BILLINGS-GATE NORTH DOCK

DESIGN & ACCESS STATEMENT

Design Team:

JOE BONOMO	HARRY CHEUK	ESTHER WILES	MARYAM SULEMAN	NATHAN HEALEY
19016542	19015286	19018968	18053858	18053631

the brief

At 13 acres in size, the Billingsgate site will play a significant role in connecting the Isle of Dogs and South Poplar - two socio-economically and physically contrasting areas.

Separated by Aspen Way and the Docklands Light Railway (DLR), the task is to reimage the Billingsgate Market site as a viable, high-quality, mixed-use development, that not only resolves the polarised socio-economic divide but creates a desirable place to live, work and visit.

The proposal should maximise spatial connectivity and land uses, delivering employment, leisure and housing.

With the relocation of London's wholesale fish market, the Billingsgate site provides a major opportunity of location, regional and national importance. The landowner, London Borough of Tower Hamlets, envisions a 'high quality, affordable and healthy mixed-use development where local communities unite, youth thrive and families aspire to live, work and play.

Figure 1 (below): Map identifying the Billingsgate site.

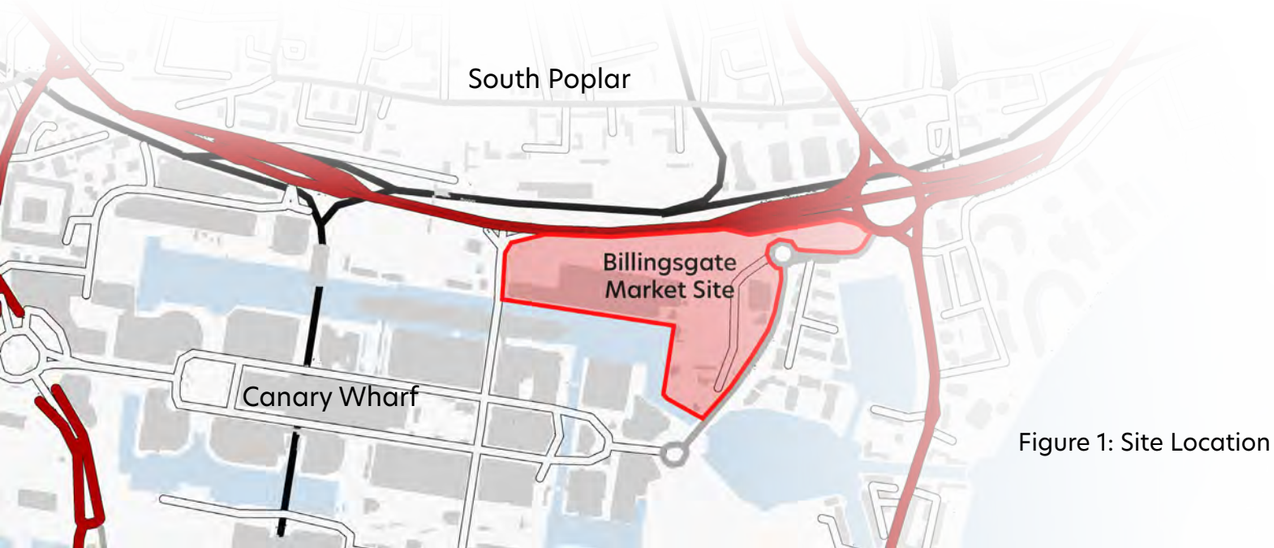

Figure 1: Site Location

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vision

A vibrant, creative, living and working community that enhances South Poplar through connectivity and urban greening.

