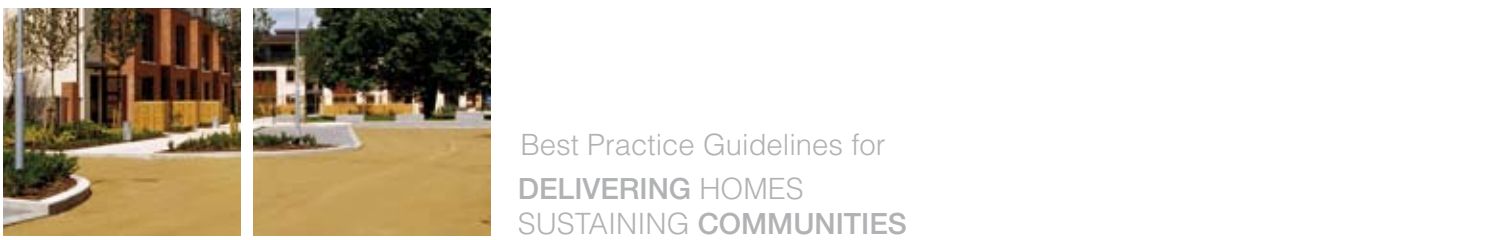
AN ROINN COMHSHAOIL, OIDHREACHTA AGUS RIALTAIS ÁITIÚIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE
AND LOCAL GOVERNMENT

Quality Housing
for Sustainable Communities



Best Practice Guidelines for
DELIVERING HOMES
SUSTAINING **COMMUNITIES**

Quality Housing
for Sustainable Communities

Department of the Environment,
Heritage and Local Government
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Introduction

Background

In February 2007, the Department of the Environment, Heritage and Local Government published a statement on housing policy, *Delivering Homes Sustaining Communities*[1], which set out the fundamentals of the Government's vision for housing in the coming years. The integrated package of policy initiatives identified a wide range of measures to promote better homes, better neighbourhoods and better urban spaces. These design guidelines are intended to assist in the implementation of those policies, and that of the Department of the Environment, Heritage and Local Governments *National Spatial Strategy 2002- 2020* and the National Development Plan 2007 - 2013.

The successful design of a good quality sustainable housing project depends on the balance struck between a range of factors. Issues such as accessibility, security, safety, privacy, community interaction, availability of appropriate services and the provision of adequate space, should be given due weight. The needs and reasonable expectations of residents are of fundamental importance. The typical family dwelling will be required to meet the needs of infants, young children, adults and older people, either separately or in combination, at various stages of its lifecycle. The design should be sufficiently flexible and adaptable to meet such demands over the foreseeable life of the building. In addition, it will normally be necessary to plan and design the scheme within a defined time period and to ensure that it can be constructed within acceptable time and cost parameters. It is clear that the achievement of a successful outcome presents a significant architectural challenge and the success of any housing project is largely dependent on the quality of planning and design input and how this is followed through in practice, at the construction stage.

The aim of these Guidelines is to identify principles and criteria that are important in the design of housing and to highlight specific design features, requirements and standards that have been found, from experience, to be particularly relevant.

In preparing the Guidelines, particular account has been taken of the objectives of government policy on sustainability, including issues such as energy efficiency, environmental protection, access for people with disabilities, meeting varied needs of occupants through their lifetime, durability and continued performance of buildings and the need to make optimal use of infrastructure and avoid unsustainable urban sprawl. This guidance document has been the culmination of wide consultation of stakeholders within the housing sector.

The Guidelines have also been developed in the context of:

- Government policy on architecture and the importance of good design in achieving a good quality living environment in residential development;
- The principles of good practice in urban design, including the need to respect existing heritage, scale, character and residential amenity and to contribute to the regeneration of rundown or under-used areas; and
- Requirements of the Department of Finance under the Capital Works Management Framework, CWMF 2007.

These Guidelines are intended for the use of all involved in the provision of housing, including Architects, Urban Designers, Engineers, Planners, Quantity Surveyors, Developers, Housing Bodies, Housing Authorities and Practitioners, City and County Managers and Directors of Services. While they may also be of assistance to consumers, by providing a benchmark for assessing quality in new housing, the need for house purchasers to obtain independent professional advice remains paramount.

The Guidelines relate primarily, but not exclusively, to housing accommodation for individual households, ranging from single person to large family households. They do not purport to be comprehensive nor seek to prescribe design solutions. They are intended to assist designers but proper design input on each project remains essential.

The Guidelines do not deal with special design features required where:

- there is sharing of facilities such as kitchens and dining facilities. Some guidance on this can be found in Department of the Environment Heritage and Local Government *Memorandum VHU: 2/02, Capital Funding Schemes for the Provision of Rental Accommodation by Approved Housing Bodies*[2]; or
- provision is to be made for people with special needs e.g., in dwellings for people with disabilities. Guidance on this can be found in the National Disability Authority publication *Building for Everyone: Inclusion, Access and Use*[3] and other sources listed in Appendix (iv) References and Select Bibliography.

These guidelines do **not** purport to provide guidance on:

- compliance with statutory planning requirements or construction standards (including Building Regulations) for housing; or
- technical, contractual or legal issues that may arise in relation to the procurement, construction or ongoing management and maintenance of housing projects.

The Guidelines supersede the Department of the Environment, Heritage and Local Government publication *Social Housing Guidelines - Design Guidelines*[4], issued in 1999 and the Department's Guidelines on site selection, *Social Housing Guidelines - Site Selection*[5], issued in 1997.

Mission Statement

The purpose of these Guidelines is to assist in achieving the objectives for *Delivering Homes, Sustaining Communities* contained in the Government Statement on Housing Policy which focuses on creating sustainable communities that are socially inclusive by:

- promoting high standards in the design and construction and in the provision of residential amenity and services in new housing schemes;
- encouraging best use of building land and optimal utilisation of services and infrastructure in the provision of new housing;
- pointing the way to cost effective options for housing design that go beyond minimum codes and standards;
- promoting higher standards of environmental performance and durability in housing construction;
- seeking to ensure that residents of new housing schemes enjoy the benefits of first-rate living conditions in a healthy, accessible and visually attractive environment; and
- providing homes and communities that may be easily managed and maintained.

Quality Housing - Essential Requirements

It is considered that good quality, sustainable housing development should be:

Socially and environmentally appropriate
The type of accommodation, support services and amenities provided should be appropriate to the needs of the people to be accommodated. The mix of dwelling type, size and tenure should support sound social, environmental and economic sustainability policy objectives for the area and promote the development of appropriately integrated play and recreation spaces.

Architecturally appropriate
The scheme should provide a pleasant living environment, which is aesthetically pleasing and human in scale. The scheme design solution should understand and respond appropriately to its context so that the development will enhance the neighbourhood and respect its cultural heritage.

Accessible and adaptable
There should be ease of access and circulation for all residents, including people with impaired mobility, enabling them to move as freely as possible within and through the development, to gain access to buildings and to use the services and amenities provided.

Dwellings should be capable of adaptation to meet changing needs of residents during the course of their lifetime.

Safe, secure and healthy
The scheme should be a safe and healthy place in which to live. It should be possible for pedestrians and cyclists to move within and through the area with reasonable ease and in safety. Provision for vehicular circulation, including access for service vehicles, should not compromise these objectives.

Affordable
The scheme should be capable of being built, managed and maintained at reasonable cost, having regard to the nature of the development.

Durable
The best available construction techniques should be used and key elements of construction should have a service life in the order of sixty years without the need for abnormal repair or replacement works.

Resource efficient
Efficient use should be made of land, infrastructure and energy. The location should be convenient to transport, services and amenities. Design and orientation of dwellings should take account of site topography so as to control negative wind effects and optimise the benefits of sunlight, daylight and solar gain; optimum use should be made of renewable sources of energy, the use of scarce natural resources in the construction, maintenance and management of the dwellings should be minimised.

01

Site Selection

1.1 Identifying Land Requirements

The Planning and Development Acts 2000 - 2006 require each planning authority to include a housing strategy for its area in its Development Plan, to ensure that the plan provides for the existing and future population of the area. The identification of land requirements for housing development should be made in the context of the requirements of the relevant housing strategy.

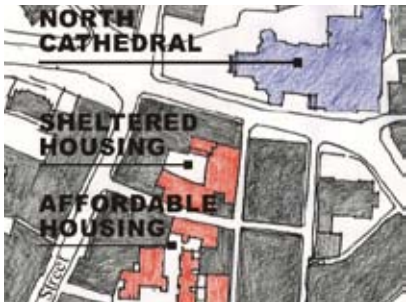
Regard should also be had to *The Residential Density Guidelines for Planning Authorities*[6] currently under review and, where relevant, the Regional Planning Guidelines and *Implementing Regional Planning Guidelines-Best Practice Guidance 2005*[7] published by the Department of the Environment, Heritage and Local Government (DoEHLG).

1.2 Selecting Suitable Sites

Selection of the site is, arguably, the single most important consideration in the process of providing housing. Factors such as the location, size and accessibility of a site and its proximity to amenities and services are important to the future development of a self-sustaining community. In the wider context, any new housing development will have a significant impact on the area in which it is located. Unless due care is given to the task of selecting suitable sites, opportunities for achieving improvements in the general environment of an area may be lost or greatly diminished. The degree of care taken in assessing the site, so that its constraints are recognised and its advantages can be exploited, will have a significant bearing on the quality of the housing development that emerges. Reference, where applicable should also be made to 5.3.1 of the *National Spatial Strategy 2002 - 2020*, Housing location in urban areas and evaluation considerations.

In relation to social housing and mixed tenure schemes, it is important that housing authorities and housing bodies avail of the opportunities provided by the social housing programme to ensure that their housing schemes will contribute to the integrated development of the areas in which they are located. New housing can act as a catalyst for the renewal of a rundown or under-utilised area by

- strengthening the fabric of urban centres;
- regenerating rundown areas;
- bringing back a mixture of uses to urban centres;
- locating people where services are available; and
- developing new areas of mixed use carefully integrated into existing patterns.



1.3 The Process of Site Selection

Site selection should be carried out in a structured way on the basis of pre-determined criteria. The most important consideration is whether a site is capable of being developed in a way that is likely to meet the needs and aspirations of future residents. Sites that initially appear to have little potential because of small size, awkward shape, difficult access, etc., should not be summarily dismissed. There are many examples where skill and imagination on the part of the architect, developer and client have resulted in the creation of very successful housing schemes on such sites.

The process of selection might commence with a series of questions about the area in which the housing scheme is to be provided, e.g.,

- Could new development be inserted to reinforce the street pattern or are there buildings that, if redeveloped, might facilitate access to a larger site behind?
- Is there scope, in a primarily commercial street, to build shops at street level with dwellings above?
- Are there large plots behind existing houses in a street that might accommodate an urban infill type of development?
- Are there other buildings, perhaps no longer occupied, which could be refurbished, upgraded or extended to provide residential accommodation?
- Are there derelict buildings, unused sites or poorly utilised sites in the area or are there redundant or functionally obsolete buildings which could be redeveloped or converted for residential use? Could parts of such buildings or sites be used for housing, with compatible uses in other parts?

In relation to social housing, some additional questions might include:

- Does the local authority already have in its possession sites that were acquired for other purposes, are no longer required for such purposes and are suitable for housing?
- Are there sites whose development for housing would complement existing or planned improvements under an urban or village renewal programme?
- Would acquisition of a derelict site under Derelict Sites legislation be appropriate?
- If the proposed site is adjoining an existing social housing scheme consideration should be given to suitability and mix of tenure.

1.4 Detailed Considerations, Inspection and Report

1.4.1 Infill sites

The use of suitable infill sites for the building of housing schemes can:

- facilitate a mix of residential tenure within an area, thereby helping to promote social integration and facilitating the creation of vibrant, sustainable communities;
- help to restore, strengthen or upgrade the social and physical fabric of an area and eliminate derelict, under-utilised areas;

- maximise use of existing infrastructure;
- act as a catalyst for urban regeneration; and
- improve the appearance of an area, enhance the public realm and help to give a sense of place for the people who will live there.

1.4.2 Use of back lands

Where a town or village lacks development in depth, the use of back lands, e.g.,, old yards, gardens, paddocks, etc., may help to improve the cohesion of the town or village. In larger urban areas, where authorities are acquiring back areas for road improvement, off street parking, etc., consideration should be given to how perimeter areas might be developed. With forethought, it may be possible to provide for clusters of housing in association with these developments.

1.4.3 Existing buildings

Disused buildings, such as schools, convents and even factories and workshops, that are structurally sound, may be capable of being converted for new housing, e.g.,, sheltered accommodation, starter homes, etc. Commercial properties that come on the market sometimes contain extensive back areas. An imaginative plan could utilise some of these areas for housing while retaining elements of compatible commercial use.

1.4.4 Adjoining lands

Regard should be had to the use (or proposed use) of adjoining lands, which may conflict with the safe use of the site for family housing purposes or have an adverse impact on the visual or environmental quality of the proposed housing scheme, e.g., busy traffic routes, inappropriate industrial use, and places of late night entertainment/activity.

1.4.5 Access and security

Particular care should be taken to ensure that pedestrian access to sites would present no undue difficulties (including security problems) for future residents, particularly children, older people or people with a disability.

1.4.6 Layout possibilities

It is important to recognise the existing character, street patterns, streetscapes and building lines of an area, particularly in the case of infill sites or where new dwellings will adjoin existing buildings. These are primarily planning and design issues, which are dealt with in later chapters, but the degree to which they will impact on any new development will need to be taken into account in assessing the development potential of any proposed site. Orientation, the microclimate (shelter/exposure, windbreaks, proximity to existing buildings and built-up areas, etc.) and features which might beneficially be incorporated into the scheme (such as trees, views, walls, streams), will all have a bearing on how well the site can be used for housing. However sites with difficult topography or infrastructural limitations should be assessed for their economic viability at the initial stages.

1.4.7 Site evaluation report

Sites should be inspected prior to acquisition by appropriately qualified professionals and the findings documented.

A range of factors that should be taken into account when assessing the suitability of a site for housing purposes and matters that should be addressed in the Inspection Report are set out in Appendix (i) to these Guidelines.

1.5 Statutory Procedures

In all cases the development of a site for housing purposes should be in accordance with proper planning and development and comply with the objectives of the Development Plan for the area.

It should be noted that the Planning Acts[8] require that an Environmental Impact Assessment (EIA) be carried out in certain cases, including

- where a development project involves the construction of more than 500 dwelling units; and
- where an urban development would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere. (In this context, "business district" means a district within a city or town in which the predominant land use is retail or commercial).

In addition, an EIA is required where the development would be likely to have significant effects on the environment. The circumstances in which this may arise are set out in the relevant sections of the Planning and Development Regulations[9]. These factors should be taken into account as part of the overall assessment of the suitability of the site.

Where applicable, in cases where a development may not come under the above criteria reference should be made to 2003 DoEHLG Publication *"Environmental Impact Assessment (EIA) Guidance for Consent Authorities regarding sub-threshold Development"*.

02

Design Brief, Procurement and Cost Control

2.1 The Design Brief

The proper approach to the design of any housing scheme requires:

a) a clear statement of what the client requires and the parameters within which the designer must operate;

b) early identification of the persons within the client organisation who will be responsible for making decisions with regard to the scheme; and

c) appropriate architectural and other professional input from the outset.

