

Appendix 3-5

Architectural Design Statement

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Crown Square Galway
Mixed Use Development| Phase 02
Architectural Design Statement
June 2019

SHD Application Stage 03 Submission



Revision	Description	Date	Checked
00	Draft Issue for Review	17.06.2019	MD
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SECTION 01 INTRODUCTION



3DDB | Artist Impression of Public Plaza

INTRODUCTION



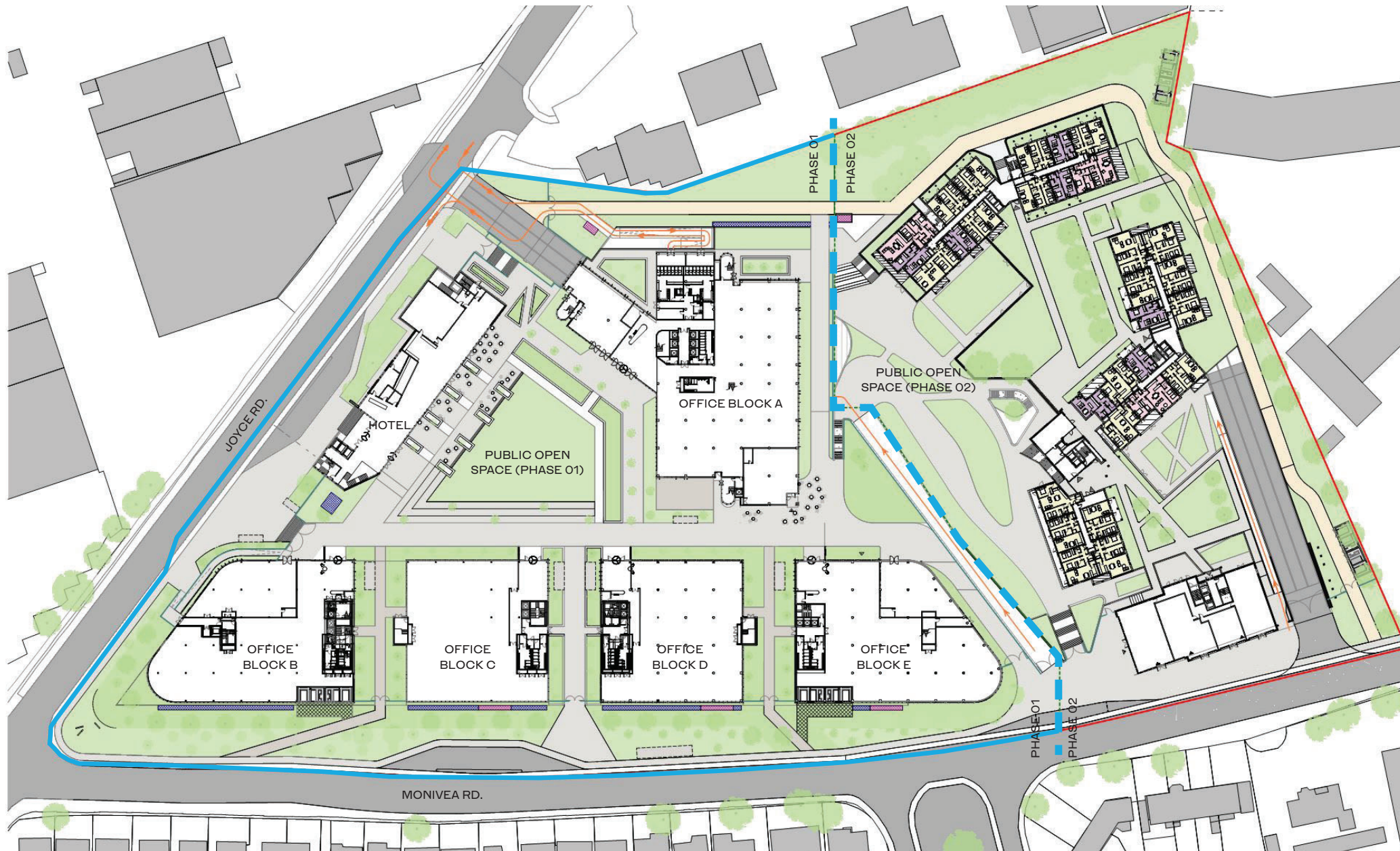
3DDB | Artist Impression of Communal Open Space

This Design Statement has been prepared to set out the evolution and basis for architectural design and site layout planning of the proposed development. Planning permission has been granted (Reg. Ref. No. 18/363) for the first phase of commercial development on the site. This Design Statement relates to the second (residential) phase of development. This Phase 2 application is represented in this statement and accompanying architectural drawings in the context of the overall site and permitted Phase 1 development scheme design

The preparation of this statement with reference to best practice guidelines has been a dynamic process during the scheme design for planning application. This statement is the result of integrated design team and developer analysis of design over time including the preparation of preliminary design, testing alternative development options, outline and detailed design brief and master planning. Briefing and master planning documents have been reviewed with the Planning Authority during the scheme design. This preparation of this statement has therefore informed the design process.



HJL Sketch View | Sunken Courtyard Garden & Bicycle Ramp





PERMITTED PHASE 01 COMMERCIAL DEVELOPMENT

PERMITTED

Planning permission has been granted (Reg. Ref. No. 18/363) for the first phase of commercial development on the site. This mixed use development consists of 5 no. office blocks ranging from 3-6 storeys over ground floor, a 5 no. storey hotel development comprising 175 no. bedrooms, a double basement and public realm and landscaping works. Two basement levels will provide for service, delivery, waste management, plant and office shower/ changing amenity along with car and bicycle parking. The following images reflect the permitted Phase 1 development in a representative scale model.



Existing Site Aerial | 5DDB Photography

PREVIOUSLY PERMITTED DEVELOPEMENT

PREVIOUS PLANNING PERMISSION

The planning permission for the previously proposed development has lapsed. This permission was for a mixed use predominantly bulky goods retail with motor sales showroom, office, hotel, leisure, crèche, residential, car-parking (1,340 spaces) and ancillary accommodation on Commercial Industrial (CI) zoned lands.

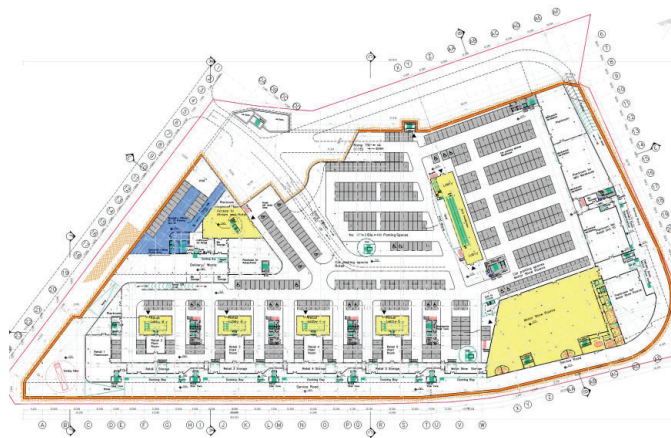
The site area is 5.12Ha (51,200m²) or 12.65 Acres. The previously permitted development extended to a gross floor area of 56,751m² producing a plot ratio (development area/site area) of 1.1:1. The QCDP plot ratio for Commercial Industrial (CI) zoned lands was then and is now stated as 1.25:1 (above ground level).

The previously permitted and incomplete development proposed an enclosed site accessed primarily by car. The permitted use was primarily (bulky goods) retail with roof level residential as well as office and hotel use. These were arranged in three large ranges or blocks of retail, hotel and office accommodation with residential use at roof level in two of the blocks. A public plaza was proposed between the

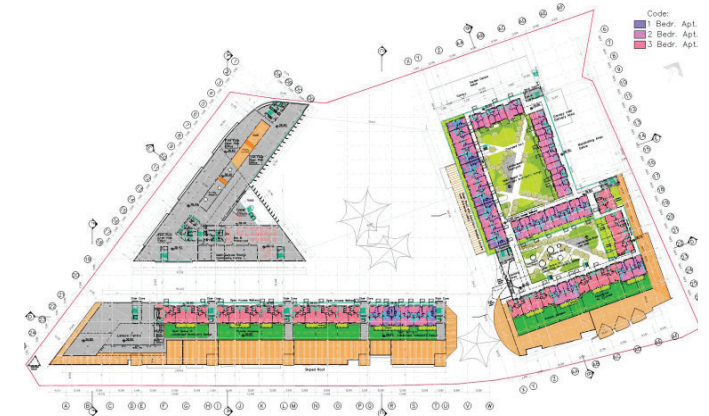
blocks. The eastern elevation to the Monivea Road was proposed as a relatively continuous range of retail warehousing behind with a break opposite the Monivea Road, McDonough and Clarke Avenue residential area.



OKM Architects | Proposed Ground Floor



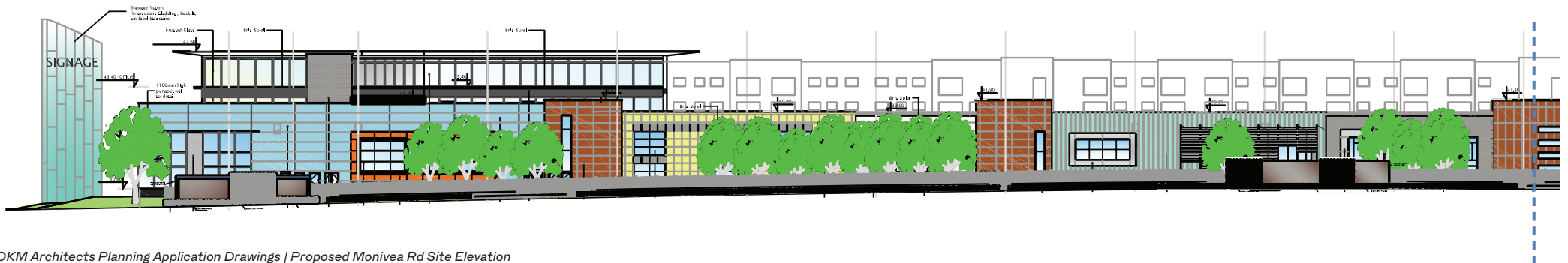
OKM Architects | Proposed Upper Basement



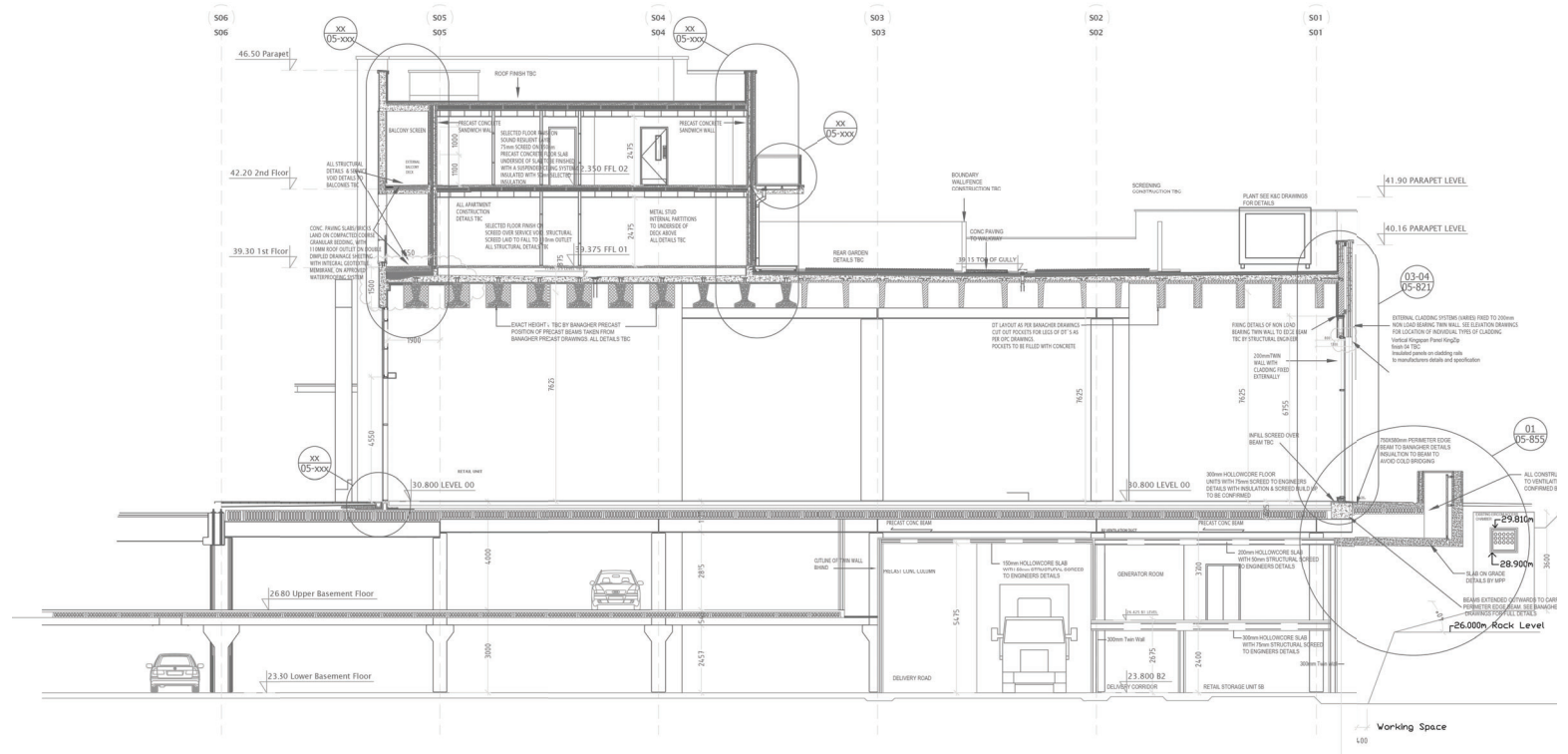
OKM Architects | Proposed First Floor



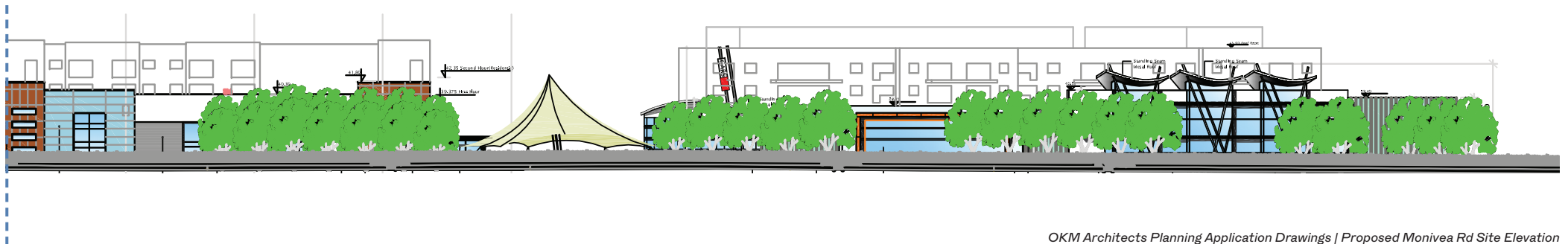
OKM Architects Planning Application Drawings | Proposed Site Plan



OKM Architects Planning Application Drawings | Proposed Monivea Rd Site Elevation



OKM Architects | Proposed Section



OKM Architects Planning Application Drawings | Proposed Monivea Rd Site Elevation

EXISTING COMPLETED DEVELOPMENT

COMMENCEMENT & COMPLETED WORKS

A substantial element of the previously permitted development has been completed. Almost the entire site has been excavated through rock to a structural formation level.

It appears from review of previous structural engineering drawings that the gross area of proposed enclosed basement construction over two levels was potentially c.70-75,000m². The previously proposed development design at basement is complex, including service roadways and double height service areas, ventilation shafts etc.

There is extensive foundation construction across the site and three levels (lower basement to ground) of the range of retail buildings proposed along the Monivea Road are complete structurally. This structure extends to approximately 26,800m² over ground and two basement slab levels. Rising column elements extend from ground floor slab in this area.

The existing structural frame will be re-used as part of the Phase O1 development. The reUse of existing foundation below the Phase O2 site is under review.

Given the extent of this structure, its retention, adaptation and re-use is proposed as a sustainable development. The suitability and regulatory compliance of this proposed re-use will be confirmed through architectural and structural engineering design assessment, including on site survey and material testing.



Existing Site View South



Existing Site View North



Existing site edge condition on Monivea Road



Site View South - Existing Site Condition

Extent of Construction to date

Image showing double basement site excavation and the completed structure of three levels (lower basement to ground) of retail buildings previously proposed along the Monivea Road.

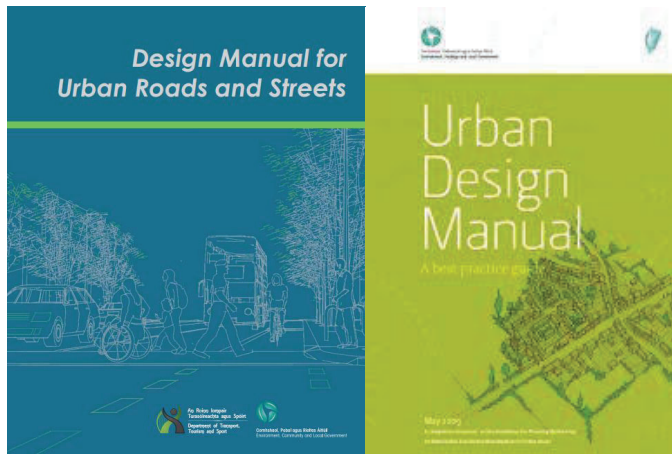


Site View West - Existing Site Condition

Extent of Construction to date

Photo taken from top level of completed retail structure. Note rising column elements extend from ground floor slab in this area.

ARCHITECTURAL DESIGN STANDARDS & GUIDELINE DOCUMENTS

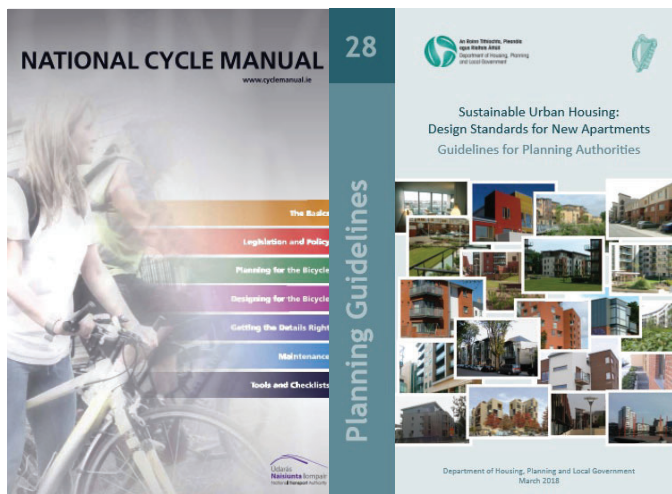


Guideline Documents

The architectural design is to be developed with reference to Galway City and national policy standards as follows;

- Galway City Development Plan 2017-2023.
Galway City Council
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities
Department of Housing, Planning and Local Government 2018
- Urban Design Manual. A Best Practice Guide 2009
Department of Environment Heritage and Local Government 2009
- Design Manual for Urban Roads and Streets 2013
Department of Transport Tourism and Sport 2013
- Design and Access Statements: how to write, read and use them.
CABE/PAS (UK) 2007
- Design Recommendations for Multi-Storey & Underground Car Parks (4th Edition)
Institute of Structural Engineers 2011
- National Cycle Manual
National Transport Authority 2011
- Energy Performance of Buildings Directive
EU 2018
- 'A Guide to Electric Vehicle Infrastructure'
British Electrotechnical and Allied Manufacturers Association (BEAMA)

These documents will be referenced with other benchmark developments and standards in the architectural Design Statement to be included in planning submissions.



Guideline Documents

GALWAY CITY DEVELOPMENT PLAN

LAND USE ZONING OBJECTIVES

	Agriculture
	Recreational & Amenity
	Low Density Residential
	Agriculture & High Amenity
	Local Area Plans for Ardaun & Murrough
	Residential
	Enterprise, Light Industry & Commercial
	Community, Cultural & Institutional
	Enterprise, Industry & Related
	City Centre

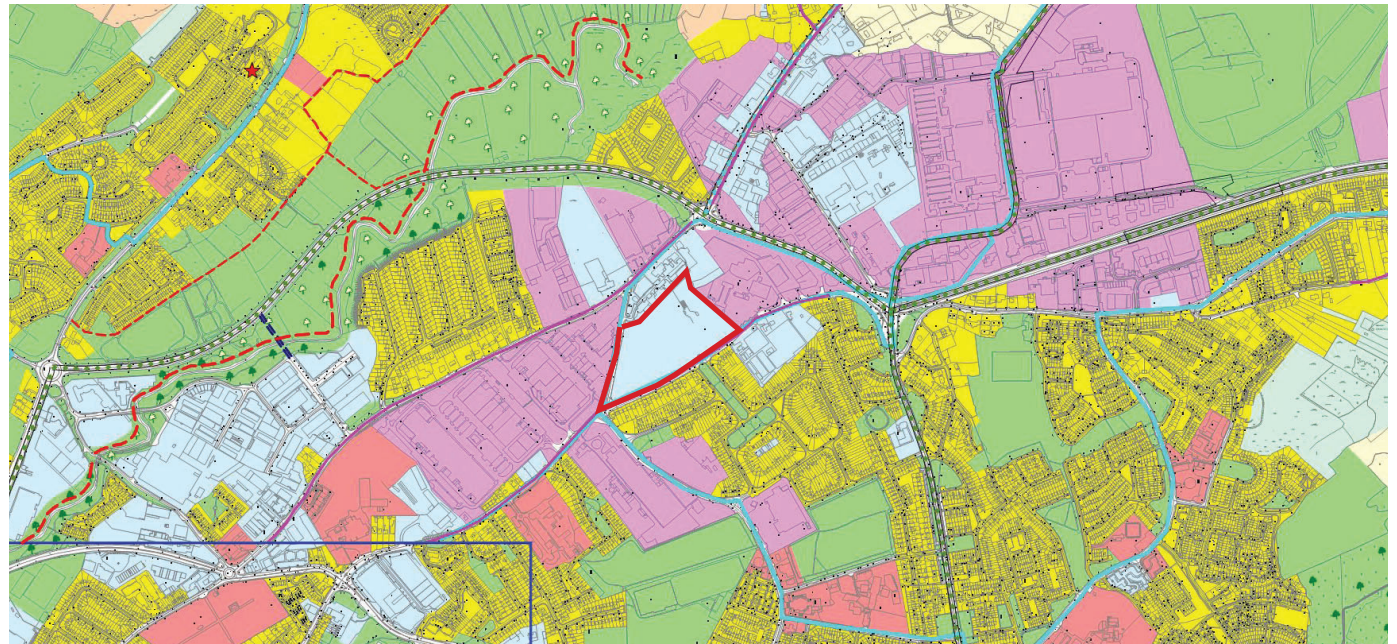
DEVELOPMENT POLICY

The general development policy and land use zoning objectives in the current 2017-2023 Galway City Council Development Plan remain similar to those of the previous Development Plan

ZONING OBJECTIVE

Under the new Development Plan, the Former Crown Equipment Site retains its Commercial/Industry (CI) zoning objective with a stated objective *“to provide for enterprise, light industry and commercial uses other than those reserved to the City Centre zone”*.

With regard to residential development the GCDP cites ‘residential content of a scale that would not unduly interfere with the primary use of the land for CI purposes and would accord with the principles of sustainable neighbourhoods outlined in Chapter 2 (GCDP)’ as use which may contribute to the zoning objectives, dependant on the CI location and scale of development’. This is therefore a secondary use within the overall Crown Equipment Site CI zoned lands. Mervue is defined in Chapter 2 GCDP as an Established Suburbs / Sustainable Neighbourhood.



Extract Land Use Zoning Map GCDP 2017-2023

 Site Outline



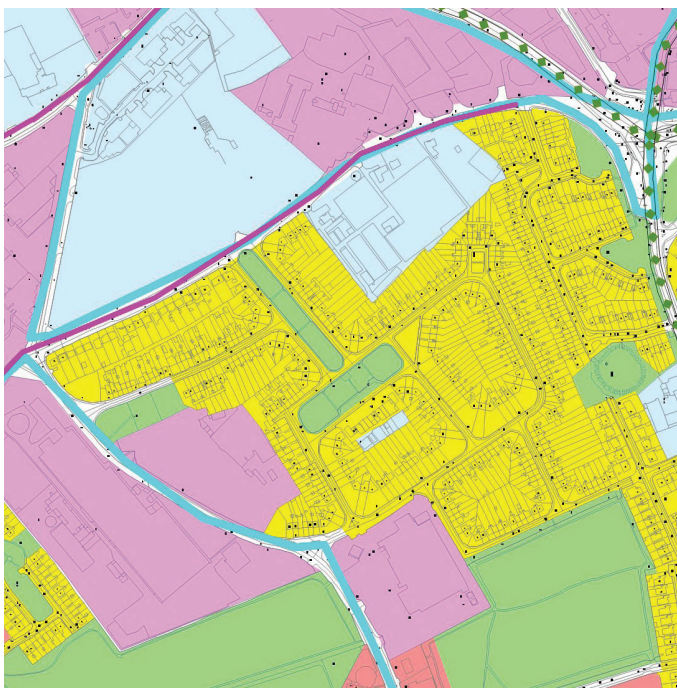
DEVELOPMENT STANDARDS & GUIDELINES

With reference to Zoning Objectives and Development Standards and Guidelines, for CI zoned lands, the following requirements of the QCDP (Chapter 11.9.1) are relevant to the design of the proposed development;

- Maximum densities shall only be attainable under optimum site conditions having regard to criteria such as height, open space and protection of amenities.
- Adequate space must be available for on-site storage of materials and refuse, loading and unloading, on site circulation of vehicles and parking for motor vehicles and bicycles. In this regard adequate on site waste management facilities must be provided.
- Adequate provision shall be made for storage of goods and materials within the building
- Developments shall be required to provide an element of open space which would include a landscaping scheme for the site having regard to screening of boundaries and vehicle parking areas and to the visual appearance of the site, in particular the area between the front building line and the front boundaries
- Open space shall be provided in a manner in which it can function as an effective amenity area taking into account its location on the site, physical size, aspect to avail of sunlight and accessibility. Such landscaping schemes shall encourage habitat bio-diversity and incorporate SUDS where feasible
- Parking spaces shall be clearly marked out and delineated. Parking spaces for vehicles of people with disabilities shall be provided and clearly marked and located close to main entrances to premises.
- Potential nuisances/polluters sources shall be addressed at the design stage and appropriate mitigation measures incorporated

into the development.

- All plant equipment shall be addressed at design stage and generally shall not be visible from public areas.
- Where security fencing is required it shall not normally be forward of the front building line of the premises. Security fencing shall be of a high visual standard.
- Advertising structures, where required, shall be sized and placed in a manner, which is unobtrusive.
- Buildings or structures intended for use by the general public shall be designed to allow access and internal circulation for people with disabilities.



Mervue; Established Suburb/ Sustainable Neighbourhood
(Extract Land Use Zoning Map GCCDP 2017-2023)

RESIDENTIAL DEVELOPMENT

Residential development is a secondary use on these CI zoned lands. Standards are mapped against the 2018 Design Standards for New Apartments in Section 3 of this statement. The following GCDP standards (Chapter 11 extracts) are noted as relevant design considerations. These are generally stated for all residential development and Mervue is defined as an **Established Suburb**.

Table 2.1 Indicative Neighbourhood Areas in Galway

Outer Suburbs	Established Suburbs	Inner Residential Areas	City Centre Residential
East Ardaun Doughiska Roscam	East Renmore Mervue Ballybaan	East Bohermore College Road Lough Atalia	Woodquay Long Walk Henry Street Area City Core
West Knocknacarra Ballyburke Ballymoneen	West Dangan Salthill Taylor's Hill Westside	West Claddagh Shantalla Newcastle Fr. Griffin Road	
North Castlegar Tuam Road	North Tirellan Ballinfoile		

A site specific approach to the development of the overall Crown Equipment site is set out in this statement and in the planning application for Phase 1. This, including issues such as residential density, amenity space, density and car/cycle parking standards, have been discussed in pre-application meetings with the planning authority.

OUTER SUBURBS

The GCDP states the following;

- Residential development shall be llaidd out in such a way so as to maximise accessibility to local services, public transport and to encourage walking and cycling.
- Pedestrian, cycle and vehicular movement shall be convenient, safe and integrated into the overall layout of the development.
- The layout of all new residential development shall have regard to adjoining developments and
- undeveloped zoned land. Where appropriate, linkages and complementary open spaces shall be provided between adjoining developments.
- Gated residential developments will be discouraged.
- Innovative layouts, including courtyard developments, shared open spaces and the clustering of dwellings shall be used, where appropriate, to achieve high standards of amenity.
- Childcare facilities shall be provided within residential development as indicated in 11.13 and Chapter 7.

Communal Open Space

Shared spaces shall be regarded as communal open space where it is designed primarily to meet the needs of pedestrians, cyclists, children and residents and where the traffic speeds and dominance of the cars is reduced through design. Communal open space in all types of residential development should:

- Be visually as well as functionally accessible to the maximum number of dwellings within the residential area.
- Be adequately overlooked by residential units.
- Be viable spaces, linked together where possible, designed as an integral part of the overall layout and adjoining neighbouring communal open spaces.

- Not include narrow pedestrian walkways, which are not overlooked by house frontages.
- Create safe, convenient and accessible amenity areas for all sections of the community.

Private Open Space

In certain site conditions and development types, provision of private open space may be made up of areas of communal open space, for example, in apartment developments provision of private open space may be made up of areas of communal open space, balconies or terraces. Apartment Developments shall adhere to the private open space standards set out in the Sustainable Urban Housing: Design standards for New Apartments (DECLQ, 2015).

Overlooking

Residential units shall not directly overlook private open space or land with development potential from above ground floor level by less than 11 metres minimum.

In the case of developments exceeding 2 storeys in height a greater distance than 11 metres may be required, depending on the specific site characteristics.

Daylight

All buildings should receive adequate daylight and sunlight. All habitable rooms must be naturally ventilated and lit and living rooms and bedrooms shall not be lit solely by roof lights.

Policy 2.6 Established Suburbs
Ensure a balance between the reasonable protection of the residential amenities and the character of the established suburbs and the need to provide for sustainable residential development.
Encourage additional community and local services and residential infill development in the established suburbs at appropriate locations.
Enhance established suburbs, such as the Mervue residential area, through the implementation of environmental improvement schemes and the protection of all open spaces including existing green spaces.
Review and implement the draft regeneration plan for Ballinbole Park entitled <i>A Better Ballinbole</i> in consultation with the local community and stakeholders.
Examine potential for a regeneration plan for open space areas in Ballybaan in consultation with the local community and stakeholders.

ESTABLISHED SUBURBS

As per standards for Outer Suburbs except:

General

In the interests of sustainability and urban design, higher densities may be appropriate when new residential development or commercial/ community development has regard to the prevailing pattern, form and density of these areas.

Amenity Standards

Shall be as per Outer Suburbs except in certain circumstances where the established form and layout would deem a reduction in these standards appropriate, in the interests of sustainability and urban design.

Car Parking Standards

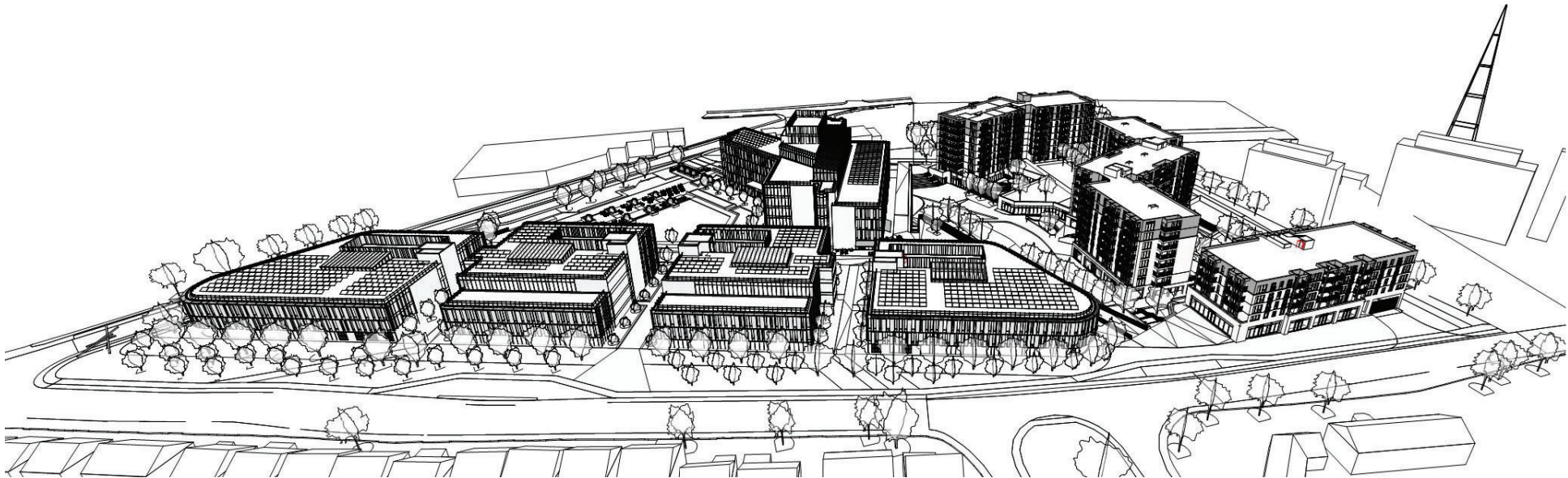
- 1 on-site per dwelling and 1 grouped visitor per 3 dwellings or,
- 1 space per dwelling if grouped.

Generally, these standards should not be exceeded.

SITE COVERAGE & PLOT RATIO

With reference to Site Coverage and Plot Ratios the following requirements of the GCCDP are relevant to the design of the proposed development;

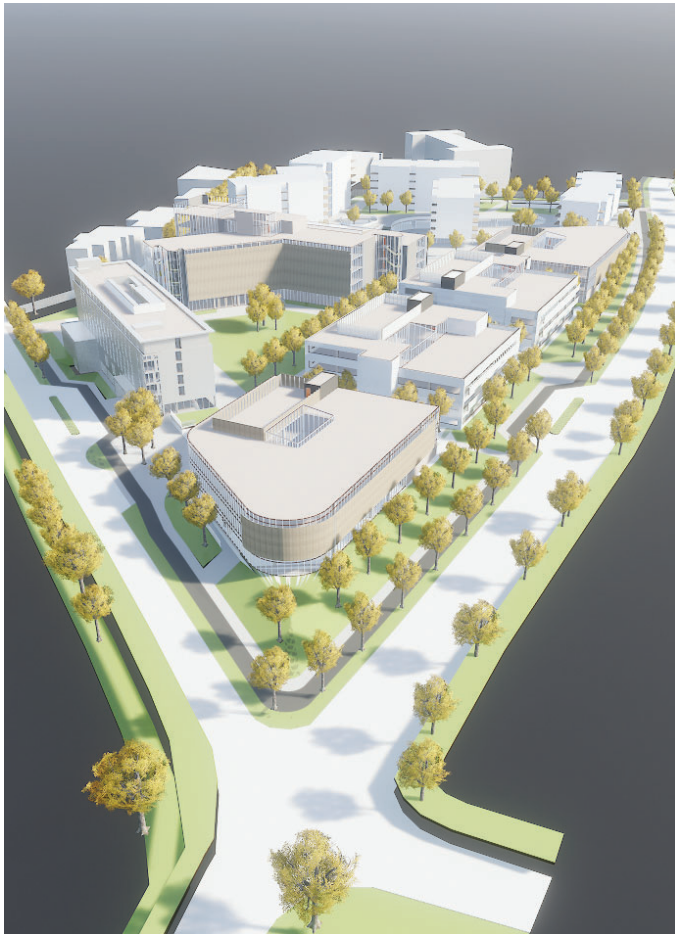
- The development intensity standards of site coverage and plot ratio are designed so as to help prevent the adverse effects of over-development.
- Site Coverage and Plot Ratio for CI and I Zoned Lands.
 - Maximum Site Coverage 0.80
 - Maximum Plot Ratio 1.25:1.00
- On CI zoned lands, where it is proposed to provide, above ground level, an amenity open space area in association with residential accommodation, this space may be accepted as open space for site coverage purposes



Sketch Model Birdseye View

SECTION 02 OVERALL SITE, MASTERPLAN & URBAN DESIGN

QUANTUM & DENSITY OF DEVELOPMENT



Henry J Lyons Massing Model Images

The proposed quantum and mix of development has been established through economic and commercial assessment of the development potential of the site. This has been influenced by the developer/ applicants discussion with local and state agencies as well as with potential end users for the various proposed uses. This discussion and economic assessment results in the inclusion of a residential component within the overall site use mix. The lands are zoned for commercial and industrial use but local and national policy and the employment sector now recognize residential as an essential component of economic infrastructural development.

Plot ratio expresses the gross floor area of buildings relative to site area and is generally set as an indicative standard by Planning Authorities depending on the particular land use zoning. It is a development control tool that helps control the bulk and mass of buildings. Other site specific factors including the following are relevant factors influencing apparent density and resultant amenity of the local area;

- site coverage
- building height
- public and private open space
- road layout
- approach to parking

Plot ratio guidance banding of 0.5-2.0:1 would not be unusual for residentially zoned lands in inner/outer city sites. The same locations zoned for employment would be guiding at 2.0-3.0:1. Other local and national policy on building height and urban density can increase density and take precedence over plot ratio as a limiting factor. Any consideration is site and land use specific and requires integrated assessment of development control and design standards.

The GCDP advised plot ratio limit of 1.25:1 applies to Commercial Industry (CI) zoning. Historically, development in this zoning would be of buildings with large footprint / site coverage and associated surface car-parking. The proposed mixed use, provision of substantial open space and location of vehicular traffic and car-parking below ground level changes the historic character of development. Public access, landscape design and visual permeability of the resultant development reduce the impact of any higher density. The proposed density of development and plot ratio are not regarded as excessive for the proposed use and layout of this site. A schedule of accommodation for the proposed development (both Phases 1 and 2) is attached to this statement at Appendix 1.

LAND USE



The proposed development comprises residential, leisure, local service and ancillary accommodation on an integrated campus with commercial office, technology and hotel use. It is proposed as a phased development with Phase 1 comprising commercial and basement/infrastructural works and with Phase 2 comprising residential, leisure and local service elements.

The previously permitted (pre-2009) retail, office, hotel and residential use is advised as being no longer commercially viable and potentially inconsistent with current best practice residential design standards and guideline publication. The proposed mix of uses are mutually compatible and support the viable completion of development on site as well as complementing existing adjacent land use. Increased public access to the site facilities and amenities benefit both the local community and city.

The specific Phase 2 uses are as follows;

RESIDENTIAL

The residential development comprises 288 apartment units with associated amenity and service accommodation.

LEISURE/FITNESS

The site location, mixed-use and integrated nature of the development support the proposed development of a stand-alone leisure / fitness facility. It is anticipated that this facility will be available to all site users including residents and to the public.

OTHER FACILITIES

Other complementary and neighbourhood facilities are proposed as follows;

- Creche
- Restaurant
- Cafe/Coffee Shop
- Convenience Store
- Medical Centre (potential Primary Care Centre)
- Pharmacy
- Other Small Retail/Service (e.g. hairdresser)

Retail units will be located with visibility from the Monivea Road with medical and community amenity facilities fronting the new public space. Service to the non-residential facilities will be provided and managed in the basement areas.

The provision of services across Phase 1 and Phase 2 is further described below.



Reference Imagery

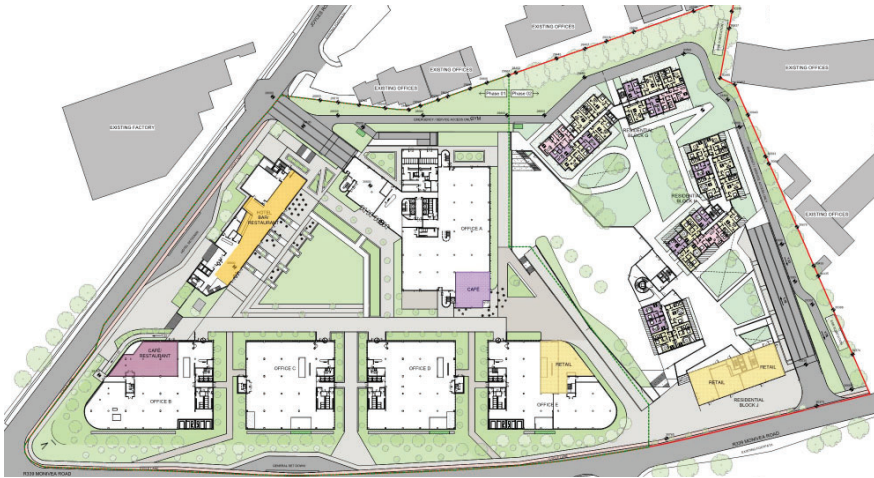


PERMITTED COMMERCIAL (PHASE 01) & PROPOSED RESIDENTIAL (PHASE 02) FACILITIES

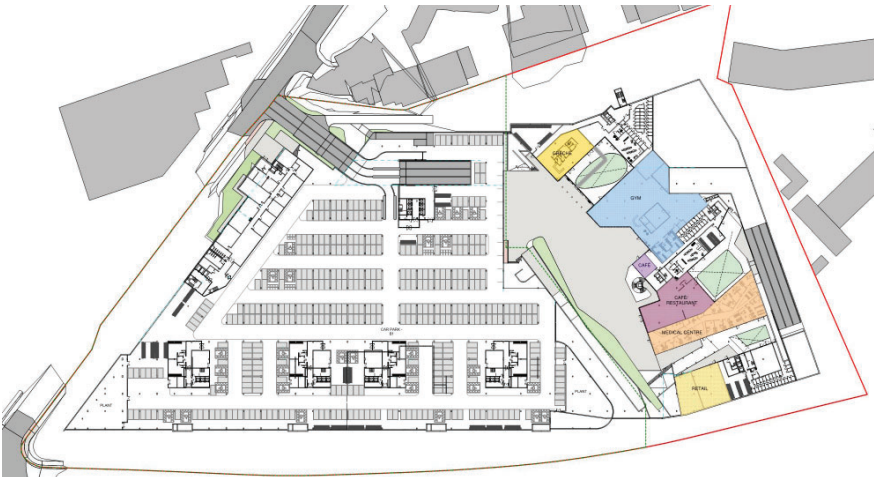
Proposed facilities associated with the permitted commercial scheme include retail, café/ restaurant located prominently at the east and west public entrances to the Phase 1 development along with the hotel ground and basement bar, restaurant and meeting rooms. Additional support or service accommodation for this commercial development is proposed in the residential scheme. The residential (Phase 2) provision is previously referred to and the table below schedules these uses, location and approximate floor area.