OBJECTIVE 1: Increasing pedestrian and cycle local connections
- Increase walkability to South Poplar
- Garden bridge to Canary Wharf
- Expand London cycle network

OBJECTIVE 2: Integrating multi-use, green, activity hubs
- Increasing usability of the waterscape
- Activity hub park under Billingsgate framework
- Community arts and exhibition centre

OBJECTIVE 3: Socially and environmentally sustainable housing and employment
- Modular housing
- Creative industry workspace
- Lifetime housing

landscape and ecology design actions

1. Low-maintenance wild meadows
2. Green activity hubs
3. Tree-lined streets
4. Living wall along Aspen Way
5. Protect flora and fauna
6. Preserve the marine landscape
7. Green roofs or solar panels

site analysis

location

Positioned along the Eastern-edge of Canary Wharf's North Dock, Billingsgate Market is a site with huge potential.

Canary Wharf is a world-class hub in the Thames Gateway, well-connected via excellent, strategic, transport connections, and is experiencing soaring land values. The area is a key part of a major growth corridor between London and Cambridge, opening up a wealth of opportunities for employment, housing and the environment.

The site is located with the London Borough of Tower Hamlets, jointly owned by the City of London Corporation which operates the Billingsgate Fish Market.

Figure 2: Graphic identifying the site.

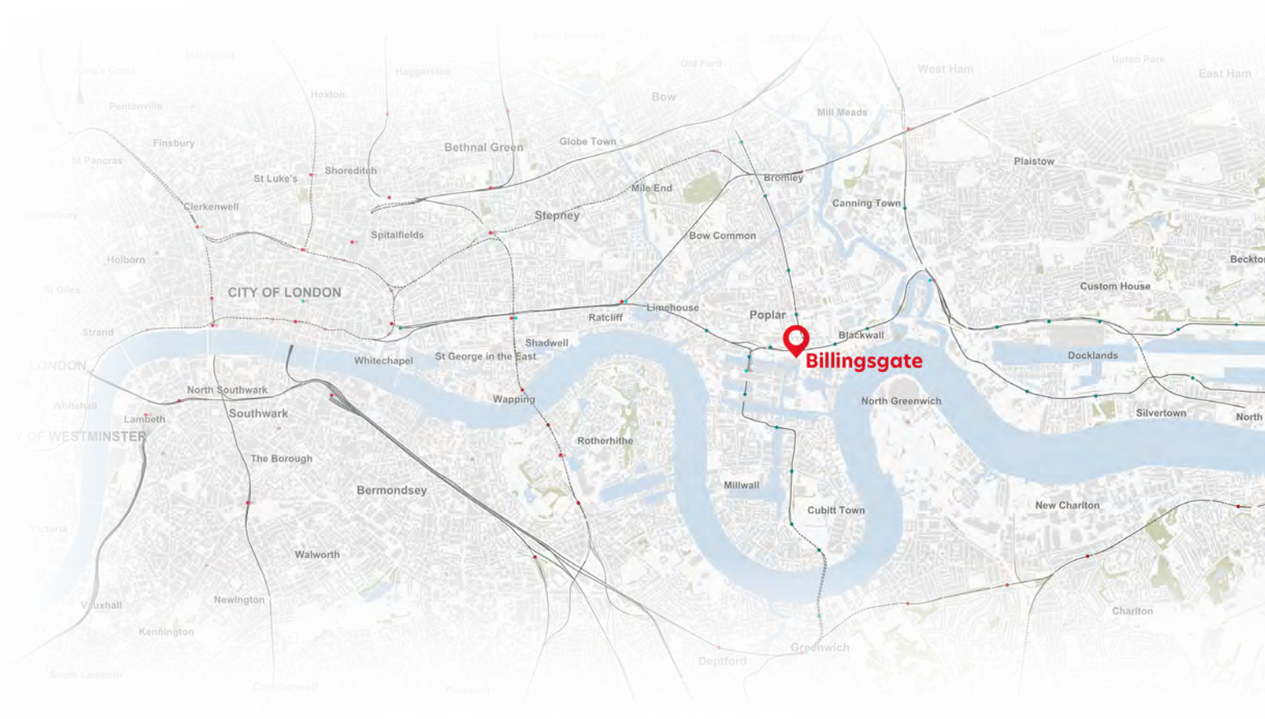


Figure 3: The site in a wider London context.

heritage context

1500s

During the 1500s infrastructure in the area started to take shape around the docks such as warehouses, merchant houses and trading yards. Merchants would trade on the streets and boats this became known as the Billingsgate Fish Market.

