatory increased target floor areas for apartments to provide internal layouts suitable for households in which age-related significantly decreased mobility may develop. The provision of such layouts is consistent with the aims of universal design to meet, in an economic manner, the principal considerations of equitable access and use. This can provide good accommodation for the widest variety of tenants. The layouts below numbered A2, A4 - A8, A10 and A22-26 provide diagrammatic examples of such age-friendly apartments. Such apartments may also be suitable for tenants with a disability as determined on a case by case basis. We are grateful for the kind input of the Centre for Excellence in Universal Design (CEUD) whilst completing these layouts, during the course of which CEUD developed a useful checklist for assessing potential universal design dwellings.¹⁴

5.3.3.7 Consistent with emerging private sector typologies, further opportunities for age-friendly dwellings exist in appropriately located social housing apartments with an open-plan layout. This was chosen as the preferred layout type in one pilot project for supported living in Inchicore. Without the constraint of the traditional entrance hall, the accommodation is considered barrier-free, with less confinement for the mobility impaired and more floor area included in the living spaces. It should be noted, however, that the omission of an entrance hallway requires a number of compensatory fire measures, which can include a sprinkler installation and an escape route located a minimum distance from potential fire sources, such as cookers. As already noted, however, responsibility for compliance with Part B, and indeed with all of the Building Regulations, rests with the architect and other consultants.

5.3.3.8 In some instances, it is possible for the open-plan, barrier-free apartment to meet the principles of universal design without any significant increase in the minimum floor areas included in DSfNA. This is the case, for instance, in the layouts for the two-bed/three-person and the two-bed/four person open plan apartments shown in layouts A23 and A24. In other cases, such as the one bedroom open plan in A21, the fully wheelchair usable bathroom is not possible. However when the floor area is increased by 10%, an apartment consistent with the principles of universal design can be achieved, as shown in A22. The design of such apartments must be carefully considered. For instance, when including bathrooms fully useable by a person in a wheelchair, it must be ensured that the bathroom does not become so oversized as to lose its domestic nature and become institutional in character, and that the plumbing is appropriately designed to cater for a level access shower.



Not to become so oversized as to lose its domestic character.

5.3.3.9 In small towns, villages or other locations where apartments might not be considered appropriate, some local authorities have successfully provided age-friendly accommodation on the ground floor of duplex-type arrangements, with general housing on one or two floors above. This has the added advantage of providing for intergenerational housing, resulting in a balance between households of differing ages, which is entirely consistent with sustainable communities objectives. In addition to mid-terrace duplex types, such an approach is also of assistance in providing special end-of-terrace type arrangements in turning the corner as discussed in Section 3.6.5 above, and ensuring active edges to both main and end street. Examples of age-friendly/accessible ground floor dwellings are provided in the layouts numbered A6+A12, A8+D6, and A9+A4 below.

5.3.3.10 In summary, in the context of emerging guidance on how to best deliver age and disability-friendly social housing, the following currently represents a value for money approach to age-friendly housing and housing for persons with disability related requirements. Following the guidance below could deliver up to 50% of dwellings in a manner that is both consistent with the principles of universal design and is economic as reflected on the internal layouts:

- The provision of special-needs dwellings should be consistent with the Department's policies in NHSPWD.
- Meeting Part M requirements, which ensures reasonable accessibility for older people, including those with moderate mobility challenges, will be the normal provision for two or three storey individual dwellings, with an expectation of either extension of the dwelling or relocation of tenants within the neighbourhood, should a specific need arise due to significant mobility impairment.
- Apart from the opportunities presented in the case of apartments with 10% larger floor areas, as required under the DSfNA, or the provision of age-friendly dwellings on the ground floor of duplex units or walk-up apartments, or in other appropriately located forms to best meet need, confirmation of the need to appreciably exceed the overall floor areas set out in QHfSC or DSfNA will be provided by way of an occupational therapist's report, the requirements of which should be met in a layout designed in an economic manner, consistent with the design principles discussed above.

5.3.4 Services

5.3.4.1 Section 4.8.2.7 above considered the potential influence of providing for services on the overall design of apartment buildings. Such considerations can sometimes influence the internal layouts of apartments and duplexes, and to an extent even of individual dwellings. Accordingly, this section briefly considers service provision that might have the potential to impact on the design of individual dwellings in multi-storey duplexes and apartment buildings. Considerations relating to fire safety, sound, drainage waste and services can significantly influence the design of apartment buildings.



5.3.4.2 Building services, including drainage, have the potential to cause noise nuisance and should be considered from an early design stage, and be appropriately located and designed to limit impact on residents. Equally, room layout and service locations should be considered at an early stage to, whenever possible, avoid locating noise-sensitive rooms next to areas where sound is generated.

5.3.4.3 Two principal methods for heating which achieve Part L compliance have been identified in the *Employer's Requirements* as appropriate for social housing: the use of heat pumps¹⁵ or a combination of a condensing boiler and photovoltaic panels. In large apartment buildings, a common combined heat and power installation may well be more appropriate, particularly in town or city centres, and this will also be favoured, where economic. Where available, district heating systems will also be supported.

The health risks associated with poor air quality, along with the carbon emissions produced by burning fossil fuels, are a growing concern. The *Climate Action Plan 2019: To Tackle Climate Breakdown* seeks to support the phasing out of fossil fuel boilers in dwellings and to phase out fossil fuel heating in public buildings.¹⁶ Accordingly, and also to assist local authorities' efforts to promote the establishment and development of decarbonised zones, the provision of solid-fuel-burning appliances with flues or chimneys can no longer be supported, except in very specialised and localised instances, and the internal layout diagrams are designed accordingly.

¹⁵ It is Government policy that heat pumps be installed in 200,000 dwellings by 2030.

¹⁶ Action Items 66: 'Roadmap to develop supply chain to support the phase out of fossil fuel boilers in new dwellings' and 62: 'Examine how and when fossil-fuel heating systems could be phased-out of public buildings, including disallowing the installation of any new fossil-fuel heating systems'.

- 5.3.4.4 The internal layout diagrams show a heat pump (HP), as this was considered the more onerous requirement in terms of floor area. The heat pump requires an associated externally located condenser unit, which is not shown on the internal layouts. This may be more difficult to accommodate on multi-storey apartment buildings, although roof-mounted condensers are an option. However, this comes with a requirement for accommodating pipework to connect to the heat pumps in the apartments, with resulting sound-insulation and fire-separation considerations. In apartments, water storage will normally be required to be provided within the dwelling, and this is usually located with the heat pump. In individual houses or on the upper floors of duplex units, the water storage can be provided in the roof space. Water storage for ground-floor duplexes may be provided in the roof space above shared stairs for instance, where appropriate.



External condensers.

- 5.3.4.5 The heating installation and heat pumps where used, will be specifically selected and designed for each development, and may therefore differ from the assumptions shown on the layouts. Accordingly, this may necessitate minor adjustment of the layouts when specific heat pumps are selected. The floor area required to accommodate this plant was not envisaged when the target floor areas were compiled in QHfSC, and consequently the provision of heat pumps has contributed to the overall target floor areas being exceeded.



Heat pump with water storage in small apartment.

- 5.3.4.6 A review of heat pump installations in local authority housing, suggests that in particular where combined with water storage, there is frequently a small area in the heat pump enclosure which can be boxed out for use as storage, in a manner which is removable for maintenance access. Such areas have been used to make a small contribution to the required storage area, similar to the convention that the area in the hot press not taken up by the heating cylinder can contribute to the storage area. Where a minor reduction in floor areas has become necessary, this has generally been taken up by way of marginal reduction in storage area, on the understanding that any under-provision, if entirely necessary and where exceeding permitted tolerance, can be provided outside the fabric of the dwelling. Such assumptions have been made in balancing any minor under provision in floor area where heat pumps are used, with the over provision of floor area where these are not, and avoiding the need to provide two internal layouts for each dwelling type, with and without heat pumps.



Heat pump in house. After boxing the manifold, a considerable area of the heat pump enclosure is available for storage.

- 5.3.4.7 Waste water pipes in individual two or three storey dwellings are ordinarily run externally on the rear wall of the dwelling, and are thus not visible from the public realm (which is why internal layouts with upper floor bathrooms on the rear elevation are favoured). Where the stack is located internally, fire separation and sound insulation requirements are not as onerous in single dwellings as they are between multi-unit developments. In duplexes, an external location on the rear wall is again preferable, as in addition to meeting Part B (Fire Safety) and Part E (Sound) requirements an internal location will need careful consideration to limit impact on the lower dwelling. In apartments, as noted, considerations such as limits on the distance that any appliance can be located away from a single stack may also impact on both duct locations and internal bathroom and kitchen layouts.
- 5.3.4.8 The vertical distribution of other services¹⁷, such as gas, water, data and electricity, in multi-unit accommodation, and indeed the provision of electrical and lift plant rooms will also influence the design, but more at the level of the building rather than at that the level of the design of the individual apartment. However, such detail and project specific considerations are beyond the scope of this manual.
- 5.3.4.9 Higher apartments can trigger many additional requirements, including specific structural considerations and additional fire safety requirements, which have an influence on the layout and design. Among these considerations are access for firefighters and the possible need for firefighters' lifts. Such considerations are beyond the scope of this manual, however, and will require project-specific support from specialist consultants.

5.4 Internal Layouts - General Items

- 5.4.1 The internal layouts are shown with the main internal dimensions and with an accompanying table to illustrate general compliance with the target floor areas and minimum room-width requirements of QHfSC and DSfNA. Specific notes in respect of any one dwelling or group of dwelling types are provided in the margin.
- 5.4.2 Doors and windows are not dimensioned but should meet relevant building regulations. The windows should also be sized and located to suit elevational considerations, and are shown on the drawings primarily to indicate the intended aspect of a room and the opportunities for single aspect dwellings on a particular floor. Consistent with good practice, all habitable rooms should be provided with a window the glazed area of which should generally exceed 10% of the floor area of the room.
- 5.4.3 All internal layouts envisage the dwelling typically as part of a terrace of dwellings with a party wall along each side or, in the case of a dwelling or group of dwellings which turns the corner, with a party wall at each end. Where a dwelling forms an end of terrace but does not face a street or public area, it may be appropriate to provide limited fenestration on that wall, subject to other considerations. Although envisaged as a terrace, it can be seen that the layouts can easily be adapted for semi-detached dwellings to suit the limited locations where that might be appropriate.
- 5.4.4 Except in the case of age-friendly dwellings or dwellings for persons with a disability, the layouts are generally shown with baths rather than showers in bathrooms, as baths usually take up more space than showers. In addition baths are usually found to be more useful for bathing small children. There is, however, no restriction on the substitution of baths with showers, if that better suits a local authority's preferences or the particular layout. Where intended to be level access, additional detailed design considerations may apply, for instance in the plumbing design.
- 5.4.5 When designing the layouts, alternative variations were considered in a few instances, and these have been included as alternatives, identified with the letters "ALT" as in A1 and A1ALT. This convention will also allow for the inclusion of alternative variations to any of the current layouts, should this be required in the future.

¹⁷ Utility providers will usually have very specific requirements in this regard.

- 5.4.6** As a general principle, the layout of all dwelling types envisages that some of the storage area required will be provided by way of built-in wardrobes, to reduce the need for tenants to purchase free-standing wardrobes as items of furniture. This also provides more space for other furniture in the bedrooms, such as desks for studying or working at home. The option of free standing wardrobes are also, in places, indicated. The table in Section 5.9 sets out the internal layouts provided, identified as Apartments (A) Duplexes (D) and Houses (H).

5.5 Shared Core Apartments

- 5.5.1** Two main types of apartments are shown in the following internal layout diagrams of apartments. The first type is the typical apartment in a multi-storey apartment building, where the apartment is accessed from a common core and corridor (Shared Core Apartment or SCA). The second type is the walk up individual apartment in a duplex arrangement, frequently with its own front door (Own Door Apartment or ODA). A variation is a limited shared access (i.e. two apartments sharing an internal stairs).



Apartments Wicklow Town.

- 5.5.2** The shared core apartment internal layouts shown below are all of a single aspect type (though these could potentially become dual aspect where used on a corner, or where accessed from a deck in the open air). This is because dual aspect apartments in spanning from the front to back of the building will be dependent on the actual building dimensions, and will be influenced by a particular access location, determined in part, from the layout of the core. Essentially, dual-aspect apartments, which must be provided in a sufficient quantity to meet the requirements of DSfNA are likely to be so building specific as to invalidate attempts to provide typical examples. They should, however, be easier to design within the target floor area of DSfNA than single-aspect apartments would be.



Shared core apartments, forming an edge to a public space. Smithfield.



Shared core Apartments forming a street edge. Dun Laoghaire.

- 5.5.3** The disposition of SCAs with the end apartment having a blank party wall was discussed in Section 4.8.5.0 above. The internal layout of single aspect, shared core apartments shown below adopts dimensions between external fabric and corridor wall that would be considered reasonably typical from a structural perspective. However, site context and other considerations may suggest different dimensions as being more appropriate. It is therefore accepted that some departure from the external fabric to corridor dimensions shown here may in some cases be preferable; this is a matter for the architect and the design team. Nevertheless, the internal apartment layouts below illustrate that it is entirely feasible in single aspect apartments to meet the internal room width and floor area requirements, and provide all the storage areas required internally, without significantly exceeding (if at all) the overall minimum internal floor area specified in DSfNA.

5.5.4 As noted in 5.3.2.13, a series of apartments which incorporate the principles of universal design are included. These meet the higher level aspirations of achieving full equal access in two major ways. First, all rooms in the dwelling are accessible in a cost efficient manner, and a wheelchair usable bathroom is provided. Second, the apartments are fully accessible and usable by residents with significant reduced mobility. In the case of shared core apartments, this is achieved by way of lift access; in the case of own door apartments, it is achieved by way of level access at ground level. In the case of shared core apartments, the overall floor area of these apartments only marginally exceeds the 10% increase in minimum floor area required of a proportion of the apartments to meet the requirements of DSfNA.

5.5.5 Further opportunities to provide more future proof apartments in a cost effective manner are afforded by the use of open plan apartments. As noted previously, such layouts were adopted in a pilot sheltered housing development in Dublin, but will require compensatory measures to achieve Part B compliance. However, some examples have been included to illustrate opportunities within the target floor areas.

5.5.6 Further to guidance in 5.1.3. above, compensatory measures for Part B compliance may also be required in a number of situations, such as in the larger apartments should the length of escape distances be found to exceed the permissible non-compensated dimension.

5.5.7 An addition to the layouts is the studio apartment, which is increasingly being used in private housing for the accommodation of single persons or couples, and local authorities are encouraged to incorporate some such accommodation in their apartment developments to better meet the needs of some applicants on their social housing waiting lists.



Deck Access with dual aspect apartments for Fold AHB, Inchicore. Reddy Architecture + Urbanism.

5.5.8 The design of balconies as private open amenity space is an important consideration, and should meet the requirements of DSfNA. While the layouts shown adopt the clip-on balcony, both for ease of construction and for best thermal isolation, this should normally be acceptable on the lower rise developments of between say four and six storeys in height. For apartment buildings above this height, consideration should be given to adapting the diagrammatic layouts to accommodate partially or wholly inset balconies into the plan layout. It is not consistent with economic design to roof over the balcony on the top floor, although it may be acceptable for elevational continuity to continue the façade across the top of the balcony. The balcony design needs to be carefully considered to ensure that specific access requirements are met, should this be required, for instance, to meet universal design principles.

5.5.9 While most of the apartments have been shown with a combined kitchen/dining/living room, this largely arises from the apartments being configured as single aspect. Normally three bedroom apartments should be dual aspect, but for the reasons discussed above, they are here shown as single aspect. Where three bedroom (or indeed two-bedroom) apartments are designed as dual aspect, the opportunity can be taken to provide the lounge separately from the kitchen/dining area, which is the preferred arrangement for three bedroom dwellings.

5.5.10 Further opportunities for dual aspect apartments arise where there is an open deck access, with light and ventilation possibilities at a high level on the external wall facing the deck. This traditional arrangement, continues to be used by a number of local authorities who realise its advantages in the delivery of dual aspect apartments. The location of paired decks in a naturally ventilated, top lit atrium is a variation of this type, which is acceptable, but one that potentially presents challenges to the ground floor apartments in terms of delivering an adequate quality of private amenity space.

5.6 Duplexes

5.6.1 Unless required as an age-friendly dwelling, or to accommodate a resident with a disability, the preference is for the ground and first floors of a duplex to be for a three bedroom dwelling, because this has access to the rear garden and is thus more suited to a household with children. Where the provision of a larger, three bedroom, dwelling on the upper floors of a duplex is required, it should be provided where possible with a larger external terrace, as in the sample internal layouts below. Some local authorities have provided both types of duplexes in some schemes.

5.6.2 Care must be taken to ensure that all upper floor balconies or terraces are designed to avoid or minimise overlooking of the private amenity open space of the ground-floor dwelling. As an alternative, access from the first floor to a ground floor open space might be considered. This has not been shown as an option in the internal layout diagrams below, but it is certainly supported where sensitively designed to minimise disruption to the ground floor residents, and designed to be readily accessible from a living room in the first floor duplex.

Typically, this will involve dividing the rear private open space in two, the lower dwelling having a patio directly outside its rear external wall. The upper dwelling accesses the remainder of the private open space, that furthest from the rear external wall, by an external stairs designed to minimise or avoid overlooking of the ground floor dwelling's patio.

5.6.3 As previously noted, the ground-floor, own-door apartments, availing of the cost savings resulting from their provision in a multi-storey dwelling, can enjoy a little more flexibility with respect to floor area. The internal layouts for such dwellings may therefore exceed the target floor areas of QHfSC. These ground-floor apartments are designed in an economic manner, however, as are the upper-floor, own-door apartments, which only marginally exceed the minimum floor areas for DSfNA.



Duplexes with two upper duplexes sharing an internal stairs, Adamstown, MOLA Architecture.

5.6.4 The preference is for external stairs to be provided in duplexes, shared between two apartments and accessing own door entrance on the first floor, such entrances being readily visible from the street. This model avoids the maintenance and management requirements of a shared internal stairs serving two first-floor dwellings, and potential disputes in this regard. A shared internal stairs is not, however, precluded where appropriately managed by the local authority or an AHB, and this arrangement is shown on layouts A6 and A9, though in both instances the staircase could be made external. Individual internal access stairs are acceptable in special instances such as turning a corner, but more general use should be supported by an element of compensatory cost saving.



Duplexes with external stairs. Sean Treacy House, social housing for Dublin City Council, Paul Keogh Architects.



Duplexes with external stairs, Portmarnock, Coady Architects

5.6.5 As duplexes can be considered both as houses and apartments, and as QHfSC or DSfNA do not appear to offer specific advice, the following guidelines are provided to clarify which target floor areas and storage requirements apply.

1. Where a dwelling forms the lower one or lower two floors of a duplex dwelling, and has its own entrance at ground level, with access to ground floor private open space, it should be considered as a house (either one or two storey as appropriate) both in terms of the storage space and target floor area.
2. Where a dwelling forms one upper floor in a duplex, the comparative floor area is that of an apartment, and the storage area provision should be that for an apartment. However, for purposes of comparison only, the floor area should be calculated to omit part of the area of the approach stairs and corridor, (unless completely separately provided as in A12 for instance) where no adjustment is required.
3. Where a dwelling forms the upper two floors of a duplex, as it has an internal stairs, the comparative floor area should be that of a two storey house (and not an apartment). As this dwelling is divorced from the ground, without access to external storage, the storage provision should therefore be that for an apartment. The target floor area should also be increased to reflect this additional storage.
4. Where the access stairs/corridor to the upper dwelling is included as an integral part of the dwelling, two floor area comparisons should be provided, one with the comparative house floor area (increased to include for the additional storage area), and one with an adjusted floor area, omitting some floor area for the access corridor and stairs. To assist, such floor area comparisons are indicated on the relevant internal layouts.

5.7 Houses

5.7.1 There are two main house types, wide fronted and narrow fronted. There are also specials, which are used to provide active frontage to two sides and turn the corner at the end of a terrace.

5.7.2 As discussed in Section 4.7.2, the particular advantage of wide fronted houses (such as H9 below) is that as a two storey type, they can be designed with minimal fenestration on the rear elevation and thus not trigger the requirement for a 20–22 metre setback between opposing upper floor windows. As can be seen from the relevant block layout in Chapter 4 above this makes wide fronted houses particularly suitable where there is a narrow width between the street and the boundary, or between two parallel streets.



In all other locations where appropriate, the more traditional narrow fronted dwellings should be used. Social housing, Mulgrave Street Limerick, Paul Keogh Architects.

5.7.3 Unless some such considerations apply, in all other locations where appropriate to use individual houses, the more traditional narrow-fronted houses on two and three storeys should be used, as they provide a more economical use of land.

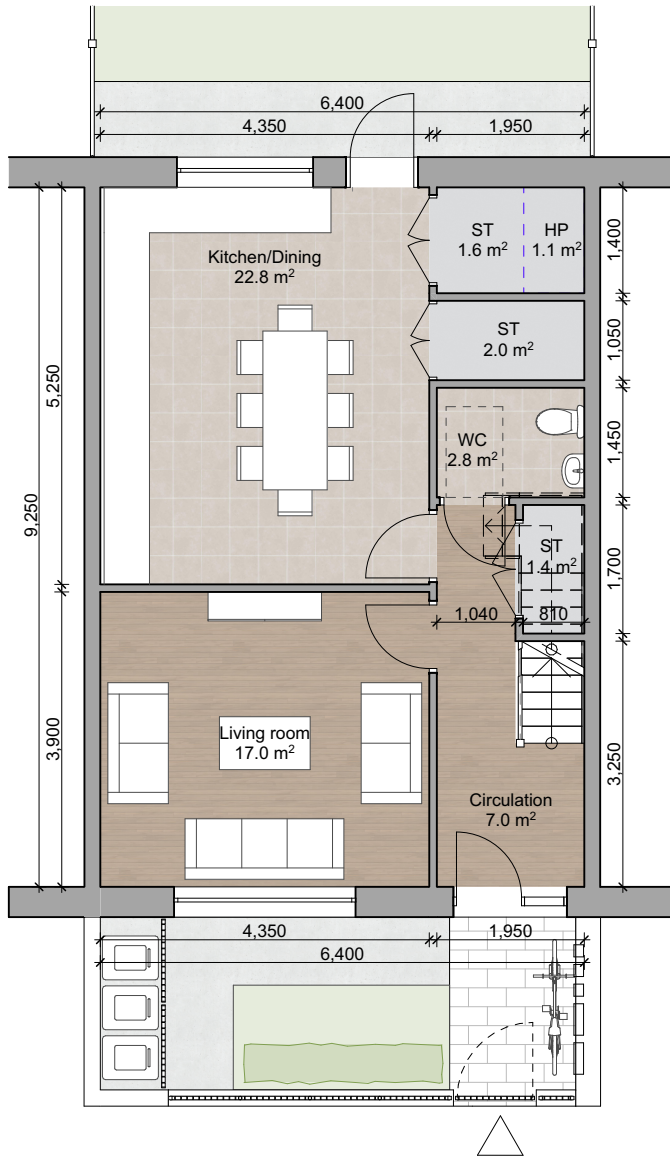
5.8 Conclusion

- 5.8.1** The intention of this manual is to provide local authorities, Approved Housing Bodies and their design teams with advice and guidance, at the level of the diagrammatic layout, on quality economic design for housing. The topics covered range from site layouts to individual dwelling design, and these are addressed in a manner consistent with the most recent design guidance and policy. The manual has been prepared in accordance with urban design and placemaking best practice and with the aim of promoting sustainable communities in compact developments, consistent with the *National Planning Framework - Ireland 2040*, while also meeting all other requirements.
- 5.8.2** Accordingly, if there are any queries on the content of this manual, local authorities are encouraged to contact and to discuss with the Architect Advisor allocated to them by the Department. Local authorities are also encouraged to consult and liaise with the Architect/QS Advisor at all main stages of each project, from site evaluation prior to purchase through preliminary site strategy and design stages up to tender procedures prior to formal stage submissions. It is hoped that such consultation and liaison will streamline the pre-contract programme and speed up delivery of quality social housing.



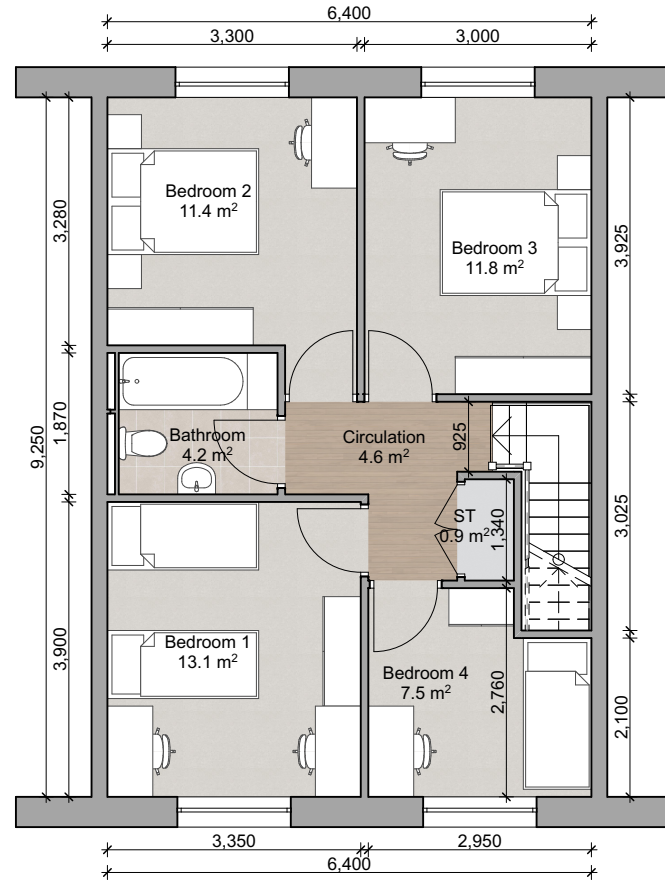
5.9 | Standard Internal Layouts

	Unit Type: A = APARTMENT D = DUPLEX H = HOUSE		
No. bedrooms / No. persons	1 Storey	2 Storey	3 Storey
4B/7P		H1	H2
3B/6P		D1	H3
		D2	
		D3	
		H4	
		H5	
		H6	
3B/5P open plan UD	A25		
	A26		
3B/5P	A1	D4	H7
	A1 Alt	D5	
	A19	D6	
		D6A	
		D7	
		H8	
		H9	
3B/4P		H10	
		H11	
2B/4P open plan UD	A24		
2B/4P UD	A2		
	A4		
2B/4P	A3	H12	
	A18	H13	
	A27		
	A28		
2B/3P open plan UD	A23		
2B/3P UD	A5		
	A6		
	A7		
	A8		
	H16		
2B/3P	A9	H14	
	A20		
1B/2P UD	A14		
	A14 Alt		
1B/2P	A10		
	A11		
	A11 Alt		
	A12		
	A13		
	A15		
	A16		
	A16 Alt		
1B/2P open plan	A21		
1B/2P open plan UD	A22		
	A22 Alt		
STUDIO	A17		
COMMUNITY DWELLING	H15, H15A, H15B, H15C		



1
H1

GROUND FLOOR HOUSE
4B-7P-2S



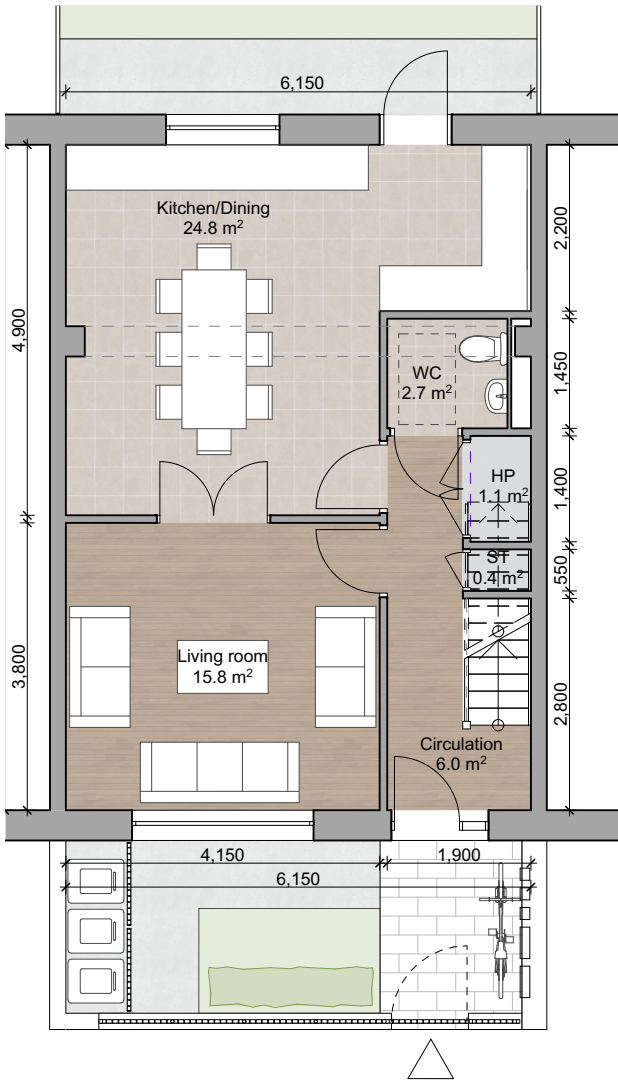
2
H1

FIRST FLOOR HOUSE
4B-7P-2S

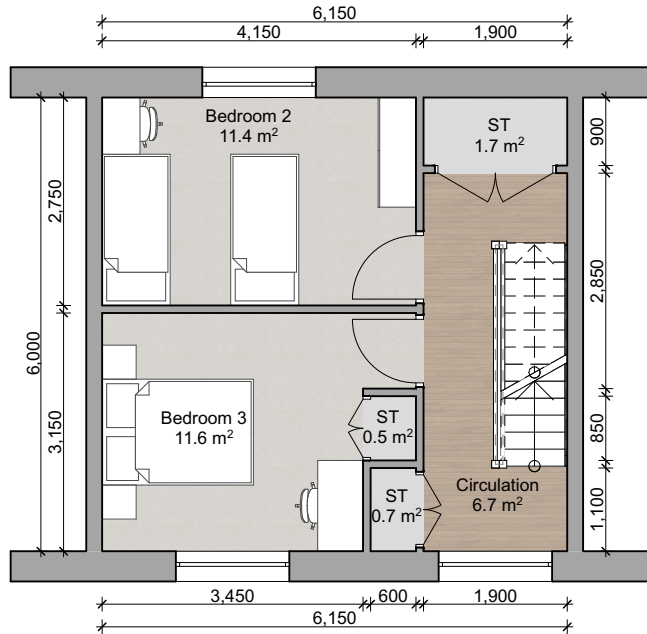
Dwelling H1

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.300	13.1	2.8	13.0	100.8
BEDROOM 2	3.300	11.4	2.8	11.4	100.0
BEDROOM 3	3.000	11.8	2.8	11.4	103.5
BEDROOM 4	2.700	7.5	2.1	7.1	105.6
LIVING ROOM	3.900	17.0	3.8	15.0	113.3
TOTAL STORAGE AREA		5.9		6.0	98.3
TOTAL LIVING/KITCHEN/DINING AREA		39.8		40.0	99.5
GROSS INTERNAL AREA		118.4		110.0	107.6