All service space opens onto the public realm, either public road or public open space within the development. The following sketch plans drawings the present master plan proposed service and other non-residential development for both phases.

Schedule of Service/ Ancillary Accommodation			
Permitted Commercial (Phase 01)			
Use	Location	Floor Level	Floor Area (GIA)
Hotel	Joyce Rd	Ground	600
Café	Block A	Ground	245
Café/ Restaurant	Block B	Ground	420
Retail	Block E	Ground	295
Sub-Total (m ²)			1560
Proposed Residential (Phase 02)			
Convenience Store	Public Open Space	Lower Ground (-1)	225
Creche	Public Open Space	Lower Ground (-1)	310
Gym/ Leisure	Public Open Space	Lower Ground (-1)	1140
Café	Public Open Space	Lower Ground (-1)	50
Restaurant/ Food Hall	Public Open Space	Lower Ground (-1)	500
Medical Centre	Public Open Space	Lower Ground (-1)	655
Pharmacy	Monivea Rd.	Ground Level	200
Retail (Small/ Service)	Monivea Rd.	Ground Level	460
Retail (Small/ Service)	Monivea Rd.	Lower Ground (-1)	337
Sub-Total (m ²)			3877
Total Phase 01 + Phase 02 Service (m ²)			5437



Permitted Commercial + Proposed Residential Ground Level Service & Amenity Sketch Plan



Permitted Commercial + Proposed Residential Level -1 Service & Amenity Sketch Plan



Architectural Sketch View | Permitted Commercial Ground Floor Service & Amenity (Block E Retail & Block A Cafe)

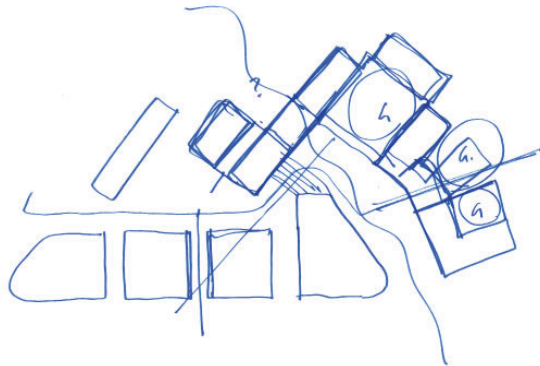
SITE LAYOUT

The site layout of the previously permitted development was influenced by the particularly proposed uses and previous GCCDP requirements. Public access, given the retail use, was primarily vehicular and mixed with pedestrian and cycle circulation at ground floor level. The proposed uses are different and require more open access, permeability and separation of vehicular and pedestrian traffic where possible.

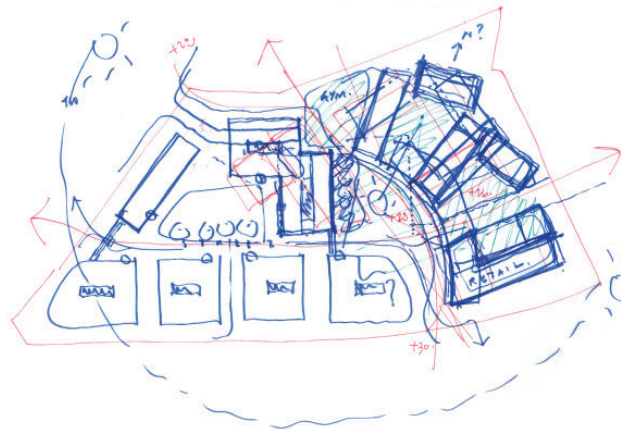
The existing completed development has a significant impact on the proposed site layout planning. The long range of completed structure along the Monivea Road is proposed to be re-used, most suitably as office. The entire site has been excavated already to lower basement level.

This results in the proposed development of the western part of the site substantially as commercial office, technology and hotel over the previously proposed basement level car-parking. The remainder of the site comprising residential, leisure, local service and ancillary accommodation (Phase 2) fronts the eastern end of the Monivea Road frontage and extends to the northern site boundary over the Phase 1 basement level completion.

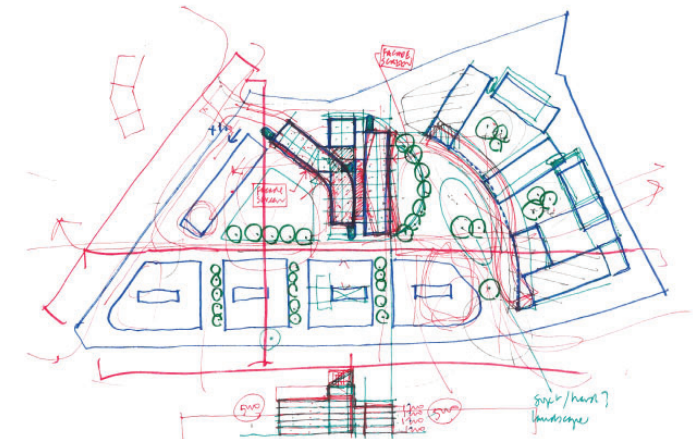
All of the proposed uses require open space and amenity. Publicly accessible high quality landscaped spaces are proposed at ground level. The site perimeter landscape is integrated with the public realm in a continuous landscape treatment, providing pedestrian, cycle, bus and vehicular set-down. Sight lines in to and within the site link the public spaces, which are universally accessible and passively secured by site layout planning. The only areas where public access is controlled are the residential communal open spaces where restriction is proposed to provide amenity, privacy and security



Site Layout Sketch 01 | HJL

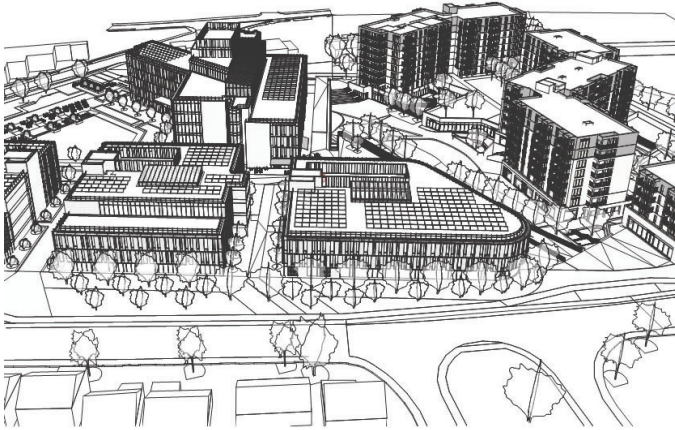


Site Layout Sketch 02 | HJL

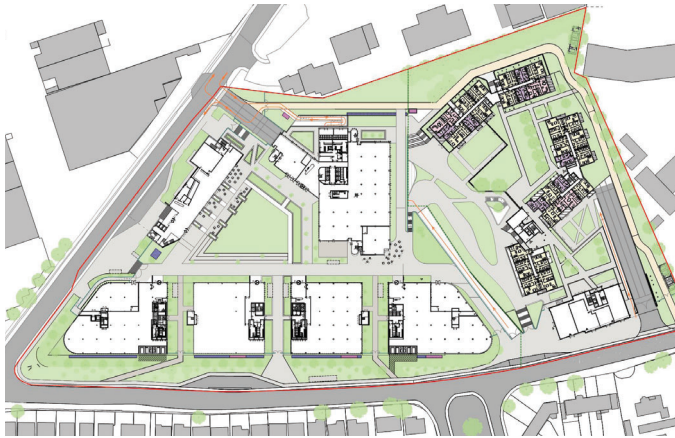


Site Layout Sketch 03 | HJL

SCALE



Sketch Model Birdseye View North over site



Site Layout Proposed | HJL

Scale is a relative term and is relevant to many development control matters from use to density/apparent density and visual impact of physical development. Density relative to use is referred to elsewhere in this statement and the proposed plot ratio suggests that development scale is compatible with the site environs. Assessment of visual impact is relative to the existing site and its environs. In this case the site is cleared above ground and surrounded to the north, east and west by similarly zoned lands with a variety of industrial and commercial building ranging from low (IDA-west) to high (Eircom-east). The existing medium density residential development on Monivea Road is low in scale and regarded by virtue of its use and character as the most sensitive adjacent use.

The development proposes, as did the previously permitted development, lower building height along the Monivea Road, stepping up across the site to the north. The Monivea Road range of buildings is broken up into 5 buildings between Phases 1 and 2 with large landscaped gaps providing visual and physical permeability as well as reducing apparent density of development. Building heights range from 3-7 storeys over ground. The site is relatively large with extensive road frontage and these heights across a number of buildings with significant open space in between are not regarded as excessive or as contributing negatively to overall site development scale.



HJL Sketch View of Public Plaza, towards steps to Monivea Rd.

LANDSCAPE

The landscaped space between and around buildings and the site edges provides public amenity and biodiversity. It is also an integral part of the architectural design of the site. Design extends to both soft and hard landscape and supports an accessible, safe and high quality approach to building approach and site permeability.

One of the challenges to completion of the previously commenced development is the design of landscape at an appropriate scale both hard and soft over areas of basement car-parking. The integration of office, commercial and residential uses is facilitated by a sharing of public open space and the separation of residential from public space by ground level change and landscape treatment.

A key element of the architectural design is the proposed removal of the hard line of leylandii trees from the public realm along the Monivea Road. This provides an opportunity for a wider, shared landscape margin between the public road and the building line including cycle lane, bus and other vehicular off road set-down.

A Landscape Design Statement prepared by Cunnane Stratton Reynolds is included in Section 03 of this report.

Landscape Masterplan Design

Extract from CSR

'A number of entrances will draw pedestrians into the scheme through a hierarchy of primary and secondary access routes. The main access routes are located close to public transport arrival points and will be announced using feature sculpture which will link on visual axis with strategically located sculptures within the development, helping the user to visually navigate through the scheme.'



Existing Leylandii Trees along Monivea Rd - Proposed for removal



Reference Image | Flexible Lawn Space & Seating



3DDB Image View South | Proposed Phase 01 Open Space



CSR Early Concept Sketch Landscape Plan (Phase O2 proposal is detailed in Section O3)

URBAN DESIGN

CONTEXT

The site is that of the former Crown Equipment at Mervue and occupies an area of 5.12 Hectares or 12.65 acres with circa 1160m of road frontage to the Monivea and Joyce Roads. The site is part of a broad corridor of industrial, commercial and institutional lands stretching north-east from Lough Atalia past the Terryland and Mervue residential areas across the N6 road to Ballybrit.

The immediately adjacent Mervue and IDA Business Parks, Eircom telecommunications centre and McDonagh and Clarke Avenue residential areas have been built over the past 30-40 years. There are significant changes in scale, particularly between the former industrial and residential uses. The industrial sites are characterized by gated and fenced enclosure with limited if any permeability. The residential development along the Monivea Road is partially 'ribbon' single house development but turns in to an extensive planned mature landscaped estate at Mervue. The Joyce Road is a short connector between the Tuam (R336) and Monivea (R339) Roads. These roads are at full capacity in terms of traffic, are frequently congested with relatively poor pedestrian and cycle amenity.

The two adjacent business parks are changing in character from light

industrial and manufacturing to include office, enterprise and service

industry use in line with national and international trend. The buildings are industrial in scale and character and in many cases unsuited to their current use. Many are past their design and commercial 'life' and in need of extensive refurbishment if not reconstruction.

This is a substantial partially derelict, 'brownfield' site in close proximity to the city centre. It provides an opportunity for significant sustainable mixed use development. The adjacent McDonagh and Clarke Avenue residential lands suggest the location for potential linkage from Mervue into this mixed use development.

The proposed development is significantly different in land use and character to that previously proposed. The site size and proposed uses require permeability and access which will result in an open landscaped public realm. This will positively contribute to re-defining the Mervue residential area western edge adding linking landscape amenity.

The proposed site layout addresses the issues of urban density, form and sub-urban location. The site layout and provision of significant open landscaped space reduces physical and apparent density appropriate to this location in Galway City.



McDonagh Avenue Residential



Existing Monivea Rd Street View



Existing Aerial View North

Site Context

GalwayTransport.info

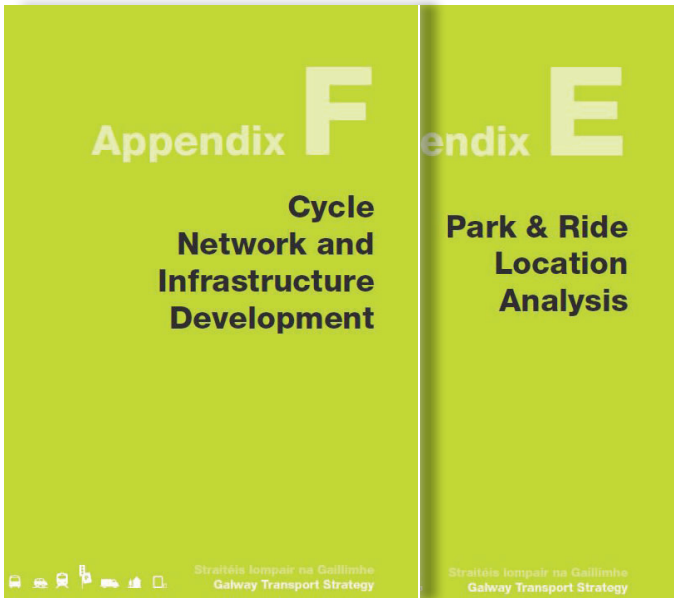
The site is part of a broad corridor of industrial, commercial and institutional lands stretching north-east from Lough Atalia past the Terryland and Mervue residential areas across the N6 road to Ballybrit.





Site Connections to City Destinations

CONNECTIONS & SITE PERMEABILITY



Galway Transport Strategy Appendices



BikeShare | Coca Cola Zero Bikes

The site is centrally located within the existing urban fringe boundary and is approximately 2.5 Km from Eyre Square. The Galway Transport Strategy (GTS) documentation indicates that the site is at a nodal point for existing and future public and sustainable transport initiatives.

It is accessible by pedestrian and cyclist and abuts proposed GTS ‘park-and-ride’ bus corridor on Joyce Road and cycle routes on both Joyce and Monivea Roads. The proposed development prioritizes public transport, local resident and commuter pedestrian and cycle access. Vehicular traffic is diverted into the basement levels on both Monivea and Joyce Roads.

The proposed uses will result in a higher population density on the site than in the previously permitted development. This is in line with current best practice and statutory planning policy and supports the development of efficient and sustainable public transport. Mobility management planning is dealt with elsewhere in this planning application and has informed the design of both site layout and buildings.

Much of this development will be outside of the site and will require integrated public infrastructural design. This development seeks to provide for this design in its layout suggesting for example locations for bus stops, public set-down and cycle facilities.

Destination	Distance	Time (min)			
		Car	Bus	Cycle	Walk
	(km)				
Eyre SQ/ Ceannt Rail- Bus Terminus	2.2 km	7	14	8	27
Galway Airport	6.7 km	10	12	20	80
NUIQ Library	3.4 km	9	27	11	40
QMIT Library	1.6 km	3	7	6	18
UCH Galway	3.4km	12	22	13	42
M6/ N67 Junction	3.8 km	6	28	12	45

INCLUSIVITY & VARIETY

The GCDP land use zoning is Commercial Industry (CI). The predominant proposed use is office / commercial supported by residential and whole site ancillary amenity, service and other commercial use. This is an accessible campus style development with permeability between the different site uses. Public open space is provided as accessible to all site users and occupants as well as to the general public. A further level of open space is provided, reserved to the residential occupants to provide for residential amenity, privacy and security.

This is a mixed use development providing hotel, recreational amenity, service and retail facilities as complementary to residential as well as office/commercial uses. These facilities are available also to the local community and general public. The residential development comprises apartments in a range of size and type and planned with reference to the 2018 Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities.

The residential apartment design will provide an additional residential type within the area.

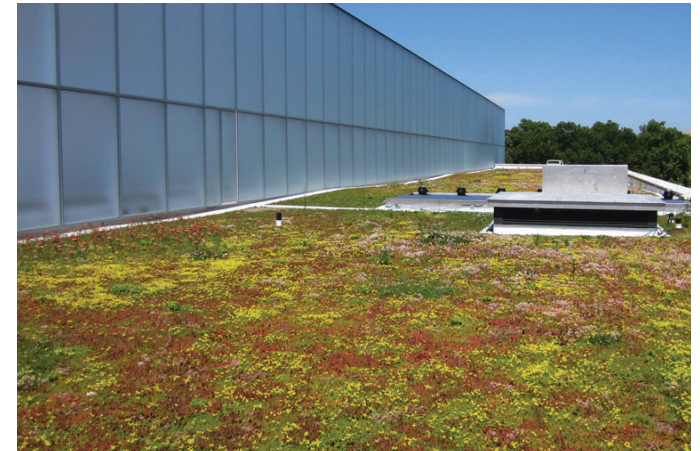
EFFICIENCY

The development will implement the GCDP land use zoning objectives, standards and guidelines as well as the Department of Housing, Planning and Local Government guidelines on urban design and density in the provision of an efficient land use. Approximately 26,800m² of existing structure will be incorporated into a total development area of approximately 85,500m² over two phases. This density of development is proposed as compatible with the location in terms of environmental impact. It is also efficient in supporting the development of sustainable work and residential accommodation in parallel with Galway City public transportation policy.

Environmental building and site services incorporate rainwater harvesting for use on site as grey water, surface water attenuation including both storage capacity and extensive areas of green roof.

The whole site development is being designed to meet the requirements of Building Regulations Part L 2017 nZEB (Near Zero Energy Building). This incorporates renewable energy generation (photovoltaic panel array and heat pump technology). This is set out in the Environmental Services and Sustainable Design report by Patrick McCaul Consulting Engineers which is attached as Appendix O3.

The site layout planning, with lower buildings to the southern boundary, stepping higher to the north around two significant public spaces has been informed by solar orientation and sunlight access to the public landscaped areas. Analysis of daylight and sunlight access prepared by IES Consulting is attached at Appendix O4.



Reference Imagery for PV panels and green roof installation

DISTINCTIVENESS

Distinctiveness is a relative term. It relates to recognizable landscape or built features and to how people describe and appreciate where they live, forming emotional attachment. In the case of the previous Crown Equipment lands, a fence enclosed industrial site, opportunity for emotional attachment was and is limited. This is not unusual in traditional commercial or industrial land use, where issues of security, health and safety led to defensive enclosure, poor public access and landscape amenity.

The proposed development provides for public access to use or traverse the site and a landscape with high visual amenity. Both public open spaces are focal points and will have public amenity access in terms of landscape and service, including hotel, cafe, restaurant uses. This access and the potential for these spaces to be used for events or festival is a positive contribution to the local and city community.

The overall design seeks to provide and promote a memorable working and living environment for Galway City.

LAYOUT

The residential (Phase 2) development will front the eastern end of the Monivea Road frontage and extend to the northern site boundary over the Phase 1 basement level completion. A significant public open landscaped space separates the residential and associated development from the Phase 1 office and hotel development. This public space provides access to the lower ground / basement level -1 overall site as well as an upper ground residential level (refer to detailed design section below). Access to this space from Monivea Road is coincidental with access to the Phase 1 office / hotel public open space with direct visual connectivity between the two principal public open spaces.

Provision of space for external vehicular set-down and public transport (bus/taxi) stops is planned as well as public 'city bike' facilities. Vehicular access to the basement car-park and service levels is proposed on both Joyce and Monivea Roads. The ground level public space will be open 24/7, planned for passive security and the basement car-park access will be a managed and secure facility. It is intended to provide for future connectivity to adjacent sites.

There are two principal pedestrian/cycle entrances to the site. On Monivea Road this will be opposite the McDonough and Clarke Avenue junction. These avenues have a high quality residential landscape character with mature trees reflecting a previous rural character of Monivea Road. This entrance will provide level pedestrian, cycle and emergency vehicle access. On Joyce Road pedestrian and cycle access is provided between office building on the corner with Monivea Road and the hotel.

The basement development layout includes a 'high bay' area for service, delivery and waste management vehicles which is accessed via ramped roadway from Monivea Road. This area provides for off-street large vehicle parking and turning as well as the temporary storing and staging of delivery and waste management. Storage areas for separation and management of waste are provided at the second basement level at each building vertical core. Waste is brought via lift or store, separated for re-cycling and stored in 1100l wheeled bins. These bins are transported horizontally by the waste removal contractors to the high bay staging area for removal from site.



Phasing Diagram

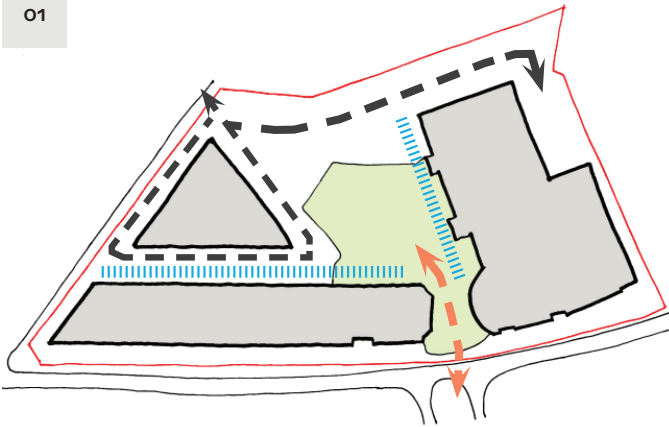
Henry J Lyons

Diagram indicating commercial and residential development across the site



Potential for public open space to host festivals and community events

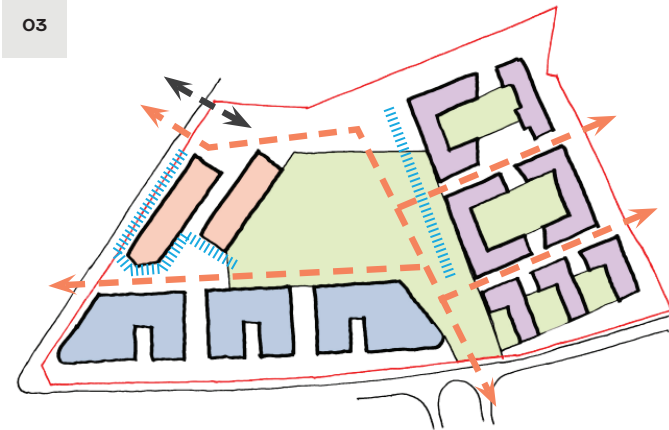
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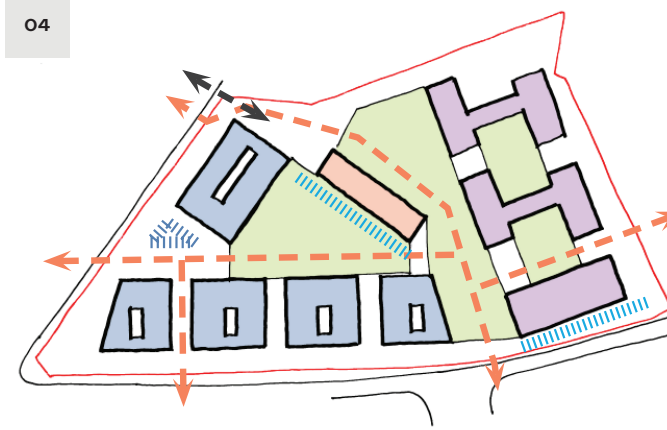
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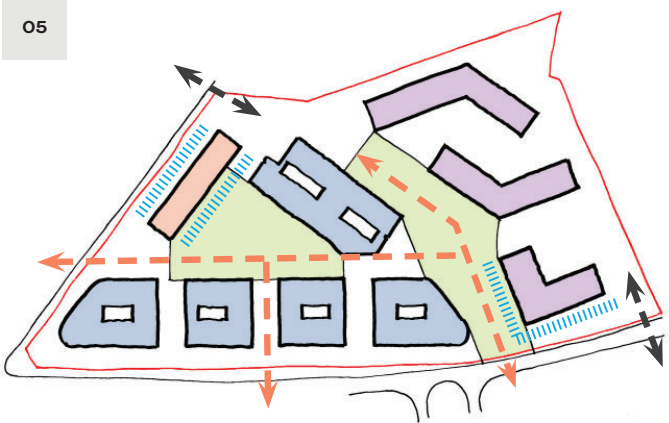
03



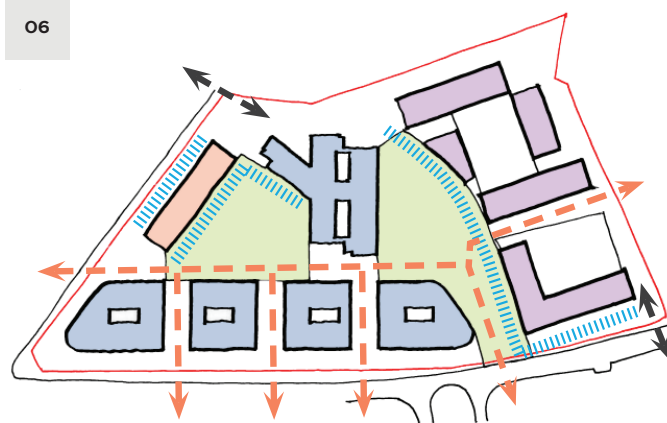
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05



06



SITE ANALYSIS

Analysis of the previously permitted site layout together with alternative layout options has informed the development of the site layout during the design process. This is set out in the following diagrams;

- O1. The previously permitted site layout is indicated this diagram. This is an enclosed site with limited pedestrian permeability with a single central public space. It is a retail park site plan with substantial underground car-parking and service access. The character of open amenity space is one of hard landscape providing maximum visible frontage for the retail units. The design effectively turns its back on the external public realm. There is vehicular circulation and parking at ground / podium level.
- O2. This layout proposes the completion of the basement structure as permitted and office/commercial and residential development. Vehicular access and car-parking is proposed in basement with the ground level reserved for pedestrian/cycle access and public amenity space. An open and permeable site is proposed with active restaurant/retail frontage addressing the main central amenity space
- O3. This layout proposes that one level of basement car park is completed (lower second level) and that the existing completed structure along the Monivea Road is completed as office / commercial space. The level of the centre of the site is lowered in steps to that of the permitted first basement. An open and permeable site is proposed with active hotel, restaurant/retail frontage addressing the main central amenity space and Joyce Road.
- O4. Diagram 4 proposes a higher quantum of office space, relocating the hotel to a central location between office and residential use and providing two separate central open amenity spaces. One is static central around the office/commercial use and the other is more active suggesting permeability along a diagonal east-west route from Monivea to Joyce Road. The quality of open space to the north of this block and the viability of the diagonal east-west route (clashing with the main site vehicular access) is questionable.
- O5. In diagram 5, the hotel use is moved to Joyce Road to provide visibility and an active dual aspect frontage. Vehicular access is proposed on both Joyce and Monivea Roads.
- O6. In this diagram the ground plane is substantially restored with a double basement built below the office/commercial use and a single basement proposed below the residential Phase 2 site. This facilitates improved level access and increased permeability across the site. The central office block is re-orientated to create a second more 'static' open amenity space with active frontage along its eastern (residential) side. The diagonal east-west pedestrian/cycle route is omitted.

The development of the Phase O2 residential site layout is set out in Section 3 of this report.





3DDB Image | View over Proposed Phase 02 Open Space at Level -1



3DDB Image | View North West over Proposed Phase 01 Open Space

PUBLIC REALM

The public realm can be described as the external areas of the site and buildings that provide both public and private amenity. The site layout planning described above sets out a basis for the planning of two principal public open spaces. One space is that surrounded by the Phase 1 office, hotel and commercial uses. The second space is between Phases 1 and 2, between office and residential use and around which the leisure and local service elements are located. The residential access is one level above this creating a semi-private level of garden courts overlooked by and for the exclusive use of the residents.

The intention is to provide two large, complementary public open spaces overlooked by the building occupants providing visual amenity and safe passive security. These are open to visitors and the general public and integrated with the car-park and other ancillary service spaces at basement levels. The intention is to limit vehicular traffic at ground level, where the greatest opportunity for high quality accessible public space exists.

The area to the north and east of the residential development is an important landscape buffer with the potential for large scale natural landscape. It is proposed as accessible and as a 'linear park'.

ADAPTABILITY

This is a large scale commercial and residential project requiring significant investment. The design has been prepared mindful of the need to provide for present and future market and environmental demand. The previously completed development, both structure and excavation provide an opportunity to plan uses in an efficient manner leaving the ground level relatively free of vehicular circulation or other constraint on potential future development or change of use.

Most of the primary services are located around the site perimeter outside of the line of the basement. The proposed basement provides for the distribution and re-distribution of services to buildings overhead. These factors facilitate change with minimum disruption of public realm.

The predominant proposed use is office/commercial and the building designs are prepared and benchmarked in line with best international practice. The nature of the modern workplace is changing and buildings need to be capable of adaptation to different occupant demands and uses. The potential future uses could be office, technology, laboratory/office, showroom etc. The office development is planned as a series of buildings to allow for phased development and commercial flexibility. One larger building is proposed to provide for a single large organization, potentially a 'headquarters' building. All of the office buildings are sub-divisible on a split floor or floor by floor letting basis.

The residential design is benchmarked against the 2018 Department of Housing, Planning and Local Government 'Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities' publication. Under 'Specific Planning Policy Requirement 8' these guidelines provide for a 'relaxation' in certain design standards for 'Build to Rent' development. While the proposed development may be operated in full or in part as such, this relaxation has not been adopted in the proposed design. This provides for adaptability in tenure over time without the need to resort to specific planning permitted residential use.

PRIVACY & AMENITY

Privacy and amenity is a primary concern in residential development. This is referred to in more detail under detailed design which follows.

The design is mindful of the need to protect the amenity of the existing residential development on Monivea Road. This is primarily addressed by limitation on height on this boundary, development of landscape screening as well as external screening of first and second floor south facing windows of the office blocks facing Monivea Road.

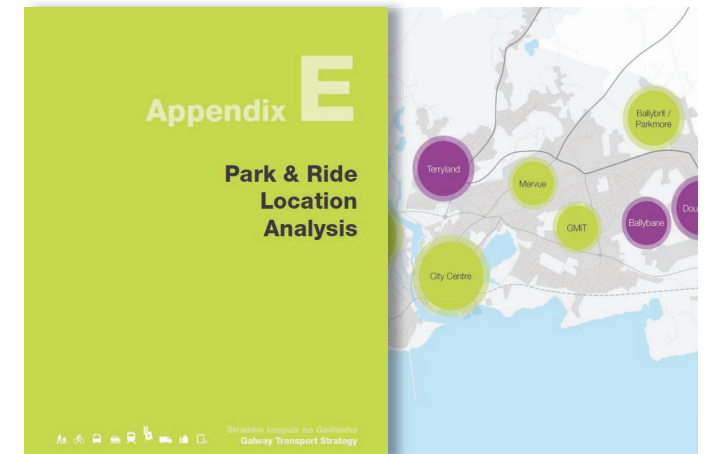
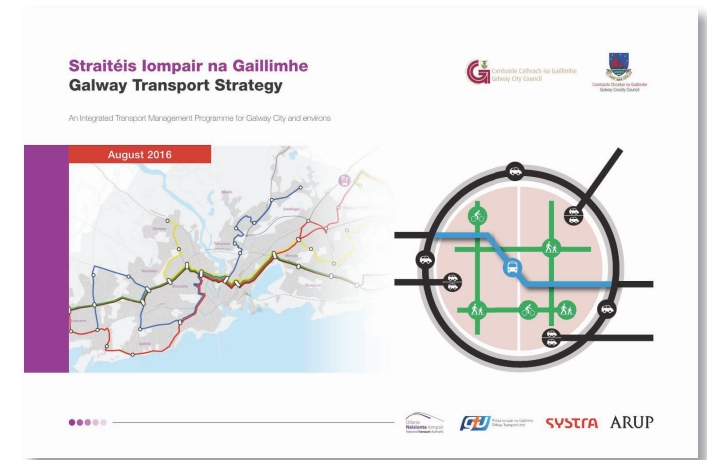
PARKING & TRANSPORTATION

The previously proposed and permitted development of the site had a substantially different employment population (relatively low) with high visitor population (retail) creating a different demand on parking and local traffic infrastructure. A car-park site capacity of 1,340 cars was previously permitted with vehicular access from Joyce Road and additional service/delivery vehicle access on Monivea Road. Internal site vehicular circulation was provided at ground and both basement levels and incorporated enclosed secure delivery yards for retail use.

The basis for the proposed site layout is set out elsewhere in this report. It is now proposed to limit internal site vehicular access primarily to basement levels with emergency vehicle access only mixing with pedestrian and cycle access at ground level. Two road entrances to the basement car-park levels are planned to facilitate demand and flexibility of vehicular planning over time. Both provide for car and light van access and one, on Monivea Road, also provides for large goods and service vehicles. Visitor, delivery, service and additional commercial and residential access will be provided in a centrally managed and secure lower ground/basement car-park facility. An area within the car-park will be reserved for 'Go Car' type (rental) facilities.

Ground level landscape planning prioritizes pedestrian and cyclist internal movement as well as the arrival and departure from the site by public transportation. Off road set-down is planned to compensate for limitation on vehicular movement at ground level. A further set-down, taxi pick-up location and public/visitor car-parking is proposed at upper basement level accessed off Joyce Road and immediately adjacent to the eastern public open space. This facilitates vehicular access to the creche as well as leisure, restaurant/cafe and medical centre etc.

Cycle parking is at the upper basement level and is accessed separately from vehicular traffic. From Monivea Road this is via a gently sloping approach through the eastern public open space between the Phase 1 and 2 developments. From Joyce Road this is via the linear park and a ramp. Drying rooms, cycle maintenance and other support facilities will be provided at lower ground/basement level. An area at ground level will be designated for 'City Bike' type (rental) facilities.



Extracts from Galway Transport Strategy

SECTION 03 DETAILED DESIGN

SITE DESIGN

SITE LAYOUT & LEVELS

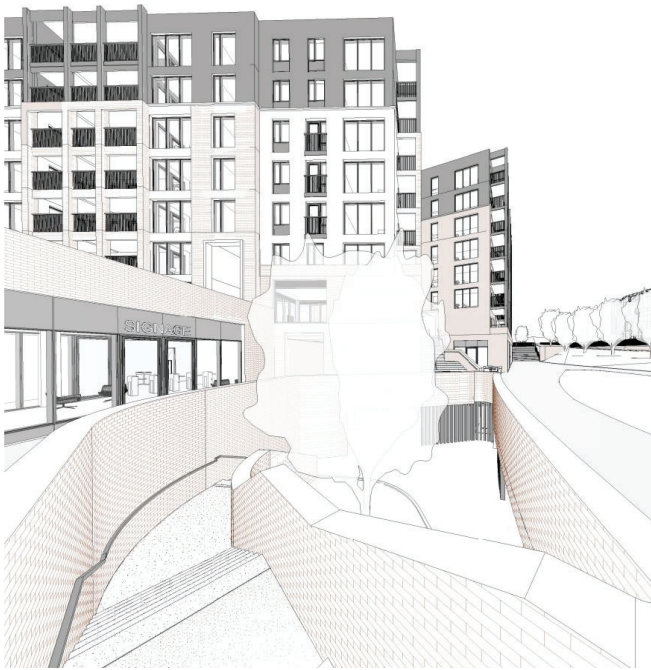
The proposed site development strategy is different to that previously permitted. The previous and partially constructed development comprised three large blocks with continuous external elevations and car-parking on a podium deck over two levels of car-parking. The south western/Monivea Road block has been constructed to ground level and the entire site has been excavated to facilitate a general lower basement level of +23.3m Ordnance Datum (OD). The partially constructed upper basement and ground floor levels are at +26.8m and +30.8m OD respectively.

In the Phase 1 office and hotel development it is proposed to complete these basement levels over the remainder of the western area of site to facilitate the re-use of the structure. The existing road levels vary from approximately 28.5m OD at the north-west (Joyce Road) corner

of the site to approximately 30.0m OD the Monivea Road south-east corner.

This produces a general ground level of development over approximately 2/3 of the site at +30.8m OD. This is the same as the overall site design level previously permitted and facilitates ramped and gently sloping approach from the public road, vehicular parking, service and storage as well the distribution of environmental services and utilities. The lower basement level of 23.3m OD will be completed across the entire excavated site.

The Phase 2 development is proposed with split lower and upper ground levels at approximately 27.3m and 31.8m OD respectively over a single basement (lower) level. This facilitates the separation of public open space and residential communal open space as described elsewhere as well as basement ramp and infrastructural service design.



HJL Sketch View to Vertical Connection from Basement to Public Plaza Level



PUBLIC REALM & SITE ACCESS CONTROL

The proposed uses differ from those previously permitted and the scheme design provides for significant public access, open space and amenity. This physical and visual 'permeability' of the site reduces apparent scale and density as well as providing for passive security.

There are two principal public pedestrian entrances on Monivea Road. The principal entrance is between proposed Phases 1 and 2, with a secondary entrance to Phase 1 between Office C and Office D. There are two principal public pedestrian entrances on Joyce Road, the principal one between the hotel and Office B with a secondary pedestrian entrance to the north of the hotel beside the vehicular entrance to the basement. There are additional pedestrian and cycle entrances between Offices B/C and D/E as well as pedestrian and cycle entrances to the residential element of Phase 2 off Monivea Road at either side of the ground floor retail use.

There are two principal public open spaces for the integrated Phase 1 / 2 development. The Phase 2 public open space is linked to Phase 1 via a terraced area (now proposed with café/retail use). The Phase 1 space is central to hotel and Offices A-D. Both are available to

site users, residents, visitors and the public. The Phase 1 space is designated as having 'event' use given its size and layout.

The development of the overall site as mixed use over substantial car-park and service structures is a significant undertaking which will require integrated management of landscape, user and public access and security. Gates have been indicated across the entire Phase 1 and 2 development in the attached drawings. The site layout is clearly, with the extent of access proposed, not a 'gated community'. There is no overt security presence at any entrance and passive security is prioritized over active measures. All public space is overlooked by its adjoining uses for both public amenity and passive security.

The gates are proposed to manage access when and if required and to prevent the establishment of public rights of way over what is necessarily a privately owned and managed development.

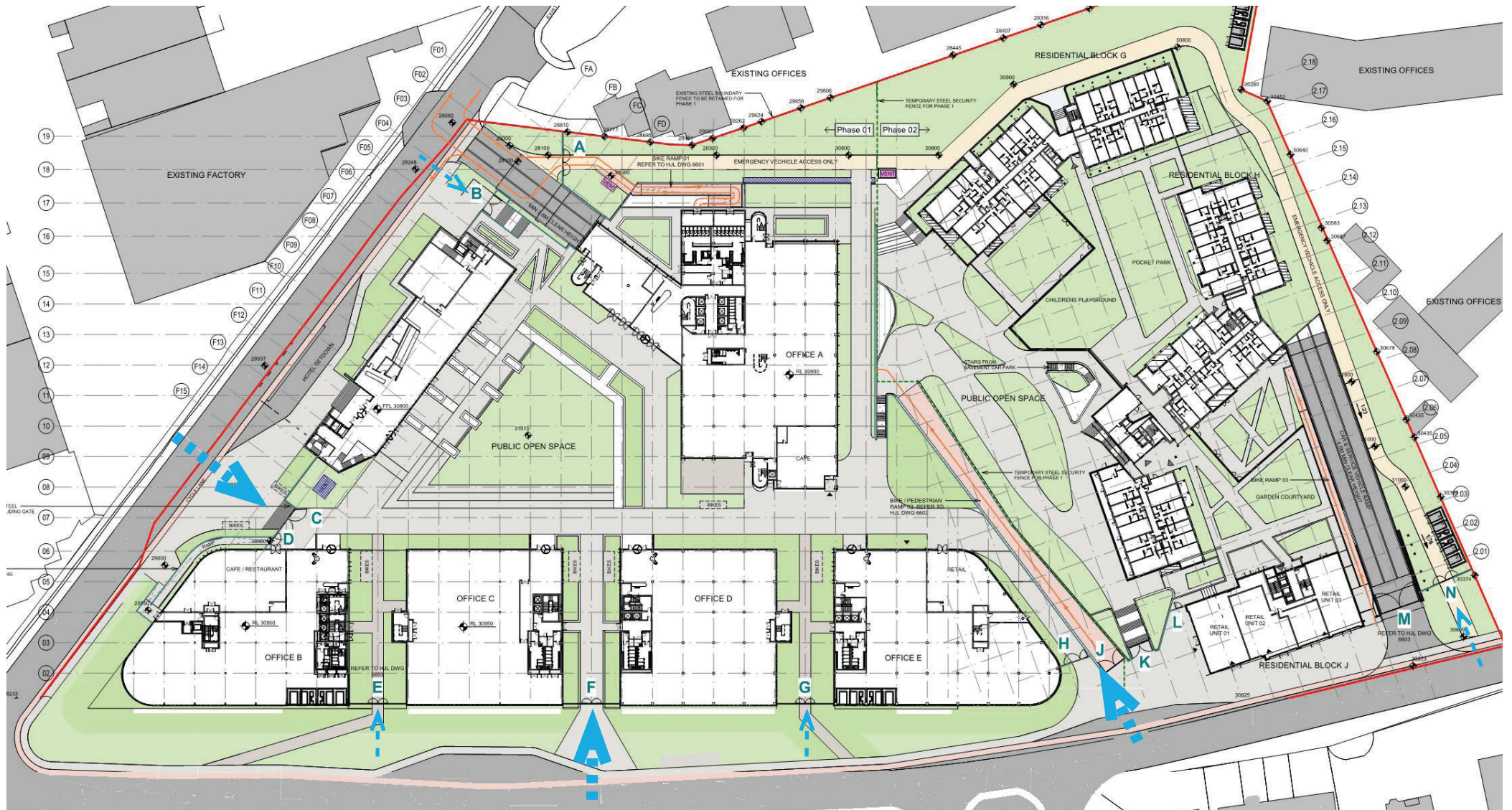
Access to the basement levels is access controlled for safety and security reasons. Access to all residential elements of Phase 2 is controlled for the same reasons and restricted to residents and visitors.