The statement of requirements should be in the form of a design brief that is coherent and unambiguous and incorporates indicative time and cost targets for the project. The design brief should be prepared before the appointment of the architect and other professionals in the design team for the scheme and clarified or augmented as necessary as planning and design of the scheme progresses.

A specific person within the client organisation should be assigned responsibility for the scheme, i.e. to provide clarification and augmentation of the brief, if required, and to 'sign-off' on the project at specified stages as the design progresses.

The degree of professional input required will depend on the location, nature, size and complexity of the scheme. The content of the brief and the level of design input should be such as to ensure that the scheme will meet the needs of the potential residents, with due regard for the interests of the wider community; that new or innovative solutions will be properly assessed; that dwelling design will be appropriate to the needs of the occupants; and that the solutions adopted will be cost effective in terms of initial capital costs and management and maintenance costs.

Where appropriate professional resources are not available in-house, the client authority should engage external consultants with appropriate qualifications, skills and experience. Where an authority engages external consultants, the process of engagement should be carried out in accordance with the requirements of the Department of Finance set out in the *Capital Works Management Framework, CWMF 2007*[10].

2.2 Preparation of the Brief

A design brief should be prepared for all schemes regardless of size and irrespective of whether the design is carried out in-house or by consultants. The brief will provide the basic ground rules for the project and, as such, will have a fundamental bearing on the development of the design and, ultimately, on the quality of the completed scheme.

The brief should:

- clearly identify the accommodation requirements ;
- highlight site characteristics that are considered to be of particular importance;
- set out the budget and timescale envisaged for the project; and
- where appropriate, direct the designer's attention to particular statutory or other requirements that must be met.

The brief should, where necessary, indicate the relative importance of items contained in the brief, i.e., distinguishing between items that are regarded as essential, highly desirable or desirable, in the context of the proposed scheme.

The initial brief should be seen as the starting point for the design. It should be as comprehensive as possible but will normally need to be augmented or clarified at various stages during the development of the design. The degree to which this occurs will depend on the nature and complexity of the scheme. It may involve:

- providing additional information;
- deciding between available options; and
- identifying priorities, if it becomes clear that not all requirements specified in the original brief can be met.

Guidance on brief preparation and process is referred to in the Department of Finance, *Capital Works Management Framework, CWMF 2007*[10].

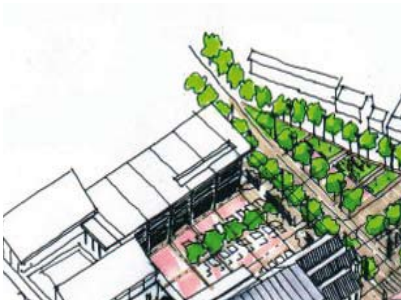
It is important that adequate provision is made for continual feedback and refining of the brief during the design process, so as to ensure that the final design solution satisfies the clients requirements and meets the best interests of the future occupants of the dwellings. If sufficient time and proper attention is given to the briefing stage it will prevent misunderstandings, minimise the risk of omissions and help to avoid delays, abortive work and related disputes.

2.3 Content of the Brief

It is not possible to provide a standard design brief template that would be suitable in all circumstances. The brief should draw the designer's attention to the guidance on scheme layout and dwelling design given in this publication, and to such other available guidance as is appropriate. Guidance on brief preparation and process is referred to in the Department of Finance, *Capital Works Management Framework, CWMF 2007*[10].

The brief should also take account of local conditions and the characteristics of the site. As far as possible, it should anticipate the preferences of potential occupants of the scheme, drawing on previous experience with similar housing projects. Much of the contents of the brief for a given project will relate to the site, the particular needs to be met by the scheme and other requirements that are considered appropriate such as specific sustainable energy measures. Issues that should normally be addressed in the brief include:

1) Housing needs and types of dwellings required, i.e.:
   - the mix of tenures anticipated for the scheme;
   - the density of development envisaged and the number, mix and size of dwellings required;
   - the form of dwelling types envisaged, e.g., houses, apartments, etc.; and
   - any specific requirements regarding consultation with prospective occupants or others.
2) General pointers for scheme layout, such as:
   - the location, type and extent of public open spaces, play spaces, car parking, etc., and the nature and extent of landscaping envisaged;
   - private space associated with each dwelling and the treatment of boundaries between adjacent private areas and between private and public areas;
   - pedestrian and vehicular circulation to, within and through the scheme, e.g., road width requirements, footpath links to surrounding facilities, etc.; and
   - the inclusion, where appropriate, of a public art project.
3) The design of individual dwelling units, including:
   - spatial standards to be achieved within individual dwellings, including the disposition of, and the relationship between individual rooms, circulating areas, etc.;
   - the extent and nature of storage provision required;
   - the type of heating system, bathroom facilities and sanitary and other services to be provided;
   - the use of particular materials, components or equipment which are considered desirable for sustainability reasons; and
   - in so far as practicable, the design should provide for flexibility in use, accessibility and adaptability.
4) Requirements relevant to the site that may affect the design of the scheme, such as:
   - status of land title and any necessary way leaves, easements, etc.;
   - results of site analysis, including topography, investigation of ground conditions, location of existing services and rights of way and the need for any further investigations;
   - the Development Plan zoning for the site and the need for compliance with any statutory planning and environmental assessment procedures, including compliance with the requirements of the Development Plan;
   - any specific requirements with regard to access to the site and existing and proposed roads and services within or adjacent to the site;



- the heritage significance of the site and any requirements for the protection, conservation, refurbishment and use of existing buildings and features within the site;
- requirements for the demolition of any structures, including the need for compliance with statutory health and safety requirements regarding removal and disposal of hazardous materials;
- requirements for the treatment of boundaries between the proposed scheme and adjoining properties;
- pointers regarding the overall impact of the scheme in the context of the surroundings;
- indication of possible uses for the remainder of the site, where the scheme under consideration relates to part of a larger site; and
- a general requirement that the proposed scheme should be appropriate in the context of economic, environmental and social sustainability policies relating to the larger neighbourhood.

5) The initial design costs:

- the inclusion of a construction cost target and awareness of cost-in-use issues in the brief are essential ingredients to ensuring the development of a design that represents value for money; and
- the initial construction cost target sets the basis for the development of a cost plan and for subsequent cost checks to ensure that the design is developed to tender stage in line with the initial brief.

6) A time frame for the delivery of the scheme, including target dates for completion of the various stages from initial design to contract completion.

The brief should be accompanied by available information on the characteristics of the site, including documentation prepared having regard to the recommendations on site selection in chapter 1, at time of site acquisition. Any gaps in that information should be corrected at this stage and included in the brief.

2.4 Cost Control for Housing Design

The design team should have regard to the implications of design decisions for both capital costs and costs-in-use, i.e. costs associated with the on-going operation, management and maintenance of the completed dwellings. The aim should be to produce a design of good quality while maintaining capital costs within the overall cost parameters agreed for the scheme. Durability, maintenance characteristics and suitability of materials, components and fittings should be carefully considered, so as to ensure acceptable levels of cost-in-use. Effective cost control procedures should be in place so that, when choosing between alternatives, the cost implications can be properly quantified and assessed. Factors that have a bearing on the initial and running costs of any housing scheme include:

- the topography of the site and the manner in which this is taken into account in the design - particularly as it affects the amount of excavation required for foundations and services;

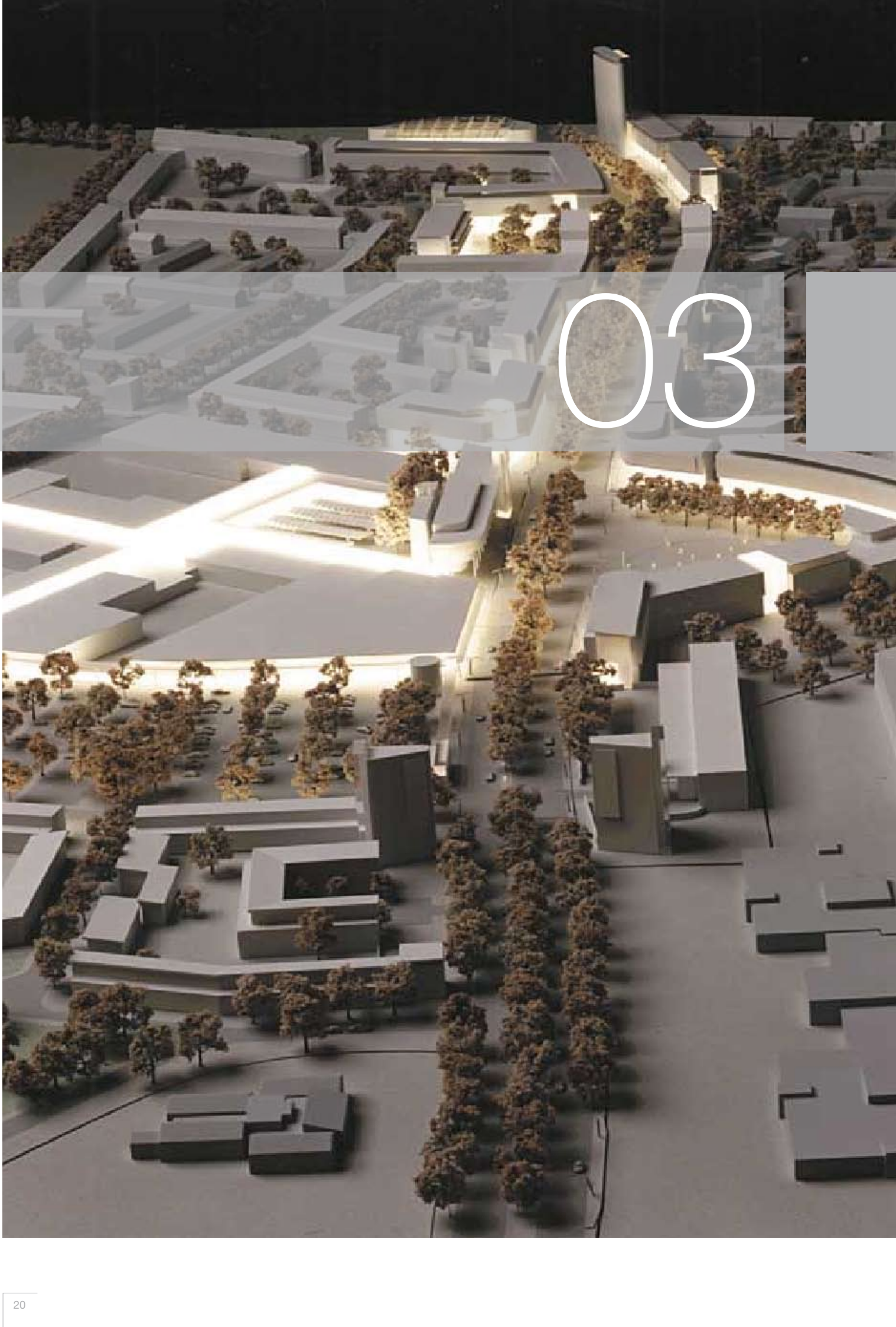
- the density of the scheme, i.e. the number of dwellings/persons accommodated per hectare;
- the variety of different dwelling types used in the scheme and the number of each type used;
- the lengths of roads, footpaths, service runs, etc., relative to the number of dwellings provided;
- the extent of "hard" landscaping required, including screen walling and front garden walls, relative to the number of dwellings provided;
- the durability and maintenance characteristics of forms of construction, components or materials used; and
- the degree to which the forms of construction, components or materials used, are likely to be familiar to the contractor, or to require specialist skill and a particularly high level of supervision to ensure proper installation.

Design teams should give particular attention to features and characteristics of the site that have the potential to adversely affect the development costs of the scheme, e.g., existing streams and waterways, sharp changes of level and pockets of ground with poor load-bearing capacity. In addition, features that should be preserved, such as trees, buildings or other structures on the site, should be identified at the site investigation stage and appropriate provision for their protection and preservation included at design stage.

2.5 Procurement Process for Social Housing Schemes

The procurement process for social housing projects should be implemented in accordance the requirements of the Department of Finance, *Capital Works Management Framework, CWMF 2007*[10] and the procedural requirements for the funding of social housing set down by the Department of Environment, Heritage and Local Government.

The merits of acquisitions under Part V of the *Planning and Development Acts 2000 - 2006*, or "turnkey" schemes, Design Build and PPP should be assessed, in terms of design quality, standard of construction and value for money.



03

Urban Design Objectives in the Provision of Housing

3.1 Urban Design

A key aim of urban design is to deliver sustainable communities through the creation of a high quality built environment, by reducing, as far as possible, the necessity to travel, particularly by private car for the purposes of employment, education and recreation and to avail of services and amenities necessary for living.

In the planning and development of residential areas, the primary method of achieving this objective is to ensure that the design takes proper account of the context in which any proposed development will exist and promotes the concept of the compact or walkable neighbourhood.

In the context of the Government Statement on Housing Policy, *Delivering Homes, Sustaining Communities*[1], particular reference is made in Chapter 3, planning for housing, which states:

"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*[22]. 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;
- 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."

3.2 Designing in Context

Context is the location, character and setting of the area within which a proposed project will sit. It includes the forms of existing settlements, buildings and spaces as well as the ecology and archaeology of the area and the circulation routes that pass through the area. It encompasses the natural as well as human history of the locale.

The process of designing in context should aim to create high quality places in which people can live happy and productive lives. To achieve this, care should be taken to:

- assess the characteristics of the neighbourhood that can be built upon to strengthen local identity and reinforce existing local communities;
- make full use of any of the site's natural features that can help to create a more sustainable development; and
- integrate the development with the surrounding built environment, using the correct materials, forms and landscape elements e.g., by respecting existing street lines and existing urban structures.

3.3 The Urban Framework

Urban Framework refers to the pattern, structure or arrangement of streets, buildings, open space and landscape that make up urban areas. It is the interrelationship between all of these elements, as much as their individual characteristics, which bond together to make a place. The appropriate mix of buildings, green spaces and streetscape is important to the quality of residential developments.

The Urban Framework provides the basis for detailed design of the various constituent elements. It creates a coherent structure, which can form the basis for the design of individual developments proposed for an area. The following elements form part of this framework, and should be considered by designers at initial concept development stages.

3.3.1 Movement framework

The movement framework concerns the structural aspects of movement, focusing on street and footpath networks that facilitate proposed densities, uses and activities and that enhance security and the impact of any new development.

3.3.2 Diversity and mixing uses

Successful communities require a full range of local services and facilities, including commercial, educational, health, religious and civic uses. These need to be conveniently sited and connected to residential areas by safe and comfortable access routes. Mixed tenure schemes should be provided with an appropriate balance between social, private, affordable, voluntary and special needs housing regardless of the size of scheme.

3.3.3 Hierarchy of spatial development.

Development of an area should be planned in the context of a spatial development hierarchy, the principal components of which are landmarks, gateways, links, nodes and edges (see 4.1).

3.3.4 Density

To achieve sustainable residential densities and to make best use of local services and public transport infrastructure, regard should be had to the Department of the Environment Heritage and Local Government publication *Residential Density Guidelines for Local Authorities*[6].

3.3.5 Public open space and landscape design

A variety of types of open space should be considered in relation to the context of the scheme surroundings and the function of the space required. The types of space required should be considered in terms of quality of design, detailing and long-term management and maintenance characteristics.

Figure 3.1: Morphological development 1838 - 1996, Westport, Co. Mayo.