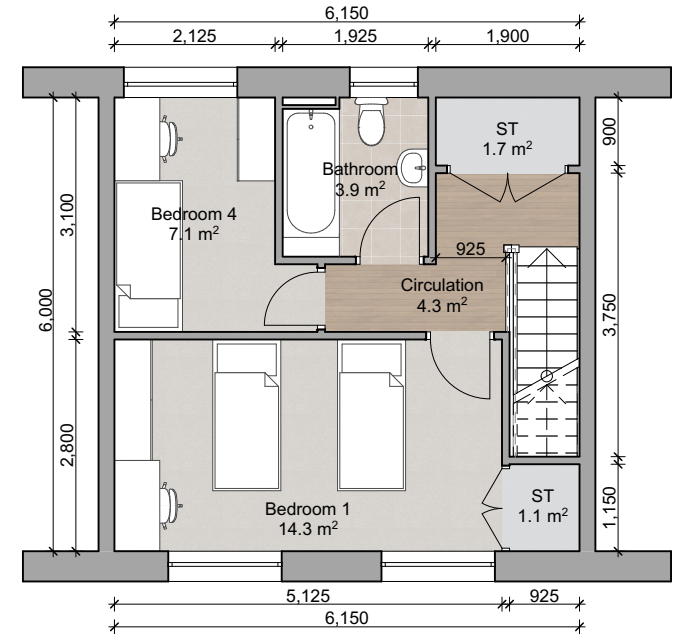
H2



1
H2
GROUND FLOOR HOUSE
4B-7P-3S



2
H2
FIRST FLOOR HOUSE
4B-7P-3S

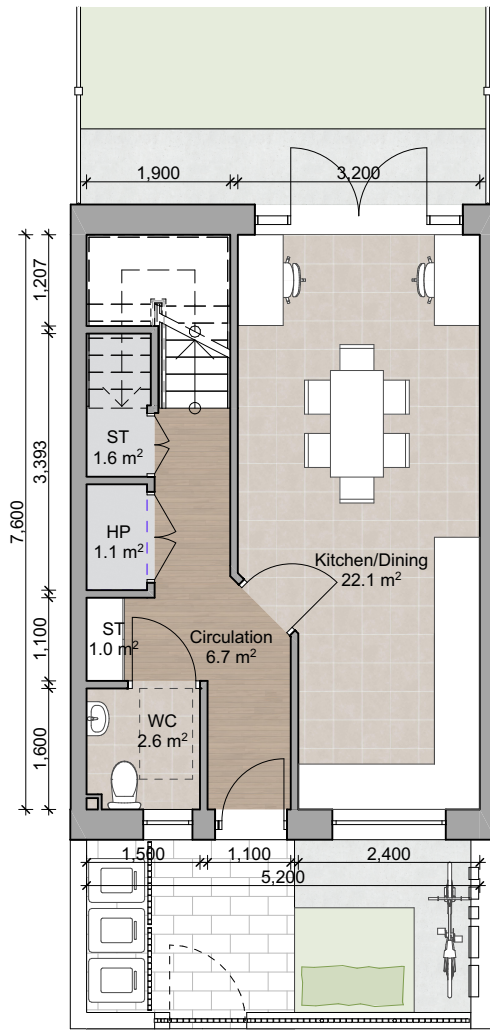


3
H2
SECOND FLOOR HOUSE
4B-7P-3S

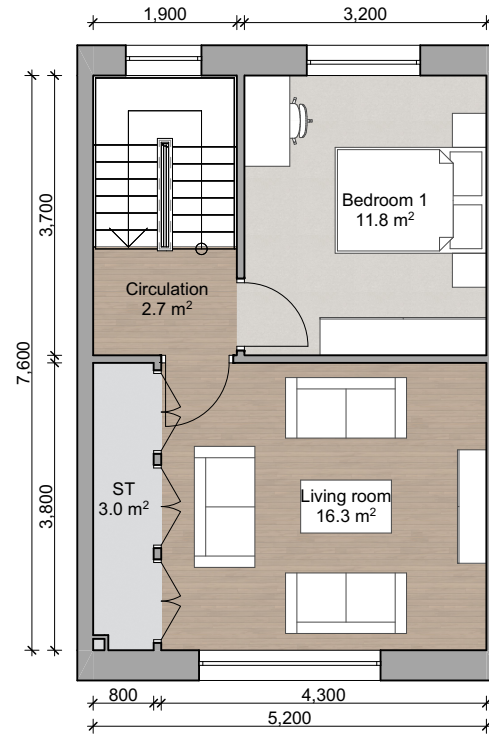
Dwelling H2

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	14.3	2.8	13.0	110.0
BEDROOM 2	2.800	11.4	2.8	11.4	101.7
BEDROOM 3	3.150	11.6	2.8	11.4	101.7
BEDROOM 4	2.125	7.1	2.1	7.1	100.0
LIVING ROOM	3.800	15.8	3.8	15.0	105.3
TOTAL STORAGE AREA		6.1		6.0	101.6
TOTAL LIVING/KITCHEN/DINING AREA		40.6		40.0	101.5
GROSS INTERNAL AREA		127.9		120.0	106.7

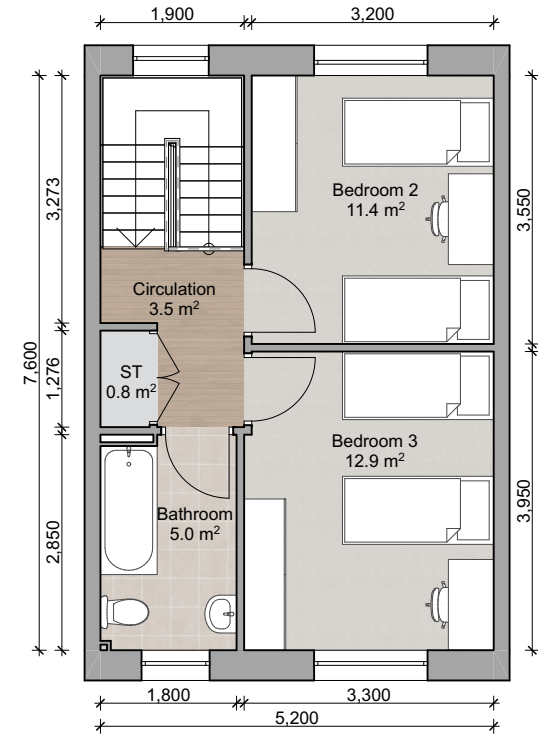
H3



1
H3 GROUND FLOOR HOUSE
3B-6P-3S



2
H3 FIRST FLOOR HOUSE 3B-6P-3S

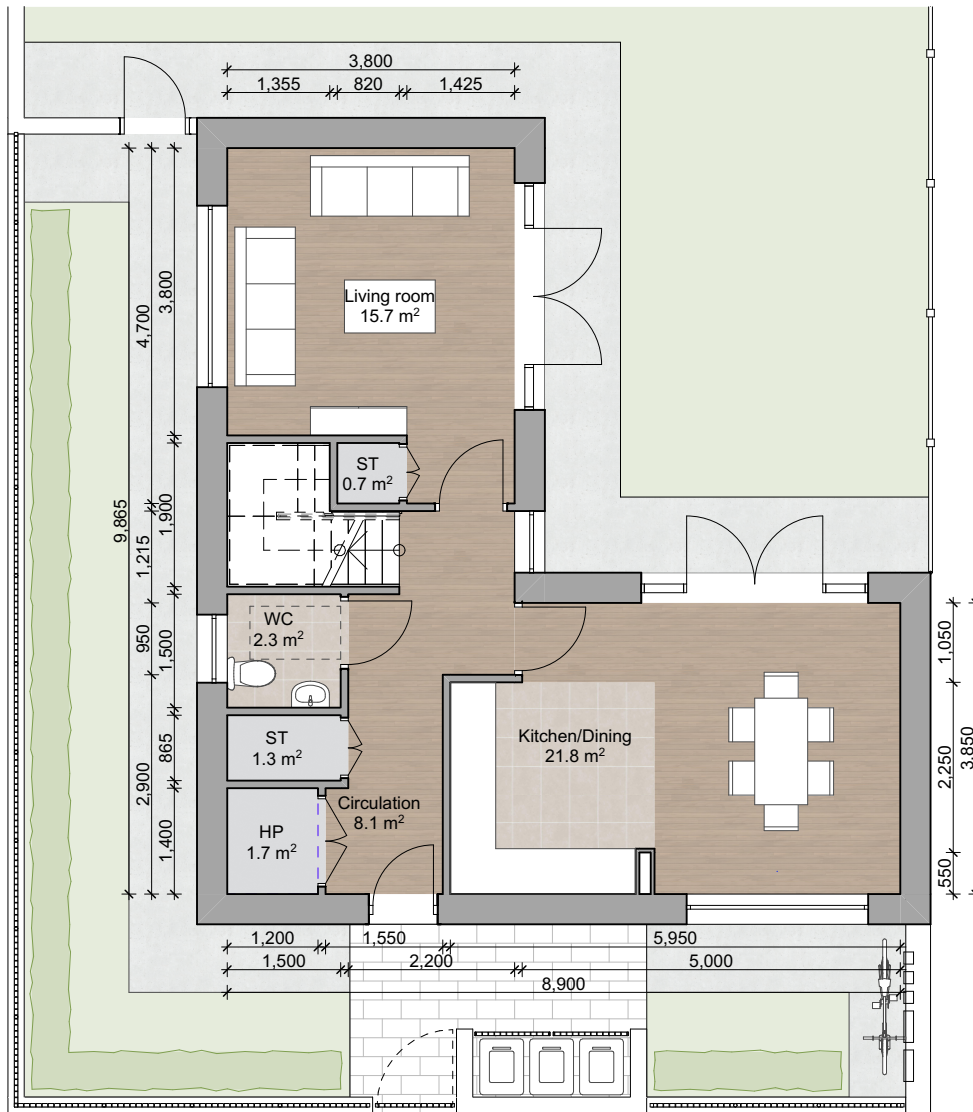


3
H3 SECOND FLOOR HOUSE 3B-6P-3S

Dwelling H3

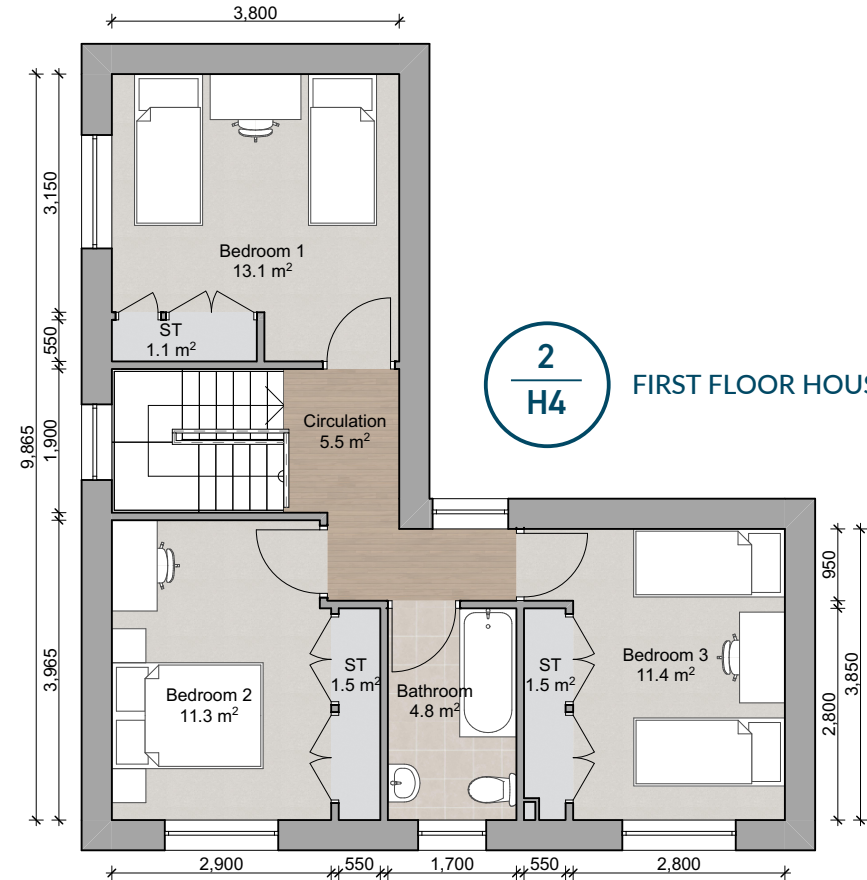
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	11.8	2.8	11.4	105.2
BEDROOM 2	3.200	11.4	2.8	11.4	100.0
BEDROOM 3	3.200	12.9	2.8	13.0	99.2
LIVING ROOM	3.800	16.3	3.8	15.0	118.6
TOTAL STORAGE AREA		6.4		6.0	106.7
TOTAL LIVING/KITCHEN/DINING AREA		38.4		37.0	103.8
GROSS INTERNAL AREA		118.5		110.0	107.7

H4



1
H4

GROUND FLOOR HOUSE
3B-6P-2S



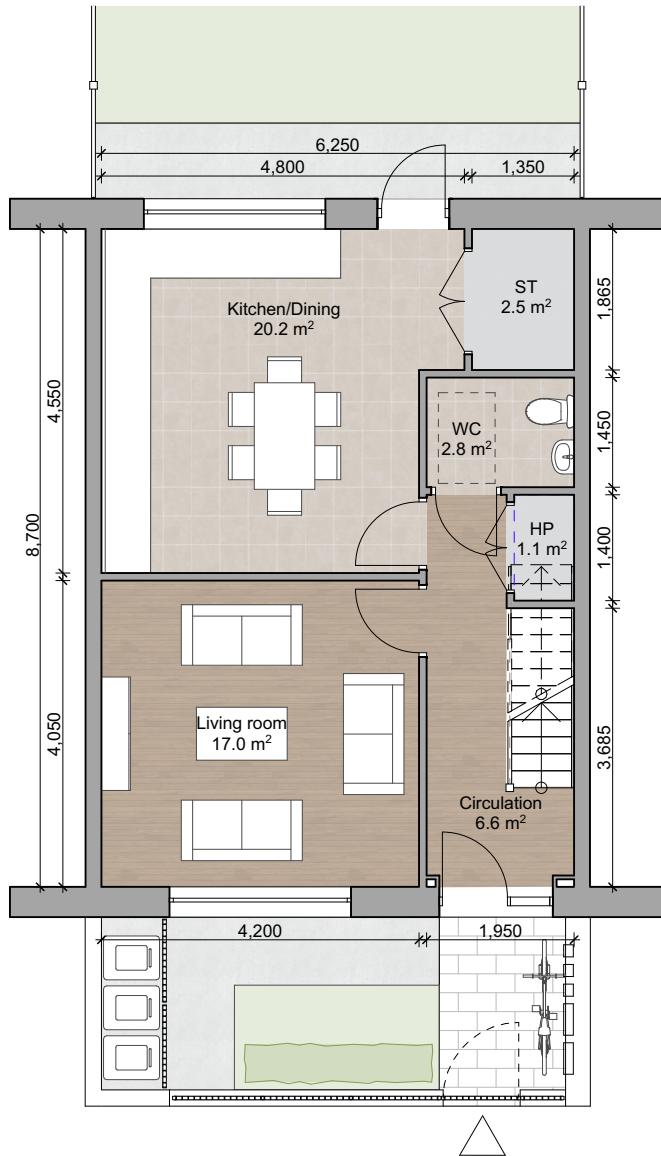
2
H4

FIRST FLOOR HOUSE 3B-6P-2S

Dwelling H4

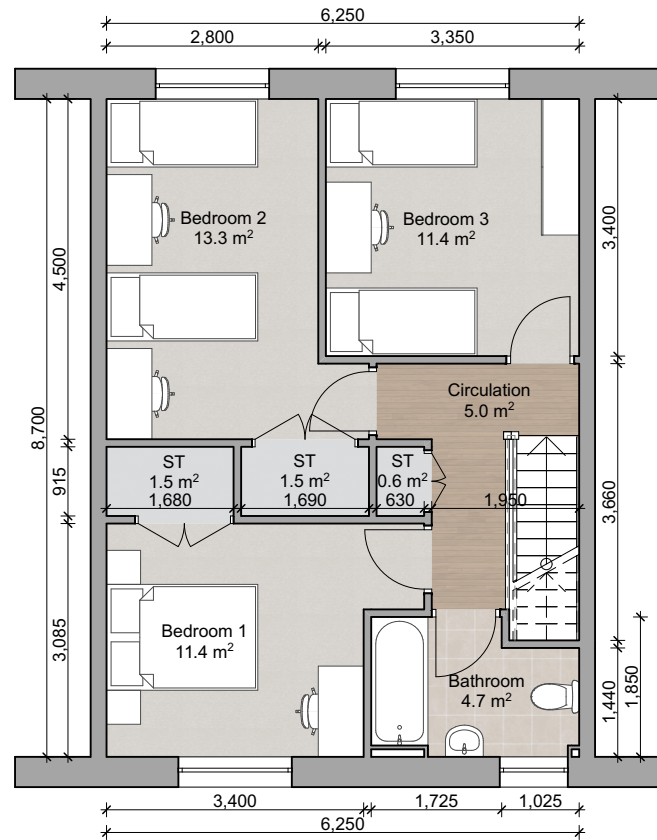
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.800	13.1	2.8	13.0	100.8
BEDROOM 2	2.900	11.3	2.8	11.4	99.1
BEDROOM 3	2.800	11.4	2.8	11.4	100.0
LIVING ROOM	3.800	15.7	3.8	15.0	104.7
TOTAL STORAGE AREA		6.1		6.0	101.7
TOTAL LIVING/KITCHEN/DINING AREA		37.5		37.0	101.3
GROSS INTERNAL AREA		114.2		100.0	114.2

H5



01
H5

GROUND FLOOR HOUSE
3B-6P-2S

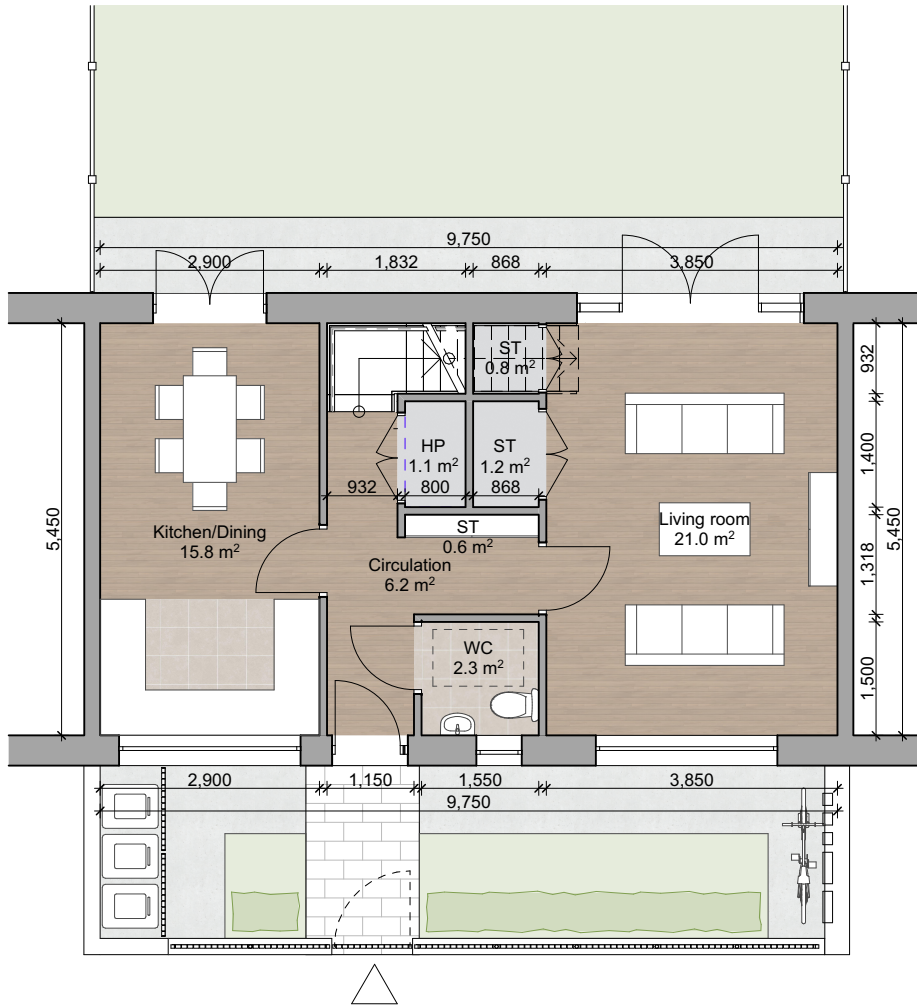


02
H5

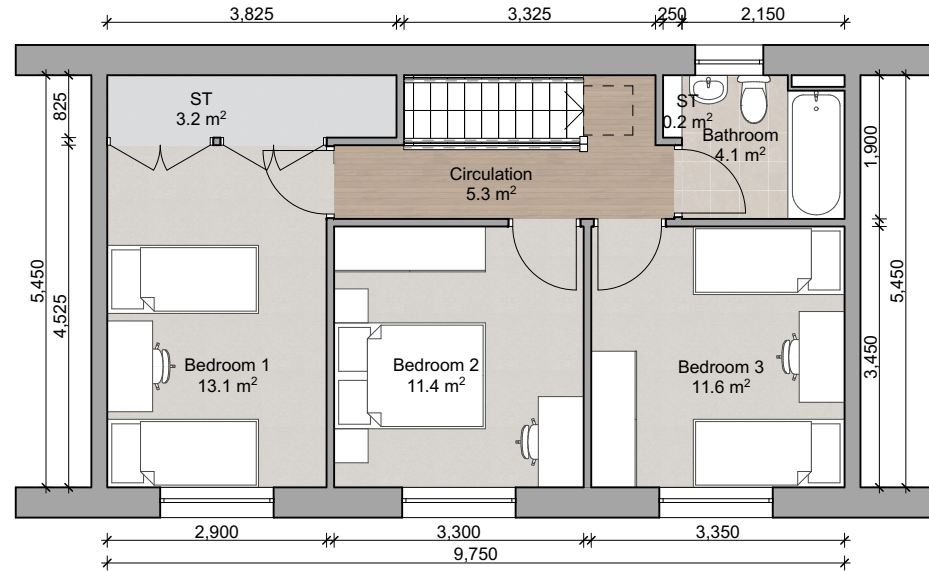
FIRST FLOOR HOUSE 3B-6P-2S

Dwelling H5

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	11.4	2.8	11.4	100.0
BEDROOM 2	2.800	13.3	2.8	13.0	102.3
BEDROOM 3	3.300	11.4	2.8	11.4	100.0
LIVING ROOM	4.000	17.0	3.8	15.0	113.3
TOTAL STORAGE AREA		6.1		6.0	101.7
TOTAL LIVING/KITCHEN/DINING AREA		37.2		37.0	100.5
GROSS INTERNAL AREA		108.8		100.0	108.8



1
H6
GROUND FLOOR HOUSE
3B-6P-2S

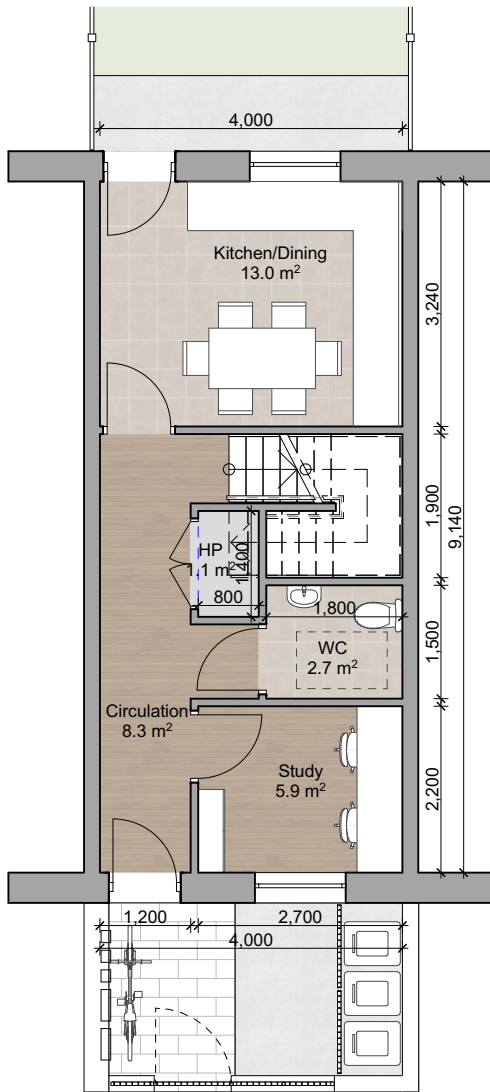


2
H6
FIRST FLOOR HOUSE
3B-6P-2S

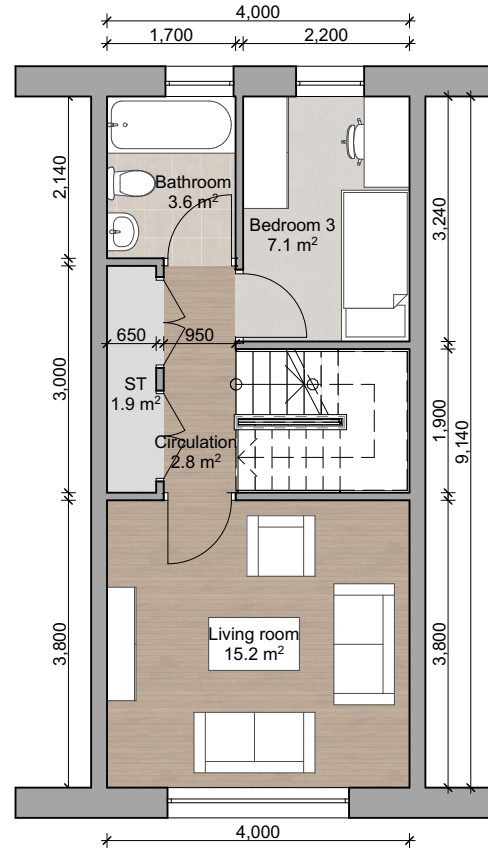
Dwelling H6

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.1	2.8	13.0	100.8
BEDROOM 2	3.330	11.4	2.8	11.4	100.0
BEDROOM 3	3.300	11.6	2.8	11.4	100.0
LIVING ROOM	3.900	21.0	3.8	15.0	140.0
TOTAL STORAGE AREA		6.0		6.0	99.9
TOTAL LIVING/KITCHEN/DINING AREA		36.8		37.0	99.5
GROSS INTERNAL AREA		106.2		100.0	106.2

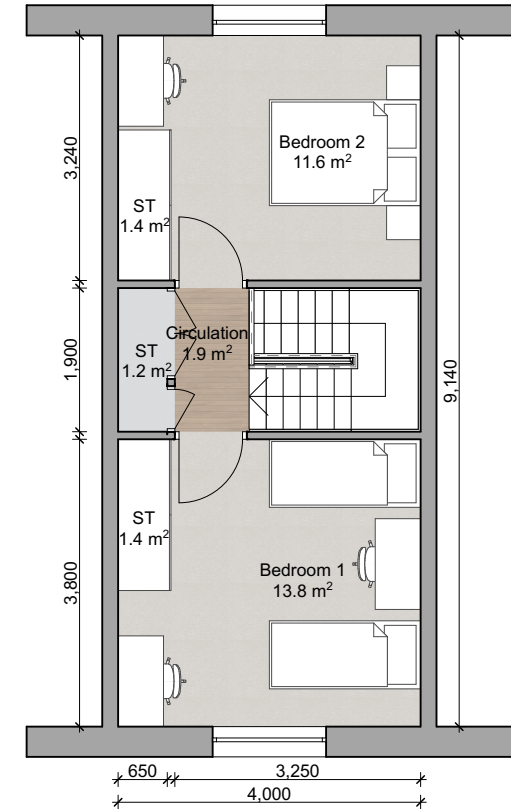
H7



1
H7 GROUND FLOOR HOUSE
3B-5P-3S



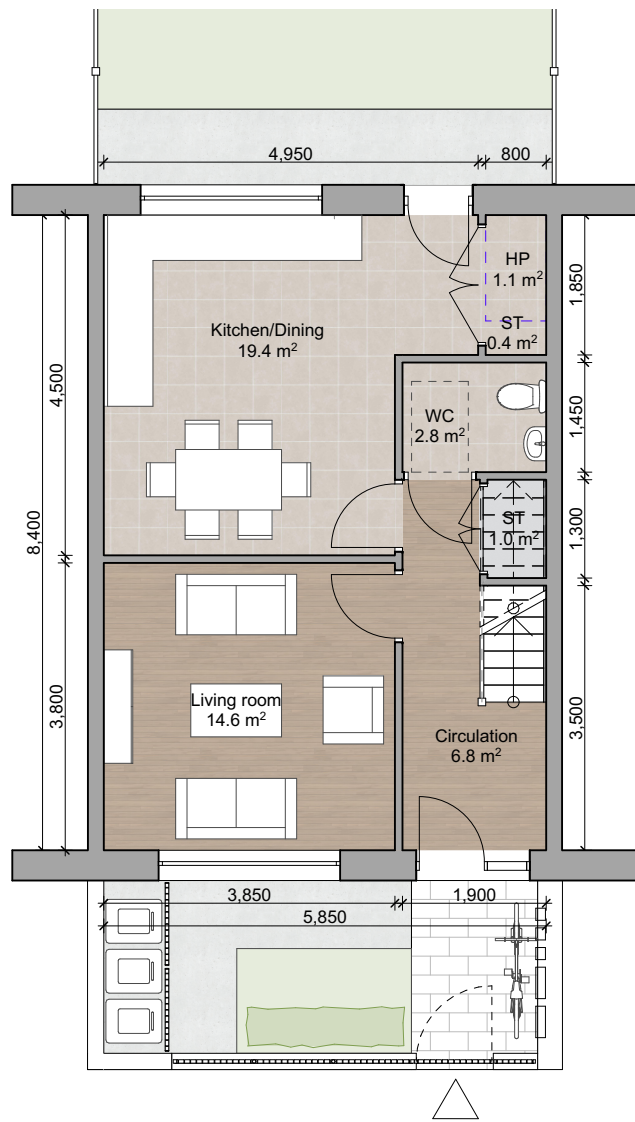
2
H7 FIRST FLOOR HOUSE 3B-5P-3S



3
H7 SECOND FLOOR HOUSE
3B-5P-3S

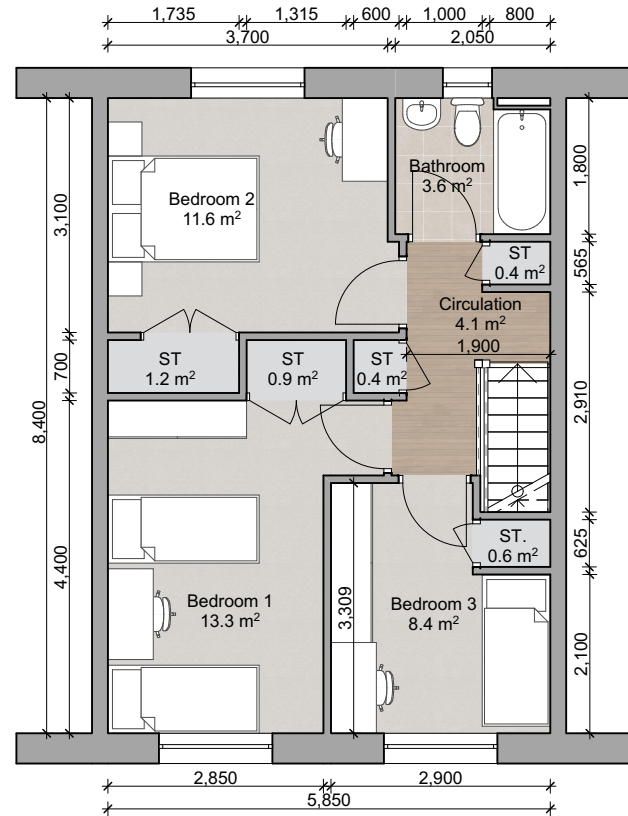
Dwelling H7

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.800	13.8	2.8	13.0	106.1
BEDROOM 2	3.200	11.6	2.8	11.4	103.5
BEDROOM 3	2.200	7.1	2.1	7.1	100.0
LIVING ROOM	3.600	15.2	3.8	13.0	116.9
TOTAL STORAGE AREA		5.9		5.0	118.0
TOTAL LIVING/KITCHEN/DINING AREA		34.1		34.0	100.3
GROSS INTERNAL AREA		109.8		102.0	107.7



