Overview

The London Legacy Development Corporation (LLDC) has commissioned MICA Architects to undertake this Density Study to support the policies and approach in its revised Local Plan 2020 by providing further evidence on the area’s contextual factors. The Study builds on and complements the LLDC’s Characterisation Study 2019 by providing detailed assessment of existing and planned densities across the area. Through study of various typologies and relevant built examples, the Study also examines the various ways that different densities are achieved. This evidence is intended to help guide and inform discussions about the density of emerging proposals and their relation to the surrounding context. The key aims of the study are to give the LLDC, and those working within the area, further information on the current context; allow informed guidance on the appropriate densities of the emerging development schemes that are being considered within or making their way formally into the planning process to be given; and to achieve, through negotiations, appropriate and successful outcomes that reflect the established and emerging character of the area.

The report is divided into two parts:

– Part 1: Density mapping and literature review and;
– Part 2: Case studies as a way to explore the relationship between building typologies and densities.

Part 1 a) maps all residential, commercial and mixed use densities across the LLDC area and areas directly adjacent. This is inclusive of the sites that are not yet developed but have extant planning permission, as well as those sites that are currently under construction. The maps establish the baseline for the densities across the LLDC area. They also allow the experience of particular densities to be better articulated. They however should not be considered prescriptive or used in isolation. The Characterisation Study should be used to provide a picture of the type and character of development associated with any location. The information, including mapping, represents a point in time and is based on the best information available. The maps shown in the Study will not therefore always reflect future development or changes to current plans for development. However, it is intended that the density map is turned into a live geodatabase of densities to be updated on a regular basis.

Parts 1 b) and c) use a combination of literature review and case studies to examine the relationship between density and building typologies. With the support of diagrams, a wide range of typologies are set out; highlighting their qualities, constraints, and general density ranges. The five key issues of delivering quality homes at a high density are discussed.

The report culminates in an exploration of nine detailed case studies (choosing examples within the LLDC boundary, all host Boroughs and across London) that have merits. The accompanying analysis explains in detail the context, the qualities of the development and discusses the lived experience. The Local Plan divides the area into four different sub-areas. Given that each of the sub-area has its own distinct character, the main goal of this section is to encourage discussions on future sites about optimal densities and appropriate building typologies that integrate with and respond to the local context in a sustainable manner.

Status of the document

The Density Study is intended to build on the policy approach in the Local Plan 2020 and support its objectives. It also acts as a guide to the character and approach taken to growth in the area. Read alongside the Characterisation Study 2019 and other available supplementary planning guidance documents, it is intended to give LLDC and those working within the area context and guidance on development schemes that are being considered; negotiate appropriate and successful outcomes that reflect the established and emerging character of the area; and meet the requirements of related policy set out in the LLDC Local Plan and the London Plan. It is hoped that developers and other interested stakeholders will use these findings as a guidance to inform their work on future development proposals.
Background to the Density Study

The LLDC is a Mayoral Development Corporation established in 2012 as a delivery and regeneration body that also has the planning powers for its area. A key part of its remit is to bring forward significant development on its own land, mainly within and around what is now the Queen Elizabeth Olympic Park, while also planning for delivery on the significant sites elsewhere in its area. The investment in the development of the Queen Elizabeth Olympic Park and the wider infrastructure delivered to support the 2012 Games has acted as a catalyst for investment and change in the areas surrounding the Park. Much of the area benefits from excellent connectivity and high public transport accessibility levels, particularly within and around Stratford Metropolitan Centre, allowing higher density development to come forward in those locations.

In view of the above and that the LLDC is located within the Lower Lee Valley Opportunity Area, it is expected to continue to grow and accommodate larger scale developments. Given its capacity to accommodate this growth, the housing delivery target for LLDC is capacity-based and set to contribute to meeting the wider, strategic need for housing across London. This also means that the highest density assumptions were utilised within the 2017 London Strategic Housing Land Availability Assessment (SHLAA) - a technical exercise to determine the quantity and suitability of land potentially available for housing development. The new SHLAA assessment has resulted in the much higher housing delivery target. Consequently, the revised Local Plan now includes the new, more ambitious, housing target of 2,154 per annum; this is 33% more than the previous target. In view of this, there is considerable be little scope for increasing densities significantly beyond those planned for across the available development sites.

In the context of an evolving area with strong built and natural assets, as well as development pressure as outlined above, the ambition of this work is to provide a guide to appropriate development densities and to secure that these densities are achieved through a design-led approach that reflects local circumstances.

Policy Context

The Density Study is being undertaken within a period of change in the wider planning policy context. The revised National Planning Policy Framework (NPPF) was published in July 2018 and the Mayor of London published an “Intend to Publish” version of the new London Plan in December 2019 which is due to be published in its final form in the near future. The focal point of both documents is the well-recognised need to deliver more homes in order to meet the identified levels of need and demand locally and across London. The various evidence studies produced to support both documents indicate that there are many instances of inefficient use of land whereby many sites failed to deliver their optimal capacity. However, it is also recognised that the growing emphasis on providing more homes at higher densities is much more than just providing a higher number of new homes - it is also about the quality and sustainable integration of new development into its surrounding environment. The LLDC has also revised its adopted Local Plan (2015) to respond to the changes within the national and London Plan as well as to new local circumstances. The Local Plan 2020 was adopted at the LLDC Board meeting of July 2020. The Local Plan contains a number of policies that address matters of design and character. The national, London and Local Plan key policy changes relating to the densities are outlined below.

The new NPPF includes a changed approach to determining appropriate densities for new development. The section on ‘Making effective use of land’ emphasises the importance of ensuring that all developments are at an appropriate density. In particular, local planning authorities are encouraged to avoid low density developments where there is an existing or anticipated shortage in the supply of housing. It requires that policies and decisions should support development that makes efficient use of land, taking into account issues such as: identified housing need; market conditions and viability; availability and capacity of infrastructure; the desirability of maintaining existing character and setting compared to regeneration/ change; and the importance of well-designed attractive and healthy places.

The approach to density within the
Intend to Publish London Plan is set out within Policy D6. This policy focuses on the individual site-based factors that are required to deliver successful sustainable residential development. The new policy also removes the density matrix that was contained in the London Plan 2016. Instead, it places the design quality as the central criteria in determining optimal density. Instead of being prescriptive and predetermine appropriate densities, this policy approach allows proposals to make a case for their chosen densities based on good design quality and area’s characteristic and context.

This approach is supported by Policy D1 and Policy D2. Policy D1 details the required physical characteristics of the places new development should create. Policy D2 requires local plans and area-based strategies to evaluate the current characteristics of an area and use this evidence to establish the most appropriate form of development and to create places which meet the requirements of Policy D1. This approach and the removal of the density matrix means that the onus is now on local authorities to provide sufficient guidance to ensure that sites are achieving appropriate densities. The LLDC Local Plan contains a number of policies that sets out this plan-led approach and address matters of character and design. Key policies are: BN.1 - Responding to place, BN.4 – Designing development, BN.5 – Tall buildings, BN.10 – Protecting key views. For instance, policy BN.1 outlines the principles against which proposals for development will be considered, including urban fabric, natural environment, connectivity and infrastructure. The policy requires development to respond to context in accordance with these set principles. These principles are tailored to address a number of design issues that are pertinent to the LLDC area and ensure that development of the highest quality is delivered. Policy BN4 provides guidance on the design quality and BN.5 sets the approach on tall buildings.

The separate Characterisation Study 2019 has been prepared to provide context to the approach taken in these policies, including the associated ‘prevailing’ and ‘generally expected’ heights that are identified within the Local Plan sub areas. The study identifies the physical characteristics of the area as a whole and breaks this down into character areas. The aim of this document is to provide an in depth understanding of the character of the LLDC area today, to provide guidance and parameters to influence future development in the area through a variety of means. The LLDC has also published a range of additional planning guidance, these include the adopted Bromley-by-Bow, Pudding Mill and Hackney Wick Fish Island Supplementary Planning Documents (SPD’s). These documents along with the Density Study provide a robust evidence on the local context and should be used as guidance to ensure that sites are achieving appropriate densities in accordance with the policy principles.
## Contents

### Overview

3

### 1) Density 8

(a) Density Mapping 10
- Introduction
- Methodology
- Plot boundaries
- Worked examples
- Density map by sub-area
- Density map

(b) Typologies 32
- Introduction
- Housing typologies

(c) Key themes 36
- Introduction
- Ground floor experience
- Communal amenity space
- Scale and proportion
- Quality of homes
- Sustainability

### 2) Best Practice Examples 48

- Introduction
- Vesta House
- Monier Road
- Camden Courtyards
- Lanterns Court
- The Scene
- Hoxton Press
- Royal Albert Wharf
- St Andrews Hospital Site
- Park View Mansion

### Conclusion 88
1) Density
(a) Density Mapping

The purpose of the first section of this report is to set out what “exists” currently, both in terms of built fabric and likely to be built i.e. extant consents. This is examined through calculating the density within the LLDC area and beyond; allowing comparison of areas against one another.

The map is intended to act as a guide as to what may be an appropriate level of development by providing context to a site. It should not be considered prescriptive or in isolation: the later sections of this report set out different ways of achieving density successfully and should be read in conjunction with the new London Plan, the Local Plan 2020 and supporting evidence base.
Methodology

Choice of density measurement
There are many different ways to describe and measure density. Density can measure, floorspace, number of homes, people or habitable rooms; and can take into account other uses than just residential.

The purpose of this study is to evidence current and planned densities within the LLDC area.

Floor Area Ratio can take account of all uses on a site (residential, mixed and non-residential) and gives a better description of the intensity of the development on a site than dwellings per hectare or habitable rooms per hectare. However, it is recognised that FAR is not a perfect measurement – particularly as it gives no distinction to how floorspace is arranged within a site. For example, a building that covered all of its site with one storey would have the same FAR as a four storey building that only covered 25% and had large amounts of public realm.

The Density Study should be read alongside the Legacy Corporation Characterisation Study 2019, which provides an analysis of heights within the area and taken together provide a clearer picture of the spatial aspects of the described densities.

Calculating FAR
FAR calculations have been made by identifying the gross internal area of a development (including basements) and the “plot area” (see next page for definition of plot boundaries.

Gross internal area = Floor area ratio plot area

Data sources
For all developments that have been granted planning permission since 2012, data on floorspace has been sourced from the LLDC planning portal. Where the applicant has stated the gross internal area (GIA) within the design and access statement, planning statement, area schedule or Community Infrastructure Levy form, this figure has been used. In a small number of cases, the applicant has not supplied a GIA figure within the application and therefore this has had to be estimated. This has been done by multiplying the stated number of units by their corresponding minimum floor areas (as set out in the “nationally described space standards”) and, in the case of apartments and maisonettes, applying an uplift of 25% to convert net internal area into an estimate of gross internal area.

In some instances, the only floorspace figure supplied within an application is the maximum permitted GIA and in the absence of any other information has been used in the density calculation.

Data for “existing” developments i.e. before 2012 has been calculated by estimating gross external area. This has been done by utilising building footprint and height as detailed in the UK Building August 2019 dataset. The height of each building has been used to estimate the number of floors, assuming a floor to floor height of 3m and multiplied by the footprint. The resultant area has then had 5% removed to convert the GEA into an estimated GIA.

It was recognised at the outset of the study that this method of calculating area for existing properties was not fool proof and could lead to discrepancies. For example, many buildings do not have a consistent floorplate across all floors.

To help avoid this, each zone of existing properties was visually checked against Google Maps to identify if there may be any major discrepancies. Where this was judged to be the case, the footprint was broken up into relevant sections. Where existing buildings were known to be purely commercial, the floorspace was crossed checked against UK business rates valuation data.

Uses included or excluded
Residential use, shops, offices and industrial space has been included within the density calculations. Arenas, schools, hospitals, utilities and transport infrastructure have been excluded. However, these uses have been indicated on the density map to provide context.

Plots where these uses have been consented but not yet built and still have existing functioning floorspace, have not been included within the density mapping.