Figure 3.2: Adamstown SDZ, an Urban Design Framework.

Figure 3.3: Heuston Gateway, Landmark Tower.

3.4 Detailing the Place

The detailed design of urban space requires careful attention to the building line and three-dimensional building mass that helps create the character of streets, places, neighbourhoods and squares. Negative left-over spaces that have no character or positive function should be avoided. Aspects to be considered include the following:

- **Making open space.** Outdoor space should have a clear function, character and shape with distinct boundaries, through the positioning of adjacent buildings, walls, fencing, trees and hedges.
- **Creating edges.** Buildings and open space should be considered in their totality. Part of the success of any development is the positive contribution that it makes to the public realm, e.g., by facing the street and helping to make sure that all adjacent space is used positively.
- **Building size and scale.** The size, configuration and scale of a development in relation to its surroundings, has a bearing on its:
  - sustainability (in terms of energy efficiency and adaptability);
  - relationship with the surrounding urban structure; and
  - contribution to neighbouring public space and streetscapes.
- **Enhancing the public realm.** Careful attention to the structure of a space and the elements it contains, can help to create a comfortable, accessible and stimulating public realm that encourages social interaction.
- **Making safe places.** Safety and security are important considerations in any urban development. Careful design can assist in enhancing a sense of well being for the residents of an area and in making places more user friendly, easy to understand and secure. It can also help to create a shared sense of confidence in the use of streets and facilities. However, the scheme design should encourage the development of integrated communities and 'gated developments' should generally be avoided.

3.5 Implementation

The delivery of a successful urban framework or housing scheme emerges from:

- careful site selection and analysis and a well thought out brief and design proposal;
- the assembly, at the outset, of a high quality professional team working as a cohesive unit towards clear objectives;
- the establishment of an appropriate design management and review process with a clear reporting structure and good decision making skills; and
- consistent commitment to quality by all involved in the process, including private clients, public authorities, voluntary organisations, developers, builders and funding agencies, as well as architects, urban designers and professional design teams.

The focus on quality should be sustained throughout a project's lifetime, from inception, through the design and construction stages and into the later management and maintenance stages.

In the context of the Statement on Housing Policy, *Delivering Homes, Sustaining Communities*[1], Chapter 6, box 6.2, reference should made to Sustainable Community Proofing and the series of critical questions to be asked at the inception of any new urban framework or project.

3.6 Dwellings in Rural Locations

Architectural quality is as important for houses in rural locations as it is for houses in urban settings and it is essential that new houses be properly integrated into their surroundings. Many local authorities have prepared guidance in relation to the siting, planning and design of houses in rural locations within their administrative areas. Examples of these are guidelines published by Cork County Council (*Building a New House in the Countryside)*[11] and Louth County Council *(Building Sensitively and Sustainably in County Louth)*[12], which provide valuable guidance that has relevance to many other areas of the country.

In the planning of dwellings in rural locations, regard should be had to the guidance contained in the Department of the Environment, Heritage and Local Government publication *Sustainable Rural Housing - Guidelines for Planning Authorities*[13].

Consideration should be given to the availability of the necessary social services to support the life-cycle needs of the occupants and the likely long-term demand for this type of accommodation in a rural location.

Special consideration should also be given to the design of clustered housing on the edges of small towns and villages or infill schemes in small towns. These can often provide opportunities for the strengthening of the local urban fabric and merit specific consideration at the design stage.

In the case of social housing, before deciding on locations for such dwellings, careful consideration should be given to the practicality and cost of providing adequate water supply and sewerage services.

In many cases the site may not be serviced by public water supply or sewerage services. In such circumstances, the site size will be dictated by the need to provide for water supply and sewage treatment on site. The area of the site must be adequate to allow for the safe disposal of the waste water from the sewage treatment plant, without contamination of the water supply source for the dwelling or adjacent dwellings, or of the groundwater generally. Drainage and wastewater disposal systems for houses must comply with the requirements of Part H of the Building Regulations. Guidance as to how these requirements can be met is given in *Technical Guidance Document H: Drainage and Waste Water Disposal.*[14]

04

Scheme Layout and Design

4.1 Local Area Plans

Where a proposed housing development will occupy an area that is part of a larger development site, an Action Plan or Local Area Plan should be prepared for the whole site. This plan should outline, in a general way, possible uses for the site and indicate their relationship to each other and to their surroundings. The location and layout of any proposed housing should be planned to enhance the attractiveness of the overall area for all residents, and should be properly integrated within the area as a whole. Where appropriate, an Urban Framework plan should form part of the overall Action Plan. The Urban Framework plan should address the pattern, structure or arrangement of development blocks, streets, buildings, open space and landscape and the spatial interrelationship between all these elements. It should provide the basis for integration or detailed design of individual elements of developments, existing or proposed for an area. Such elements include:

- **Landmarks:** the most recognisable features of an area. They may be historic as in the case of a castle, tower or landscape features such as a tree or a mound, or serve a particular function such as a church, shop or simply comprise a large or prominent building.
- **Gateways:** points of access, entry or exit between a movement network and an existing or proposed development area. They may include such features as road junctions and access points, railway stations and bridges.
- **Links:** corridors of activity that facilitate movement within and between existing and proposed development areas. They comprise networks that may include public transport routes, roads, streets, footpaths, cycle paths and linear open spaces such as vistas, public walks and routes.
- **Nodes:** generators and hubs of activity that may include such destinations as town, district, and local centres, public spaces, amenities and non-residential uses including schools and childcare facilities. They range in scale from major commercial centres to individual local features such as a crèche or play areas.
- **Edges**: these are barriers to movement that may contain or define existing or proposed development areas and may include walls, fences, hedges, rivers, canals, major roads, railway lines, large open spaces and overhead power lines. Edges are also an opportunity to create enclosure, to define places and to give character and expression to spaces, both public and private.

These elements should be examined in relation to the proposed development and should either reinforce or contribute to an existing urban design framework or act as a catalyst to generate a new and improved framework.

4.2 Design Approach

The main considerations underpinning the approach to the overall design of a housing scheme should be the need to facilitate a good quality of life for the residents, secure the long-term sustainability of the development and enhance the environment of the area as a whole.

Factors to be addressed include:

- the extent to which the scheme creates a pleasant, safe and secure living environment that provides a sense of identity and place and fosters the development of community; and
- the positive contribution that it makes to the overall environment of the locality, e.g., by integrating new housing into the existing natural and built environment in a way that contributes to the social, environmental and economic sustainability of the area.

In the planning and design of the scheme, the architect should:

- seek to create a high quality living environment for residents and enhance the social, environmental and visual quality of the area as a whole;
- seek to ensure a high level of safety and security for the residents. The layout should be designed to discourage anti-social behaviour, e.g., access ways and public areas should be overlooked by dwellings or be otherwise open to casual surveillance by residents;
- maximise amenity and energy efficiency by climate sensitive design that takes account of orientation, topography and surrounding features to control wind effects, while optimising the benefits of sunlight, daylight and solar gain;
- eliminate barriers to accessibility for all users - particularly older people and those with mobility impairment or other disability;
- seek to ensure that the scheme can be constructed, managed and maintained at reasonable cost and in a way that is economically, socially and environmentally sustainable, e.g., by using appropriate indigenous materials, optimising the use of infrastructure and minimising the lengths of roads and service runs, without compromising the quality of design of the scheme;
- design public open space so as to maximize its potential benefit to the residents, e.g., by eliminating small, poorly-defined or poorly integrated areas of public open space that are frequently unusable as well as being costly to maintain and a source of nuisance to residents; and
- promote the concepts of enclosure, clear separation of public/private realm and good permeability as the means to achieve a high quality living environment.

In general, residential schemes should be designed to the optimum densities consistent with proper planning and development of the area and in accordance with the objectives of the Development Plan for the area. Further guidance in relation to this is given in the Department of the Environment, Heritage and Local Government publication *Residential Density Guidelines for Local Authorities*[6].

4.3 Building Sustainable Communities

4.3.1 Diversity and mixed use

The Statement on Housing Policy, *Delivering Homes, Sustaining Communities*[1], sets out the Government's vision for housing in the coming years and identifies a wide range of measures to promote better homes, better neighbourhoods and better urban spaces.

Successful communities require a range of local services and facilities, including employment, commercial, educational, health, spiritual, civic amenities and services. These should be accessible from residential areas by safe and convenient routes.

In that connection, architects should consider carefully the following in the course of the development of the scheme design:

- the potential for strengthening the existing neighbourhood where identity is linked to a particular activity or tradition; and
- the need to ensure compatibility in any diversity of building use, thus avoiding later conflict.

The potential for introducing non-residential uses into a housing area can vary significantly between the centre and edge of a settlement. Mixed-use centres are best located at nodes, ref. 4.1 and along main movement routes, within walking distance of homes, so as to strengthen their identity. Each case should be considered individually but, in general, the availability of a school, shop and bus stop will usually be the minimum level of available services/facilities.

4.3.2 Dwelling Types

The choice of dwelling types will be influenced by the location and characteristics of the site, and the type and density of the scheme being proposed. In the case of social and affordable housing it should be determined primarily by the nature of housing need being addressed.

To avoid the monotony frequently associated with developments restricted to a single dwelling type or building height, consideration should be given to varying the heights of buildings, having regard to the objectives of the Development Plan for the area. Where it is considered appropriate to do so, the provision of higher buildings could be considered in key locations such as strategic corners, along principal routes, at the ends of vistas or on the edges of parks or large expanses of water.

The use of terraced dwellings affords advantages in terms of security, privacy, economic use of building land and economy with regard to construction and running costs, while affording scope for architectural expression.

The provision of apartment buildings can provide scope to increase densities and to create landmark buildings, to mark points of reference such as important junctions or entrances to schemes.

All dwellings should have clearly defined private open space, e.g., private garden space or adequately sized balcony. New dwellings should be integrated in a way that reinforces the existing or newly created streetscape, e.g., by adopting the existing building line. This may result in dwellings fronting directly onto the public realm. In such cases, care should be taken

to provide a measure of defensible space to the front of dwellings and to avoid potential hazards for passers-by arising from opening windows or projecting building elements. Similar considerations may also arise in the case of high-density schemes where the provision of traditional type garden spaces may be inappropriate.

4.3.3 Mix of Dwellings

The choice of mix of dwellings should be informed by the relevant Local Authority Housing Strategy.

In the case of social housing the mix of dwelling types should be based primarily on the results of the most recent assessment of housing need and the characteristics of households likely to be accommodated in the scheme. Regard should be had to current best estimates regarding the size and type of households likely to seek housing in the future and to the need to achieve a balanced mix of dwelling types, sizes and tenure, both in the immediate locality and in the housing stock as a whole. Larger schemes should be designed to accommodate a balanced range of household sizes and types, including apartments, duplex units and sheltered housing, where appropriate.

4.3.4 Densities

In general, the number of dwellings to be provided on a site should be determined by reference to the *Residential Density Guidelines*[6] published by the DoEHLG. The number of dwellings to be provided will be influenced by the location of the site, the proposed mix of dwelling types and the availability of public services, e.g., public transport, piped water supply and public sewerage system.

Generally, schemes should be built up to the maximum densities appropriate to proper planning and development and the objectives of the Development Plan for the area. The quality of design is of paramount importance to ensure the achievement of sustainable urban development. The DoEHLG guidelines on residential density indicate the type of location where higher densities are appropriate and provide guidance on the criteria that should be applied in order to protect the quality of the residential environment. Higher residential densities can be particularly appropriate in redeveloping brownfield sites, in proximity to the centres of towns, cities and public transport nodes.

Infill developments and urban redevelopment projects should respect the character of the existing neighbourhood. However, densities need not normally be restricted to comply with existing densities, where the latter are no longer appropriate having regard to the nature of the site location and transport accessibility. In the case of town and village extensions, development should consolidate the existing urban character and settlement pattern while realising the full potential of these sites.

4.3.5 Private Space

Provision for private open space should take account of the requirements of the Development Plan for the area. Insofar as practicable, all dwellings should be provided with private space adjacent to the dwellings. The private space associated with individual dwellings should be clearly defined relative to other adjoining public and private spaces. Particular care should be taken in the design of boundaries of dwellings to ensure that they enhance the visual quality of the scheme as a whole.

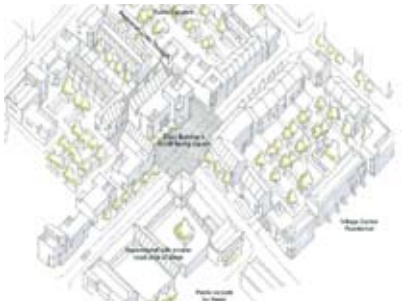
Rear gardens and similar private areas should be screened from public areas, e.g., by the appropriate location of the main building structure or outbuildings and by the provision of screen walls or fences, as necessary. Rear gardens should not back onto roads or public open spaces. Provision should be made for an appropriately sized clothes-drying area, with footpath access, screened from public view. Rear gardens should provide safe and secure play areas for small children. The rear garden should be overlooked from the window of a living area or kitchen. Boundaries to rear gardens should be robust and provide an adequate level of security and privacy.

For certain types of schemes, e.g., apartments, the scope for the provision of private space for individual dwellings may be limited. In such cases, provision should be made for balcony or other private space of suitable size. Balcony guards and railings should be carefully designed with safety, especially that of children, in mind. Railings and guards should be unclimbable by small children and balcony floors should have suitable upstands to prevent objects from falling over the edges. The possibility of converting a balcony into a winter garden, e.g., by the use of moveable screens, should be considered. Care should be taken to ensure that any such arrangement would not impinge on the fire safety requirements of Part B of the Building Regulations. The visual implications of any such arrangements, particularly in multi-storey buildings, should be considered. In that context, the use of recessed balconies may be more appropriate than projecting balconies.

Provision may also be required for shared open space and communal facilities, where these cannot be accommodated within the curtilage of the dwelling. Such areas need to be carefully designed to ensure that they do not detract from the visual quality of the scheme.

4.3.6 Apartments

Apartments constitute a significant proportion of new dwelling units in the larger cities and towns. The successful planning and design of apartments requires that particular attention be paid to a range of issues which normally pose less difficulties in the planning and design of traditional housing types. Factors requiring special consideration include provision for private open space and communal shared areas, play space, access, fire safety, sound insulation, storage, laundry facilities, refuse disposal, etc.



Insofar as the layout of the scheme is concerned, factors that need to be considered include:

- Disposition of apartment buildings on site and the relationship between heights of buildings and distances between them so as to provide;
  - maximum opportunity for dual aspect and cross ventilation for habitable rooms;
  - an adequate amount of public open space and useable private space; and
  - acceptable views from habitable rooms and apartments while maintaining a satisfactory degree of privacy.
- Provision of convenient and secure car-parking space with adequate provision for accessible parking spaces for people with disabilities. Where it is not possible to provide such spaces close to entrances to apartment buildings, consideration should be given to the provision of suitable ‘set-down’ space adjoining entrances; and

- Provision for communal storage/refuse collection points, including separate storage for recyclable materials as required by the local authority for the area. Such areas should be located and designed so as not to detract from the visual quality of the development while not compromising the need to ensure convenience and accessibility as well as safety and security for residents and management/ maintenance personnel using the facilities.

Additional guidance in relation to the planning and design of individual apartments is given in 5.1.2. In all cases designs should comply with the Development Plan for the area.