1
H8

GROUND FLOOR HOUSE
3B-5P-2S

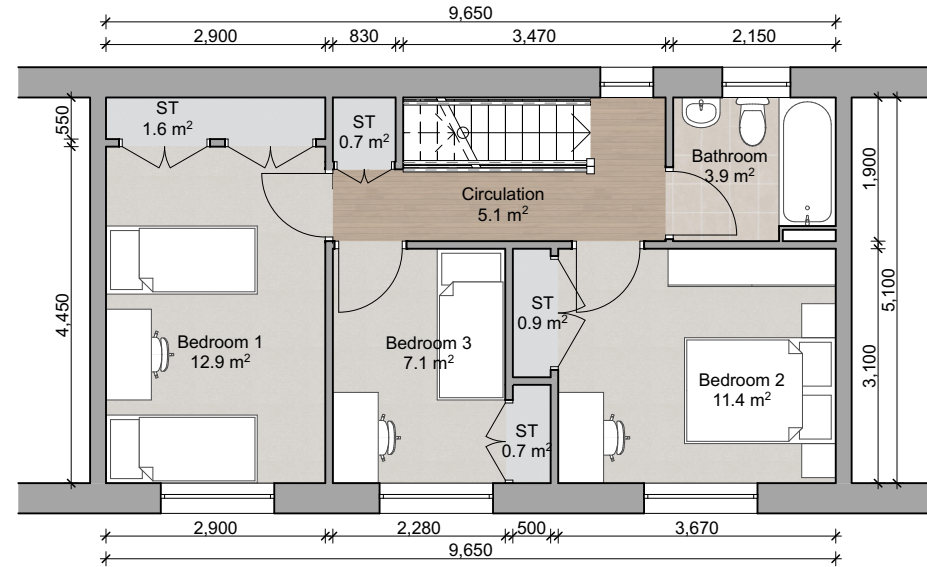
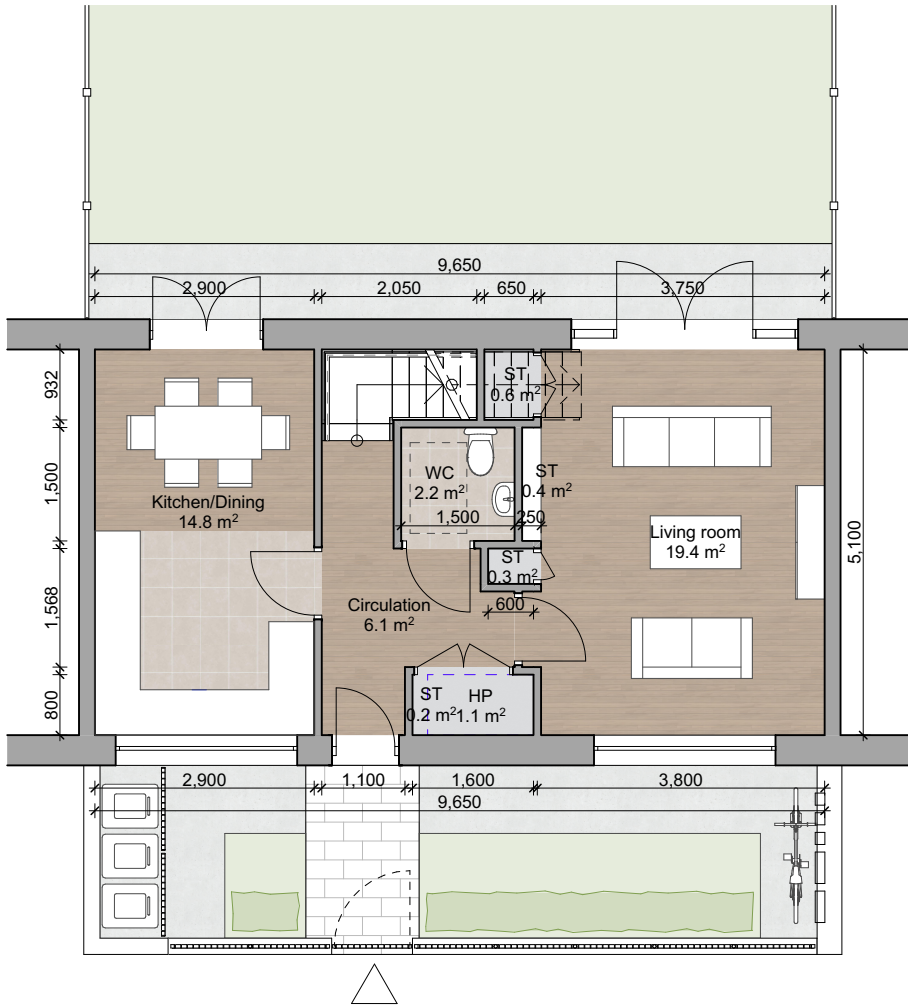


2
H8

SECOND FLOOR HOUSE
3B-5P-2S

Dwelling H8

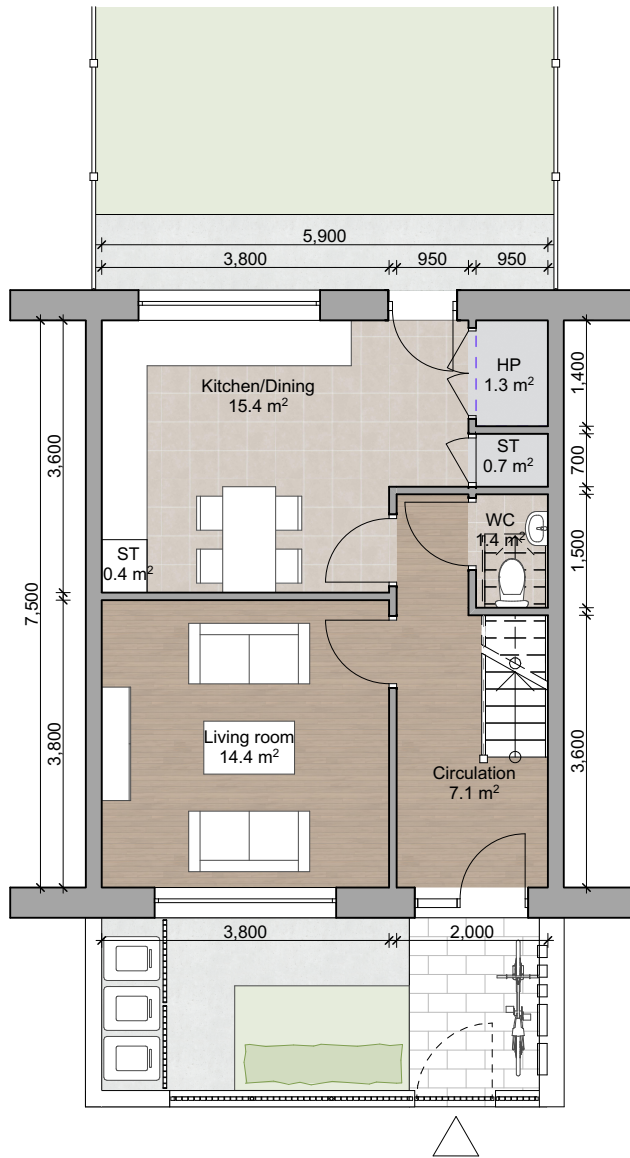
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.850	13.3	2.8	13.0	102.3
BEDROOM 2	3.100	11.6	2.8	11.4	101.7
BEDROOM 3	2.900	8.4	2.1	7.1	118.3
TOTAL STORAGE AREA		4.9		5.0	98.0
TOTAL LIVING/KITCHEN/DINING AREA		34.0		34.0	100.0
GROSS INTERNAL AREA		98.2		92.0	106.8



Dwelling H9

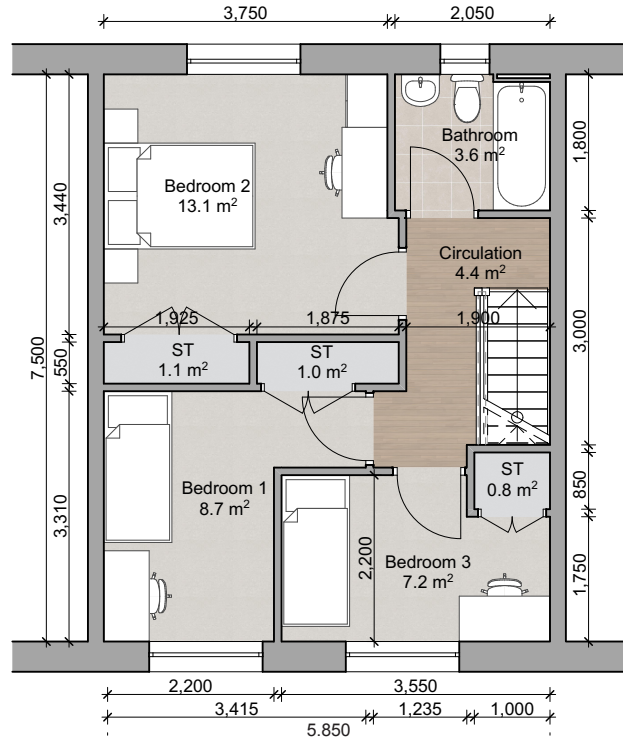
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	12.9	2.8	13.0	100.0
BEDROOM 2	3.100	11.4	2.8	11.4	100.0
BEDROOM 3	2.280	7.1	2.1	7.1	100.0
LIVING ROOM	3.800	19.4	3.8	13.0	149.2
TOTAL STORAGE AREA		5.4		5.0	108.0
TOTAL LIVING/KITCHEN/DINING AREA		34.2		34.0	100.6
GROSS INTERNAL AREA		98.0		92.0	106.6

H10



1
H10

GROUND FLOOR HOUSE
3B-4P-2S



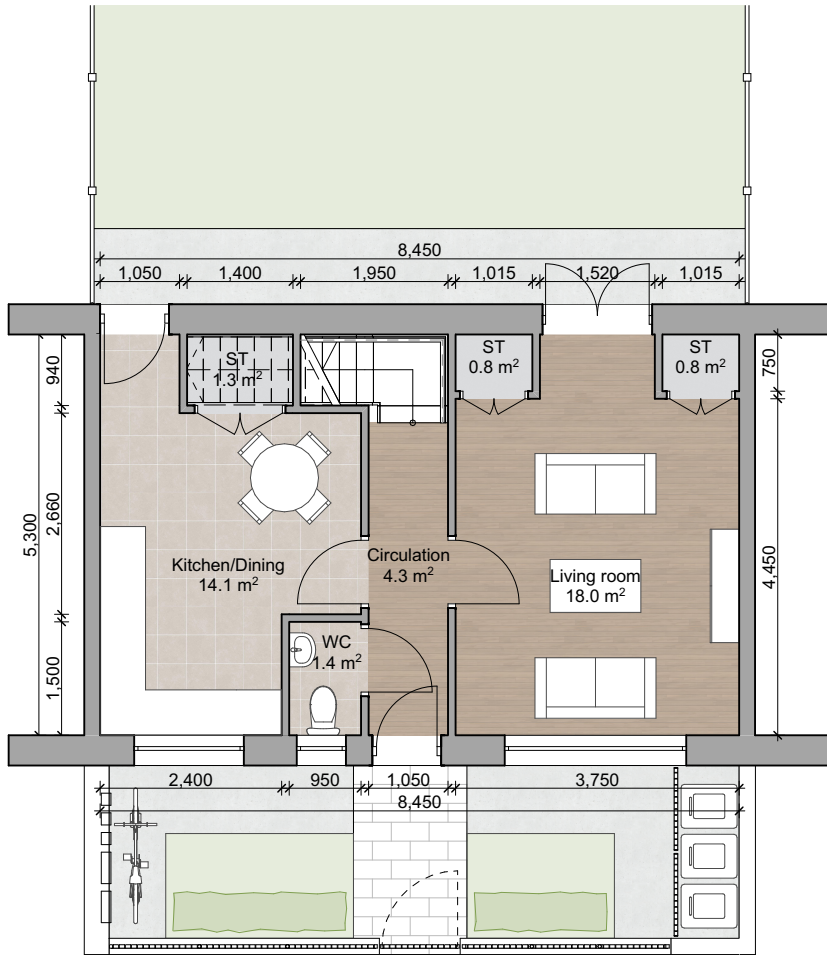
2
H10

FIRST FLOOR HOUSE
3B-4P-2S

Dwelling H10

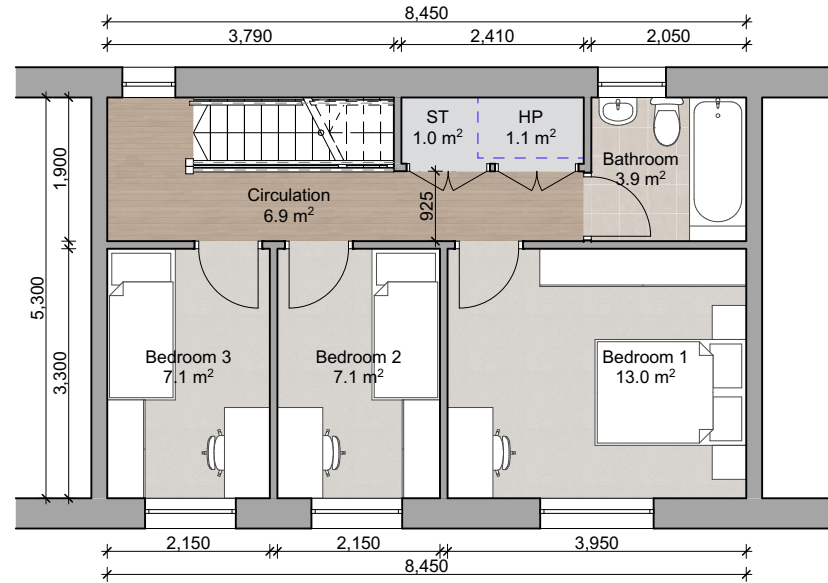
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.200	8.7	2.1	7.1	119.7
BEDROOM 2	3.440	13.1	2.8	13.0	100.0
BEDROOM 3	2.200	7.2	2.1	7.1	105.6
LIVING ROOM	3.800	14.4	3.8	13.0	110.8
TOTAL STORAGE AREA		4.0		4.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		29.8		30.0	99.3
GROSS INTERNAL AREA		88.2		83.0	106.3

H11



1
H11

GROUND FLOOR HOUSE
3B-4P-2S

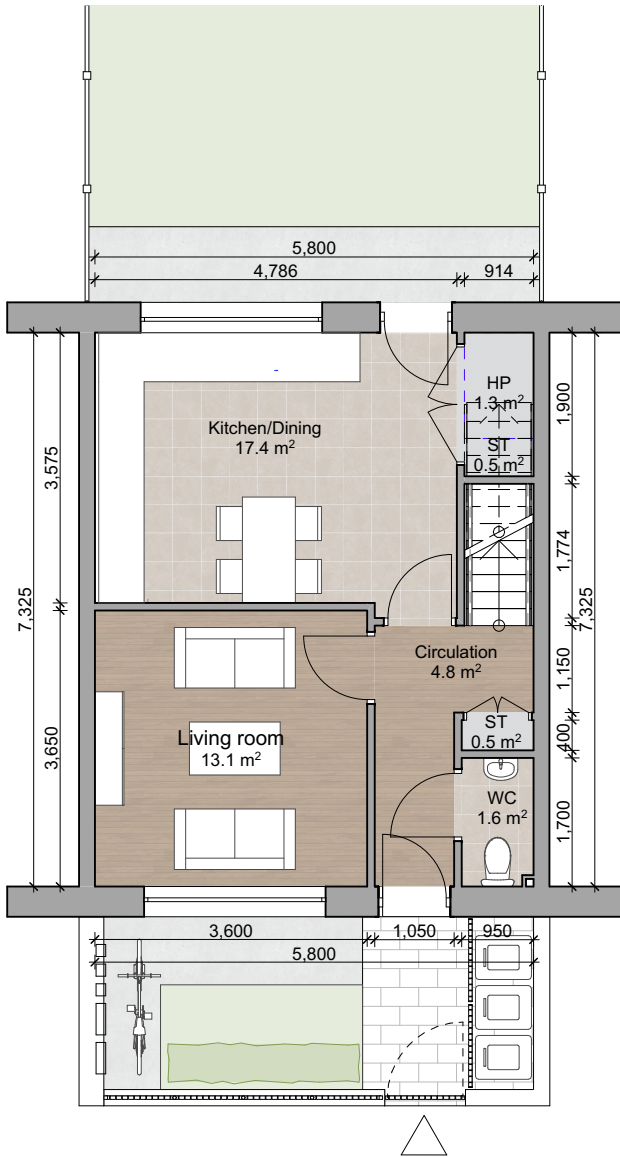


2
H11

FIRST FLOOR HOUSE
3B-4P-2S

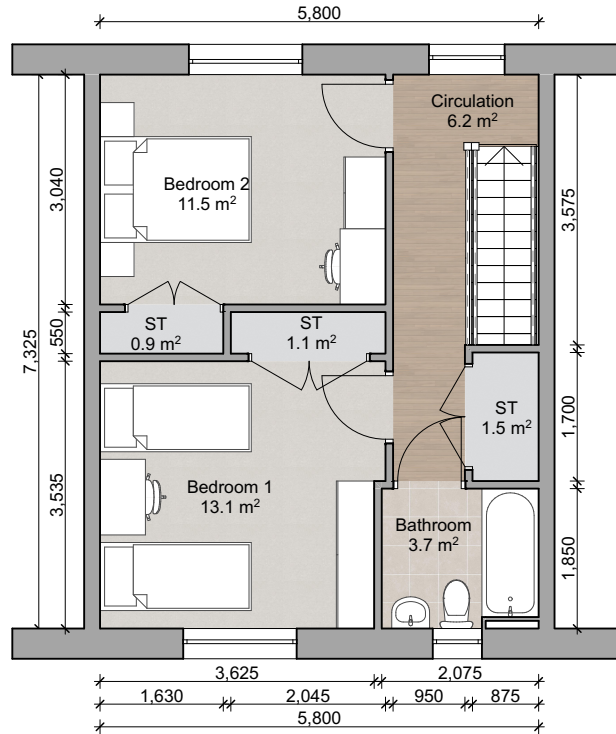
Dwelling H11

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.300	13.0	2.8	13.0	100.0
BEDROOM 2	2.150	7.1	2.1	7.1	100.0
BEDROOM 3	2.150	7.1	2.1	7.1	100.0
LIVING ROOM	3.800	18.0	3.8	13.0	138.5
TOTAL STORAGE AREA		3.9		4.0	97.5
TOTAL LIVING/KITCHEN/DINING AREA		32.1		30.0	107.0
GROSS INTERNAL AREA		89.6		83.0	108.0



1
H12

GROUND FLOOR HOUSE
2B-4P-2S



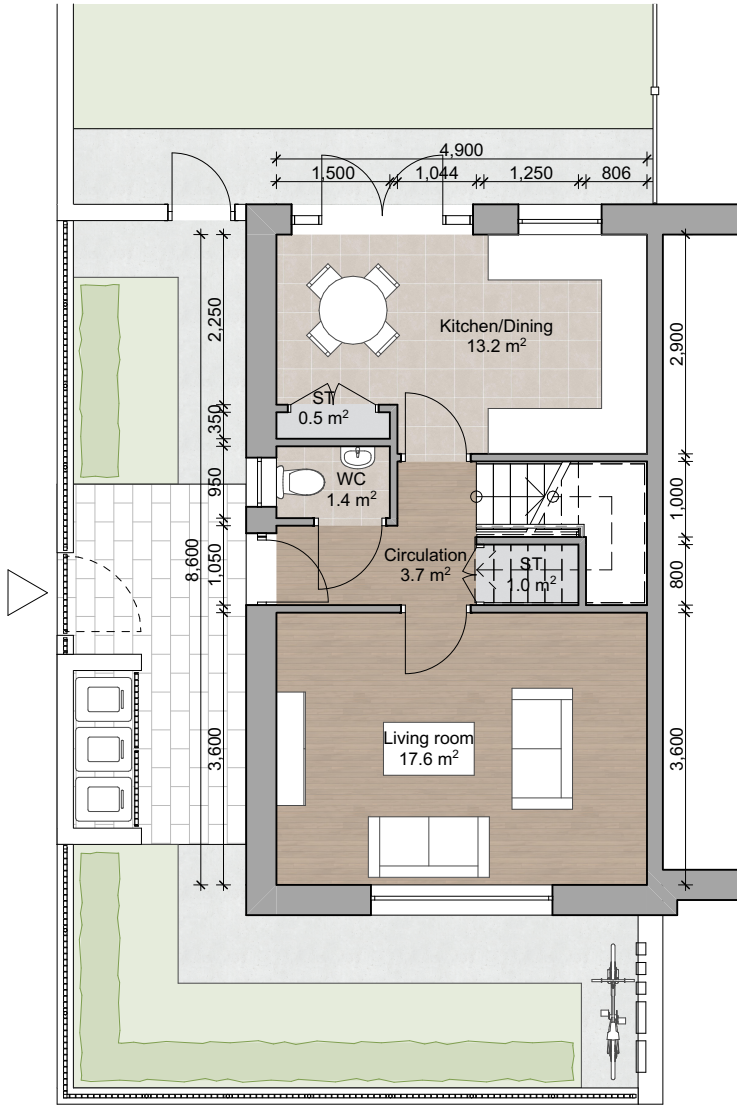
2
H12

FIRST FLOOR HOUSE
2B-4P-2S

Dwelling H12

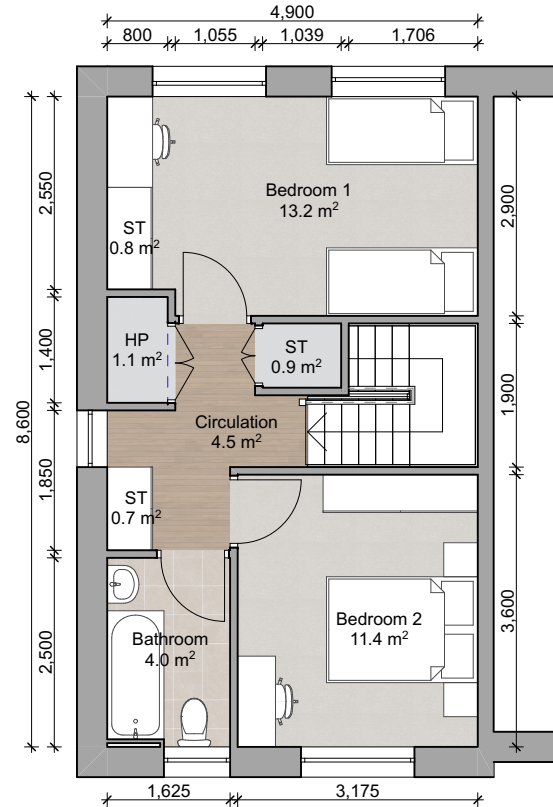
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.500	13.1	2.8	13.0	100.0
BEDROOM 2	3.000	11.5	2.8	11.4	100.9
LIVING ROOM	3.600	13.1	3.6	13.0	100.8
TOTAL STORAGE AREA		4.5		4.0	112.5
TOTAL LIVING/KITCHEN/DINING AREA		30.5		30.0	101.7
GROSS INTERNAL AREA		85.0		80.0	106.2

H13



1
H13

GROUND FLOOR HOUSE
2B-4P-2S



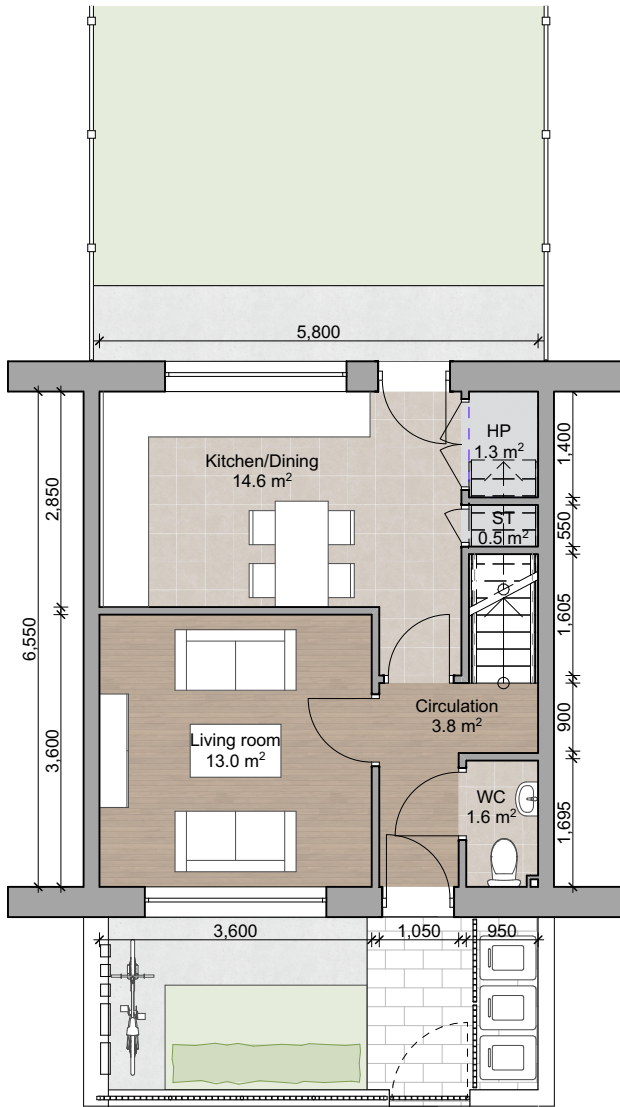
2
H13

FIRST FLOOR HOUSE
2B-4P-2S

Dwelling H13

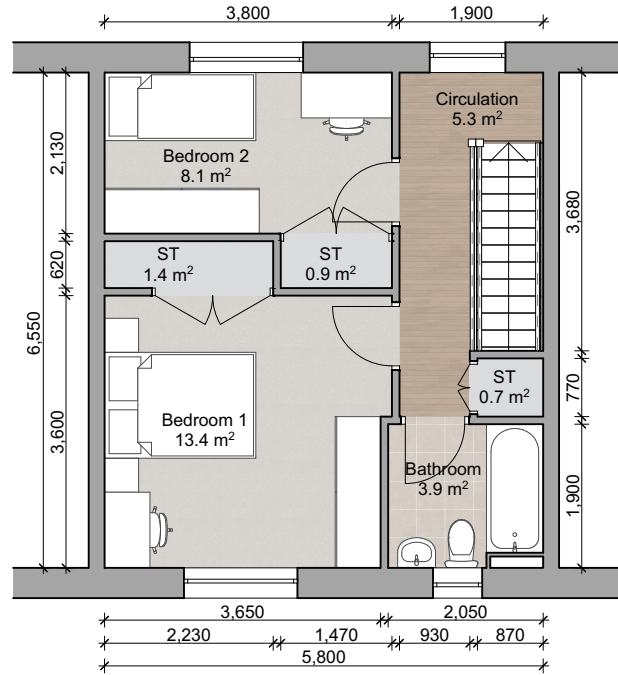
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.2	2.8	13.0	103.1
BEDROOM 2	3.100	11.4	2.8	11.4	100.0
LIVING ROOM	3.600	17.6	3.6	13.0	135.4
TOTAL STORAGE AREA		3.9		4.0	97.5
TOTAL LIVING/KITCHEN/DINING AREA		30.8		30.0	102.7
GROSS INTERNAL AREA		84.2		80.0	105.2

H14



1
H14

GROUND FLOOR HOUSE
2B-3P-2S



2
H14

FIRST FLOOR HOUSE
2B-3P-2S

Dwelling H14

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.600	13.4	2.8	13.0	103.1
BEDROOM 2	2.130	8.1	2.1	7.1	111.3
LIVING ROOM	3.600	13.0	3.6	13.0	100.0
TOTAL STORAGE AREA		3.5		3.0	116.7
TOTAL LIVING/KITCHEN/DINING AREA		27.6		28.0	98.5
GROSS INTERNAL AREA		75.3		70.0	107.6