Density range increments
Whilst the exact floor area ratio has been calculated, each site has been categorised into increments of 0.25 FAR from 0-6+. This range and increments thereof is a function of the densities and graphic representation i.e. a balance between illustrating as “finer grain” as possible across the majority of densities. A small number of sites are far in excess of the average density of the LLDC area and are captured by the 6+ FAR category.

“Buffer” zones
Some areas outside of the LLDC boundary have been included to provide context to sites around the edges of the LLDC area where development is likely to take place. These zones indicate the existing density only i.e. they do not include sites which have extant planning approval.
Outline vs reserved matters
For some areas within LLDC, sites have multiple consents including outline, reserved matters, variations and non-material amendments. Where this occurs, the most up to date floorspace has been used. In some instances, a site has outline consent for all of it and detailed consent for parts. In this instance, the density for each part has been calculated separately.

The map is intended to be a live representation of existing and consented schemes within the LLDC boundary and will be updated at regular intervals to account for new planning permissions, permissions lapsing and wherever new data becomes available.

Density measurement is a quantitative calculation that can only ever convey a certain amount of information. To understand the physical and perceptual effects of density, particularly high density, the second half of this report examines how density achieved: through typology, the common issues and case study examples.
Methodology

Plot boundaries

The plot boundary for each development has been drawn following a series of rules set out on the next page. The overarching principle behind these rules is to include all of the site area plus the middle of adjoining footways, carriageways, paths, rivers, canals and other existing open spaces that have an impact on the usability of the site. For example, where a site is bounded by a road, the plot boundary has been drawn to the middle of the road.

For schemes consented since 2012, the plots have been drawn in line with individual applications. For established areas, existing buildings have been grouped together into zones according to characteristics such as street grain and building heights.
Plot boundaries for typical conditions

1. Minor road: middle of the road
2. Major road: middle of road
3. Canal: middle of canal
4. Rail: edge of site
5. Public realm 'street condition': middle of street
6. Greenway: middle of path
7. Major public realm: middle of road
8. Minor public realm i.e. still considered as part of the street: middle of street
9. Motorway: edge of site

Figure 4: Plot boundaries for typical conditions
Worked example 1
Fish Island Village

Fish Island Village (formerly known as Neptune Wharf Planning ref. no 12/00210/OUT) is located within Fish Island Village in Hackney Wick and comprises of up to 524 new homes and A1, A3, A4, B1 and D1 floorspace. Phases 1 and 2 are almost complete, with Phase 3 under construction.

Phases 1&2
GIA = 41,889sqm*

*As quoted within application 15/00337/VAR which varies the conditions of 12/00210/OUT.

N.B. there is a detailed application for block A but this stays within the maximum GIA permitted within application 15/00337/VAR.

Plot area = 18638sqm (measured from OS data)

FAR = \( \frac{41889}{18638} = 2.25 \)

Phase 3
GIA = 8219sqm*

*As quoted within application 19/00022/NMA.

Plot area = 3852sqm (measured from OS data)

FAR = \( \frac{8219}{3852} = 2.13 \)

Phase 4
This plot has outline consent for a new primary school and therefore has been excluded from calculations.
Figure 6: Existing plan overlaid with plot boundaries used for density calculation.
Worked example 2
Carpenters Estate

The Carpenters Estate was built in the 1970s and there are 710 homes, 434 in three high rise blocks (James Riley Point, Lund Point and Dennison Point), and 276 in low rise blocks and terraced houses.

\[ \text{GEA} = 67,256 \text{sqm}^* \]

Data for “existing” developments i.e. before 2012 has been calculated by estimating gross external area. This has been done by utilising building footprint and height as detailed in the UK Building dataset. The height of each building has been used to estimate the number of floors, assuming a floor to floor height of 3m and multiplied by the footprint.

\[ \text{GIA} = 67,256 \times 0.95 = 63,893 \text{sqm} \]

Plot area = 80701sqm (measured from OS data)

\[ \text{FAR} = \frac{63893}{80701} = 0.79 \]
Worked example 3
Wickside, McGrath, 3-13 Hepscott Road

Wickside is a comprehensive mixed use redevelopment in up to 39 new/refurbished buildings / blocks comprising up to 435 homes and A1, A2, A3, A4, B1, D1 and D2 floorspace. Construction is yet to commence.

GIA = 62,607sqm*

*As quoted within application 16/00451/OUT.

Plot area = 18638sqm (measured from OS data)

FAR = $\frac{62607}{33054} = 1.89$
Sub Area 1
Hackney Wick and Fish Island

Sub Area 1 has its urban origins as part of the wider area of industry that grew alongside the River Lea at the eastern edge of London.

The built form of the area today is varied, with housing to the north, other built forms such as industrial warehousing to the south, new mixed-use developments emerging around Hackney Wick Station and structures such as the Copper Box Arena and Here East.

The largest part of Hackney Wick and Fish Island has a distinct industrial, cultural and creative heritage, which has strongly influenced housing elements of new mixed-use developments that are coming forward.

The prevailing density is up to 2.25 FAR, which with built form of typically 6-8 storeys is perceived as medium density. This density is consistent with the average across the LLDC area. Sub Area 1 has the smallest range of density, with no areas above 3.75.

Higher density areas are typically non-residential, large format warehouses, that are consistent with or lower in height than neighbouring mixed-use, lower density developments.

Figure 11: Proportion of the sub area within each FAR density range
Figure 12: View along Hertford Union Canal
Figure 13: Public Space within Fish Island Village
Figure 14: Monier Road in Fish Island
Figure 15: View along the River Lee to Here East
Figure 16: Fish Island Village

Individual sites FAR

<table>
<thead>
<tr>
<th></th>
<th>Density Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5 - 0.75</td>
</tr>
<tr>
<td>2</td>
<td>1.25 - 1.5</td>
</tr>
<tr>
<td>3</td>
<td>0.5 - 0.75</td>
</tr>
<tr>
<td>4</td>
<td>1.5 - 1.75</td>
</tr>
<tr>
<td>5</td>
<td>1.25 - 1.5</td>
</tr>
<tr>
<td>6</td>
<td>0.5 - 0.75</td>
</tr>
<tr>
<td>7</td>
<td>0.75 - 1</td>
</tr>
<tr>
<td>8</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>9</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>10</td>
<td>1.5 - 1.75</td>
</tr>
<tr>
<td>11</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>12</td>
<td>1 - 1.25</td>
</tr>
<tr>
<td>13</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>14</td>
<td>0.5 - 0.75</td>
</tr>
<tr>
<td>15</td>
<td>3 - 3.25</td>
</tr>
<tr>
<td>16</td>
<td>1 - 1.25</td>
</tr>
<tr>
<td>17</td>
<td>1.25 - 1.5</td>
</tr>
<tr>
<td>18</td>
<td>1.25 - 1.5</td>
</tr>
<tr>
<td>19</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>20</td>
<td>1.25 - 1.5</td>
</tr>
<tr>
<td>21</td>
<td>1 - 1.25</td>
</tr>
<tr>
<td>22</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>23</td>
<td>3.25 - 3.5</td>
</tr>
<tr>
<td>24</td>
<td>1.75 - 2</td>
</tr>
<tr>
<td>25</td>
<td>1.75 - 2</td>
</tr>
<tr>
<td>26</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>27</td>
<td>1.5 - 1.75</td>
</tr>
<tr>
<td>28</td>
<td>1.5 - 1.75</td>
</tr>
<tr>
<td>29</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>30</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>31</td>
<td>0.75 - 1</td>
</tr>
<tr>
<td>32</td>
<td>2.5 - 2.75</td>
</tr>
<tr>
<td>33</td>
<td>3.5 - 3.75</td>
</tr>
<tr>
<td>34</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>35</td>
<td>2 - 2.25</td>
</tr>
</tbody>
</table>

Key

- Green Area
- Extant planning permission

Excluded from density Calculation:
- Bobby Moore Academy
- Potential new primary school
- Copper Box Arena
- Kings Yard Energy Centre
- Mossbourne Riverside Academy
- Here East parking structure

Non-residential
Mixed-use
Residential
Sub Area 2
North Stratford and Eton Manor

Sub Area 2 was historically dominated by the open space of areas such as Eton Manor and facilities such as the Eastway Cycle Circuit. Previous residential and industrial uses were concentrated within the central part of the sub area, to the north of the historic Stratford railway lands. Much of the area was cleared from 2007 in preparation for the 2012 games.

East Village was the first legacy neighbourhood established following the London 2012 Olympic and Paralympic Games. The buildings are predominantly medium density, grouped along open space. They are approximately ten storeys high, organised in perimeter blocks, arranged in regular patterns, providing internal private communal gardens and have excellent permeability.

The emerging residential area of Chobham Manor provide a stepped transition in scale, massing and density in relation to East Village.

Other newly completed development includes two residential towers at 27 and 31 storeys high and outline permissions up to 37 storeys. These will form a cluster of higher-rise blocks, capitalising on the high public transport accessibility in this area. This will provide a transition into the predominantly high-rise developments within the Metropolitan Centre to the south.

The density of the area reflects the fact that the majority of the area has been planned under the LCS masterplan, with a distinct transition from high density around Stratford International Station to the lower-rise, lower density fronting onto the Olympic Park.
Key:
- Green Area
- Extant planning permission

Excluded from density calculation:
- Lee Valley Hockey Centre
- The Velodrome
- Place of Worship
- Chobham Academy
- Health Centre
- DLR Station

Non-residential
Mixed-use
Residential

Figure 19: View from Chobham Manor to the Velodrome
Figure 20: Chobham Manor
Figure 21: Manhattan Loft Gardens residential tower and hotel
Figure 22: Aerial view of Sub Area 2
Figure 23: View within the Athlete’s Village

Figure 24: Map of Floor Area Ratio across Sub Area 2
Sub Area 3
Central Stratford and Queen Elizabeth Park South

Sub Area 3 is historically known for the variety of industries that located in the area during the 19th century period of industrialisation. The coming of the railway led to Stratford becoming a transport hub where it capitalised on its location between London and East Anglia.

Second World War bombing and post-war redevelopment led to a change in character and built form. The Carpenters Estate incorporates three high-rise 1960s point block’ residential towers alongside low rise terraced dwellings and flatted developments. Later developments from the 1990s onwards, particularly along and within the vicinity of the High Street, continue the higher rise nature of the area. Much of the remaining character reflects the recent history of the 2012 Games and the development of Westfield Stratford City. International Quarter London South is currently developing where residential communities sit alongside office blocks, with more development to come forming new higher rise locations.

A large amount of Sub Area 3 is covered by cleared areas forming part of the LCS outline permission. The highest densities within the LLDC area are found within Sub Area 3 and are generally located in the areas of high levels of transport accessibility i.e. around Stratford Station. The highest density areas are a combination of high rise residential towers and lower rise but large footprint commercial buildings.

The high densities along the northern side of Stratford High Street are inconsistent with the prevailing medium density development across the southern half of the area.