Proposed Scheme - Phase 02 Public Open Space View
HJL Sketch View from Block C



Proposed Scheme - Phase 02 Public Open Space View
HJL Sketch View from Monivea Rd pedestrian entrance over Phase 02 public space



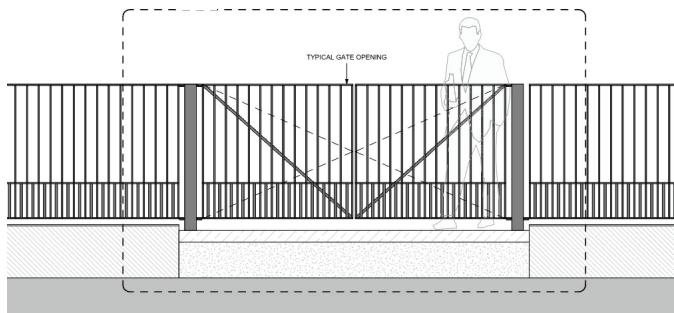
Proposed Gate Location Site Plan

SITE FENCE & GATES

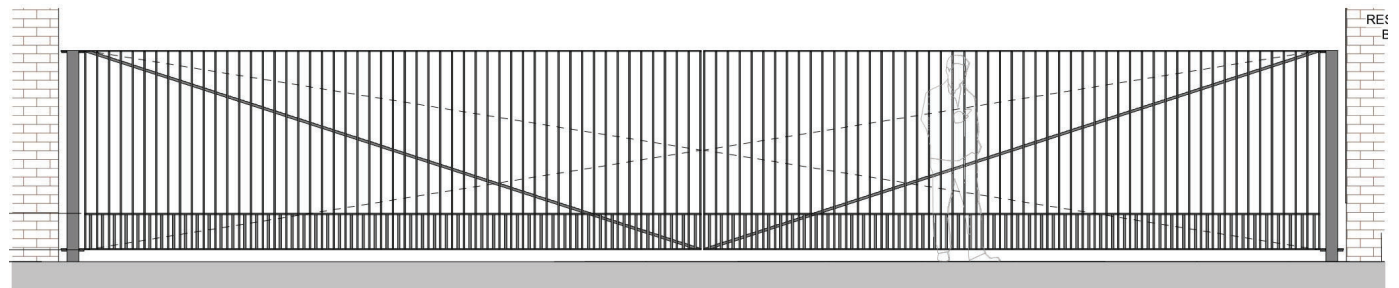
The site layout plan indicates the extent of railing and gates to the site enclosure, see previous page. This diagram labels proposed gates and notes points of pedestrian entry to the site.

The detailed drawing below indicates the typical design of the gates and railing. With the exception of the gates to the 'linear park' area (Gates A and N), the gates are proposed to manage access when and if required and to prevent the establishment of public rights of way over what is necessarily a privately owned and managed development. It is intended that the gates to the linear park will close at night, similar to those of public parks for security and to protect the amenity of the residential element overlooking this area.

Access to the basement levels is access controlled for safety and security reasons. Access to all residential elements of Phase 2 is controlled for the same reasons and restricted to residents and visitors.



Typical Gate/ Railing Elevation



Typical Gate/ Railing Elevation

LANDSCAPE DESIGN

CUNNANE STRATTAN REYNOLDS

The Crown Square (Phase 2) development represents a significant scale residential and commercial scheme close to the centre of Galway City, offering a unique opportunity to positively contribute to the surrounding urban environment.

The primary pedestrian entrance to Phase 2 of the development, is located adjacent to public transport arrival point on Monivea Road and will be visually announced using bespoke landmark sculpture. From here pedestrians are invited directly into the scheme with onward movement to the visitors chosen level, (ground level, lower ground level or upper level), within the development - facilitated through a choice of ramps or steps.

The various levels play an integral role within Phase 2 in balancing in the provision of private residential open space with adjacent public access to the schemes commercial and retail elements.

PERMEABILITY

Pedestrian permeability and linkage between Phase 1 and Phase 2, through the creation of a variety of public open spaces, is a key consideration within the overall design. A hierarchy of connected spaces have been developed, with various forms of planting proposals assisting in the creation and control of comfortable micro-climates within these spaces. Additionally a linear public park loops around the external perimeter of Phase 2, linking with both the south west corner at Monivea Road and the northwest corner of Phase 1 – allowing pedestrians and cyclists to circumnavigate the entire scheme within the environment of a public greenspace.

Alternatively pedestrians can move directly through the scheme by entering via the ‘Public Streetscape’ and traversing the ‘Public Plaza’ at lower ground level before either moving into Phase 1 or connecting with the ‘Public Linear Park’ to exit, or vice versa.

LANDSCAPE CHARACTER AREAS

Five main character areas have been developed within the scheme, three of which offer public access and two being semi- private communal residential spaces.

The three main public access areas are defined as; ‘Public Streetscape’ presented to the Monivea Road, connecting to the ‘Public Plaza’ at the lower ground level which offers public access through the heart of the development, and finally a ground level ‘Public Linear Park & Fitness Trail’ which offers public access around the scheme’s eastern and northern perimeter ultimately linking with Phase 1 development and accessing the northwest corner of the scheme.

The semi-private communal residential areas are defined as ‘Private Communal Open Space’ which is accessed at the upper level and ‘Private Sunken Courtyard Gardens’ which are accessed at the lower ground level.

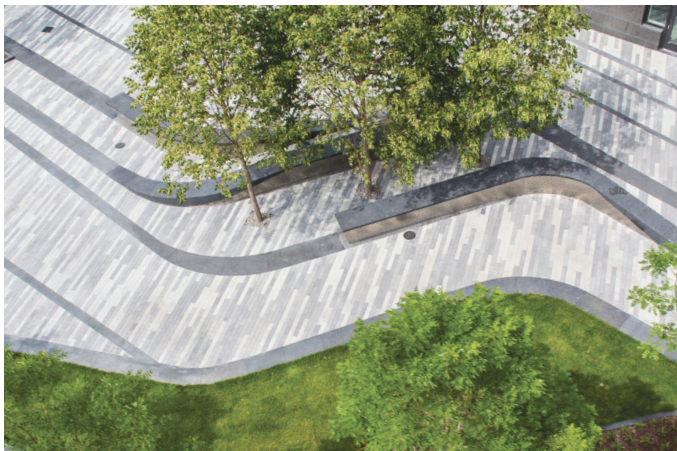
Schedule of Open Space Types	
Type	Public/ Semi- Private
Public Streetscape	Public
Public Plaza	Public
Public Linear Park & Fitness Trail	Public
Private Communal Open Space	Semi-Private (Residential)
Private Sunken Courtyard Gardens	Semi-Private (Residential)



Reference Imagery: Communal Open Space



Reference Image: Public Streetscape



Reference Image: Public Plaza



Reference Image: Public Linear Park

PUBLIC STREETSCAPE

The public streetscape represents the schemes frontage to Monivea Road and is designed in such a manner as step back from the road edge creating a generous pedestrian space between the Monivea Road and the proposed commercial units. This creates an interphase area that allows the development of a strong streetscape planting scheme, reflecting the modern architectural design and incorporating seating opportunities, which acts as a visual and physical buffer softening the manner in which the development addresses the Monivea Road.

PUBLIC PLAZA

The 'Public Plaza' space offers the capacity for both formal and informal public events, whilst facilitating pedestrian and emergency vehicle movement through the interior of the development. This space has been furnished with large scale raised planters, enabling medium to large tree species to be incorporated, adding human scale and visually softening the urban environment and in particular exposed elevations of ramps and podiums. It is intended that through detail design stages a surface paving philosophy will be developed with aim of using a suitable palette of paving material types, textures and colours to create an interesting yet cohesive patterned treatment of the paved pedestrian surface – with particular emphasis being placed on creating visual interest from the overlooking windows. It is anticipated that a combination of natural stone and man-made paving products will be utilised to achieve this aim. Seating and lighting will where possible be integrated into built landscape structures such as low walls, raised planters, steps etc – avoiding a clutter of standalone furniture.

PUBLIC LINEAR PARK & FITNESS TRAIL

The liner park creates a strong linkage between Phase 1 and Phase 2, offering a high quality public space acting as a 'greenway' route for pedestrians and cyclists around the entire development as a whole. It can be accessed from the existing public streets and internally from the 'Public Plaza'. It will also play an important role in terms of visual impact mitigation creating the opportunity to plant a native woodland screen around the northern and eastern perimeter of the overall site (Phase 1 & 2).



Public Linear Park Sketch Section

PRIVATE SUNKEN COURTYARD GARDENS

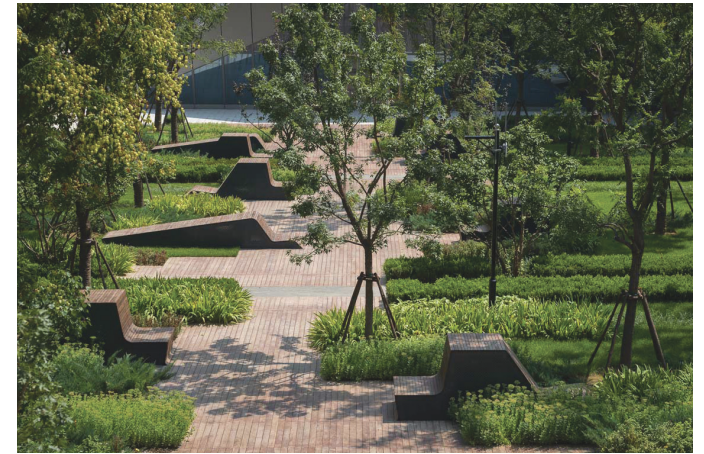
Set amongst the residential buildings are a series of private residential communal 'Sunken Courtyard Gardens', each having their own identity in terms of form and planting. These communal outdoor living spaces for residents will offer secluded and peaceful retreats with sheltered outdoor seating opportunities integrated with raised planters, hosting ornamental tree and shrub species.

PRIVATE COMMUNAL PUBLIC OPEN SPACE

Provision is also made for a mix of passive and more active recreation within the 'Private Communal Open Space' areas which incorporate a dedicated outdoor children's playground, fully equipped with natural high quality Robinia timber play equipment and sand safety surface.



CSR Landscape Plan



Reference Image: Private Sunken Courtyard Gardens



Reference Image: Private Communal Open Space



Linear Park Gym Trail & Integrated Seating-Planters



Lower Ground Level Landscape Plan



Ground Level Landscape Plan

DETAILED DESIGN

SCALE

Scale has been referred to earlier in Section 02 of this statement. Section 02 sets out scale in regard to the overall development site. The scale of this residential scheme design is primarily influenced by the objectives and policies set out in the 2018 Sustainable Urban Housing: Design Standards for New Apartments - Guidelines for Planning Authorities (Department of Housing, Planning and Local Government) and an objective to match the other architectural design standards and guideline documents set out in Section 01 of this statement with the economic viability of the development. This is a mixed-use residential development with a density of c. 142 units/Hectare. As such it is proposed as a reasonable response to national policy in regard to sustainable development and density while providing site and local area character and amenity.

Early design options investigated proposed multiple courtyard residential block development. While potentially resulting in lower building height overall, the scale and introverted nature of the internal courtyards was considered limiting in terms of overall amenity. The chosen strategy is of wider and open garden courtyards, one opening west, one east and interconnecting. Early solar modelling supported this as a relatively risk-free model in terms of achieving adequate access to sunlight and daylight.

BLOCK LAYOUT

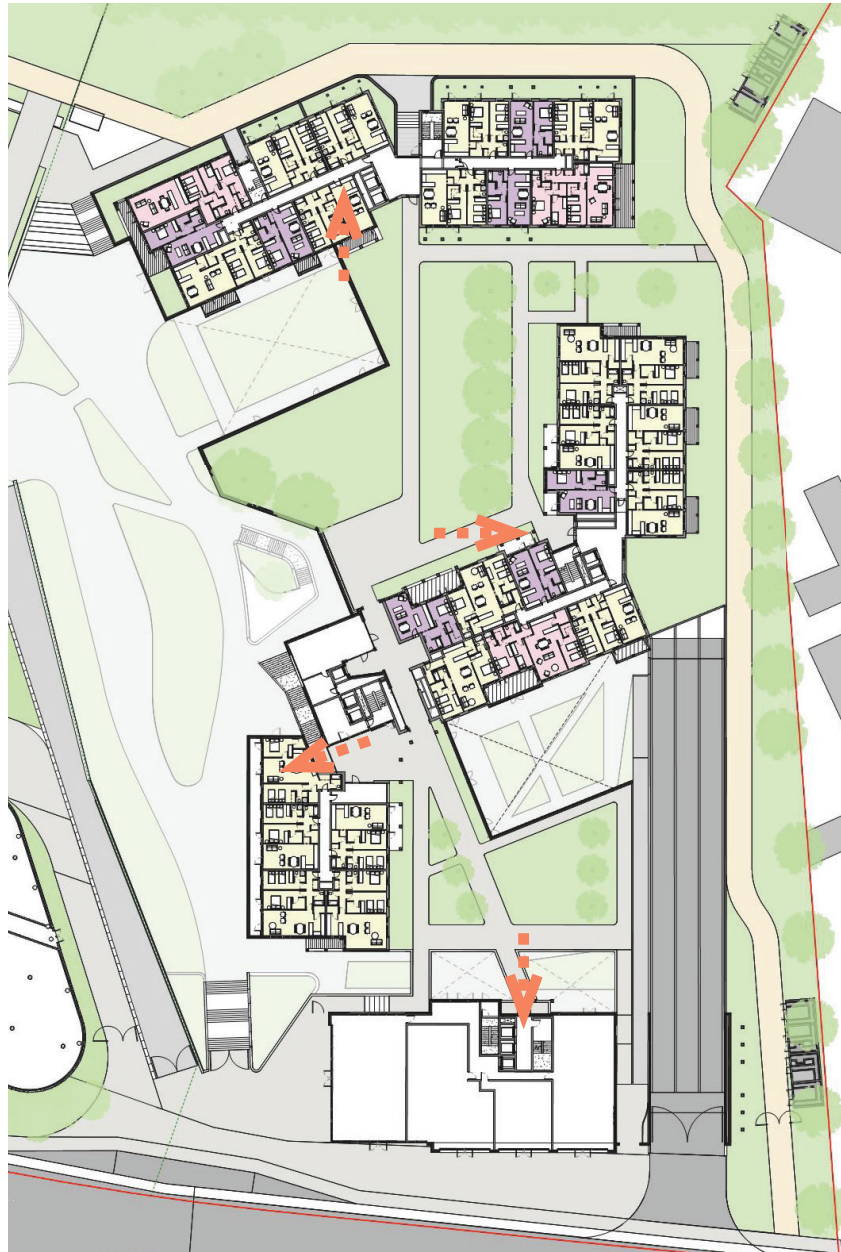
The apartments are proposed in three blocks (designated G, H and J) forming two U-shaped garden courtyards at upper ground level. Their height steps back from Monivea Road. Block J to Monivea Road incorporates street level retail units. Blocks G and J are located at an upper ground level of 31.8m OD surrounded by their communal open space. There are further smaller garden courtyards 'cut out' of the upper ground level and which provide daylight and ventilation to parts of the lower ground floor residential and other accommodation.

All of the apartment lift and stair cores connect directly to both lower ground and basement level -2 amenity, car and cycle parking and service facilities. There is a centrally located public stair and lift connecting the main level -2 car-park with the public open space at level -1. This continues on to upper ground floor residential level where there is an access controlled entrance for visitors. The primary access for resident and visitors is at upper ground floor level from the communal open space. Residents can additionally enter their stair and lift cores from either basement levels. Residents car parking and waste management areas are at level -2 and cycle and other amenity facilities are at level -1.

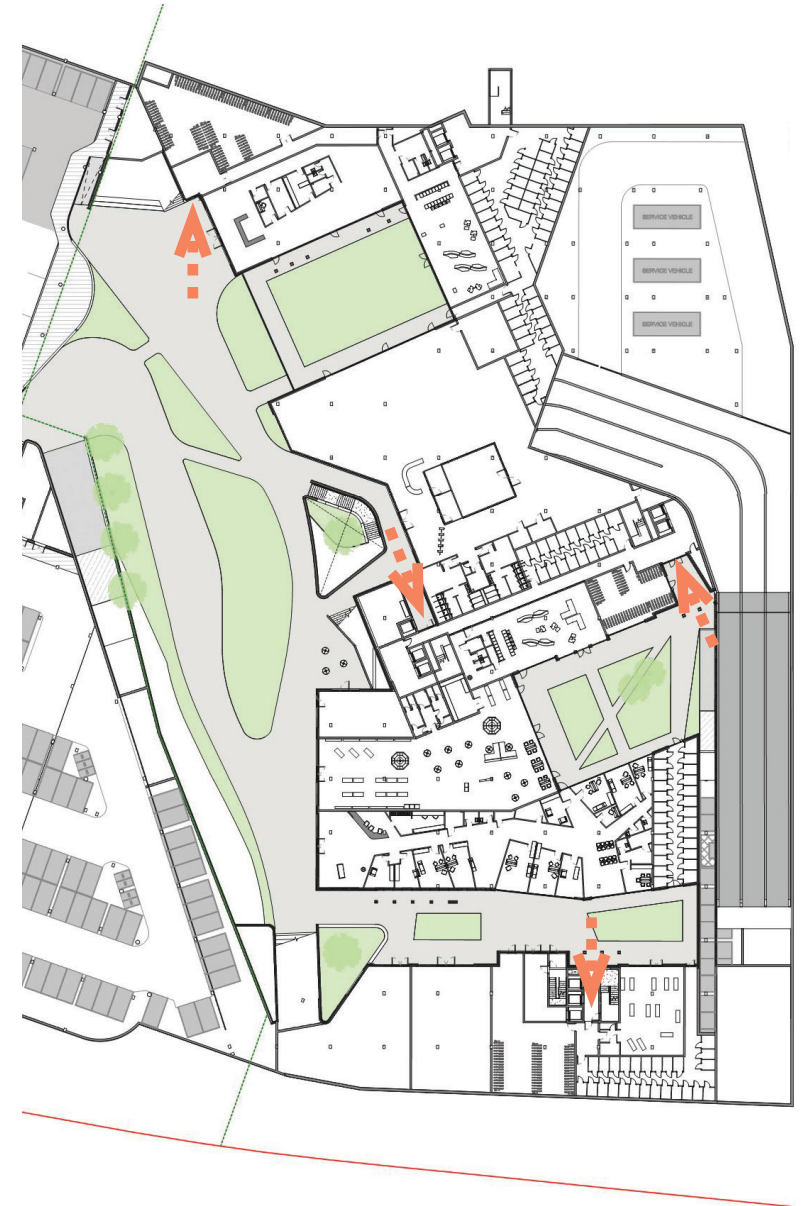
Block J has 4 residential levels over ground floor retail with 12 apartments per level, per core. Blocks H and G are 7 and 8 storeys respectively over the upper ground level. These are planned with 9 and 11 apartments per level, per core.

The single staircase core access is planned to limit travel distance from apartment entrance to stair to 15m maximum. There are 14 no. apartment layouts presently proposed in 1, 2 and 3 bed configurations. Some have conventional (protected fire lobby) access and others have direct access to living space ('American' layout with no lobby) requiring sprinkler protection.

RESIDENTIAL ACCESS



Ground Level Residential Block + Residential Access Diagram



Lower Ground Level Residential Block + Residential Access Diagram



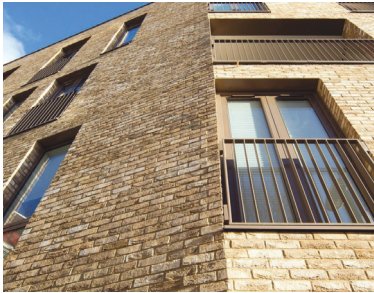
APPEARANCE

The appearance of the development is assessed on two levels. The first is at a wider external neighborhood level and which is addressed in Section 02 of this statement. The second level of assessment is that of the building user and particularly in this case the residents. The UK Commission for Architecture and the Built Environment (CABE), in their publication 'Design and Access Statements: how to write, read and use them' (CABE/PAS (UK) 2007) state as follows.

'What a place will look like is often mistakenly understood to mean its design. This in turn is often wrongly read to mean architectural style. But appearance is really the visual representation of all the decisions that went into the design. So, layout, scale and landscaping will all affect what a place looks like. The statement needs to explain what the person applying for permission wants the place to look like and why. It also needs to explain how a good appearance will be achieved and maintained.'

The rationale for the design of the overall site layout and allocation of use within this mixed use development has been set out in Section 02 of this statement. The design seeks to protect the residential amenity both physically in terms of access control but also in terms of separation for visual and privacy screening. A key early decision in the site planning was a decision to form the major public pedestrian entrance between the residential and commercial elements of the overall site and directly opposite the McDonagh and Clarke Avenue public open space. Visual connectivity between existing and new residential areas as well as new neighborhood amenity (public open space, gym, restaurant, medical centre etc). is central to the appearance of the development. Landscape design in terms of hard and soft finish and scale of materials supports the appearance of the new public open space as open and as a setting for the higher density residential development.

The residential access and primary (communal) amenity space are designed at upper ground level. This is deliberate and intended to provide privacy and passive security as well as a 'buffer space' between the open public space and the more private courtyard gardens of the residential element. There is a stepped progression from external public to site public to communal and private open space. This is supported by layout, landscape and materials.



MATERIALS

The design and material selection of the of the overall site development is intended to break down the impact or apparent appearance of the large scale of development. The permitted design of commercial development of hotel, office and ancillary amenity has a range of materials reflecting function and scale. Offices are substantially glazed with some stone façade elements. The hotel presents as a more solid identifiable block with (different) stone cladding and a very open glazed ground floor – similar to the ground level public amenity facilities in the office buildings. The layout facilitates permeability and pedestrian circulation between the commercial and residential elements of the overall site.

Aside from the functionally driven difference in appearance of residential as compared with office buildings, a conscious decision has been made to make the appearance of the residential element different. This works at two levels, one relates to scale and appearance and the other to durability and simplicity of finish for maintenance over time.

In early design development, ground and public/neighborhood centre interface level was proposed as stone finish, matching that of the stone finish to the opposing elevation of the permitted commercial offices and car park. Brick was considered for use with the residential as being appropriate in terms of scale and 'robustness'. The most significant element in terms of appearance of higher density residential development in Ireland is that of the apartment balcony/ private open space. In early design these were primarily projecting or cantilevered structures.

In developed design of the public open space and its landscape, brick has been proposed as more appropriate in scale and more flexible in terms of adaptation of straight and curvet walls and for incorporation with landscape elements. Its colour differentiates this more residential element of the overall site presenting a material of more human scale and warmth of finish. The material finishes for the residential development are as follows. Full brick facades for residential blocks of this scale were considered as potentially too large for a single material

and potentially overbearing if the brick colour were to be strong. On this basis light coloured render and metal (zinc) cladding are also proposed to provide variety and to break down the scale of the facades as well as to provide light reflectance / brightness to the residential courtyards. Material selection is proposed as follows;

Brick

Lower ground level public open space,
Neighborhood Centre facades
Monivea Road
Public facing element of residential blocks.

Render

Residential blocks, primarily courtyard elevations.

Metal Cladding/Zinc

Residential blocks – upper floor roof levels.

Metal Cladding / Painted Steel Frame

Some balcony structures

Metal Frame Glazing

Ground and Lower Ground Floor Shop
Fronts and Neighborhood Centre facades.

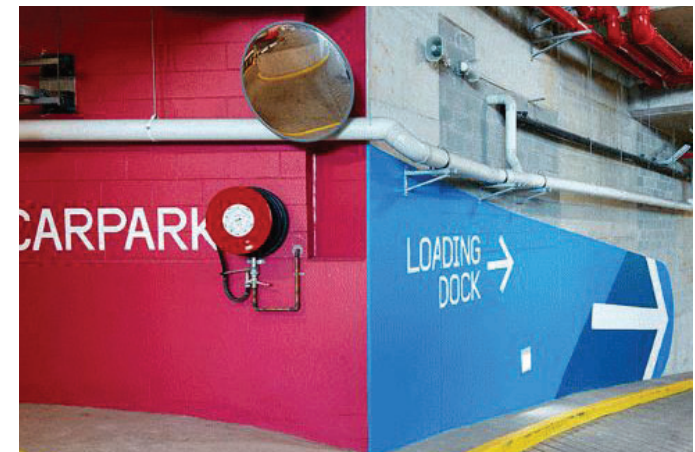
BASEMENT LEVEL

The basement is a large and significant element of the overall development providing for all building occupants, users and visitors. The upper basement level opens onto the second, lower level public open space and is therefore not a full basement. Hotel and office facilities including locker, shower and changing facilities are provided at this level. This level will also primarily be reserved for cyclist and visitor vehicular parking. The lower basement will provide the bulk of occupant/user car-parking as well as waste management, plant and ancillary service accommodation.

Both basement levels are designed to provide structural height to provide or present and future distribution of services. Ventilation including smoke in emergency will be provided by mixed natural and mechanically assisted system.

The high bay access area provides for large vehicle including maintenance, construction and emergency access. Access to this area is reserved and will be managed as will, with the entire basement, be under the control of the overall site management company.

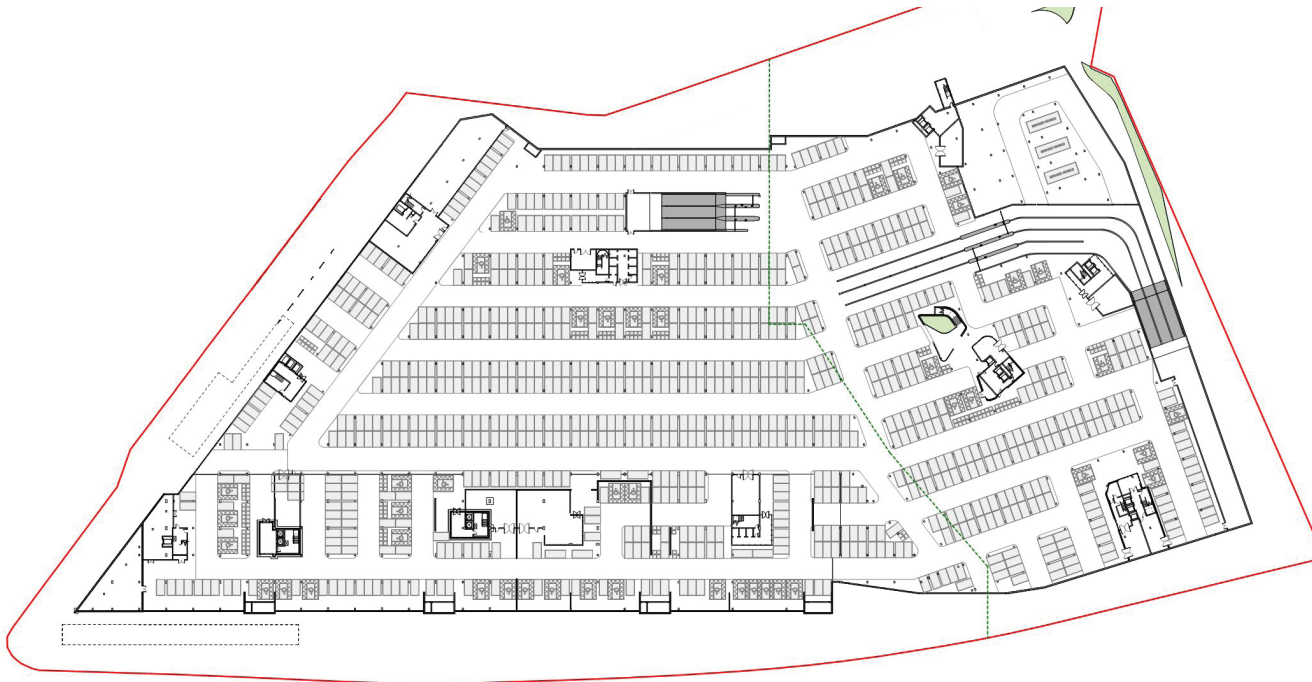
The basement levels will be finished to a high standard to provide for the safety and security of people using facilities at this level. The design of traffic, cyclist and pedestrian movement will be completed at detailed design stage and in consultation with the overall site management company.





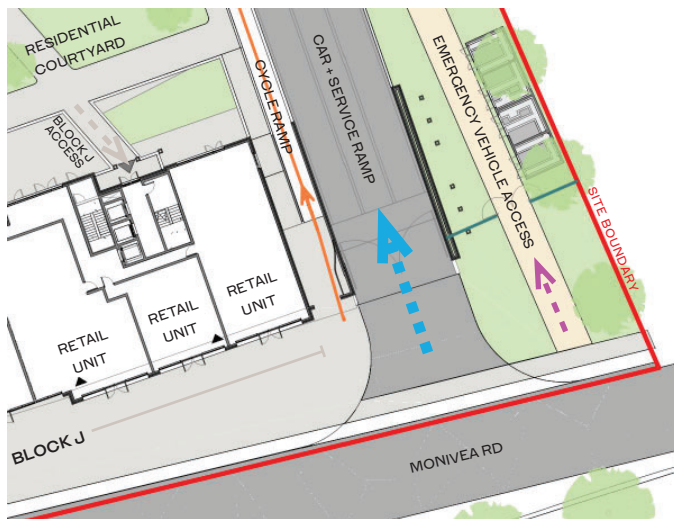
UPPER BASEMENT PLAN

The upper basement level opens on the second, lower level public open space and is therefore not a full basement. Hotel and office facilities including locker, shower and changing facilities are provided at this level. This level will also primarily be reserved for cyclist and visitor vehicular parking.

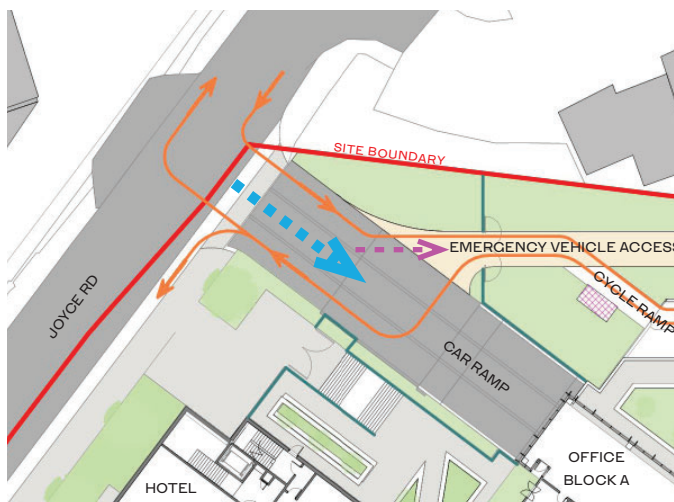


LOWER BASEMENT PLAN

The lower basement will provide the bulk of occupant/user car-parking as well as waste management, plant and ancillary service accommodation. The high bay access area provides for large vehicle including maintenance, construction and emergency access. Access to this area is reserved and will be managed as will, with the entire basement, be under the control of the overall site management company.



Vehicular Access to Basement | Monivea Rd



Vehicular Access to Basement | Joyce Rd

- Cycle Access Route
- - - Vehicular Access to Basement
- - - Perimeter Emergency Vehicle Access

BASEMENT ACCESS CONTROL

Access to basement levels will be controlled for the safety and security of site and building users and to support Mobility Management Planning. It is envisaged that the vehicular access ramps on Monivea and Joyce Roads will have gates / shutters for any necessary closure, likely at nighttime. Building users will have 'fob' type access control over these gates and on-site '24/7' security management will support these users. For normal daytime access these gates will be open and there will be barrier access control in a managed operation of the car-park.

Cycle access to basement levels is separate from the vehicular access. From Monivea Road the cycle access is via a pedestrian and cycle ramp within the public open space between Phases 1 and 2. This leads directly to the open sided upper basement level car-park. This ramp will be shared with Phase 1. From Joyce Road the cycle access is via a cycle only ramp to the north of Office A entering directly in to the upper basement level car-park.

MANAGEMENT AND SECURITY

A Management and Security Office suite is located at Upper Basement Level between the car park and lower level public open space to the east. This provides operational and welfare facilities for the overall and integrated site management and security staff on site as well as a public contact point.



CAR PARK LAYOUT & ALLOCATION OF SPACES

Car parking will be provided in the basement levels permitted under PI Ref 18/363 for occupants and residents of the development. Please note that whilst a total of 1,395 no. car parking spaces were permitted under PI Ref 18/363, the project architects have now commenced detailed design of the Phase I scheme and the number of car parking spaces have reduced to 1,377 which represents a minor reduction of 18 no. spaces (-1.2%) compared to the permitted scheme. The applicants have commenced the conditions compliance on PI Ref 18/363 and an updated Mobility Management Plan reflecting the revised parking proposals will be submitted to Galway City Council to discharge Condition No. 18.

The car park is accessed from both the Monivea and Joyce Road entrances. The car park will be managed by the estate director who is responsible for mobility management of the development. The Estate Director (or Mobility Manager) will regulate the allocation of the 1,377 parking spaces and will ensure any on-site illegal or inconsiderate parking is appropriately dealt with. Please see the enclosed Mobility Management Plan and Operational Management Plan for further details.

In accordance with GCDP requirements provision will be made for disabled parking, • an area within the car-park visitor spaces may be reserved for 'GoCar' type (rental) facilities and • Electrical Vehicle (EV) charging Points will be provided in accordance with the EU Directive - Energy Performance in Building Directive 2018 and the GCDP.

The car park split per user is envisaged to be broken down as follows:

UPPER BASEMENT LEVEL

The upper basement level is open to the public open space to the east. It is proposed that this car park level will provide for site visitors and public as well as hotel guest/public and office users. A set-down area is planned immediately adjacent to the public open space beside the visitor/public parking and Management and Security Office. This is to facilitate set-down including taxi pick-up, particularly for the adjacent residential and associated neighbourhood centre uses.

This set-down and visitor vehicular circulation is from Joyce Road and is designed as a 'loop' or short circuit around the block of visitor parking routing back out and up the exit ramp to Joyce Road, please refer to at Proposed B1 Upper Basement – Site Layout Plan.

It is proposed that the upper basement level car spaces will be allocated by the overall site management company in line with the site Mobility Management planning and for diverse and efficient use e.g. hotel demand will be higher in evening/over-night while office demand will peak during the day. Equally for evening/week-end public events or other amenity access, office spaces can be allocated for visitor/public use. These allocations are indicatively shown on the car park plan on page 7 of the Operational Management Plan.

LOWER BASEMENT LEVEL

It is proposed that the lower basement level will primarily be used by residential and office occupant users. Hotel staff parking is also provided immediately below the hotel. The residential parking is allocated on a 1 space per apartment basis resulting in 288 no. car-spaces provided exclusively for residential use. The balance of the spaces will be allocated by the site management company in line with Mobility Management planning and for diverse and efficient use with those at upper basement level.

CAR SPACE ALLOCATION				
USE	UPPER BASEMENT	LOWER BASEMENT	TOTAL	PROPOSED ALLOCATION
HOTEL	142	27	169	MANAGED
OFFICE	237	604	922	MANAGED
VISITOR	79	0	79	MANAGED
RESIDENTIAL	0	288		PERMANENTLY ALLOCATED
TOTAL	458	919	1377	



UPPER BASEMENT PLAN

The upper basement level is open to the public open space to the east. It is proposed that this car park level will provide for site visitors and public as well as hotel guest/public and office users. A set-down area is planned immediately adjacent to the public open space beside the visitor/public parking and Management and Security Office. This is to facilitate set-down including taxi pick-up, particularly for the adjacent residential and associated neighbourhood centre uses.



LOWER BASEMENT PLAN

Along with waste management, plant and office occupant parking the lower basement will accommodate residential parking. The residential parking is allocated on a 1 space / apartment resulting in 288 no. car-spaces provided exclusively for residential use.

RESIDENTIAL PARKING	
OFFICE PARKING	
HOTEL PARKING	
VISITOR PARKING	

PROVISION OF EV CHARGING POINTS

Charging points for electric vehicles (EV) and cycles will be provided at basement levels in accordance with the Galway City Development Plan and the 2018 revised EU Energy Performance of Buildings Directive.

The **Galway City Development Plan** states, at the end of Section 3.3 under 'parking'...

'In commercial developments, one parking space shall be equipped with one fully functional and clearly

marked EV charging point in accordance with the requirements of Transportation Section and ESB'.

GCDP Section 11 states...

'The introduction of electric vehicles (EV) and the government target of 10% of all road vehicles to be powered by electricity by 2020 will require additional EV charging points in the city. The Council will work in conjunction with ESB networks in the provision of charging points in public areas in the city'.

The revised **Energy Performance in Building Directive** is to be transposed into Irish Law within 20 months of its 2018 publication. It addresses the need to provide for future EV charge points. It states the following...

'With regard to new non-residential buildings and non-residential buildings undergoing major renovation, with more than ten parking spaces, Member States shall ensure the installation of at least one recharging point within the meaning of Directive 2014/94/EU of the European Parliament and of the Council and ducting infrastructure,

namely conduits for electric cables, for at least one in every five parking spaces to enable the installation at a later stage of recharging points for electric vehicles...'

and also that...

'With regard to new residential buildings and residential buildings undergoing major renovation, with more than ten parking spaces, Member States shall ensure the installation of ducting infrastructure, namely conduits for electric cables, for every parking space to enable the installation, at a later stage, of recharging points for electric vehicles...'

This is in line with industry design guidance. The **British Electrotechnical and Allied Manufacturers Association (BEAMA)** publication, 'A guide to electric vehicle infrastructure' states the following...

'It is widely accepted that over 80% of electric vehicle charging will take place at home and mostly overnight. This provides benefits not only to the consumer but also to the UK energy system as a whole. Opportunity or en route charging from workplace or public infrastructure is a smaller but just as important part of the picture, not least for PHEVs to maximise use of their battery-only mode. To some extent, the installation of on street charge points has been motivated by the anticipation of drivers' "range anxiety" which can be reduced by having a charge point on every street. However, many people believe this concern will naturally diminish as EV ownership grows without the need for an over-generous vehicle to charge point ratio. In order to provide confidence for drivers and deliver commercial longevity for the infrastructure, accessibility and carefully planned locations are probably more important considerations than total charge point numbers'.

These statutory policy, regulatory and industry design requirements

and guidance all suggest the need for the provision of EV infrastructure and that home/residential charging points will deal with most EV charge demand. The EPBD refers to the provision of 'ducting infrastructure, namely conduits for electric cables' to facilitate EV charging. The proposed development has the potential capacity to provide EV charging to the majority of car-parking spaces due to the double basement construction. Electrical ducting / conduits will be provided at high level at both upper and lower basement car and cycle parking along with the general electrical services. The EV charging points will be wall or column mounted, similar to the installation illustrated below.



RESIDENTIAL DESIGN STANDARDS - NEW APARTMENTS

DESIGN STANDARDS

The proposed Phase 2 development comprises 289 no. apartments with associated amenity space, crèche and neighbourhood centre commercial use.

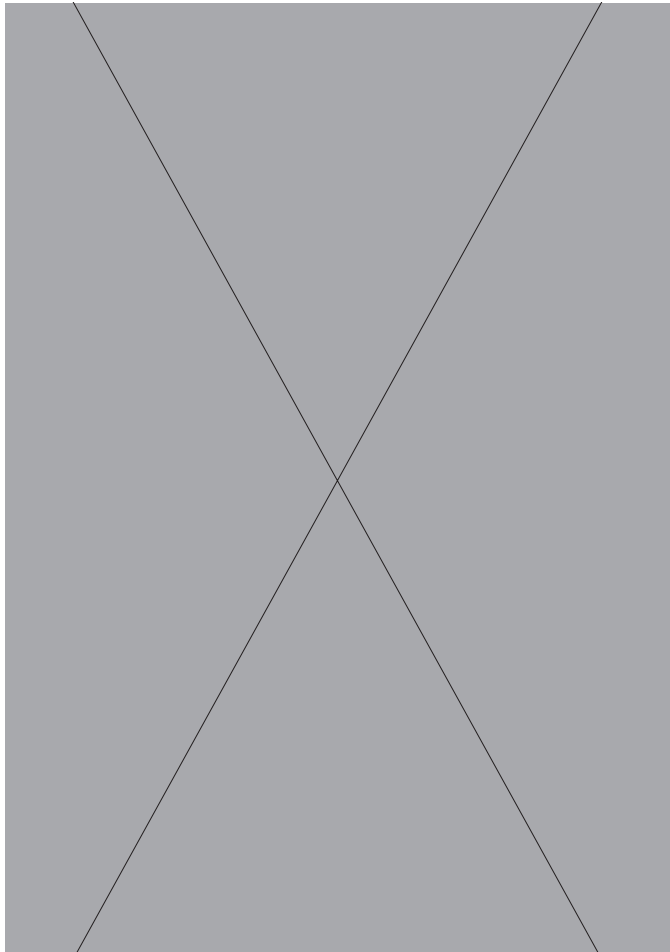
The proposed apartments are designed with reference to the 2018 Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities. These guidelines for planning authorities have amended and replaced the 2015 guidelines expressly to address the following;

- Enable a mix of apartment types that better reflects contemporary household formation and housing demand patterns and trends, particularly in urban areas;
- Make better provision for building refurbishment and small-scale urban infill schemes;
- Address the emerging 'build to rent' and 'shared accommodation' sectors; and
- Remove requirements for car-parking in certain circumstances where there are better mobility solutions and to reduce costs.