H15



1
H15

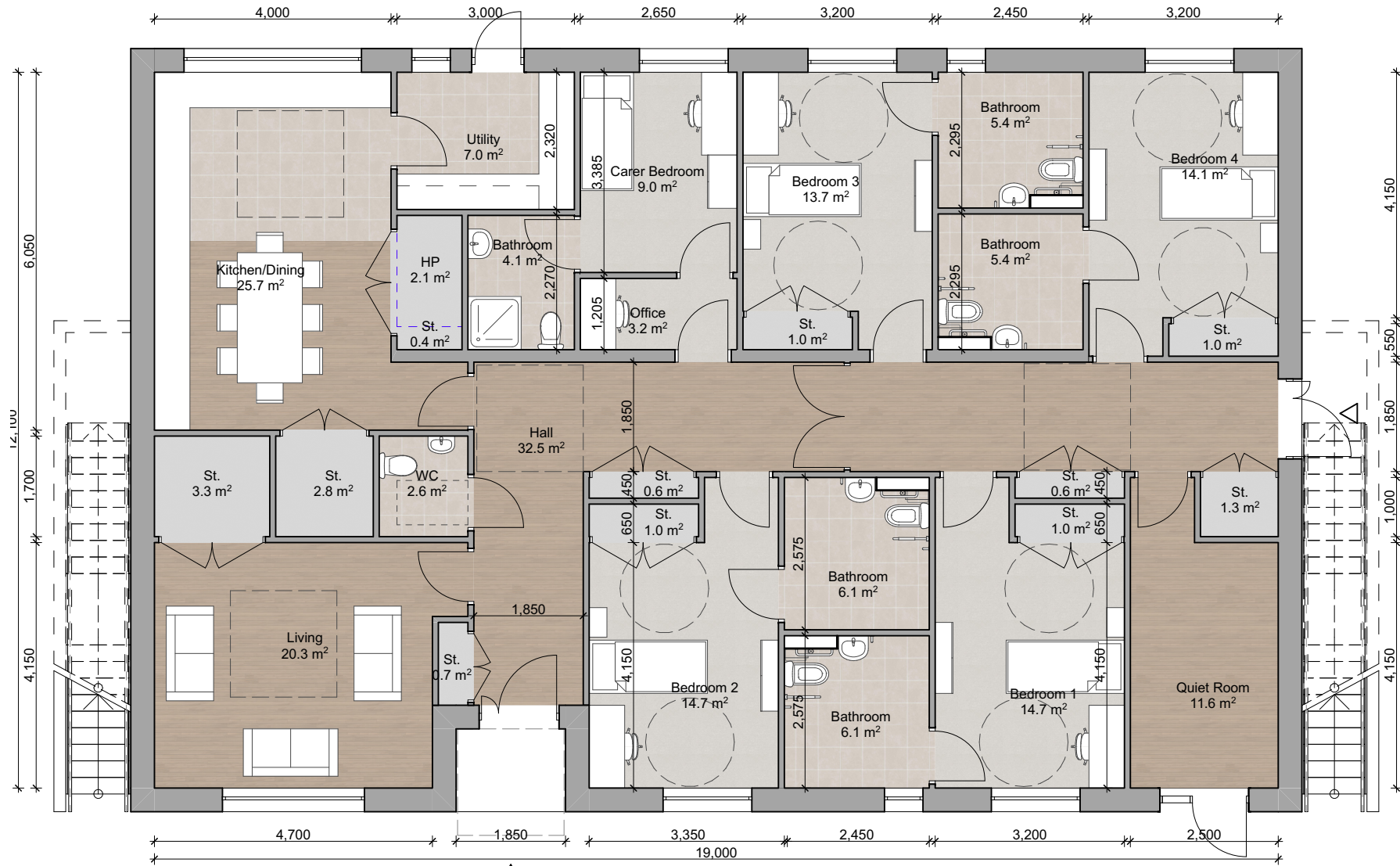
GROUND FLOOR COMMUNITY
5B-4P(+CARER)-1S

Dwelling H15

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	14.7	2.8	12.5	117.6
BEDROOM 2	3.350	14.7	2.8	12.5	117.6
BEDROOM 3	3.200	14.1	2.8	12.5	112.8
BEDROOM 4	3.200	14.1	2.8	12.5	112.8
LIVING ROOM	2.650	9.0	2.1	7.1	126.8
TOTAL STORAGE AREA		21.7		11.0	197.5
TOTAL LIVING/KITCHEN/DINING AREA		57.6		40.0	144.1
GROSS INTERNAL AREA		226.2		-	0.0

H15A

(below A18)



GROUND FLOOR COMMUNITY 5B-4P(+CARER)-1S

(BELOW UPPER FLOOR APT A18
APARTMENTS)

Dwelling H15A

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	14.7	2.8	12.5	117.6
BEDROOM 2	3.350	14.7	2.8	12.5	117.6
BEDROOM 3	3.200	13.7	2.8	12.5	109.6
BEDROOM 4	3.200	14.1	2.8	12.5	112.8
CARER BEDROOM	2.650	9.0	2.1	7.1	126.8
TOTAL STORAGE AREA		20.7		11.0	215.5
TOTAL LIVING/KITCHEN/DINING AREA		57.6		40.0	144.0
GROSS INTERNAL AREA		226.2		-	-



H15B

(below A19+A20)

1
H15B

GROUND FLOOR COMMUNITY
5B-4P(+CARER)-1S
(BELOW UPPER FLOOR APT A19 +A20
APARTMENTS)

Dwelling H15B

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	14.5	2.8	12.5	116.0
BEDROOM 2	3.350	14.7	2.8	12.5	117.6
BEDROOM 3	3.200	13.7	2.8	12.5	109.6
BEDROOM 4	3.200	14.1	2.8	12.5	112.8
CARER BEDROOM	2.650	9.0	2.1	7.1	126.8
TOTAL STORAGE AREA		32.6		11.0	215.5
TOTAL LIVING/KITCHEN/DINING AREA		59.1		40.0	144.0
GROSS INTERNAL AREA		266.1		-	-

H15C

(below D6A)



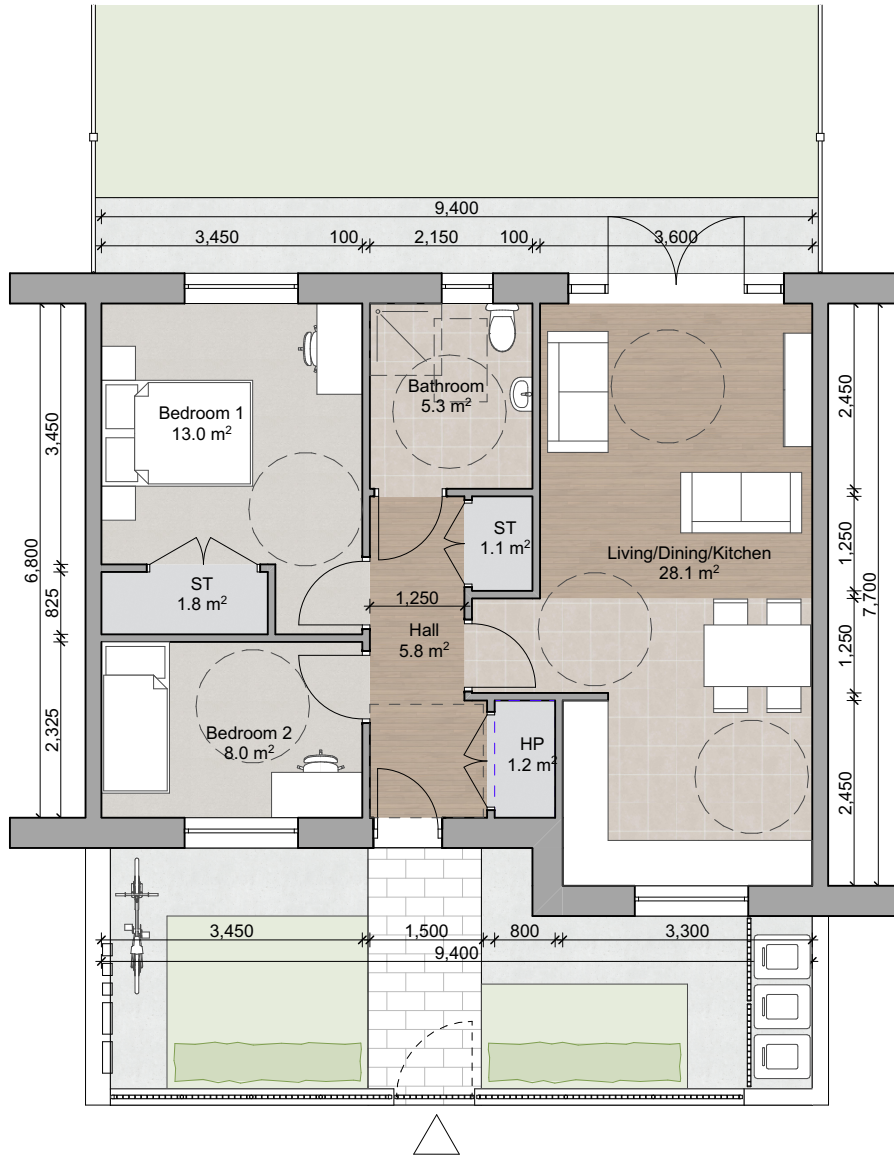
GROUND FLOOR COMMUNITY
5B-4P(+CARER)-1S

(BELOW UPPER FLOORS D6A 3B-5P-2S
DUPLEX APARTMENTS)

Dwelling H15C

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	14.7	2.8	12.5	117.6
BEDROOM 2	3.350	14.7	2.8	12.5	117.6
BEDROOM 3	3.200	14.1	2.8	12.5	112.8
BEDROOM 4	3.200	14.1	2.8	12.5	112.8
CARER BEDROOM	2.650	9.0	2.1	7.1	126.8
TOTAL STORAGE AREA		22.1		11.0	201.1
TOTAL LIVING/KITCHEN/DINING AREA		57.6		40.0	144.1
GROSS INTERNAL AREA		226.2		-	0.0

H16

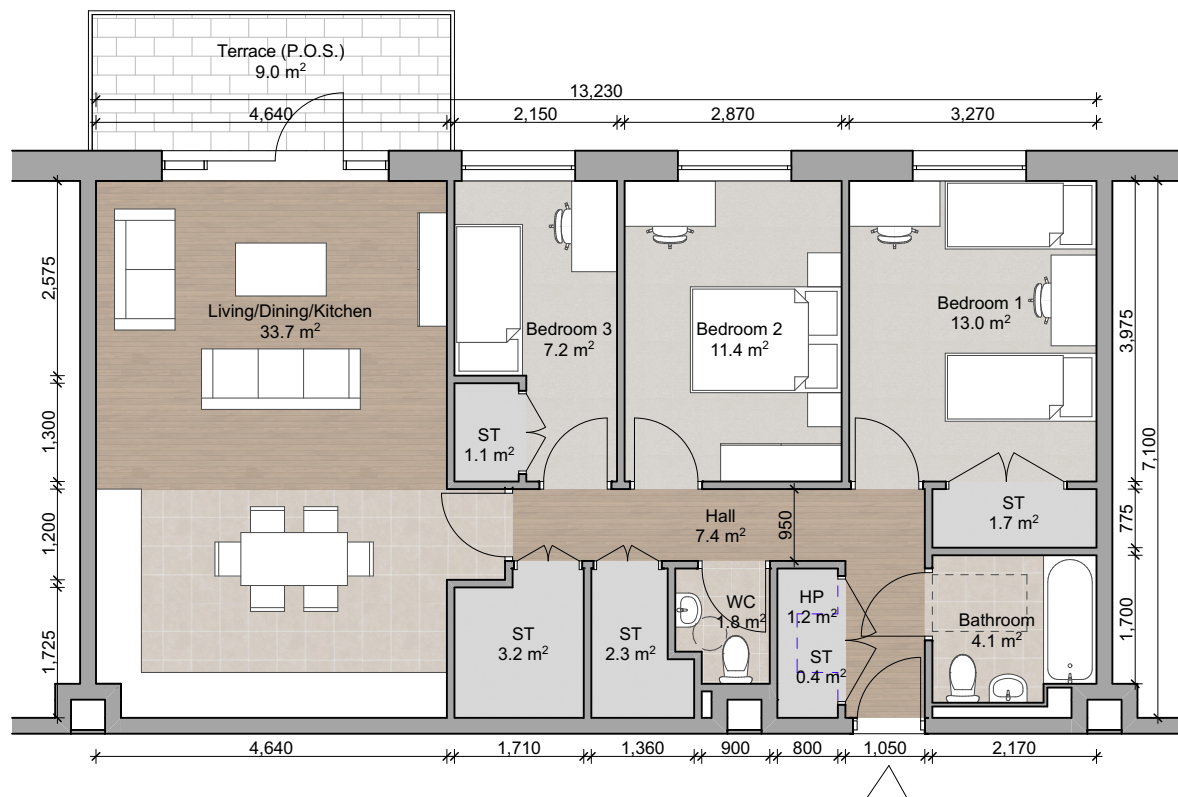


1
H16

GROUND FLOOR HOUSE 2B-3P-1S-UD

Dwelling H16

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.700	13.0	2.8	13.0	100.0
BEDROOM 2	2.300	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		2.9		3.0	96.7
TOTAL LIVING/KITCHEN/DINING AREA		28.1		28.0	100.4
GROSS INTERNAL AREA		66.9		60.0	111.5



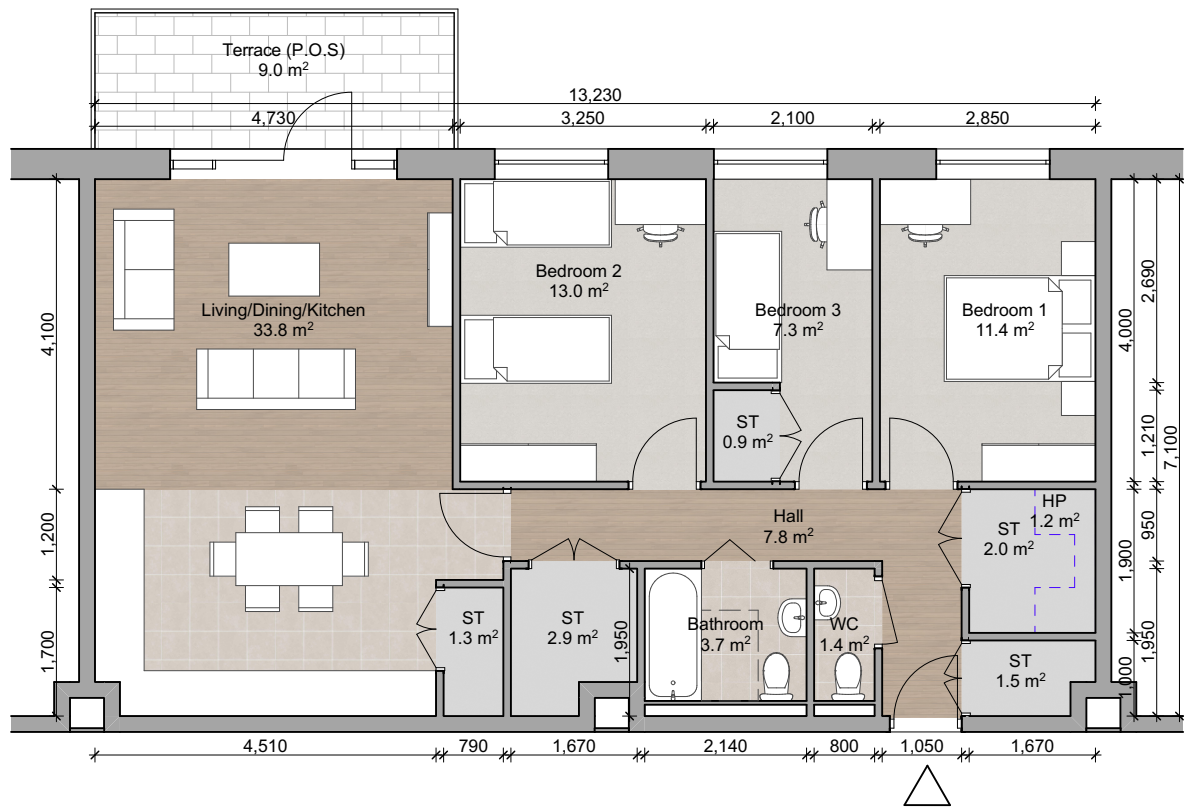
1
A1

APARTMENT 3B-5P-1S

Dwelling A1

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	13.0	2.8	13.0	100.0
BEDROOM 2	2.810	11.4	2.8	11.4	100.0
BEDROOM 3	2.150	7.2	2.1	7.1	101.4
TOTAL STORAGE AREA		8.7		9.0	96.7
TOTAL LIVING/KITCHEN/DINING AREA		33.7		34.0	99.1
GROSS INTERNAL AREA		93.2		90.0	103.6
PRIVATE OPEN SPACE (P.O.S)		9.0		9.0	100.0

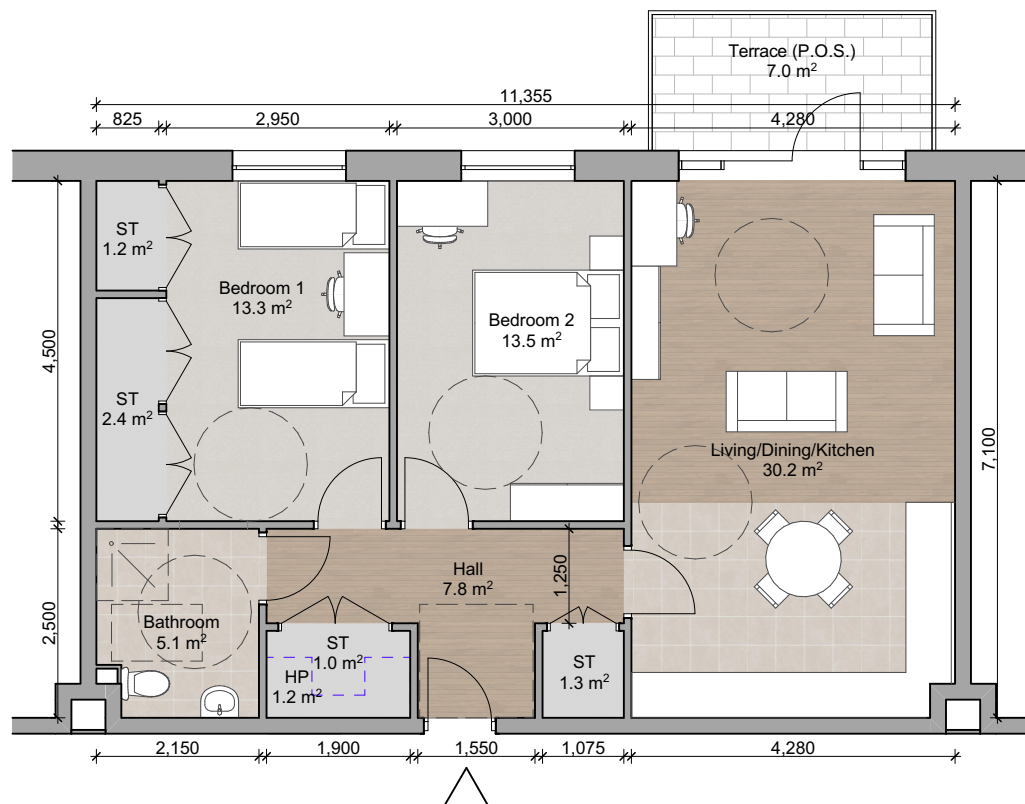
A1 ALT



APARTMENT 3B-5P-1S

Dwelling A1 ALT

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.850	11.4	2.8	11.4	100.0
BEDROOM 2	3.250	13.0	2.8	13.0	100.0
BEDROOM 3	2.100	7.3	2.1	7.1	102.8
TOTAL STORAGE AREA		8.6		9.0	95.5
TOTAL LIVING/KITCHEN/DINING AREA		33.8		34.0	99.4
GROSS INTERNAL AREA		93.2		90.0	103.6
PRIVATE OPEN SPACE (P.O.S)		9.0		9.0	100.0

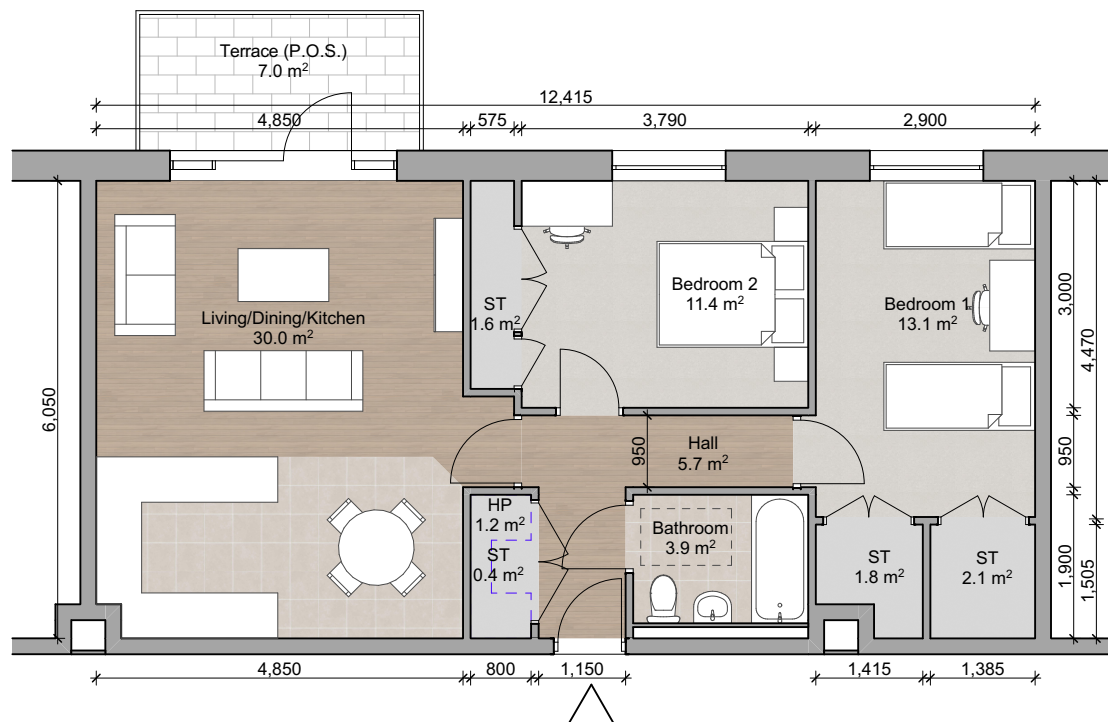


1
A2

APARTMENT 2B-4P-1S-UD

Dwelling A2

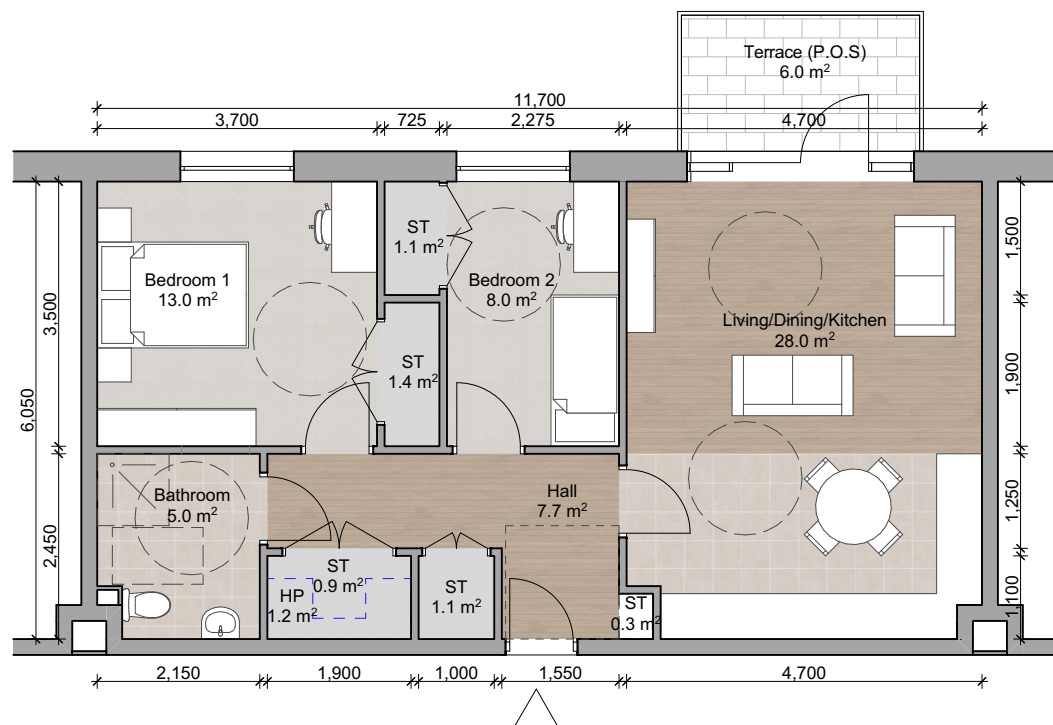
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.950	13.3	2.8	13.0	102.3
BEDROOM 2	3.000	13.5	2.8	11.4	118.4
TOTAL STORAGE AREA		5.9		6.0	98.4
TOTAL LIVING/KITCHEN/DINING AREA		30.2		30.0	100.7
GROSS INTERNAL AREA		80.3		73.0	110.0
PRIVATE OPEN SPACE (P.O.S)		7.0		7.0	100.0



APARTMENT 2B-4P-1S

Dwelling A3

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.1	2.8	13.0	100.8
BEDROOM 2	3.000	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		5.9		6.0	98.4
TOTAL LIVING/KITCHEN/DINING AREA		30.0		30.0	100.0
GROSS INTERNAL AREA		74.6		73.0	102.2
PRIVATE OPEN SPACE (P.O.S)		7.0		7.0	100.0



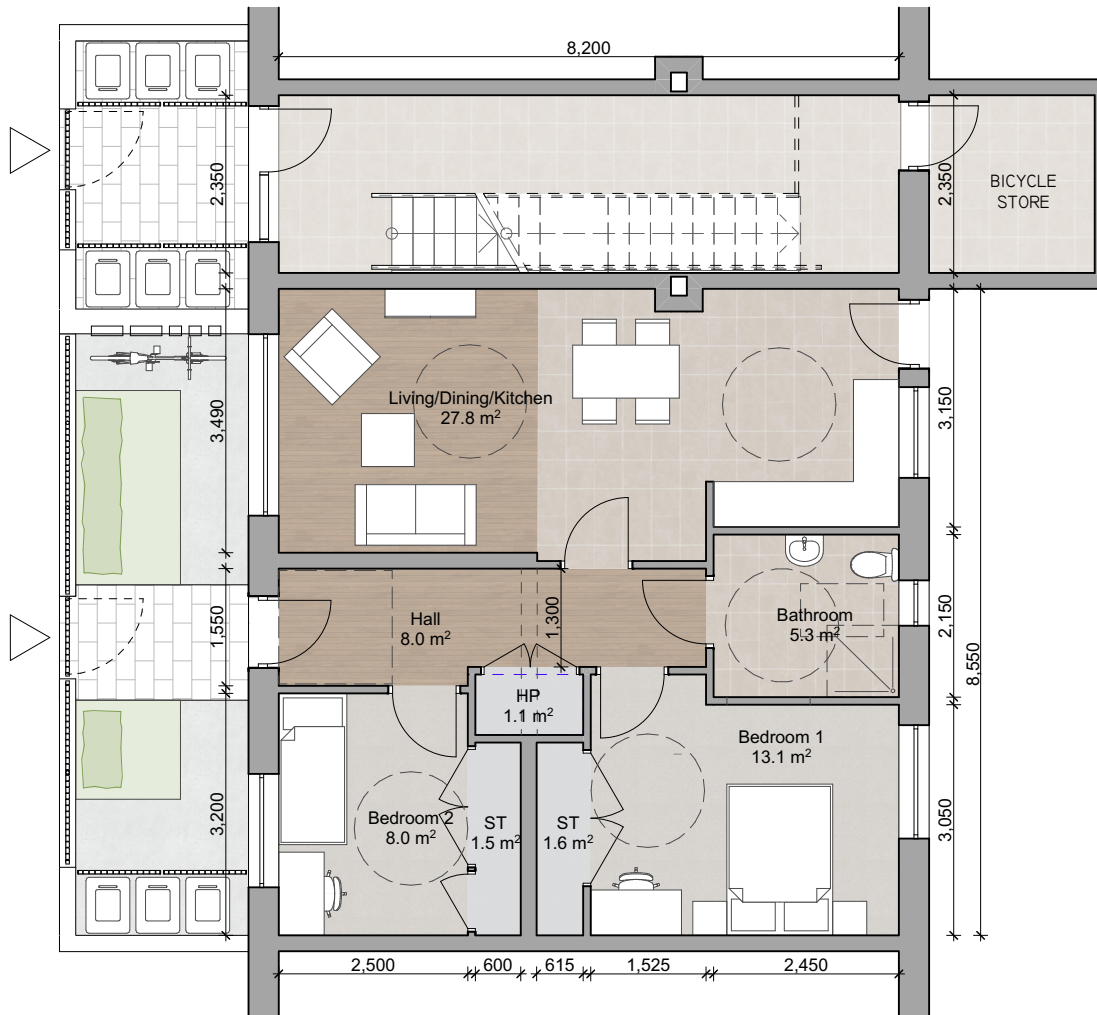
1
A5

APARTMENT 2B-3P-1S UD

Dwelling A5

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.500	13.0	2.8	13.0	100.0
BEDROOM 2	2.275	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		4.8		5.0	96.0
TOTAL LIVING/KITCHEN/DINING AREA		28.0		28.0	100.0
GROSS INTERNAL AREA		70.4		63.0	111.7
PRIVATE OPEN SPACE (P.O.S)		6.0		6.0	100.0

A6+A12

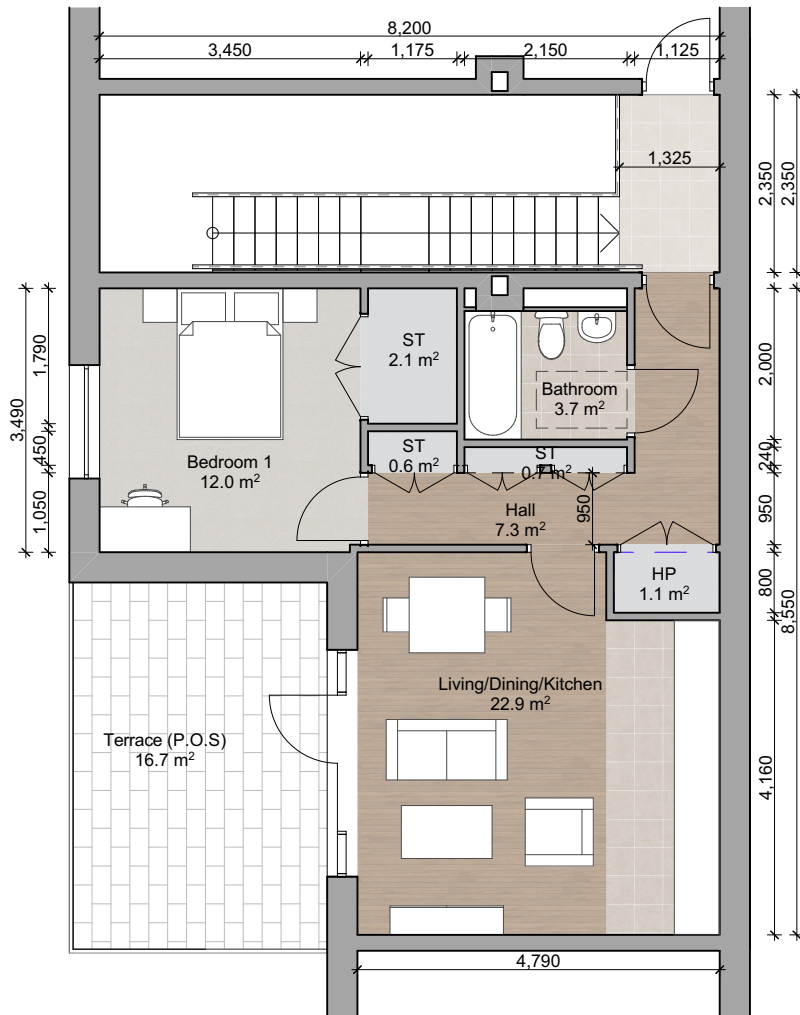


GROUND FLOOR APT A6
2B-3P-1S UD

Dwelling A6

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	13.1	2.8	13.0	100.8
BEDROOM 2	2.500	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		3.1		3.0	103.3
TOTAL LIVING/KITCHEN/DINING AREA		27.8		28.0	99.3
GROSS INTERNAL AREA		69.9		60.0	116.5