Figure 25: Proportion of the sub area within each FAR density range
The Velodrome
London
Stadium
London Aquatics Centre

Key
- Green Area
- Extant planning permission

Excluded from density calculation:
- Stratford International Station
- Bus Depot
- Stratford Station
- Parking structure
- London Aquatics Centre
- Arcelor Mittal Orbit
- London Stadium
- Carpenters Primary School

*Site has extant permission that cannot be implemented

Individual sites FAR

<table>
<thead>
<tr>
<th>Site</th>
<th>FAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.75 - 5</td>
</tr>
<tr>
<td>2</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>3.25 - 3.5</td>
</tr>
<tr>
<td>4</td>
<td>5.75+</td>
</tr>
<tr>
<td>5</td>
<td>1 - 1.25</td>
</tr>
<tr>
<td>6</td>
<td>2.5 - 2.75</td>
</tr>
<tr>
<td>7</td>
<td>5 - 5.25</td>
</tr>
<tr>
<td>8</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>9</td>
<td>4 - 4.25</td>
</tr>
<tr>
<td>10</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>11</td>
<td>5.75+</td>
</tr>
<tr>
<td>12</td>
<td>3.25 - 3.5</td>
</tr>
<tr>
<td>13</td>
<td>5.75+</td>
</tr>
<tr>
<td>14</td>
<td>4 - 4.25</td>
</tr>
<tr>
<td>15</td>
<td>0.75 - 1</td>
</tr>
<tr>
<td>16</td>
<td>3 - 3.25</td>
</tr>
<tr>
<td>17</td>
<td>4 - 4.25</td>
</tr>
<tr>
<td>18</td>
<td>3 - 3.25</td>
</tr>
<tr>
<td>19</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>20</td>
<td>2.75 - 3</td>
</tr>
<tr>
<td>21</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>22</td>
<td>1.75 - 2</td>
</tr>
<tr>
<td>23</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>24</td>
<td>1.75 - 2</td>
</tr>
<tr>
<td>25</td>
<td>3.5 - 3.75</td>
</tr>
<tr>
<td>26</td>
<td>1 - 1.25</td>
</tr>
<tr>
<td>27</td>
<td>0.75 - 1</td>
</tr>
<tr>
<td>28</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>29</td>
<td>2 - 2.25</td>
</tr>
<tr>
<td>30</td>
<td>1.5 - 1.75</td>
</tr>
<tr>
<td>31</td>
<td>4.25 - 5</td>
</tr>
<tr>
<td>32</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>33</td>
<td>3.75 - 4</td>
</tr>
<tr>
<td>34</td>
<td>2.25 - 2.5</td>
</tr>
<tr>
<td>35</td>
<td>3.75 - 4</td>
</tr>
<tr>
<td>36</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>37</td>
<td>2.5 - 2.75</td>
</tr>
<tr>
<td>38</td>
<td>4 - 4.25</td>
</tr>
<tr>
<td>39</td>
<td>0.75 - 1</td>
</tr>
<tr>
<td>40</td>
<td>5.5 - 5.75</td>
</tr>
<tr>
<td>41</td>
<td>3.75 - 4</td>
</tr>
<tr>
<td>42</td>
<td>3.75 - 4</td>
</tr>
<tr>
<td>43</td>
<td>3 - 3.25</td>
</tr>
</tbody>
</table>

Figure 26: Map of Floor Area Ratio across Sub Area 3
Sub Area 4

Bromley-by-Bow, Pudding Mill, Sugar House Lane and Mill Meads

Historically Sub Area 4, as with much of the surrounding area, has been known for industry. The area is crossed by the various channels of the River Lea as it flows south to the River Thames. The location to the east of London led to the construction of a range of industrial and infrastructure buildings and structures, with those remaining often being of historic interest.

The area today has a varied character, containing pockets of remaining historic industrial use, large new development sites and completed new developments, with the predominance of housing in these new schemes.

The area continues to include larger format employment buildings ranging from film studios and print business premises that reflect historic land usage, to a large format Tesco superstore.

The developments that are underway across the area are typically medium rise, medium density and consistent with the majority of Sub Area 4.

Higher density outliers are located along Stratford High Street in the form of high rise towers. The densities are also higher around the Pudding Mill station where a new town centre is emerging as envisaged by the site allocation and SPD. To the east the Abbey Lane area continues to be typified by low density housing dating from 19th century to contemporary.

Figure 32: Proportion of the sub area within each FAR density range
Figure 33: High rise development along Stratford High Street behind Sugar House Lane
Figure 34: Bow River Village in Bromley by Bow
Figure 35: Contemporary housing at Abbey Lane adjacent to the post war estate
Figure 36: Sugar House Lane
Figure 37: Legacy Wharf in Pudding Mill

Individual sites FAR

Key
- Green Area
- Extant planning permission
- Excluded from density calculation:
  - Abbey Mills Pumping Station
  - Nursery
  - Rail infrastructure
  - Pudding Mill DLR Station
- Non-residential
- Mixed-use
- Residential

Figure 38: Map of Floor Area Ratio across Sub Area 4
The adjacent map details the existing and consented development densities within the Legacy Corporation area and within a buffer zone around its edges. It includes residential, commercial and mixed-use development but excludes sports venues, education, medical, utilities, stations and transport infrastructure and parking structures.

The density has been calculated using Floor Area Ratio (refer to page 8 for a detailed methodology).

The map should be read in conjunction with the Legacy Corporation’s Characterisation study for a clearer understanding of the density and character of the area. Taken together with the building heights map (page 26), the map provides a picture of the volumetric intensity of development across the area.

Figure 39: Proportion of sub area 1 within each FAR density range

Figure 40: Proportion of sub area 2 within each FAR density range

Figure 41: Proportion of sub area 3 within each FAR density range

Figure 42: Proportion of sub area 4 within each FAR density range

Figure 43: Proportion of the LLDC Area within each FAR density range
Figure 0.1: Character Areas Map

- Victoria Park
- Hackney
- Locally Listed Buildings
- Listed Buildings
- Conservation Area
- Green Area
- Local/Neighbourhood Centre
- Character Area Boundary
- Borough Boundary
- Sub Area Boundary

Notes:
- Mabley Green
- Eastway & Trowbridge Estate
- A12
- Railway
- River Lee Navigation
- A12
- Sub 1
- Eastwick & Here East

Figure 0.2: Building Form and Heights

- Sub Area Boundary
- Borough Boundary
- Existing
- Area Under Construction
- Permitted (REM, FULL, OUTLINE)
- Area Covered By SPD

Building Heights
- 30+ Storeys
- 20 - 29 Storeys
- 12 - 19 Storeys
- 5 - 11 Storeys
- 0 - 4 Storeys
Density mapping

Notes:

Figure 46: LLDC Density Map
(b) Typologies

This section provides an overview of the various common typologies. With the support of diagrams, they are examined, highlighting their qualities, constraints, and general density ranges. These factors are then applied to analyse and understand what works where and why.
Terraced homes would struggle to reach the same densities that perimeter blocks or towers can achieve. They are however a defining vernacular of British housing, and provide a good solution for family housing.

The back to back type has the greatest potential for maximising the density of this type. Through locating private amenity on the roof as a terrace, the plot depth is dramatically reduced. They therefore offer a good solution for family housing on particular small or narrow sites.

There are however restrictions to this type. Whilst clever manipulation of the plan and form may allow for an element of dual aspect, their primarily single facing rooms means that they are far better suited to sites with a North-South aspect so that homes face either East or West. They could also be used within a mews street context either off a street or within a block, where other larger typologies could not be applied.

Urban villas are a fully dual aspect typology, forming essentially a small apartment block of between two and four flats per floor, typically between three and six storeys. The massing can often be likened to a large villa, whilst still achieving a relatively high density, meaning that it is highly suitable for certain urban contexts.

Like a semi-detached block, flats have a primary aspect to the front or rear or both, with secondary aspects to the sides, meaning issues of privacy can be designed out by directing views away from neighbouring windows, whilst flats still benefiting from the environmental benefits of multiple aspects.

With a relatively small building footprint, the typology can be applied either as a singular building, or multiple, and can cope with sites of varying shapes and sizes. Furthermore, depending on the site, external amenity space, can often be located to the back of the buildings. Furthermore, on sites where parking may be required, these can often be located off the street either along the flank walls, or to the rear provided there is sufficient access.

A block which contains a mix of maisonettes and flats offers a good typology when providing a range of home sizes. Maisonettes, which are often tailored to larger family homes, can be found along streets each with front doors, and often with gardens to the rear in the centre of the block. Maisonettes can be double stacked to increase density, whilst maintaining fully dual aspect.

Blocks of flats at the two ends of the blocks are often deeper and taller. Arranged around one or multiple cores, these can, but not always accommodate smaller one or two bed dwellings. Due to the core access, the ground floor can often be used for commercial space. There would however be a requirement, with the extents depending on the size of the block, for residential ancillary space such as cycle and refuse stores. With good design, these areas would not dominate the ground floor frontage and instead be found to the rear. Where an access lane may be possible to the rear of these blocks, they provide opportunities for refuse collection and serving any commercial units.
Typologies
Block to towers

Intensified courtyards
FAR: 3.69
275-325 DpHa
7 storeys

Intensified courtyards are one of the densest forms of mid-rise typologies. With a maximum height of around seven storeys, this type has a higher proportion of dual aspect homes than the common perimeter block. It does however require a larger site. With courtyards depths and widths of around 18m, a minimum privacy distance can be achieved. With much more height than this, unless the footprint were to be significantly increased, the level of sunlight and daylight reaching the lowest points of the inner courtyard would be extremely low.

Like a traditional perimeter block, ancillary spaces can be distributed relatively evenly at each core, with potential for maisonettes and commercial space to fill a high proportion of the street frontage. Furthermore, parts of the building which step down in scale provide opportunities for increasing sunlight levels in the central spaces. This can be a good solution for relatively large sites, where a high density is required but significant development height is not appropriate. Furthermore, where the block size is increased extensively, pedestrian permeability in the area is reduced. This could therefore be well suited to an edge condition.

Flats with deck access
FAR: 3.5
200-300 DpHa
5-7 storeys

Deck access is a good example of how to achieve a high proportion of dual aspect flats. High levels of dual aspect improves opportunities for passive methods of ventilation, reducing the likelihood of overheating. This typology works well with flats being located on the upper floors and either ground floor street fronting maisonettes or commercial space.

The central courtyard can provide a good solution for communal amenity space if needed, or can be used as rear gardens by street fronting maisonettes.

Whilst deck access may require a lesser number of cores to provide access to flats, in practice it could be seen as undesirable to pass large numbers of dwellings, along long decks to reach the front door of homes.

Often, habitable windows do not face out onto the access deck. This means that on particularly narrow sites reduced building to building distances can be achieved within the courtyard. However, this still needs to be balanced with the requirement for a policy compliant amount of amenity space that is well lit throughout the year.

Flats with core access
FAR: 3.72
200-300 DpHa
6 storeys

Flats with core access rather than deck can have double loaded corridors and therefore an increased density however this inevitably decreases the number of dual aspect flats. Blocks can be arranged at almost any scale, therefore giving the potential for higher densities.

Like the previous example, a central courtyard provides good opportunities for communal amenity. This space is well overlooked and therefore suited to secure doorstep play space. Where there are requirements for large amounts of parking or commercial space, or where a high density development leads to large areas of plant, cycle parking and bin stores, the central courtyard can sit on a deck above ground floor. This would inevitably have cost implications however could be a suitable solution for highly dense schemes.

Perimeter blocks with this configuration will generally have a greater number of cores than a deck access scheme. Cores which supply a high number of flats per floor will be more cost effective but compromise residential quality. Where each core supplies a smaller number of flats per floor, issues for viability can arise.
Perimeter blocks which can accommodate elements of taller massing offer the most highly dense solution for this typology. Furthermore, where sites have varying conditions within the surrounding context, areas of increased height in some, can allow for other areas to have a lesser number of storeys without reducing the total number of dwellings.

Where a block typology may benefit from the use of a central courtyard as external amenity space, the scheme should be designed so that these taller elements do not heavily impose themselves on this area e.g. by overshadowing. Where some elements are taller, others can be lowered to maximise light into this space, depending upon orientation. This articulation in the form can also provide opportunities for roof terraces, either communal, or for family dwellings.

This typology can still maintain a good street frontage through maisonettes and commercial space, however like most high density schemes, high requirements for plant, bins and bicycle stores, and in some cases parking, can mean that the ground floor is heavily constrained. In such cases, basements or a podium are required.

A tower is likely to be able to achieve the highest density of any typology depending on its height, footprint and site dimensions. Towers can however have the biggest effect on both the local context through heavily impacting the immediate micro-climate, as well as the wider context in terms of wider views. Towers can act as landmarks for significant points within the urban context such as travel infrastructure. Furthermore, through their small footprint, space at ground floor can be freed up to create larger areas of public realm. Where towers have four flats per floor, or are massed in stepped way, 100% dual aspect dwellings can be achieved.

Issues can arise when large amounts of ancillary spaces dominate the ground floor condition. Particularly where towers have a relatively small footprint, these can become dominated by bins and bicycles which is inherently poor for the ground floor experience. Basements should be provided where possible to alleviate this.