A new Chapter of these Guidelines addresses apartments in the emerging 'build to rent' and 'shared accommodation' sectors. These are stated to be rental only developments that are subject to centralised management arrangements, on a specified long-term basis, where individual housing units may not be separately sold for a specified period. They are also noted as more likely to include the provision of added amenities for residents and other factors that allow for more communal lifestyles.

Planning authorities and An Bord Pleanála are required to have regard to the guidelines and are also required to apply any specific planning policy requirements (SPPRs) of the guidelines, in carrying out their functions. Where SPPRs are stated in the guidelines, they take precedence over any conflicting, policies and objectives of development plans, local area plans and strategic development zone planning schemes.

2018 SUSTAINABLE URBAN HOUSING: DESIGN STANDARDS FOR NEW APARTMENTS
APPENDIX 1



APARTMENT DEVELOPMENT IN IRELAND

DESIGN STANDARDS

Apartment design standards in these guidelines include:

- General location consideration
- Apartment mix
- Internal space standards for different types of apartments
- Dual aspect ratios
- Floor to ceiling height
- Apartments to stair/lift core ratios;
- Storage spaces
- Amenity spaces including balconies/patios
- Car parking
- Room dimensions for certain rooms

LOCATION

The guidelines state that in general terms, apartments are most appropriately located within urban areas and that the scale and extent of development should increase in relation to proximity to core urban centres and other relevant factors.

The guidelines state the following;

Identification of the types of location in cities and towns that may be suitable for apartment development, will be subject to local determination by the planning authority, having regard to the following broad description of proximity and accessibility considerations:

1) Central and/or Accessible Urban Locations

Such locations are generally suitable for small- to large-scale (will vary subject to location) and higher density development (will also vary), that may wholly comprise apartments, including:

- *Sites within walking distance (i.e. up to 15 minutes or 1,000-1,500m), of principal city centres, or significant employment locations, that may include hospitals and third-level institutions;*
- *Sites within reasonable walking distance (i.e. up to 10 minutes or 800- 1,000m) to/from high capacity urban public transport stops (such as DART or Luas); and*
- *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) to/ from high frequency (i.e. min 10 minute peak hour frequency) urban bus services. 6 The range of locations outlined above is not exhaustive and will require local assessment that further considers these and other relevant planning factors.*

2) Intermediate Urban Locations

Such locations are generally suitable for smaller-scale (will vary subject to location), higher density development that may wholly comprise apartments, or alternatively, medium-high density residential development of any scale that includes apartments to some extent (will also vary, but broadly >45 dwellings per hectare net) including:

- *Sites within or close to i.e. within reasonable walking distance (i.e. up to 10 minutes or 800-1,000m), of principal town or suburban centres or employment locations, that may include hospitals and third level institutions;*
- *Sites within walking distance (i.e. between 10-15 minutes or 1,000-1,500m) of high capacity urban public transport stops (such as DART, commuter rail or Luas) or within reasonable walking distance (i.e. between 5-10 minutes or up to 1,000m) of high frequency (i.e. min 10 minute peak hour frequency) urban bus services or where such services can be provided;*
- *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) of reasonably frequent (min 15 minute peak hour frequency) urban bus services. The range of locations is not exhaustive and will require local assessment that further considers these and other relevant planning factors.*

3) Peripheral and/or Less Accessible Urban Locations

Such locations are generally suitable for limited, very small-scale (will vary subject to location), higher density development that may wholly comprise apartments, or residential development of any scale that will include a minority of apartments at low-medium densities (will also vary, but broadly.

APARTMENT TYPES & FLOOR AREA

PROPOSED DEVELOPMENT

The site location is defined in Chapter 2 GCDP as Mervue and is described as an Established Suburbs / Sustainable Neighbourhood. The site may be described for the purpose of guideline analysis as an Intermediate Urban Location and this category is used for the application of guideline development control standards. It is marginally outside of the strict guideline definition of Central and/or Accessible Urban Locations.

APARTMENT MIX

The guidelines state an objective to sustainably increasing housing supply, targeting a greater proportion of urban housing development and matching to the type of housing required. They state a need for greater flexibility, removing restrictions that result in different approaches to apartment mix on the one hand, and to other forms of residential accommodation on the other. This results in Specific Planning Policy Requirement 1.

Specific Planning Policy Requirement 1

Apartment developments may include up to 50% one-bedroom or studio type units (with no more than 20-25% of the total proposed development as studios) and there shall be no minimum requirement for apartments with three or more bedrooms. Statutory development plans may specify a mix for apartment and other housing developments, but only further to an evidence based Housing Need and Demand Assessment (HNDA), that has been agreed on an area, county, city or metropolitan area basis and incorporated into the relevant development plan(s).

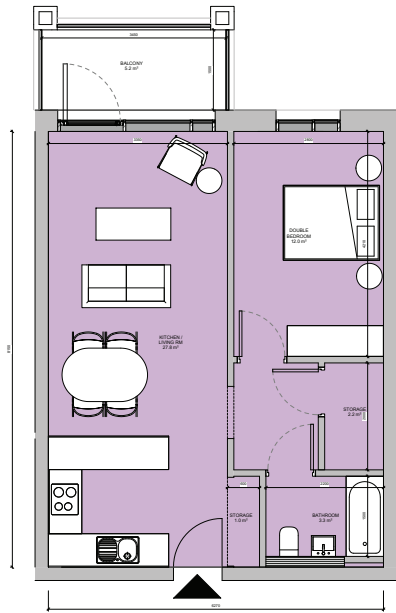
PROPOSED DEVELOPMENT

The development apartment mix is proposed as being in compliance with SPPR 1 and is as follows. There are no studio or 2-bed/3-person units proposed.

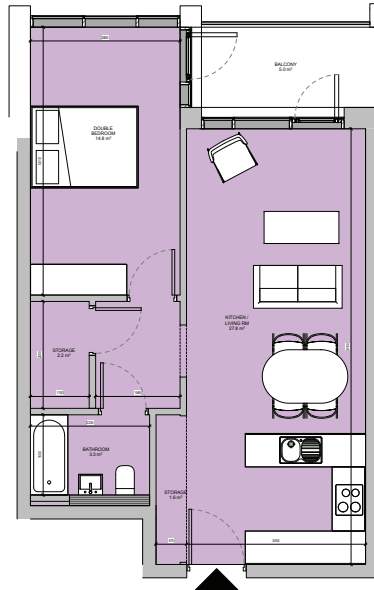
APARTMENT MIX			
APT. TYPE	SPPR1 REQ.	NO. OF UNITS	TOTAL
1-BED	<50%	75	26%
2-BED (4P)		185	64%
3-BED		28	10%
TOTAL		288	100%

Within each apartment type there are a range of unit types which vary in layout and size. The present proposed design includes four 1-Bed apartment types, seven 2-Bed apartment types and three 3-Bed apartment types. These are illustrated on the following pages.

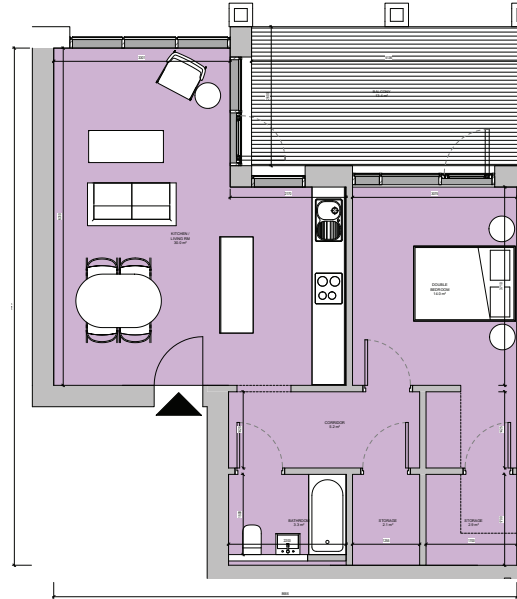
1-BED APARMENT TYPES



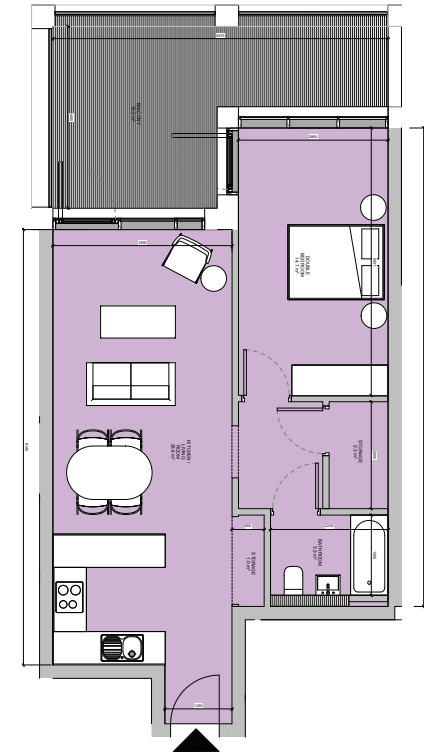
1-BED | TYPE A



1-BED | TYPE B

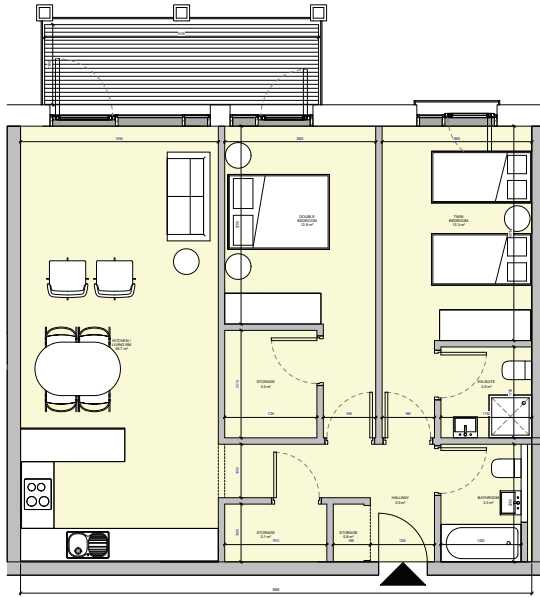


1-BED | TYPE C

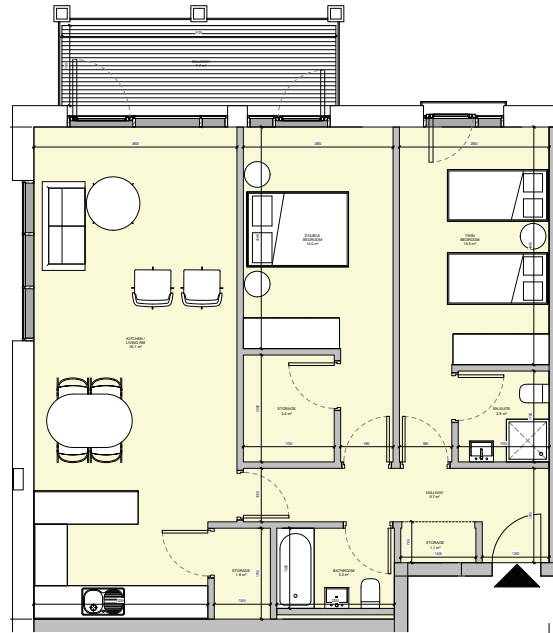


1-BED | TYPE D

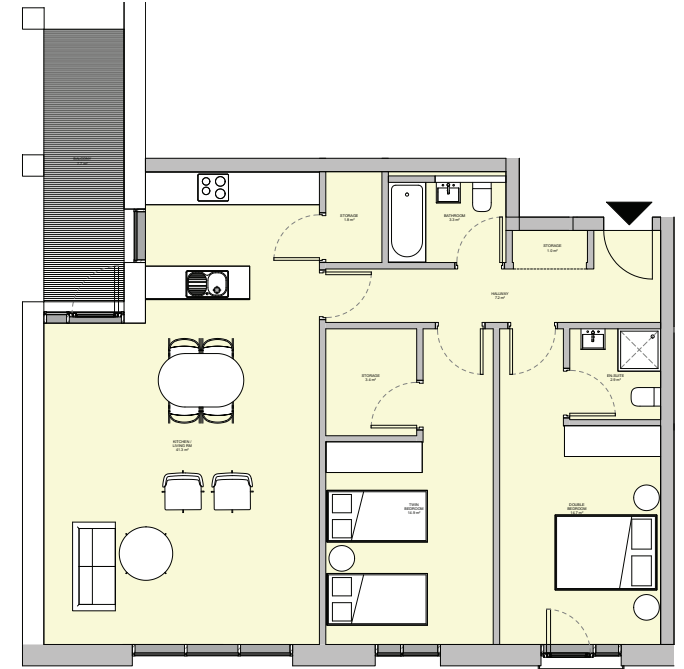
2-BED APARMENT TYPES



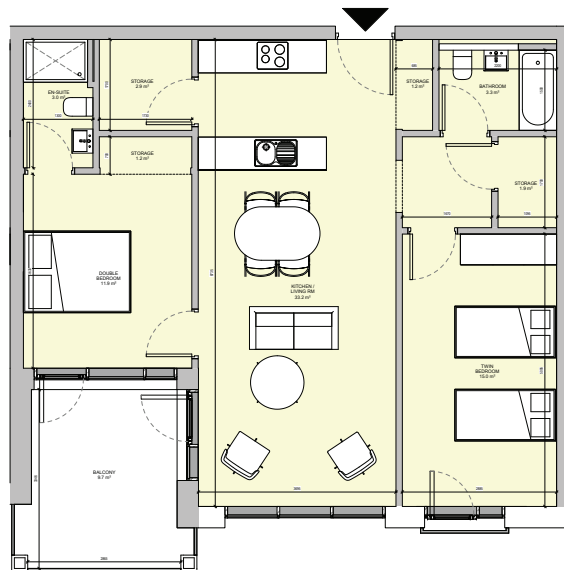
2-BED | TYPE A



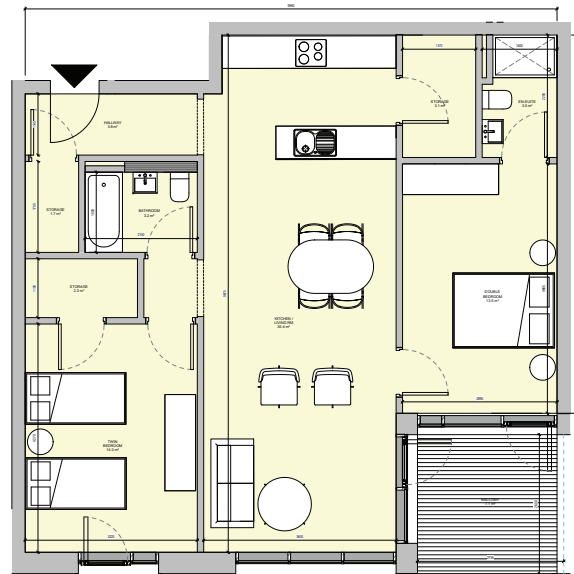
2-BED | TYPE B



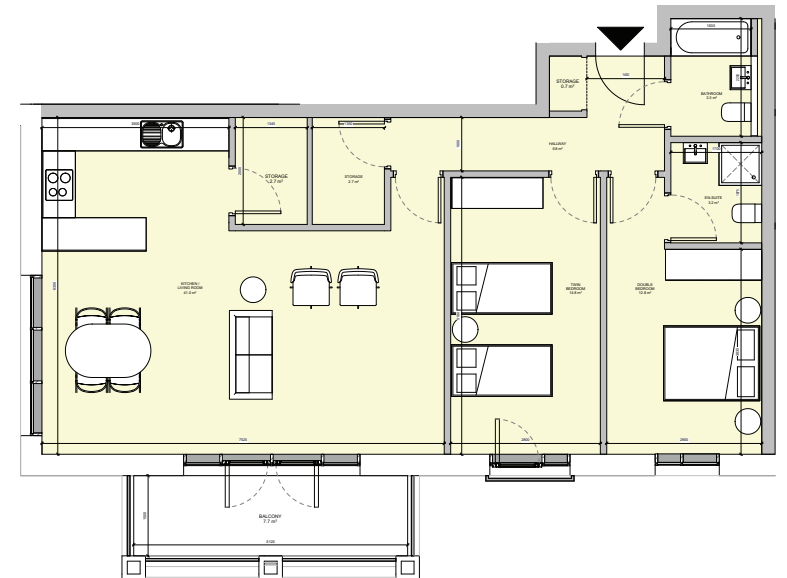
2-BED | TYPE C



2-BED | TYPE D

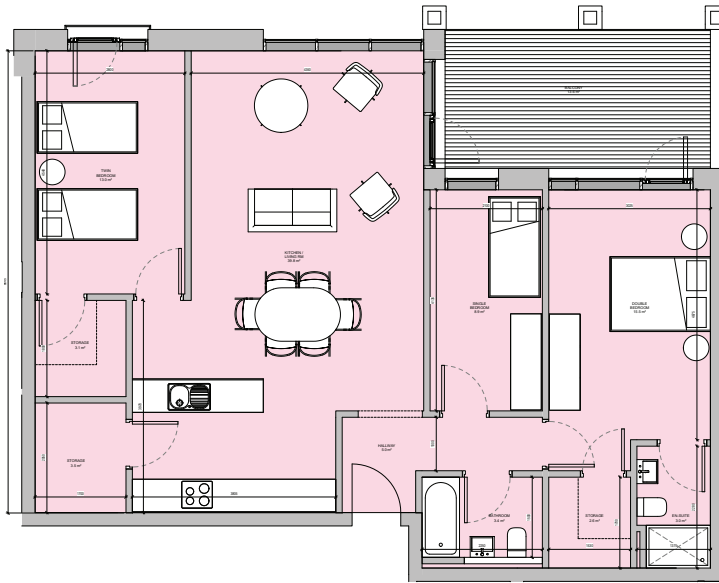


2-BED | TYPE E

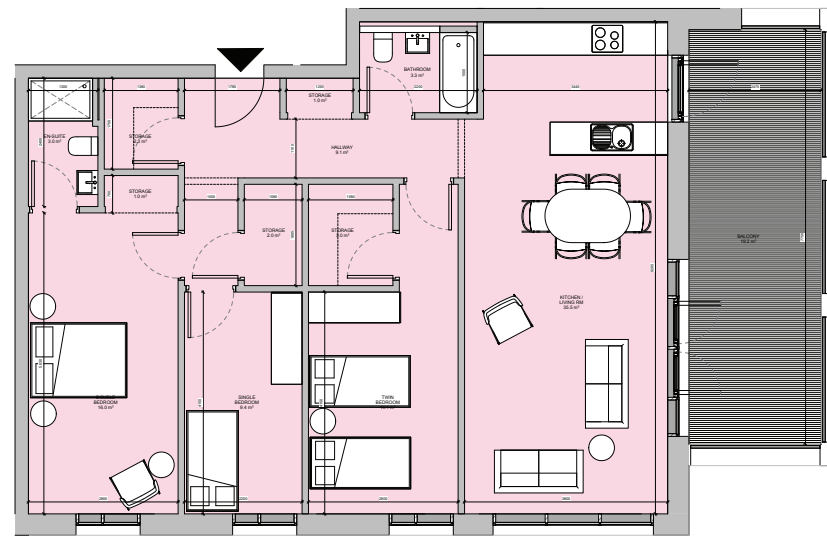


2-BED | TYPE G

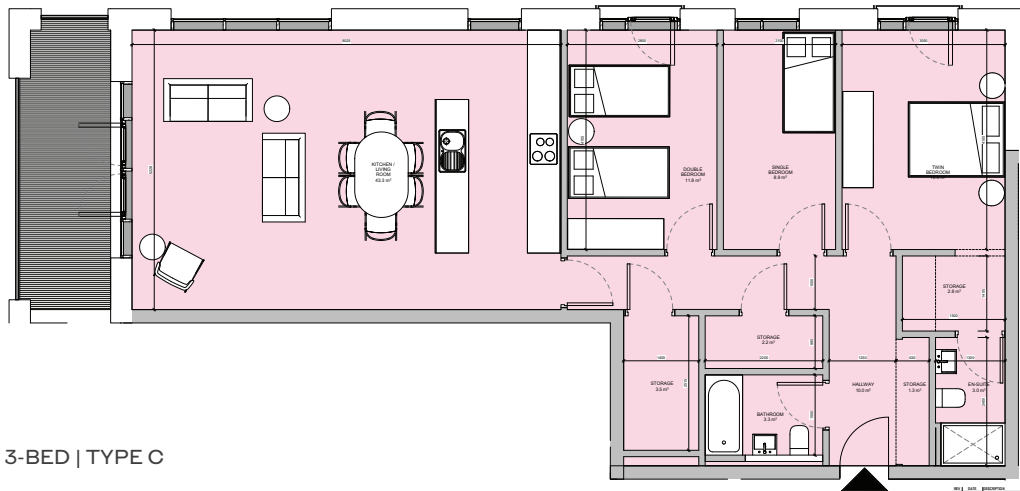
3-BED APARMENT TYPES



3-BED | TYPE A



3-BED | TYPE B



3-BED | TYPE C

APARTMENT FLOOR AREA

The 2015 guidelines provided for studio type apartments (i.e. a small unit with a combined living/sleeping area, generally provided for a single person), but in very limited, specific circumstances, i.e. as part of new 'build-to-let' managed accommodation above a scale threshold of 50 or more units and subject to dwelling mix restrictions. The provisions with regard to studio accommodation have been updated in the 2018 guidelines to reflect the potential that this type of dwelling has, to contribute to both meeting housing need and to the viability of apartment schemes. The minimum size of studio apartments has also been adjusted slightly to enable modular developments and a 'mix and match' approach between studios and the minimum size of two-bedroom apartments. This results in Specific Planning Policy Requirement 3.

Specific Planning Policy Requirement 3 - Minimum Apartment Floor Areas:

- *Studio apartment (1 person) 37 sq.m*
- *1-bedroom apartment (2 persons) 45 sq.m*
- *2-bedroom apartment (4 persons) 73 sq.m*
- *3-bedroom apartment (5 persons) 90 sq.m*

The guidelines state that the floor area parameters set out in SPPR 3 above shall generally apply to apartment schemes and do not apply to purpose-built and managed student housing. They also state the necessity, in relation to social housing, or purpose built housing for older people that the guidelines would also make provision for a two-bedroom apartment to accommodate 3 persons.

On this basis, they advise that, planning authorities may also consider a two-bedroom apartment to accommodate 3 persons, with a minimum floor area of 63m² (in accordance with the standards set out in Quality Housing for Sustainable Communities). The guidelines note that this type of unit may be particularly suited to certain social housing schemes such as sheltered housing. However, the guidelines

state that no more than 10% of the total number of units in any private residential development may comprise this category of two-bedroom three-person apartment noting that this is to allow for potential social housing provision further to Part V of the Planning and Development Act 2000 (as amended), or, if this type of unit is not required to meet social housing requirements, that it would allow for an acceptable level of variation in housing type.

The guidelines state, in the interests of sustainable and good quality urban development that they should be applied in a way that ensures delivery of apartments not built down to a minimum standard, but that reflect a good mix of apartment sizes. They state a requirement that;

- a. The majority of all apartments in any proposed scheme of 10 or more apartments shall exceed the minimum floor area standard for any combination of the relevant 1, 2 or 3 bedroom unit types, by a minimum of 10% (any studio apartments must be included in the total, but are not calculable as units that exceed the minimum by at least 10%).*
- b. Build-To-Rent developments are excepted(sic) from this requirement (see SPPR 8 below) as such developments are required to provide compensatory communal facilities and amenities for use by residents.*

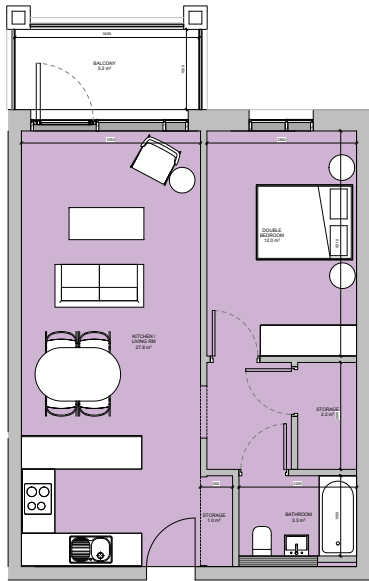
And further note that;

- *Subject to mix, the additional 10% of floor space may apply to one or more unit type.*
- *Any apartment unit type may also exceed the minimum required floor area standards to a greater extent than the parameters set out above.*

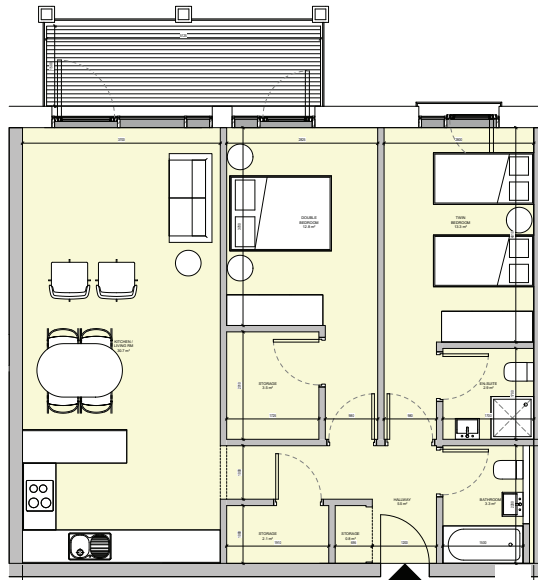
PROPOSED DEVELOPMENT

The development apartment floor areas are proposed as being in compliance with SPPR 2 and are as follows. Refer also to Housing Quality Assessment table attached.

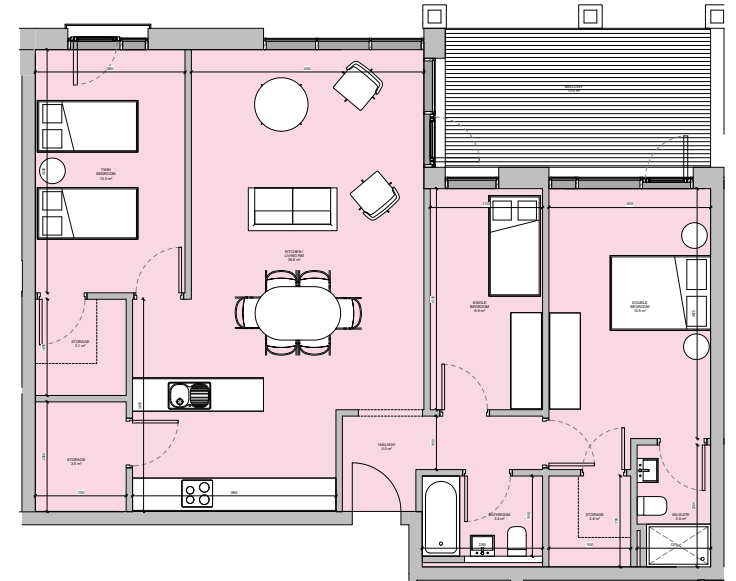
APARTMENT SIZE			
		PROPOSED DEVELOPMENT UNIT AREA	
APARTMENT TYPE	SPPR2 MIN. FLOOR AREA (SQ.M)	MIN. FLOOR AREA (SQ.M)	PERCENTAGE OF UNITS WITH AREA > (MINIMUM + 10%)
1-BED	45	48.9	+90% (RANGE 51.1 - 54.5)
2-BED (4P)	73	78.0	+40% (RANGE 82.2 - 93.5)
3-BED	90	100.7	100% (RANGE 100.7 - 106.2)



1-BED UNIT TYPE A

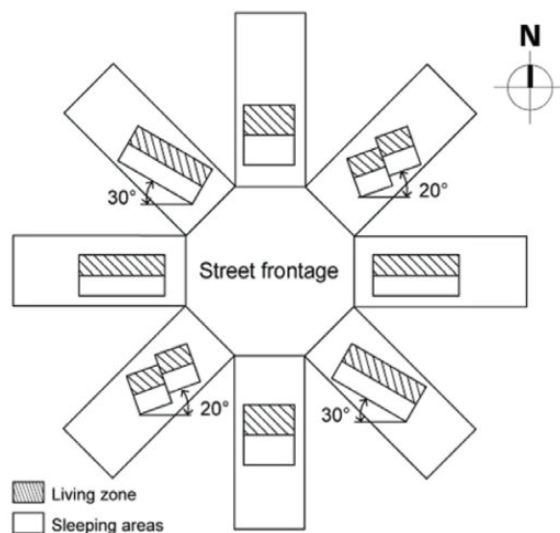
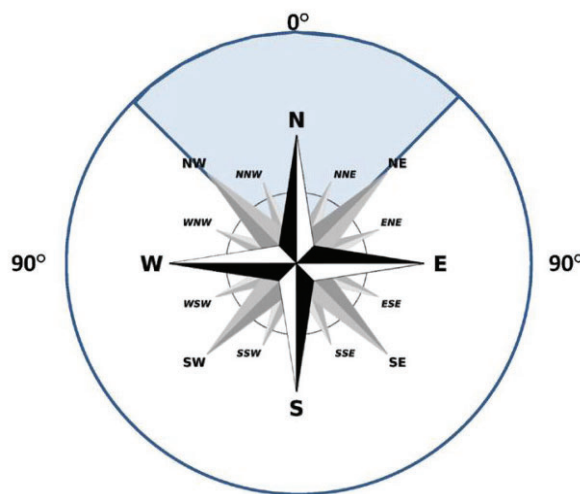


2-BED UNIT TYPE A



3-BED UNIT TYPE A

DUAL ASPECT & ORIENTATION



DUAL ASPECT RATIO

The guidelines state that dual-aspect apartments, as well as maximising the availability of sunlight, also provide for cross ventilation, should be provided where possible and that the day lighting and orientation of living spaces is the most important objective. This requires detailed analysis and modeling of daylight and sunlight. The general design principles are set out below;

- At least 33% of the units as dual aspect in more central and accessible and some intermediate locations, i.e. on sites near to city or town centres, close to high quality public transport or in SDZ areas, or where it is necessary to ensure good street frontage and subject to high quality design. Where there is a greater freedom in design terms, such as in larger apartment developments on greenfield or standalone brownfield regeneration sites where requirements like street frontage are less onerous, it is an objective that there shall be a minimum of 50% dual aspect apartments. Ideally, any 3 bedroom apartments should be dual aspect.
- Where single aspect apartments are provided, the number of south facing units should be maximised, with west or east facing single aspect units also being acceptable. Living spaces in apartments should provide for direct sunlight for some part of the day. North facing single aspect apartments may be considered, where overlooking a significant amenity such as a public park, garden etc.

This results in Specific Planning Policy Requirement 4.

Specific Planning Policy Requirement 4

In relation to the minimum number of dual aspect apartments that may be provided in any single apartment scheme, the following shall apply:

- A minimum of 33% of dual aspect units will be required in more central and accessible urban locations, where it is necessary to achieve a quality design in response to the subject site characteristics and ensure good street frontage where appropriate.*
- In suburban or intermediate locations it is an objective that there shall generally be a minimum of 50% dual aspect apartments in a single scheme.*
- For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, planning authorities may exercise further discretion to consider dual aspect unit provision at a level lower than the 33% minimum outlined above on a case-by-case basis, but subject to the achievement of overall high design quality in other aspects.*

PROPOSED DEVELOPMENT

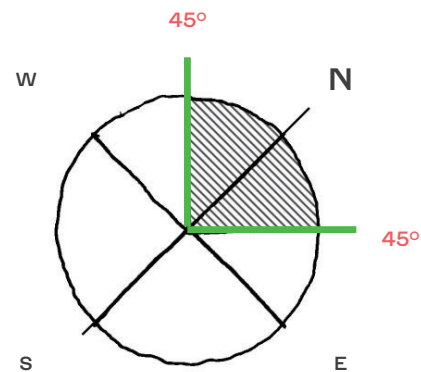
The development dual aspect unit ratio is proposed as being in compliance with SPPR 4 on the following basis.

BUILDING ORIENTATION

The guidelines define north facing units as units that face predominantly north, north-west or north-east and fall within a 45° angle of 0° (due north). The scheme design proposes that all principal facades of the apartment blocks are outside of this north facing definition. Some facades are on the 45°angle and any block face rotation to south away from this defined limit improves solar access for more apartments. There is a direct relationship between sunlight (duration) and perceived quality of amenity for an apartment. More detailed solar modeling and analysis prepared by Integrated Environmental Solutions (IES) is attached at Appendix 04.

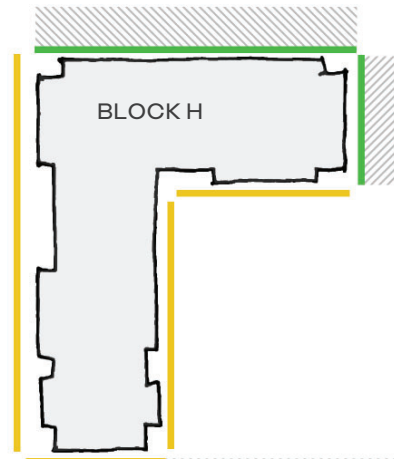
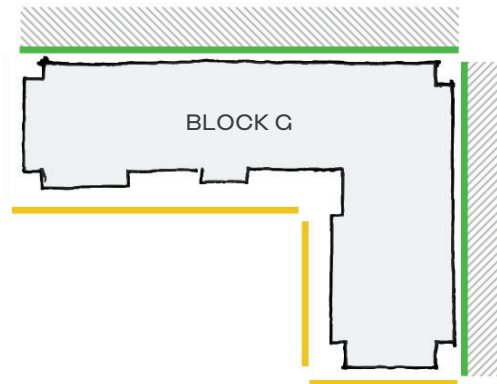
Alternative block plan arrangements have been considered in scheme design development. An empirical analysis of these scheme design Options 01 and 02 is set out below.

The diagrams indicate the linear extent of façade on the 45°angle. Options 1 and 2 have approximately 300m and 200m respectively of façade on this 45°angle. Note that Option 02 is the proposed scheme due to it's improved solar orientation.

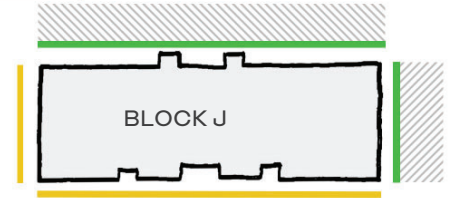
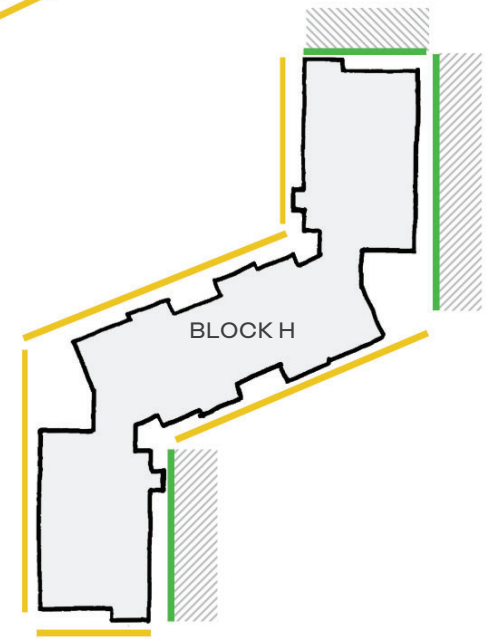
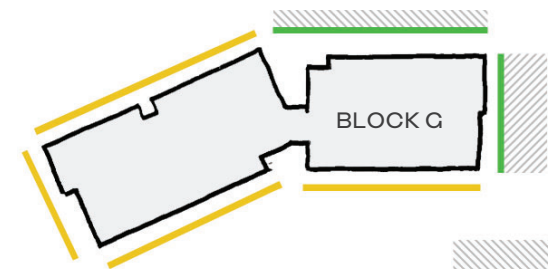


- GOOD SOLAR ORIENTATION
- ON THE LIMIT - ACCEPTABLE
- NORTH FACING - NOT ACCEPTABLE

OPTION 01



OPTION 02



SUNLIGHT ACCESS TO COURTYARD GARDENS

The quality of an external amenity space is directly related to the amount of sun light it receives. This is substantially a function of block layout. This is a qualitative measure that requires more detailed solar modeling. However, empirical analysis of scheme design Options 1 and 2 suggests that the Option 2 amenity spaces will receive more sun light than Option 1 due to the layout and orientation of the central block.

WIND ANALYSIS - MICRO CLIMATE STUDY

IES Consulting were commissioned to investigate the potential impact of wind movement on pedestrian comfort around the proposed Crown Square development, Galway.

The analysis was performed to study:

- The effect of building layout on acceleration and/or deceleration of wind as it passes through the site.
- Determine the effect from air movement on amenity spaces within the development including walkways, breakout spaces, restaurant/café outdoor seating and building entrances.

The Lawson Criteria was used as a reference to assess the wind effects. It is the most widely used reference for assessment of pedestrian comfort. It considers the air speed at the location as well as the frequency of the occurrence of this air speed. It consists of two assessment criteria:

1. The first criteria assesses whether the air movement will be comfortable for the pedestrian for different types of activities.
2. The second criteria assess the feeling of safety or distress by the pedestrian at higher air speeds.

The Lawson's pedestrian comfort assessment criteria has been complete for following activities:

- Category Pedestrian Activ(s)
- Business Walking
- Leisurely Walking
- Standing
- Sitting

The design showed excellent compliance with the Lawson's Pedestrian Comfort and Safety criterion as is detailed in the appended report (Appendix O6)

DUAL ASPECT RATIOS

Dual-aspect apartments maximize the availability of sunlight and also provide for cross ventilation. The guidelines state that they should be provided where possible and that the day lighting and orientation of living spaces is the most important objective.

The guidelines state in regard to the minimum number of dual aspect apartments that may be provided in any single apartment scheme, the following shall apply:

- i. A minimum of 33% of dual aspect units will be required in more central and accessible urban locations, where it is necessary to achieve a quality design in response to the subject site characteristics and ensure good street frontage where appropriate.
- ii. In suburban or intermediate locations it is an objective that there shall generally be a minimum of 50% dual aspect apartments in a single scheme.

The scheme design objective is to achieve >50% dual aspect and improved solar access.



DEFINING DUAL ASPECT

The guidelines do not define dual aspect. Various definitions state dual aspect flats as those with windows on two or more sides with a view in two directions at 90° to each other. The UK Mayor of London/London Assembly Policy D4 on Housing Quality and Standards states the following;

Dual aspect dwellings with opening windows on at least two sides have many inherent benefits. These include better daylight, a greater chance of direct sunlight for longer periods, natural cross-ventilation, a greater capacity to address overheating, mitigating pollution, a choice of views, access to a quiet side of the building, greater flexibility in the use of rooms, and more potential for future adaptability by altering the use of rooms.

PROPOSED DEVELOPMENT

We are defining dual aspect on the following basis;

Type A | Corner Units

These are clearly dual aspect with continuous façade split c.50:50 in two directions at 90° to each other

Type B | Through-Block Units

These are clearly dual aspect with façade split c.50:50 in two directions at 180° to each other.

Type C | Partial Corner Units

These are at internal angle corners along the façade and are proposed as dual aspect provided they

- a. Have a wall return at 90°from the principal façade of min 2.5-3.0m length and
- b. Overlook a significant amenity as defined in section 3.18 of the guidelines.

The scheme design seeks to provide this feature to the apartment living space.

OPTION 01						
UNIT NO.	DUAL ASPECT TYPE					DUAL ASPECT NO.
	A	B	%	C	%	
300	88	32	40%	42	54%	162

OPTION 02						
UNIT NO.	DUAL ASPECT TYPE					DUAL ASPECT NO.
	A	B	%	C	%	
288	123	0	42.5%	57	62%	180

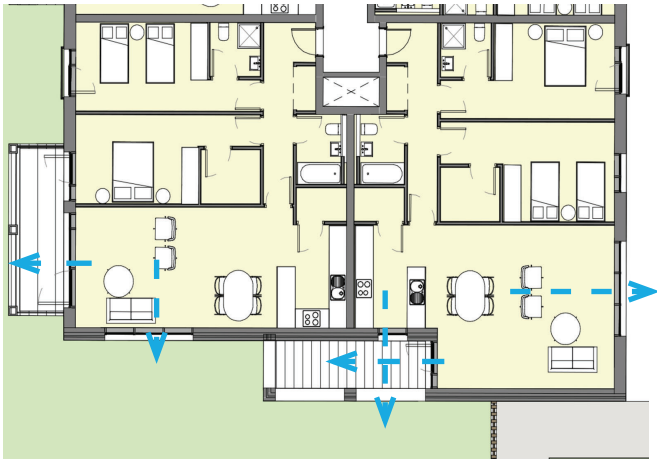
This analysis indicates that while both scheme design Options 1 and 2 are similar in their capacity to provide dual aspect units, Option 2 has a higher potential, particularly in the provision of Type A units.

This is due to the linear block nature. The L-shape of Option 1 with 90° internal angle corner limits its potential. Option 2, creates more corner units bringing the ratio of dual aspect Type A+C apartments to 62%.

On this basis Option 2 is the proposed scheme.