A6+A12



FIRST FLOOR APT A12
1B-2P-1S

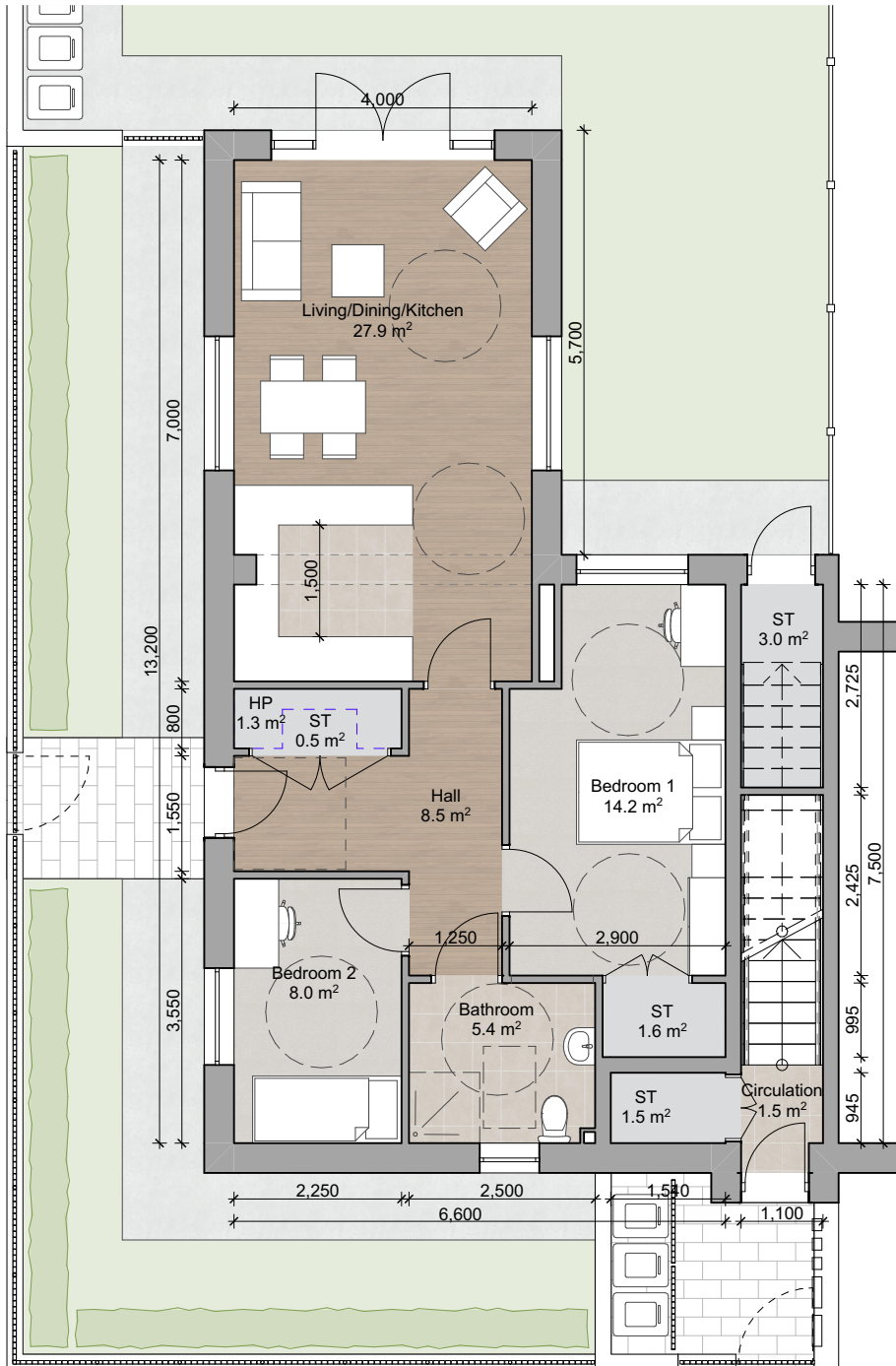
Dwelling A12

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.150	12.0	2.8	11.4	100.0
TOTAL STORAGE AREA		3.4		3.0	113.3
TOTAL LIVING/KITCHEN/DINING AREA		22.9		23.0	99.6
GROSS INTERNAL AREA		52.7		45.0	117.1
PRIVATE OPEN SPACE (P.O.S.)		16.7		5.0	334.0

A7+A13

01
A7+A13

GROUND FLOOR APT A7
2B-3P-1S UD



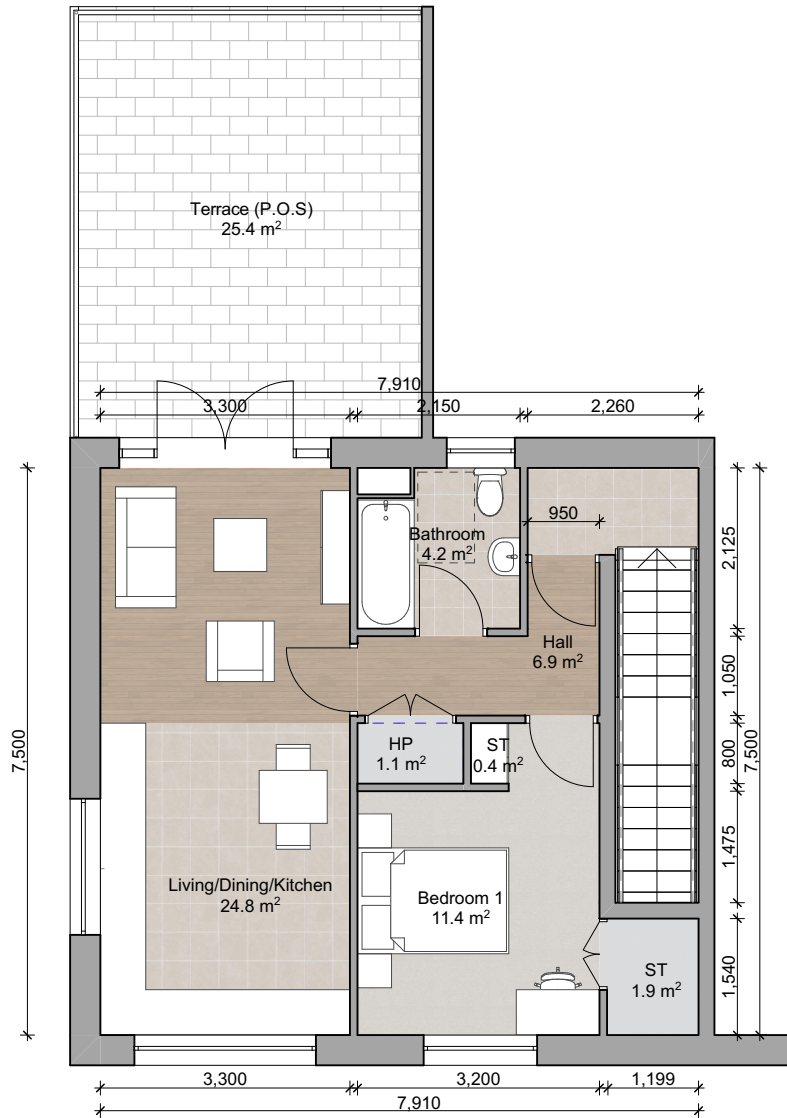
Dwelling A7

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	14.2	2.8	13.0	109.2
BEDROOM 2	2.250	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		5.1		3.0	170.0
TOTAL LIVING/KITCHEN/DINING AREA		27.9		28.0	99.6
GROSS INTERNAL AREA		70.3		63.0	111.1

A7+A13



FIRST FLOOR APT A13
1B-2P-1S



Dwelling A13

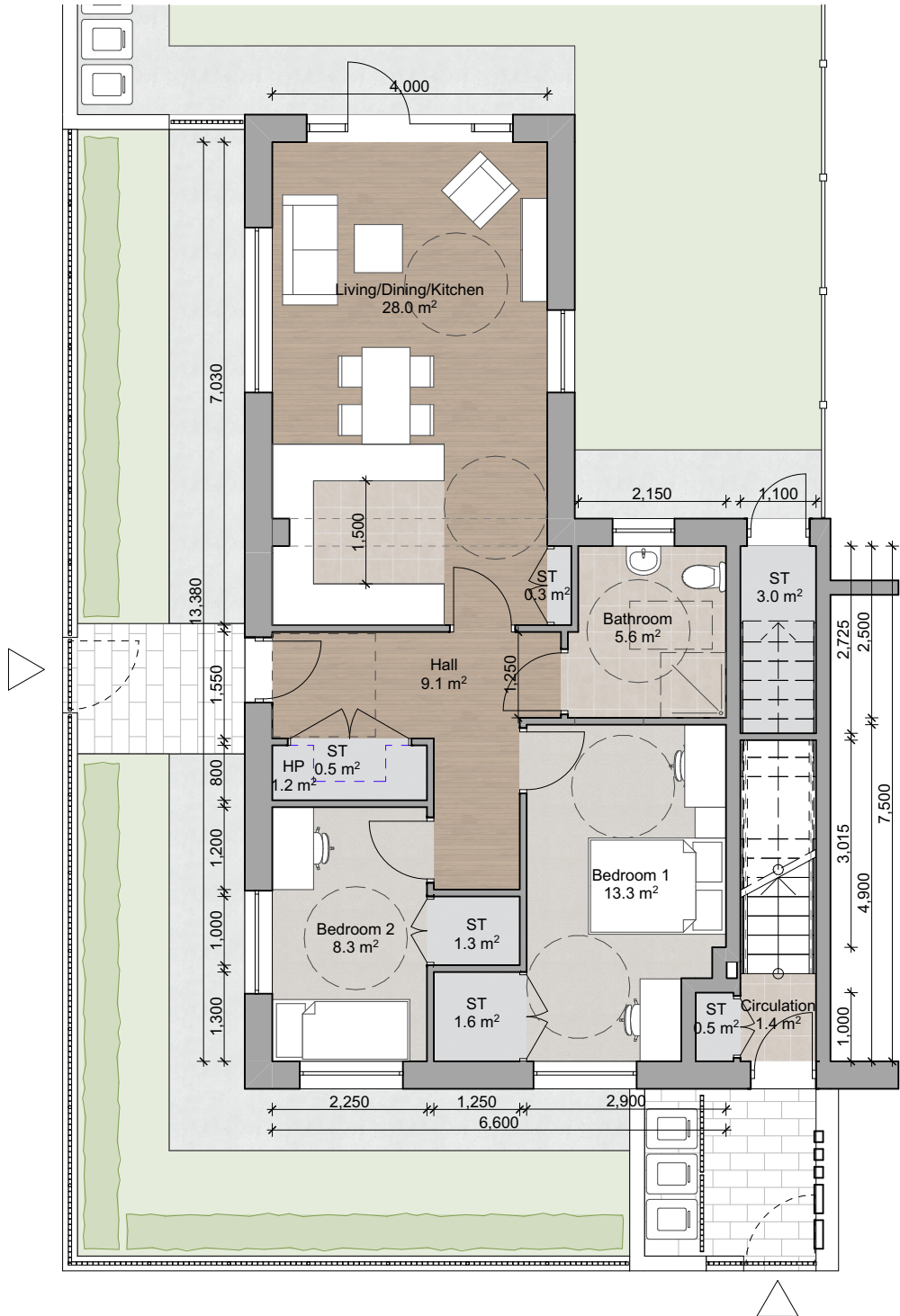
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.200	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		3.8		3.0	126.6
TOTAL LIVING/KITCHEN/DINING AREA		24.8		23.0	107.8
GROSS INTERNAL AREA	50.2*	61.3		45.0	111.6*
PRIVATE OPEN SPACE (P.O.S.)		25.4		5.0	508.0

* Excluding stairs

A8+D6

01
A8+D6

GROUND FLOOR APT A8
2B-3P-1S UD

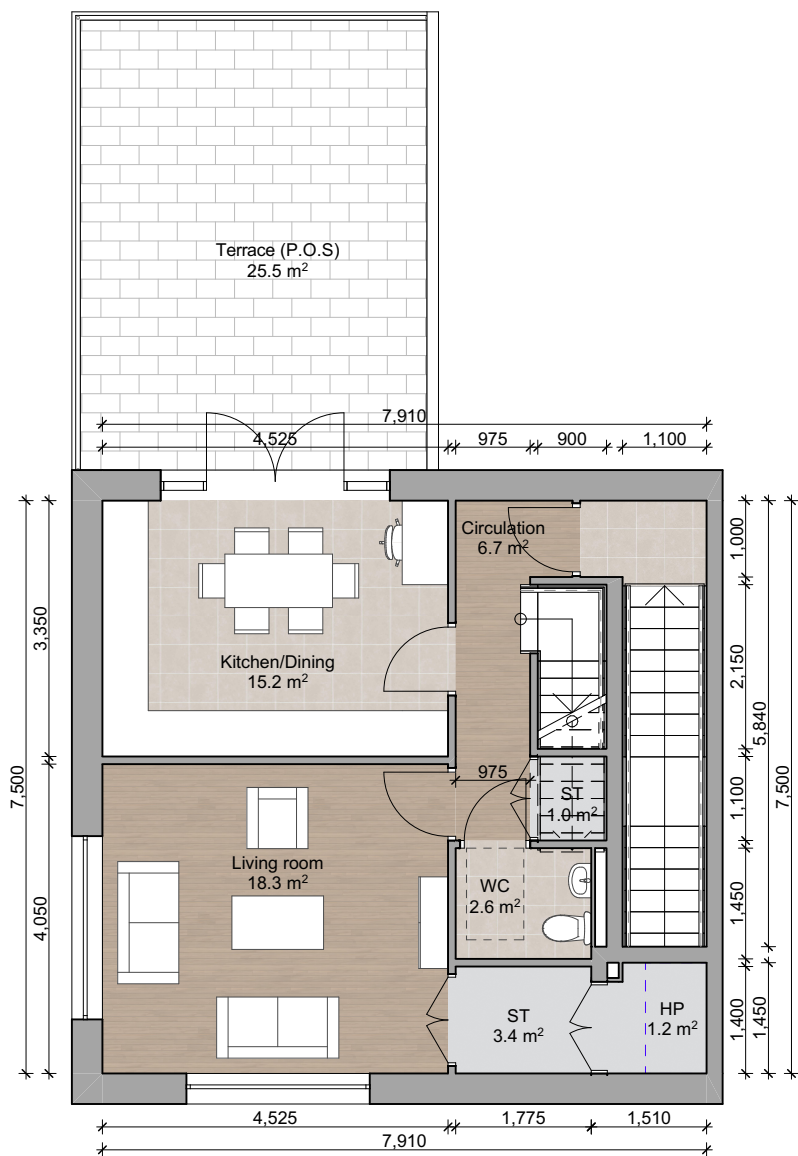


Dwelling A8

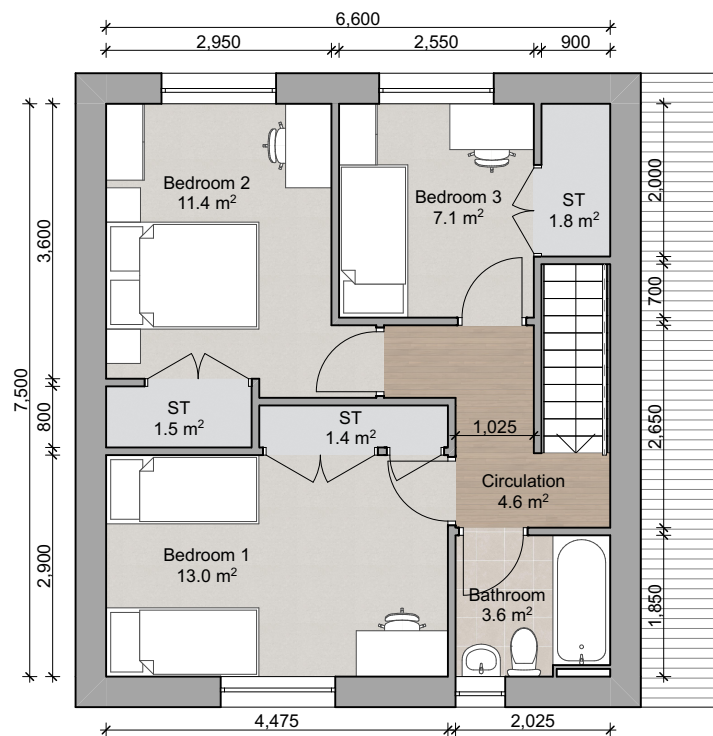
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.700	13.3	2.8	13.0	102.3
BEDROOM 2	2.300	8.3	2.1	7.1	116.9
TOTAL STORAGE AREA		6.7		3.0	223.0
TOTAL LIVING/KITCHEN/DINING AREA		28.0		28.0	100.0
GROSS INTERNAL AREA		72.1		63.0	114.4

FIRST FLOOR DUPLEX D6

3B-5P-2S



SECOND FLOOR DUPLEX D6 3B-5P-2S



Dwelling D6

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %	
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)		
BEDROOM 1	2.900	13.0	2.8	13.0	100.0	
BEDROOM 2	2.950	11.4	2.8	11.4	100.0	
BEDROOM 3	2.550	7.1	2.1	7.1	100.0	
TOTAL STORAGE AREA	9.6		9.0		106.8	
TOTAL LIVING/KITCHEN/DINING AREA	33.5		34.0		98.5	
GROSS INTERNAL AREA	100.3*	109.9	96.0		104.5*	114.5
PRIVATE OPEN SPACE (P.O.S.)	25.5		9.0		283.3	

* Excluding stairs

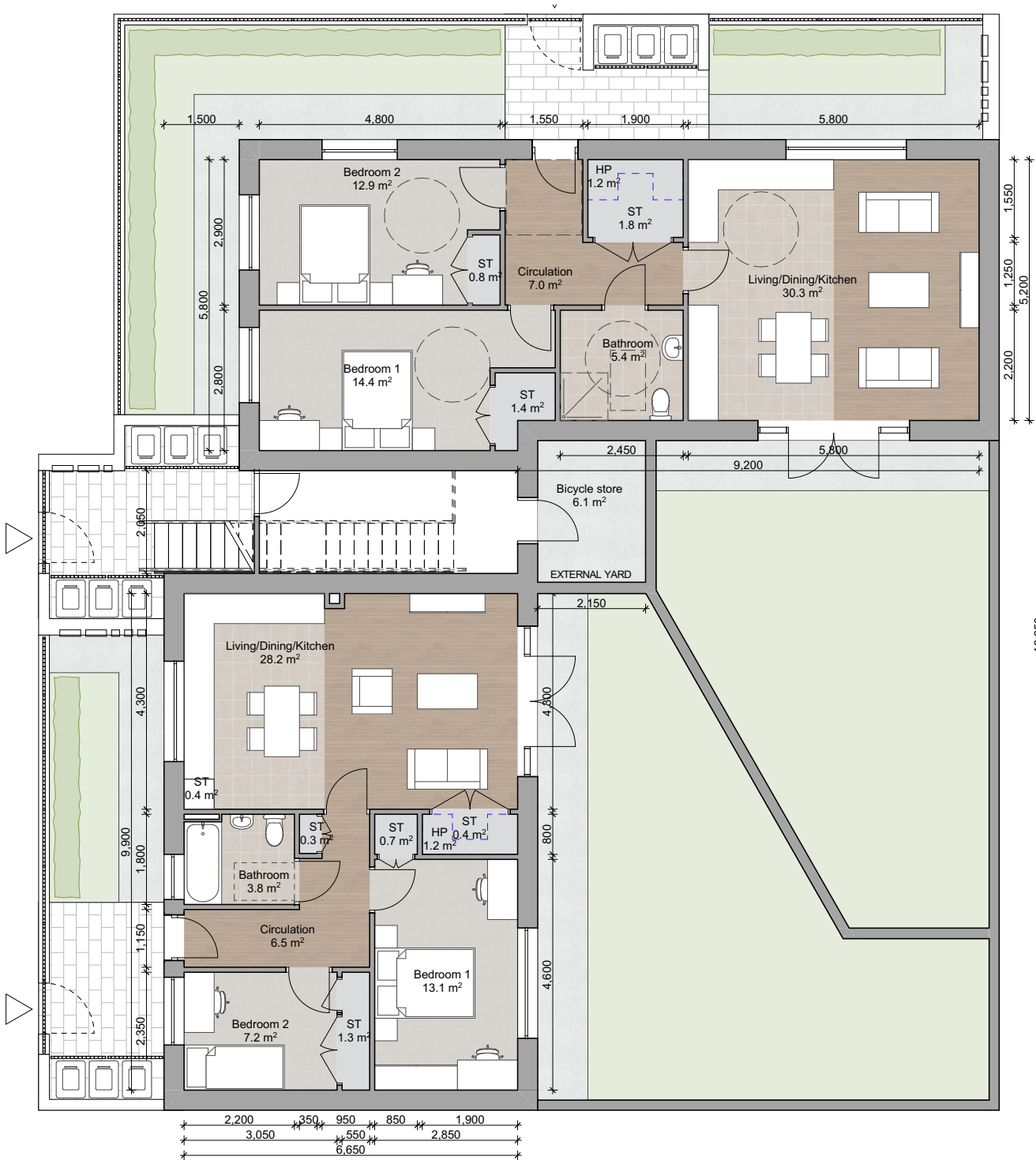
A9+A4

(Below A10+D5)

1
A9+A4

GROUND FLOOR APT A9/APT A4
2B-3P-1S + 2B-4P-1S UD

(Upper floors APT A10 1B-2P-1S + DUPLEX D5 3B-5P-2S)



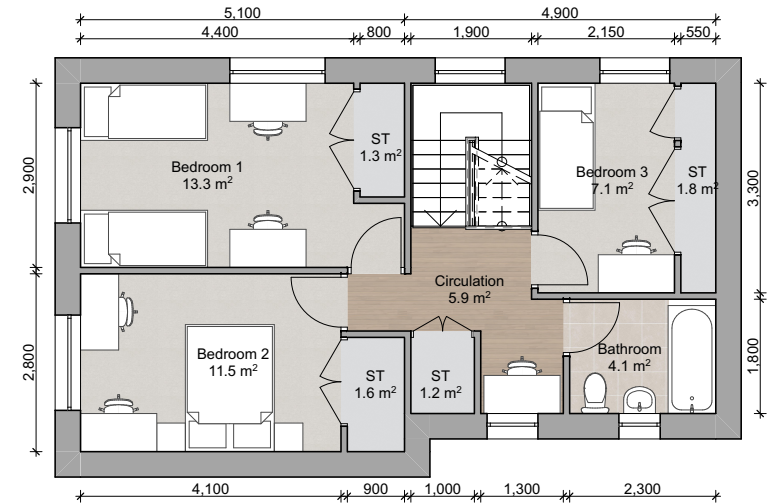
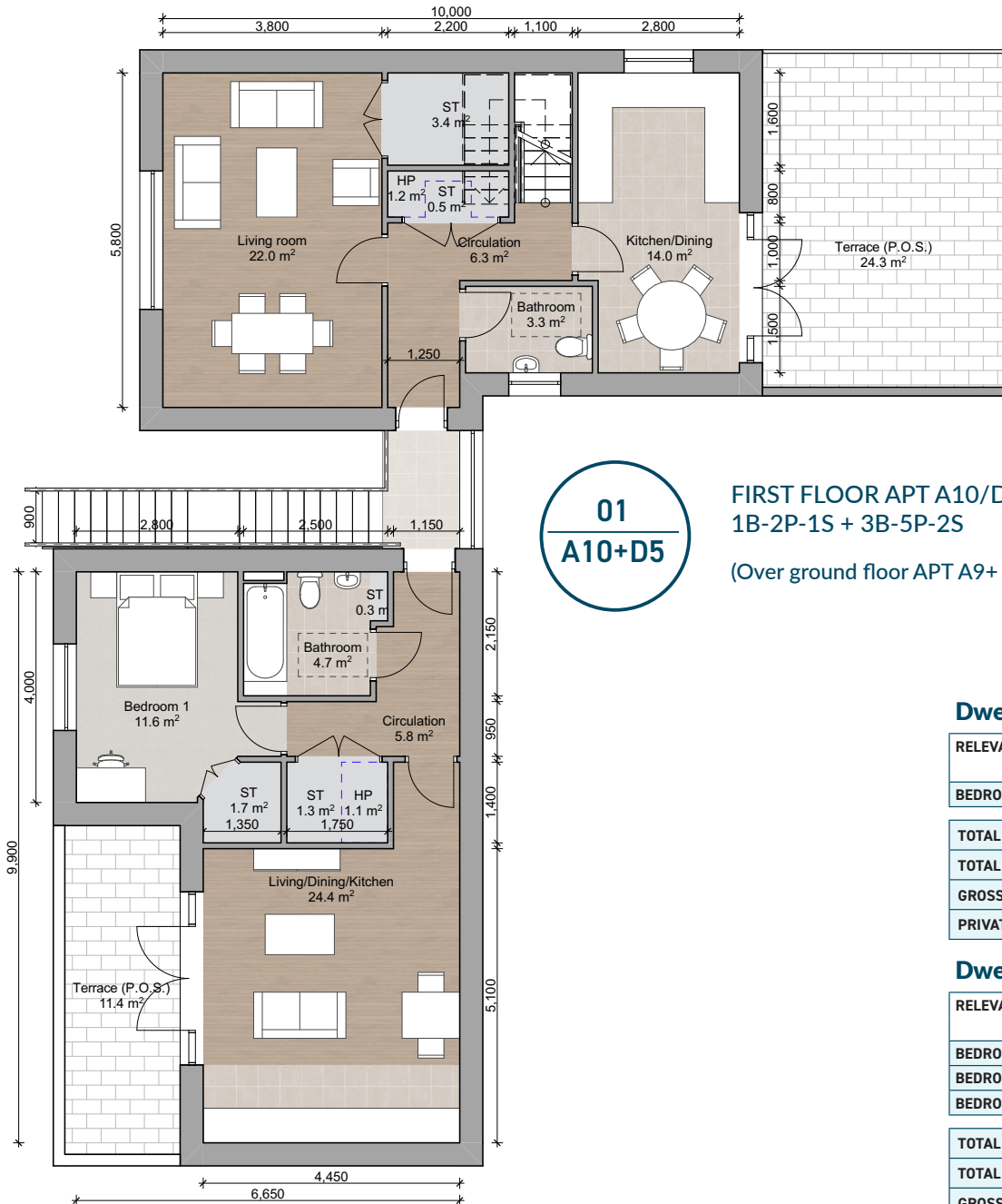
Dwelling A4

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.125	14.4	2.8	13.0	110.8
BEDROOM 2	2.800	12.9	2.8	11.4	113.2
TOTAL STORAGE AREA		4.0		4.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		30.3		30.0	101.0
GROSS INTERNAL AREA		77.7		73.0	106.4

Dwelling A9

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	13.1	2.8	13.0	100.8
BEDROOM 2	2.350	7.2	2.1	7.1	101.4
TOTAL STORAGE AREA		3.1		3.0	103.2
TOTAL LIVING/KITCHEN/DINING AREA		28.2		28.0	100.7
GROSS INTERNAL AREA		65.3		63.0	103.6

A10+D5 (over A9+A4)



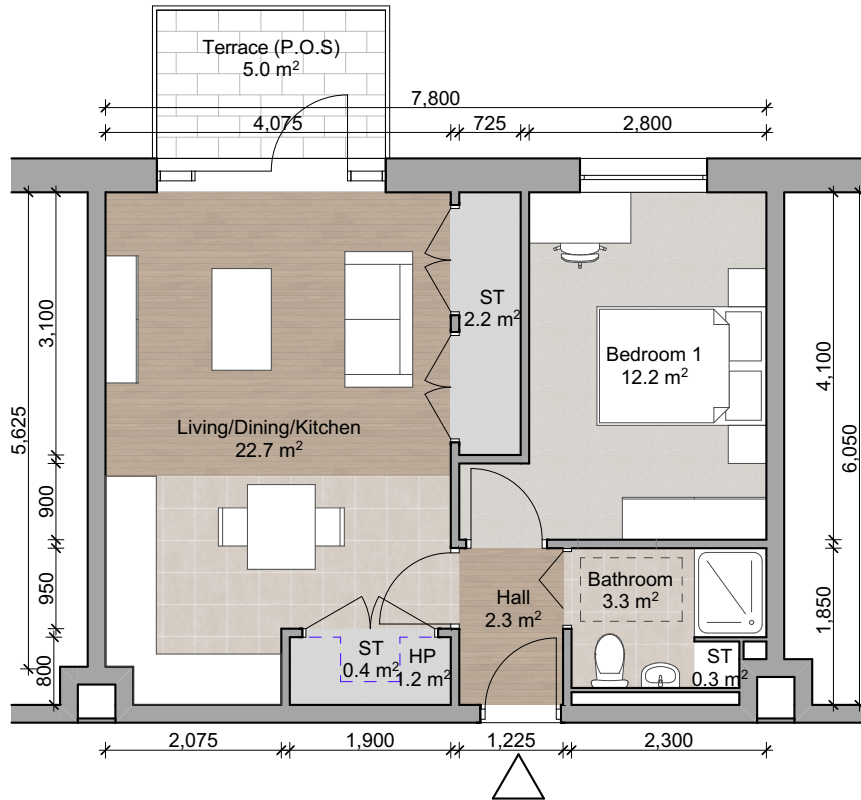
Dwelling A10

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	11.6	2.8	11.4	101.7
TOTAL STORAGE AREA		3.3		3.0	110.0
TOTAL LIVING/KITCHEN/DINING AREA		24.4		23.0	106.1
GROSS INTERNAL AREA		52.9		45.0	117.6
PRIVATE OPEN SPACE (P.O.S.)		11.4		5.0	228.0