Issues of viability arise through construction costs of building at height. This is often overcome through private sales where values of sales are increased at higher storeys. It is challenging to create a mixed tenure tower if separate cores are required by the developer that is also viable.

A podium offers some solutions to some of the issues associated with towers particularly at ground floor. Due to a larger footprint, there is greater opportunity to balance for active frontage with ancillary space by locating refuse and cycle storage deep within the plan of the building. The extended ground floor frontage also gives opportunity to incorporate ‘front doors’ in the form of maisonettes accessed from a the street.

On the roof of the deck amenity space can be provided. Where the development has family units, this space may be utilised for play space and allow private amenity spaces directly connected to podium fronting homes.

A tower with a podium also offers greater potential for varying types of ground floor commercial space, particularly with the growing need for ‘big box’ employment typologies to be retained across London and increasing co-located development on industrial land. Where the podium fills the extents of the plot, there is also the potential to provide street frontage on every side, reducing the chance of leaky, poorly defined public realm.
(c) Key themes

When considering the merit of residential and mixed use developments, it is important to have an understanding of the extensive features which impact both the dweller, the community and the wider built environment. Housing makes up the largest part of our built environment and the way we live. Housing not only provides a home for us to dwell, but also defines streets, neighbourhoods and the towns and cities in which we live every day. For this reason, developments can and must provide built qualities which extend beyond the homes which we retreat to.

This section introduces five key issues to develop a baseline assessment criteria for evaluating residential developments. Though each development is determined through various specific factors, whether they be political, social, contextual etc, these five themes attempt to capture the underlying issues to be considered in any development. The National Design Guide and various other documents help give further guidance on design quality.
1. Ground floor experience: How does the scheme impact the ground floor experience and enhance the overall public realm?

At Kings Crescent, a singular streetscape becomes an animated centrepiece. This well overlooked street provides space for a multitude of recreational and social activities with a rich blend of formal and informal playspace, a variety of seating and planting, and areas for events and theatrics.
2. Communal amenity space: How successful is the environment, position and overall quality of the communal amenity space?

At plot no. 14. in the East Village, a south facing, central courtyard, with a mix of soft and hard landscaping provides a generous space for play and social activity. The space is well overlooked by balconies and bounded by ground floor gardens.
3. Scale and proportion: How does the scale and massing relate to the immediate and wider context as well as the wider vision; are taller masses appropriately located?

For example at St Andrew’s, the massing along Devas Street relates to the estate across the road, and increases towards the railway line at the North of the site. Two towers anchor the site at the northern corners, with the taller massing acting as a landmark to Bromley-by-Bow station.
4. Quality of homes: What is the journey like from street to front door? Do homes enjoy dual aspect, good orientation of key spaces and high quality private amenity space?

For example at Monier Road in Fish Island village at Hackney Wick, the use of deck access has been carefully designed to maximise dual aspect whilst minimising overlooking, by ensuring that each resident passes a maximum of two other homes to reach their own.

Figure 50: Monier Road © Nick Kane
5. Innovation

How does the scheme seek to reduce its energy consumption?

All homes at Chobham Manor are being built to the Code for Sustainable Homes (CSH) Level 4 with an additional 26 exemplar homes built to CSH Level 5 being delivered during the first two phases. These homes will achieve Zero Carbon standards through on-site measures alone.
2) Best Practice Examples
Best Practice Examples

This section presents a number of case studies of different typologies and densities. They have been selected having an understanding of the opportunities and constraints of various typologies set out in section 1 b), and being mindful of the various components of successful housing design and placemaking outlined in section 1 c) Each case study is evaluated in a consistent way to maximise opportunity for comparisons where possible. Each case study sets out the various contingents such as location, relevant policies, and where relevant, whether it is part of a wider masterplan.

The aim of this exercise has not been to portray wholly outstanding examples, but rather give a broad overview of the different ways medium and high densities have been achieved, with an understanding of the merits in specific areas and where challenges have arisen. This chosen case studies are listed below.

1. Vesta House, Newham
2. Monier Road, Tower Hamlets
3. Camden Courtyards
4. Lanterns Courts, Tower Hamlets
5. The Scene, Walthamstow
6. Hoxton Press, Hackney
7. Royal Albert Wharf, Newham
8. St Andrews Hospital, Bow
9. Chobham Manor, Newham

Figure 52: Map showing case study locations
1) Vesta House
Atrium block

Overview
Vesta house is a 14 storey medium rise tower consisting of 120 residential dwellings and 3 retail units. It was originally built to provide accommodation for athletes during the 2012 Olympics, and makes up part of a much wider vision to develop Stratford City.

The building has a triangular footprint which is reflective of its plot shape. All of the apartments within the building are arranged around, and accessed from, a central atrium which is top lit by a skylight (Figure 55).

The site is located on a crossroad plot within the heart of the East Village. As part of a rapidly developing district, it sits amongst a large number of planned and newly built developments. It is extremely well connected, achieving a PTAL rating of 6b. There are a number of bus stops just seconds walk from the building, as well as Stratford International train station, underground and DLR station within 400m or a 5-minute walk.

The plot sits within zone 5 of the wider masterplan. Policies such as housing quantum, mix, density etc. are therefore targeted across a number of developments, rather than on a plot by plot basis. Where individual schemes may fall short or exceed these targets, they must be achieved in total across the wider masterplan.

Zone 5 has a target of around 2500 new homes, over an area of almost 14 hectares with a maximum density of 198 dwellings per hectare or 599 habitable rooms per hectare (whichever is the lesser). Vesta house achieves a density of 308 DpHa and 892 HrHa. Whilst this is significantly higher than the zonal masterplan target, it allows for neighbouring developments to achieve a lower density.
Figure 54: View looking of the corner of Celebration Avenue and Prize Walk © Dennis Gilbert

Figure 55: Central internal atrium © Dennis Gilbert

Figure 56: 3D axonometric

Figure 57: Location plan

Figure 58: Building height to street width ratios
1) Vesta House

Atrium block

<table>
<thead>
<tr>
<th>Number of flats per core: 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling aspect: 30% Dual aspect 70% Single aspect</td>
</tr>
<tr>
<td>Communal space: Internal atrium &amp; roof terrace</td>
</tr>
<tr>
<td>Play space: No</td>
</tr>
<tr>
<td>Net to Gross ratio: 77%</td>
</tr>
<tr>
<td>Wall to Floor ratio: 0.63*</td>
</tr>
<tr>
<td>Tenure mix: 70% Market 30% Affordable (intermediate)</td>
</tr>
<tr>
<td>Housing mix: 48 one bed units (40%) 72 two bed units (60%)</td>
</tr>
</tbody>
</table>

*N.B. Gross internal area figure excludes area of void

Scale and Proportion
The massing for Vesta House has been largely determined by the design parameters set out within the zonal masterplan. There is a good proportional relationship of building heights and street widths, with neighbouring plots. With a height of around 54m, it also meets the maximum height requirements set out in the masterplan. The triangular massing with its sharply angular form does, however, create several awkwardly shaped flats at two of the three corners of the block on each floor.

Ground floor experience
The building is bounded on two of the three sides by the main North-South and East-West streets through the East Village. The third is by Prize Walk which is a planted, pedestrianised street between Vesta House and plot 10. At ground floor, Vesta House provides 478sqm of retail space across 3 units located at each corner. The remainder of the ground floor is taken up by plant, cycle and refuse stores. Bins are collected from a centrally located store along Celebration Avenue, whilst there are two residential entrances each found along Liberty Bridge Road, and Prize Walk. Both of these streets are well planted, with Liberty Bridge Road also benefiting from a generously wide pavement.

Residential Quality
The scheme is made up of 1 and 2 bed units which are all designed to lifetime home standards. There are no wheelchair adaptable units within the development. Upon planning, it was acknowledged by the applicant that there is a requirement for wheelchair adaptable homes, and that the required number would be found in adjacent plots.

The building provides private external amenity space in the form of balconies for 94% of the apartments. The only exceptions to this are the seven units at first floor which have juliette balconies. Within the whole building 36 out of 120, or 30%, are dual aspect; found at the three corners of each repeated floorplate. This figure is
less than optimum, particularly that 24 of these are North-East facing single aspect flats. The approach of maximising the number of dwellings in an awkwardly shaped plot has led to a reduction in quality of some dwellings. Whilst more than the minimum required private amenity is provided to try and compensate for this, the environmental quality of these homes is likely to be lower than those with dual aspect.

Communal amenity
The central atrium provides an internal shared space for the residents, encouraging a sense of community and meeting places, as well as improving the journey from the street to the resident’s front door. There is a communal decked terrace found on the roof which provides views across the Olympic Park and further afield across London.

Whilst the roof terrace (Figure 62) provides a form of external shared space, the scheme does not provide any play space within its curtilage. However, the lack of larger dwellings in the building suggests that there will be a low proportion of families in the building, therefore reducing the requirement for on-site play space.

Innovation
As highlighted, the orientation of the building, and the high number of single aspect flats gives very little opportunity for passive methods of ventilation and solar gain. However, the scheme does aim to achieve code for sustainable homes level 4 target of achieving a BREEAM rating of very good. The building has also incorporated a green and brown roof to enhance the ecology of the site.

Conclusion
Vesta House, which could be described as a medium rise tower, provides an alternative solution for small and awkwardly shaped sites. The top lit central atrium provides a shared communal space not often found within traditional tower typologies. With ten flats per floor over 12 residential storeys, it also achieves a high density without significantly exceeding heights in its context.

Nevertheless, Vesta House should be studied with some caution. With no 3 bedroom or wheelchair accessible homes, nor any play space provision, it is far from a policy compliant example when studied as a standalone building. Within the context of the wider masterplan, however, it uses an appropriate unit type mix for the site limitations. For this reason, Vesta House can only be used as a relevant and useful case study when understood in relation to the wider approach.
2) Monier Road

Deck Access

Overview
A 71 home development including 3 and 4 four bed maisonettes, 1 & 2 bed flats, and ground floor employment space. Notably, the scheme organises traditional deck access in such a way that each resident must pass only a maximum of two flats before reaching their own.

Scale and Proportion
The building is rectangular in form which is in keeping with its surrounding context on all sides, and is also reflective of the industrial warehouse buildings which previously stood on the site.

Along Wyke Road and Monier Road, 4 storey maisonettes comfortably match that of the adjacent 85 Monier Road which completes the full urban block. Where these row of maisonettes meet Roach Road, the massing steps up to 7 storeys which is both reflective of the condition at the opposite end of the neighbouring block, and also appropriately matches the blocks opposite.

Overall, the scale and proportion of the scheme appears to sit comfortably in relation to the scale of the local context and street widths.
2) Best Practice Examples

Figure 66: 3D axonometric

Figure 67: Location plan

Figure 68: Building height to street width ratios

Figure 69: Ground floor commercial unit © Kilian O’Sullivan

Figure 70: View looking north east along Monier Road © Kilian O’Sullivan
2) Monier Road
Deck Access

- Number of flats per core: 9
- Dwelling aspect: 100% Dual aspect
- Communal space: Small first floor terrace
- Play space: Yes
- Net to Gross ratio: 79%
- Wall to Floor ratio: 0.54
- Tenure mix: 79% Market
  14% Affordable (intermediate)
  7% shared ownership
- Housing mix: 28 one bed units (39%)
  30 two bed units (42%)
  8 three bed units (12%)
  5 four bed units (7%)

Ground floor experience
Front doors and windows to homes along Wyke Road and Monier Road help to give life and activity to the streets. Privacy buffers between the street and ground floor windows are minimal, which is a reflection of the scale and hierarchy of the street to which they face. Windows and balconies on floors above provide further overlooking and natural surveillance to the street.

At ground floor along Roach Road, glass fronted units are occupied by fashion studios. This provides a visible active frontage and retains some of the pre-existing employment types of the area.

Overall, this scheme successfully managed to organise its back-of-house spaces away from the street, and maintains a consistent frontage of residential front doors and commercial spaces. The street-proportions do not appear overwhelming, however, the street condition could benefit from some soft landscaping, particularly within the recess of the ground floor maisonettes. This would also improve privacy to these homes.