4.4 Design for Sustainability

4.4.1 General

A key aim in the design of any housing scheme should be to ensure that it is socially, environmentally and economically sustainable by:

- providing a high quality environment that meets the needs and, as far as possible, the preferences of the residents and fosters the development of community;
- achieving energy efficiency both at construction stage and during the lifetime of the scheme, e.g., by climate sensitive design which takes account of the orientation, topography and surrounding features so as to control wind effects, while optimising the benefits of daylight and solar gain;
- having due regard to the social and environmental consequences associated with the construction process and the use of materials and resources, e.g., minimizing the use of water and energy in construction, making efficient use of land, minimising the use of scarce non-renewable materials and using renewable resources and materials that have minimal environmental consequences, wherever practicable;
- integrating the new housing into the existing natural and built environment in a way that makes a positive contribution to the overall environment of the locality; and
- designing individual dwellings so that they are comfortable, adaptable to changing needs, cost effective to build and economic to manage and maintain.

4.4.2 Microclimate

The creation of a satisfactory microclimate for the housing scheme requires a balance between the provision of wind shelter and optimising the availability of daylight, sunlight and solar gain. Wind shelter, in addition to reducing the risk of wind-induced damage to buildings, can provide protection from driving rain, reduce energy requirements for space heating and make external spaces warmer and more usable, particularly for the young and old. Sunlight provides a feeling of warmth and well-being. Adequate daylighting can contribute significantly to the creation of a satisfactory living environment and, together with passive solar gain, can help reduce energy consumption and heating costs.

The degree to which the designer can favourably influence microclimate is frequently constrained by the size, location and nature of the site. In deciding on the site layout, designers should have regard to:

- scope for optimising daylighting and solar gain for dwellings, through the disposition and orientation of buildings;
- the scope for optimising the advantages of shelter and direct sunlight through the location and orientation of play areas, courtyards and gardens, relative to existing features such as buildings, walls, trees, hedges, both on and adjacent to the site;
- the scope for ground shaping and landscaping to provide shelter and to limit the extent of overshading of buildings, play areas and other areas that will be extensively used by residents; and
- the need to limit funnelling and channeling of the wind, e.g., by appropriate building spacing and orientation and the avoidance of long straight building lines and passageways between buildings.

Decisions regarding the retention or otherwise of on-site features, e.g., trees, vegetation or structures, should have regard to their potential to make a positive or negative contribution to the micro-climate of the finished scheme, e.g., the degree to which they may act as windbreaks or, alternatively, produce over-shading. It should be noted that the removal of any tree or trees may be prohibited by a Tree Preservation Order, made under the Planning Acts. The local authority for the area should be consulted for advice in this regard.

4.4.3 Transport

Every effort should be made to facilitate and encourage pedestrian access and the use of public transport by the residents. Sites from which amenities and services such as shops, schools (including pre-school facilities), community buildings, bus stops, train stations, etc. can be safely reached on foot, will have particular advantages.

The appropriate authorities should be consulted regarding current services in the area and to ascertain and make provision for future services, where appropriate. Where access to public transport is available, or is likely to become available, adjacent to the site, the layout of footpaths should facilitate safe and easy access to such services.

The planning and design of roads within housing schemes should aim:

- to facilitate pedestrians and cyclists and minimise, as far as possible, the need for the use of private cars. The relevant planning and transport authorities should be consulted to ensure that any necessary provision is made in the layout of the scheme for bus routes and bus stops at locations that are convenient for pedestrian access. The layout of pedestrian routes should facilitate access to those services; and
- the layout of the road network should be conducive to effective traffic control and traffic calming and adequate provision should be made for cycle paths, pedestrian routes and natural walkways in the overall design. Guidelines dealing with a range of road planning and traffic management issues are given in the publication *Traffic Management Guidelines Manual*[15], jointly published by the Department of Transport, the DoEHLG and the Dublin Transportation Office. These guidelines provide guidance on issues such as traffic planning, traffic calming and management, the incorporation of speed restraint measures in new residential designs and the provision of suitably designed facilities for public transport users and vulnerable road users. In relation

to vulnerable road users, the guidelines take account of cyclists, motorcyclists and pedestrians, including those with mobility or sensory impairments. The manual gives guidance on how the relevant guidelines should be examined and implemented in the context of overall transportation and land use policies.

4.4.4 Site Drainage

Proper surface water management is an important aspect of planning for sustainability.

Traditional drainage systems involve the collection and conveyance of surface water run-off through gullies and pipes, away from the site and into watercourses. This bypasses the natural buffering and filtration effects of percolation through the soil and increases the volumes and rates of runoff. This, in turn, can lead to flooding and other undesirable effects, such as contamination of water bodies. In the planning and design of any housing scheme the aim should be to maximise the use of existing natural drainage patterns and to limit the requirement for separate offsite disposal of surface water through the use of Sustainable Urban Drainage System (SUDS) methods. The Greater Dublin Strategic Drainage Study (GDSDS) 2005 is one of many useful documents for reference in this regard.

Sustainable Urban Drainage involves a more integrated approach to drainage than heretofore and requires that due consideration be given to overall land use planning, water quality, water disposal, creation of amenity spaces and wildlife habitat enhancement. The extent of surface water runoff should be controlled by the judicious use of permeable and semi-permeable surfaces and vegetation and by limiting the use of hard surfaces. Existing waterways, ponds and lakes should be utilised, where possible, and, in specific cases, the provision of artificial retention ponds for surface water may be considered. Such an approach can help to lessen the risk of flooding and can enhance amenity by increasing landscaping potential and providing varied wildlife habitats. It may also allow new development in areas where existing drainage systems are at, or close to, full capacity.

Where such measures are being proposed, designers should have particular regard for any health, safety, management and maintenance issues that can arise. The advice of the relevant section of the Local Authority for the area should be sought and measures taken to ensure compliance with the Development Plan.

4.4.5 Landscape and Ecology

New housing should respect the topographical environment of the area in which it is situated. Earthworks should be minimized, as far as possible, so as to require little or no transfer of material onto or off the site. Every effort should be made to retain existing trees and vegetation. In choosing vegetation for new and planting, indigenous species and those likely to provide an attractive wildlife habitat should be preferred (see also 3.3.5 and 4.9.5).

4.4.6 Materials

The choice of materials for site-works should be made having regard to overall environmental impact, performance in use, lifetime durability and maintenance requirements. Due regard should be had to the full lifecycle cost of the materials used and the potential for recycling and reuse. There should be a preference for material from renewable or recycled sources, where it is available and found to be economic and appropriate for the function. In order to limit the environmental impact and reduce the need to transport material on or

off site, the design should take account of the natural topography of the site. Any surplus material should be used for on-site filling or other purposes, where possible.

The design should aim to ensure that all materials are used efficiently with a minimum of waste. Where the scale of development warrants it, a waste management plan for the recycling of construction and demolition waste should be adopted at initial design stage. Guidance in relation to the preparation of waste management plans is given in the DoEHLG publication *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*[15].

4.5 Design for Safety and Security

4.5.1 Making safe places

A satisfactory level of safety and security is a key element in encouraging neighbourliness, fostering a sense of community and discouraging anti-social behaviour, vandalism and crime in a new housing area. The design should aim to ensure that roads, footpaths, play areas and other common areas in schemes, can be used in safety by children and adults. Public spaces should be designed in a way that fosters a sense of ownership and mutual protection and encourages people to take responsibility for these spaces.

Designing safe places requires that careful attention be given to issues such as:

- ensuring informal surveillance by putting “eyes on the street”, i.e. making buildings face the public realm and minimising exposed blank facades, avoiding blank walls and facades and maximising front door entrances;
- ensuring that play areas are located in areas to which there is safe and easy access for children and which are overlooked from adjoining dwellings;
- locating car parking on-street in front of buildings or in secure private courtyards. If underground car parking is provided it should be well lit and access points should be located where they are overlooked from adjoining dwellings; and
- taking care with the choice of type and location of planting, so as to avoid blind corners and minimise the risk of planting being used as cover by potential assailants, burglars and the like.

The layout and design of roads within residential areas should aim to ensure that traffic volumes and speeds are appropriate and that through vehicular traffic is discouraged. Additional guidance on this issue is given in Chapter 4.

Materials used for hard surfaces, play areas, etc., should be chosen with due regard for safety in use. The general layout and design of the scheme should aim to minimise potential hazards, e.g., in the treatment of changes of level and of open watercourses that may be retained or created. Adequate lighting should be provided for roads and pedestrian routes, including routes from public areas to dwelling entrances and from dwellings to external stores.

4.5.2 Design for Security

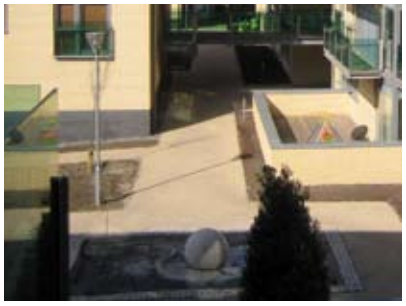
All development schemes must be designed so as to reduce the potential for criminal activity and anti-social behaviour but care should be taken to ensure that the measures taken will not adversely affect the safety of the residents, e.g., through limiting the means of escape in the case of fire or other emergency and do not compromise the aesthetic and environmental quality of the project.

The layout should be such as to provide the greatest possible degree of natural surveillance consistent with the need to maintain privacy. All public and semi-public areas should be overlooked. Footpaths, other than footpaths beside roads, should be short and direct, with each end visible from the other end, as far as possible. Roads and footpaths should be adequately lit. The scheme should be designed to eliminate dark, hidden or secluded public areas and should review the following items:

- the fronts of dwellings should be overlooked from other dwellings or from well trafficked public areas. “Blind” gables next to public areas and gables not visible from other dwellings or from public areas should be avoided;
- access via back lanes or side passage-ways should be avoided where possible. Back gardens should back onto other back gardens or onto secure private areas, but not onto roadways or public areas. The need for separate access to the rear of dwellings should be avoided as far as possible. If provision is considered essential, such rear access routes should not be linked in a way that provides through routes. Particular attention should be paid to security where dwellings adjoin open spaces or adjoin areas that are difficult to secure e.g., open land, industrial estates, railway lines or sidings;
- security at points of entry to dwellings requires careful consideration. Such entrance points should be overlooked, where possible, and should be adequately lit. Where it is necessary to use common entrances, e.g., in apartments, access to the building should be confined to residents, their guests and others who have legitimate business in the building;
- common entrances should be arranged so that as few households as possible share each entrance. If more than four households share a common entrance, a system of controlled entry should be considered, that does not hinder those with visual or healing impairments. Common areas in the vicinity of such entrances should be adequately lit and designed to discourage loitering;
- service meters should be securely housed and located within private garden areas or, in the case of apartments, in a shared common area, where they are open to surveillance and can be read without the need to enter the dwelling; and
- materials used in the boundaries between public and private areas should be sufficiently robust to discourage vandalism.

Early consultation with the Crime Prevention Design Advisor (CPDA) of An Garda Síochána[16] is advisable so as to ensure that features of the scheme that might encourage anti-social or criminal behaviour, or inhibit community-policing objectives, can be identified and appropriately dealt with at the design stage. The CPDA will also advise on the operation of

the joint Garda/National Standards Authority of Ireland (NSAI) Certification Scheme[17], devised to encourage the adoption of crime prevention measures in development design so as to assist in creating a safer and more secure environment, thereby reducing the opportunity for crime and the fear of crime.



4.6 Accessibility

Part M of the Building Regulations, *Access for People with Disabilities*[14], requires that dwellings are visitable by people with disabilities and that buildings, other than dwellings, are accessible and usable by people with disabilities. The underlying philosophy on which these requirements are based is that buildings should be accessible and usable by everyone, including people with disabilities. Those involved in the design and construction of housing developments should have regard to the philosophy of universal access and should consider making additional provision where practicable and appropriate.

The design and layout of a housing scheme should provide safe and convenient access to all dwellings within the scheme and to adjacent facilities and services. The needs of pedestrians, especially children, persons with impaired mobility and older people, should be accorded particular importance along with measures to facilitate cyclists and to minimise the need for reliance on private cars.

The design should aim to minimise vehicle flows and speeds within the housing scheme and to discourage through vehicular traffic. However, care should be taken to ensure that adequate provision is made for access for fire, ambulance, other emergency services, as well as for refuse collection and other service and delivery vehicles. The works should be designed in a way that contributes to safety and security but does not detract from the attractiveness of the scheme overall.

4.7 Vehicular and Pedestrian Circulation

4.7.1 Streets, roads, footpaths and cycleways

Streets, roads, footpaths and cycle facilities in housing schemes should be designed taking account of the recommendations in the *Traffic Management Guidelines Manual*[18], jointly published by the Department of Transport, the Department of the Environment, Heritage and Local Government and the Dublin Transportation Office.

The design approach may provide for pedestrians and vehicles sharing the use of the same surface, e.g., in cluster housing or courtyard type layouts where separate roadways for vehicles and footpaths for pedestrians are not provided. Signs, road markings, surface texture or other appropriate measures should be used to indicate that vehicles do not have priority over pedestrians and other users. Particular attention should be paid to the design of entry points to such shared surfaces or homezones. For example, the use of tight kerb radii, ramps at entry points and distinctive surface materials and colours on shared surfaces will help to emphasise the difference between shared surfaces and other types of roadway. In such areas, the aim should be to use design and layout measures to restrict maximum vehicle speeds to safe levels.

Footpaths should be provided to facilitate pedestrian movement within and through the scheme and to provide easy and convenient access to facilities and services adjacent to

the scheme. In traditional layouts, footpaths should normally be provided on both sides of roadways. Where dwelling access is confined to one side of a roadway, a footway on that side only may suffice. Where routes, other than those alongside the roadway, are likely to be preferred by pedestrians, consideration should be given to the provision of footpaths on such routes. Such footpaths should be as short as possible. In the interest of safety and security, it is desirable that no part is hidden from general view, either from the roadway or nearby dwellings.

Where footpaths cross road kerbs, the kerbs should be dished to facilitate people using prams, buggies and wheelchairs and the surfaces should be appropriately textured or marked to facilitate people with sight impairment. All footpaths should be provided with adequate public lighting.

The scheme should be designed to allow for safe and convenient access by cyclists, taking account of the guidance in the *Traffic Management Guidelines Manual*[18]. The provision of specific on-road or segregated cycle facilities may need to be considered, depending on likely vehicle volumes or vehicle speeds.

4.7.2 Parking

Parking provision should be limited to that necessary to meet the estimated needs of the residents, visitors and users of delivery and service vehicles. Account should be taken of the location, proximity to public transport systems and the likely level of vehicle ownership.

Provision for residents' parking should be situated as close as practicable to, and within view of, the dwelling entrance. The approach from the car-parking space to the dwelling or apartment block entrance should be level or gently sloping. All parking should be so located as to be overlooked from dwellings.

Particular care should be taken to ensure that car-parking areas are located, detailed and landscaped in a way that does not detract from the visual quality of the scheme. Consideration should be given to temporary set down parking on-grade in high-density schemes for disabled residents parking.

4.8 Services

4.8.1 Water Supply

Every dwelling should be provided with an adequate supply of water for drinking, culinary use and other general domestic purposes, which should comply with current water quality standards and regulations[19] set down by the Department of the Environment, Heritage and Local Government.

The relevant Fire Authority should be consulted regarding water supply for fire-fighting purposes.