Dwelling D5

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.3	2.8	13.0	103.8
BEDROOM 2	2.800	11.5	2.8	11.4	100.9
BEDROOM 3	2.150	7.1	2.1	7.1	100.0
TOTAL STORAGE AREA		9.8		9.0	108.9
TOTAL LIVING/KITCHEN/DINING AREA		36.0		34.0	105.9
GROSS INTERNAL AREA		110.2		96.0	114.8
PRIVATE OPEN SPACE (P.O.S.)		24.3		9.0	270.0

A11

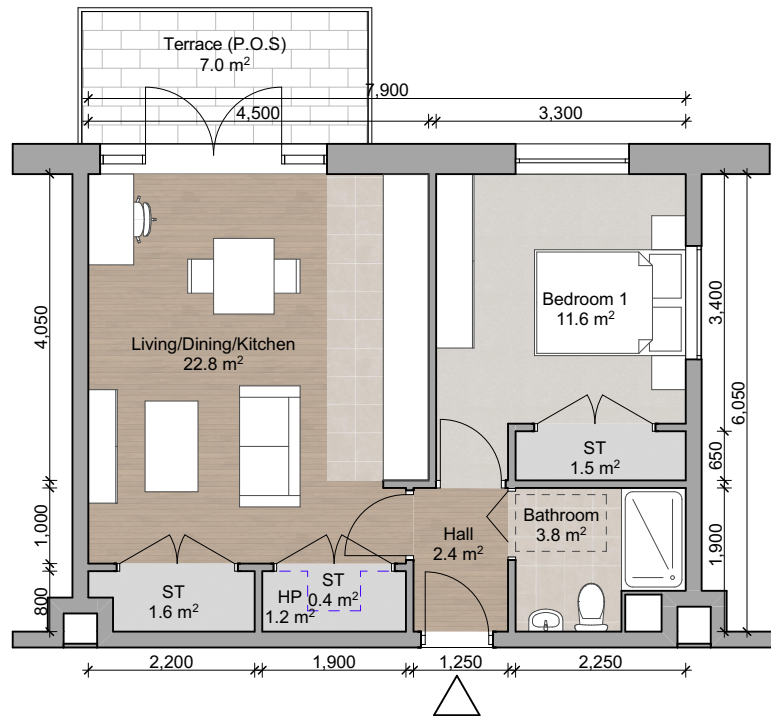


APARTMENT 1B-2P-1S

Dwelling A11

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	12.2	2.8	11.4	107.0
TOTAL STORAGE AREA		2.9		3.0	96.6
TOTAL LIVING/KITCHEN/DINING AREA		22.7		23.0	98.7
GROSS INTERNAL AREA		46.8		45.0	104.0
PRIVATE OPEN SPACE (P.O.S.)		5.0		5.0	100.0

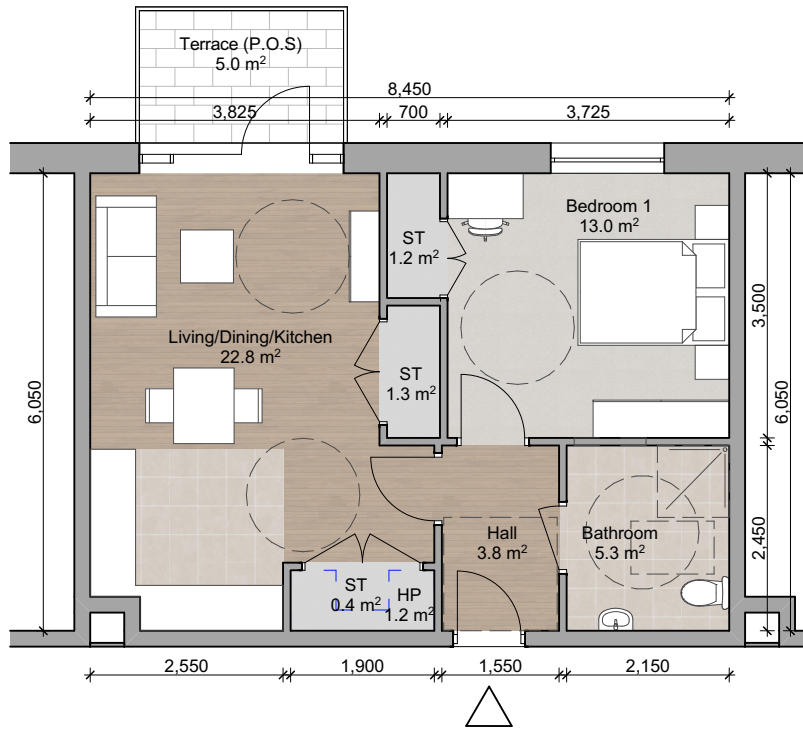
A11 ALT



APARTMENT 1B-2P-1S

Dwelling A11 ALT

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.300	11.6	2.8	11.4	101.8
TOTAL STORAGE AREA		3.5		3.0	116.6
TOTAL LIVING/KITCHEN/DINING AREA		22.8		23.0	99.1
GROSS INTERNAL AREA		47.5		45.0	105.6
PRIVATE OPEN SPACE (P.O.S.)		7.0		5.0	140.0

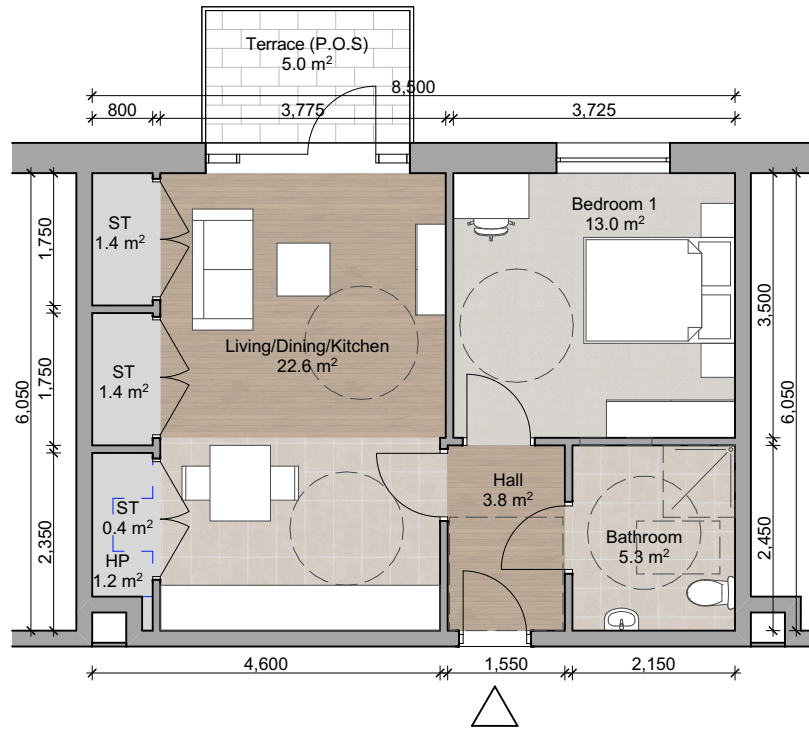


APARTMENT 1B-2P-1S-UD

Dwelling A14

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.5	13.0	2.8	11.4	114.0
TOTAL STORAGE AREA		2.9		3.0	96.6
TOTAL LIVING/KITCHEN/DINING AREA		22.8		23.0	99.1
GROSS INTERNAL AREA		50.8		45.0	112.9
PRIVATE OPEN SPACE (P.O.S.)		5.0		5.0	100.0

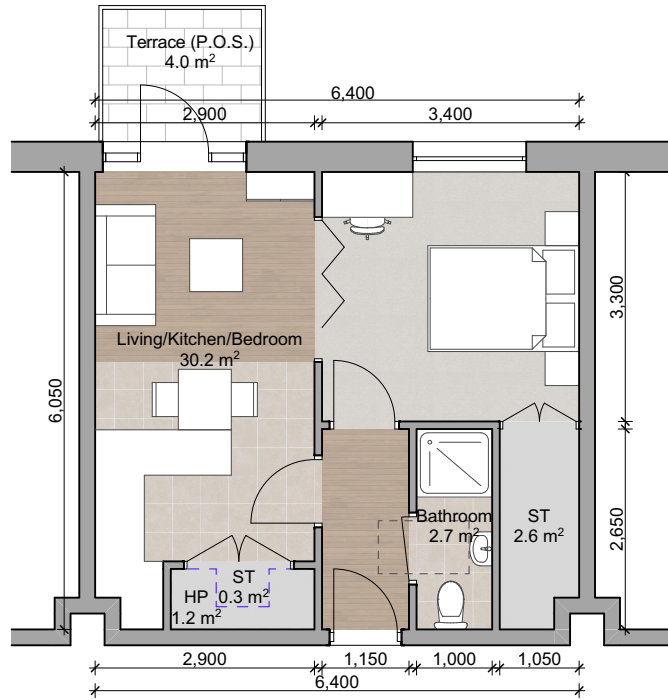
A14 ALT



APARTMENT 1B-2P-1S-UD

Dwelling A14 ALT

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.500	13.0	2.8	11.4	114.0
TOTAL STORAGE AREA		3.2		3.0	106.7
TOTAL LIVING/KITCHEN/DINING AREA		22.6		23.0	98.3
GROSS INTERNAL AREA		51.1		45.0	113.6
PRIVATE OPEN SPACE (P.O.S.)		5.0		5.0	100.0



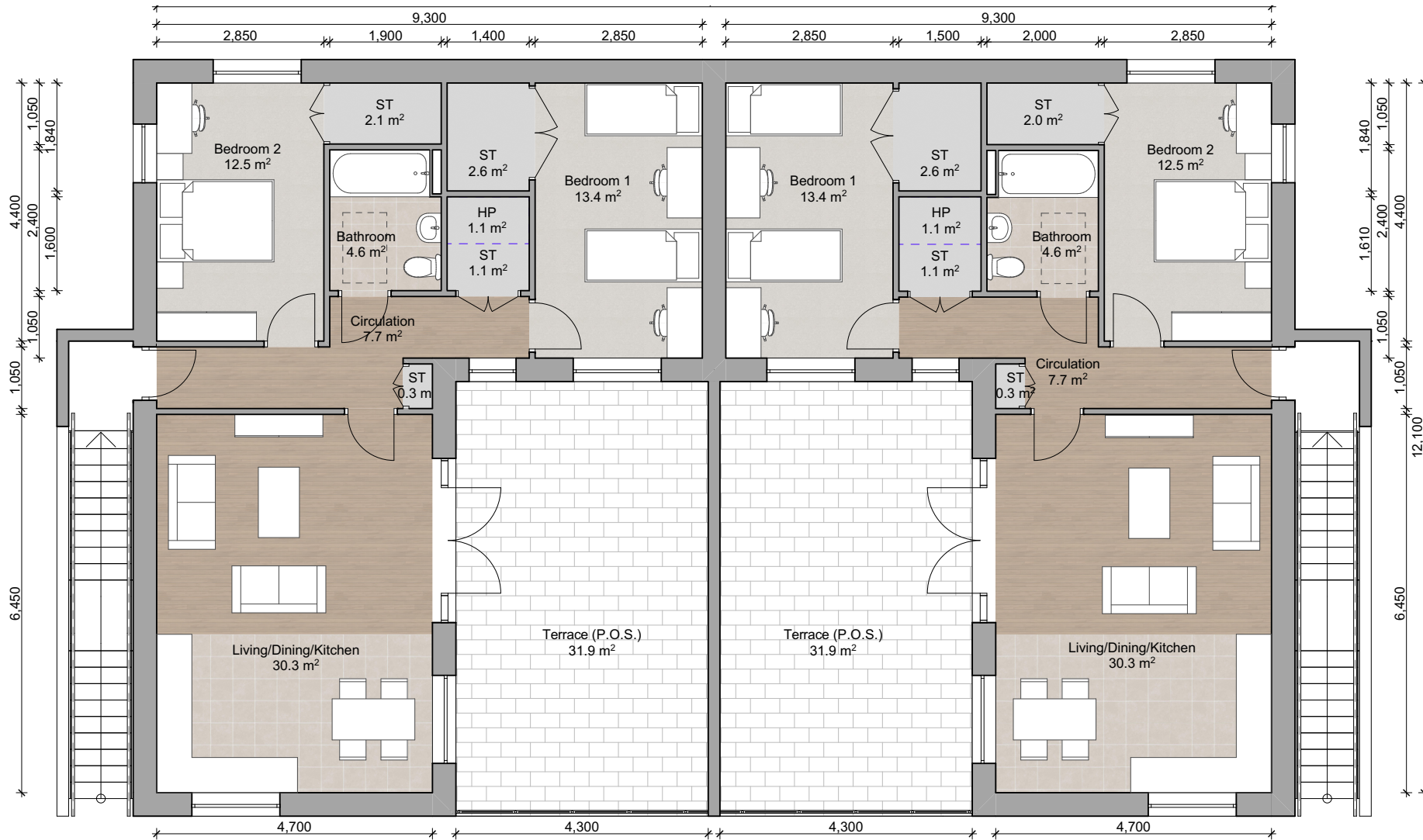
STUDIO 1B-2P-1S

Dwelling A17

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
TOTAL STORAGE AREA		2.9		3.0	96.7
TOTAL LIVING/KITCHEN/DINING AREA		30.2		30.0	100.7
GROSS INTERNAL AREA		38.4		37.0	103.8
PRIVATE OPEN SPACE (P.O.S.)		4.0		4.0	100.0

A18

(over H15A)



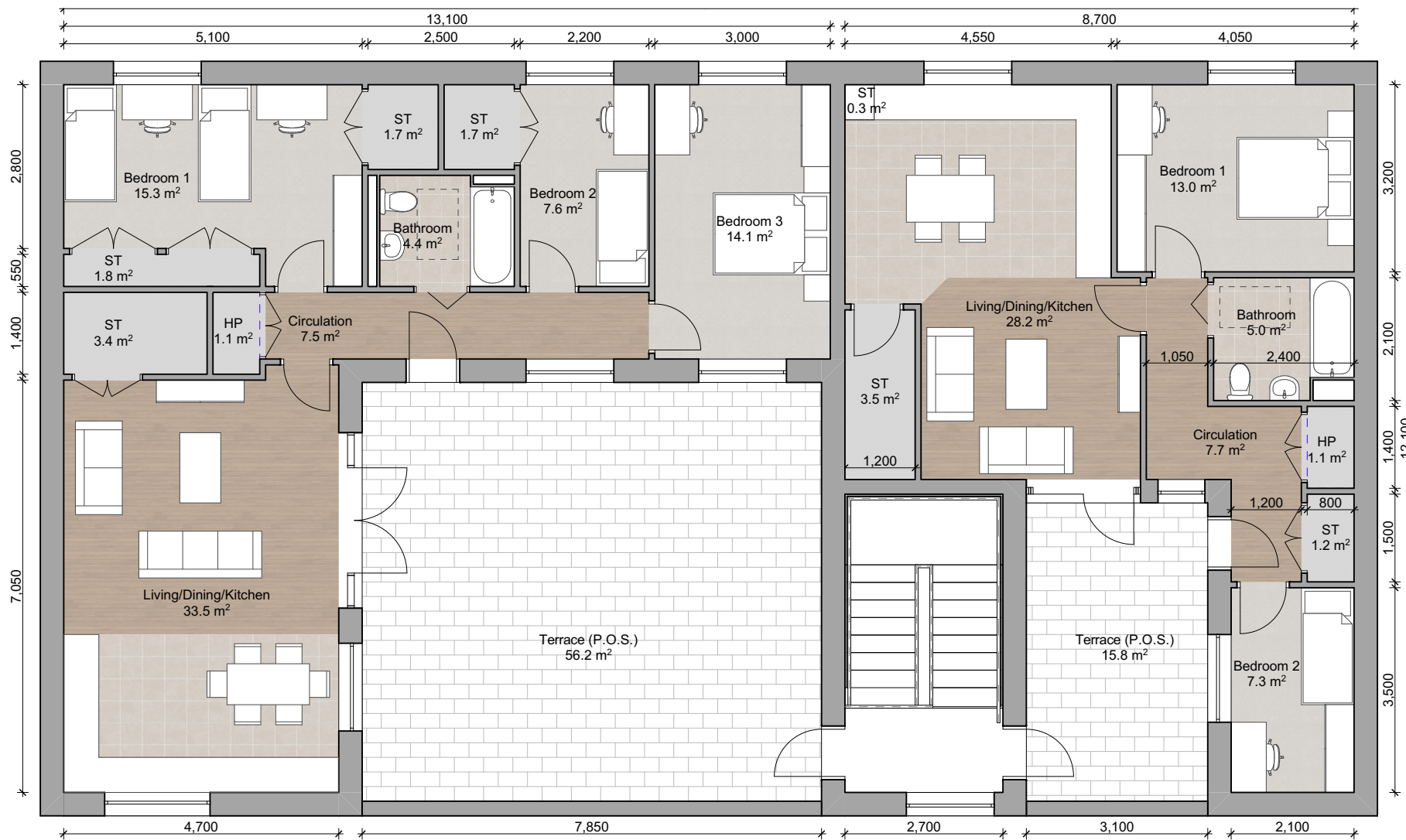
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A18

FIRST FLOOR 2B-4P-1S APARTMENT

(Over ground floor H15A COMMUNITY DWELLING)

Dwelling A18

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.925	13.4	2.8	13.0	126.9
BEDROOM 2	2.925	12.5	2.8	11.4	109.6
TOTAL STORAGE AREA		6.0		6.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		30.0		30.0	101.0
GROSS INTERNAL AREA		78.4		73.0	107.4
PRIVATE OPEN SPACE (P.O.S)		31.9		7.0	455.7



A19 A20

(over H15B)

1
A19+A20

FIRST FLOOR
3B-5P-1S APT +
2B-3P-1S APT

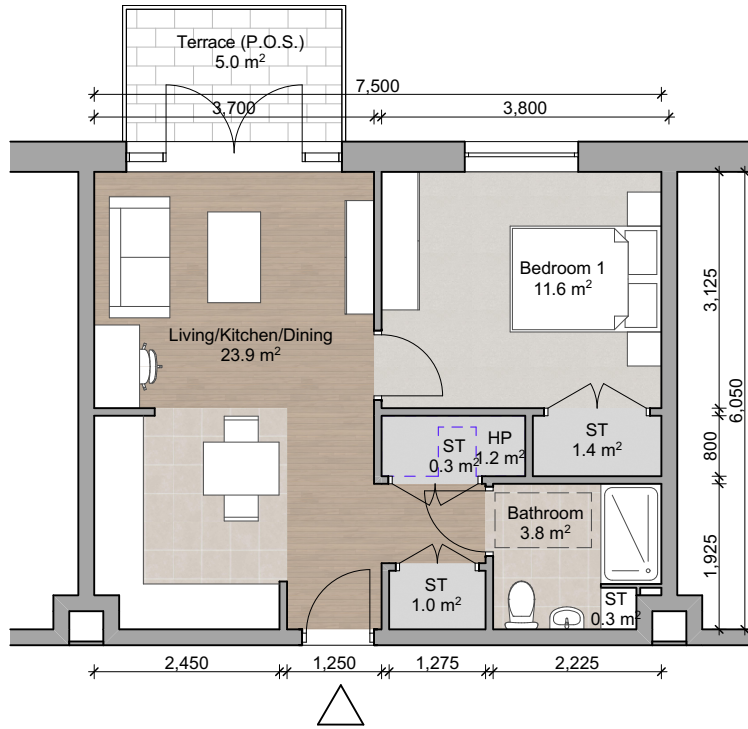
(OVER H15B
COMMUNITY
DWELLING)

Dwelling A19

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.7	15.3	2.8	13.0	117.7
BEDROOM 2	2.65	7.6	2.1	7.1	140.8
BEDROOM 3	3.700	14.1	2.8	11.4	123.7
TOTAL STORAGE AREA		8.6		9.0	95.6
TOTAL LIVING/KITCHEN/DINING AREA		33.5		34.0	98.5
PRIVATE OPEN SPACE (P.O.S.)		56.2		9.0	624.4
GROSS INTERNAL AREA		96.3		90.0	107.0

Dwelling A20

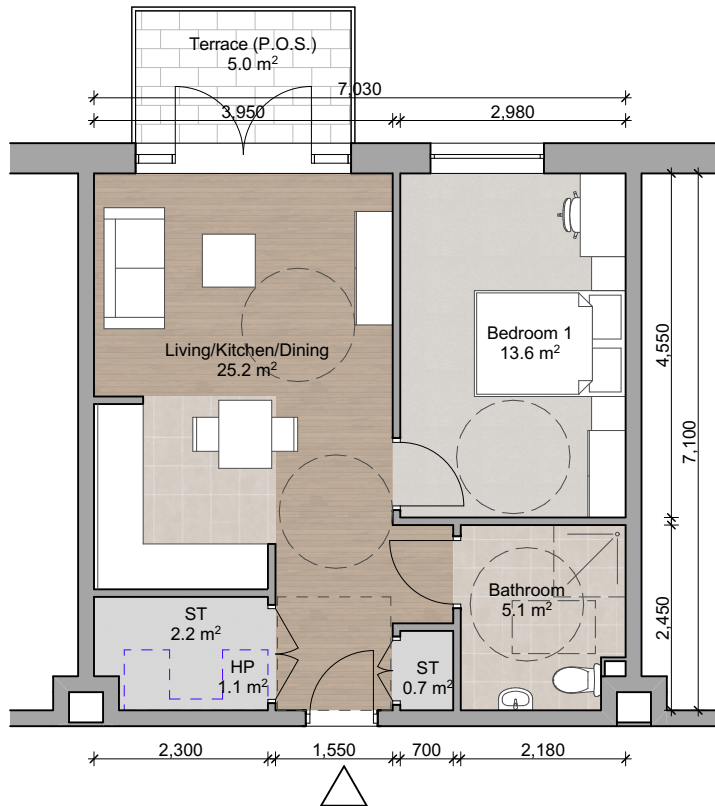
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.2	13.0	2.8	11.4	143.8
BEDROOM 2	2.1	7.3	2.1	7.1	143.8
TOTAL STORAGE AREA		5.0		5.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		28.2		28.0	100.7
GROSS INTERNAL AREA		70.0		63.0	111.1
PRIVATE OPEN SPACE (P.O.S.)		15.8		6.0	263.3



APARTMENT 1B-2P-1S

Dwelling A21

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.225	11.6	2.8	11.4	101.8
TOTAL STORAGE AREA		3.0		3.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		23.9		23.0	103.9
GROSS INTERNAL AREA		45.0		45.0	100.0
PRIVATE OPEN SPACE (P.O.S)		5.0		5.0	100.0

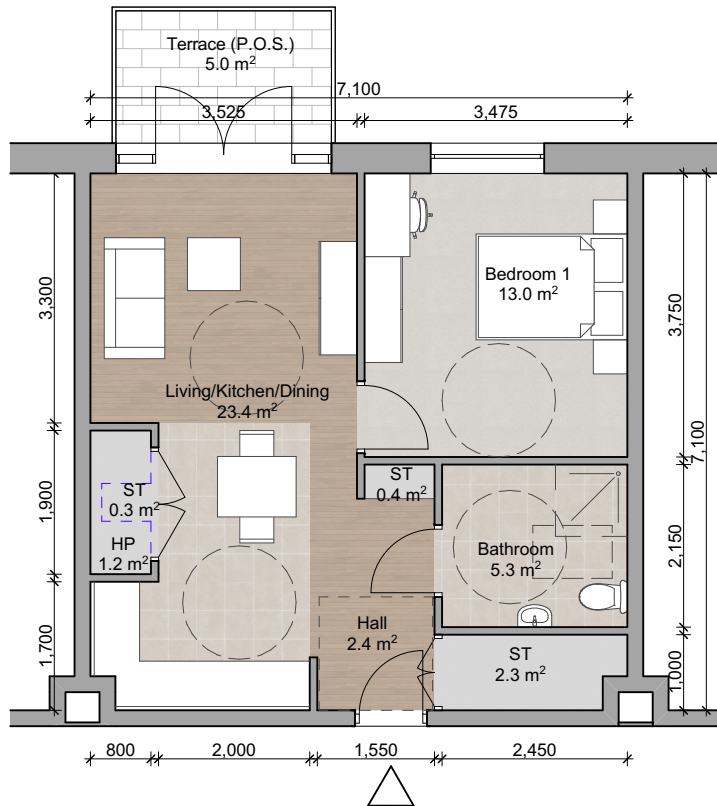


APARTMENT 1B-2P-1S UD

Dwelling A22

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.950	13.6	2.8	11.4	119.3
TOTAL STORAGE AREA		2.9		3.0	96.6
TOTAL LIVING/KITCHEN/DINING AREA		25.2		23.0	109.6
GROSS INTERNAL AREA		49.6		45.0	110.2
PRIVATE OPEN SPACE (P.O.S.)		5.0		5.0	100.0

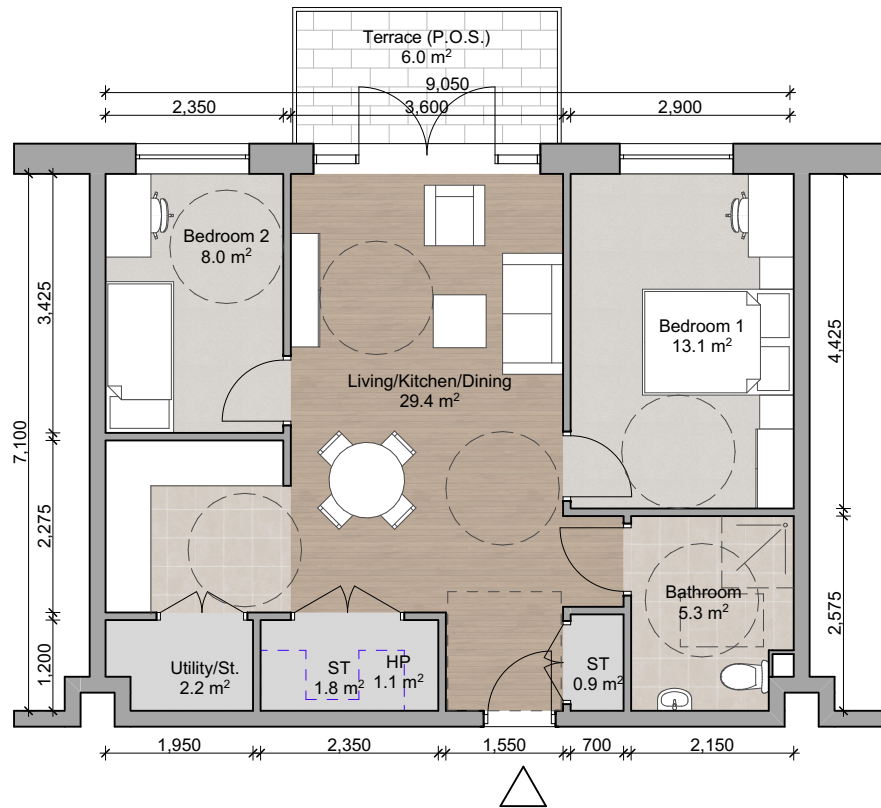
A22 ALT



APARTMENT 1B-2P-1S UD

Dwelling A22 ALT

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.475	13.0	2.8	11.4	114.0
TOTAL STORAGE AREA		3.0		3.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		23.4		23.0	101.7
GROSS INTERNAL AREA		5.0		5.0	100.0
PRIVATE OPEN SPACE (P.O.S.)		49.8		45.0	110.7



APARTMENT 2B-3P-1S UD

Dwelling A23

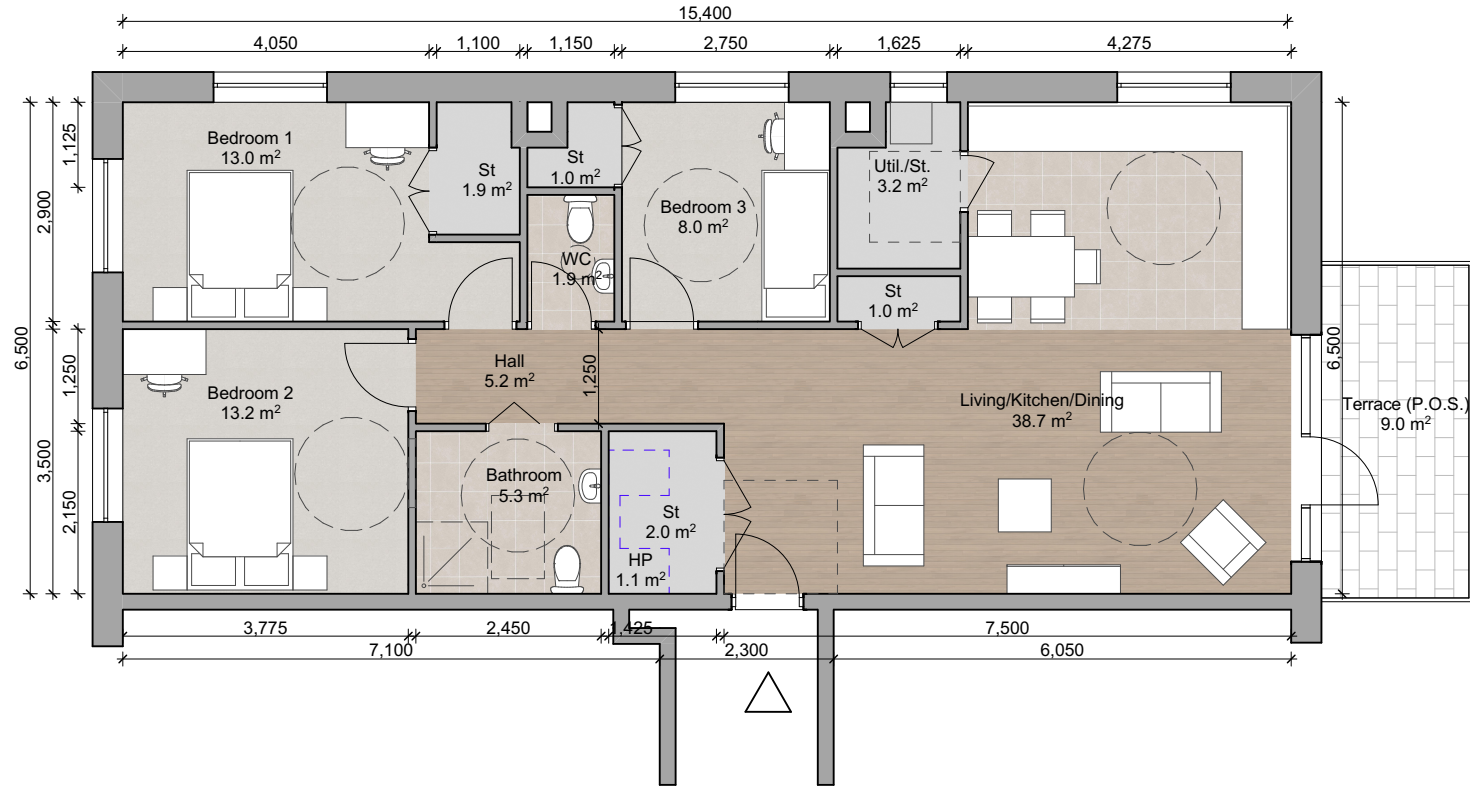
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.1	2.8	13.0	100.8
BEDROOM 2	2.350	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		4.9		5.0	98.0
TOTAL LIVING/KITCHEN/DINING AREA		29.4		28.0	105.0
GROSS INTERNAL AREA		64.3		63.0	102.1
PRIVATE OPEN SPACE (P.O.S)		6.0		6.0	100.0