Residential Quality
As highlighted, the scheme is made up of two maisonette blocks, and one deck accessed scheme. Of the maisonettes, all are dual aspect, with ground floor dwellings benefiting from rear gardens.

Deck access flats are entered off an external gallery deck allowing almost all to benefit from having dual aspects with the exception of one flat whose front door is located to the side of the lift core. Whilst the primary outward aspect along Monier Road is to the North East, most of the flats along
this side will benefit from south-west light from the deck side. The flats also appear well planned and proportioned and all have private external amenity space in the form of inset balconies or roof terraces. Upon entry, the flat arrangement allows for views of daylight through and out of the bedroom windows. Where bathrooms are located at entry from the deck, these could have benefited with from high level windows to improve ventilation and daylight.

Communal amenity
The scheme provides a small amount of play space on a first floor deck above cycle stores. Whilst it is well overlooked by the surrounding flats and communal decks within the block, and has met the total minimum amount required, in reality its realisation is less successful than other parts of the scheme. The space could benefit from seating, to allow residents of all ages to enjoy the amenity.

Innovation
With regards to overall innovation and sustainability in this scheme, there does not appear to be any stand out factors. As highlighted, the high proportion of dual aspect dwellings allows for passive methods of ventilation, with most achieving some amount of passive solar gain through south facing windows. The scheme meets level 4 of the code for sustainable homes, with level 6 being the best.

Conclusion
Overall Monier Road is a good example of a deck access scheme. Notable is the low number of flats passed on the journey to the front door. The residential quality of flats generally seems good with most units achieving dual aspect. However, further detailed investigation could be made into the amount of sunlight the north-east facing deck accessed flats receive.

The scheme is well proportioned both in terms of massing and elevational composition, and retains visual and material character both with the pre-existing industrial nature of the site, as well as the neighbouring buildings. This could be highlighted as a significant positive of being part of a wider masterplan. Monier Road also manages the arrangement of front and back of house functions well, with ancillary spaces having minimal impact on the street condition. It is a good example of achieving a high density, particularly on a tight site.
3) Camden Courtyards

Mansion block

Overview
Camden Courtyards is a 164 home fully-residential mansion block. The building sits at the junction of St Pancras Way and Camden Road which are both busy arterial roads, whilst Rochester Place to the north, is a quiet, mews like residential lane.

The building has an s-shaped footprint, with flats and maisonettes arranged around two central courtyards. These central spaces provide a distinctively calmer condition to the noise of the road and junction. There is also a 50:50 split between the affordable and private homes. Each of the two courtyards defines this arrangement, whilst presenting little clear sign of a contrast in quality of the homes between the two tenures.

The scheme achieves a density of 309 DpHa. This is particularly high for this typology, and therefore provides a good example of a high density, mid-rise scheme. At no more than 7 storeys high, the building has a positive impact on the townscape of the area, and mediates a busy urban environment through strategic site planning.

Scale and proportion
There is a clear relationship between the massing and neighbouring buildings. Along Camden Road and St Pancras Way, the tallest parts of the building respond to the larger housing developments which sit opposite. Along Rochester Place, the massing steps down to 5 storeys, respecting the smaller scale mews streets. Whilst here there is still a conflict in scales, taller elements are positioned to align with the gable end walls.

There is a consistent building datum around the whole block which is defined by a 5 storey brick parapet. Where the building height exceeds this to 6 and 7 storeys, the appearance changes into a corten-steel clad mansard structure. This variation in material and form, helps decrease the overall massing impact.
1. St Pancras Way
2. Camden Road
3. Rochester Place

Figure 80: 3D axonometric
Figure 81: Location plan
Figure 82: Building height to street width ratios

© Simon Kennedy

St Pancras Road
Rochester Place
Camden Road

Plot boundary
Number of flats per core: 4-6

Dwelling aspect:
- 73% Dual aspect
- 27% Single aspect

Communal space: Internal courtyard & roof terrace

Play space: Yes

Net to Gross ratio: 75%

Wall to Floor ratio: 0.67

Tenure mix:
- 50% Market
- 50% Affordable

Housing mix:
- 50 1 bed (30%)
- 99 2 bed (60%)
- 14 3 bed (8%)
- 3 4 bed (2%)

Camden Courtyards
Mansion block

Ground floor experience
The block maintains street frontage on each of its four sides with numerous front doors and shared residential entrances. Along St Pancras Way, railings which surround lightwells to lower ground windows deepens the threshold from the pavement to the front door. The same applies along Camden Road with an additional band of planting, all of which improve privacy to ground floor dwellings. These homes, and numerous flats at upper floors create an increased sense of natural surveillance, and improves the relationship with the street.

Ancillary spaces such as bins and cycle stores have been designed to minimise the negative impact to the ground floor experience, as can often be the case with higher density developments. Doors to refuse stores have been detailed discretely, and are evenly placed amongst front doors so as not to dominate large expanses of the street frontage.

Residential Quality
73% of the total number of homes benefit from at least two aspects. Through an S-shaped building plan a greater number of flats are located at corners than a typical perimeter block. Fourteen metre floor depths allow for many homes to extend across the depth of the block, therefore benefiting from both street and courtyard aspects. This is particularly beneficial to homes which face St Pancras Way and Camden Road, both loud and busy streets.

To achieve this high density with a medium rise courtyard typology, elements such as building separation distances have been minimised. Both courtyards have a square shape with dimensions of 18m. This is the minimum suggested distance set out in the Camden Planning Guidance Document to allow for a sufficient level of privacy.
The block is arranged around six cores, each of which give access to no more than six flats per floor. This is within the recommended guidance of the London Design Guide and allows for internal shared corridor distances to be minimised. These circulation spaces all have windows which provide natural daylight, ventilation and views out into the courtyards. Every home within the scheme also has access to external private amenity space in the form of a terrace, patio or balcony.

Communal amenity
Two central courtyards and two roof terraces are provided for communal amenity. The close proximity of the buildings means that these courtyards offer opportunities for little more than informal encounters and access to some ground floor maisonettes and cycle stores. These narrow courtyards have been designed to allow an adequate amount of light into lower floor dwellings, and to provide alternative aspect to homes, rather than primarily for usable communal space.

The communal landscaped roofs, which receive far more sunlight, offer better quality amenity space. These terraces incorporate play space, and offer views as well as a place of relaxation for residents.

Innovation
Whilst there does not appear to be any stand-out features within this scheme in terms of innovation or sustainability, the development is well designed with a good proportion of dual aspect homes which will benefit from passive methods of ventilation and cooling. Green and brown roofs will support the ecology of the area. Water butts, used for rainwater harvesting, irrigate the brown roofs. The scheme achieves code for sustainable homes level 4. The use of PVs and a combined heat and power engine has reduced the carbon dioxide emissions by 40%. All new homes have also been designed to lifetime homes standards.

Conclusion
Camden Courtyards offers a good example of achieving high density using a courtyard urban block typology. Located at the junction of two busy roads, these spaces offer alternative and quieter aspects to residents. These courtyards have been designed with minimum required dimensions in terms of privacy distances and provide little in terms of usable amenity space. Instead, roof terraces offer greater quality communal space and are therefore important in contributing to the scheme.

The buildings S-shaped footprint allows for a high proportion of dual aspect, with short internal shared corridors, all of which are naturally lit. At between 5 and 7 storeys, this case study provides a good example of a mid-rise development which has a positive impact on the townscape of the area.
4) Lanterns Court
Superblock

Overview
Lanterns Court is a 639 home development, which includes a mix of family homes, blocks of flats, and an 18 storey tower. It is located on the Isle of Dogs, just south of the finance district of Canary Wharf which is home to some of London’s tallest buildings. The site marks the border between an area of low rise Victorian terraces to the south, and a growing number of newer, much larger, towers to the north.

The scheme uses a range of low to medium rise block typologies and a singular 18 storey tower to mediate the varying scales of the neighbouring context, creating a diverse and varied development. It achieves a density of 488 DpHa which is extremely high for this type of development, and might be a figure expected by a pair of 20 storey towers on a relatively small site. The development also includes a basement providing 271 residential car parking spaces.

Scale and Proportion
Melish Street to the south of the site is largely defined by 2 storey, Victorian Terrace houses. This lower scale is respected within the scheme by a 4-5 storey block of maisonettes which have rear gardens to set back the building line of the development. Though still taller than these terraces, these lower massings help mediate the scale change from the larger buildings towards the north of the development.

The tallest elements of the scheme are in the North-East corner of the site in the form of a 16 storey block and an 18 storey tower. The location of this height relates to the adjacent buildings which increase in height towards Canary Wharf. The remaining parts of the development are 8-10 storey blocks, which also reflect the scale and typologies of neighbouring buildings.

Type: Mixed development
Number of buildings: 3
Height: 4-18 storeys
Units: 639 units
PTAL: 4
Data completed: 2011
Site Area: 1.31 ha (plot boundary)
Density: 488 DpHa (plot boundary)
GIA: 56 500 sqm (approx)
Plot coverage: 5617 sqm
Plot coverage Ratio: 0.43 (Plot boundary)
FAR: 4.31
Figure 92: View looking east along Larson Walk © Squire and Partners

Figure 93: View looking east along Larson Walk © Squire and Partners

Figure 94: Location plan

Figure 95: 3D axonometric

Figure 96: Build height to street width ratios


1:0.5 1:0.7 1:0.4
4) Lanterns Court
Superblock

Number of flats per core: 4-18

Dwelling aspect: 25% Dual aspect
75% Single aspect

Communal space: Central courtyards and a first floor terrace

Play space: No

Net to Gross ratio: NA*%

Wall to Floor ratio: 1.18

Tenure mix: 80% Market
20% Affordable

Housing mix: 101 studio (16%)
353 1 bed (55%)
119 2 bed (19%)
44 3 bed (7%)
3 4 bed (<1%)
19 5 bed (3%)

Ground floor experience
There is a mix of residential and commercial units at ground floor. Along Millharbour, within the North-Eastern block, there are a series of retail units, one of which is a supermarket. This is likely to be highly beneficial to residents, particularly given the density of the development.

Some residential units at ground floor face onto surrounding streets including Millharbour, Lanterns Way and Cassills Road. These are largely, flats and studios which are single aspect. This imposes issues with regards to privacy where all habitable rooms, including bedrooms, are street facing only. Curtains are therefore often drawn in these flats. The street frontage is worsened by the fact that these flats are accessed by internal corridors at the back of the block rather than from street facing front doors.

Residential quality
Internally accessed flats make up the largest proportion of the scheme. Double loaded corridors of up to 30m in length with very few windows make these spaces low in quality, receiving little to no natural daylight. This arrangement type also means that a significant number of the flats are single aspect. Along Lanterns Way, flats are north facing, and the scale of opposing buildings means that a large number of homes will receive little or no direct sunlight nor daylight. This is also the case for lower level flats, particularly those arranged at the inner corners of the courtyards.

The maisonettes located along the south side of the site are of better quality. Accessed from a deck on the north side of the block, these units benefit from dual aspect. In some cases, however, bedrooms are located on the deck facing side, which raises further issues of privacy.

Generally, a large proportion of flats have private external amenity space in the form of balconies, terraces, or gardens. Flats at ground and first floor however do not have any external amenity space, other than juliette balconies.
Communal amenity

The main amenity space is in the form of two landscaped courtyards within the North-Western block, and an additional first floor terrace adjacent to the tower. These spaces are south facing so receive good amounts of mid-day sun, however, the scale and close proximity of the buildings mean that in the afternoons, particularly during post school hours, these spaces will be heavily overshadowed. These courtyard spaces have also been likened by residents to an ‘echo chamber’ due to the close positioning of the buildings.

Within the planning application, drawings appeared to show three planted roof terraces above the blocks to the North-West. These would have offered better quality spaces with better levels of sunlight and views to the south, however, this does not appear to have materialised.

There is no defined play space on the site. This is particularly problematic with the large number of family homes and overall scale of the development, and is worsened by the shortage of opportunities for play within the immediate area.