4.8.2 Sewerage

The discharge of foul water should be to a public sewer or to a sewer that forms part of an approved group sewerage scheme. Where, in exceptional circumstances, this is not possible, provision should be made for treatment of sewerage and disposal of effluent using an appropriate waste water treatment system. Guidance on waste water treatment systems is given in the Environmental Protection Agency publications *Waste Water Treatment Manuals*[21].

4.8.3 Other Services

Every dwelling should be connected to the electricity network and to the telephone, natural gas supply and TV signal via cable networks, where available. The pipework and cabling associated with such provision should be located underground. This should be facilitated by the provision of the necessary trenching and ductwork at the scheme construction stage, following consultation with the various service undertakers regarding their requirements.

4.8.4 Location of Underground Services

The established practice of the local authority and the preferences of the relevant utilities and non-statutory bodies regarding routing and disposition of sewers, watermains and other underground services relative to each other, should be ascertained and, as far as possible, this should remain constant throughout the scheme.

The location of sewers, drains and other services in private areas adjacent to dwellings should allow for possible future extensions without the need for significant re-routing of such services.

4.9 Community Facilities and the Public Realm

4.9.1 Community Facilities and Services

Consideration should be given to the availability of key services and amenities, such as shops, schools (including pre-school facilities), churches, parks and playing fields, community meeting places, recreation and leisure facilities. Many new schemes will be relatively small and located within existing settlements where such facilities already exist. For larger proposals, schemes that form part of larger developments or strategic framework plans and for individual schemes, the provision of services and amenities either within or adjacent to the site of a proposed scheme may need to be considered. Sources of funding for the capital cost and the management and maintenance costs of such facilities should be established at the early planning stage of the project.

4.9.2 Enhancing the Public Realm

The quality of the public realm in cities, towns and villages and within housing schemes is particularly important in the creation of environments in which people want to live and work.

The three-dimensional mass of buildings helps to define the public realm. Designers should take into account the various proportions and scale of development around spaces to ensure high quality in the public realm. Detailed attention to the structure of a space and the elements that it contains is required to create a comfortable and stimulating public realm that encourages social interaction.

The following should be considered in the context of housing scheme design:

- provision of spaces which offer scope for compatible social leisure activities adjacent to living areas;
- establishment of routes that can enable people to pass through such spaces to other areas within the development;
- the retention of existing historic elements, features or landmarks or the provision of local community-driven arts projects;

- careful choice of planting to define and complement open spaces or areas adjoining housing units;
- careful attention to the design of street furniture, such as lights, shelters, bollards, signs, etc; and
- the use of public art in a way that helps to foster a sense of community by building on local character and/or creating a new sense of local identity.

4.9.3 Public Open Space and Landscape Design

Open spaces can vary in scale and function from nature reserves, woodlands and parks, to squares, courtyards, playgrounds, communal areas, semi-private spaces and private gardens. The scale and design of public spaces should be appropriate to the particular context and should be defined by appropriately scaled buildings and trees fronting onto them.

The character and function of open spaces that should be provided in a housing development depends on the type of housing scheme, the needs of the residents of the area and the amount of existing open space in the area. The type of spaces required should be defined in the design brief. In designing open spaces, the following should be considered:

- public open spaces should be designed as important nodes in the sustainable place-making hierarchy, regardless of scale or type, in order to facilitate community interaction and create a sense of place;
- it may be appropriate to locate play areas and landscaped spaces close to neighbourhood centres or local area nodes such as crèches and to locate playing pitches, tennis courts, etc., close to community centres or on the edge of existing major parks or public open spaces;
- public open spaces should be appropriately located, should preferably have a south or west facing aspect and be overlooked by adjoining dwellings or from frequented roads or footpaths to ensure that there is a measure of passive surveillance;
- outdoor space should be given a clear function, character, shape and definition with distinct boundaries, through the positioning of adjacent buildings, walls, fencing, trees and hedges;
- open space should be laid out so that it is attractive and useable by the residents. Large undefined areas and negative leftover type spaces should be avoided, as should pockets of badly shaped, fragmented or unusable land which are difficult to maintain and may become locations for anti-social behaviour; and
- reference should be made to the relevant local authority Development Plan for open space requirements and standards.

4.9.4 Children's Play Space

Private, secure space attached to the dwelling should be the primary space for play for small children. However consideration should be given to the needs of different age groups. Where safe, secure and well-managed playgrounds suitable for older children are not already available in reasonable proximity to the scheme, consideration should be given to providing space for such facilities. The installation of playground equipment should be deferred until

there is a clearly identified demand from the residents and proper arrangements can be made for management and supervision of the facility. Playgrounds should be located so that they can be overlooked informally from dwellings. They should not be so located that they become sources of nuisance to residents, particularly older people. The Office of the Minister for Children (OMC) should be consulted and account should be taken of policies in relation to children's play, set out in the OMC policy document *Ready, Steady, Play - A National Play Policy*[22].

4.9.5 Landscaping

Provision should be made for soft and hard landscaping of common open space areas, boundaries and private gardens as appropriate. Appropriate plant species and landscaping materials with good resistance to accidental damage and with low maintenance characteristics should normally be chosen, with due regard to the need for visual variety from diversity of species. Semi-mature planting should be considered in appropriate cases. Vegetation requiring regular watering in dry periods should be avoided. Every effort should be made to retain existing trees, shrubs and other landscape features. Care should be taken to ensure that retained and new trees or other features do not pose a risk of injury to persons or damage to dwellings or other structures. Landscaping work should be carried out by specialists and, in social housing projects, this should be included in the building contract.

4.9.6 Public Art

The "Per Cent for Art Scheme" is available to all public bodies delivering capital construction projects, including social housing projects. This scheme provides that, within the overall budget, funding may be allocated for the purpose of carrying out art projects that would help to enhance the quality of the environment. It may be possible to accumulate the funding allowed from a number of projects or combine funding from the "Per Cent for Art Scheme" with funding from other similar schemes operated by other Departments or public bodies and apply the accumulated fund for a single appropriate art project. Every effort should be made to involve the community in the commissioning process as far as practicable.

The Department of Arts, Sport and Tourism publication, *Public Art: Per Cent for Art Scheme*[23], gives guidance in relation to the scheme, including the level of funding allowed and the operational procedures that should be followed.

05

Dwelling Design

5.1 Design Approach

5.1.1 Key Issues

The primary design aim should be to create visually attractive dwellings that will provide appropriate accommodation and good quality living environments for prospective occupants. Dwellings should be suited to the needs of the occupants and be designed to have reasonable levels of cost-in-use over their full lifetime with regard maintenance. Insofar as possible, the designer should consider the particular needs and preferences of the future occupants and their likely response to particular design solutions. Direct consultation with future occupants is preferable but not always possible. In the case of social housing, the designer may need to rely on the guidance of the housing authority and other public service agencies. Key issues to be addressed by the design team include making provision for:

- ease of access to, circulation within and use of the dwelling;
- an adequate level of amenities, such as kitchen facilities, storage areas, sanitary and bathroom facilities, space and water heating, electrical and other services;
- accommodating the range of diverse activities likely to be met in normal day-to-day living;
- economic, social and environmental sustainability, taking account of the needs of the occupants and the wider environmental impact associated with the construction and use of the dwelling;
- the safety and security of the occupants;
- compliance with the requirements of the Building Regulations; and
- represent value for money and require a reasonable level of maintenance costs in use.

Products, materials and methods of construction used in the construction of new housing must comply with the requirements of Part D of the Building Regulations. Guidance as to how the requirements can be met is given in *Technical Guidance Document D - Materials and Workmanship*[14]. It includes guidance on appropriate methods of certification for materials and products that cannot be shown from experience in use to possess the necessary qualities of performance and durability. The key elements of the building should have a service life in the order of 60 years, during which period no excessive expenditure should be required on operation, maintenance or repair. Further guidance in relation to the durability of buildings, building elements, products and components is given in British Standard BS 7543[24].

Materials such as timber used in construction should be obtained from sustainably managed sources.

5.1.2 Apartments

Apartments should be designed to provide good quality, permanent and sustainable living accommodation. The design approach should not be predicated on the assumption that apartment living is a transient phase in the life of people who will eventually move to a house.

Specific issues that need to be considered in relation to the site layout of apartments are dealt with in 4.3.6. Insofar as the design of individual apartments is concerned, factors that need particular consideration include the following:

- the range of apartment type and size, together with the range of other dwelling types in a development, should provide for a balanced community;
- recommended spatial standards are set out in 5.3.2;
- the design should provide for well-proportioned rooms with adequate daylight and cross ventilation. Single aspect apartments which face north should be avoided as far as possible and every effort should be made to ensure that kitchen areas are provided with natural lighting;
- in the case of shared entrances, care should be taken to reduce the impact of long-term management and maintenance. Provision should be made for controlled entry, long access corridors should be avoided and internal finishes should be durable. The number of apartments served by one entrance should be kept to the minimum, consistent with the need to make the best use of the site, in terms of the number and type of dwellings to be provided;
- statutory requirements for access for people with disabilities are set out in Part M of the Building Regulations. Common stairs should be designed in accordance with Part K of the Building Regulations. The need for lift access should be given particular consideration, not only from the point of view of facilitating people with disabilities but also in the context of sustainable living for all users. Parallel with this is the need to consider the arrangements that should be put in place to ensure the ongoing management of communal services and facilities. Where a lift is not provided initially, space should be provided for the future installation of such a lift;
- the design should aim to facilitate future adaptability, e.g., by locating the kitchen/bathroom core in a way that allows for different layout possibilities. External private space, e.g., a balcony or patio, should be orientated to make best use of available views and sunlight and be adequate in size to accommodate a small table and a number of chairs. The possibility of converting such a space into a winter garden, e.g., by the use of moveable screens, should be considered (see 4.3.5);
- apartment design measures to minimise visual and acoustic intrusion are particularly important. Private open spaces and balconies should be located so as to minimise overlooking from adjoining balconies. Dwellings should be planned to ensure that noisier living areas are remote from the quieter bedroom areas (which may also be used for study purposes) in adjoining dwellings. The requirements of Part E of the Building Regulations must be complied with in relation to sound insulation of dwellings. Guidance as to how the requirements of Part E can be met is given in *Technical Guidance Document E - Sound*[14]; and
- provision for adequate storage is also very important for apartment dwellings. Where provision cannot normally be made within the dwelling (e.g., bicycles, refuse containers, fuel, etc.) there should be safe and convenient access to external or common storage areas (see 4.3.6 and 5.6.5).

In all cases, the relevant requirements of the Local Authority Development Plan for the area should be complied with.

5.2 Flexibility and Adaptability

All new housing should be reasonably accessible for older people, the very young and people with disabilities

Designers should consider not just the immediate needs of the prospective occupants but also their changing needs over the life of the dwelling. In so far as practicable, the design should provide for flexibility in use, accessibility and adaptability. The aim should be to ensure that dwellings can meet the changing needs of occupants over their lifetimes, including needs associated with moderate mobility difficulties and the normal frailty associated with old age. Older people or persons with moderate disabilities, who wish to remain independent in their own home, should be able to do so without the need for costly and disruptive remodelling of the dwelling. Guidance in relation to the design of "Lifetime Homes" is given in *Meeting Part M and designing Lifetime Homes*[25] published by the Joseph Rowntree Foundation (JRF). A schedule of JRF recommendations is attached as Appendix (ii) to these guidelines.

Where special housing provision is necessary, e.g., for those with severe mobility difficulties necessitating the use of a wheelchair, design guidance is given in the Habinteg Housing Association publication *Wheelchair Housing Design Guide*[26].

5.3 Internal Layout and Space Provision

When adopted, the Consultation Draft Guidelines for Planning Authorities *Sustainable Urban Housing: Design Standards for Apartments* will be the spatial guidelines for Local Authorities in this regard[27].

5.3.1 General Principles

Floor plans should provide for the comfort, convenience and safety of the occupants in their use of the dwelling. The design of each room should facilitate the main activities likely to be carried out in that room. Related or compatible activities should be accommodated in the same room or in adjacent rooms or spaces, e.g., dining areas should be close to food preparation. The layout should also provide for the separation of incompatible activities as far as possible, e.g., noisy group activity areas should be remote from study or relaxation areas. The plan should provide for reasonable privacy for living rooms and bedrooms, taking account of likely internal and external sources of noise. To cater for the possibility that the occupant of a dwelling may have reduced mobility in the future, the potential for providing bed space at the main entrance level should be considered. Such an arrangement may also facilitate 'working from home' possibilities.

The layout of the dwelling should be designed to make effective use of natural daylight and sunlight, as far as practicable. Dwellings should be oriented so that all main rooms get direct sunlight at some time during the day. Windows should be adequately sized and room shapes should be designed to allow good daylight penetration. Care should be taken to minimise obstruction of daylighting to nearby windows by protruding extensions or outbuildings.

The size, shape and location of windows should be designed to obtain optimal benefit from available views, with due regard for the need for privacy. A view to the street from a habitable area is desirable. Window locations should facilitate supervision of small children at play in private external space and also allow surveillance of the immediate surroundings of the dwelling. Living room windowsills should normally be below the eye-level of seated persons. It should be noted that safety glazing and/or guarding of glazed areas is required in certain circumstances. The statutory requirements are set out in Part K of the Building Regulations and guidance as to how the requirements can be met is given in *Technical Guidance Document K - Stairways, Ladders, Ramps and Guards.*[14]

5.3.2 Space Requirements and Room Sizes

Space requirements and room sizes are primarily determined by the uses of individual rooms and spaces. Adequate floor areas and room sizes are important considerations but do not necessarily create good quality living spaces. Living room and bedroom spaces should be well proportioned, in terms of floor shapes and ceiling heights, so as to provide a good quality living environment for the occupants.

Space provision should be adequate to accommodate appropriate furniture and equipment in each room while allowing free circulation within that area. In general, adequate space should be provided for the following:

- the normal range, and typical arrangement of, furniture for each room;
- a reasonable degree of freedom of circulation, appropriate to the likely activities;
- the movement of larger items of furniture into and between rooms;
- space for family gatherings, including occasional visitors;
- working area and storage facilities appropriate to the likely activities;
- door swings which do not interfere with other doors, furniture or circulation routes; and
- the location of heating radiators and other service fittings in a way that does not limit the arrangement of furniture within a room.

The table opposite 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.

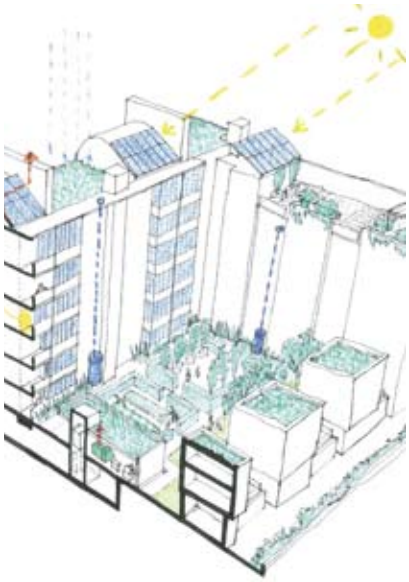
The recommended minimum unobstructed living room widths are **3.3 metres** for one bedroom, **3.6 metres** for two bedroom and **3.8 metres** for three bedroom dwellings, and the minimum room widths for bedrooms are **2.8 metres** for double bedrooms and **2.1 metres** for single bedrooms.