APARTMENT 2B-4P-1S UD

Dwelling A24

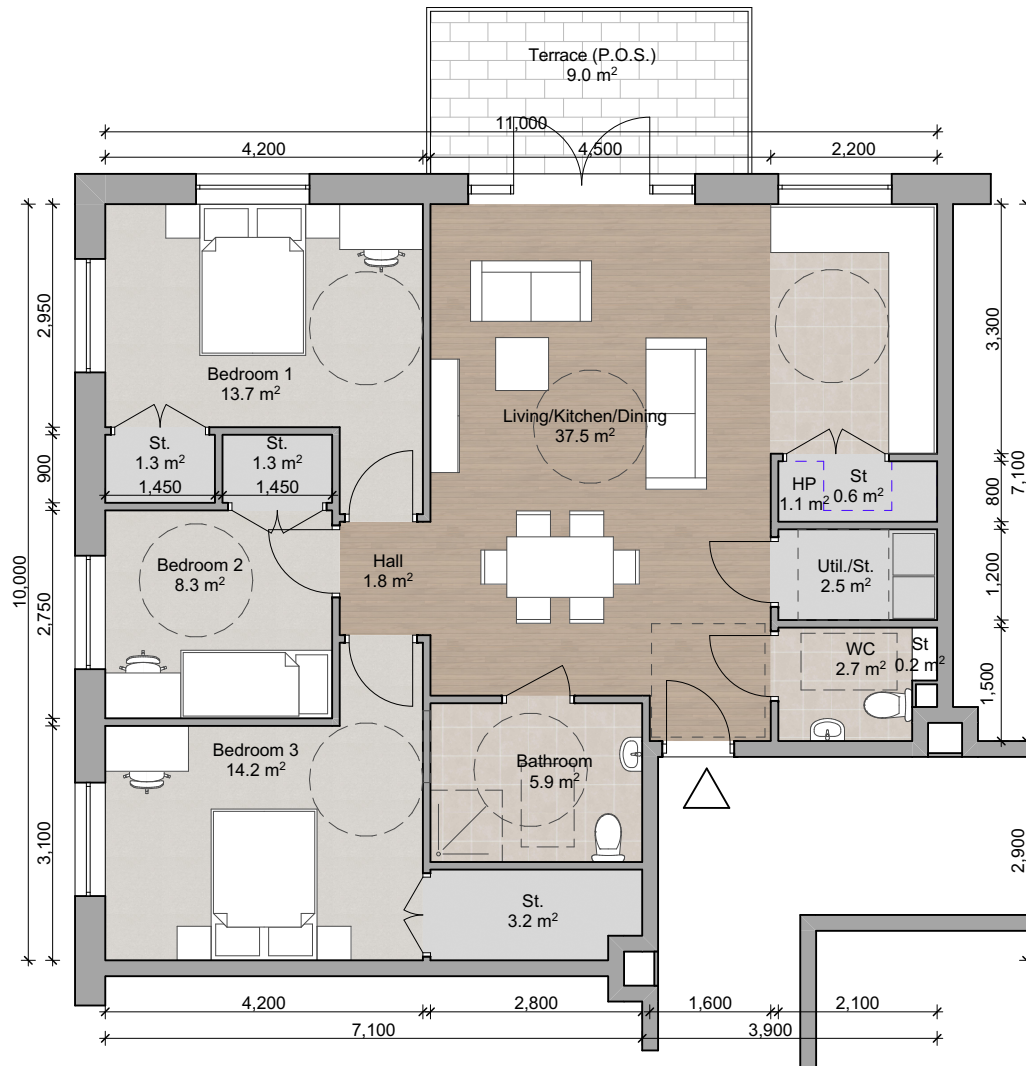
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2,900	13.2	2.8	13.0	101.5
BEDROOM 2	3,200	13.1	2.8	11.4	114.9
TOTAL STORAGE AREA		6.1		6.0	101.7
TOTAL LIVING/KITCHEN/DINING AREA		32.9		30.0	109.7
GROSS INTERNAL AREA		74.3		73.0	101.8
PRIVATE OPEN SPACE (P.O.S.)		7.0		7.0	100.0



APARTMENT 3B-5P-1S UD

Dwelling A25

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	13.0	2.8	13.0	100.0
BEDROOM 2	3.500	13.2	2.8	11.4	115.8
BEDROOM 3	2.700	8.0	2.1	7.1	112.7
TOTAL STORAGE AREA		9.1		9.0	101.1
TOTAL LIVING/KITCHEN/DINING AREA		38.7		34.0	113.8
GROSS INTERNAL AREA		99.7		90.0	110.8
PRIVATE OPEN SPACE (P.O.S.)		9.0		9.0	100.0



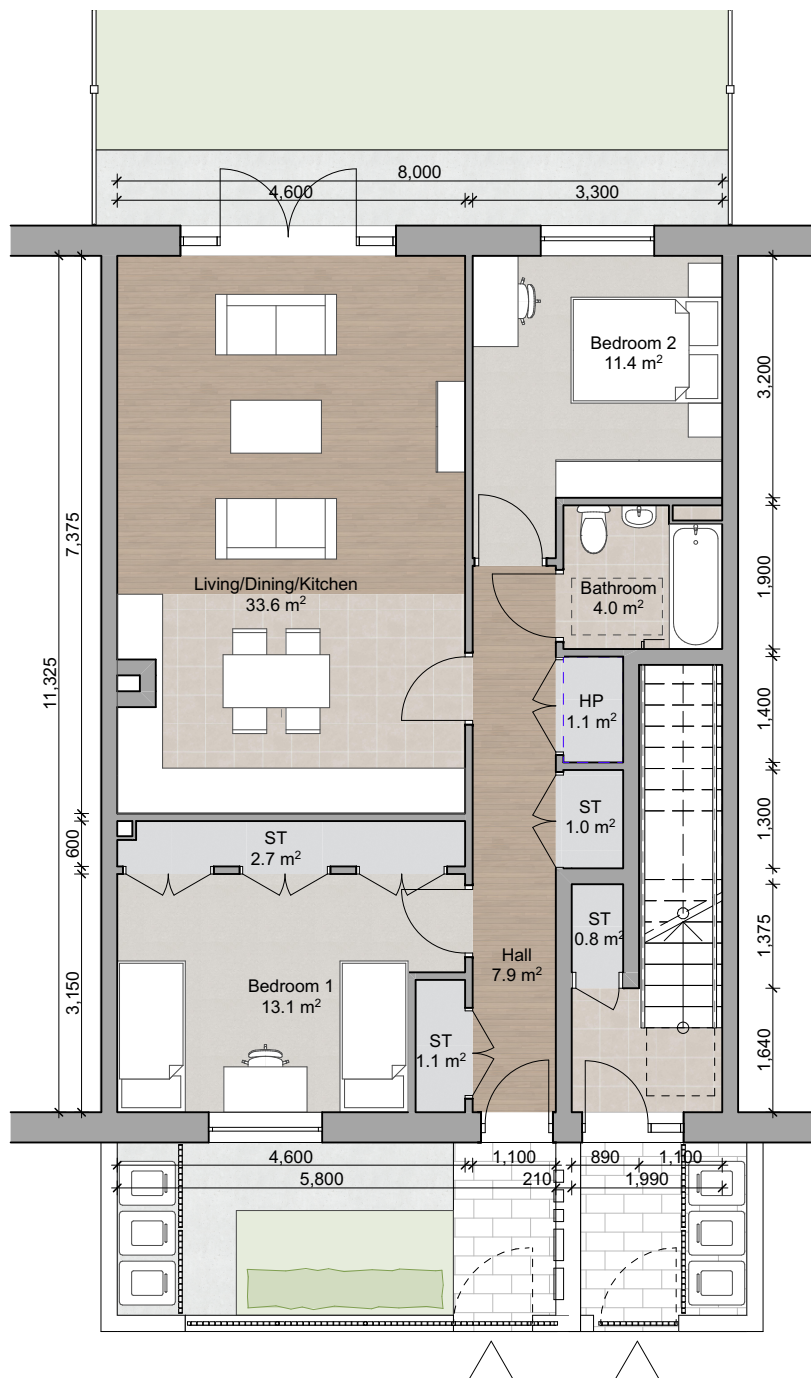
1
A26

APARTMENT 3B-5P-1S

Dwelling A26

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.950	13.7	2.8	13.0	105.4
BEDROOM 2	2.750	8.3	2.1	7.1	116.9
BEDROOM 3	3.100	14.2	2.8	11.4	124.6
TOTAL STORAGE AREA		9.1		9.0	101.1
TOTAL LIVING/KITCHEN/DINING AREA		37.5		34.0	110.3
GROSS INTERNAL AREA		98.4		90.0	109.3
PRIVATE OPEN SPACE (P.O.S.)		9.0		9.0	100.0

A27+A28



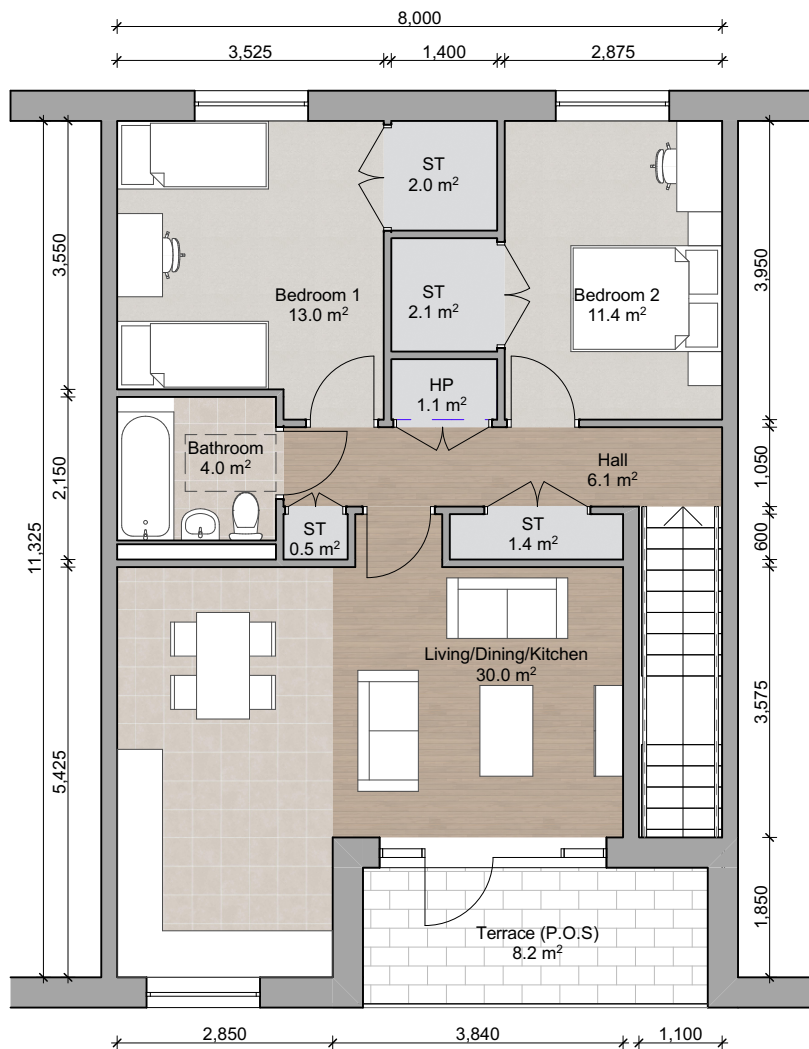
01
A27+A28

GROUND FLOOR APT A27
2B-4P-1S

Dwelling A27

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.150	13.1	2.8	13.0	100.8
BEDROOM 2	3.200	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		4.8		4.0	120.0
TOTAL LIVING/KITCHEN/DINING AREA		33.6		30.0	112.0
GROSS INTERNAL AREA		79.7		73.0	109.4

A27+A28



02
A27+A28

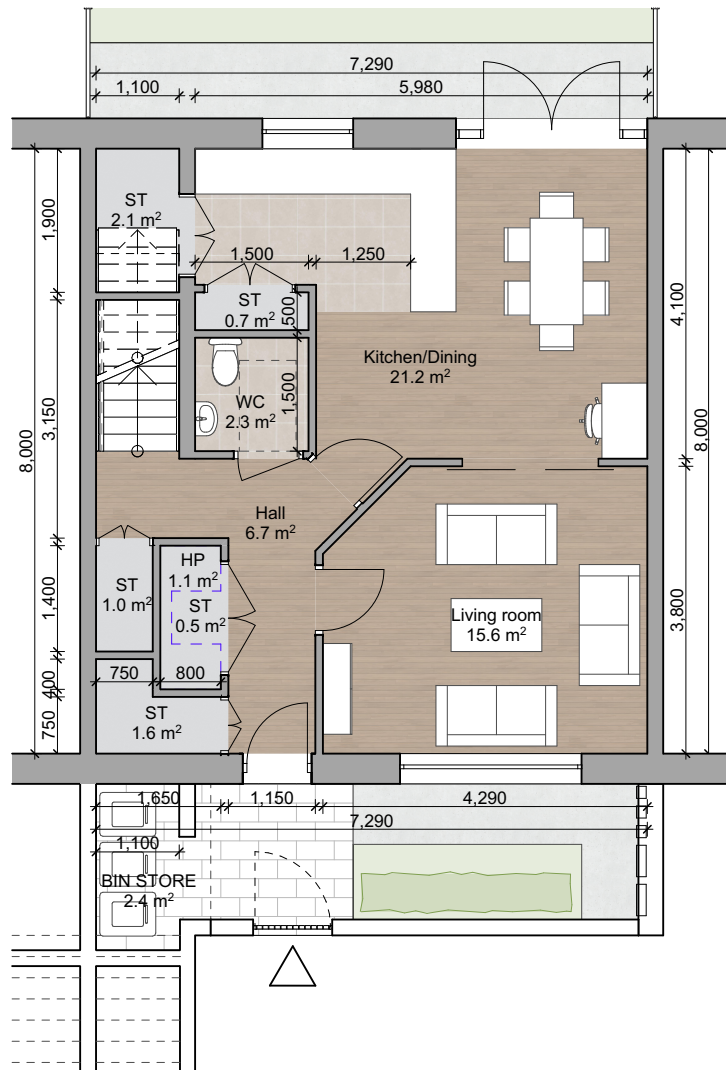
FIRST FLOOR APT A28
2B-4P-1S

Dwelling A28

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SQM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.550	13.0	2.8	13.0	100.0
BEDROOM 2	2.875	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		6.8		6.0	113.2
TOTAL LIVING/KITCHEN/DINING AREA		30.0		30.0	100.0
GROSS INTERNAL AREA	76.9*	85.2		73.0	105.3*
PRIVATE OPEN SPACE (P.O.S)		8.2		7.0	117.1

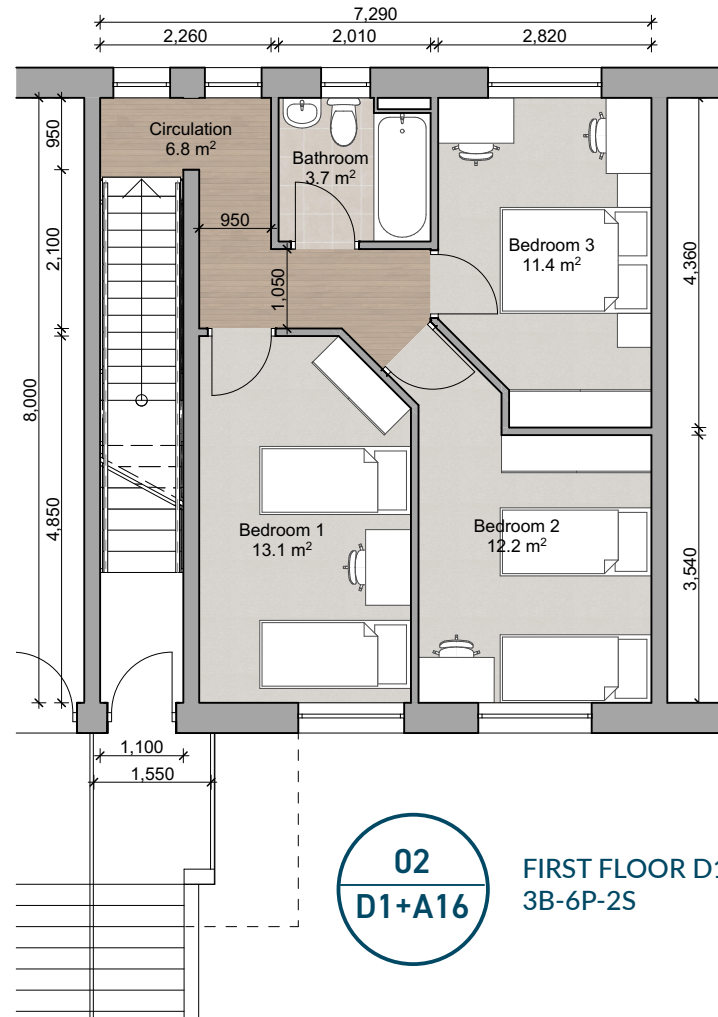
* Excluding stairs

D1+A16



01
D1+A16

GROUND FLOOR D1 DUPLEX
3B-6P-2S



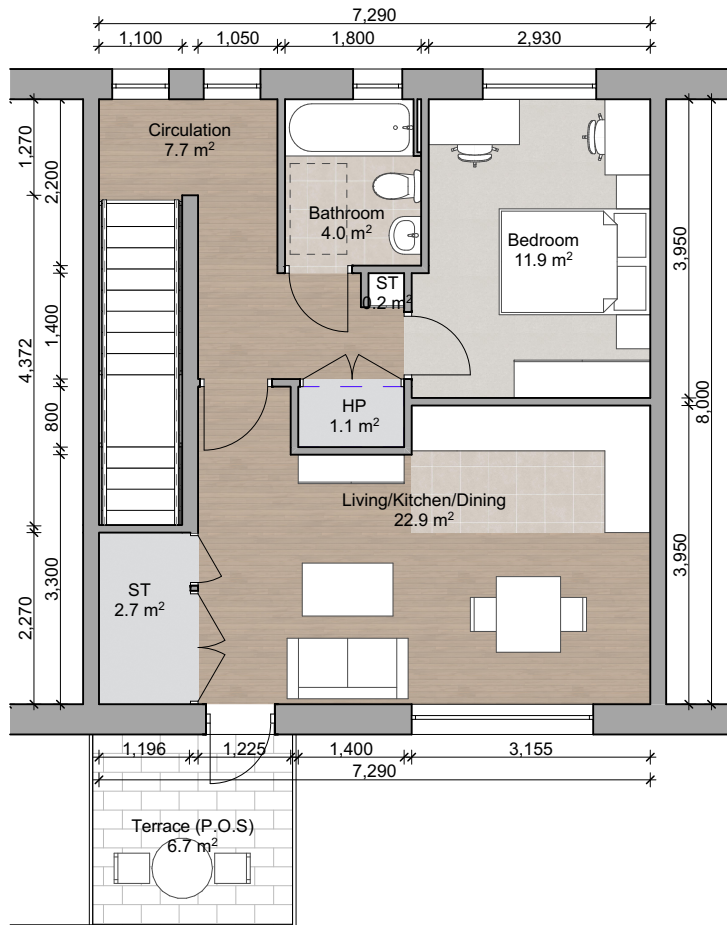
02
D1+A16

FIRST FLOOR D1 DUPLEX
3B-6P-2S

Dwelling D1

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT. GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	13.1	2.8	13.0	100.8
BEDROOM 2	3.080	12.2	2.8	11.4	107.0
BEDROOM 3	2.820	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		5.9		6.0	98.4
TOTAL LIVING/KITCHEN/DINING AREA		36.8		37.0	99.5
GROSS INTERNAL AREA		111.3		92.0	121.0

D1+A16



03
D1+A16

SECOND FLOOR APT A16
1B-2P-1S

Dwelling A16

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT. GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.930	11.9	2.8	11.4	107.9
TOTAL STORAGE AREA		2.9		3.0	96.7
TOTAL LIVING/KITCHEN/DINING AREA		22.9		23.0	99.6
GROSS INTERNAL AREA	50.8*	60.2		45.0	112.9* 133.8
PRIVATE OPEN SPACE (P.O.S.)		6.7		5.0	134.0

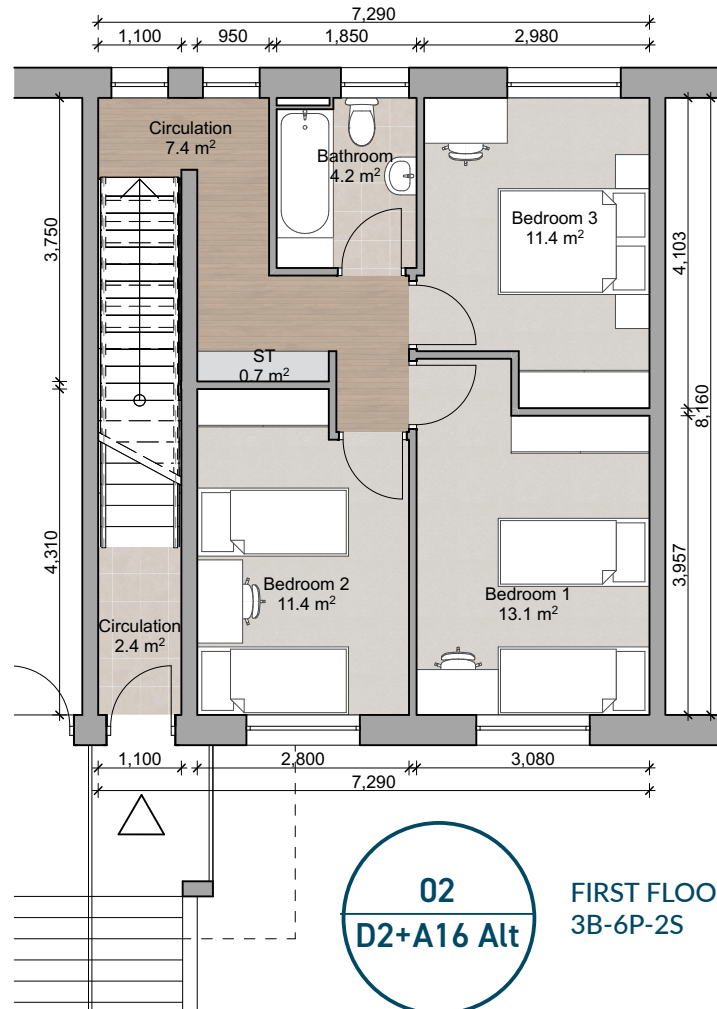
* Excluding stairs

This detailed floor plan shows the layout of the apartment with furniture and specific area measurements. The overall dimensions are 8,160 mm by 4,060 mm.

- Living room:** 16.4 m², featuring a sofa and a coffee table.
- Kitchen/Dining:** 20.3 m², featuring a dining table and chairs.
- Hall:** 7.6 m², the central circulation area.
- Bedrooms:** Two bedrooms, each 11.3 m², each with a bed.
- Bathroom:** 5.4 m², featuring a bathtub, toilet, and sink.
- WC:** 2.3 m², a separate toilet.
- Storage:** Includes a bin store (2.4 m²), a wardrobe (1.1 m²), and several built-in wardrobes (ST) and closets (HP).
- Stairs:** A staircase is located near the entrance.
- Entrance:** The entrance area is 5.080 m wide.

The plan also shows the location of the front door, windows, and various built-in features like the kitchen unit and bathroom fixtures.

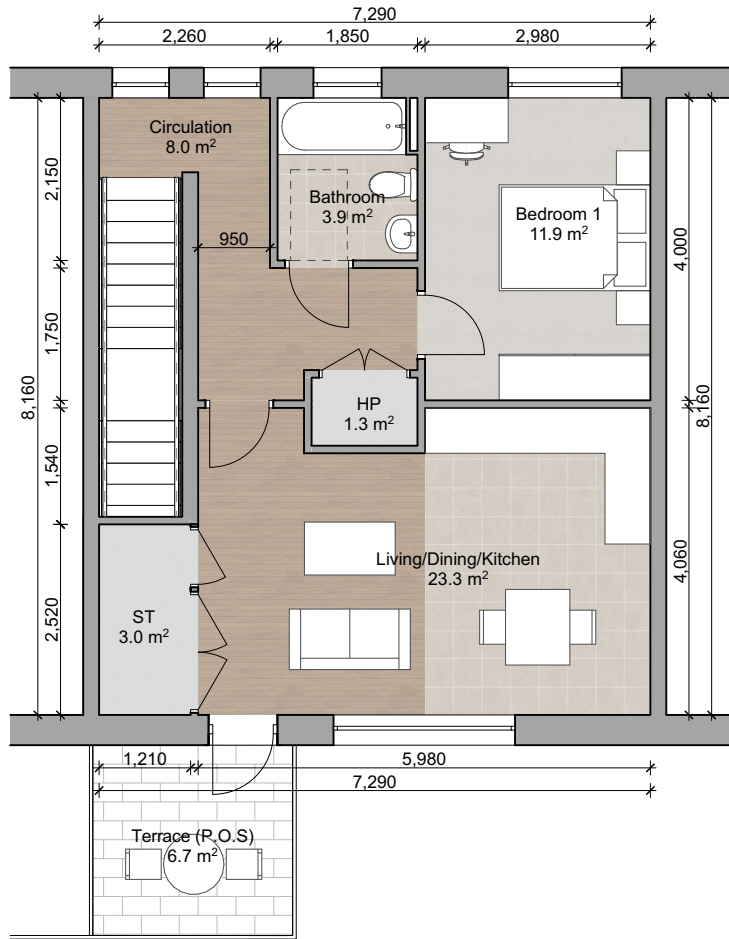
GROUND FLOOR D2 DUPLEX
3B-6P-2S



FIRST FLOOR D2 DUPLEX
3B-6P-2S

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT. GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	13.1	2.8	13.0	100.8
BEDROOM 2	2.900	11.4	2.8	11.4	100.0
BEDROOM 3	3.000	11.4	2.1	11.4	100.0
TOTAL STORAGE AREA	6.7		6.0		111.7
TOTAL LIVING/KITCHEN/DINING AREA	36.7		37.0		99.2
GROSS INTERNAL AREA	112.6		92.0		122.4

D2+A16 Alt

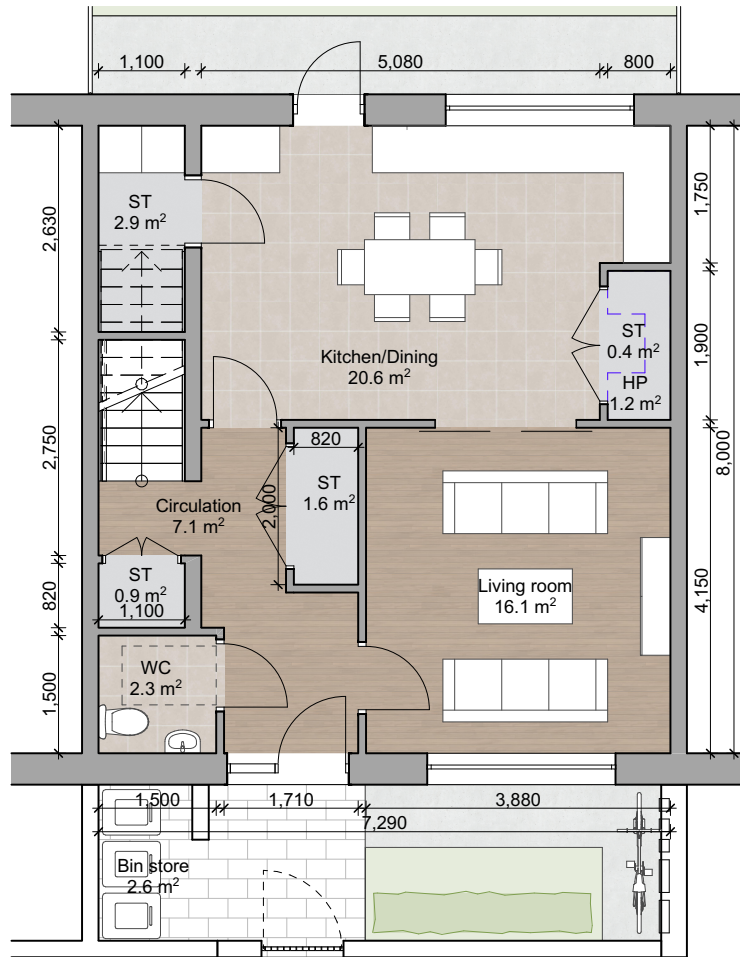


SECOND FLOOR APT A16 Alt
1B-2P-1S

Dwelling A16 Alt

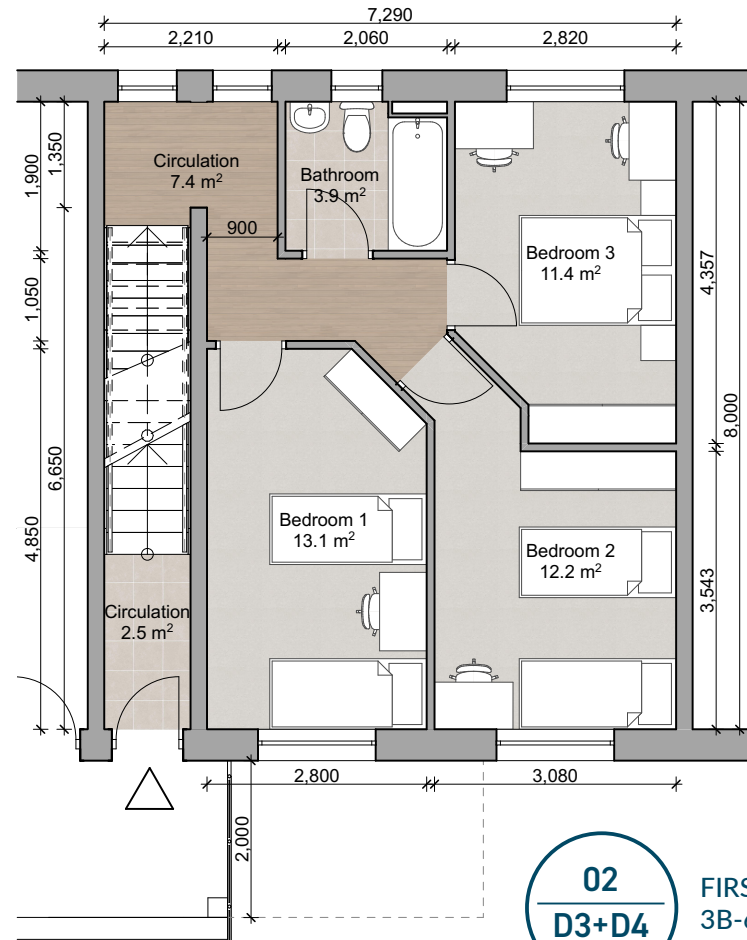
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	11.9	2.8	11.4	107.0
TOTAL STORAGE AREA		3.0		3.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		23.3		23.0	101.3
GROSS INTERNAL AREA	52.1*	62.5		45.0	115.8* 138.9
PRIVATE OPEN SPACE (P.O.S.)		6.7		5.0	134.0