Innovation

Lanterns Court has a basement providing 271 residential car parking spaces and 28 for commercial use which accounts for 41.6% of the development. This is particularly high, however at the time of construction, the Borough of Tower Hamlets policy set a maximum of 50% provision. Though the site has access to Canary Wharf underground and DLR station, it has a PTAL rating of 2 which is at the lower end of the rating system. Overall, the scheme achieves very good by BRE assessment.

Conclusion

Lanterns Court provides an example of an extremely high density scheme, whilst it includes taller elements, it largely takes the form of a large urban block. The mix of different housing typologies creates for a varied range of home types and sizes. The scheme also mediates the heavily varying scales of its neighbouring buildings. The ratio of affordable to private tenure homes is particularly low, with a ratio of 20:80 respectively. Due to the large provision of larger family homes, however, the affordable provision in terms of total number of habitable rooms equates to 27%.
5) The Scene
Mixed-Use

Overview
The Scene is a 121 home development located within the heart of Walthamstow. The scheme includes a mix of flats and larger family maisonettes, all of which sit above a cinema and a number of ground floor restaurants. The homes are arranged around a quiet courtyard at first floor which covers the full extent of the commercial spaces below. The scheme offers a good example of a mixed-use residential and commercial scheme, as well as achieving a high density through no more than 6 storeys in height.

In 2011, a short term masterplan was implemented to help guide the vision of Walthamstow Town centre. Due to the site’s prominent corner spot at the top of the High Street it was highlighted as a site of particular significance, acting as a gateway into the town’s main retail centre.

Scale and Proportion
Within the masterplan, it was suggested that development on this site should provide a consistent building line. A massing of between three and five storeys was proposed, with the potential for a carefully considered taller element.

The site has two primary frontages onto High Street and Hoe street. Prior to the construction of the development, the site was used as a temporary public space. Along Hoe Street, the scheme sits amongst a variety of low rise buildings. Adjoining it at the north side is a 2 storey bank. At 5 storeys, the scheme is larger than its immediate context, however, given the street proportions (see figure 112), and its prominence on the corner of the high street, this seems appropriately scaled.

As the building wraps around onto High street, the ground level slopes down, however, the scheme retains a consistent 5 storey brick datum line, with an extra level at this point stepped back from the building frontage.
The scheme also has a smaller frontage onto Cleveland Park Avenue. This is a primarily residential street consisting of typical two storey Victorian terraced houses. The scheme includes four new terraced houses along this street which relate to the existing context in terms of scale, proportion and housing typology.

With a maximum height of 6 storeys, the development exceeds the guidance set out in the masterplan. A consistent datum line at 5 storeys, defined by a parapet, with top storeys set back does, however, help to reduce the overall massing. Furthermore, a slight increase in scale gives emphasis to the sites prominent gateway location.
Ground Floor experience
At ground floor, the two main frontages along High Street and Hoe Street consist of numerous restaurants and bars, as well as the entrance to a cinema. With seating which spills out onto the public space, these commercial units provide activity and create a vibrant street condition during the day time and at night. The introduction of a cinema was part of a council led strategy to improve the night time economy in the area.

Along Cleveland Park Avenue, small front gardens create a threshold from the street and homes allowing for some degree of privacy. These gardens provide space to neatly keep bins behind a brick wall. These spaces could however be improved with some landscaping to both soften the street edge and improve privacy to ground floor windows of these homes.

Communal amenity
There is a landscaped terrace at first floor within the centre of the development. This is particularly well suited to this development providing respite from the busy roads and high street below. This area is well overlooked by main living spaces and balconies, and also acts as the main circulation route to access maisonettes at this level.

Landscaping is a mix of planted beds and grass turf which offer opportunities for relaxation and informal play. The planning drawings for this area showed areas of designated playspace, however, this does not appear to have materialised. An opening in the massing along the High Street, and the lower rise homes along the Western edge, allows this terraced courtyard to receive good levels of sunlight. Its used as a means of access to homes also increases the activity within this space. However, the lack of defined playspace does raise the question of the usability of this space for people of all ages, particularly given the built up town centre location.
Residential quality
55% of the total number of homes benefit from two or more aspects. Of the remaining single aspect homes, 7 of these are north facing. Every home has access to some form of private external amenity space. Maisonettes both at ground and terrace level have private gardens, whilst flats have either balconies or terraces. There is a mix of inset and protruding balconies. Along Hoe Street, inset balconies provide added privacy, and arguably some form of noise reduction to flats. This is also the case to some flats along High Street, however, several, particularly towards the corner, have protruding balconies. Given the high footfall of this area, there could be some issues of privacy in relation to these balconies, though a mixed use of solid and corrugated metal which wrap the balconies may help reduce this. These flats may also suffer more heavily from solar gain, where inset balconies could provide natural shading in the summer months.

The number of flats accessed by each core generally ranges between 4 and 6 which is below the London maximum requirements of 8 per core per floor. The circulation cores are not naturally lit nor passively ventilated. However, the distance from lifts and stairs to front doors is relatively short, therefore minimising the length of internal corridors. Maisonettes upon the first floor deck have a more pleasant journey from street to front door through an external stair case and across the landscaped courtyard.

Innovation
The scheme sits in a well-connected, town centre location with a PTAL rating of 6B. This has allowed it to work as a car free development, with the exception of the 3 spaces off Cleveland Park Avenue which serve, and sit adjacent to, the wheelchair accessible homes. The development also achieves Code for Sustainable Homes level 4, with the commercial space designed to achieve BREEAM rating very good.

Furthermore, the landscaped courtyard, which provides a place of amenity for residents, also provides further soundproofing from the cinema below, and boosts ecology in the area.

Conclusion
The scene is a good example of how a mixed use scheme can help regenerate a town centre through new commercial space. The ground floor frontage of restaurants and bars provides activity to the street at both day and night time, with the cinema further increasing footfall and activity to the area.

Notably, the scheme utilises the roof of the commercial space to create a terraced central courtyard. This provides an alternative condition for residents to provide respite from the busy urban environment within a town centre. Though some of the flats arguably suffer from a poorer environmental quality, such as the north facing single aspect flats, the scheme as whole provides a good model for integrating commercial space, particularly ‘big box’ types such as a cinema, into an urban centre context.
Overview

Hoxton Press is a pair of residential towers which form phase 3 of the Colville Estate Masterplan. These are located at the north east corner of Shoreditch Park in East London. It accommodates 198 apartments all of which are for private sale to cross-subsidise the construction of 450 affordable homes across the wider development. There are also 39 car parking spaces at basement level.

The choice for two towers, which take up only a small proportion of the masterplan area, has meant that the wider development has been based around streets and medium rise blocks of 4-8 storeys. The towers achieve a density of 440DpHa whilst the overall density of the masterplan is around 225DpHa.

Scale and Proportion

The towers have been arranged and located on the site to create a new gateway route into the development from Shoreditch Park. The towers orientation is reflective of the shape of the site and neighbouring buildings. Though each tower has a repeated footprint, each provides frontage to the three streets which bound it, as well as the public space formed at their base.
Figure 112: Ground floor public realm © Simon Menges

1. Bridport Place 16.5m  1:0.3

2. Penn Street 83m  1:1.6

Figure 113: 3D axonometric

Figure 114: Site location plan

Figure 115: Building height to street width ratios

Plot boundary

Bridport Place 16.5m

Penn Street 83m
Ground Floor experience
The base of the towers can be defined by transparency, with glazed ground floors further enhancing views through the site.

This has been made particularly possible through the use of a basement to locate ancillary spaces such as refuse and cycle stores, which commonly dominate ground floor space in tower developments. Instead, the ground floors are glazed on all sides, with a cafe being located in the taller of the two towers, providing a sense of arrival to the site and wider development. Within the other tower, however, much of the ground is taken up by a vehicle ramp down to the floor below.

Almost all of the public realm and the ground floor finish of the two towers is laid in granite cobbles. With the exception of a number of small cluster of trees, there is very little soft landscaping which in turn creates a relatively hard street condition. Whilst it was acknowledged that this public realm should relate more closely to the masterplan than the park, there is little to invite people to use this space particularly whilst the cafe space is vacant or not in use.

There is a designated 0-11 years play area located to the north east end of the site. This area creates a sense of being at the ‘back’ of the site, largely due to being located behind a sub-station, with little natural surveillance from residents in the towers. It will also be overshadowed for much of the day, particularly at after school hours. In addition, the granite cobble landscaping, which continues into this area, and the cobbled stumps offer little real opportunity for play with the exception of a fixed concrete table tennis table.

Communal amenity
The scheme offers no communal amenity space other than the public realm. At the competition stage of the scheme, roof gardens were proposed, however, increased fire requirements would have led to a total gross internal area exceeding the permitted maximum set out in the

---

6) Hoxton Press Tower

Number of flats per core: 3-6

Dwelling aspect: 100% Dual aspect

Communal space: No

Play space: Yes

Net to Gross ratio: 72%

Wall to Floor ratio: 0.59

Tenure mix: 100% Market

Housing mix: 18 Studio (9%)
84 1 bed (42%)
84 2 bed (42%)
12 3 bed (6%)

Figure 118: Base of towers © Peter Landes
Figure 119: Ground floor atrium © Peter Landes
Figure 120: Interior view of flat © Peter Landes
There is also no communal amenity space within the development other than that at ground floor at the base of the towers. However, the immediate proximity to Shoreditch Park which is home to a mix of grass areas, sports fields and play space does lessen this issue.

Each tower uses a hexagonal shaped floor plate with 3-6 flats per floor. Homes are planned around at least one faceted corner and therefore all benefit from at least two aspects. This improves passive methods of ventilation, and provides wide aspect of views over the surrounding context. Every home also has access to a private balcony. These are also located at corners and so benefit from improved qualities of sunlight, and an increased aspect.

The scheme achieves Code for Sustainable Homes level 4. The building uses water based surface heating and cooling systems which exploit thermal properties of the concrete slab construction. All hot water requirements are met through a gas fired combined heat and power unit which is connected to the site wide district heat network. The buildings also have areas of biodiverse roofs with wildflowers to positively impact on the ecology of the area. During the construction of the buildings, 98% of waste was diverted away from landfill.

At conception stage of the masterplan, engagement with residents led to a preference for a lower rise development of between 4-8 storeys. Through utilising a small part of the site to accommodate two towers, this development type could be achieved over the rest of the masterplan. Though the towers were 100% private sale, the sales helped subsidise the 50% affordable housing across the wider scheme. When assessing the credentials of Hoxton Press, it is therefore key to understand how it fits within the wider masterplan both in terms of location, density, tenure and viability. From a typological perspective, this example also show how towers can in some circumstances provide high quality homes. The hexagonal footprint means that every flat is located at a minimum of one corner, therefore 100% of the homes have dual aspect.

Towers also allow for a high density development with a smaller plot coverage than an urban block. At Hoxton Press, the towers create a gateway route between the park and into the development. A cafe, which can spill out onto the public realm, creates ground floor activity. The quality of the public realm is however questionable, particularly in relation to the play space provision. The entirety of hard landscaping, which becomes defined as ‘playable’ space should be investigated further as to how successful this is in practice.
7) Royal Albert Wharf
Perimeter block

Overview
Royal Albert Wharf is a masterplan at the east end of the Royal Albert Docks. Combined, the total development will deliver 1500 new homes. This study focuses on plots A and B of the phase 1 development which saw the delivery of 227 new homes giving a plot density of 190 DpHa. This is towards the lower end of a high-density development, yet is more reflective of its location and connectivity where it has a PTAL rating of 2.

The scheme is a good example of a perimeter block typology, particularly where there is a higher requirement for car parking provision. The scheme utilises a central ground floor podium car park, therefore minimising the impact of vehicles on the street scape. The scheme also addresses flood risk whereby ancillary rooms such as utility rooms, storage spaces and other occasionally used rooms are located at ground floor, with primary living spaces located above.

Scale and Proportion
The scheme is composed of north-south running blocks with east-west running blocks articulated to improve daylight and sunlight qualities to central communal spaces. Taller elements are located along the expansive river edge, maximising the units with river views and using taller block elements to anchor the proposals and provide a positive presence and identity on the river frontage.