Table 5.1 over relates to standard dwellings for people for whom no special provision is required. Floor areas for dwellings designed to accommodate older people, disabled

people and others with special needs, may vary from these, depending on the particular requirements to be met. This will also apply in the case where the accommodation is not self-contained and a degree of communal sharing of facilities is provided, e.g., communal kitchen, sanitary facilities or living room.

Table 5.1: Space provision and room sizes for typical dwellings

DWELLING TYPE	TARGET GROSS FLOOR AREA	MINIMUM - MAIN LIVING ROOM	AGGREGATE LIVING AREA	AGGREGATE BEDROOM AREA	STORAGE
	(m^2)	(m^2)	(m^2)	(m^2)	(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



5.4 Sustainability and Energy Efficiency

5.4.1 Sustainable Energy

The concept of sustainable energy encompasses the generation and efficient use of energy in a way that allows us to meet present needs without compromising the ability of future generations to meet their own needs.

Maximising the sustainability of social housing through improved thermal performance and insulation standards, thereby reducing greenhouse gas emissions due to lower energy requirements, will contribute to the achievement of Ireland's commitments under the Kyoto Protocol.

In relation to dwellings, design for sustainability involves:

- locating dwellings close to shops, schools, workplaces, and transport nodes;
- optimising the energy performance of the building so as to reduce CO_2 emissions in the context of the general intention of substantially improving the energy efficiency of new homes by 40%;
- making optimum use of renewable materials and reducing the need for the use of natural resources and non-renewable materials in the construction and future maintenance of the building;
- reducing the consumption of natural and scarce resources during the lifetime of the building through the use of efficient, low-maintenance systems, components and fittings;
- the maintenance of a high quality indoor environment, e.g., through avoidance of the use of products and materials that may adversely affect indoor air quality or comfort;
- minimisation of waste production during the construction process and provision for recycling of both construction waste and domestic waste generated during the maintenance of the building;
- design for flexibility so as to facilitate future adaptation to the changing needs of the occupants and the maximisation of the building's lifespan; and
- greater use of materials from local, sustainable sources, where available.

During the design process, regard should be had to the implications for sustainability of all aspects of dwelling design.

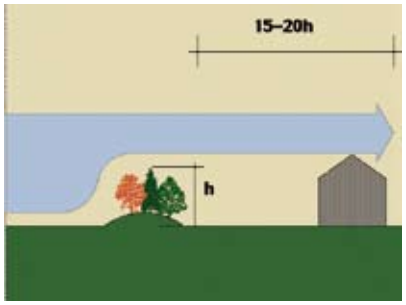
Dwelling Energy Assessment Procedure (DEAP) is the official Irish procedure for calculating and assessing the energy performance of dwellings. Published by Sustainable Energy Ireland (SEI), the procedure takes account of the energy required, for space heating, ventilation, water heating and lighting, less savings from energy generation technologies. It calculates both the CO_2 emission rate and energy consumption per annum. This is a useful tool for designers when considering and comparing options to conserve energy and reduce CO_2 emission.

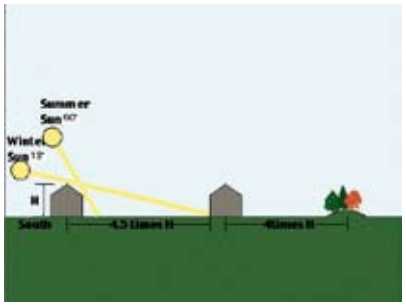
The right design decisions in relation to building form, dwelling layout, levels of insulation, amount and orientation of glazing, utilisation of solar energy, heating system and fuel type, use of draught lobbies, construction materials and measures to conserve potable water, can

contribute greatly to sustainability. In addition these will lead to cost savings, in the long term, while raising the level of comfort for the occupants of the dwelling.

DEAP is also used to calculate the Building Energy Rating (BER) of a dwelling. The BER must be supplied to the buyer or tenant when a building is constructed, sold or let. The BER is a label containing the energy performance of the dwelling, expressed in kilowatt hours per square metre per annum (kWh/m2/per annum) and illustrated as an Energy Rating (A1, B1, B2, B3 etc) for the dwelling, it also includes an estimation of the CO_2 emissions associated with this energy use and an advisory report. Guidance and assistance on these and other matters pertaining to the sustainable use of energy is available from Sustainable Energy Ireland (SEI).

Improving the energy efficiency and comfort conditions of homes in a cost effective manner requires careful consideration of many issues at the design stage. Priority should be given to compactness of design, orientation, thermal insulation and air change management on the basis that they should not entail significant additional capital cost if addressed properly at the design stage, should not require the active management of the householder, and continue to deliver cost and comfort benefits throughout the life of the building. Other issues include consideration of the life expectancy relative to the building as a whole, the need for regular maintenance to maintain optimum performance, and embodied energy requirements of proposed materials or components. Cost-in-use assessments comparing capital to operating costs should be used to inform the design process.





5.4.2 Daylighting and Solar Gain

The importance of the scheme layout in influencing the micro-climate around dwellings has been emphasised in 4.4.2. The orientation of the dwelling on site, the internal layout of the dwelling and window orientation, can affect significantly the level of daylighting within the dwelling and the impact of solar gain on internal temperature. Where feasible, the main habitable rooms should have south and/or west facades. It is also desirable that bedrooms have a southerly or easterly aspect. Circulation and ancillary areas may be located on the north side. For all dwellings, including apartments, at least one main living room should be facing within 90° of due south. As high a proportion as practicable of the glazed areas of the dwelling should be facing within 30° of due south so as to maximise solar gain. The amount of north facing glazing should be minimised. Depending on site layout and degree of over shading by trees or other buildings in summertime, it may be necessary to make provision for shading against excessive solar gain. For rooms likely to experience high levels of solar gain, at least some elements of the room enclosure should have high thermal capacity, e.g., masonry or concrete components.

5.4.3 Thermal insulation

Mandatory standards for thermal insulation in new dwellings are laid down in Part L of the Building Regulations. Guidance as to how these standards may be met is given in *Technical Guidance Document L - Conservation of fuel and energy*[14] currently under revision. In individual cases where the aim is to exceed statutory requirements an innovative approach should be encouraged within specific best practice.

5.4.4 Fuels and Heating

Efficiency, affordability and environmental impact, e.g., emissions of CO_2 and other harmful gasses, are particularly important in the context of sustainability. It is recognised that natural

gas is the most efficient non-renewable source of fuel for space heating. Designers may however wish to consider the possibility of utilising renewable sources of energy such as solar collectors, photo-voltaic, hydropower, wind power, wood pellets, biogas, geothermal sources, or where available local source of waste heat energy etc. For apartment buildings over 1000m^2, the Energy Performance of Buildings Directive, requires designers to carry out a feasibility assessment of alternative energy systems before construction. Guidance and assistance on this is available from Sustainable Energy Ireland (SEI).

Designers should aim to address issues relating to fuel poverty. Factors to be taken into account in choosing the heating system and fuel for space and water heating are detailed in 5.8.7.

5.4.5 Construction Materials

The factors outlined in 4.4.6, in relation to the choice of materials for site works are also relevant to materials used for dwelling construction. The design should ensure that, as far as possible, standard sizes of materials and components can be used, with minimum need for on-site modification and associated construction waste. In addition, in relation to materials for internal finishes and fittings, designers should choose non-toxic materials. Care should be taken to limit emissions of pollutants such as formaldehyde, solvent vapours and other volatile organic compounds that can adversely affect indoor air quality.

External finishes should be durable and maintenance free, as far as possible, particularly in inaccessible areas or areas which cannot easily be reached for maintenance purposes.

5.4.6 Water

The design should aim to conserve potable water, insofar as practicable, having regard to the requirements of the relevant Sanitary Authority. Water saving fittings, e.g., showerheads, taps, toilet cisterns and other appliances should be used, where feasible and acceptable. Consideration should be given to the collection and safe storage of rainwater and its use for purposes other than human consumption.

5.4.7 Waste

Every effort should be made at both design and construction stages to minimise the amount of waste associated with the construction process. Where the possibility of recycling construction waste exists, provision should be made for appropriate separation of demolition and construction waste.

Guidance in relation to the preparation of waste management plans is given in DoEHLG publication *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.*[15]

In relation to domestic waste, provision should be made for the storage of recycling bins, garden-composting facilities, etc. The requirements of the local authority and its statutory waste management plan in this regard should be ascertained.

5.5 Access and Circulation

5.5.1 Access

Every dwelling should be provided with a safe and convenient means of access. Circulation within dwellings should provide a safe and convenient route from the main access point to each of the main areas within the dwelling. Circulation spaces, including lifts, should

allow safe and comfortable movement between the various areas, without causing undue interference with the use of those areas, and should be adequate in size to allow for the movement of larger items of furniture, bicycles, etc. In case of emergency, it should be possible to move a stretcher from internal habitable rooms to an emergency service access area.

Access and circulation arrangements should have regard to the varying needs of occupants over their lifetimes, including needs associated with moderate mobility difficulties and the normal frailty associated with old age. It should be possible for older people and moderately disabled persons to gain access to, and circulate within, the dwelling without undue difficulty. In that connection care should be taken in the selection of automatic door closer mechanisms so as to ensure that they are operable by people with disabilities while ensuring that fire safety and security requirements are not compromised.

Part M of the Building Regulations sets out the provision that must be made in a building to enable people with disabilities to safely and independently gain access to and use the building. Guidance as to how the requirements can be met is given in *Technical Guidance Document M - Access for People with Disabilities.*[14]

The document gives guidance on the minimum level of provision to meet the requirements. The underlying philosophy on which these requirements are based is that buildings should be accessible and usable by everyone, including people with disabilities. Those involved in the design and construction of buildings should have regard to the philosophy of universal access and should consider making additional provision where practicable and appropriate. It should be remembered that features, such as ramps, level entrances, wider doors and access corridors, etc., would also facilitate ease of circulation for children and older people.

In relation to dwellings, T*echnical Guidance Document M* gives guidance on such matters as

- the provision of a convenient approach to the dwelling and ease of access into the dwelling (including standards for pathway widths and gradients, steps, location of landings, provision of kerbing, handrails and guarding to changes in level, shelter for and lighting of entrance areas, minimum door widths, level thresholds, etc.);
- access to habitable rooms at entry level (including convenient layout of rooms, hallway and corridor widths, minimum door widths, stairway design, position of light switches and door handles, etc.); and
- access to and use of a WC by people with disabilities, including location and size of compartment and layout of sanitary fittings.

5.5.2 Circulation

Access to each of the principal rooms, including the main bathroom/WC, should be directly from the main internal circulation area and not from another room. However, the dining room may open off the main living room and/or the kitchen without direct access from the circulation area. Where the dining area is not integrated with the kitchen, it should be adjacent to the kitchen and movement between those areas should not require the negotiation of steps or stairways. In smaller dwellings, the kitchen may be an annexe to the living room and open directly off it. The kitchen should be located so that there is a convenient route to the front access door and the door leading to the rear garden, where provided.

As a general rule the living room (or main family room) should be at entrance level.

Hallways and corridors within the dwelling should be free of intermediate steps. There should be adequate circulation space for wheelchair users at entry level, affording them access to the main rooms within the living area, e.g., sitting room, dining area and kitchen, with space to turn a wheelchair within this area.

In dwellings of two or more storeys, where there is no bedroom at entry level, there should be space within the living area at entry level that could conveniently and safely accommodate a bed space. The stairs design should be designed to allow future provision of a stair lift. The possible future location of a 'through-the-floor' lift, e.g., from the ground floor hall to a landing area next to the bathroom on the first floor, should also be considered at design stage.

Guidance in relation to the design of "Lifetime Homes" is given in *Meeting Part M and designing Lifetime Homes*[25] published by the Joseph Rowntree Foundation (JRF). For ease of reference, a schedule of JRF recommendations is attached as Appendix (ii) to these guidelines.

5.6 Safety and Security in the Home

5.6.1 General

Many design decisions can have safety and/or security implications. Compliance with the Building Regulations is mandatory in the design and construction of new dwellings.

Parts B, J and K of the Building Regulations deal with:

- fire safety, including means of escape in the case of fire, fire alarms, and limitation of fire spread;
- the installation and location of heat producing appliances and associated flues and storage tanks; and
- the design of stairs, ramps and guards.

Guidance as to how the requirements of Parts B, J and K of the Regulations can be met is given in *Technical Guidance Documents B - Fire Safety, J - Heat Producing Appliances and K - Stairs, Ladders, Ramps and Guards*[14].

Statutory requirements in relation to the health and safety of people involved in the construction and maintenance of buildings are set down in the *Safety, Health and Welfare at Work (Construction) Regulations*[26]. Guidelines on how these requirements can be met are contained in the *Guidelines to the Regulations*[29], published by the Health and Safety Authority.

Designers should consider 'safety-in-use' requirements for apartments and houses so as to minimise the risks of accidents in the home, bearing in mind the physical needs of children and the infirm.

Careful attention to security can significantly reduce the risk of break-ins and burglaries. The extent to which the designer should focus on security issues depends on the nature and

location of the building and the degree of vulnerability of the prospective occupants. Where appropriate, the *Crime Prevention Design Advisor*[16] (CPDA) of An Garda Síochána should be consulted regarding the security aspects of the dwelling design. Designers should ensure that decisions on security measures do not adversely affect the safety of the occupants e.g., through limiting the means of escape in the case of fire or other emergency. They should also ensure that such security measures are integrated in the design in a way that does not compromise the aesthetic and environmental quality of the project.

5.6.2 Security: Prevention of Unauthorised Entry

To reduce the risk of break-in, the issues that should be considered include:

- the layout of the scheme so as to prevent unauthorised access from public areas to back gardens;
- the use of building forms that give more security, e.g., terraced houses;
- secure side access to the rear garden, e.g., with full height gates, lockable from the inside;
- avoiding shared passageways where possible. Where this is not possible, ensuring that access points are adequately secured;
- ensuring that public areas are overlooked;
- locating external features, such as drainpipes or low roofs, in a way that does not facilitate easy access to upper floor windows;
- ensuring that all external doors and windows are adequately fixed and that windows from bedrooms can be easily opened from the inside, in compliance with Part B of the Building Regulations. Guidance on this is given in *Technical Guidance Document B - Fire Safety*[14];
- ensuring that external doors have a 3-point locking system; and
- the letterbox should be located as required by Part D of the Building Regulations, with a minimum distance of 400 mm from the door lock to the nearest point of the letterbox.

5.6.3 Safety: Fire

The construction of all new housing must comply with Part B of the Building Regulations. Guidance as to how these requirements of Part B can be met, including guidance on matters such as means of escape, window sizes, alarm system and limitation of fire spread, is given in *Technical Guidance Document B - Fire Safety*[14]. Gas and solid fuel cookers and fires should be located to minimise the risk of accidental fires. Hearths to open fires must be constructed in accordance with Part J of the Building Regulations. Oil storage tanks, where provided, must be safely located in accordance with the requirements of Part J of the Building Regulations.

5.6.4 Safety: Pedestrian Movement and Circulation

Statutory requirements for the construction of stairways, ladders, ramps and guards are set out in Part K of the Building Regulations. *Technical Guidance Document K - Stairways, Ladders, Ramps and Guards*[14] gives guidance as to how the requirements of Part K can be met.