TYPE A | CORNER UNIT

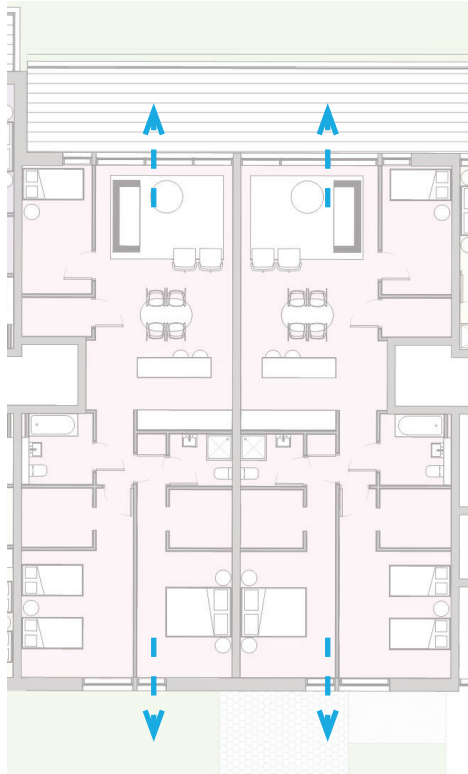
These are clearly dual aspect with continuous façade split c.50:50 in two directions at 90° to each other



TYPE B | THROUGH-BLOCK UNIT

These are clearly dual aspect with façade split c.50:50 in two directions at 180° to each other.

**Note that the proposed scheme does not include any Type B dual aspect units.*

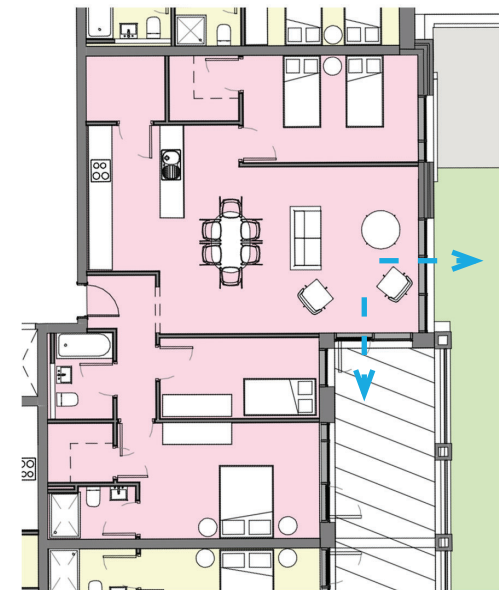


TYPE C | PARTIAL CORNER UNIT

These are at internal angle corners along the façade and are proposed as dual aspect provided they

1. Have a wall return at 90° from the principal façade of min 2.5-3.0m length and
2. Overlook a significant amenity as defined in section 3.18 of the guidelines.

The developed design will seek to provide this feature to the apartment living space.



BLOCK DESIGN



CORE & CORRIDOR PLANNING

Inevitably, increasing the number of apartments per core produces corridor access, typically of the order of 15m in length. This has an impact on common area quality presenting difficulty in day lighting, ventilation and (over) heating of these corridors. One of the scheme design objectives is to provide good quality daylight and potential for natural ventilation at the core locations. Each of the cores provided in the proposed scheme have staircases and protected lobbies on external walls facilitating good day lighting, natural ventilation and more importantly efficient fire safety design in terms of smoke ventilation and means of (final) escape.

FLOOR TO CEILING HEIGHT

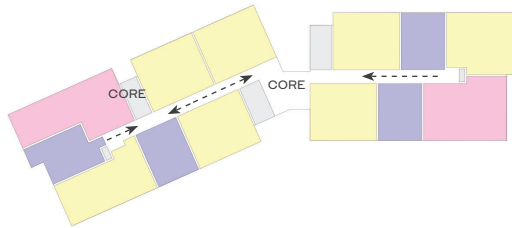
This is a qualitative standard with minimum 2.4m clear floor to ceiling height required for compliance with Part F of the Building Regulations. Increased height (to 2.7m generally) is recommended and ground floors must be this height or preferably 3.0m. This results in Specific Planning Policy Requirement 5.

Specific Planning Policy Requirement 5

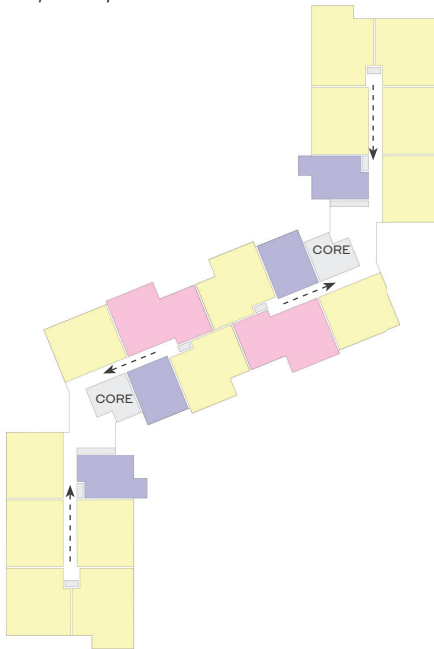
Ground level apartment floor to ceiling heights shall be a minimum of 2.7m and shall be increased in certain circumstances, particularly where necessary to facilitate a future change of use to a commercial use. For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, planning authorities may exercise discretion on a case-by-case basis, subject to overall design quality.

PROPOSED DEVELOPMENT

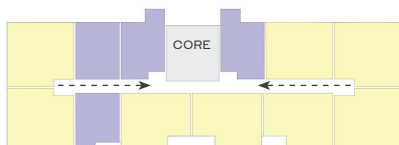
The development floor to ceiling heights are proposed as being in compliance with SPPR 5. Ground floor level apartments will have a minimum floor to ceiling height of 2.7m. Upper level floor to ceiling heights may vary subject to a minimum floor to ceiling height of 2.5m.



Current Block G | 9 units per core



Current Block H | 10 units per core



Current Block J | 12 units per core

LIFT & STAIR CORES

The number of lift and stair cores or apartment to core ratio is primarily determined by design response to dual aspect design criteria. It is further constrained by building circulation quality and compliance with building regulations, particularly in relation to fire safety.

The guidelines state that enabling a dwelling mix that includes a greater proportion of one-bedroom or studio type units would facilitate an increase in the number of apartments per floor per individual stair/lift from the previous maximum of 8 in the 2015 guidelines, to a maximum 12 apartments per floor per individual stair/lift core. This is stated as particularly applicable to higher density schemes in more central and accessible and some intermediate locations i.e. sites near to city or town centres, close to high quality public transport or in SDZ areas, subject to high quality design.

The guidelines note that this increase in efficiency of use will assist in ensuring that service charges and maintenance costs faced by residents into the future are kept at reasonable levels. This results in Specific Planning Policy Requirement 6.

Specific Planning Policy Requirement 6

A maximum of 12 apartments per floor per core may be provided in apartment schemes. This maximum provision may be increased for building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, subject to overall design quality and compliance with building regulations.

PROPOSED DEVELOPMENT

The development lift and stair core design is proposed as being in compliance with SPPR 6. The central Block H is subdivided into two blocks. Each of the four blocks has a single access core with duplex lift and stair access. Block G has an additional stair. The number of apartments per core varies from 9 to 12, as indicated on the accompanying diagrams.

All of the cores are located on external walls with significant access to daylight/sunlight (3 with dual aspect) and natural ventilation.



INTERNAL STORAGE

As part of required minimum apartment floor areas, provision should be made for general storage and utility. Minimum requirements for storage areas are set out and are intended to accommodate household utility functions such as clothes washing and the storage of bulky personal or household items.

The locations and nature of storage is defined in the guidelines. Storage should be additional to kitchen presses and bedroom furniture, but may be partly provided in these rooms. In such cases this must be in addition to minimum aggregate living/dining/kitchen or bedroom floor areas. A store off a hallway or landing will facilitate access, but hot presses or boiler space will not count as general storage. As a rule, no individual storage room within an apartment should exceed 3.5m².

The guidelines advise that apartment schemes should provide storage for bulky items outside individual units (i.e. at ground or basement level). They state that where secure, allocated ground or basement level storage is provided, it may be used to satisfy up to half of the minimum storage requirement for individual apartment units, but shall not serve to reduce the minimum floor area required to be provided within each individual apartment unit.

PROPOSED DEVELOPMENT

The development proposes to provide storage within each apartment in accordance with Appendix 1 of the 2018 Sustainable Urban Housing Design Standards. This is tabulated in the attached Housing Quality Assessment. In addition bulky item storage is provided at upper basement level, accessed from the main stair and lift cores and adjacent to cycle parking /access.



HJL Sketch View | Private Amenity Space



Reference; Ground Floor Privacy Strip

SECURITY CONSIDERATIONS

The guidelines state that apartment design should provide occupants and their visitors with a sense of safety and security, by maximising natural surveillance of streets, open spaces, play areas and any surface bicycle or car parking. The following requirements are noted.

- blocks and buildings should overlook the public realm
- entrance points should be clearly indicated, well lit, and overlooked by adjoining dwellings.
- ground floor apartments located adjoining public areas, should be given to the provision of a 'privacy strip' of approximately 1.5m in depth.

The guidelines note that privacy may also be achieved through partial elevation of the ground floor of the apartment building above the adjoining street or space or that an alternative arrangement may be to locate a duplex dwelling on the lowest two floors of the apartment development, benefiting from a small privacy strip, and a ground floor open space towards the interior of the block.

PROPOSED DEVELOPMENT

The general site layout, architectural and urban design is set out in Section 2 of this statement. The ground floor level, access and communal open space is proposed at upper ground floor level. The apartment blocks overlook this communal open space, the adjacent public open space and perimeter 'linear park' landscape. A landscape privacy strip is proposed for the limited number of apartments which directly adjoin communal open space.

PRIVATE, COMMUNAL & PUBLIC OPEN SPACE



Balcony Reference | Alison Brooks Architects Ely Court

PRIVATE AMENITY SPACE

The guidelines state that it is a policy requirement that private amenity space shall be provided in the form of gardens or patios/terraces for ground floor apartments and balconies at upper levels. Where provided at ground level, it is a requirement that private amenity space shall incorporate boundary treatment appropriate to ensure privacy and security. The guidelines state that private amenity space should be located to optimise solar orientation and designed to minimise overshadowing and overlooking.

Balconies are required to adjoin and have a functional relationship with the main living areas of the apartment. In certain circumstances, glass-screened ‘winter gardens’ may be provided. The design requirements and minimum required areas for private amenity space are set out in the guidelines.

Schedule of Proposed Private, Communal and Public Open Space			
Type	B01	00	Total
Public Open Space	3585	5865	9450
Communal Amenity Space (Residential)	1015	3165	4180
Private Amenity Space (Residential)			2631
*Refer to Housing Quality Assessment (Appendix 02) for detailed breakdown			

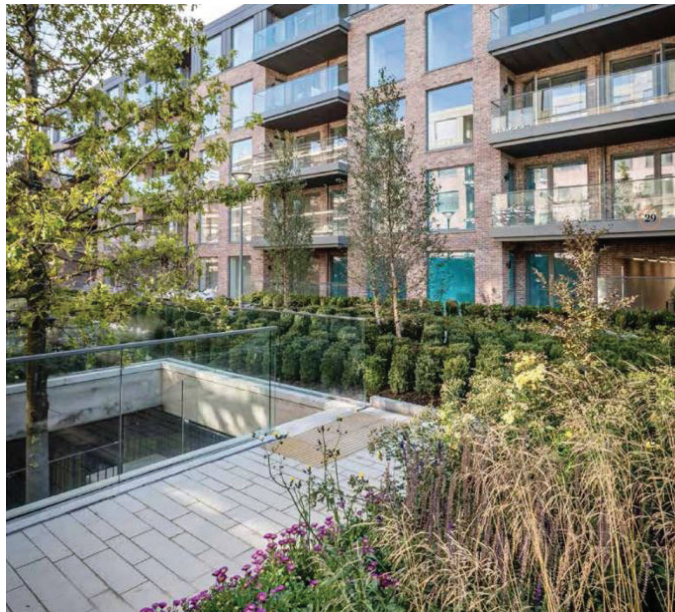
PROPOSED DEVELOPMENT

The development proposes to provide private amenity space in accordance with Appendix 1 of the 2018 Sustainable Urban Housing Design Standards. This is tabulated in the attached Housing Quality Assessment (Appendix 02).

Plan diagrams illustrating the extent of public, residential communal and residential private open space at Lower Ground and Ground levels are attached as Appendix 05.



HJL Sketch View over proposed garden courtyard



Reference Image

COMMUNAL AMENITY SPACE

The minimum required areas for public communal amenity space are set out in the guidelines. They note accessible, secure and usable outdoor space is a high priority for families with young children and for less mobile older people. Where private and communal amenity space adjoin each other, the guidelines recommend that there should generally be a clear distinction with an appropriate boundary treatment and/or a 'privacy strip' between the two.

The guidelines state that communal amenity space may be provided as a garden within the courtyard of a perimeter block or adjoining a linear apartment block. The following recommendations are made.

- the heights and orientation of adjoining blocks should permit adequate levels of sunlight to reach communal amenity space throughout the year.
- roof gardens may also be provided but must be accessible to residents, subject to requirements such as safe access by children (note that children's play is not passively supervised as with courtyards).
- regard must also be had to the future maintenance of communal amenity areas in order to ensure that this is commensurate with the scale of the development and does not become a burden on residents.

PROPOSED DEVELOPMENT

Communal open space is provided at upper ground level in two main garden courtyards formed by three apartment block arranged to provide for appropriate solar access to apartments and open space. This is explained in detailed solar modeling and analysis prepared by Integrated Environmental Solutions (IES) is attached at Appendix O4. Pedestrian comfort is also assessed in a wind analysis/ micro-climate study also prepared by IES and attached as Appendix O6.

A landscape privacy strip is proposed where ground level apartment abut the communal open space. As the residential ground level is generally higher than the public open space and as sunken garden courts are formed within the communal open space there is generally good privacy separation between apartments and open space (public or communal residential).



CHILDREN'S PLAY

Amenity, health, safety and security are prime considerations. The guidelines state that...*the recreational needs of children must be considered as part of communal amenity space within apartment schemes. Experience in Ireland and elsewhere has shown that children will play everywhere. Therefore, as far as possible, their safety needs to be taken into consideration and protected throughout the entire site, particularly in terms of safe access to larger communal play spaces.*

Children's play needs around the apartment building should be catered for:

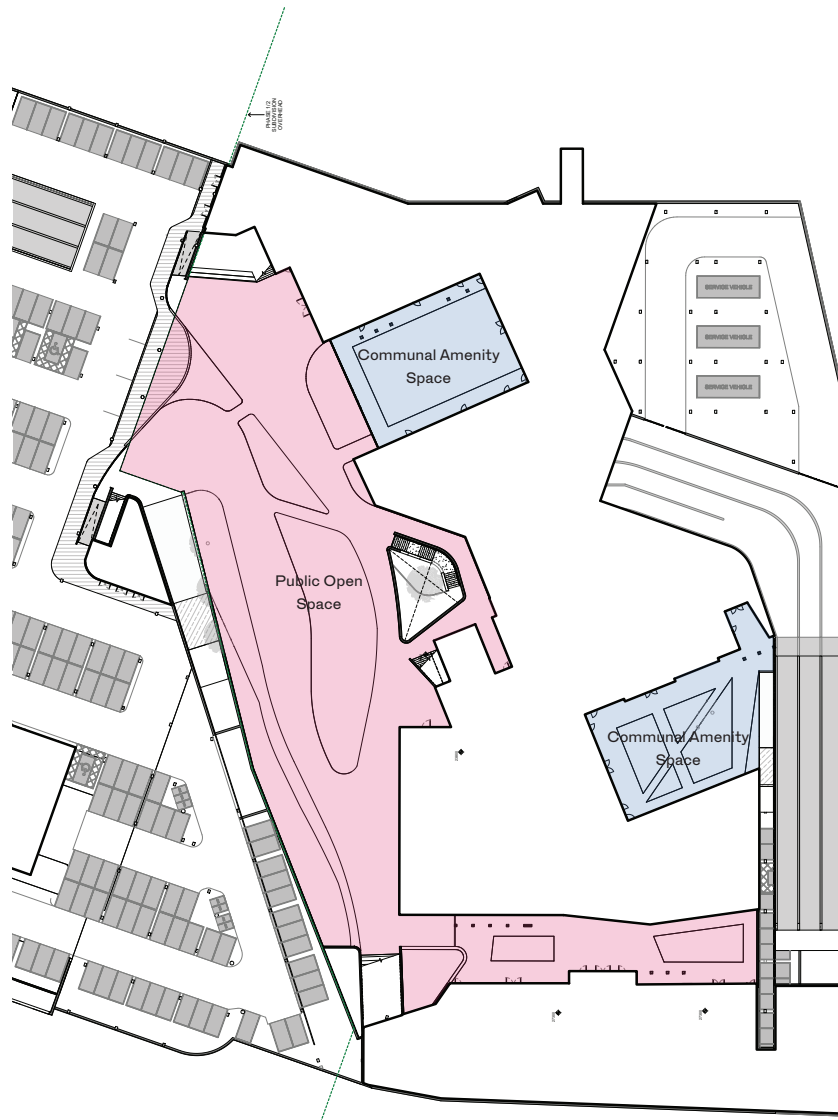
- *within the private open space associated with individual apartments;*
- *within small play spaces (about 85 – 100m²) for the specific needs of toddlers and children up to the age of six, with suitable play equipment, seating for parents/guardians, and within sight of the apartment building, in a scheme that includes 25 or more units with two or more bedrooms; and*
- *within play areas (200–400m²) for older children and young teenagers, in a scheme that includes 100 or more apartments with two or more bedrooms.*

The guidelines note that a perimeter block with a central communal open space is particularly appropriate for children's play, especially if access from the street is controlled. They note that the landscape design and orientation of play areas can contribute significantly to their amenity value but that noise from courtyard play areas can diminish residential amenity

PROPOSED DEVELOPMENT

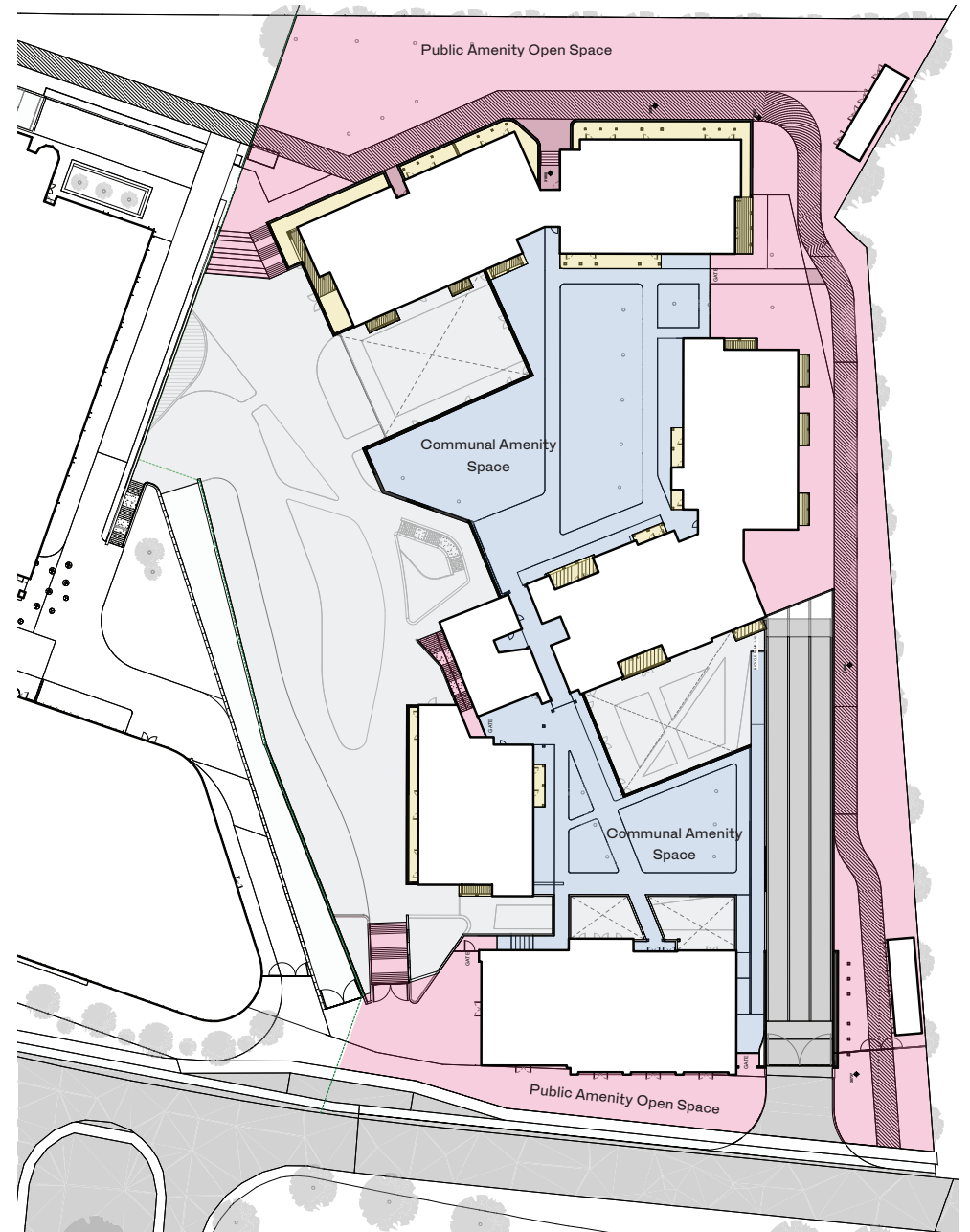
A south facing children's play area associated with the Creche is provided at lower ground level -1. A playground is also provided at upper ground level within the northern communal open space. All of the communal open space and lower ground level creche garden space is securely enclosed with access restricted to residents or parents/ carers of Creche children.

Both communal open space courtyards are linked and each has vehicular access for maintenance or emergency services. The public open space between Phase 1 and Phase 2 is immediately adjacent to the residential development and also has vehicular access for maintenance/emergency services from Monivea Road.



- Public Amenity Open Space
- Residential Communal Amenity Space
- Residential Private Amenity Space

Upper Basement | Open Space Diagram



Ground Level | Open Space Diagram

COMMUNAL FACILITIES



ACCESS & SERVICES

The guidelines state the need for apartment schemes to be easy for people to use and to reflect the fact that all people experience changes in their abilities as they progress through the different stages of life.

They state that hallways and shared circulation areas should be appropriate in scale and should not be unduly narrow. They also state that these should be well lit, with some natural light, where possible and adequate ventilation. Movement about the apartment building should be easily understandable by all users by keeping internal corridors short with good visibility along their length.

PROPOSED DEVELOPMENT

The primary access to each apartment block is at upper ground level from the communal open space. Each of the lift and stair cores is located on an external wall with good daylight and ventilation and 3 of the 4 cores are dual aspect. These cores continue down to lower ground / basement level -1. At this level additional entrance is provided from the public open space with adjacent cycle parking and bulky item storage. At this level also amenity spaces are proposed for residential use. Each of these amenity spaces overlook and open on to garden courtyards. The cores continue to basement level -2 where car-parking and waste management for each core is provided.

COMMUNAL FACILITIES

Communal rooms may be provided in apartment schemes, particularly in some larger developments. For example, communal laundry facilities and for drying clothes may be provided in well-ventilated areas. Other communal facilities may include community or meeting rooms or a management/maintenance office on-site. The provision of facilities within an apartment development could also extend to childcare or gym uses that may be open to non-residents.

The guidelines note that the provision of such facilities can have a significant impact on management and maintenance costs for future residents.

The guidelines refer to Planning Guidelines for Childcare Facilities (2001) in respect of crèche facilities and offer advice on interpretation of demand by apartment type.

PROPOSED DEVELOPMENT

Communal or amenity space is provided at lower ground / basement level -1. In blocks G and H this is proposed as lounge / work from home space. In block J this is proposed as studio/amenity space. In addition to dedicated residential communal facilities the following facilities are provided also at lower ground level, all accessed off the public open space;

- Crèche
- Fitness/Leisure-Gym
- Medical Centre
- Café
- Restaurant/Food Hall

Additional community facilities – retail, café/restaurant etc are available within the overall Phase 1 / 2 site at ground floor level.

REFUSE STORAGE

The guidelines advise that refuse facilities shall be accessible to each apartment stair/ lift core and designed with regard to the projected level of waste generation and types and quantities of receptacles required. The following general design considerations are recommended in the provision of refuse storage facilities:

- Sufficient communal storage area to satisfy the three-bin system for the collection of mixed dry recyclables, organic waste and residual waste;
- In larger apartment schemes, consideration should also be given to the provision of separate collection facilities for other recyclables such as glass and plastics;
- Waste storage areas must be adequately ventilated so as to minimise odours and potential nuisance from vermin/flies and taking account the avoidance of nuisance for habitable rooms nearby;
- Provision in the layout for sufficient access for waste collectors, proximity of, or ease of access to, waste storage areas from individual apartments, including access by disabled people;
- Waste storage areas should not present any safety risks to users and should be well-lit;
- Waste storage areas should not be on the public street, and should not be visible to or accessible by the general public. Appropriate visual screening should be provided, particularly in the vicinity of apartment buildings;
- Waste storage areas in basement car parks should be avoided where possible, but where provided, must ensure adequate manoeuvring space for collection vehicles;
- The capacity for washing down waste storage areas, with wastewater discharging to the sewer.

PROPOSED DEVELOPMENT

The residential refuse storage and separation for each residential block is provided at basement level -2 in designated secure areas. Waste/refuse removal is managed site wide with refuse vehicles accessing the designated 'high bay' delivery/waste removal area accessed off Monivea Road. Refuse bins (1100l wheeled) are moved from their residential secure area to the central high bay area for temporary storage and removal in a planned manner. A waste management plan is included within this planning submission.



BICYCLE PARKING & STORAGE

The guidelines set out an objective to secure wider government policy to achieve more sustainable urban development that will enable more households to live closer to their places of work without the need for long commuter journeys and disruption of personal and family time. Enabling citizens to more easily get around our cities and urban areas is a fundamental planning concern and maximising accessibility of apartment residents to public transport and other sustainable transport modes is advised as a central theme of these guidelines.

The guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes. Cycle parking and storage facilities should be for both residents and visitors. The accessibility to, and secure storage of, bicycles is noted as a key concern. Requirements of the guidelines include:

- Location – cycle storage facilities should be directly accessible from the public road or from a shared private area that gives direct access to the public road avoiding unnecessarily long access routes with poor passive security or, slopes that can become hazardous in winter weather.
- Quantity – a general minimum standard of 1 cycle storage space per bedroom shall be applied. For studio units, at least 1 cycle storage space shall be provided. Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units.
- Design – cycle storage facilities shall be provide in a dedicated facility of permanent construction, preferably within the building footprint or, where not feasible, within an adjacent or adjoining purpose built structure of permanent construction. Cycle parking areas shall also be designed so that cyclists feel personally safe - secure cage/compound facilities, with

electronic access for cyclists and CCTV, afford an increased level of security for residents. Effective security for cycle storage is also maximised by the provision of individual cycle lockers and it is best practice that planning authorities ensure that either secure cycle cage/compound or preferably locker facilities are provided.

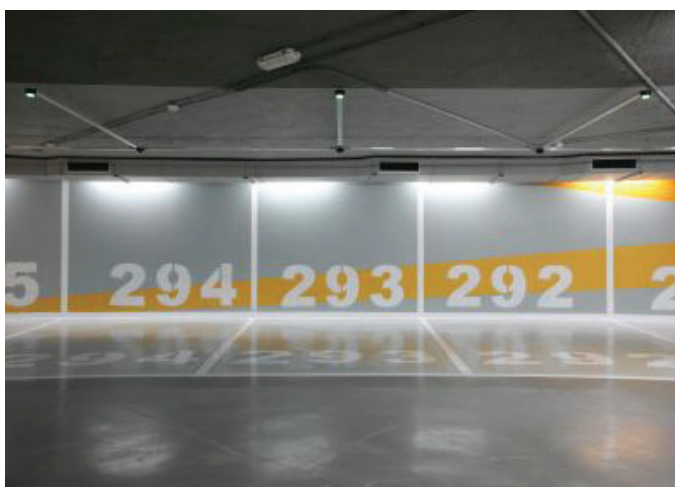
- Management - an acceptable quality of cycle storage requires a management plan that ensures the effective operation and maintenance of cycle parking, in particular, avoiding arrangements that lead to a significant number of lockers being left locked whilst empty for instance. Cycle parking shall be the subject of a funded maintenance regime that ensures that facilities are kept clean, free of graffiti, well-lit and the parking equipment will be properly maintained. It is essential, therefore, that as far as possible cycle parking is low maintenance, easy to use and easy and attractive to use by residents.

The guidelines refer to specific cycle design guidelines as being available from the National Cycle Manual (National Transport Authority, 2011) and Bike Parking Infrastructure Guidance (Dublin Cycling Campaign, 2017).

PROPOSED DEVELOPMENT

General site layout planning and access for cycles is set out in Section 2 of this statement. Access to cycle parking for Blocks G and J is from Monivea Road via the lower ground level public open space from Monivea Road, where public and visitor cycle parking is also provided. Access to cycle parking for Block H is directly from Monivea Road via ramp and lower amenity level garden court.

Resident cycle parking is provided in secure rooms within the lower ground levels of the blocks. A total of 672 cycle spaces are proposed in accordance with the guideline standard.



CAR PARKING

The guidelines state that the quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria. Guideline advice is as follows;

Central and/or Accessible Urban Locations:

In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity.

These locations are most likely to be in cities, especially in or adjacent to (i.e. within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART, commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10 minute peak hour frequency) bus services.

Intermediate Urban Locations:

In suburban/urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard.

Peripheral and/or Less Accessible Urban Locations:

As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required.

The guidelines state that for all types of location, it is necessary to ensure, where possible, the provision of an appropriate number of drop-off, service, visitor parking spaces and parking for the mobility impaired. Provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles and cycle parking and secure storage. It is also a requirement to demonstrate specific measures that enable car parking provision to be reduced or avoided.

The guidelines state that as well as showing that a site is sufficiently well located in relation to employment, amenities and services, it is important that access to a car sharing club or other non-car based modes of transport are available and/or can be provided to meet the needs of residents, whether as part of the proposed development, or otherwise. 'Car free' development is permissible and if developed, must be fully communicated as part of subsequent apartment sales and marketing processes.

PROPOSED DEVELOPMENT

General site layout planning and vehicular/car access is set out in Section 2 of this statement. The car-parking extends over two basement levels. It is presently anticipated that residential car-parking will be allocated at lower basement (-2) level adjacent to the residential stair/lift core entrances. Access to car parking is available from both Monivea and Joyce Roads.

PART V REQUIREMENTS

PART V PLANNING ACT

Part V requirements under the Planning Act apply to BTR developments. As outlined in DHPCLG Housing Circular 36 2016, Section 96(3) sets out 6 types of Part V agreement that may be made, which include:

1. Transfer of lands (section 96(3), paragraph (a));
2. Build and transfer of up to 10% of the proposed housing units (section 96(3), paragraph (b)(i));
3. Transfer of housing units on any other land in the functional area of the planning authority (section 96(3), paragraph (b)(iv));
4. Lease of housing units either on the site subject to the application or in any other area within the functional area of the planning authority (section 96(3), paragraph (b)(iv)a
5. Combination of a transfer of land and one of more of the other options; and
6. Combination of options not involving a transfer of the ownership of land (section 96(3), paragraph (b)(viii)). The particular circumstances of BTR apartment projects may mitigate against the putting forward of acquisition or transfer of units and land options outlined above and the leasing option may be more practicable in such developments.

PROPOSED DEVELOPMENT

The proposed development will comply with Part V of the Planning and Development Act. The developer is in discussion with Galway City Council on the detail of the Part V proposal.

APPENDIX 01

Proposed Schedule of Accommodation

PROPOSED SCHEDULE OF ACCOMMODATION | PHASE 01

PHASE 01 PERMITTED DEVELOPMENT (GCC PL. REF. 18/363)

PHASE 01 - PLANNING APPLICATION TO GCC	
Site Area	51148
P1 Site Area	30883
P1 Development	49080
P1 Plot Ratio (above ground)	1.59

SUMMARY	OFFICE (P1)	HOTEL (P1)
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GODP PLOT RATIO ANALYSIS	SQ M.
Site Area	51148
GCDDP Permitted Plot Ratio	1.25
Max. Permitted Development Area (above ground)	63935

BRIEF DEVELOPMENT AREA		
Use	Development Phase	
Office	Phase 1	40,405
Hotel	Phase 1	8,675
Residential	Phase 2 - SHD	32,379
Ancillary	Phase 2 - SHD	4,096
Total Development (above ground)		85,554
Development Plot Ratio (above ground)		1.67

Upper Basement	Phase 1	23,930
Lower Basement	Phase 1	38,245
Total Development (below ground)		62,175
Total Development (above & below ground)		147,729

PHASE 01 SITE ANALYSIS	
Site Coverage	0.39
Open Space (18,666m2)	60%

OFFICE/ COMMERCIAL TARGET AREAS	SQ M.
BLOCK A	
Office GIA	14320
Ground Floor Café	245
Total GIA	14565

BLOCK B	
Office GIA	5965
Ground Floor Café/ Restaurant	420
Total GIA	6385

BLOCK C	
Office GIA	6535
Total GIA	6535

BLOCK D	
Office GIA	6535
Total GIA	6535

BLOCK E	
Office GIA	6090
Ground Floor Convenience Store	295
Total GIA	6385

TOTAL GIA	40405
Total Ancillary	960
Total Office	39445
Office/ Commercial Total NIA	80% GIA
	31556

HOTEL	SQ M.
Total No. of Rooms	175
GIA (estim)	5750

HOTEL AMENITIES	
Front of House including . Bar/Lounge	600
Conference	350
Back of House/ Circulation	1540
GIA (estim)	2490

TOTAL	Sqm
	8675

PHASE 01 PROPOSED CAR & CYCLE PARKING PROVISION

CAR PARKING PROVISION	
Upper Basement Car Spaces	458
Lower Basement Car Spaces	919
Total Car Parking Provided	1,377
Accessible Parking (min. 5% of total)	72
Motor Cycle Parking	154

PHASE 01 CYCLE PARKING PROVISION SUMMARY	
Office Requirements	316
Hotel Requirements	35
Ancillary Requirements	20
Total Cycle Parking Provided	371

OFFICE CYCLE PARKING REQ ¹		
Cycle Spaces	10% Employee No.	3,156
(National Cycle Manual Section 5.5.7)		316
Total Office Cycle Parking		316

Based on the following design guidelines;

¹National Cycle Manual Section 5.5.7

ANCILLARY CYCLE PARKING REQ ²			
Ancillary	5 per	20	spaces
Total Ancillary Cycle Parking		20	

Based on the following design guidelines;

²Galway City Development Plan

HOTEL CYCLE PARKING REQ. ²			
Cycle Spaces	5 per	20	spaces
	5 per	e/a 50	spaces
Total Hotel Cycle Parking			35

Based on the following design guidelines;

²Galway City Development Plan

PROPOSED SCHEDULE OF ACCOMMODATION | PHASE 02 DEVELOPMENT

SHD APPLICATION | STAGE 03 SUBMISSION

PHASE 02 - SHD APPLICATION		
Site Area		51148
P2 Site Area		20,265
P2 Development		36,475
P2 Plot Ratio (above ground)		1.80
Residential Density	per hectare	143

PHASE 02 - SHD APPLICATION		
	Area SQM	%
Total P2 Development	36,475	100%
Residential	32,379	89%
Other/ Ancillary	4096	11%

RESIDENTIAL SUMMARY

RESIDENTIAL ACCOMMODATION					
UNIT MIX					
	Qty	%	Min.	Unit Floor Area Range	Min Area SQM
1B Units	75	26.0%	45	48.9 - 55.5 sq.m	3,375
2B Units (3P)	0				
2B Units (4P)	185	64.2%	73	73.6 - 82.6 sq.m	
3B Units	28	9.7%	90	99.5 - 104.1 sq.m	2,520
Min. Total	288	units	(49% min)		19,400
Actual Total					21,841
(*) New categories as per 2018 Guidelines. Areas based on minimum standards					
Refer Housing Quality Assessment (HQA) for detailed breakdown of residential accommodation					
RESIDENTIAL ANCILLARY ACCOMMODATION					
Amenities	Concierge, Lounge, WCs, Games, Movie room & Storage units				1,275
TOTAL RESIDENTIAL ANCILLARY					1,275
TOTAL RESIDENTIAL DEVELOPMENT (Gross Internal Area)					
Gross Building Area (Blocks G, H & J)					25,650
Gross Circulation					5,454
Amenities	Concierge, Lounge, WCs, Games, Movie room & Storage units				1,275
Total Gross Floor Area					32,379

OPEN SPACE as per 2018 Apartment Guidelines	Required
Min. floor areas for communal space (x sq m per unit type)	1,922
Note as per 2018 Apartment Guidelines:	
Minimum floor area for private amenity space	1,931
Minimum floor area for communal amenity space	1,931

OPEN SPACE	
Req.d	Total
5 sq m	375
6 sq m	
7 sq m	1,295
9 sq m	252
	1,922

BLOCK SUMMARY				
	1B	2B	3B	Total
Block G	32	56	16	104
Block H	27	97	12	136
Block J	16	32	0	48
Total				288

RESIDENTIAL DUAL ASPECT		
Type	%	Qty
A	42.5	123
B	-	-
O	19.5	57
Total Dual Aspect Units		180
Total Dual Aspect Percentage		62%

PART V ACCOMMODATION	
Unit Type	Qty
1B Units	8
2B Units (4P)	17
3B Units	4
Total Part V Units	29
Part V Residential Units Required	29

OTHER (P2)

FITNESS/ LEISURE		
Gym		1090
Plant		50
TOTAL	Sq m	1140

ANCILLIARY		
Restaurant		500
Coffee Shop		50
Convenience Store		225
Pharmacy		200
Other (Plaza Level)	2 x	Units 337
Other (Ground Floor)	3 x	Units 460
Crèche		310
TOTAL	Sqm	2082

MEDICAL CENTRE BRIEF		
Primary Care Facility		655
TOTAL	Sq m	655

OTHER ANCILLARY SERVICES		
Service Access & Lift Access		197.5
Service Shaft / Vent Shaft		21
TOTAL	Sq m	219

PHASE 02 PROPOSED CYCLE PARKING PROVISION

RESIDENTIAL CYCLE PARKING	
Cycle spaces	1 no. Space per bedroom
Visitor carparking	1 no. space per 2 units
(Design Standards for New Apartments 2018)	
Total Residential Cycle Parking	673

ANCILLARY CYCLE PARKING				
Fitness/ Leisure	5 per	20	car spaces	10
Restaurant	5 per	20	spaces	10
Coffee Shop	5 per	20	spaces	5
Convenience Store	5 per	20	spaces	5
Medical Centre	2 per consulting room		est.	10
Crèche	5 per	20	spaces	5
Pharmacy	5 per	20	spaces	5
Other	5 per	20	spaces	10
Total				60

APPENDIX 02

Housing Quality Assessment

Job No. 950144
 Job Name: PHASE 03 - CROWN SQUARE GALWAY
 Schedule: STRATEGIC HOUSING DEVELOPMENT - HOUSING QUALITY ASSESSMENT
 Revision: 05.07.2019

Henry J Lyons

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2
Ground Floor																	
BLOCK G																	
G0.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	72.3	9
G0.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	22.9	7
G0.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	40.5	7
G0.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	35.7	7
G0.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	18.7	5
G0.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	48.6	7
G0.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9
G0.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	12.1	5
G0.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	18.9	7
G0.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	12.3	7
G0.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5	5
G0.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	28.4	7
G0.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5
Total		980.4															
BLOCK H																	
H0.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	15.3	7
H0.02	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	15.4	7
H0.03	2 Bed Type F (+10%)	80.5	73	80.3	YES		Single	S/SW	2	36.1	30	27.7	24.4	6.3	6	15.2	7
H0.04	1 Bed Type C (+10%)	58.8	45	49.5	YES		Single	SW/W	1	30	23	14	11.4	5	3	13.2	5
H0.05	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7
H0.06	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5
H0.07	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5
H0.08	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	9.9	7
H0.09	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7
H0.10	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	15.3	7
H0.11	2 Bed Type A	78	73	80.3	NO		Single	NE	2	30.7	30	26.2	24.4	6.4	6	8.5	7
H0.12	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	8.5	7
H0.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	8.5	7
H0.14	3 Bed Type A (+10%)	100.7	90	99	YES		Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9
H0.15	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7
H0.16	2 Bed Type A	78	73	80.3	NO		Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	10.5	7
H0.17	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7
Total		1339.3														525.5	202
Total		2319.7															

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2	
First Floor																		
BLOCK G																		
G1.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9	
G1.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G1.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G1.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G1.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5	
G1.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7	
G1.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9	
G1.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	
G1.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G1.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G1.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	
G1.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7	
G1.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5	
Total		980.4		958.1														
BLOCK H																		
H1.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	
H1.02	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.05	1 Bed Type C (+10%)	58.8	45	49.5	YES		Single	N/NE	1	30	23	14	11.4	5	3	13.2	5	
H1.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	SW/W	2	35.4	30	27.1	24.4	7.1	6	7.1	7	
H1.07	1 Bed Type A (+10%)	51.1	45	49.5	YES	YES	Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5	
H1.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	
H1.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7	
H1.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	15.3	7	
H1.12	2 Bed Type A	78	73	80.3	NO	YES	Single	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.14	2 Bed Type A	78	73	80.3	NO	YES	Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.15	3 Bed Type A (+10%)	100.7	90	99	YES	YES	Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	
H1.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	
H1.17	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	E	1	28	23	14.9	11.4	3.1	3	5	5	
H1.18	2 Bed Type A	78	73	80.3	NO	YES	Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H1.19	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	NE/E	2	41.3	30	29.6	24.4	6.2	6	7.6	7	
Total		1468.2																
BLOCK J																		
J1.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SW	2	35.4	30	28	24.4	6.1	6	16.4	7	
J1.02	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	S/SW	1	27.8	23	12	11.4	3.2	3	5.8	5	
J1.03	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	
J1.04	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	
J1.05	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
J1.06	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	NE/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	
J1.07	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	NE/E	2	35.6	30	28.8	24.4	6.2	6	7.6	7	
J1.08	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	
J1.09	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	6	6	9.8	7	
J1.10	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	
J1.11	1 Bed Type B	48.9	45	49.5	NO		Single	SW	1	24.1	23	13.6	11.4	3.2	3	7	5	
J1.12	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	S/SE	2	35.6	30	28.8	24.4	6.2	6	16.8	7	
Total		868														377.1	290	
Total		3316.6																