Ground Floor experience
There are two main street types which define the ground floor condition. The first, and most prominent, is found at the southern edges of the two blocks, which face out onto the dockside. This pedestrianised street is fronted by a range of workshops, community spaces, cafés and shops, all of which can spill out to maximise use of the waterfront and southern aspect. The massing along this edge vary from the 7 storey ends of the north south blocks, down to two storeys within the centre. This prevents the buildings from overwhelming the public space.

Type: Perimeter block
Height: 2-9 storeys
Units: 227
PTAL: 2
Architect: Maccreanor Lavington

Data completed: 2018
Site Area: 1.194Ha
Density: 190 DpHa
697 HrHa
GIA: 25,736 m²
Plot coverage: 6819 m²
Plot coverage Ratio: 0.57
FAR: 2.16
Figure 127: Ground floor public realm © Tim Crocker

Figure 128: First floor communal courtyard © Tim Crocker

Figure 129: 3D axonometric

Figure 130: Site location plan

Figure 131: Building height to street width ratios

1. Hudson Way 27m
   1:0.08

2. Royal Albert Wharf 27m
   1:2.75

3. Frobisher Yard 24m
   1:1

Best Practice Examples
Along the north south axis streets (and along Shackleton Way to the North) maisonette front doors and residential entrances provide street frontage on every face of the block. These are accompanied by shallow, landscaped front gardens which help soften the street condition, and contrast the waterfront character to the south. Where car parking is integrated within the development it is arranged discreetly, in amongst further beds of landscaping and trees, and distributed away from the primary public realm to the south. Further parking is located within the centres of the blocks beneath a landscaped podium deck. Bin, cycle and plant room doors are also well detailed, and located discretely as to minimise the negative impact on the streetscape, therefore reducing long stretches of blank inactive frontage. Within the centre of the two blocks, the street width opens to a generous space with a closer likeness to a local square. This offers a new scale and type of public space for both pedestrians and residents to use, and is also well overlooked.

Communal amenity
Central courtyards at first floor provide various types of a communal space from play areas to planted beds. These spaces are of good scale and proportion, with widths of between 24 and 34 metres. They are well overlooked by homes and balconies, and are bounded by front gardens. In both blocks, the central massing of the southern blocks steps down to two storeys. This maximises sunlight into these spaces, as well as improving views from apartments out over the water. The commercial space at ground floor, which currently includes a Co-op provides a further form of amenity. Given the detached and island like nature of the site, a supermarket within immediate walking distance is likely to be greatly appreciated by residents.

7) Royal Albert Wharf
Perimeter block

Number of flats per core: 3-7

Dwelling aspect: 66% Dual aspect 34% Single aspect

Communal space: Raised central courtyards

Play space: Yes

Net to Gross ratio: 79%

Wall to Floor ratio: 0.59

Tenure mix: 33% Market 30% Shared ownership 36% Affordable rent

Housing mix: 47 1 bed (21%) 106 2 bed (47%) 61 3 bed (27%) 13 4 bed (6%)
Residential quality
Overall the scheme achieves 66% dual aspect homes, with all single aspect dwellings having either east, south or west facing aspect. Furthermore, single aspect homes have been planned to have a maximum depth of around 6 metres which improves ventilation efficiency. Homes located within the north south axis blocks are accessed from an internal central corridor. These circulation spaces benefit from at least one window providing daylight and views out, and opportunities for natural ventilation. Homes within these blocks also have access to external amenity space in the form of either private gardens at podium level, or protruding balconies at upper floors, which therefore maximise views towards the water.

Maisonettes and flats along east west axis blocks, the northern edge are arranged so that all are dual aspect. Therefore, these homes all have a south, water facing aspect and private amenity space.

Innovation
Great Eastern Quays phase 1 development achieved a Code for Sustainable Homes Level 4 rating for individual dwellings, and a BREEAM ‘Very Good’ rating for the commercial buildings. Due to the close proximity to the airport, common sustainability improving methods such as PVs and green roofs, could not be used. It was thought that PVs might reflect light to low flying aircraft, and that green roofs would attract birds that could strike planes. Instead, the issues associated with the flight path, such as increased noise pollution, were used as a driver to improve the overall performance of the building fabric. Improved efficiency of the envelope and baffles on the ventilation with no trickle vents and improved air tightness ensured that buildings were better sound proofed which also led to an improved thermal performance.

Conclusion
Royal Albert Wharf provides an excellent example of a perimeter block typology from an urban scale, down to the individual residential dwelling.

At ground floor, the scheme creates well fronted streets, with a mix of front doors along streets, to community frontage opening up onto the south facing public realm along the water front. Car parking, and other ancillary spaces have been discretely located as to have a minimal negative impact on the street scape.

The massing has been articulated to maximises views for residents towards the water, whilst allowing south light to flood into central communal courtyards. This also reduces the overall impact on the water fronting public realm.

Overall, the scheme highlights how car parking provision, adaptation to flood risk, and relation to public space can be addressed cohesively, whilst achieving a density of 190 DpHa.
8) St Andrews Hospital

Masterplan

Overview
The St Andrew’s masterplan in Bromley-By-Bow consists of 964 residential units, a health centre, a community building, and a variety of open spaces including a public square and a small park. The scheme includes three perimeter blocks and two towers of up to 28 storeys. This study looks at the various attributes of the urban block and tower typologies within the context of the wider masterplan which achieves a total density of 295 Dpha.

Scale and Proportion
Along Devas Street, there is a clear relationship between the 3 urban blocks of the scheme, and the housing blocks it faces. Taller north-south axis blocks, with lower central south facing blocks articulate the street in a consistent manner with the 4-6 storey housing blocks opposite.

There is a significant jump in scale between the low rise, 2-3 storey buildings to the west of the site, block A which is between 7-9 storeys and the tower to the north which is 18 storeys.

Ground floor experience
Across the three urban blocks, the ground floor is fronted on every side by front doors to maisonettes and communal entrances. The only exception to this is at the north side of the west block where a medical centre opens onto a new urban square. This square has a mix of soft and hard landscaping, and opens up to the street, acting as a gateway to the development from the West.
Figure 141: Ground floor public realm © Glenn Howells

Figure 142: Ground floor public realm © Edmund Sumner

Figure 143: Ground floor public realm © Townshend Landscape Architects

Figure 144: Ground floor public realm © Townshend Landscape Architects

Figure 145: Ground floor public realm

Best Practice Examples
8) St Andrews Hospital

Masterplan

<table>
<thead>
<tr>
<th>Number of flats per core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower: 9</td>
</tr>
<tr>
<td>Urban blocks: 3-10</td>
</tr>
</tbody>
</table>

| Dwelling aspect |
| Urban blocks: 41% Dual aspect (block C) |
| 59% Single aspect |

| Communal space: |
| Internal courtyard & roof terrace |

| Play space: Yes |
| Net to Gross ratio: 73%* (approx) |

| Wall to Floor ratio |
| Towers: 0.58 |
| (Block E): 0.57 |

| Tenure mix: |
| 57% Market |
| 25% Social rented |
| 18% Shared ownership |

| Housing mix: |
| 99 Studio (10%) |
| 300 1 bed (31%) |
| 276 2 bed (29%) |
| 248 3 bed (26%) |
| 27 4 bed (3%) |
| 14 5 Bed (1%) |

Front doors to homes at street level have a shallow defensible zone, which is largely landscaped with low level planting and shrubbery. North-south streets which run through the blocks are pedestrianised with the exception of access from the north of the site and blue badge parking. These spaces are well landscaped, with green central zones which contain a range of trees, planting and benches, and will receive good amounts of sunlight due to their orientation. A perpendicular linear park terminates these streets to the north. This space has a mix of playspace, planting and seating all of which is well overlooked. The central massing of the urban blocks on this edge all drop to four storeys as to not overshadow these spaces.

Another form of public space is found at the east part of the site in the form of sloped a park. This largely grassed area provides a set back to the development from the busy A12 which bounds it along this edge, and provides an alternative route to mediate the level change to reach Bromley-By-Bow station from the south of the site. The location of this park in relation to neighbouring building means that this area will also receive sunlight throughout the year. This is particularly key for residents in tower 2 who do not have any communal amenity space within the building.

Communal amenity
Within the centres of the urban blocks are high quality, landscaped courtyards. There is a rich variety of planting and trees providing opportunities for informal play and relaxation. From street level, double height openings provide views deep into these spaces. Where central massings along Devas Road are reduced to 3 storeys, the amount of southern sunlight is maximised within these spaces.

As mentioned, the western tower does not have any on-site communal amenity space, however, the tower does face onto the park area. The eastern tower also sits adjacent to the linear park at the north end of the site, but it also benefits from a roof terrace, providing views across the city.
Residential quality
Across the masterplan, homes are either arranged within three similar urban blocks, or two similar towers. Within the urban block, upper floor flats are accessed by a central corridor, which provides access to up to 10 flats per core, which is high than the maximum suggested within the London Plan. Circulation cores within these blocks have windows providing natural daylight and ventilation, as well as views into the central courtyard. Where there are single aspect homes within the blocks, these are arranged so that they have either east or west aspects. The proportion and massing of the urban blocks means that the number of homes with a north south aspect is minimised. These homes are generally deck access along the northern edge therefore providing dual aspect, with south facing amenity space in the form of terraces or gardens.

However, within the towers blocks are arranged along an east west access, with around 9 flats per floor. This creates a poor condition for the homes within these blocks, with a high proportion of single aspect, north facing flats.

Innovation
The development’s residential units are all designed to Code for Sustainable Homes level 3. It is a ‘low carbon’ scheme which is defined as a 37.5% improvement below the Target Emission Rate as determined by the 2006 building regulations. Within the scheme, over 20% of the energy demand is met by biomass boilers. The development also utilises rainwater harvesting which collects water from roof space and stores it on site. Where roof space is not used as private or communal amenity space, they are largely green and brown roofs to enhance the ecology of the area.

Conclusion
Overall St Andrew’s provides a good example how a masterplan can create a high density, providing a rich mix of streets, open spaces and high quality communal spaces. The arrangement of the north-south blocks, which step down along the southern edge create well-lit, communal, courtyards. Furthermore, the placement of towers along the northern edge increases the density and therefore allows for a larger open public green space which helps create a separation from the noisy A12. Furthermore, the edge condition to the north of the railway means that the overshadowing impact of the towers is somewhat reduced.

This being said, there appears to be a contrast of the residential quality of the urban blocks and the towers. Whilst the urban blocks generally have a good provision of amenity and aspect, flats within the tower suffer with many being north facing and single aspect.

Overall, it is clear from this example that a mix of towers and urban blocks can help create a high density development of nearly 300 Dpha. Care should be taken to ensure that this is not to the detriment of overall residential quality.
9) Park View Mansions

Mansion Block

Type: Mansion Block

Height: 3-6 storey blocks

Units: 88 residential dwellings

PTAL: 2

Architect: Haworth Tompkins

Data completed: 2017

Site Area: 0.6586 Ha (plot boundary) 2.95 Ha (PDZ6 Phase 1)

Density: 134 DpHa (Plot boundary)
468 HrHa (Plot boundary)
c. 88 DpHa (PDZ6 Phase 1)
c. 442 HrHa (PDZ6 Phase 1)

GIA: 11590 (approx.)
34709 sqm. (PDZ6 - Phase 1)

Plot coverage: 3062 sqm
Plot coverage Ratio: 0.46 (plot boundary)

FAR: 1.76 (plot boundary)

Overview

Park View Mansions is an 88 home, fully residential scheme within the new neighbourhood of Chobham Manor in the Olympic Park. The block has a prominent position, overlooking the Olympic Park, as well as sitting adjacent to the Lee Valley Velopark.

The development takes the primary form of a 6 storey mansion block, with an additional four mews style terraced houses located within the central courtyard to the rear. Notably, the scheme provides a high proportion of larger homes with 50% having 3 or 4 bedrooms.

Park View Mansions is part of the wider masterplan guiding the development of the areas in and around the Olympic Village and Stratford. The scheme was one of the several new blocks which made up phase one of PDZ6, which saw the delivery of 259 new homes.