Figure 4: West India Docks.

1800s

In 1802 the West India Docklands were opened during the British Empire Boom. The docks then became renowned for being the greatest civil engineering structures of its time. As a result of this growth, prosperity and industry started to grow.

1940s

During the second world war, the docklands were the recipients of heavy bombing destroying most infrastructure in the area.

Figure 5: Heavy bombing damaged the docklands.

1960s

1961 saw the docklands' peak year when over 60 million tonnes of cargo passed through the port from worldwide. This was mainly due to advances in transport technology. However, at this point, all original warehouses had been removed after the war.

1970s

New technologies and developments in containerisation meant the docklands couldn't keep up with their competitors, and by the early 1970s the docklands had closed. This led to massive disinvestment in the area, businesses closed or moved away.

1980-1982

The local Government Planning and Land Act 1980 brought the London Docklands Development Corporation. This corporation was meant to secure regeneration by: Bringing land and buildings into use, Encouraging industry and commerce, Creating an attractive environment, Assisting in the provision of housing and social facilities to encourage people to live and work in the area. In 1982 Billingsgate Market was relocated to the site it is now found near Canary Wharf.

Figure 6: DLR in the 80's.

1987-1989

London City airport and the Docklands Light Railway all opened, Britain's first-ever automated light rail transit system. This improved connectivity to the docklands made the area more desirable for developers, businesses and investors.

1990s

Canary Wharf was opened in 1991 and the connections to and from the site are improved, with bridges, tunnels and increased rail stops for the light railway. The first of the 572 families are relocated to the area and become the first residents of Canary Wharf. The demand from the office workers and local residents meant shops and restaurants started to open in the area.

Figure 7: Billingsgate Market now.

2000s

Banks such as Citibank and HSBC built their corporate offices in Canary Wharf. The number of shops and restaurants in the area increased and Canary Wharf became the business hub it is today.

We can see that the site and the surrounding area has a rich history that dates back hundreds of years, which has ultimately resulted in the area becoming what it is today. It is important to protect and enhance this heritage, due to the significance it has had not only on the area itself but also throughout London and the rest of the country

morphological analysis

Figure 8: Maps presented as an analysis of the morphological layers.

green network

There is significantly less green infrastructure in Canary Wharf than South Poplar, primarily due to the large offices that fill the area. There is a need to create a green network south, connecting London's Green Grid from Stratford through Poplar to the Isle of Dogs.

blue network

The site is within proximity to the River Thames, which creates a future flood risk. The historic West India Dock is itself managed, in order to regulate the water level and support the docks biodiversity. The Docks are of heritage importance and its character must be preserved.

street network

The street network around Canary Wharf and South Poplar is very car-orientated, focusing movement towards Canary Wharf and the Isle of Dogs. The map highlights the disparity in the street layouts, with South Poplar having preserved its traditional tight urban grain and Canary Wharf presenting a contrasting modern grid layout.

figure ground map

Displaying a similar theme to the street structure, South Poplar demonstrates a traditional urban grain, whereas Canary Wharf has larger blocks with capacity for sizable offices. The masterplan needs to find a way to soften the physical divide, blending the large urban blocks and the tight urban grain.