* Excluding stairs



01
D3+D4

GROUND FLOOR D3 DUPLEX
3B-6P-2S

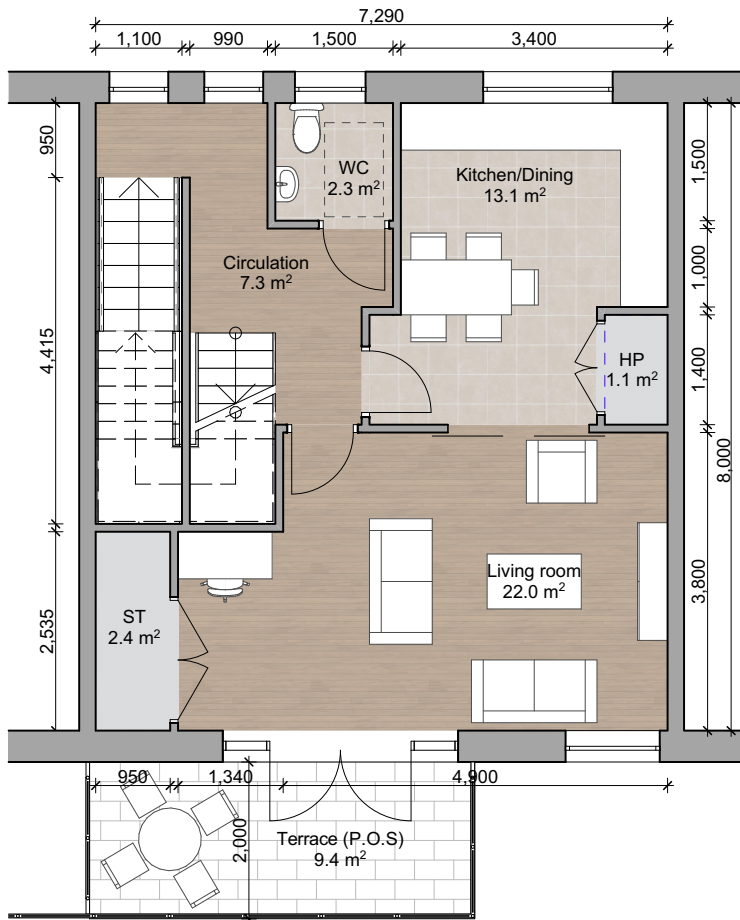


02
D3+D4

FIRST FLOOR D3 DUPLEX
3B-6P-2S

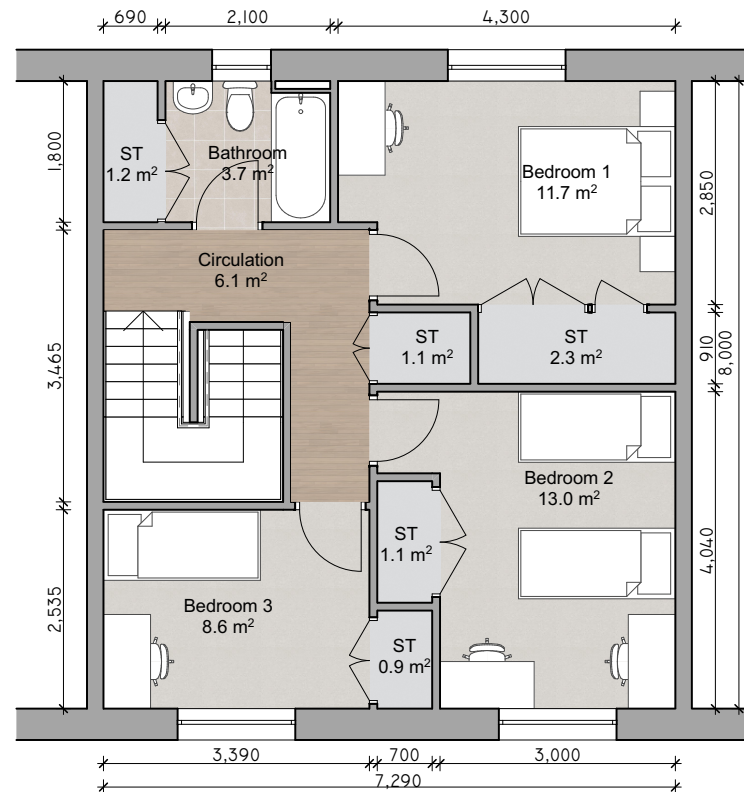
Dwelling D3

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	13.1	2.8	13.0	100.8
BEDROOM 2	3.080	12.2	2.8	11.4	107.0
BEDROOM 3	2.820	11.4	2.8	11.4	100.0
TOTAL STORAGE AREA		5.8		6.0	96.7
TOTAL LIVING/KITCHEN/DINING AREA		36.7		37.0	99.2
GROSS INTERNAL AREA		112.1		100.0	112.1



03
D3+D4

SECOND FLOOR D4 DUPLEX
3B-5P-2S



04
D3+D4

THIRD FLOOR D4 DUPLEX
3B-5P-2S

Dwelling D4

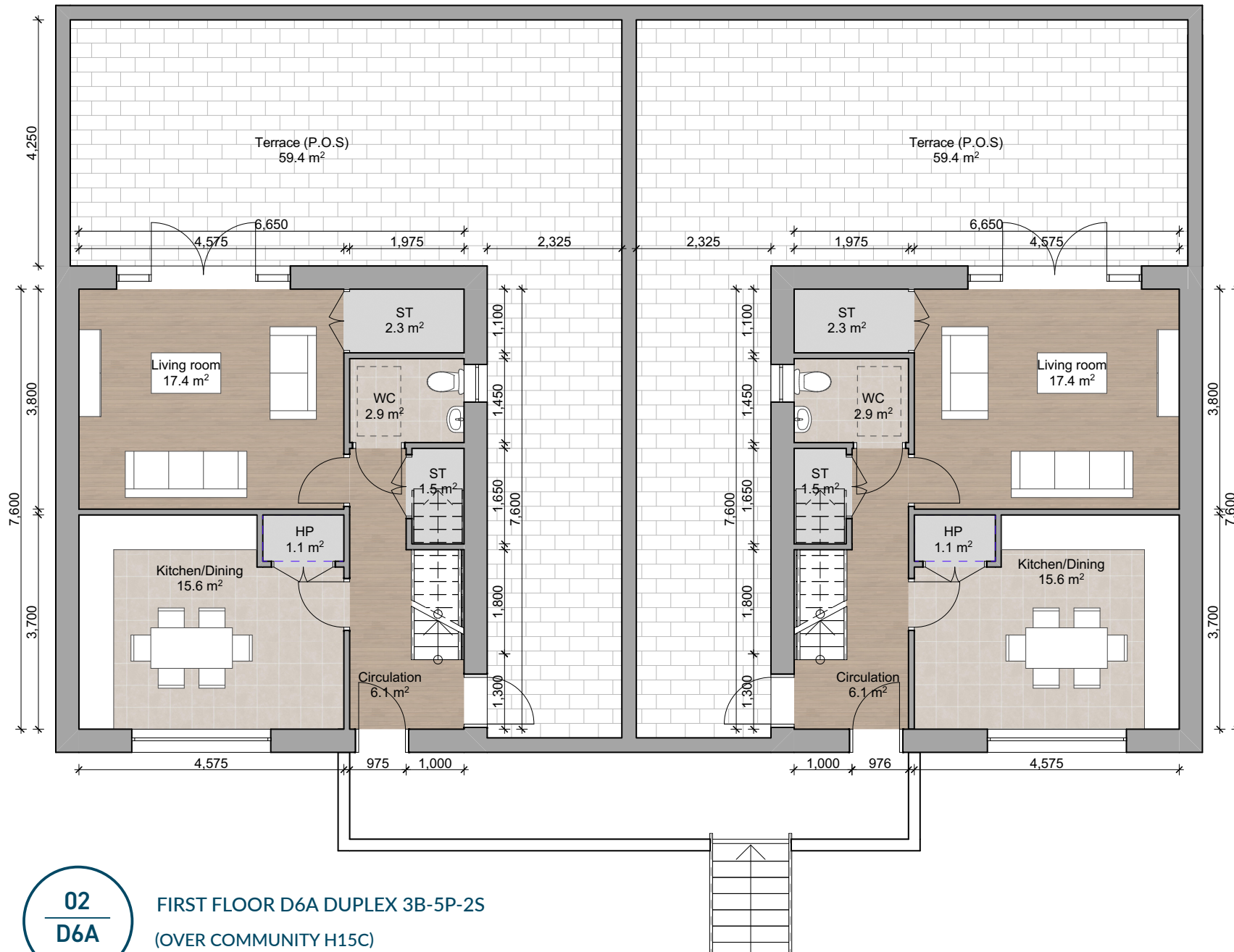
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT. GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.900	11.7	2.8	11.4	107.0
BEDROOM 2	3.000	13.0	2.8	11.4	116.6
BEDROOM 3	2.530	8.6	2.1	7.1	121.1
TOTAL STORAGE AREA		9.0		9.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		35.1		34.0	103.2
GROSS INTERNAL AREA	113.1*	119.1		96.0	117.8* 124.0
PRIVATE OPEN SPACE (P.O.S.)		9.4		9.0	104.4

* Excluding stairs

D3+D4

D6A

(over H15C)

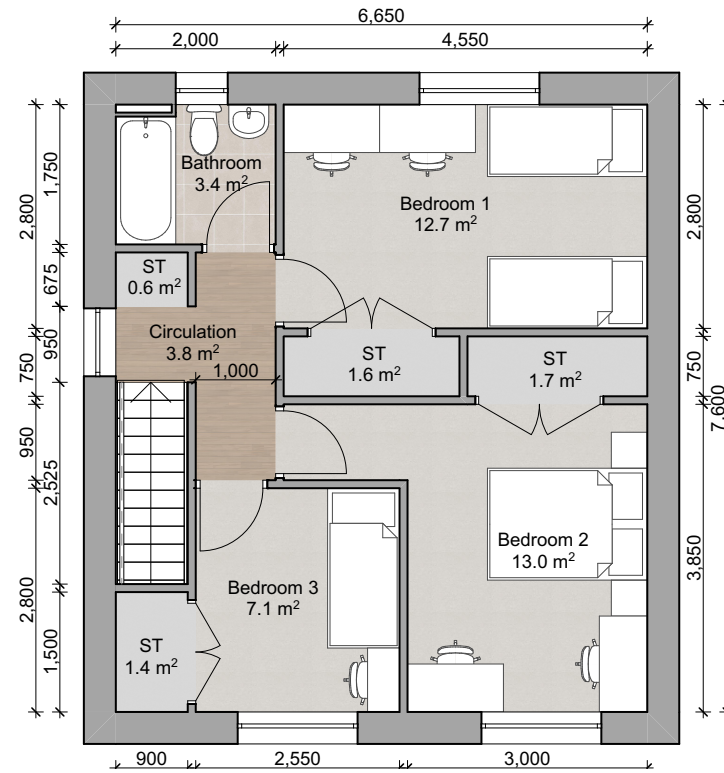
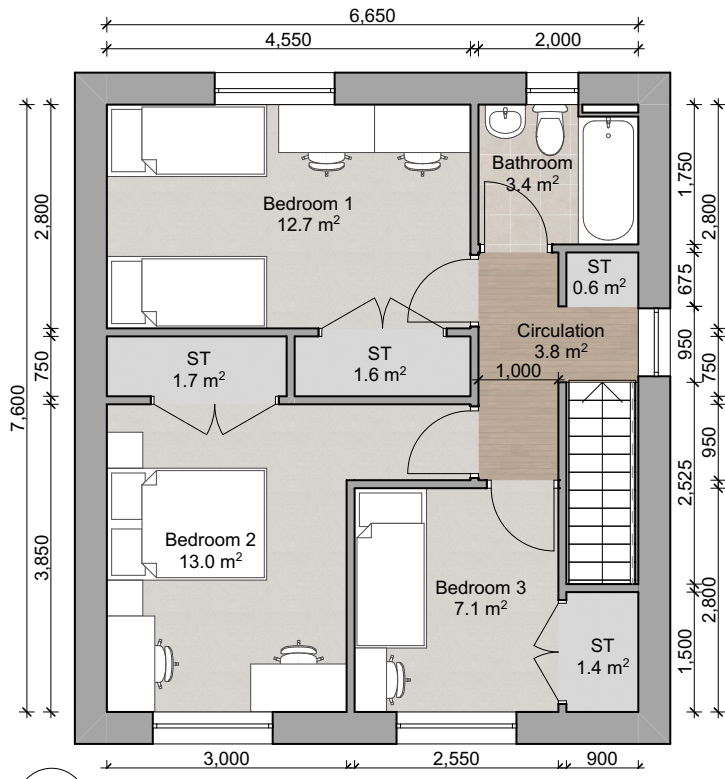


02
D6A

FIRST FLOOR D6A DUPLEX 3B-5P-2S
(OVER COMMUNITY H15C)

D6A

(over H15C)



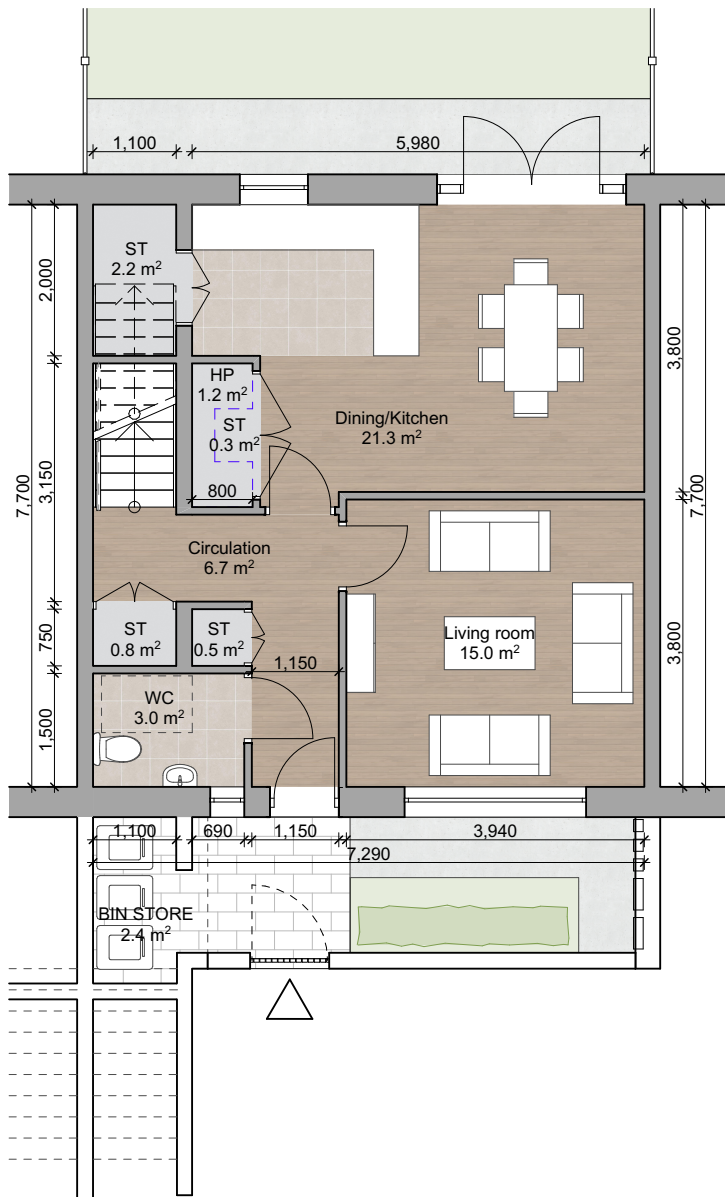
03
D6A

SECOND FLOOR D6A DUPLEX 3B-5P-2S (OVER COMMUNITY H15C)

Dwelling D6A

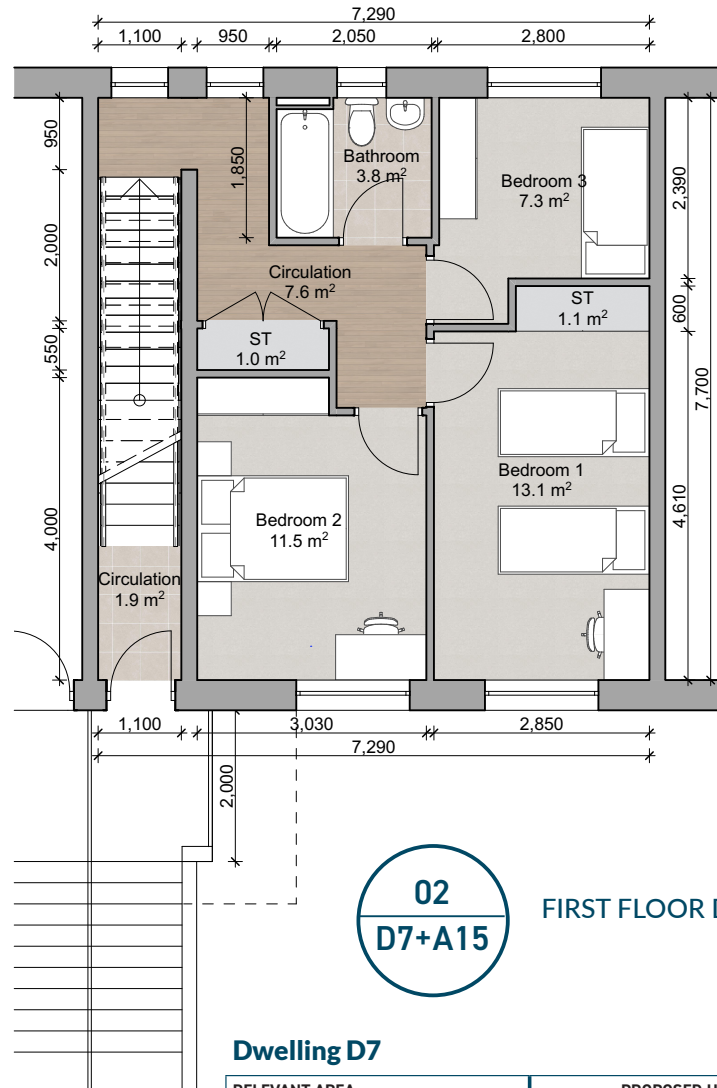
RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	2.800	12.7	2.8	11.4	100.8
BEDROOM 2	3.000	13.0	2.8	13.1	100.0
BEDROOM 3	2.500	7.1	2.1	7.1	100.0
TOTAL STORAGE AREA		9.1		9.0	101.3
TOTAL LIVING/KITCHEN/DINING AREA		33.0		34.0	97.1
GROSS INTERNAL AREA		101.0		96.0	105.2
PRIVATE OPEN SPACE (P.O.S.)		59.4		9.0	660.0

D7+A15



01
D7+A15

GROUND FLOOR DUPLEX D7 3B-5P-2S

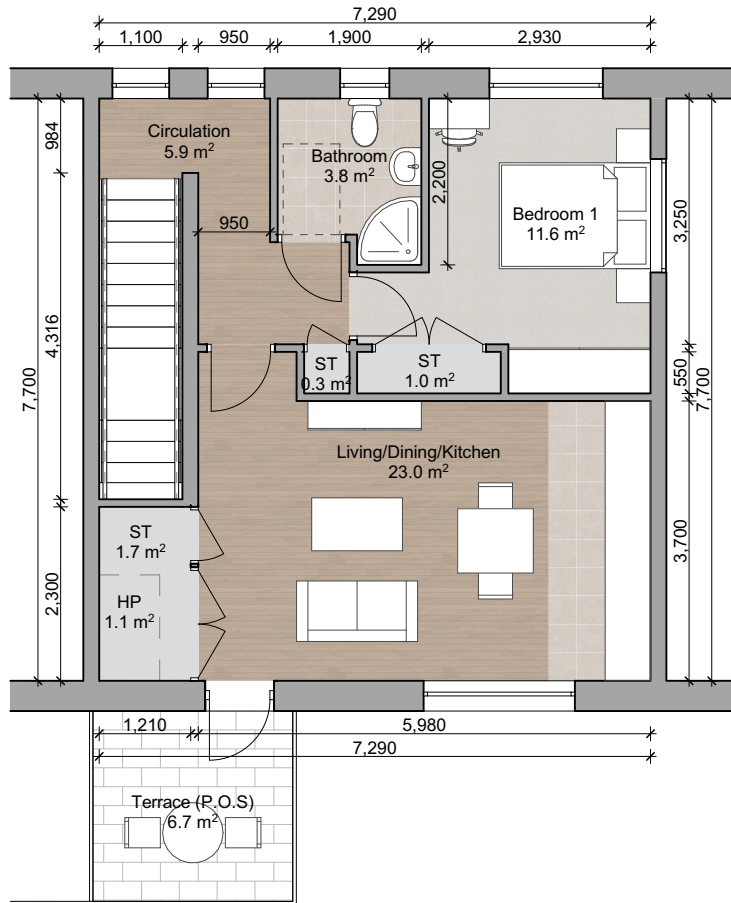


02
D7+A15

FIRST FLOOR DUPLEX D7 3B-5P-2S

Dwelling D7

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT. GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	13.1	2.8	13.0	107.8
BEDROOM 2	3.000	11.5	2.8	11.4	100.0
BEDROOM 3	2.500	7.3	2.1	7.1	105.6
TOTAL STORAGE AREA		5.9		5.0	118.0
TOTAL LIVING/KITCHEN/DINING AREA		36.3		34.0	106.7
GROSS INTERNAL AREA		107.4		92.0	116.8



SECOND FLOOR APARTMENT A15 1B-2P-1S

Dwelling A15

RELEVANT AREA	PROPOSED UNIT		EQUIVALENT DEPT GUIDELINES		COMPARISON OF FLOOR AREA %
	ACTUAL WIDTH	ACTUAL AREA (SqM)	MIN WIDTH	MIN FLOOR AREA (M2)	
BEDROOM 1	3.000	11.6	2.8	11.4	104.4
TOTAL STORAGE AREA		3.0		3.0	100.0
TOTAL LIVING/KITCHEN/DINING AREA		23.0		23.0	100.0
GROSS INTERNAL AREA	49.1*	58.7		45.0	109.1* 130.4
PRIVATE OPEN SPACE (P.O.S.)		6.7		5.0	134.0

* Excluding stairs

Design Manual for **Quality Housing**

Appendices



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Appendix 2 | Acknowledgements

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Irish Council Social Housing

Cluid Housing Association

Respond Housing Association

Tuath Housing Association

Age Friendly Ireland

Centre for Excellence in Universal Design

Housing & Sustainable Communities Agency

National Development Finance Agency

Cavan County Council

Clare County Council

Cork City Council

Dublin City Council

Dun Laoghaire-Rathdown County Council

Donegal County Council

Fingal County Council

Galway City Council

Galway County Council

Kildare County Council

Kilkenny County Council

Leitrim County Council

Limerick City and County Council

Longford County Council

Louth County Council

Mayo County Council

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Photos of Housing Developments Included in Manual

Finally, whilst as wide a spread of images has been included, as was possible, travel restrictions during this period limited the range of images available to specifically amplify points in the text. Whilst every effort has been made to acknowledge all images used, if any have inadvertently been incorrectly accredited, or an accreditation missed out, please contact DMfQH@housing.gov.ie so that later editions can be amended..

Section	Project	Architects	Photographer
Cover	Colivet Court, Sheltered Housing, Limerick	ABK Architects	Paul Tierney
Front piece	Ballymoneen, Galway	O'Briain Beary Architects	Paul Tierney

Section	Project	Architects	Photographer
INTRODUCTION	Georges Place, Dun Laoghaire	Dun Laoghaire-Rathdown Co Co Architects and A2 Architects	Marie-Louise Halpenny
0.12	Lower Fermanagh Street, Clones	Craft Studio Architects	Paul Connolly, Monaghan Co Co
0.12	Upper Fermanagh Street, Clones	Craft Studio Architects	Paul Connolly, Monaghan Co Co
0.13	Upper Bridge Street, Callan	Canice Architects	Brian Cregan
0.14	No 5 and 6 Shandon Street, Cork City	Cork City Architects & James Bourke Architects	Tony Duggan
0.21	Infill Housing, Frascati Road, Blackrock	Dun Laoghaire-Rathdown Co Co Architects	Department

Section	Project	Architects	Photographer
CHAPTER 1	Riverside, Kells	Cooney Architects	Courtesy Cunningham Contracts Ltd.

Section	Project	Architects	Photographer
CHAPTER 2	Deanrock, Cork City	Cork City Architects	Jed Niezgoda
2.1.8	Housing for Habinteg AHB, Lifford Co Donegal	Caroline Dixon Architects	Google Earth
2.1.8	Belarmine, Stepside	DDA Architects	Department

Section	Project	Architects	Photographer
CHAPTER 3	PPP Housing Scheme, Blessington	Coady Architects	Courtesy NDFA
3.4	Tooting Meadows, Scarlet St., Drogheda	McKevitt King Architects	Richard Hatch
3.4.2	Georges Place, Dun Laoghaire	Dun Laoghaire-Rathdown Co Co and A2 Architects	Marie-Louise Halpenny
3.4.4	Belarmine, Dublin 18	DDA Architects	Department
3.5.3.1	Adamstown, Lucan	O'Mahony Pike Architects	Department
3.5.3.1	Tubberhill, Westport	Mayo Co Co Architects	Courtesy Mayo Co Co
3.6.4.2	St. Joseph's Mansions	Dublin City Council Architects, Hebert Simms. Renovated for Cluid by Reddy Architecture + Urbanism	Google Earth
3.6.5.2	Cliona Park, Moyross	National Building Agency	Courtesy The Housing Agency
3.6.5.3	Adamstown, Lucan	O'Mahony Pike Architects	Department
3.6.8.3	Cox's Demesne, Dundalk	Fingal Co Co Architects	Courtesy Louth Co Co
3.6.8.3	Georges Place, Dun Laoghaire	Dun Laoghaire-Rathdown Co Co and A2 Architects	Marie-Louise Halpenny
3.6.8.6	Housing Pearse Street	Horan Keogan Ryan Architects	Department
3.6.10.3	Riverside, Kells	Cooney Architects	Courtesy Cunningham Contracts Ltd.
3.6.12	Plas Lorcaín, Monaghan	J N P Architects	Courtesy Albert Hall

Section	Project	Architects	Photographer
CHAPTER 4	Ballymoneen, Galway	O'Briain Beary Architects	Paul Tierney
4.2.4	Wallers Well, Janesboro, Limerick	Paul Keogh Architects	Courtesy PKA
4.2.5	Cliona Park, Moyross	National Building Agency	Courtesy The Housing Agency
4.4.2	Adamstown, Lucan	O'Mahony Pike Architects	Department
4.4.2	The Maltings, Ballinacollig	Tony Dennehy Architect	Tony Duggan
4.4.2	Dun Si, St. Marnock's Bay, Portmarnock	B K D Architects	Courtesy Cluid
4.4.3	Grange PPP, Kilcarbery, Dublin 22	Sean Harrington Architects	Courtesy South Dublin Co Co
4.4.4	Riverside, Kells	Cooney Architects	Courtesy Cunningham Contracts Ltd.
4.4.4	Naomh Columba Close, Carrick	Donegal Co Co Architects	Department
4.5.1	Dolphin House, Dublin 8	Dublin City Council Architects	Ros Kavanagh
4.7.1	Wallers Well, Janesboro, Limerick	Paul Keogh Architects	Courtesy PKA
4.7.2	Georges Place, Dun Laoghaire	Dun Laoghaire-Rathdown Co Co and A2 Architects	Department
4.8.5.4	Pearse Street, Dublin 2	Horan Keoghan Ryan Architects	Department

Section	Project	Architects	Photographer
CHAPTER 5	Dolphin House, Dublin 8	Dublin City Council Architects	Ros Kavanagh
5.0.1	Cusheen Road, Cork	O'Mahony Pike Architects	Google Street View
5.1.2.4	Fold Housing, Inchicore	Reddy Architecture & Urbanism	Richard Hatch
5.1.3.4	Duplex, Skerries	Reddy Architecture & Urbanism	Department
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5.4.2	Smithfield, Dublin	Horan Keogan Ryan Architects	Department
5.4.7	Adamstown, Lucan	MOLA Architecture	Department
5.5.3	Fold Housing, Inchicore	Reddy Architecture & Urbanism	Richard Hatch
5.5.4	Sean Tracy House, Dublin	Paul Keogh Architects	Peter Cook
5.5.4	Portmarnock, Co. Dublin	Coady Architects	Ros Kavanagh
5.6.2	Mulgrave Street, Limerick	Paul Keogh Architects	Courtesy PKA

Sources for Images Included in Text

3.5.1.3 / 3.5.1.5 / 3.5.2.1 / 3.5.3.4 / 3.6.2.1 / 3.6.2.4 / 3.6.3.2 / 3.6.8.4

Courtesy Design Manual for Urban Roads and Streets (DMURS)

1.1.1 / 3.5.2.2 / 3.6.2.1 / 3.6.3.2 / 3.6.8.2

Courtesy Urban Design Compendium (UDC)

1.1.1 / 3.5.1.2

Courtesy Ordnance Survey Ireland (OSI)

2.1.5 / 3.1.1 / 5.0.1

Courtesy Google Street View

2.1.8 / 3.6.4.1 / 3.6.4.2 / 3.6.4.2 / 3.6.5.2 / 3.6.7.1 / 4.2.4

Courtesy Google Earth

1.1.1

Courtesy Irish Independent

3.5.2.1

Courtesy Congress New Urbanism

3.5.3.1

Courtesy Georgia Pozoukidou

2.2.1 / 2.2.1 / 3.6.12 / 4.8.2.2 / 4.8.2.7 / 5.1.2.4 / 5.1.2.5 / 5.2.2.3 / 5.2.3.4 / 5.2.3.5

Courtesy Unsplash

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Rialtas na hÉireann
Government of Ireland