The scheme achieves a density of 134 Dpha and 468 HrHa. The PDZ6 was an area designated to have a high proportion of larger family sized homes, with no less than 75% being 3- bed or larger. Park View Mansions therefore offers a good example of a housing typology with a greater emphasis on larger unit types. Though it can be studied as an isolated typology, it should be understood within the context of the immediate zonal masterplan, as well as the wider LCS development.

Scale and Proportion

The scheme is defined by a continuous 6 storey massing, with a footprint which is shaped by the bend of Olympic Park Avenue. The form of the building steps back as the height of the massing increases, creating large terraces which provide amenity space that overlook the park. Whilst the majority of the surrounding housing types within Chobham Manor are 3-4 storey terraced houses, the increase in height and overall massing signifies the varying condition to the residential streets, by a more appropriate scale to define the edge condition of the park.
Best Practice Examples
9) Park View Mansions
Mansion Block

This can be seen in figure 152. The ratios highlight how the massings and street widths create generous street proportions which are well suited to the family focused housing typologies, as well as the schemes overall density.

Ground Floor experience
At ground floor, ample front doors and windows open onto, and overlook, the street, creating a sense of activity and natural surveillance. This is further increased by the balconies and terraces at upper floors. Front gardens create a threshold zone from the street, providing some privacy to ground floor homes, and offer opportunities for planting to soften the street edge.

The streets are well proportioned, with generous paving widths, particularly, towards the north, along Olympic Park Avenue. Where there is on-street parking, these spaces are integrated within the overall streetscape, and are broken up into small clusters, separated by planted and widened pavements. An internal car park at ground floor, accessed from the rear within the central courtyard helps further reduce the impact of cars upon the streetscape.

Communal amenity
As an isolated typology, the scheme provides no communal amenity space, with the landscaped first floor terrace providing private gardens to maisonettes. Within the context of PDZ6 however, there is plenty of immediate shared green space and playspace. As highlighted, the scheme overlooks the extents of the Olympic Park, with a large play area immediately opposite. There is also a more intimate green space, with additional and differing playspace located along the quieter residential street Villiers Gardens.

Notably, the phase 1 provided 1430sqm of the required 1500sqm allocated publicly accessible open space for the total PDZ6 development.
Residential quality
Overall the scheme provides 70% dual aspect homes. Where homes are single aspect, they are either two storey maisonettes, or have a minimised plan depth to improve ventilation efficiency. Furthermore, each core provides access between 3 and 5 flats per floor which is well beneath the London requirements. Core zones are well-lit and ventilated, with minimal corridor distances to dwelling front doors.

All maisonettes have front door access directly onto the street and have large private gardens at first floor above a podium car park. Apartments at upper floors have well-proportioned terraces at the front which overlook the park. Due to the stepped forms, these are open above which maximises the quality of light and openness. A secondary, alternative form of private amenity is also offered to the rear in the form of balconies which offer greater privacy and shelter, as well as alternative aspect.

Innovation
Overall the scheme achieves a code for sustainable homes level four. The scheme, along with all buildings within the development achieves a 20% reduction in CO2 emissions through the use of on-site renewable energy generation sources, and are connected to the district heating system.

Notably, the scheme integrates a number of measures to improve flexibility and the ability for future adaptation. Within all dwellings, movable partitions, and soft spots within walls allow for changing layouts of rooms and access. Furthermore, dwellings at ground floor have higher floor to ceiling heights to offer the opportunity for a future use change from residential to commercial.

Conclusion
Park View Mansions is a good example of achieving a high proportion of family sized dwellings. The mansion block typology, with a stepped form creates terraces more suitable for larger external amenity requirements. Though the density is lower than many of the examples shown within this study, this is generally due to the higher provision of larger units.

It is important to understand that this typology works due to its implementation within the wider masterplan. With its lack of communal amenity, it would not be policy compliant as a standalone application. Within the context of PDZ6, however, it has been developed within the context of a wider neighbourhood which provides ample playspace and access to open green space.
Conclusion

The variety of density within the LLDC area reflects its rich history, physical characteristics and scale of change since the 2012 games.

Section 1 identified the current and planned density across each Sub Area and is summarised below:

Sub Area 1
Sub Area 1 has the smallest range of density, with the majority of the area below 2.75 FAR. The largest part of the area (around Hackney Wick Station and Fish Island) is consistently medium density, with a prevailing height of 6-8 storeys.

Sub Area 2
The density of Sub Area 2 correlates with it being the most advanced element of the LCS and that it has little historic fabric. The design approach of the LCS is strongly evident in the stepped transition in density from the low-rise terraces of Chobham Manor to perimeter blocks in East Village to the towers around Stratford International Station.

Sub Area 3
Sub Area 3 has the most varied built form of the LLDC Area, and this is reflected in its density. The FAR ranges from 0.5 up to 12, with a higher average than the other sub areas. This is due to the high-rise development along Stratford High Street, towers around Stratford Station and Stratford International Station, as well as Stratford City and the International Quarter South. This area has the highest PTAL levels and the majority of high density development are within or adjacent to the metropolitan town centre.

The majority of Sub Area 4 is of a density consistent (0.5 to 3) with the average seen across the LLDC Area. Lower density elements typically consist of existing industrial areas e.g. areas of Pudding Mill without extant planning permission and low-rise housing along Three Mills Wall River Weir.

Read together with the LLDC Characterisation Study, particularly the Heights Map, the Density Map illustrates that actual density and perceived density can be different. For example, it is not always the case that greater height results in greater density. High rise residential towers set with an appropriate quantity and quality of public realm may be less dense than large footprint commercial development that fills its site. Equally, medium rise, mansion block typologies can achieve higher densities than may be perceived from street level.

Density can be achieved using multiple housing typologies. Even with an increasing demand to maximise development potential, this study has shown that high density does not have to mean high rise. The choice of housing typology should be informed by its context, and the spaces around. Furthermore, this study has highlighted how different typologies have particular qualities, as well as constraints, which prove themselves to be the preferable choice within certain scenarios.

For example, standalone towers, can achieve a high density, with only a small footprint. This can therefore
offer opportunities for providing public space at ground level. On the other hand, perimeter blocks which have a much larger footprint, create large expanses of frontages which define streets, and provide a more private space in the centre for amenity and ancillary spaces away from the public realm. For this reason, creating higher density developments should be achieved using a mix of typologies that are appropriate to the surrounding context.

Different housing typologies also have maximum potential densities. As density increases above this, it is likely that the quality of homes and spaces will be diminished. If for example, a six storey perimeter block, was doubled in height to therefore double the density, heavy overshadowing would result in poor quality, deck courtyards and low level flats.

The five key issues, which provide the framework for this study, raise questions to assess the appropriateness of a chosen housing typology. In reality, there are many more factors which help inform this decision such as viability and cost. This being said, these additional influences should not come at the expense of delivering a scheme which positively responds to these five key issues. These five criteria, which have been informed by various guidance policies such as the National Design Guide, provide a framework for assessing developments. Based upon demonstrated practices of well-designed places and buildings they are broad enough to be applied to any typology or context.

This study has introduced a variety of housing typologies with a range of densities. The baseline study has provided the benefits and limitations of varying housing types. For example, at Monier Road, a combination of deck access flats and stacked maisonettes on an east west axis block meant that a high proportion of dual aspect homes could be achieved in a sophisticated way. On a narrow plot, which would have made separation distances too tight to have facing habitable windows, this typology lent itself well to the proportions of the site whilst achieving a density of 203 DpHa. Furthermore, at The Scene, the use of a deck landscape podium above ground floor commercial space was well suited for its town centre location, providing an alternative aspect for residents. Though a podium could have been implemented with a tower type, the perimeter block helped provide a buffer to the condition of the central communal space.

Whilst understanding how typologies have been implemented, and their given densities achieved, a significant conclusion can be drawn with regard to the maximum densities of different typologies. As highlighted in this study, whilst the urban perimeter block can be conceived in countless manifestations, there are limitations to its success in achieving super high densities that could be comparable to a tower typology. If we look at both Lanterns Court and Camden Courtyards, we see two high density typologies. Though contrastingly different, they both follow the same basic principles of an urban block in terms of a building line which follows...
the outer perimeter of the block facing out onto the streets which define its footprint, with some form of central, open space.

Camden Courtyards, which takes the form of mansion block of between 5 and 7 storeys, achieves a density of 309 DpHa. Two central courtyards, provide many of the flats with a secondary aspect to the busy roads which surround it, and their 18m square dimensions provide the minimum yet adequate separation distances in terms of privacy. The proportions of these courtyards allow for daylight to reach the lower level blocks, whilst landscaped roof gardens provide communal amenity space to residents. Overall, the scheme generally appears to be a good example of a high density urban block.

Royal Albert Wharf, specifically plots A & B studied within this exercise, includes two semi-equal perimeter blocks. At 190 DpHa, the scheme encompasses a central access road, with two ground floor podium car parks. Overall the scheme achieves a density of 190 DpHa and is an excellent example of a perimeter block, providing high quality amenity space, well fronted streets, and an overall good standard of homes.

Though Lanterns Court includes singular, taller, tower elements, it largely takes the form of a dense urban block, and achieves a density of 488 DpHa. This example sees a high number of homes with single aspect street facing or north facing blocks. Tighter and taller blocks suggest that levels of privacy will be reduced, whilst lower level dwellings will receive little to sunlight. For this reason, Lanterns Court could be considered an unacceptable in terms of policy compliance today, or at least a far poorer example of achieving a high density scheme than Royal Albert Wharf and Camden Courtyards. It could be concluded that Camden Courtyards has maximised the density potential for a traditional urban block within policy limits.

In addition to plot by plot and individual housing typologies, this study has also highlighted the impact that masterplanning, often with a mix of typologies, can have on achieving different densities. At St Andrews for example, which achieved a density of 295 DpHa, the development included three urban blocks, and two tall towers. The inclusion of two towers inevitably increased the density of the scheme whilst still allowing for the inclusion of a large public green space. If instead there was an additional urban block and no towers, the density would have inevitably been less, and the large public place would have been lost. The same could be said for the Collville Estate. Though the quality of playspace at ground floor could be questioned, the case study highlighted the principles of how a tower typology, with its small footprint can offer opportunities for larger expanses of public realm at the base. Within this example, the two towers act as a gateway into the wider development of the Collville Estate.

Another key factor highlighted within this study was the impact of viability. From a typology perspective, Hoxton Press highlighted how tower
typologies could create high quality residential homes with good aspect. However, when we look at the wider picture, we can see that the two towers are 100% private tenure. As an isolated typology, this would not be compliant and negates principles of mixed tenure developments. It is known that these towers help to subsidise the affordable homes across the wider estate. Furthermore, from consultations with residents, there was a preference for a development which was largely made up of medium rise blocks and streets. The choice for two towers, of higher density on this site, ultimately helped to alleviate the density pressures across the wider site and therefore achieve the existing residents aims for their estate renewal.

At both Vesta House and Park View Mansions, we also see how contrasting schemes rely on a site wide approach to become policy compliant. Vesta House, which is a 14 storey tower on an awkwardly shaped site, uses an atrium to provide an internal form of communal amenity space not often common in towers. Though elements of its residential quality could be questioned, it has a density of 308 DpHa. However, this is achieved through a disproportionally high number or 1 and 2 bedroom homes. In comparison, at Park View Mansions the typology is primarily focussed at larger, family sized homes in the form of a mansion block. Though the residential quality appears to be high, there is no immediate on-site communal amenity space. When we consider both of these examples within the context of their respective zonal masterplan, we understand that these have been allocated across neighbouring plots. Within Vesta House, it was acknowledged that adjacent buildings would have a higher proportion of family sized units, whilst at Park View Mansions, the required open green space, and play space provision was located immediately adjacent to the park and on the streets.

Though the study has been set out to assess the typologies in terms of five criteria – scale and proportion, ground floor experience, communal amenity, residential quality and innovation - what has been highlighted also is the importance of understanding each scheme within the context of the local planning policy, or how it sits within a wider masterplan area.