SWOT

strengths

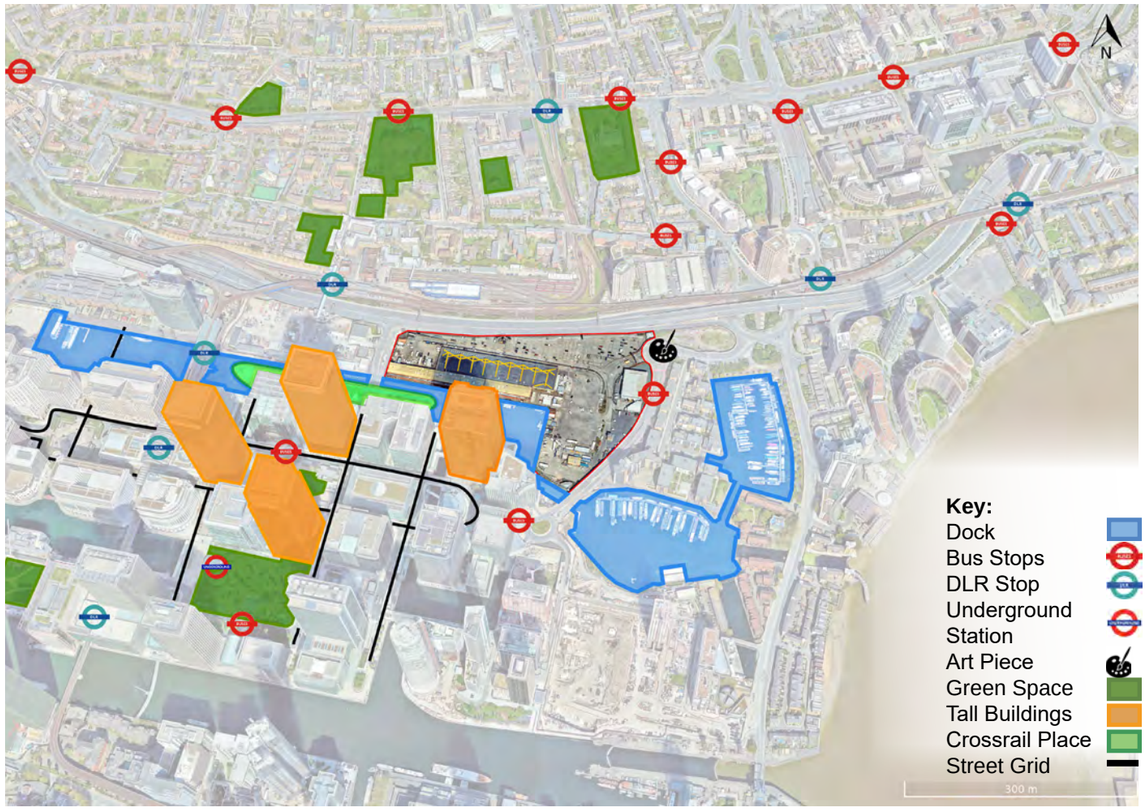


Figure 9: Illustration of the strengths of the site and its surroundings.

Key:
Site Boundary

Blue Infrastructure
Being located on the waterfront benefits physical and mental well-being, but also creates an attractive place. The water adds vitality and character, as well as increasing market values.

Green Infrastructure
The masterplan should seek to maximise connectivity between greenspace. Much of the greenspaces around Canary Wharf are not targeted for families, so the masterplan will need to provide create linkages to family-friendly spaces.

Streets
The area is extremely well-connected by bus, by tube (to Central London), by DLR (to East London and City Airport), and has multiple bicycle hire stations.

Blocks, Plots, Buildings
The local plan identifies Billingsgate as its own place, and the masterplan should build on this. Canary Wharf has a strong grid structure, which could be extended into the site. High-rise buildings maximise development potential, but a balance must be struck between the building heights in Canary Wharf and South Poplar.