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2	
Second Floor																		
BLOCK G																		
G2.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9	9
G2.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G2.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G2.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G2.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G2.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7	7
G2.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9	9
G2.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G2.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G2.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G2.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G2.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7	7
G2.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5	5
Total		980.4																
BLOCK H																		
H2.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H2.02	2 Bed Type A	78	73	80.3	NO		Single	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.05	3 Bed Type A (+10%)	100.7	90	99	YES		Single	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H2.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H2.07	1 Bed Type A (+10%)	51.1	45	49.5	YES	YES	Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H2.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
H2.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
H2.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H2.12	2 Bed Type A	78	73	80.3	NO	YES	Dual - A	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.14	2 Bed Type A	78	73	80.3	NO	YES	Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.15	3 Bed Type A (+10%)	100.7	90	99	YES	YES	Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H2.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H2.17	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H2.18	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
H2.19	2 Bed Type A	78	73	80.3	NO	YES	Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H2.20	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
Total		1561.2																
BLOCK J																		
J2.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J2.02	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	S/SW	1	27.8	23	12	11.4	3.2	3	5.8	5	5
J2.03	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
J2.04	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
J2.05	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
J2.06	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	NE/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J2.07	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	NE/E	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
J2.08	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J2.09	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	6	6	9.8	7	7
J2.10	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J2.11	1 Bed Type B	48.9	45	49.5	NO		Single	SW	1	24.1	23	13.6	11.4	3.2	3	7	5	5
J2.12	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	S/SE	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
Total		868														359.2	299	
Total		3409.6																

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2	
Third Floor																		
BLOCK G																		
G3.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9	9
G3.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G3.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G3.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G3.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G3.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7	7
G3.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9	9
G3.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G3.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G3.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G3.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G3.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7	7
G3.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5	5
Total		980.4																
BLOCK H																		
H3.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H3.02	2 Bed Type A	78	73	80.3	NO		Single	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.05	3 Bed Type A (+10%)	100.7	90	99	YES		Single	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H3.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H3.07	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H3.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
H3.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
H3.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H3.12	2 Bed Type A	78	73	80.3	NO	YES	Dual - A	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.14	2 Bed Type A	78	73	80.3	NO	YES	Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.15	3 Bed Type A (+10%)	100.7	90	99	YES		Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H3.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H3.17	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H3.18	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
H3.19	2 Bed Type A	78	73	80.3	NO	YES	Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H3.20	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
Total		1561.2																
BLOCK J																		
J3.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J3.02	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	S/SW	1	27.8	23	12	11.4	3.2	3	5.8	5	5
J3.03	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
J3.04	1 Bed Type B (+10%)	53.4	45	49.5	YES	YES	Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
J3.05	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
J3.06	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	NE/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J3.07	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	NE/E	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
J3.08	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J3.09	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	6	6	9.8	7	7
J3.10	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J3.11	1 Bed Type B	48.9	45	49.5	NO		Single	SW	1	24.1	23	13.6	11.4	3.2	3	7	5	5
J3.12	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	S/SE	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
Total		868														359.2	299	
Total		3409.6																

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2	
Fourth Floor																		
BLOCK G																		
G4.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9	9
G4.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G4.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G4.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G4.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G4.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7	7
G4.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9	9
G4.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G4.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G4.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	7
G4.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	5
G4.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7	7
G4.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5	5
Total		980.4																
BLOCK H																		
H4.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H4.02	2 Bed Type A	78	73	80.3	NO		Single	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.05	3 Bed Type A (+10%)	100.7	90	99	YES		Single	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H4.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H4.07	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H4.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
H4.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
H4.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	7
H4.12	2 Bed Type A	78	73	80.3	NO		Dual - A	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.14	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.15	3 Bed Type A (+10%)	100.7	90	99	YES		Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	9
H4.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	7
H4.17	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E	1	27.8	23	12	11.4	3.2	3	7.9	5	5
H4.18	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
H4.19	2 Bed Type A	78	73	80.3	NO		Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
H4.20	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7	7
Total		1561.2																
BLOCK J																		
J4.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J4.02	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	S/SW	1	27.8	23	12	11.4	3.2	3	5.8	5	5
J4.03	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	5
J4.04	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	5
J4.05	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	7
J4.06	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	NE/SW	2	35.4	30	28	24.4	6.1	6	7.6	7	7
J4.07	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	NE/E	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
J4.08	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J4.09	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	6	6	9.8	7	7
J4.10	2 Bed Type D	78.8	73	80.3	NO		Single	NE/E	2	32.6	30	26.6	24.4	7.2	6	9.8	7	7
J4.11	1 Bed Type B	48.9	45	49.5	NO		Single	SW	1	24.1	23	13.6	11.4	3.2	3	7	5	5
J4.12	2 Bed Type B (+10%)	87.8	73	80.3	YES		Dual - A	S/SE	2	35.6	30	28.8	24.4	6.2	6	7.6	7	7
Total		780.2														359.2	299	
Total		3321.8																

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size requried including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies requried m2	
Fifth Floor																		
BLOCK G																		
G5.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9	
G5.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G5.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G5.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G5.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5	
G5.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7	
G5.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9	
G5.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	
G5.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G5.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7	
G5.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5	
G5.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7	
G5.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5	
Total		980.4																
BLOCK H																		
H5.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	
H5.02	2 Bed Type A	78	73	80.3	NO		Single	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.05	3 Bed Type A (+10%)	100.7	90	99	YES		Single	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	
H5.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	
H5.07	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5	
H5.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5	
H5.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7	
H5.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	7.5	7	
H5.12	2 Bed Type A	78	73	80.3	NO		Dual - A	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.14	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.15	3 Bed Type A (+10%)	100.7	90	99	YES		Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9	
H5.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7	
H5.17	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E	1	27.8	23	12	11.4	3.2	3	7.9	5	
H5.18	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5	
H5.19	2 Bed Type A	78	73	80.3	NO		Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7	
H5.20	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7	
Total		1561.2														269.1	223	
Total		2541.6																

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2
Sixth Floor																	
BLOCK G																	
G6.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9
G6.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G6.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G6.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G6.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5
G6.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7
G6.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9
G6.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5
G6.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G6.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G6.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5
G6.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7
G6.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5
Total		980.4															
BLOCK H																	
H6.01	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	S/SE	2	35.1	30	28.4	24.4	6.3	6	7.5	7
H6.02	2 Bed Type A	78	73	80.3	NO		Single	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.03	2 Bed Type A	78	73	80.3	NO		Dual - A	S/SE	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.04	2 Bed Type A	78	73	80.3	NO		Dual - A	SW/W	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.05	3 Bed Type A (+10%)	100.7	90	99	YES		Single	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9
H6.06	2 Bed Type E (+10%)	84.3	73	80.3	YES		Dual - C	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7
H6.07	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	7.9	5
H6.08	1 Bed Type B (+10%)	53.4	45	49.5	YES		Dual - C	S/SW	1	28	23	14.9	11.4	3.1	3	5	5
H6.09	2 Bed Type A	78	73	80.3	NO		Single	S/SW	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.10	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	S/SW	2	41.3	30	29.6	24.4	6.2	6	7.6	7
H6.11	2 Bed Type B (+10%)	85.6	73	80.3	YES		Dual - A	N/NE	2	35.1	30	28.4	24.4	6.3	6	7.5	7
H6.12	2 Bed Type A	78	73	80.3	NO		Dual - A	NE	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.13	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.14	2 Bed Type A	78	73	80.3	NO		Dual - A	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.15	3 Bed Type A (+10%)	100.7	90	99	YES		Dual - C	S/SW	3	39.8	34	34.7	31.5	9.2	9	13.2	9
H6.16	2 Bed Type E (+10%)	84.3	73	80.3	YES		Single	N/NE	2	35.4	30	27.1	24.4	7.1	6	7.1	7
H6.17	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E	1	27.8	23	12	11.4	3.2	3	7.9	5
H6.18	1 Bed Type B (+10%)	53.4	45	49.5	YES		Single	NE/E	1	28	23	14.9	11.4	3.1	3	5	5
H6.19	2 Bed Type A	78	73	80.3	NO		Single	NE/E	2	30.7	30	26.2	24.4	6.4	6	7.5	7
H6.20	2 Bed Type C (+10%)	93.5	73	80.3	YES		Dual - A	E/SE	2	41.3	30	29.6	24.4	6.2	6	7.6	7
Total		1561.2														269.1	223
Total		2541.6															

Unit No.	Type	Unit Size m2	Min Unit Size required m2	Min Unit Size required including 10% m2	Min Unit Size > 10%	Part V Allocation	Dwelling Aspect	Orientation (*refer footnote below)	Number of bedrooms	Living/ Kitchen room area provided m2	Living / Kitchen room area required m2	Aggregate bedroom area provided m2	Aggregate bedroom area required m2	Storage area provided in apartment m2	Storage area required m2	Private terrace / balconies provided m2	Private terrace / balconies required m2
Seventh Floor																	
BLOCK G																	
G7.01	3 Bed Type C (+10%)	106.2	90	99	YES		Dual - A	S/SW	3	43.3	34	33.7	31.5	10	9	9	9
G7.02	2 Bed Type A	78	73	80.3	NO		Dual - C	W	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G7.03	2 Bed Type A	78	73	80.3	NO		Dual - A	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G7.04	2 Bed Type A	78	73	80.3	NO		Dual - C	W/NW	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G7.05	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	W/NW	1	27.8	23	12	11.4	3.2	3	5.1	5
G7.06	2 Bed Type B (+10%)	82.2	73	80.3	YES		Dual - A	NW/N	2	34	30	26.1	24.4	6.1	6	7.7	7
G7.07	3 Bed Type B (+10%)	103.5	90	99	YES		Dual - A	NE/N	3	35.5	34	39.5	31.5	9.3	9	19.1	9
G7.08	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5
G7.09	2 Bed Type A	78	73	80.3	NO		Dual - A	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G7.10	2 Bed Type A	78	73	80.3	NO		Dual - C	E/SE	2	30.7	30	26.2	24.4	6.4	6	7.7	7
G7.11	1 Bed Type A (+10%)	51.1	45	49.5	YES		Single	E/SE	1	27.8	23	12	11.4	3.2	3	5.1	5
G7.12	2 Bed Type G (+10%)	90.7	73	80.3	YES		Dual - A	SE/S	2	41.5	30	27.6	24.4	6	6	7.7	7
G7.13	1 Bed Type D (+10%)	54.5	45	49.5	YES		Dual - C	S	1	28.6	23	14.8	11.4	3.2	3	15.2	5
Total		980.4														112.5	87
Total		980.4															
Net Residential Floor Area		21840.90															
Number of Bedrooms									529								
Total Dual Aspect Type A Units							123	42.50%									
Total Dual Aspect Type C Units							57	19.50%									
Total Dual Aspect Units							180	62%									
Total Private Amenity Space																2630.9	1922

APPENDIX 03

Patrick McCaul Consulting Engineers

Mechanical & Electrical Services Planning Report

**RESIDENTIAL DEVELOPMENT & COMMERCIAL UNITS
AT CROWNE SQUARE,
GALWAY**



**MECHANICAL AND ELECTRICAL
SERVICES PLANNING REPORT**

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Contents

1. Introduction
2. Thermal Performance
3. Renewable Energy
4. Energy Saving Measures

1. Introduction

This report shall outline the energy strategy for the proposed Residential & Commercial Development at the proposed new Crowne Plaza Development.

Landlord services shall be provided to common stair cores and underground car parking. This will include general plant, site lighting, common stairwells/core (lifts etc), emergency lighting and fire alarm services.

The commercial units shall be provided with a standalone energy centre providing heating, cooling, domestic hot water services and ventilation as required.

The commercial units shall be provided with both heating and cooling. This shall be provided through high efficiency air source heat pump technology. Simultaneous heating and cooling can be provided as necessary. The heat pump technology shall be based on the new environmentally friendly R32 gas.

With regard to domestic hot water this shall also be provided via an air source heat pump.

The electrical installation shall incorporate all low energy systems such as LED lighting and controls and variable speed drives for pumps, lifts etc. With regard to the possible restaurant/server units, consideration shall be given to natural gas for water heating and cooking.

Fresh air shall be provided through air handling units incorporating thermal wheel technology and inbuilt heat pumps having a high COP and compliant with ErP EcoDesign 2018.

The units shall all have separate meters for water and electricity for the tenants to monitor and target their usages.

Each residential unit shall have a wet system to provide heating, with openable windows and trickle ventilation to supply fresh air.

The wet system shall be served by an air source heat pump, which will also supply the domestic hot water.

The units shall all have separate meters for water and electricity for the tenants to monitor and target their usages.

The electrical installation shall incorporate all low energy systems such as LED lighting and controls and variable speed drives for pumps, etc.

2. Thermal Performance

The development will be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of CO₂ emissions associated with this energy use insofar as is reasonably practicable. We have outlined the key issues within this section and the proposed design solutions to demonstrate compliance with regulations.

Thermal Insulation

The proposed thermal insulation standards shall be in line with current Part L 2017 (nZEB) regulations, the development shall meet the minimum requirements set by the building regulations as shown below.

Maximum average elemental U-Value (W/m ² K)	
Pitched Roof, insulation horizontal at ceiling level	0.16
Pitched roof, insulation on slope	0.16
Flat Roof	0.20
Walls	0.21
Ground Floor	0.21
Other exposed floors	0.21
External personnel doors, windows and rooflights	1.6
Vehicle access and similar large doors	1.5
Curtain Walls	1.8

The U Values shall be designed in the context of the balance of heat loss and heat gain, overheating, Building Regulations, Building Energy Rating and comfort conditions. These shall be improved upon where possible limiting the heat loss and, where appropriate, maximizing the heat gains through the fabric of the building.

Passive energy measures

Within the design we shall endeavor to employ passive energy measures to minimise energy consumption.

Passive design strategies will use ambient energy sources instead of purchased energies - electricity and natural gas - these shall include where applicable daylighting, natural ventilation, solar energy and heat pump technology.

Building Energy Rating

The BER shall be calculated using the Non Domestic Energy Assessment Procedure (NEAP) using IES Software. IES Version 6.1.1.3 as this is the latest version of the software to incorporate VE Compliance and BER modules for Republic of Ireland certificates.

Air Permeability

Infiltration of cold outside air shall be limited by reducing unintentional air paths as far as is practicable. The maximum permissible air permeability as set out by building regulations Part L is shown below;

Infiltration due to structure = 5m3/h/m2 at 50 Pa

This shall be improved upon where possible over the whole thermal envelope, including elements separating the building from adjoining heated or unheated areas.

3. Renewable Energy

Renewable energy will be provided in compliance with Part L 2017 (nZEB) i.e. the nearly zero or very low amount of energy required shall be covered to a significant extent by energy from renewable sources, including energy from renewable sources produced onsite or nearby.

With regard to the most suitable renewable building technologies for this site we shall employ a combination of air source heat pump technology and photovoltaics.

4. Energy Saving Measures

Energy costs may only be a small percentage of turnover but reducing them can directly increase revenue without the need to increase sales. Money saved on energy goes straight to the bottom line which makes businesses more competitive – and with rising energy prices, this is more important than ever. The implementation of simple energy efficiency measures can also increase levels of staff and customer comfort as well as improving general morale. (*Carbon trust*)

The M&E services will be designed to provide / create a cost effective, durable, low maintenance, energy efficient, low carbon and sustainable installation.

The design will allow for ease of access for future maintenance and /or replacement of building services taking into account building control regulations, lifecycle costs and site constraints.

The ultimate goal is to reduce fuel use as much as possible without compromising the safe operating conditions required within the offices and hotel in order to future proof against the expected energy price increases.

As part of the proposed development the following strategies and technologies will be incorporated to provide a new high efficiency installation;

- Where possible equipment will be listed on the SEAI Triple E register
- An intelligent, computer-based BMS - building management system - ensuring control systems are set correctly for different weather conditions and occupancy levels. Operational costs can be reduced by maintaining appropriate temperatures and ensuring that heating equipment and controls are operated and managed correctly.
- Set appropriate hot water temperatures - Excessive heating of hot water is wasteful and could scald staff or guests. The optimum temperature for stored hot water is 60°C which is adequate to kill Legionella bacteria and is sufficiently warm for staff and guests to use.
- Match ventilation to demand - Ventilation requirements may vary at different times and in different parts of a building throughout the day. Check that operating times for ventilation and cooling systems are consistent with the occupancy patterns of the building, unless ventilation is being used to provide cooling overnight.
- Low energy fans for ventilation systems
- Installing variable-speed drives to ensure pumps and fans only operate at the speeds necessary to meet demand. This reduction in speed saves energy and there are corresponding heating and cooling cost savings too.
- High efficiency motors – low loss and variable speed types with good controls
- LED lighting for both general and emergency lighting
- Automatic lighting controls to minimise electricity consumption where applicable

- Heat metering – every circuit will be provided with its own heat meter to allow quantification across the different areas.
- Water Saving Measures -wasting water is literally throwing money down the drain. All hospitality businesses could benefit from the installation of water conserving devices such as:
 - Tap controls – these switch taps off after a certain time and are useful in communal areas such as toilets and leisure facilities in hotels.
 - Spray taps and water efficient showerheads – these reduce the volume of water coming out of a tap or shower and can reduce consumption without diminishing the service to the customer, provided the water pressure is adequate.
 - Urinal flush controls – these help to reduce unnecessary flushing in toilets.
- Rainwater harvesting - this is the process of collecting and the storing rainwater that falls on your property. Rainwater shall be collected at carpark level then in turn be distributed to each building. Each building shall be provided with a break tank and distribution system for rainwater and the water shall be used for flushing toilets. Rainwater harvesting is a simple way to reduce your environmental impact and reduce your water usage.
- Heat recovery - It costs money to heat the air inside a building and it may be possible to reclaim some of that energy.
- There is increasing recognition of the benefits of future proofing against increasing fuel costs through energy efficiency and using sustainable technologies. The final design solution will incorporate where possible the most energy efficient systems to provide a complete new operational and sustainable system.

APPENDIX 04

IES Consulting

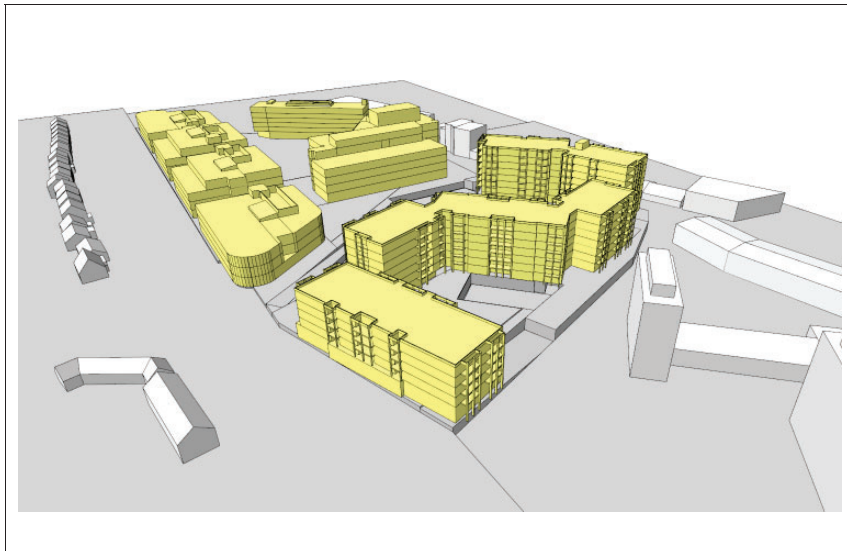
Daylight, Sunlight & Overshadowing study

Report for: Henry J Lyons

Project No.: 14246

Crown Square, Galway

Daylight, Sunlight and Overshadowing Study



Confidential

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Executive Summary

This report was complete to quantify the Sunlight / Daylight performance of the proposed residential development at Crown Square, Mervue, Galway. The analysis also quantified Sunlight / Daylight performance of the proposed development on the existing dwellings located to the south of the proposed development.

The following can be concluded based on the preliminary studies undertaken:

Shadow Analysis

The Shadow analysis shows the proposed development sits to the North of the existing residential buildings on Monivea Road, therefore no resulting overshadowing is visible

Daylight Analysis of existing buildings

For the residential properties considered on Monivea Road, the Vertical Sky Component for all of the points tested have a vertical sky component greater than 27% or not less than 0.8 times their former value (that of the Existing Scheme).

Therefore, these points all exceed the BRE recommendations.

Sunlight to the Proposed Amenity Spaces

As mentioned above under Section 3.3.17 of BRE's Site Layout Planning for Daylight and Sunlight states that for a space to appear adequately sunlit throughout the year, at least half of the garden or amenity area should receive at least 2 hours of sunlight on the 21st of March.

The images show on the 21st of March for both the **Phase 01** and the **Phase 02** amenity areas, over half of the amenity spaces would receive at least 2 hours of sunlight exceeding the BRE recommendations.

Average Daylight Factors

Overall 80% of the living and bedroom areas tested are in accordance with the BRE 2011 guidance for the average daylight factors. Of those which remain 15% of these rooms have an average daylight factor within 80% of the recommended minimum values as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight.

Given that tested rooms were on the ground floor and first floor, results would improve at upper levels therefore in excess of 95% the rooms would exceed the BRE guidelines.



Discussion

It should be noted that the guidance in 'Site layout planning for daylight and sunlight: a guide to good practice' is not mandatory and the Report itself states 'although it gives numerical guidelines these should be interpreted flexibly because natural lighting is only one of many factors in site layout design.'

Whilst the results shown relate to the criteria as laid out in the BRE guidance targets it is important to note that the BRE targets have been drafted primarily for use in low density suburban development and should therefore be used with flexibility and caution when dealing other types of sites.

Despite the above, the site performs well in relation to the metrics considered in this report.

When assessing the proposed development impact on the neighbouring properties, the following can be concluded:

- In terms of shading on surrounding properties, as the proposed development sits to the North of the existing residential buildings on Monivea Road, no resulting overshadowing is visible.
- VSC values for the proposed development all exceed the BRE recommendations.
- 80% (28 out of 35) of the tested spaces are in line with BRE recommendations and should achieve good levels of daylight. With 95% as a whole within 80% of BRE recommendations.

Also in terms of Sunlight to the Proposed Amenity Spaces, over half of the amenity areas would receive over 2 hours of sunlight on the 21st March therefore these can be defined as quality spaces in terms of sunlight/daylight.

Overall the results demonstrate the proposed development exceeds the BRE recommendations of the BRE 'Site Layout Planning for Daylight and Sunlight' guide, sometimes referred to as BRE Digest 209.

1 Introduction

This report was complete to quantify the Sunlight / Daylight impact of the proposed residential development at Crown Square on the existing dwellings located to the south of the proposed development.

The focus of the study considers the following items with respect to the proposed new development:

- **Shadow Analysis** - A visual representation analysing any potential changes that may arise from the proposed development on to the neighbouring existing developments.
- **Daylight Analysis of Existing Buildings** - via consideration of Vertical sky component (VSC).
- **Sunlight to proposed amenity space and gardens** - via annual sunlight hours comparison.
- **Average Daylight Factors** – via average daylight factor calculations across sample rooms on the first floor of the proposed development.

The analysis was complete out using the IES VE software.

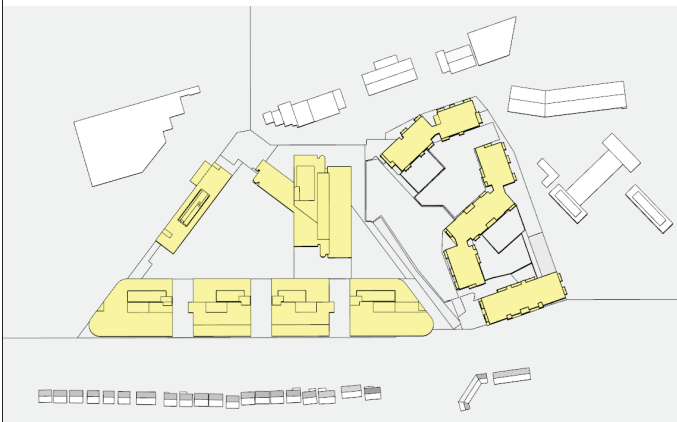
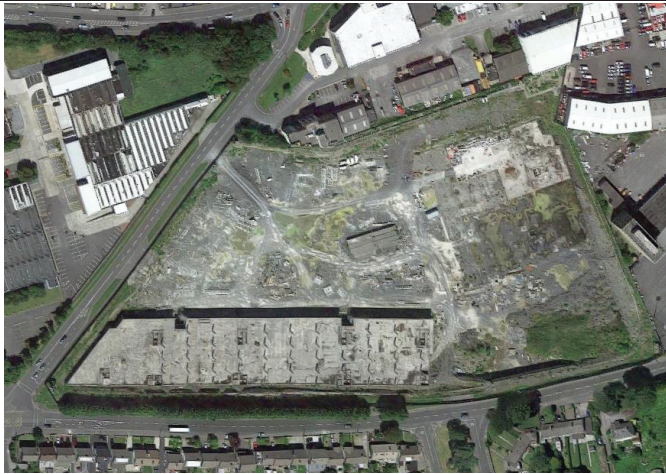
The assessment is based on recommendations given in BRE – Site Layout Planning for Daylight and Sunlight guide.

2 Methodology

2.1 Orientation

The model orientation has been taken from drawings provided by the Architect and the resulting angle shown below used in the analysis.

Orientation

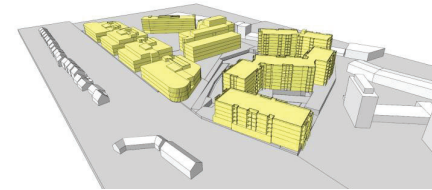


2.2 Model Geometry

The following images show the models created for use on across various views.



North of Site



East of Site



South of Site



West of Site

3 Shadow Analysis

The statistics of Met Eireann, the Irish Meteorological Service, show that the sunniest months in Galway are May and June, based on 1981-2010 averages or latest - <https://www.met.ie/climate/30-year-averages>.

The following can also be shown:

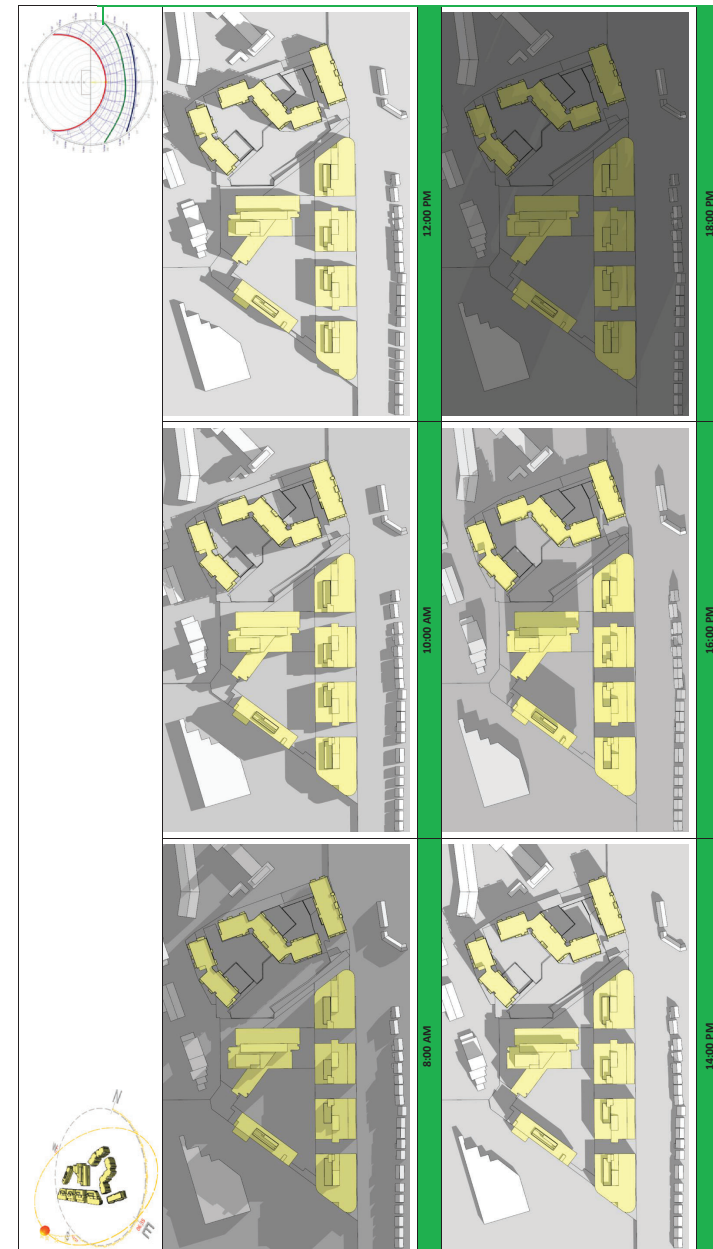
- During December a mean daily duration of 1.6 hours of sunlight out of a potential 8.1 hours sunlight each day is received (i.e. only 20% of potential sunlight hours).
- During June a mean daily duration of 5.2 hours of sunlight out of a potential 15.8 hours sunlight each day is received (i.e. only 33% of potential sunlight hours).

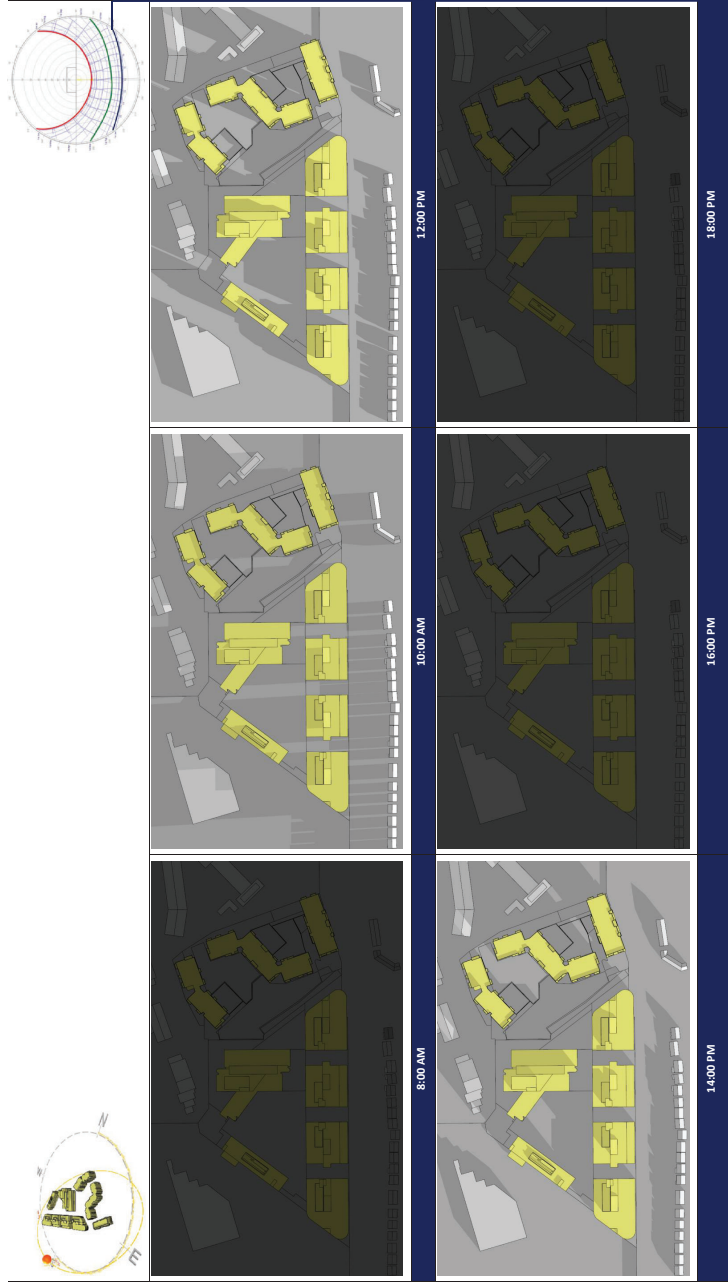
Therefore, impact caused by overshadowing are generally most noticeable during the summer months and least noticeable during the winter months.

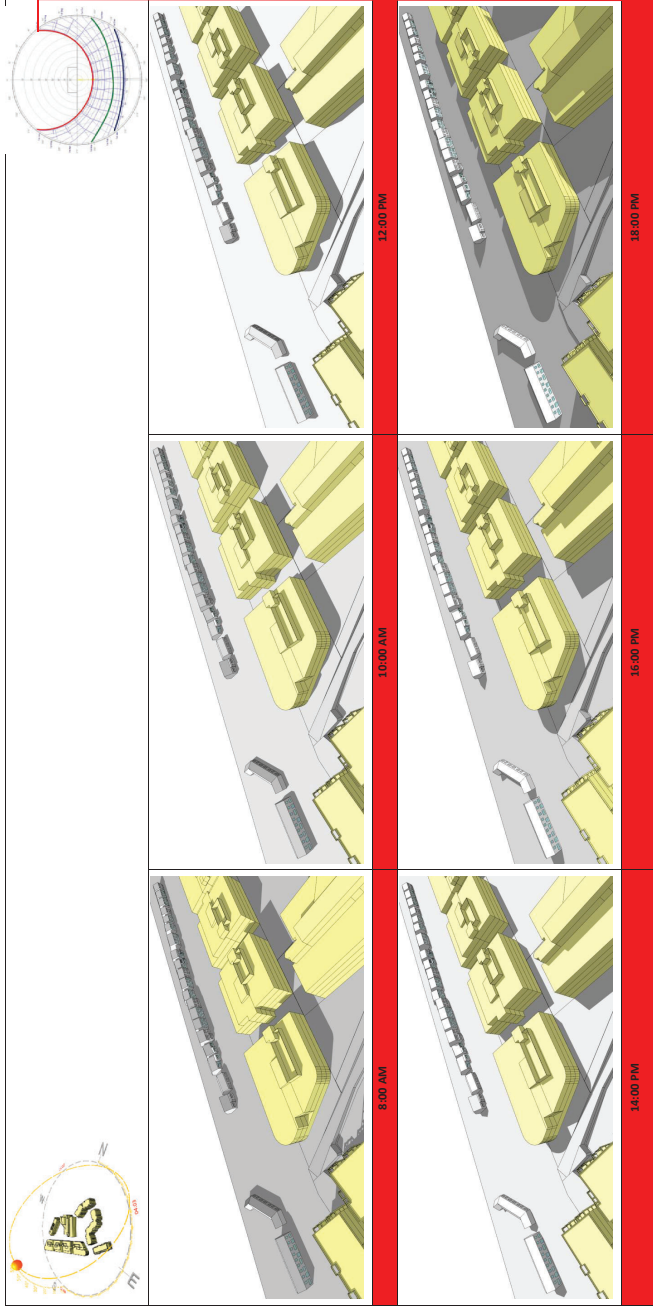
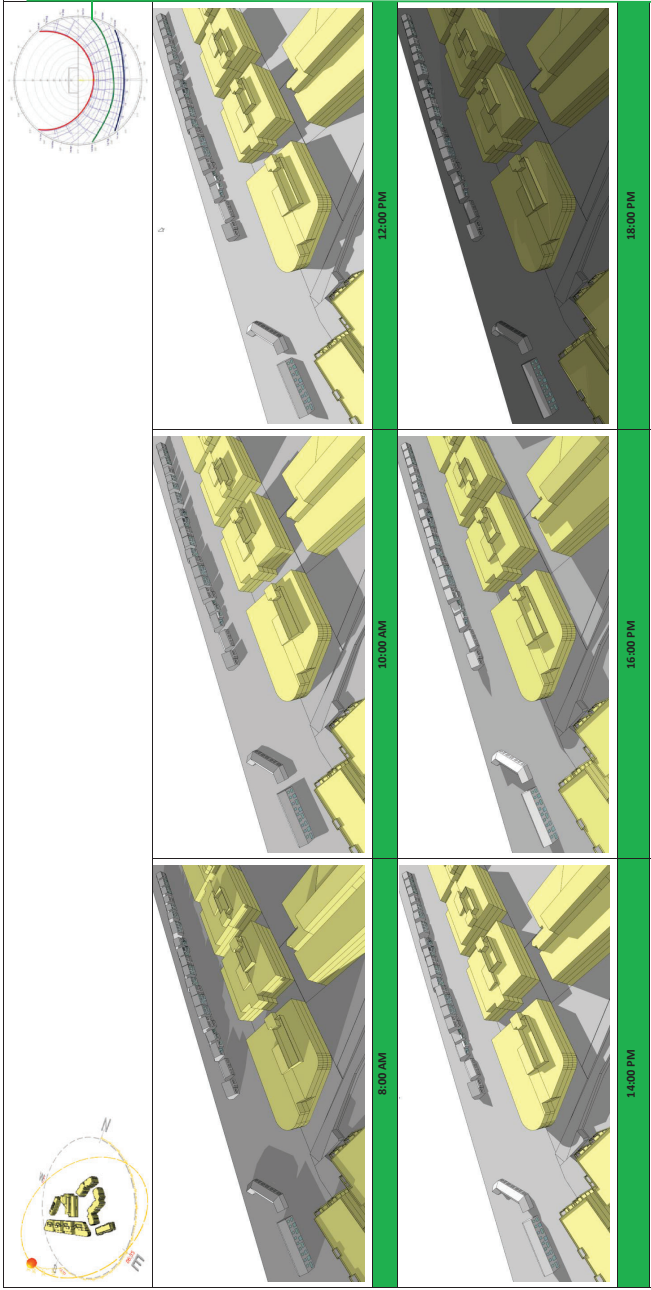
This section will consider the shadows cast for the Proposed development for the following dates;

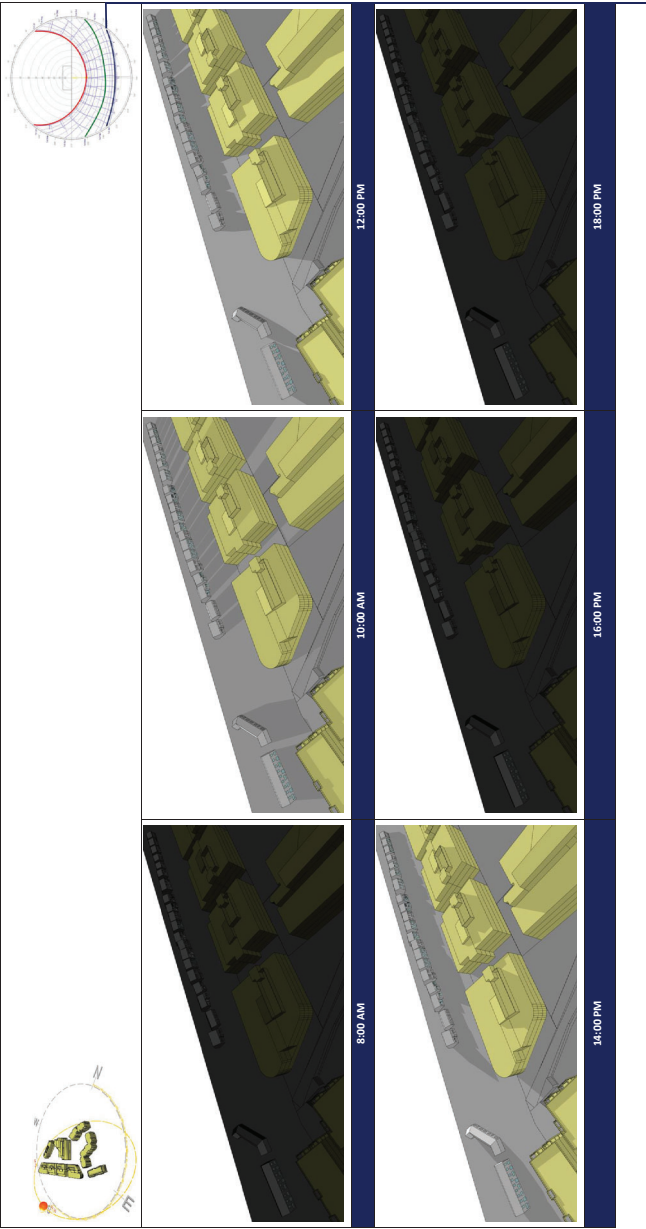
- December 21st (Winter Solstice)
- March 21st / September 21st (Equinox)
- June 21st (Summer solstice)

These images will show shadows cast for 'perfect sunny' conditions with no clouds and assumed that the sun is out for every hour shown. Given the discussion above it is important to remember that this is not always going to be the case.









3.2 Discussion

The Shadow analysis shows the proposed development sits to the North of the existing residential buildings on Monivea Road, therefore no resulting overshadowing is visible.

4 Daylight Analysis of Existing Buildings

4.1 Guidance Requirements

BRE Site layout planning for daylight and sunlight (Section 2.2)

When designing a new development, it is important to safeguard the daylight to nearby buildings. The BRE's 2011 guidance provide numerical values that are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints. Another issue is whether the Existing building is itself a good neighbour, standing a reasonable distance from the boundary and taking no more than its fair share of light. Any reduction in the total amount of skylight can be calculated by finding the vertical sky component at the centre of key reference points. The vertical sky component definition from the BRE's 2011 is described below;

Vertical sky component (VSC)

Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.

The maximum possible VSC value for an opening in a vertical wall, assuming no obstructions, is 40%. This VSC at any given point can be tested in the Radiance module of the IES VE software.