Matters requiring attention include ensuring that:

- doors and opening sections of windows do not create hazards for users of passageways and circulation routes (see Building Regulations Technical Guidance Documents K and M);
- floors likely to get wet should have non-slip finishes;
- stairs and corridors have adequate lighting;
- light fittings and fire alarms are located so that there is safe and convenient access for changing bulbs or for testing. Particular care should be taken in locating such fittings in the vicinity of stairs and over voids, to avoid risk of falls; and
- external routes to clotheslines, bin storage and fuel store (if provided) are free from steps, have a reasonable slope and are adequately illuminated.

5.6.5 Safety: Windows and Glazing

Windows should be easily accessible for opening and cleaning. Particular attention should be paid to staircase and bathroom windows in this regard.

Windows at second floor and above, with the exception of those opening onto balconies, should be capable of being cleaned safely from inside the building.

Opening sections, other than small ventilation lights, should be provided with suitable safety restrictor mechanisms, which allow limited opening for ventilation purposes with positive action or significant pressure required to open the sections to the full extent. This is to deter opening by small children and to minimise the risk of the window inadvertently swinging open, while allowing the window to be readily opened in an emergency, e.g., in the case of fire.

In that connection, the requirements of *Part B of the Building Regulations* must be complied with. Guidance as to how the requirements of Part B can be met, is given in *Technical Guidance Document B - Fire Safety.*[14]

Safety glazing must be used where required by Parts D and K of the Building Regulations. Guidance as to these requirements can be met is given in Technical Guidance Document D - Materials and Workmanship and *Technical Guidance Document K - Stairways, Ladders, Ramps and Guards.*[14]

5.6.6 Safety: Kitchen

Kitchen layouts should be designed so as to provide safe working conditions, e.g.,:

- the location of doors should ensure that through traffic does not interfere with the working area;
- the cooker position should be located away from doors, windows and circulation routes and has side worktop space available;
- storage space should be within easy reach with sufficient room for door opening; and
- cupboards should not be located directly over cookers.

5.6.7 Safety: Electricity, Heating and Gas Services

All electrical work should be carried out in accordance with the *National Rules for Electrical Installations*[30] published by the Electro-Technical Council of Ireland. Light switches should be easily accessible and artificial lighting arrangements should provide adequate lighting, without excessive shading, for the main circulation routes and work areas. Gas installations should comply with the requirements of I.S. 813:1996 Domestic Gas Installations[31]. Regard should also be had to the requirements of I.S.265, Installation of Gas Service Pipes[32] and I.S. 3216, Code of Practice for the bulk storage of liquefied petroleum gas[33], where relevant.

See also guidelines regarding the provision of electricity and gas services in 5.8.8.

5.7 Kitchen Facilities and Layout

5.7.1 Kitchen Facilities and Equipment

Every kitchen should be provided with adequate storage space for food, cutlery, crockery, small appliances and other kitchen equipment and a sink, draining board and adequate worktop space for food preparation, etc.

Suitable space should be provided for an electric, gas or solid fuel cooker, as appropriate, together with the necessary gas or electrical service and/or flue connection. This space should not be under or immediately adjacent to a window. The kitchen layout should also provide suitable locations and adequate space for the installation of a dishwasher and full height refrigerator (or fridge/freezer) together with the necessary electrical points and plumbing service inlets and outlets, in appropriate locations. Consideration should be given to the location of 'noise-generating' equipment, such as washing machine, dryer and dishwasher, together with the necessary electrical points and plumbing service inlets and outlets, in a utility area off the kitchen, which could also act as a draft lobby between the kitchen and the open air.

5.7.2 Kitchen Storage

The following table gives guidance on the minimum level of storage provision that should be provided in or adjacent to the kitchen, for different sizes of dwellings.

Table 5.2: Minimum kitchen storage standards

DWELLING TYPE	KITCHEN STORAGE VOLUME (m^3)
4 Bed/7 person	2.75
3 Bed/6 person	2.60
3 Bed/5 person	2.45
3 Bed/4 person	2.30
2 Bed/4 person	2.15
2 Bed/3 person	2.00
1 Bed/2 person	1.70

This storage should be enclosed and made up of a combination of floor and wall units. It should include one tall unit, at least 1.5m high, which can be used for the storage of cleaning equipment and other large items such as brooms, ironing boards etc. The layout of storage units should take account of the normal activity pattern in a kitchen and the need to ensure accessibility and useability by the occupants of the dwelling.

5.7.3 Work Surfaces

The worktop area should be 600mm deep and the minimum length of worktop provided, exclusive of the sink draining board and cooker, should be as follows:

- 1/2 person household - 1200mm;
- 3/4 person household - 1500mm; and
- 5+ person household - 1800mm.

The sink, cooker and other fitments should be arranged so that the sequence “worktop, cooker, worktop, sink, worktop” is continuous and unbroken by a doorway or circulation route. The minimum length of an individual element of worktop should be 300mm. The positions selected for the sink and cooker should facilitate this sequence.

5.7.4 Layout - General Considerations

In deciding the dimensions, shape and layout of the kitchen, the following should be considered:

- it is desirable there should be a direct route, i.e. other than through another room, from the kitchen to the front door;
- if the kitchen has a door leading directly to the outside it should be adequately draught-proofed. The provision of a small utility room doubling as draught lobby should be considered;
- the cooker should be located away from internal and external doors and should not be under or immediately adjacent to a window. The front of the cooker should be readily accessible but should be clear of circulation routes to avoid the risk of spillages and accidental contact with hot surfaces, cooking equipment and utensils;
- the sink should preferably be located under a window;
- the distance between floor units and an opposite wall, or opposite floor units, should be at least 1500mm;
- if the dining area is not adjacent to and integrated with the kitchen, the layout should facilitate the location of a small table or equivalent, to allow for meals to be taken in the kitchen;
- adequate natural ventilation should be provided, where possible. Effective mechanical extract ventilation, sufficient to prevent cooking smells and steam migrating to the rest of the dwelling should be installed. The minimum requirements for ventilation are set out in Part F of the Building Regulation’s. Guidance on how these requirements can be met is given in *Technical Guidance Document F - Ventilation*[14] ; and

- adequate natural lighting and a direct view to the outside should be provided and the kitchen window should overlook a private secure area suitable for small children playing, e.g., the rear garden. Where this may not be possible, e.g., in smaller apartment dwellings, every effort should be made to provide a view from the kitchen area through an adjoining room to the outside.

Kitchens should be designed to avail of the economies afforded by the use of standardised worktop and cupboard sizes (normally multiples of 300mm) and guidance should be sought from appropriate kitchen manufacturers and suppliers in this regard.

5.8 Sanitary Facilities and Bathroom Provision

5.8.1 Sanitary Appliances

Part G of the Building Regulations specifies requirements in relation to the provision of bathrooms, bathroom appliances, hot and cold water supplies, sanitary conveniences and washing facilities. *Technical Guidance Document G - Hygiene*[14] gives guidance on how these requirements can be met.

In addition, Part M of the Building Regulations requires the provision of a WC that is designed to facilitate access to, and use of, the WC by persons with disabilities. Guidance as to how this can be done is given in T*echnical Guidance Document M - Access for People with Disabilities.*[14]

This may be designed as a separate bathroom with a WC, washbasin and level access shower.

5.8.2 Bathroom

The bathroom should be of adequate size to allow for the suitable location and layout of sanitary appliances, space for normal activities associated with bathing, use of WC, etc., space for fitting suitable shelving and storage presses and door opening without obstruction.

A bath should normally be provided. The bath should have a slip-resisting surface and be fitted with a shower, including all necessary plumbing. Grab rails should be provided to assist entrance to, egress from and safe use of the shower. A suitable shower screen and any associated fittings should also be installed.

Areas of walls adjacent to the bath, shower and washbasin should be finished with tiling or other appropriate finish impervious to water.

The bathroom layout (relative position of fittings and circulation space) should facilitate later adaptation for wheelchair users, if required. Walls adjacent to baths and WCs should be of sufficient strength to allow the fixing of such equipment as additional grab rails, etc, should these be required at a later date. Reference should be made to National Disability Authority Publication - *Building for Everyone: Inclusion, Access and Use*[3] and the Habinteg Housing Association publication *Wheelchair Housing Design Guide*[34].

The requirements of Part M of the Building Regulations represent the minimum level of provision that must be made. Those involved in the design and construction of dwellings should have regard to the philosophy of universal access and should consider making additional provision where practicable and appropriate.

5.8.3 Bathroom Ventilation

Where a bathroom window is provided it should be located where it does not interfere with the shower area or bath and can be opened conveniently and safely, e.g., not directly over the bath. Bathroom ventilation must comply with the requirements of Part F of the Building Regulations. Guidance as to how these requirements may be met is set out in *Technical Guidance Document F - Ventilation*[14].

5.8.4 Sanitary Pipework

Sanitary pipework providing for the discharge of soil and waste water to foul water drains should generally be of the single stack type, i.e. with a single stack serving as a combined soil and vent stack.

The layout of the dwelling should facilitate the appropriate arrangement of appliances, necessary to meet the required standards. Statutory requirements for the installation of bathrooms, kitchens, sanitary conveniences and washing facilities, are set out in Part G of the Building Regulations and standards for drainage and waste water disposal are set out in Part H of the Regulations.

Guidance as to how these standards can be met is set out in *Technical Guidance Document G - Hygiene and Technical Document H - Drainage and Wastewater Disposal.*[14] Adequate provision should be made for access for testing and maintenance purposes, to accommodate thermal movement and to prevent noise nuisance - particularly where the soil stack is located in an internal duct.

5.8.5 Standardisation

Consideration should be given to the standardisation of the plumbing and ductwork arrangements in dwellings, to facilitate precutting of pipework and avail of the economies of prefabrication.

For large developments, (particularly for multi-storey, multiple-occupancy apartments) consideration should be given to the use of prefabricated bathroom “pods” that meet the required standards of construction, where such an approach would have capital and maintenance cost advantages. Such an approach to construction would be facilitated by the use of standardised bathroom layouts.

5.8.6 Access Ducts

In multi-story, multiple-occupancy buildings, where services such as water supply, foul waste, electricity etc, are run within the building, the Building Regulations must be complied with. This will necessitate the enclosure of services in ducts complying with the requirements of Part B (Fire) and Part E (Sound) of the Building Regulations.

Ducts should preferably be located where they can be accessed, for maintenance purposes, from public areas of the building. Such ducts, which should be shown on the design drawings from the early planning stage, should not be located in a way that adversely affects the arrangement and useability of fixtures, fittings and furniture in habitable rooms.

5.8.7 Heating

5.8.7.1 Space Heating - Design Approach

Provision should be made for whole house heating capable of achieving and maintaining the following temperatures set out below when the external temperature is -1°C and the air

change rates are in compliance with the requirements of Part F of the Building Regulations. Guidance as to how the requirements of Part F can be met is given in *Technical Guidance Document F - Ventilation.*[14]

Table 5.3: Room or space temperatures

ROOMS OR SPACES	TEMP (^{o}C)
Living areas, e.g., lounge, dining, study, (including bedrooms used part time for study or as living area and kitchen used as living area)	21
Kitchens and bedrooms (not used as living areas); Separate WC; Circulation areas, e.g., hall, landing	18
Bathroom	22

In calculating heat losses for individual rooms, losses or gains between adjoining rooms should be taken into account, as should losses to adjoining dwellings (on the basis of an assumed temperature of 11°C in such dwellings).

5.8.7.2 Heating System and Fuel Choice

The choice of central heating system and fuel should be determined having regard to such factors as efficiency in use, expected emissions of smoke, CO_2 and other harmful gasses, the likely preferences of the occupants, the need for fuel storage, ease of operation and expected capital and running costs, including possible servicing and maintenance costs.

Natural gas, where available, is generally the preferred fuel for space and water heating, unless there are particular reasons for the use of other fuels, such as oil or electricity. Consideration should also be given to the use of more sustainable alternative fuels. Provision for future connections to gas should be considered where applicable.

The most usual form of central heating system will be one based on a single boiler per dwelling, with heat distribution by hot water to radiators. However, consideration should also be given to the merits of other types of system. For smaller dwellings, in particular, the use of individual room heaters may be more efficient and economical. In certain circumstances, the use of communal heating, based on a central boiler, may be appropriate.

Consideration should also be given to making provision for obtaining part or all of the space and/or water heating from alternative sources, such as solar collectors, wind energy, wood pellets, district heating, geothermal and waste/surplus energy, where this is found to be economically advantageous.

Guidance and assistance on these and other matters pertaining to the sustainable use of energy is available from Sustainable Energy Ireland (SEI)[35].

5.8.7.3 Heating System Design

Radiators, where used, should be sized to ensure that, in normal operating conditions, heat output is adequate to achieve the room temperatures indicated in 5.8.7.1. In calculating the heat output required to meet heat losses for each room, 10 W/m^2 floor area should be added to allow for intermittent use. Where the control system does not assign priority

to either space or water heating, the boiler should be sized so that the normal operating output is sufficient to meet the sum of the design outputs of the room heaters, together with an allowance of 2 kW for domestic hot water. An appropriate allowance should be made for heat losses from heating pipes located outside the heated area. The extent of such pipework should be minimised and the extent of boiler over-sizing should be limited as far as practicable.

Irrespective of the type of main space heating system and fuel used, consideration should be given to providing a secondary means of heating, solely in the main living room. Traditionally this has tended to be a solid fuel open fire or closed appliance. Such heating systems must be capable of burning smokeless fuels, where required to comply with the requirements of the Air Pollution Act. Where necessary the relevant local authority should be consulted to ascertain if the housing scheme is located in a special smoke control area. Accessibility and ease of operation of controls and thermostats for heating should always be considered.

5.8.7.4 Hot Water

Provision should be made for an adequate supply of hot water to bath, shower, sink and washbasin installations. The hot water cylinder insulation should preferably be in the form of a permanent factory-applied coating.

Where hot water heating provision is integral with the central heating system, and the system would not be appropriate for the provision of hot water only, alternative provision should be made for summer water heating. This will normally be in the form of a time-controlled electric dual immersion heater.

5.8.8 Electrical and Other Services

5.8.8.1 General

Appropriate provision should be made for the following services to each dwelling:

- electricity;
- natural gas (where available);
- telephone; and
- cable TV (where available).

The location of any necessary meters, fuseboards, etc. should accord with the requirements of the relevant utility. Particular care should be taken with the routes of services and the location of service outlets to ensure that the fire or acoustic performance of separating walls and compartment walls and floors, as required by Part B of the Building Regulations, are not compromised. Guidance as to how this can be done is given in *Technical Guidance Document B - Fire Safety.*[14]

To minimise the visual intrusion of services meter boxes, care should be taken in regard to the location of such boxes. Where possible, meter boxes should located away from the front elevation of the building.

5.8.8.2 Electricity

Electricity installations must comply with the requirements of the latest edition of the *National Rules for Electrical Installations*[30] published by the Electro-Technical Council of Ireland (ETCI).

Adequate levels of artificial lighting should be provided for all rooms and circulation areas. Suitable energy-saving light fittings should be used where possible.

The need for supplementary lighting in specific areas, e.g., adjacent to kitchen worktops, in the main living room and in the main bedroom should be considered. External lights should be provided at all external doors. Light switches should be rocker type and should be conveniently located, generally adjacent to doorways, at a height between 900 mm and 1200 mm above the floor and at least 300 mm from internal corners of rooms, hallways and corridors. No more than two switches should be grouped together at any one location. Two-way switches should be provided where appropriate, e.g., for landing lights.