weaknesses

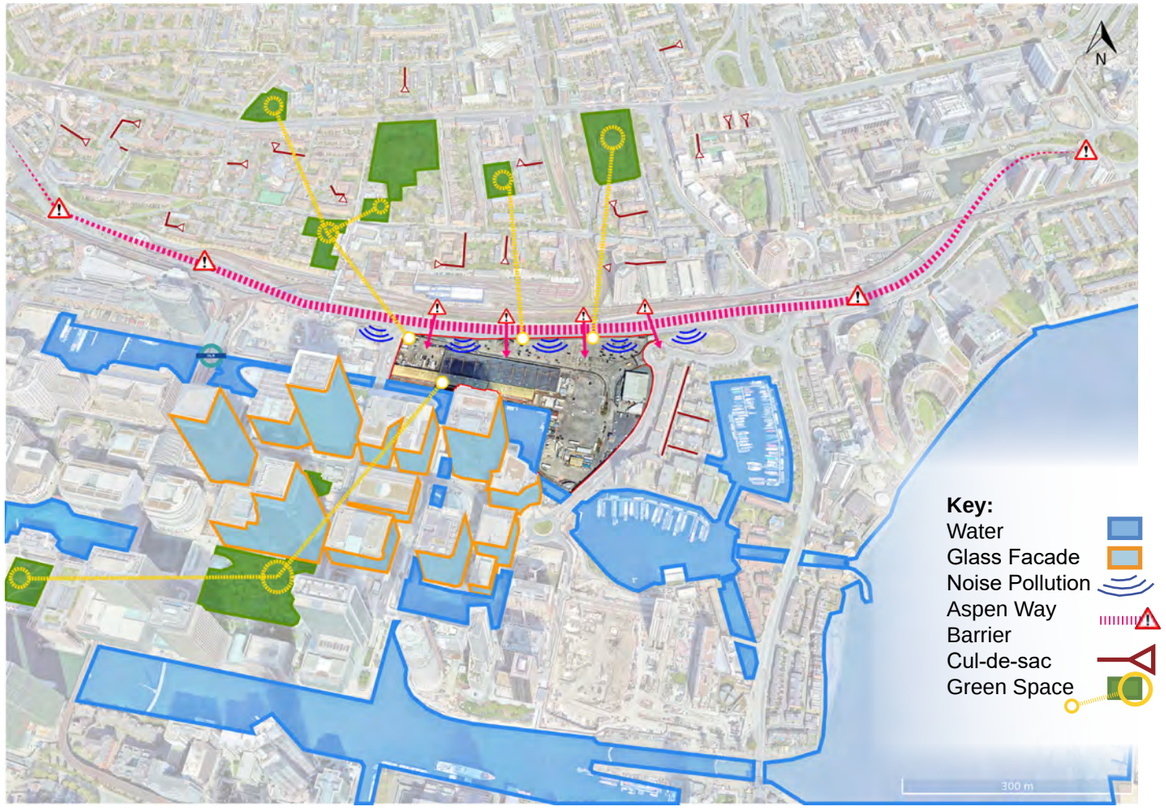


Figure 10: Illustration of the weaknesses of the site and its surroundings.

Key:
Site Boundary

Blue Infrastructure
Though having its benefits, the North Dock lacked maintenance, the water was dirty and produced unpleasant smells. The water also presents an accessibility issue in terms of connecting to Canary Wharf.

Green Infrastructure
Much of the green infrastructure is not a walkable distance from the site. Jubilee Park, the closest, is not tailored for families, so suitable greenspace will need to be created on-site. In terms of connecting to Greenwich Park, mobility is restricted by the foot tunnel.

Streets
Aspen Way and the DLR line and depot pose significant visual and physical barriers to South Poplar making accessibility difficult for pedestrians, but also contributing to an unattractive environment with noise and air pollution.