For typical Schemes the BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight which states the following in Section 2.2.7

2.2.7 If this VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy, and electric lighting will be needed more of the time.

As such this study will compare the Existing Scheme and Proposed Schemes and consider whether the VSC values are greater than 27% and if not, any reduction will be no greater than 20%.

4.2 Potential Sensitive Receptors

To help understand the potential impact to surrounding buildings potential sensitive receptors were identified as illustrated below.



4.3 Assessment

4.3.1 Monivea Road – Residential

Based on the above, the following locations have been modelled:



4.3.1.1 3 Monivea Road



Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	39.05	36.87	94%	✓
2	39.07	37.36	96%	✓
3	39.02	37.31	96%	✓
4	38.93	37.70	97%	✓
5	39.06	38.00	97%	✓
6	38.98	38.11	98%	✓
7	38.87	36.23	93%	✓
8	39.12	36.73	94%	✓
9	38.94	37.23	96%	✓
10	38.87	37.61	97%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore these points all exceed the BRE recommendations.

4.3.1.2 5 Monivea Road



The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore, these points all exceed the BRE recommendations.

4.3.1.3 7 Monivea Road



The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore, these points all exceed the BRE recommendations.

4.3.1.4 10 Monivea Road



Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	38.91	34.55	89%	✓
2	38.89	34.59	89%	✓
3	38.89	34.58	89%	✓
4	38.87	34.5	89%	✓
5	38.96	34.58	89%	✓
6	39.03	34.66	89%	✓
7	39.09	34.59	88%	✓
8	38.88	34.82	90%	✓
9	39	34.8	89%	✓
10	37.34	31.76	85%	✓
11	38.78	32.54	84%	✓
12	38.75	33	85%	✓
13	38.62	33.2	86%	✓
14	38.85	33.31	86%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore, these points all exceed the BRE recommendations.

4.3.1.5 11 Monivea Road



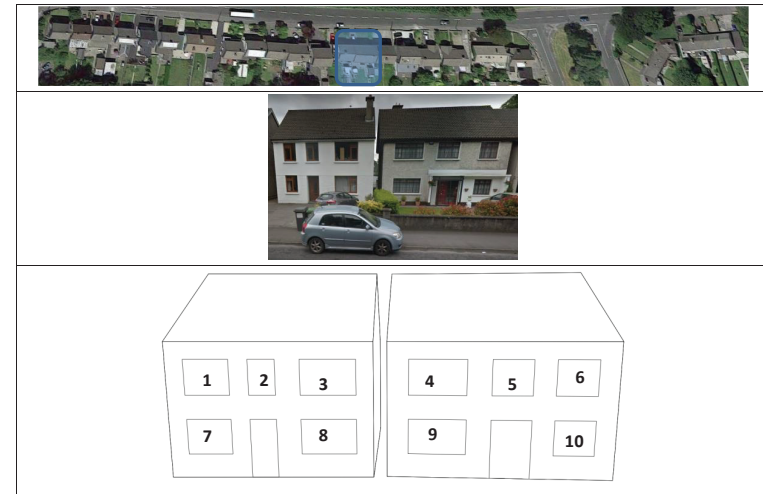
Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	36.61	31.92	87%	✓
2	38.64	34.04	88%	✓
3	38.57	33.91	88%	✓
4	38.85	34.00	88%	✓
5	38.87	34.26	88%	✓
6	38.88	34.33	88%	✓
7	34.85	29.22	84%	✓
8	37.79	31.88	84%	✓
9	38.83	32.75	84%	✓
10	38.92	32.78	84%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore, these points all exceed the BRE recommendations.

4.3.1.6 15 Monivea Road



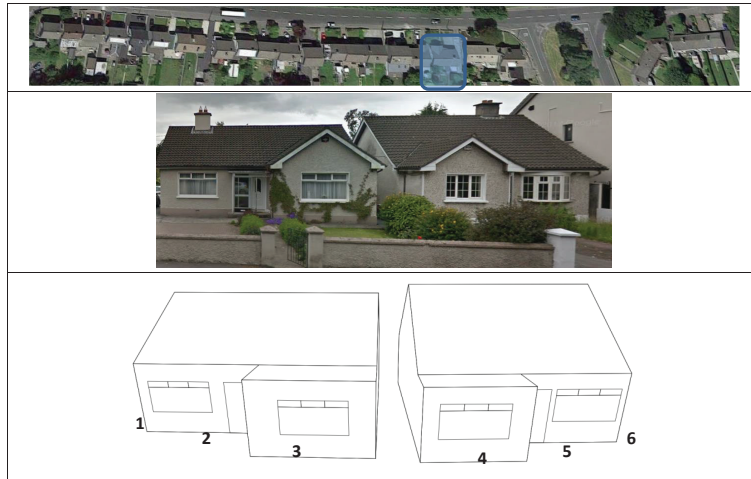
Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	38.86	33.90	87%	✓
2	38.93	34.07	88%	✓
3	38.86	34.25	88%	✓
4	38.74	34.22	88%	✓
5	38.88	34.16	88%	✓
6	38.83	34.37	89%	✓
7	38.67	32.39	84%	✓
8	38.66	32.86	85%	✓
9	38.70	32.87	85%	✓
10	38.66	32.59	84%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%.

Therefore, these points all exceed the BRE recommendations.

19 Monivea Road



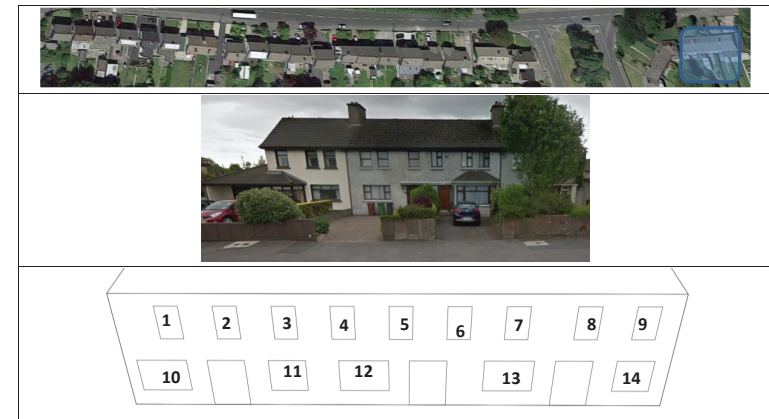
Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	37.62	31.77	84%	✓
2	28.27	23.56	83%	✓
3	38.36	31.99	83%	✓
4	38.79	32.09	83%	✓
5	27.52	22.36	81%	✓
6	34.05	28.26	83%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27% or of not less than 0.8 times their former value (that of the Existing Scheme).

Therefore, these points all exceed the BRE recommendations.

4.3.1.7 30 Monivea Road



Points	Existing Scheme VSC	Proposed Scheme VSC	Proposed VSC as % of Existing Scheme	Comment
1	37.81	31.34	83%	✓
2	38.04	31.16	82%	✓
3	38.08	31.08	82%	✓
4	38.09	31.27	82%	✓
5	38.13	31.21	82%	✓
6	38.14	31.58	83%	✓
7	38.34	31.70	83%	✓
8	38.28	31.65	83%	✓
9	38.35	32.14	84%	✓
10	37.69	29.80	79%	✓
11	37.80	29.53	78%	✓
12	37.58	29.78	79%	✓
13	37.89	30.21	80%	✓
14	38.04	30.50	80%	✓

The following conclusions can be made:

✓ All of the tested points have a vertical sky component value greater than 27%. Therefore these points all exceed the BRE recommendations.

Discussion

For the residential properties considered on Monivea Road, the Vertical Sky Component for all of the points tested have a vertical sky component value greater than 27% or not less than 0.8 times their former value (that of the Existing Scheme).

Therefore these points all exceed the BRE recommendations.

5 Sunlight to the Proposed Amenity Spaces

5.1 Requirements

The impact of the development proposal on the sunlight availability in the amenity areas will be considered to determine how they perform when assessed against the BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight which states the following in Section 3.3.17;

Summary

3.3.17 It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.

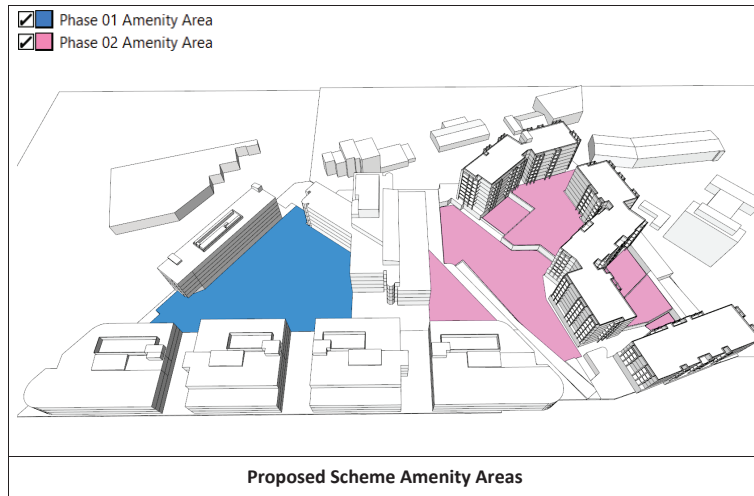
BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight states in 3.3.17 that for a space to, appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least 2 hours of sunlight on 21st March.

5.2 Assessment

5.2.1 Methodology

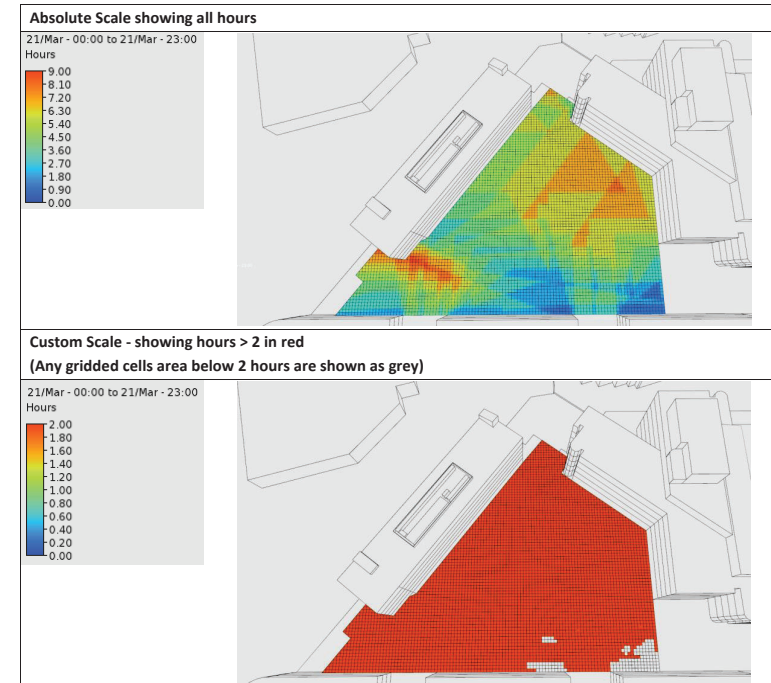
As stated above for a space to, appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least 2 hours of sunlight on 21st March.

This analysis will be performed on the following proposed amenity spaces shown in the images below:



5.3 Phase 01 Amenity Areas

The following images show the predicted results with respect to this space receiving at least 2 hours of sunlight on 21st March, across the gridded cells.



5.5 Discussion

As mentioned above under Section 3.3.17 of BRE’s Site Layout Planning for Daylight and Sunlight states that for a space to appear adequately sunlit throughout the year, at least half of the garden or amenity area should receive at least 2 hours of sunlight on the 21st of March.

The images above show on the 21st of March for both the **Phase 01** and the **Phase 02** amenity areas, over half of the amenity spaces would receive at least 2 hours of sunlight which exceeds the BRE recommendations.

6 Average Daylight Factors

This section addresses daylight to the proposed apartments.

BRE’s 2011 guidance document Site Layout Planning for Daylight and Sunlight states the following in Appendix C with respect to Average Daylight Factors (ADF);

C4 If a predominantly daylight appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of ADF which should be attained even if a predominantly daylight appearance is not achievable.
From BRE’s 2011 guidance document Site Layout Planning for Daylight and Sunlight

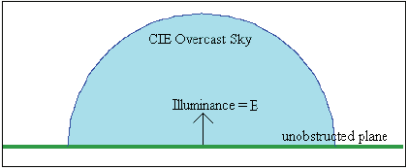
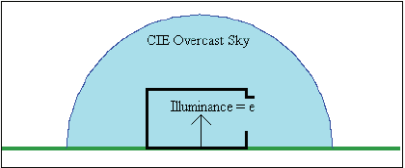
From this the recommended Average Daylight Factors (ADF) are therefore;

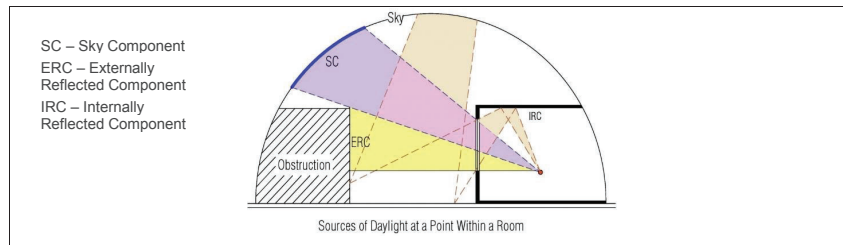
- Bedrooms – 1.0%
- Living Rooms / Kitchens – 1.5%

This study will consider the predicted average daylight factor to the proposed Phase 2 apartments. Analysis has been carried by using the Radiance module of IES VE software to quantify the metrics describe below.

Daylight is constantly changing, so its level at a point in a building is usually defined as an average daylight factor.

This is the ratio of the indoor illuminance at the point in question to the outdoor unobstructed horizontal illuminance.

Daylight Factor Methodology	
	
E = illuminance on unobstructed plane	e = illuminance at point in interior
Daylight Factor = e/E (often expressed as a percentage)	



Both illuminances are measured under the same standard sky, a CIE overcast sky. Since the sun is in a particular position for only a short period each day, direct sunlight is excluded. Instead diffuse sunlight is used for average daylight calculations. Diffuse sunlight describes the sunlight that has been scattered by molecules and particles in the atmosphere but has still made it down to surface of the earth.

For average daylight factor there are three possible paths along which diffuse light can get into a room through glazed windows.

- Light from the patch of sky visible at the point considered, is expressed as the sky component.
- Light reflected from opposing exterior surfaces and then reaches the point, is expressed as the externally reflected component.
- Light entering through the window but reaching the point only after reflection from internal surfaces, is expressed as the internally reflected component.

6.1 Assumptions

The following assumptions are to be used in the study:

- Sky Conditions: Standard CIE overcast sky
- Time (24hr): 12:00
- Date: 21 September
- Working Plane: 0.85m

The following Surface Reflectance's are to be used in the study:

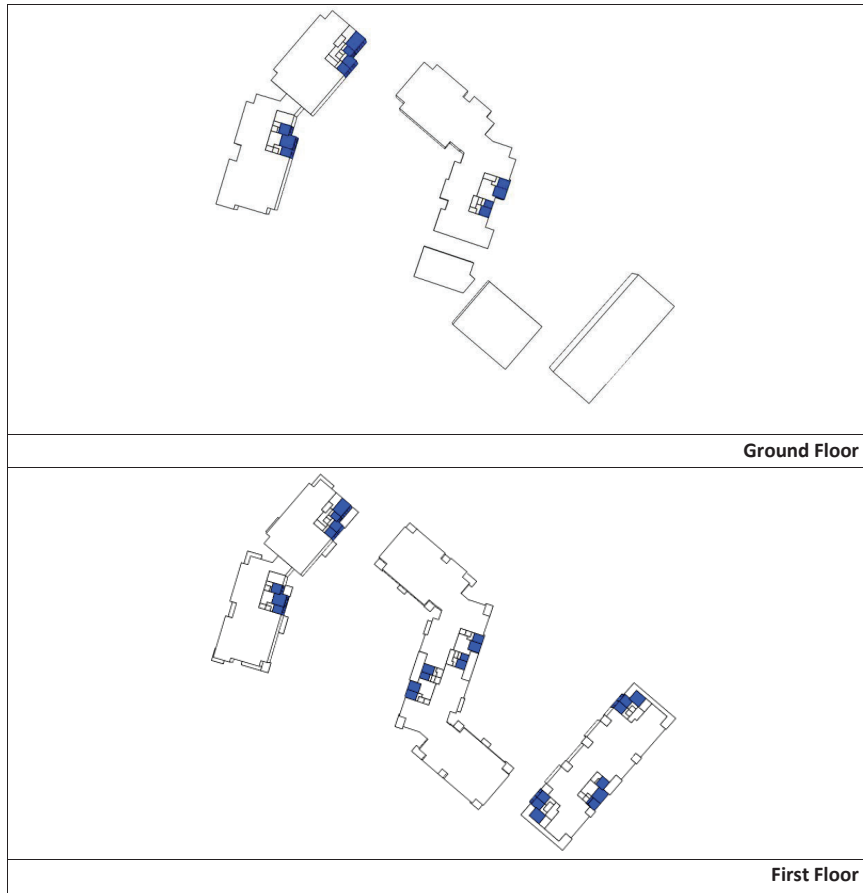
Material Surface	Reflectance
External Wall	0.50
Internal Partition	0.50
Roof	0.20
Ground	0.20
Floor/Ceiling (Floor)	0.20
Floor/Ceiling (Ceiling)	0.70

Glazing Transmittance:

- Light Transmittance: 70%
- Assumed Window Frame thickness: 50 mm

6.2 Rooms Considered

Typical rooms across the following floor plates were considered



6.3 Average Daylight Factor Results

6.3.1 Ground Floor



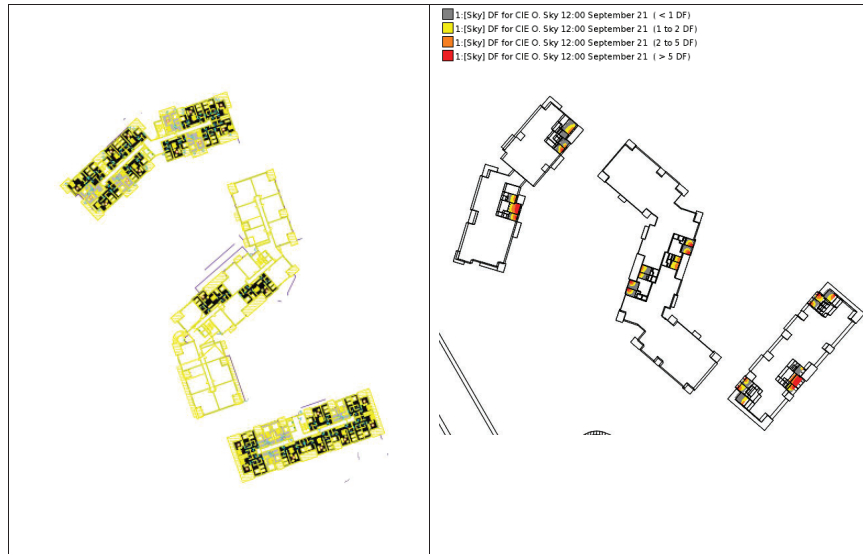
Room Reference	Room Activity	Average Daylight Factor	BRE Recommendation
L00: Block G_Bedroom 05	Bedroom	1.96	✓ ¹
L00: Block G_Living 02	Living	4.61	✓ ¹
L00: Block G_Bedroom 01	Bedroom	1.56	✓ ¹
L00: L00: Block G_Bedroom 03	Bedroom	0.84	✓ ²
L00: Block G_Bedroom 02	Bedroom	1.43	✓ ¹
L00: Block G_Bedroom 04	Bedroom	1.48	✓ ¹
L00: Block G_Living 01	Living	1.49	✓ ²
L00: Block H_Bedroom 03	Bedroom	0.94	✓ ²
L00: Block H_Bedroom 02	Bedroom	0.90	✓ ²
L00: Block H_Bedroom 01	Bedroom	2.08	✓ ¹
L00: Block H_Living room	Living	6.31	✓ ¹

The following conclusions can be made:

✓¹ All these rooms have an average daylight factors in excess of the recommended minimum values (1.5% for living rooms and 1.0% for bedrooms) as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight. These points are in line with BRE recommendations.

✓² All these rooms have an average daylight factor within 80% of the recommended minimum values (1.2% for living rooms and 0.80% for bedrooms) as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight.

6.3.2 First Floor



✓ ¹ All these rooms have an average daylight factors in excess of the recommended minimum values (1.5% for living rooms and 1.0% for bedrooms) as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight. These points are in line with BRE recommendations.

✓ ² All these rooms have an average daylight factor within 80% of the recommended minimum values (1.2% for living rooms and 0.80% for bedrooms) as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight.

✓ ³ These rooms have a typically lower average daylight factor than the recommended minimum values.

Room Reference	Room Activity	Average Daylight Factor	BRE Recommendation
L01: Block J_Living 01	Living	1.63	✓ ¹
L01: Block H_Bedroom 04	Bedroom	2.37	✓ ¹
L01: Block H_Living 02	Living	2.02	✓ ¹
L01: Block H_Bedroom 05	Bedroom	1.64	✓ ¹
L01: Block H_Bedroom 06	Bedroom	1.65	✓ ¹
L01: Block H_Bedroom 03	Bedroom	1.17	✓ ¹
L01: Block H_Bedroom 02	Bedroom	1.16	✓ ¹
L01: Block J_Bedroom 03	Bedroom	1.94	✓ ¹
L01: Block G_Living 01	Living	1.23	✓ ²
L01: Block H_Bedroom 01	Bedroom	2.19	✓ ¹
L01: Block J_Bedroom 04	Bedroom	2.36	✓ ¹
L01: Block J_Living 02	Living	2.70	✓ ¹
L01: Block J_Bedroom 01	Bedroom	1.70	✓ ¹
L01: Block G_Bedroom 05	Bedroom	2.13	✓ ¹
L01: Block G_Living 02	Living	4.80	✓ ¹
L01: Block G_Bedroom 04	Bedroom	1.25	✓ ¹
L01: Block G_Bedroom 01	Bedroom	1.77	✓ ¹
L01: Block G_Bedroom 02	Bedroom	0.62	✓ ³
L01: L01: Block G_Bedroom 03	Bedroom	0.72	✓ ³
L01: Block H_Living 01	Living	1.82	✓ ¹
L01: Block J_Bedroom 06	Bedroom	2.77	✓ ¹
L01: Block J_Living 03	Living	6.86	✓ ¹
L01: Block J_Bedroom 05	Bedroom	1.74	✓ ¹
L01: Block J_Bedroom 02	Bedroom	1.67	✓ ¹

The following conclusions can be made:

6.4 Discussion

Full results for the rooms considered can be seen above. These are summarised as follows:

- **Ground Floor (tested)**

Tested	11
Living Room above BRE recommendations	3
Bedroom above BRE recommendations	4
Within 20% of recommendation (not less than 80%)	4
Below BRE recommendations by more than 20%	0
	64%

- **First Floor (tested)**

Tested	24
Living Room above BRE recommendations	6
Bedroom above BRE recommendations	15
Within 20% of recommendation (not less than 80%)	1
Below BRE recommendations by more than 20%	2
	88%

- **Ground Floor and First Floor (tested)**

Tested	35
Living Room above BRE recommendations	9
Bedroom above BRE recommendations	19
Within 20% of recommendation (not less than 80%)	5
Below BRE recommendations by more than 20%	2
	80%

In terms of the Ground/First floor rooms tested 80% of the rooms have Average Daylight Factor (ADF) above recommended Average Daylight Factors (ADF) in line with BRE guidelines.

- Bedrooms – 1.0%
- Living Rooms / Kitchens – 1.5%

The results with respect to Average Daylight Factors demonstrate that the Proposed development should achieve good levels of daylight in line with BRE recommendations. Given that tested rooms were on the ground floor and first floor, results would be expected to improve at upper levels.

7 Conclusion

The following can be concluded based on the studies undertaken.

7.1 Shadow Analysis

The Shadow analysis shows different shadows being cast at some times of the year for the proposed scheme.

As the proposed development sits to the North of the existing residential buildings on Monivea Road, no resulting overshadowing is visible

7.2 Daylight Analysis of existing buildings

For the residential properties considered on Monivea Road, the Vertical Sky Component for all of the points tested have a vertical sky component greater than 27% or not less than 0.8 times their former value (that of the Existing Scheme).

Therefore, these points exceed the BRE recommendations.

7.3 Sunlight to the Proposed Amenity Spaces

As mentioned above under Section 3.3.17 of BRE's Site Layout Planning for Daylight and Sunlight states that for a space to appear adequately sunlit throughout the year, at least half of the garden or amenity area should receive at least 2 hours of sunlight on the 21st of March.

The images above show on the 21st of March for both the **Phase 01** and the **Phase 02** amenity areas, over half of the amenity spaces would receive at least 2 hours of sunlight in line with the BRE recommendations.

7.4 Average Daylight Factors

Overall 80% of the living and bedroom areas tested are in accordance with the BRE 2011 guidance for the average daylight factors. Of those which remain 15% of these rooms have an average daylight factor within 80% of the recommended minimum values as stated under BRE's 2011 guidance document Site Layout Planning for Daylight and Sunlight.

Given that tested rooms were on the ground floor and first floor, results would improve at upper levels therefore in excess of 95% the rooms would exceed the BRE guidelines.

7.5 Discussion

It should be noted that the guidance in 'Site layout planning for daylight and sunlight: a guide to good practice' is not mandatory and the Report itself states 'although it gives

numerical guidelines these should be interpreted flexibly because natural lighting is only one of many factors in site layout design.

Whilst the results shown relate to the criteria as laid out in the BRE guidance targets it is important to note that the BRE targets have been drafted primarily for use in low density suburban development and should therefore be used with flexibility and caution when dealing other types of sites.

Despite the above, the site performs well in relation to the metrics considered in this report.

When assessing the proposed development impact on the neighbouring properties, the following can be concluded:

- In terms of shading on surrounding properties, as the proposed development sits to the North of the existing residential buildings on Monivea Road, no resulting overshadowing is visible.
- VSC values for the proposed development exceed the BRE recommendations.
- 80% (28 out of 35) of the tested spaces are in line with BRE recommendations and should achieve good levels of daylight. In the overall development, 95% of all rooms would exceed the BRE recommendations.

Over half of the proposed amenity areas would receive over 2 hours of sunlight on the 21st March therefore these spaces are quality spaces in terms of sunlight and they exceed the BRE recommendations.

Overall, the results demonstrate the proposed development exceeds the BRE recommendations in the BRE 'Site Layout Planning for Daylight and Sunlight' guide, sometimes referred to as BRE Digest 209.



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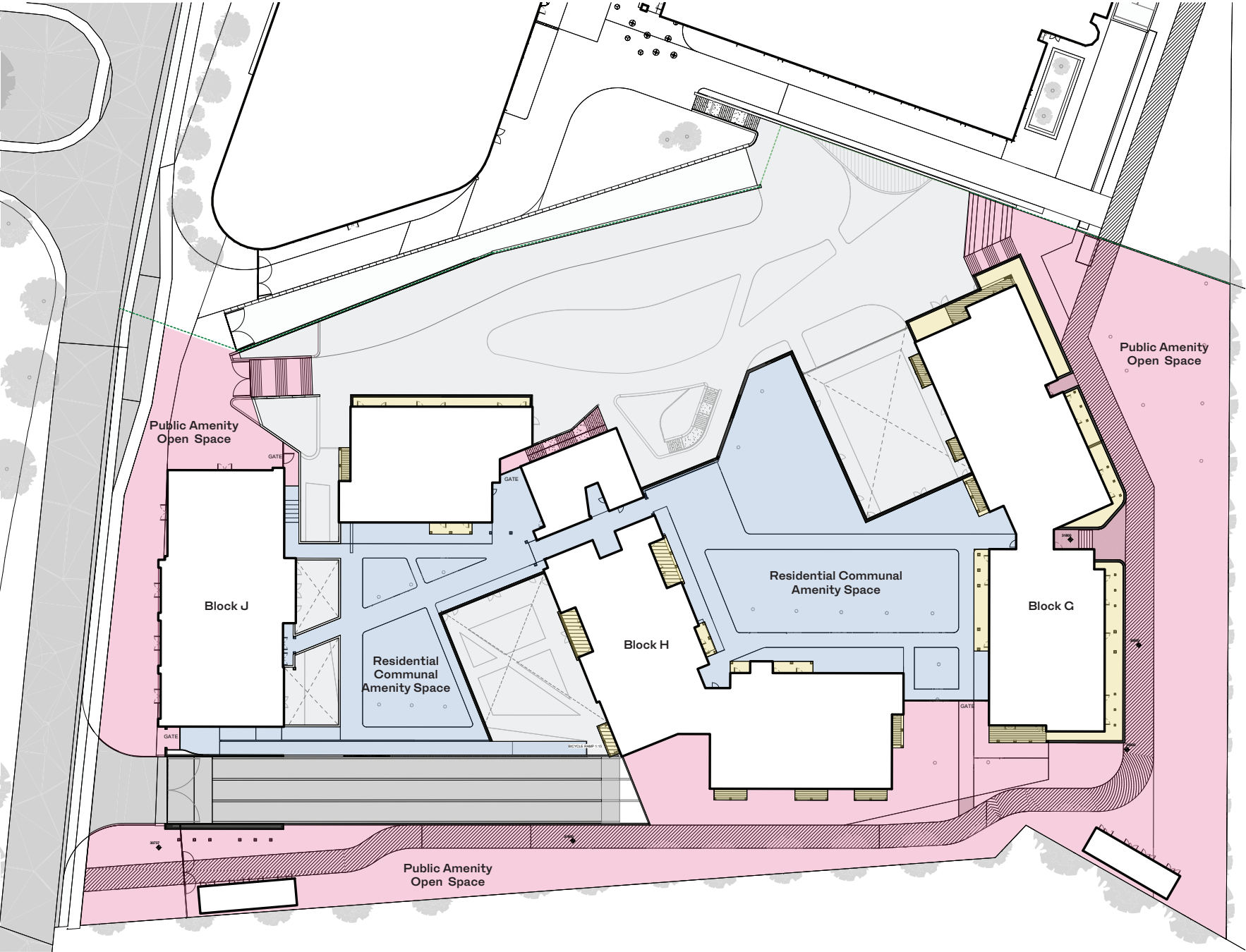
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APPENDIX 05

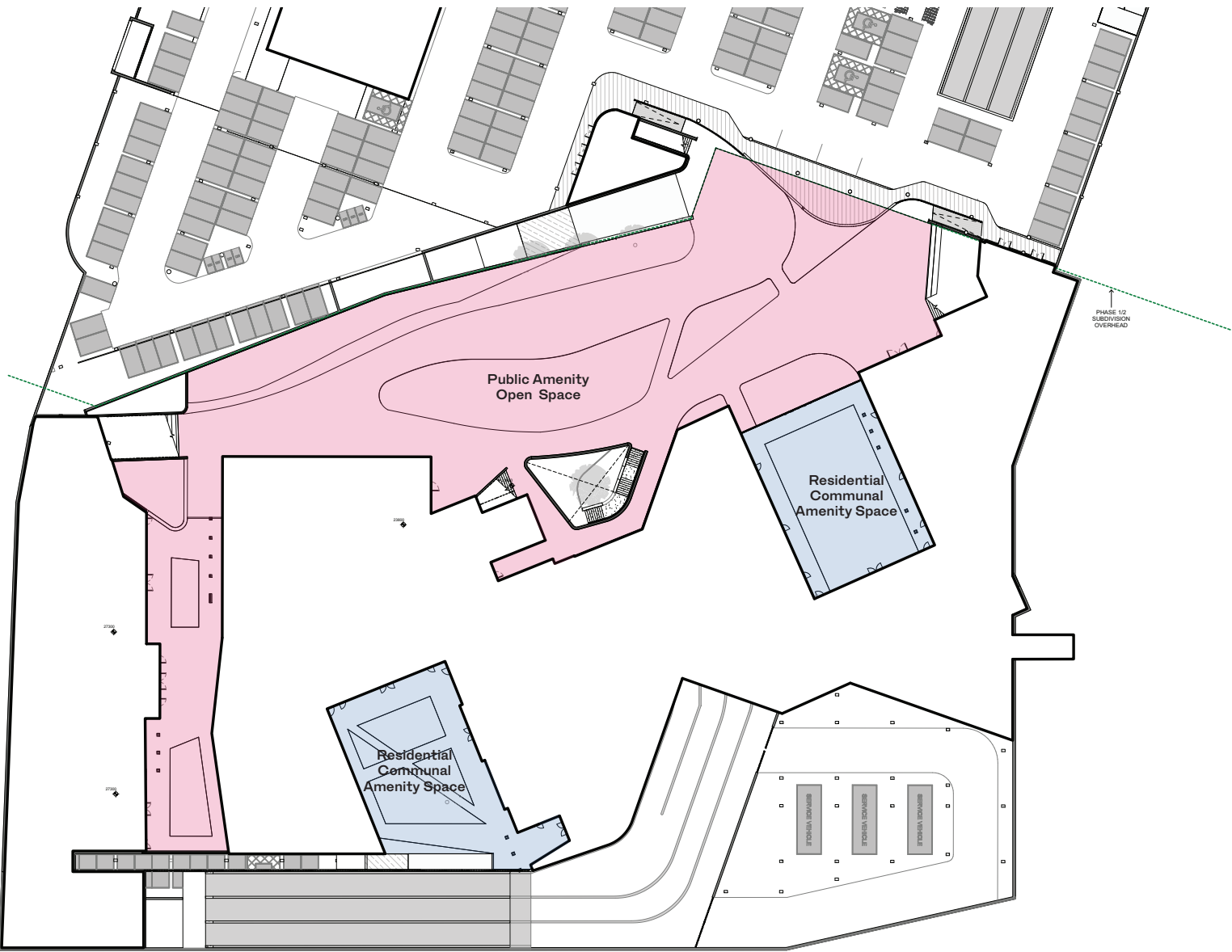
Schedule of Residential Private, Communal & Public Open Space

GROUND LEVEL | OPEN SPACE DIAGRAM



- Public Amenity Open Space
B01 - 3585 sq.m
G00 - 5865 sq.m
- Residential Communal Amenity Space
B01 - 1015 sq.m
G00 - 3165 sq.m
- Residential Private Open Space
B01 - 0 sq.m
G00 - 580 sq.m

UPPER BASEMENT LEVEL | OPEN SPACE DIAGRAM



- Public Amenity Open Space**
B01 - 3585 sq.m
G00 - 5865 sq.m
- Residential Communal Amenity Space**
B01 - 1015 sq.m
G00 - 3165 sq.m
- Residential Private Open Space**
B01 - 0 sq.m
G00 - 580 sq.m

APPENDIX 06

IES Consulting

Micro-Climate Study & Wind Analysis

14519

Crown Square Galway

Pedestrian Comfort CFD Analysis

Report P1

Consultant: Harshad Joshi CFD Project Leader
Checker: Colin Rees Consultancy Manager

Monday, 15 July 2019



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1 Executive Summary

The following report explains the methodology for performing the wind related comfort and safety assessment for the Crown Square Development in Galway. The Development consists for two phases –

- 1) Commercial
- 2) Residential

The assessment was used to identify if locations in the development are likely to be subjected to adverse effects from wind.

For the analysis, 8 steady state CFD simulations were performed, one each for 8 wind directions – N, NE, E, SE, S, SW, W and NW. The wind speed was set to the annual average. The wind was assumed to have characteristics associated with wind flowing through a large city centre. The results obtained from these simulations were extrapolated along the annual weather data to obtain the most probable local air speed for each hour of the year. Statistical analysis was performed on this dataset to check compliance against the Lawson's Pedestrian Comfort criterion.

The following table provides the values for the Lawson's pedestrian comfort assessment criteria for various activities.

Category	Pedestrian Activity	Threshold mean hourly wind speed not to be exceeded for more than 5% of the time (m/s)
C1	Business Walking	10
C2	Leisurely Walking	8
C3	Standing	6
C4	Sitting	4

The following table provides the values for Lawson's Pedestrian Safety Assessment criteria.

Category	Pedestrian Type	Threshold mean hourly wind speed not to be exceeded more than once per annum ² (m/s)
S1	Typical Pedestrian	20
S2	Sensitive Pedestrian	15

The following sections discuss the findings of the analysis.

1.1 Sitting Criterion

The results are visualised in [section 6.1](#). The site shows good compliance with the sitting criterion in both phases of the development.

In phase 1 (commercial), some locations show a frequency of between 5 - 10% occurrence of local air speeds greater than 4 m/s. These locations are near the access paths to the office blocks B and C, see [Figure 31](#). The primary reason for this is the site being aligned along the south-westerly wind corridor. However, the trees and bushes placed as mitigation measures, seem to control the overall wind ingress and prevent the air speed increasing significantly. The results improve further when winter is excluded – when outside seating would be very unlikely, see [Figure 32](#).



For phase 2 (residential), the results demonstrate a similar trend. Generally, the development shows good compliance with the sitting criterion. The only location showing marginal compliance is the passage between block G and H. As before, this is along the pre-dominant south-westerly direction and could be subject to accelerating winds between the buildings, see [Figure 33](#). If the winter results are excluded then a marginal improvement is observed, see [Figure 34](#). Again, sitting would not be the primary activity here as it is likely to be transitional location.

For the residential phase, some higher level balconies on blocks G and H show marginal compliance with the sitting criterion. Improvement is observed when winter results are excluded – as balconies are unlikely to be used often in winter.

1.2 Standing Criterion

The results are visualised in [section 6.2](#). The entire site shows excellent compliance with the standing criterion.

1.3 Leisure Walking Criterion

The results are visualised in [section 6.3](#). The entire site shows excellent compliance with the leisure walking criterion.

1.4 Business Walking Criterion

The results are visualised in [section 6.4](#). The entire site shows excellent compliance with the business walking criterion.

1.5 Safety Criteria

The results are visualised in [section 6.5](#) and [section 6.6](#). The entire site shows excellent compliance with the safety criterion for normal pedestrians. The site also shows good compliance for sensitive pedestrians



2 Introduction

IES Consulting have been commissioned to investigate the potential impact of wind movement on pedestrian comfort around the proposed at the Crown Square in Galway, Ireland.

The analysis to be performed includes:

- The effect of building layout on wind acceleration and/or deceleration as it flows through the site.
- Determine the air movement effect on amenity spaces within the development including walkways, car parks, surrounding streets, etc.

The following simulation report describes the modelling methodology used in the study, including assumptions and calculations to determine the boundary conditions, and results obtained from the simulations.



3 Analysis Methodology

The methodology for the analysis was as follows:

- 1) The annual mean wind speed was determined from the weather file.
- 2) 8 steady state CFD simulations were performed corresponding to the 8 directions – SW, W, NW, N, NE, E, SE and S respectively.
- 3) The local air speed at various designated locations around the site was recorded for each of the simulations.
- 4) This value was compared to the meteorological wind speed used and the magnification factor at that location for the corresponding wind direction was determined.
- 5) The magnification factor was used to determine the air speed at the designated locations for the various recorded values of the wind speed and direction in the weather file, thus generating the local air speeds at designated locations for a year.
- 6) These recorded values were compared to the Lawson Pedestrian Comfort/Safety Criteria.

3.1 Lawson Pedestrian Comfort/Safety Criteria

The Lawson Criteria¹ was used as a reference to assess the wind effects. It is the most widely used reference for assessment of pedestrian comfort. It considers the air speed at the location as well as the frequency of the occurrence of this air speed. It consists of two assessment criteria:

- 1. The first criteria assesses whether the air movement will be comfortable for the pedestrian for different types of activities.
- 2. The second criteria assess the feeling of safety or distress by the pedestrian at higher air speeds.

Following table gives the values for the Lawson’s pedestrian comfort assessment criteria for various activities.

Category	Pedestrian Activity	Threshold mean hourly wind speed not to be exceeded for more than 5% of the time (m/s)
C1	Business Walking	10
C2	Leisurely Walking	8
C3	Standing	6
C4	Sitting	4

Following table gives the values for Lawson’s Pedestrian Safety Assessment criteria.

Category	Pedestrian Type	Threshold mean hourly wind speed not to be exceeded more than once per annum ² (m/s)
S1	Typical Pedestrian	20
S2	Sensitive Pedestrian	15

¹T. V. Lawson (2001) *Building Aerodynamics*, Imperial College Press, London.
²Once per annum means the safety threshold is not be exceeded 0.01% of the year.



4 Weather Data

The analysis is based on Athenry weather data obtained from the Met Eireann weather data set. The variation of wind speed recorded in the weather file is shown in figure 1 below. Figure 2 shows the wind direction variation and Figure 3 shows the wind rose.

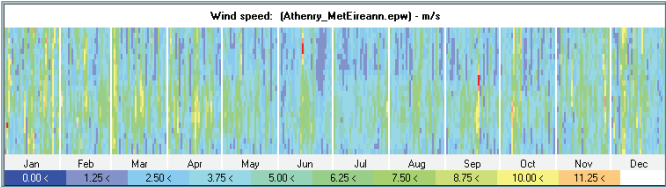


Figure 1: Wind speed variation as per Athenry wind data from Met Eireann

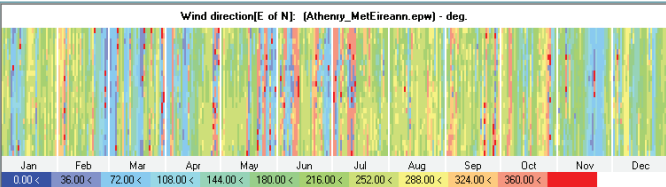


Figure 2: Wind direction variation as per Athenry wind data from Met Eireann

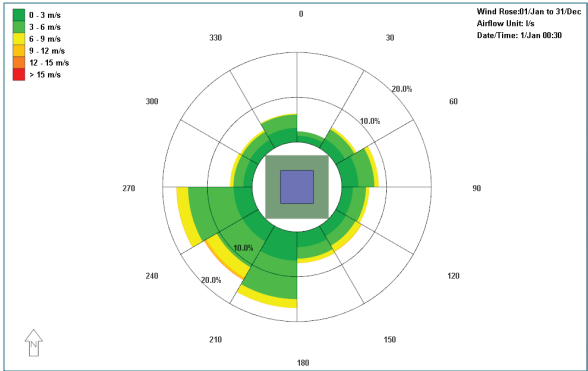


Figure 3: Wind rose as per Athenry wind data from Met Eireann



5 CFD Model

The CFD model was created based on the CAD drawings provided.