Sufficient socket outlets should be provided in each habitable room. Table 5.4 below indicates the level of provision that should generally be provided. There should be least one socket in each of two opposite walls, located between 450 mm and 1200 mm above floor level and at least 300 mm from internal corners. In the kitchen at least two sockets should be located adjacent to the worktop and at a level of at least 150 mm above the worktop. The location of sockets or other service outlets should not compromise the fire safety or sound insulation performance of separating walls or compartment walls/floors.

Table 5.4: Minimum number and location of socket outlets

ROOM	MINIMUM NUMBER AND LOCATION OF SOCKET OUTLETS
Kitchen	4 twin sockets (5 if combined kitchen/dining), cooker outlet (if required), 3 single sockets*
Dining (if separate)	3 twin sockets
Living	4 twin sockets
Main bedroom	3 twin sockets
Other bedrooms	2 twin sockets
Hall	1 twin sockets
Landing	1 twin sockets

* 2 twin sockets should be located adjacent to the worktop. Single sockets should be appropriately located for refrigerator, washing machine and dryer.

Where an electric immersion water heater is to be installed, provision should be made for the necessary switch control with timer. This should be located in a visible position, i.e. not inside the hot press or any cupboard.

All dwellings should be provided with a suitable doorbell. In multiple-occupancy units, a call system and remote door release may be required. Provision for and integration of electrical white goods should be reviewed within the unit design.

5.8.8.3 Gas

Where a natural gas supply is available locally, a gas supply connection should be provided to each dwelling. Provision should be made for space heating and water heating by gas and a gas outlet point should be provided at an appropriate location for the later installation of a gas cooker.

The installation should comply with the requirements of *IS 813:1996 Domestic Gas Installations*[31] and with the requirements of An Bord Gais, as set out in their Technical Manual[36], particularly in regard to flues, the routing of gas pipes, (especially in multi-storey buildings) and the permanent ventilation of rooms.

5.8.8.4 Telephone

All dwellings should be provided with at least two telephone outlet points, one in the hallway (or other appropriate location) and one in the main living room, for the connection of a second handset or as a data outlet. A draw wire in a conduit of suitable size should be provided from the telephone cable entry point to the dwelling to the telephone outlet points in the hallway and living room, to facilitate the installation of the cable connections by the utility company.

5.8.8.5 TV Outlet

All dwellings should be provided with a suitably located TV outlet points with draw wire in conduit to the roof space or other appropriate TV cable entry point in order to facilitate later installation of necessary cabling and connection to an aerial or local TV cable network. Where the use of above ground external cabling, ducting and equipment, including satellite dishes, is unavoidable, it should be so located that it does not adversely impact on the external appearance of the dwelling. Internal ducting should be considered where appropriate.

5.9 Storage Facilities

5.9.1 General

The designer should have regard to the likely storage needs of the occupants when deciding on the overall layout of a dwelling and the sizes of individual rooms and spaces. Storage needs can be considered under the following general headings:

- general household storage, e.g.:
  - storage for larger items of household equipment and possessions, e.g., brooms and brushes, vacuum cleaner and ironing board;
  - storage for smaller items of equipment and personal possessions, e.g., books, toys; and
  - storage for equipment such as prams, pushchairs, sports equipment, sports bicycles, garden tools, outdoor clothing and for equipment used by people with disabilities.
- refuse and fuel storage;
- storage for food, cutlery, crockery, cooking utensils, washing and cleaning materials and related equipment - in, or adjacent to, the kitchen; and

- storage, separate from food preparation areas, for clothing and household linen, such as:
    - storage associated with clothes washing, e.g., soiled clothing, washed clothing;
    - storage for bedding and household linen; and
    - storage for personal clothing.

Provision should be made for a basic level of storage facilities in the construction of the dwelling. The size and shape of individual rooms and spaces should be such as to allow reasonable choice to the occupants with regard to the location of presses, inbuilt wardrobes and other storage facilities. Provision should be made, in the design of the dwelling, for general storage, kitchen storage fittings (see 5.7.2 for suggested level of provision), space for pram or buggy, fuel storage and the location for refuse containers.

5.9.2 General Storage Provision

All dwellings should be provided with a basic level of general storage. Table 5.1 gives guidance on the desirable minimum level of storage provision. Storage areas should be shaped so as to allow for storage of relatively large items.

General storage space should be provided on each floor, preferably accessible from circulation areas but not so placed as to encroach on circulation space or to impede free movement. In the case of individual dwellings and other dwellings provided with direct external access and adjacent private open space, some general storage may be provided externally. This may be provided separate from the main building, e.g., a garden shed or outbuilding, or attached to the building. The location of stores, or outbuildings should not obstruct views, should not inhibit the construction of possible future extensions and should be sited so as to contribute to screening and shelter, where appropriate. In cases where external garden space is limited, consideration should be given to the use of prefabricated, lightweight, moveable storage units, e.g., metal fuel bunkers.

Space for hanging outdoor clothes and, in the case of family dwellings, space for a pram or buggy should be provided adjacent to the main entry.

5.9.3 Hot press

A storage press for washed clothing and general household linen should be provided in all dwellings. The minimum capacity should be 0.5 m^3 for dwellings for four or more persons and 0.3 m^3 for smaller dwellings. This press should be accessible from the circulation area or bathroom.

The hot press should be sized to accommodate the hot water cylinder, with slatted shelving above the cylinder for ‘airing’ clothes. However, in multi-storey, multiple-occupancy units, where the traditional attic is unavailable for individual water storage, the water storage may be located in the hot press (e.g., in a combined storage/hot water cylinder unit). In such cases the hot press should be increased in size to provide adequate slatted shelving for clothes.

The dimensions of bedrooms and living rooms should be such as to allow reasonable choice for the occupants in relation to the location of additional storage facilities, e.g., presses for blankets and household linen, wardrobes, presses for personal clothing and effects, etc.

5.9.4 Refuse and Fuel Storage

All dwellings should be provided with an appropriate location for the storage of refuse containers, including wheeled bins. This will normally be an external location, with convenient access for the occupants and for the refuse collection service. The space should be adequate to cater for the size and number of bins normally allocated to a family in the area. The local authority should be consulted to ascertain the appropriate level of central refuse storage provision that should be made in multiple-occupancy buildings.

Dwellings with provision for the use of an open fire or other solid fuel appliances should be provided with an appropriate storage space for solid fuel. The minimum storage capacity should be 0.35m^3, except where solid fuel is the main fuel for space heating when the minimum capacity should be 1.35m^3. The location of refuse bins and fuel storage should be such as to avoid the need for excessive carry distances. Designers should also make provision for any storage needs that may be associated with other fuels, e.g., oil, LPG, etc.

In terraced houses, it may be most appropriate to provide an area for storage of ‘wheeled bins’ at the front of the house. These should be located and designed so as not to detract from the visual quality of the overall scheme. An appropriate waste management plan should be adopted when dealing with higher densities or larger schemes.

06

Appendices

Appendix (i)
Site Selection and Assessment

Detailed Considerations

The following are some factors that should be taken into account when assessing the suitability of a site for housing purposes:

The history of the site

Previous uses of the site or any buildings thereon should be investigated. The reason why a site has not previously been built on may be particularly important. Knowledge of the history of the site can be obtained by a desk study of Ordnance Survey[37] maps and any old maps, photographs or publications dealing with the area, as well as by speaking to adjoining landowners, local people, etc.

Sites of special significance

The site, including any existing buildings thereon, should be investigated to see if it is has architectural, historic, archaeological, artistic, cultural, scientific, social or technical significance. The Record of Protected Structures (RPS) and relevant Architectural Conservation Areas (ACAs) in the Development Plan should be checked to ascertain their requirements, if any, pertaining to the site. If any such requirements are found to apply to the site or its immediate surroundings, the Department of Arts, Sport and Tourism, as well as the relevant local authority, should be consulted prior to acquisition of the site.

Guidance on the protection of the Architectural Heritage is given in the Department of the Environment, Heritage and Local Government publication *Architectural Heritage Protection - Guidelines for Planning Authorities.*[38]

Amenities and services

The adequacy of amenities and services (existing and proposed) should be determined, including:

- schools, churches, shopping facilities and other community services;
- transport routes (including public transport);
- open spaces and recreation areas; and
- services (water, sewerage, electricity, refuse collection, telephone, etc.).

Access

The provision of safe and adequate vehicular and pedestrian access to new housing development should be possible at reasonable cost. Ideally sites should adjoin a public road. The provision of vehicular access should not require the creation of new access points onto National Roads. Such access may be permissible where a speed limit 50-60 kph applies or, in the case of infilling, in existing built-up areas. The requirements of the Development Plan for the area should be complied with and the National Roads Authority[39] should be consulted, where appropriate.

Physical features

The quality and topography of the land and relevant characteristics of the soil should be established, including:

- load-bearing capacity;
- drainage characteristics;
- water table and the risk of flooding;
- evidence of any subsidence, erosion or underground workings;
- the existence of potential hazards such as radon gas, methane gas, etc.;
- the presence of undesirable subsoil conditions (such as rock, bog, water, running sand, made-up ground, contamination, etc.); and
- where necessary, in rural locations, its suitability for the sinking of a well or for septic tank or sewage treatment plant location.

Trial pits or borings should be of sufficient number and depth to provide an adequate level of information on soil conditions.

Site constraints

The existence of constraints such as electricity lines, trunk services, drainage pipes etc., should be identified, their position, type and condition ascertained and the necessity for any removal or relocation works established. Restrictions on access or working space and the existence of any public or private rights-of-way or of any easements affecting the site (e.g., easements for sewers, drains, water supply pipes and watercourses, rights of light, etc.) should also be ascertained and their likely effects on any proposed development assessed.

Site boundaries

The condition of existing boundaries should be recorded and the nature and estimated cost of any necessary repair, renewal or replacement works established.

Inspection and report

Sites should be inspected, prior to acquisition, by appropriately qualified professionals, and the findings documented. The inspection report should include the following:

1. Location Map (to a suitable scale), with sketches, photographs and commentary as appropriate, indicating:
   - use of adjoining land for existing and proposed development;
   - centres of employment;

- local amenities;
- transport facilities;
- shops;
- schools;
- adjoining housing;
- churches;
- public health services; and
- general characteristics of the surrounding landscape or buildings.

2. A Site Map (to a scale of 1/500) fully dimensioned, showing 0.5 m. contours, with sketches, photographs and commentary as appropriate, and indicating:
   - the location and general levels of adjoining land and roads;
   - the location of existing services (e.g., drainage, water, electricity, gas , telephone and television supply lines) and their capacities, condition and relative levels as appropriate;
   - road widening proposals;
   - names of owners or occupants and postal addresses of surrounding properties;
   - ownership and general condition of existing boundaries;
   - rights or easements affecting the site or adjoining properties;
   - the designated planning use of the adjoining land;
   - the nature of the soil and the positions and results of trial holes, soil tests, etc.;
   - the location and description, including a photographic survey, of any building on site and an indication of the likely presence of hazardous materials;
   - the condition of the property if an existing building is to be retained or converted;
   - the positions of buildings adjoining or overlooking the site with notes of any windows; and
   - any features of the site which should be used within the development.
3. Feasibility Study showing, in outline, how the site might be developed and indicating the degree to which the site meets the criteria outlined in these guidelines.
4. Identify any abnormal works and asses a preliminary cost impact study.

Appendix (ii)

Joseph Rowntree Foundation Standards for Lifetime Homes

Outside the Home

1. Where car parking is adjacent to a home it should be capable of enlargement to 3.3m width.
2. The distance from the carparking space to the home should be kept to a minimum and should be level or gently sloping.
3. The approach to all entrances should be level or gently sloping. Gradients for paths should be the same as those for public buildings in the Building Regulations.
4. All entrances should be illuminated and have level access over the threshold, and the main entrance should be covered.
5. Where homes are reached by a lift, it should be wheelchair accessible & communal stairs should provide easy access.

Inside the Home

6. The width of doorways and hallways should conform to certain defined standards, e,g., when approach is not head on and the corridor is only 900mm wide, the min. clear opening width of the door should be 900mm.
7. There should be space for the turning of wheelchairs in kitchens, dining areas and sitting rooms, and adequate circulation space for wheelchair users elsewhere. (Turning circles are 1500mm diameter).
8. The sitting room (or family room) should be at entrance level.
9. In dwellings of two or more storeys there should be space on the ground floor that could be used as a convenient bed space.
10. There should be a downstairs WC, which should be wheelchair accessible, with drainage and service provisions enabling a shower to be fitted at anytime.
11. Walls in bathrooms and WC's should be capable of taking adaptations such as handrails.
12. The design should incorporate provision for a future stairlift and a suitably identified space for potential installation of a through the floor lift from the ground to the first floor.
13. The design should provide for a reasonable route for a potential hoist from a main bedroom to a bathroom.

14. The bathroom layout should be designed to incorporate ease of access, probably from a side approach, to the bath and WC. The washbasins should also be accessible.

Fixtures & Fittings

15. Livingroom window glazing should begin at 800mm or lower, and windows should be easy to open/ operate.

16. Switches, sockets, ventilation and service controls should be at a height usable by all ie. between 450mm and 1200mm from the floor.

Appendix (iii)

Design Audit Checklist

Does the plan cater for changing needs (over week days and weekends)?

Is there room for the family to gather together comfortably?

Is there room to entertain a few family friends?

Is there space for young children to play near a parent working in the kitchen?

Is there space for a spare bed for a visitor staying overnight?

Can some meals be taken in the kitchen?

Does the plan cater for activities needing privacy and quiet?

Are the bedrooms suitably located relative to more noisy areas, e.g., living rooms?

Can the dining space or bedrooms be used for study purposes?

Are the living spaces appropriately located relatives to each other?

Is the dining space as close as possible to the kitchen?

Does the kitchen window overlook the place where small children can play?

Can the garden/balcony be used as an extension to the living space

Can you get from one part of the dwelling to another without inconvenience?

Can you get from each bedroom to the bathroom and WC without going through another room?

Are refuse and fuel stores conveniently located for the household while not requiring deliveries or collections to be made through the dwelling?

Is there adequate and safe space for ladders for painting and window cleaning and are all roof-lights accessible for cleaning?

Can utility meters be read from outside the dwelling?

Is there some protection from the elements for callers in cold or wet weather?

Is there sufficient room at the entrance to receive visitors?

Is there adequate space for hats and coats?

Is there provision for safe and convenient circulation outside the dwelling?

Can you get from the garden to the dwelling without passing through the living room?

Can large garden tools be moved from storage to place of use without going through the dwelling?

Is there ease of access from the kitchen to the clothes drying area?

Is there somewhere safe for children to play?

Is the private garden space located so as to minimize overlooking by neighbours or passers-by?

Does the layout prevent people from passing too close to windows?

Does the layout minimize the risk of nuisance and hazards from passing traffic?

Is the car parking space located close to/overlooked by the dwelling?

Assessment of the detailed performance of each room/space

Is each room/space satisfactory for its intended use in terms of location, floor area and shape?

Can each room/space accommodate the required furniture, leaving sufficient space to circulate, open doors and windows and generally use the space for its intended purpose?

If rooms are to have alternative uses from time to time, can these uses be reasonably well accommodated?

Are all windows easily accessible for cleaning?

Does the design ensure that each room/space is appropriately orientated and has adequate provision for lighting, heating, ventilation, sound insulation.

Appendix (iv)

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