Blocks, Plots, Buildings
The character is Canary Wharf is lifeless. The modern all-glass façades create an overbearing and unwelcoming effect and should not be replicated. In contrast to Canary Wharf's grid structure, South Poplar has many cul-de-sacs, and a balance needs to be struck to tie in these two contrasting patterns.

opportunities

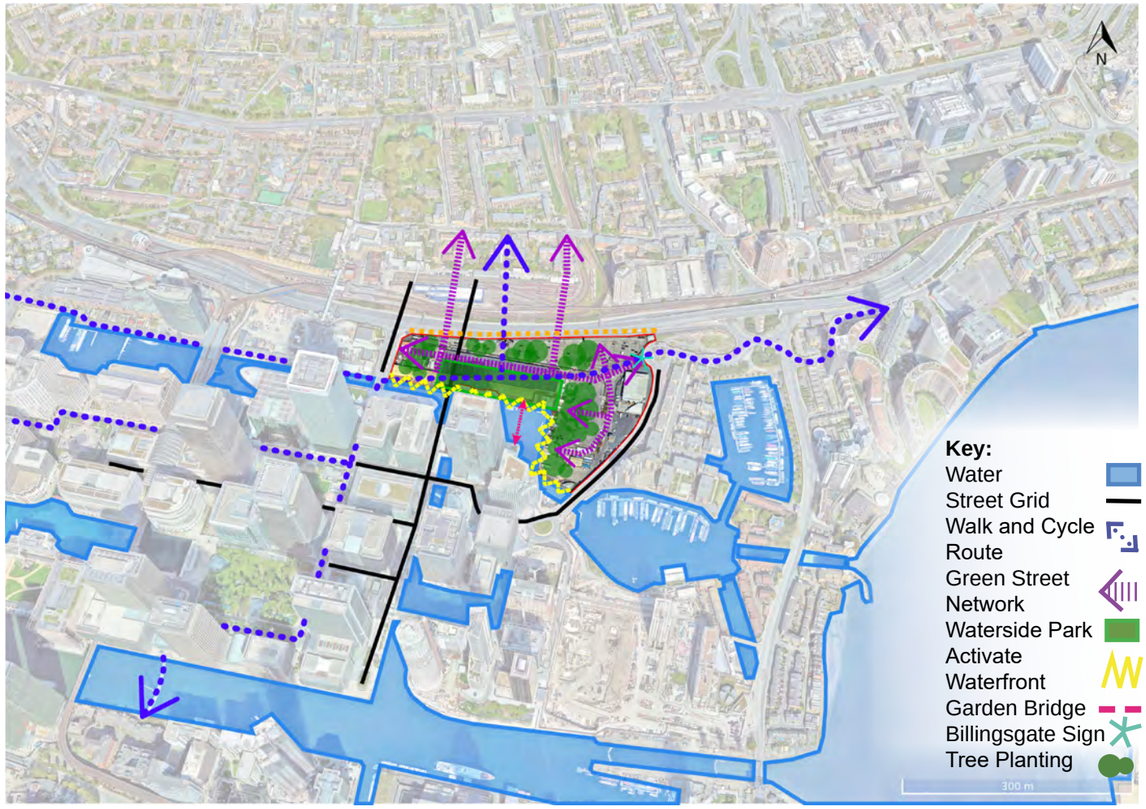


Figure 11: Illustration of the opportunities of the site and its surroundings.

Key:
Site Boundary

Blue Infrastructure
North Dock presents a significant opportunity for water-focused development, such as activating the waterfront through a waterside park, promenade and attractions.

Green Infrastructure
Enhancing the green infrastructure is a big opportunity for tieing South Poplar and the Isle of Dogs. A waterside park and garden bridge are key design actions, but the implementation of Sedum Roofs, urban greening and biophilic design could build on the site's biodiversity.

Streets
Currently car-orientated, the Billingsgate site allows the potential to expand walking and cycle routes. Also, a key opportunity is to create greener streets, with trees, planters and green walls. This would work well in a street pattern like Canary Wharf's

Blocks, Plots, Buildings
Canary Wharf currently lacks a sense of life, so development needs to create a place with vitality through active edges, mixed-uses and cultural events. The Billingsgate Market is one way to retain culture. By retaining the iconic yellow building frame, there is the potential to develop housing and a waterside park as a focal point for the site.