5.1 Model Geometry

Figures 4 to 23 show the geometry as modelled.

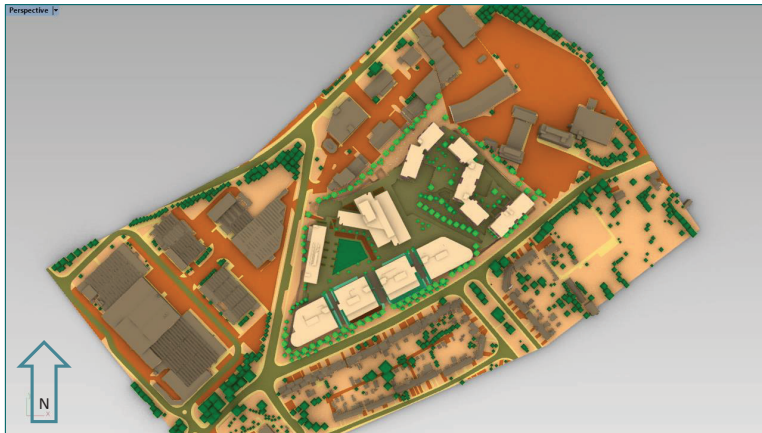


Figure 4: Plan view of the site



Figure 5: View of the site from the south

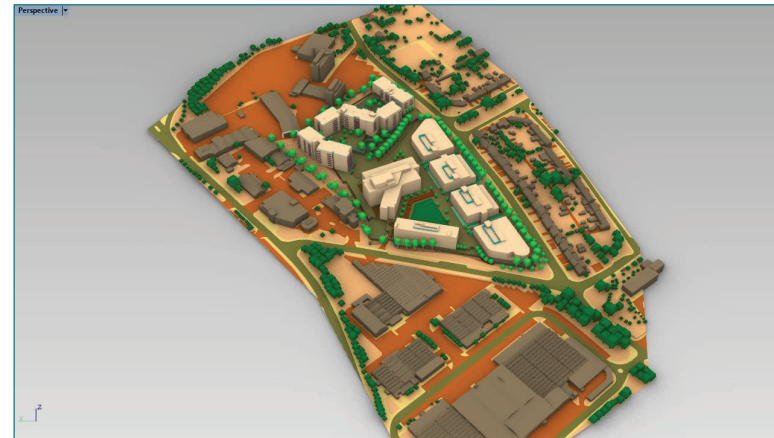


Figure 6: View of the site from the west



Figure 7: View of the site from the north

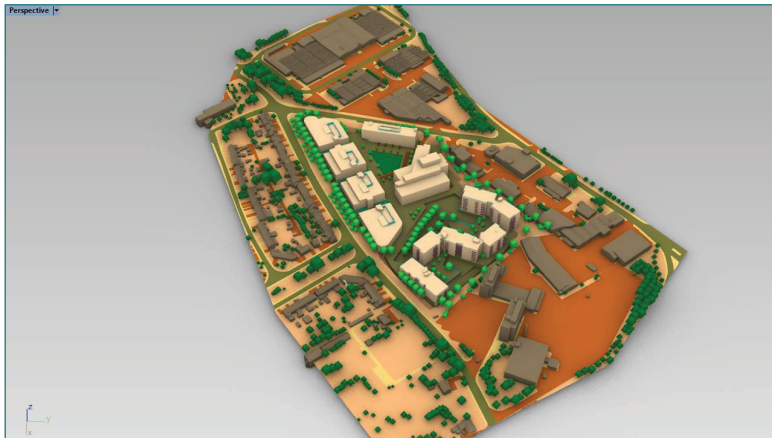


Figure 8: View of the site from the east



Figure 10: Closer view of buildings from the west



Figure 9: Closer view of buildings from the south



Figure 11: Closer view of buildings from the north



Figure 12: Closer view of buildings from the east

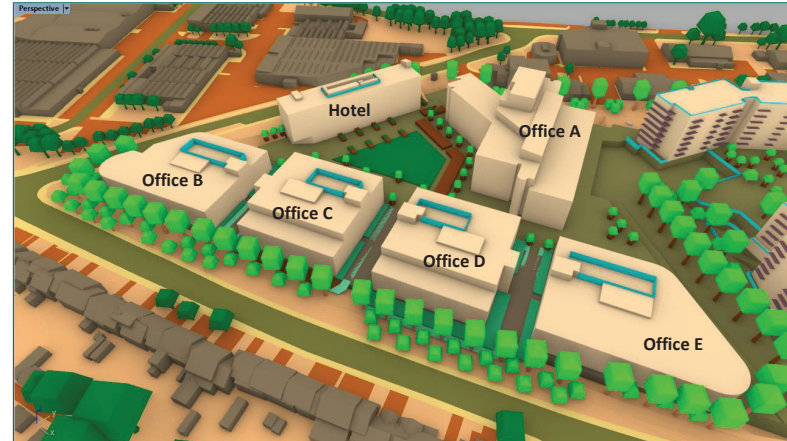


Figure 14: Closer View of the buildings in Phase 1



Figure 13: View of the Phase 1 and Phase 2

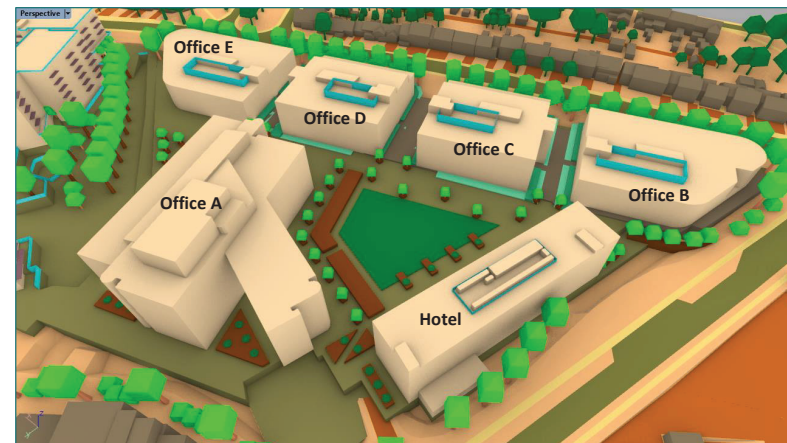


Figure 15: Closer View of the buildings in Phase 1



Figure 16: Closer View of the buildings in Phase 2

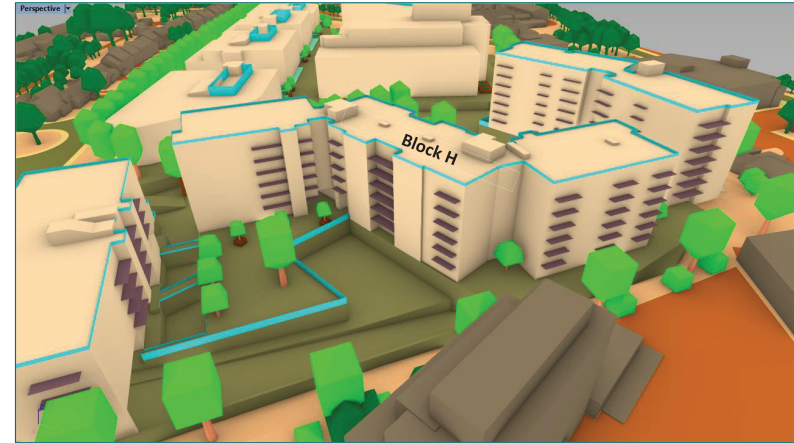


Figure 18: Closer View of the building block H in Phase 2

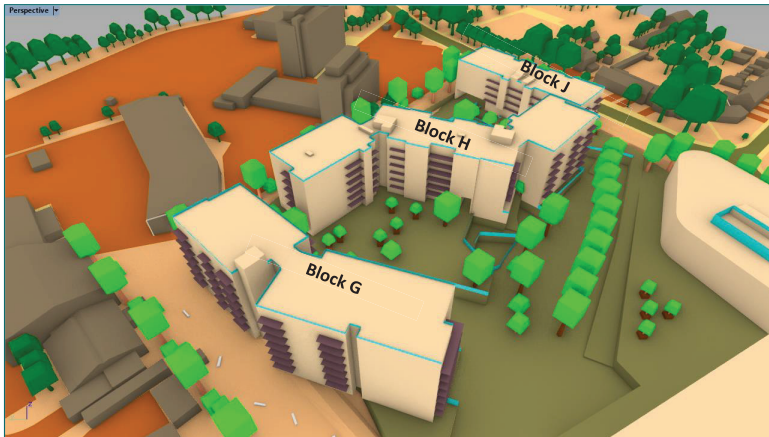


Figure 17: Closer View of the buildings in Phase 2



Figure 19: Closer View of the building block H in Phase 2

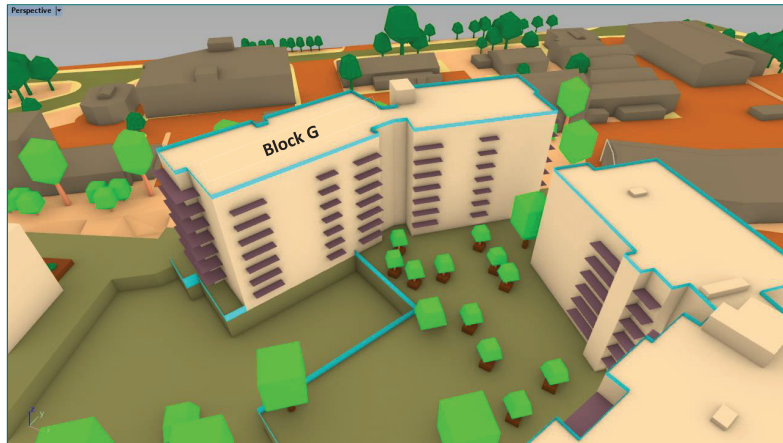


Figure 20: Closer View of the building block G in Phase 2

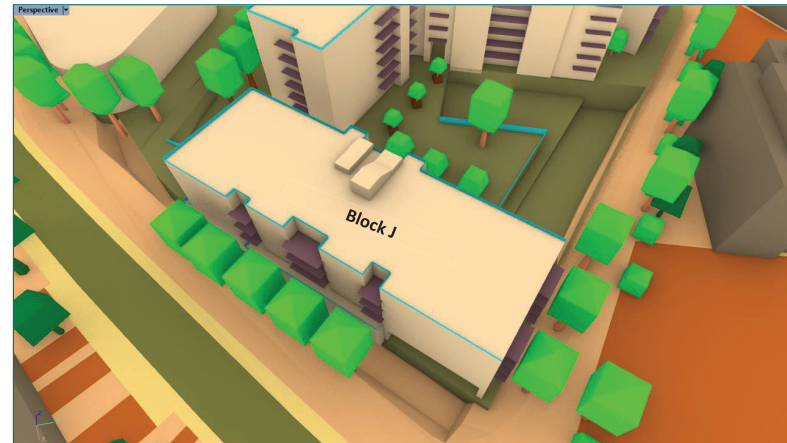


Figure 22: Closer View of the building block J in Phase 2



Figure 21: Closer View of the building block G in Phase 2

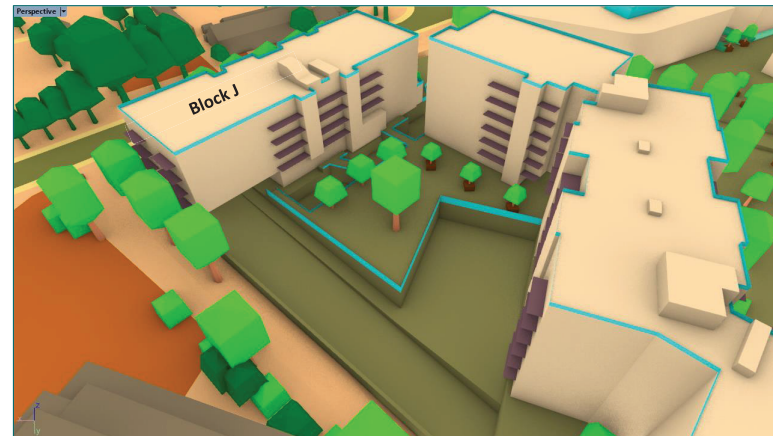


Figure 23: Closer View of the building block J in Phase 2



5.2 Reportage Locations

Figures 24 to 30 below show the different locations where pedestrian comfort parameters will be reported coloured in blue.

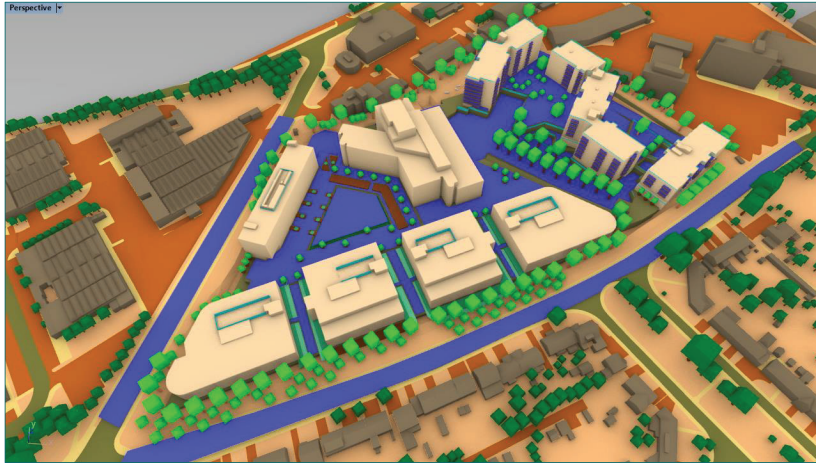


Figure 24: Reportage Locations: Seen from south

19

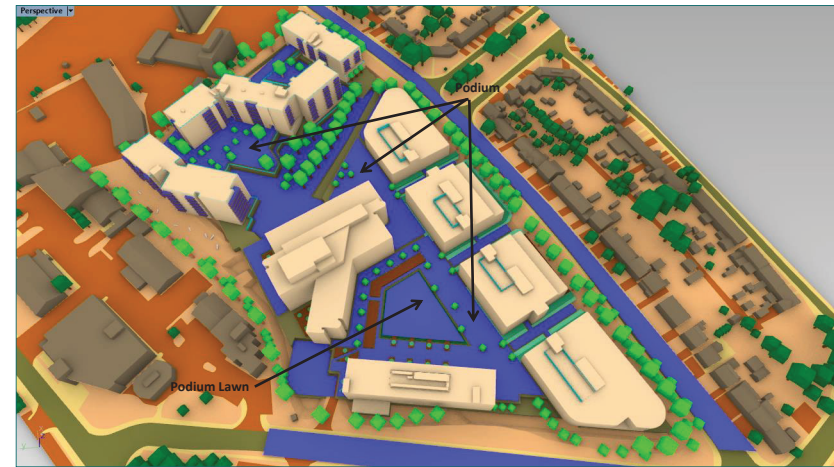


Figure 25: Reportage Locations: Seen from west

20

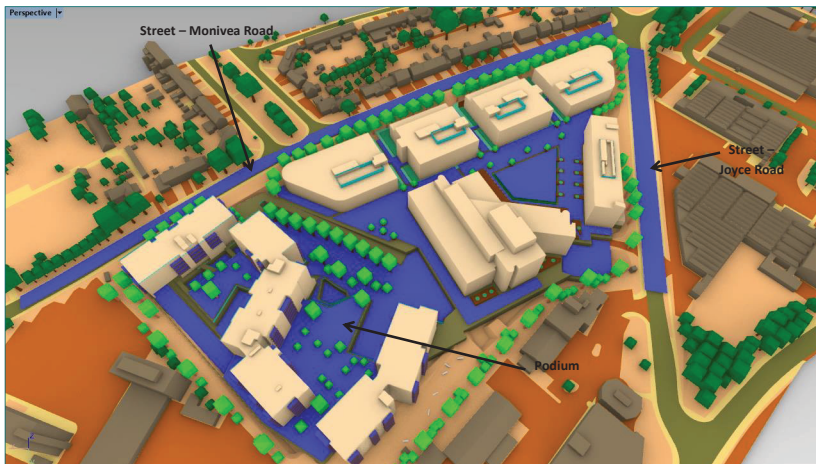


Figure 26: Reportage Locations: Seen from north

21



Figure 27: Reportage Locations: Seen from east

22

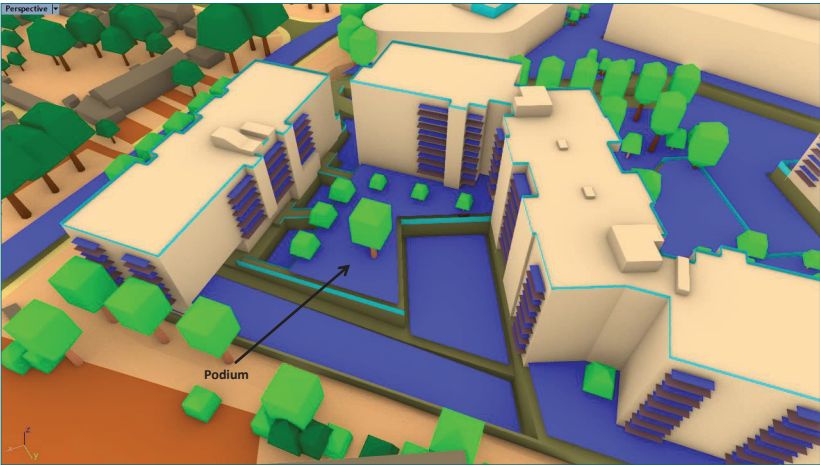


Figure 28: Reporting Locations: Podium of residential blocks



Figure 29: Reporting Locations: Podium of residential blocks

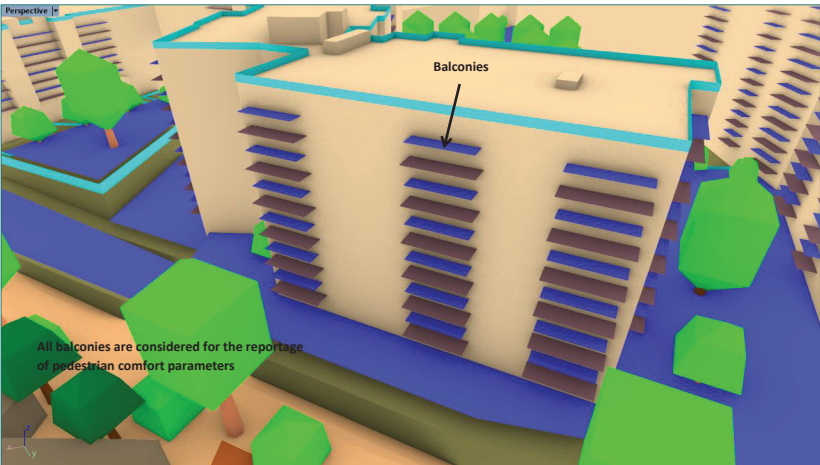


Figure 30: Reporting Locations: Balconies



5.3 Comfort Activities

The following table lists the various activities according to amenity type.

Amenity Area	Business Walking Activity	Leisurely Walking Activity	Standing Activity	Sitting Activity
Podium	✓	✓	✓	✓
Ground level amenities	✓	✓	✓	✓
Balconies			✓	✓
Streets	✓	✓		



6 Simulation Results

6.1 Sitting Criterion

Figure below shows the results for the full year sitting criterion analysis for Phase 1.

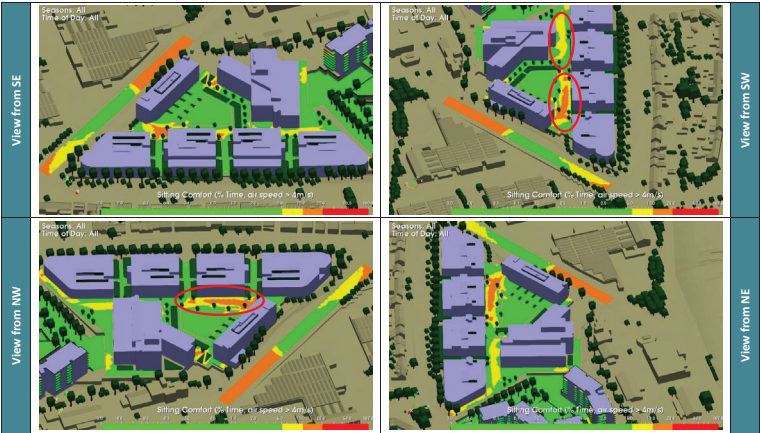


Figure 31: Sitting Criterion: Phase 1: Commercial



Figure below shows the results for the sitting criterion analysis for Phase 1 with the winter season results excluded.

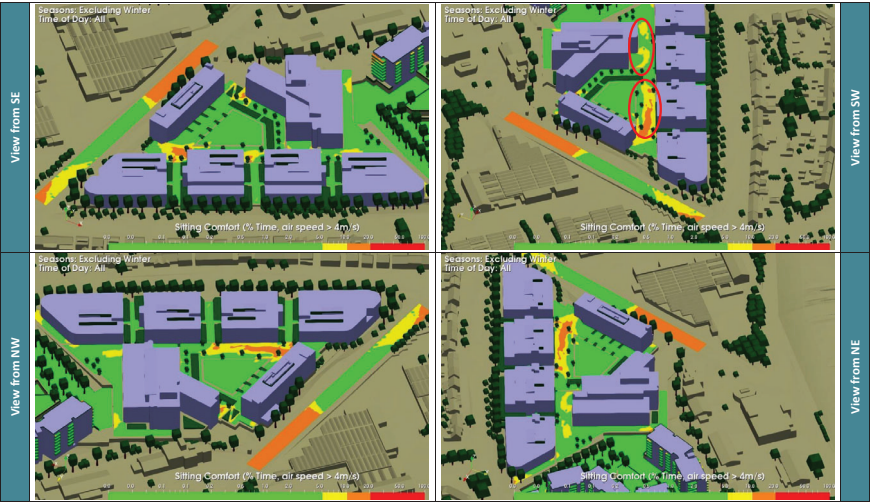


Figure 32: Sitting Criterion: Phase 1: Commercial: Winter Excluded



Figure below shows the results for the full year sitting criterion analysis for Phase 2.

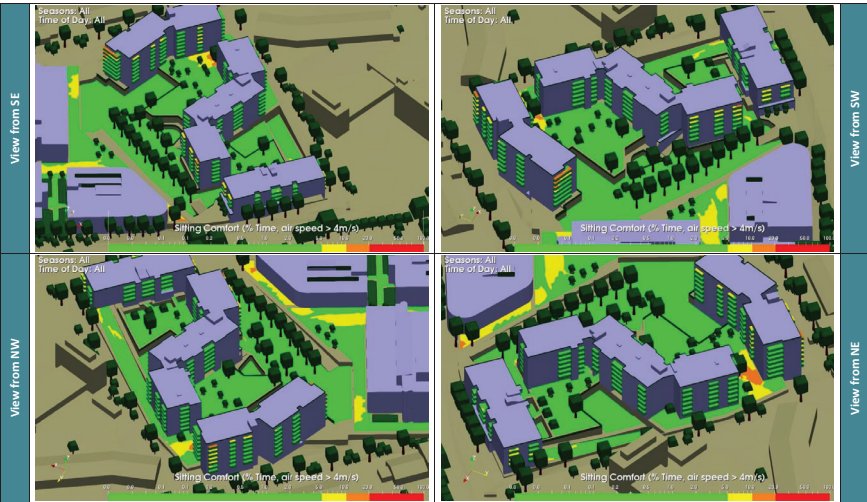


Figure 33: Sitting Criterion: Phase 1: Residential



Figure below shows the results for the sitting criterion analysis for Phase 2 with the winter season results excluded.

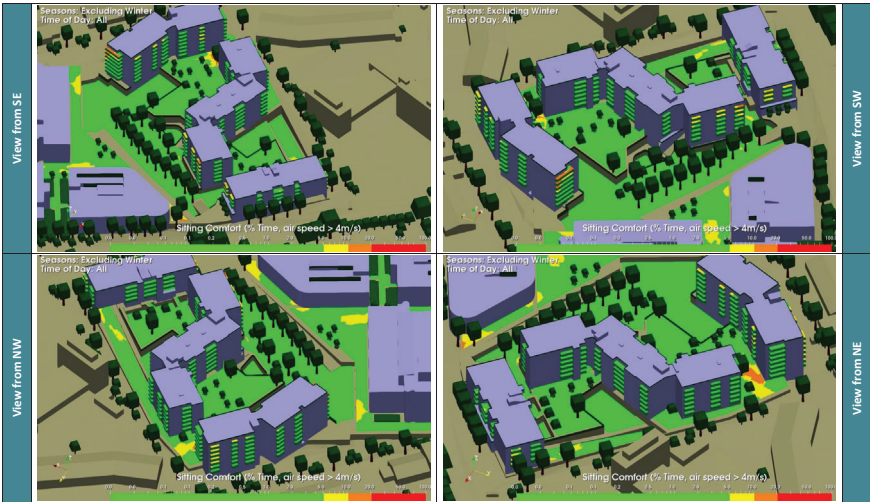


Figure 34: Sitting Criterion: Phase 1: Residential: Winter Excluded



6.2 Standing Criterion

Figure below shows the results for the full year standing criterion analysis for Phase 1.

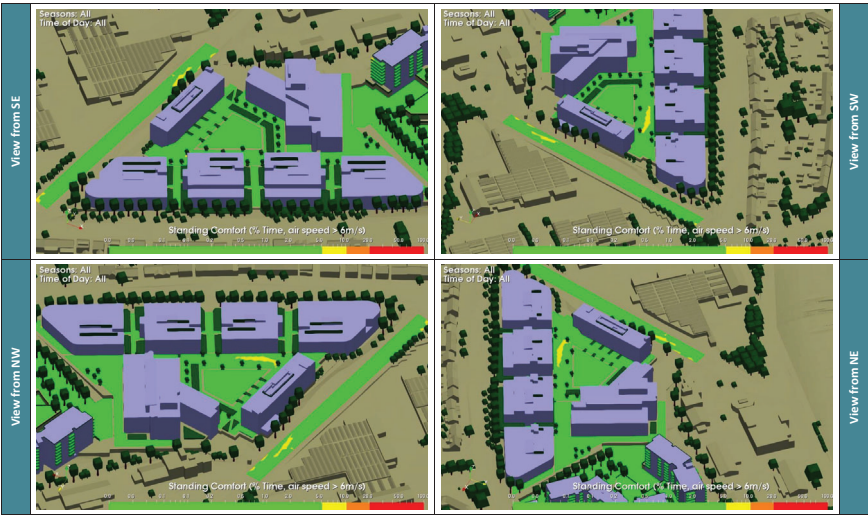


Figure 35: Standing Criterion: Phase 1: Commercial



6.3 Leisure Walking Criterion

Figure below shows the results for the full year leisure walking criterion analysis for Phase 1.

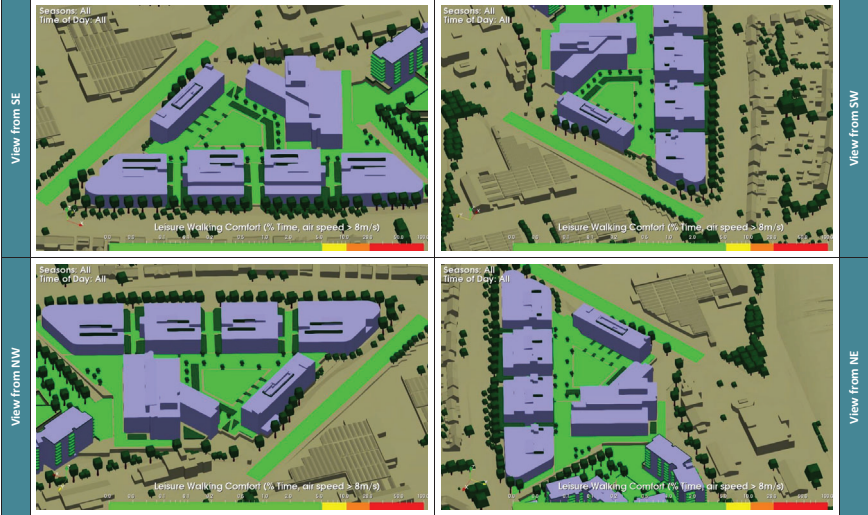


Figure 37: Leisure Walking Criterion: Phase 1: Commercial



Figure below shows the results for the full year standing criterion analysis for Phase 2.

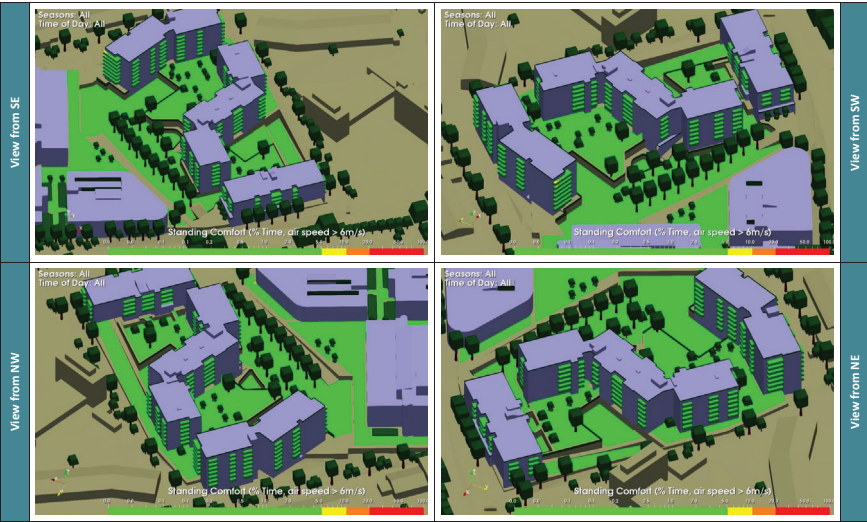


Figure 36: Standing Criterion: Phase 1: Residential



Figure below shows the results for the full year leisure criterion analysis for Phase 2.

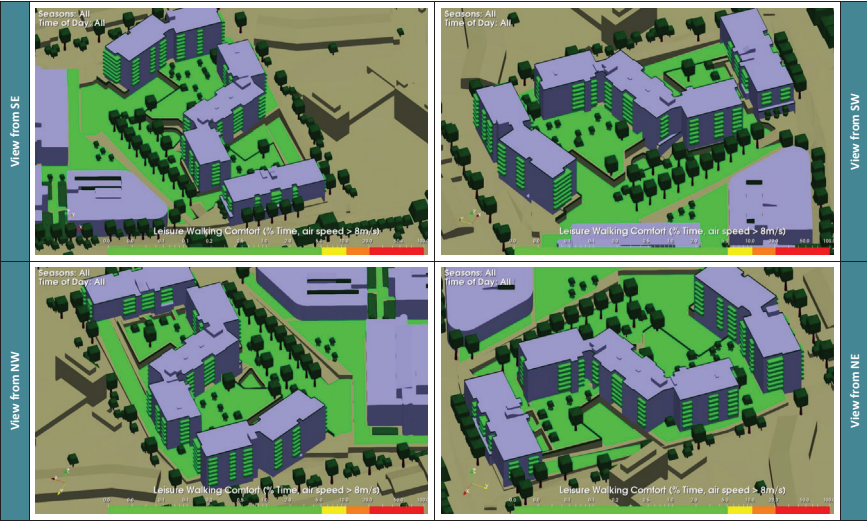


Figure 38: Leisure Walking Criterion: Phase 1: Residential



6.4 Business Walking Criterion

Figure below shows the results for the full year's business walking criterion analysis for Phase 1.

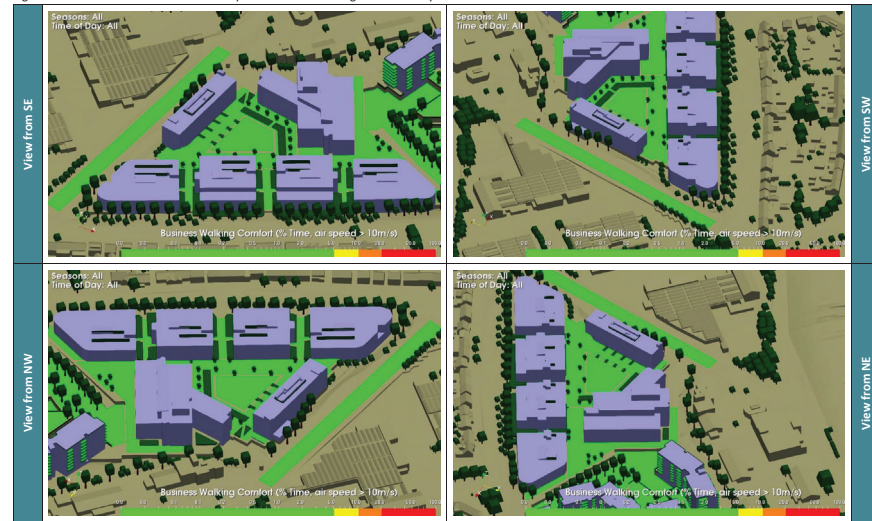


Figure 39: Business Walking Criterion: Phase 1: Commercial

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Figure below shows the results for the full year business walking criterion analysis for Phase 2.

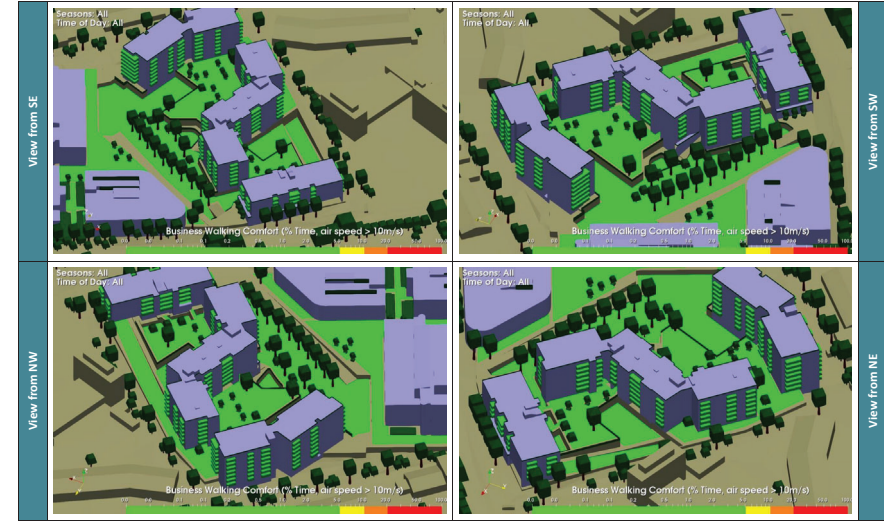


Figure 40: Business Walking Criterion: Phase 1: Residential

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6.5 Normal Pedestrian Safety Criterion

Figure below shows the results for the full year normal pedestrian safety criterion analysis for Phase 1.

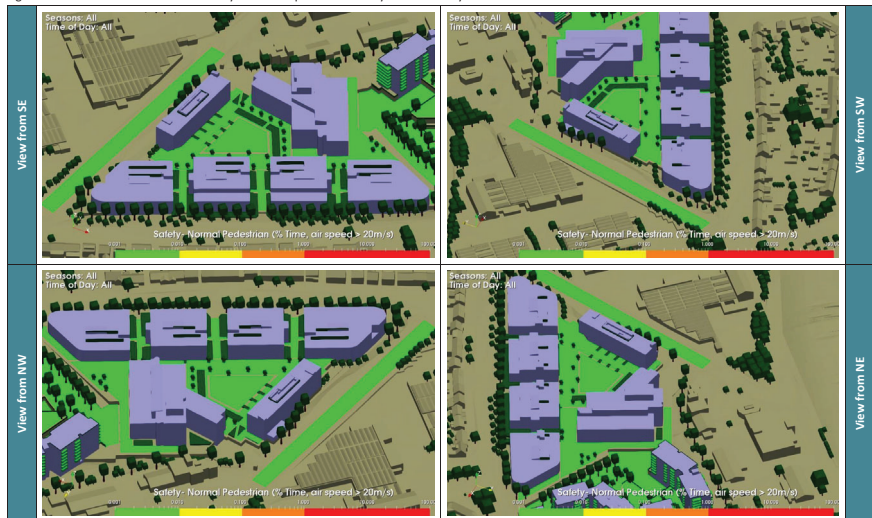


Figure 41: Normal Pedestrian Safety Criterion: Phase 1: Commercial

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Figure below shows the results for the full year normal pedestrian safety criterion analysis for Phase 2.

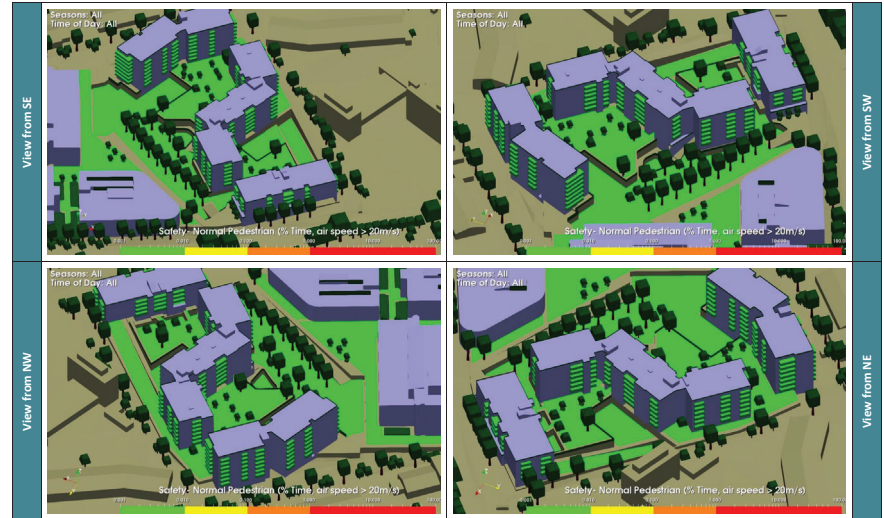


Figure 42: Normal Pedestrian Safety Criterion: Phase 1: Residential

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6.6 Sensitive Pedestrian Safety Criterion

Figure below shows the results for the full year sensitive pedestrian safety criterion analysis for Phase 1.

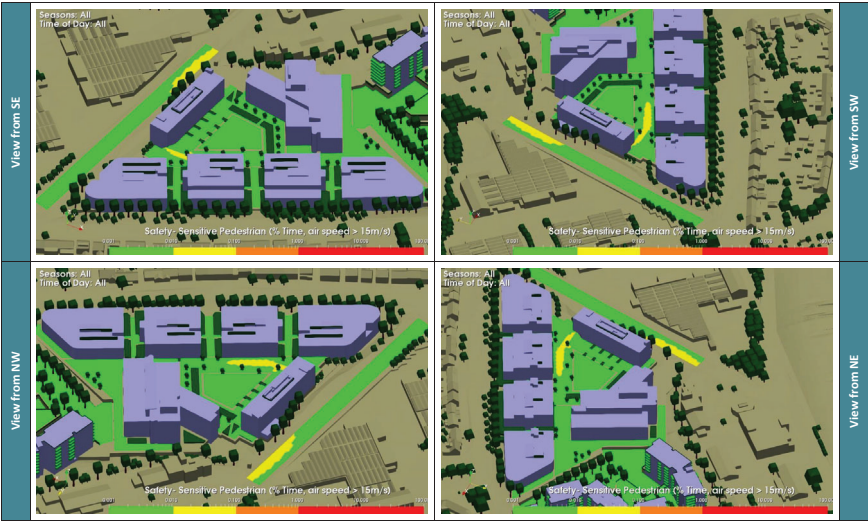


Figure 43: Sensitive Pedestrian Safety Criterion: Phase 1: Commercial



Figure below shows the results for the full year sensitive pedestrian safety criterion analysis for Phase 2.

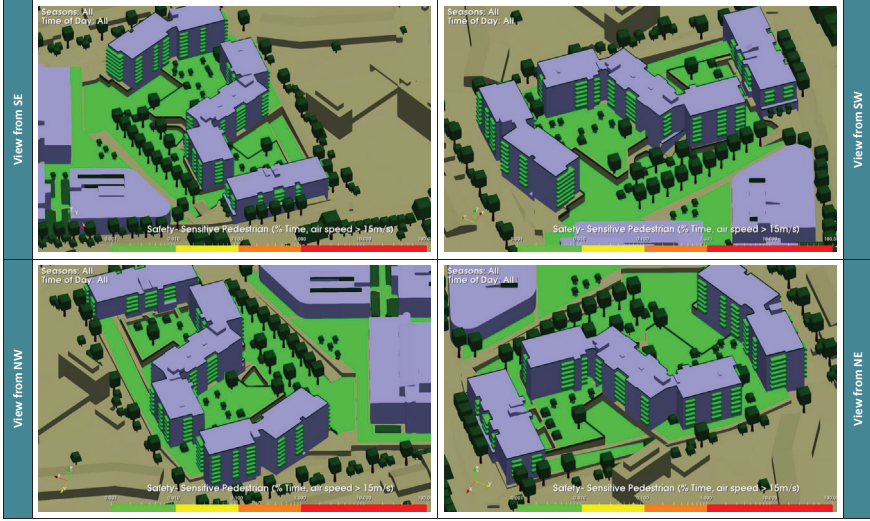


Figure 44: Sensitive Pedestrian Safety Criterion: Phase 1: Residential