threats

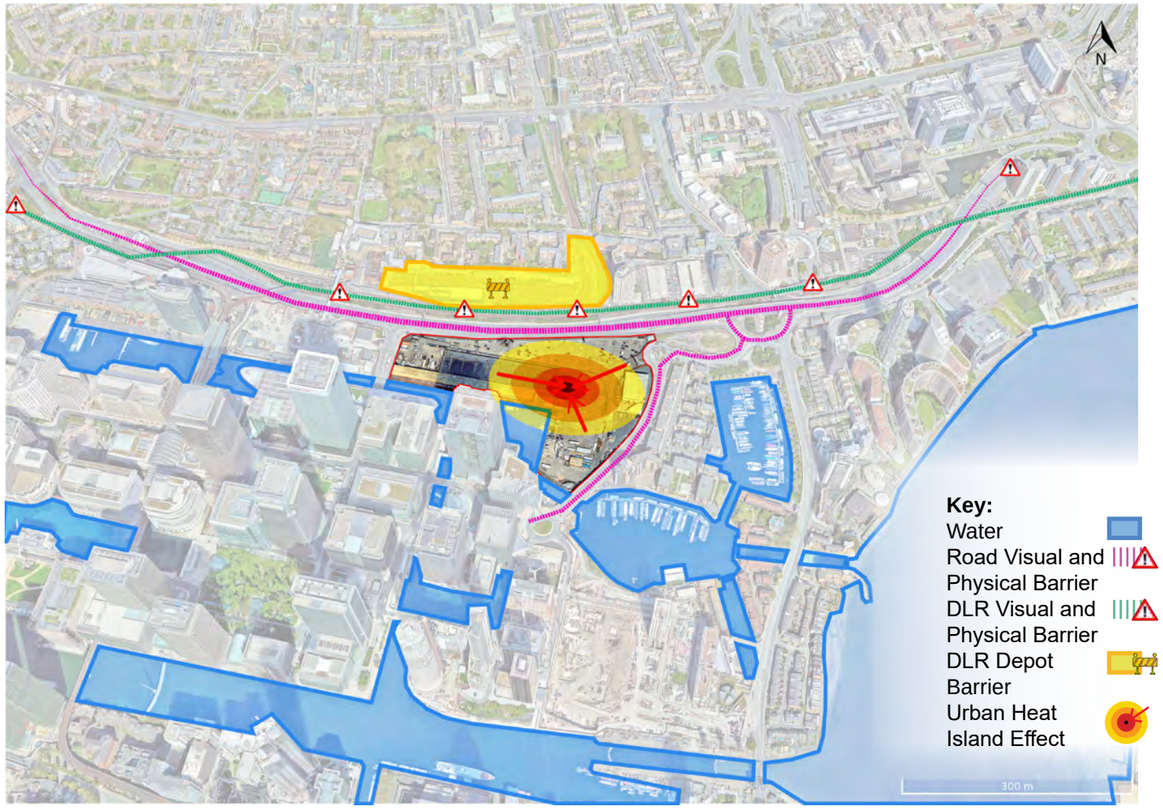


Figure 12: Illustration of the threats of the site and its surroundings.

Key:
Site Boundary

Blue Infrastructure
Whilst the docks water level is managed, proximity to the River Thames poses a flood threat in 50years, and development needs to mitigate this. The maintenance of the dock also presents a financial threat.

Green Infrastructure
Certain greenspaces can be expensive to maintain so it is important to take more natural approaches to greenspaces, such as miniature wetlands. A lack of surveillance over greenspaces also threatens safety.

Streets
The existing street network is too car-orientated, with thin pavements for pedestrians creating unsafe environments. With Aspen Way, Trafalgar Way and the DLR also acting as visual and physical barriers, this masterplan must find a way to move people away from vehicular transport.

Blocks, Plots, Buildings
The DLR rail depot creates noise pollution, reduces accessibility and is unsightly. A future threat is the Urban Heat Island effect, exacerbated by climate change. The masterplan will need to mitigate this with features such as street trees and light surface materials.

connectivity

wider connectivity

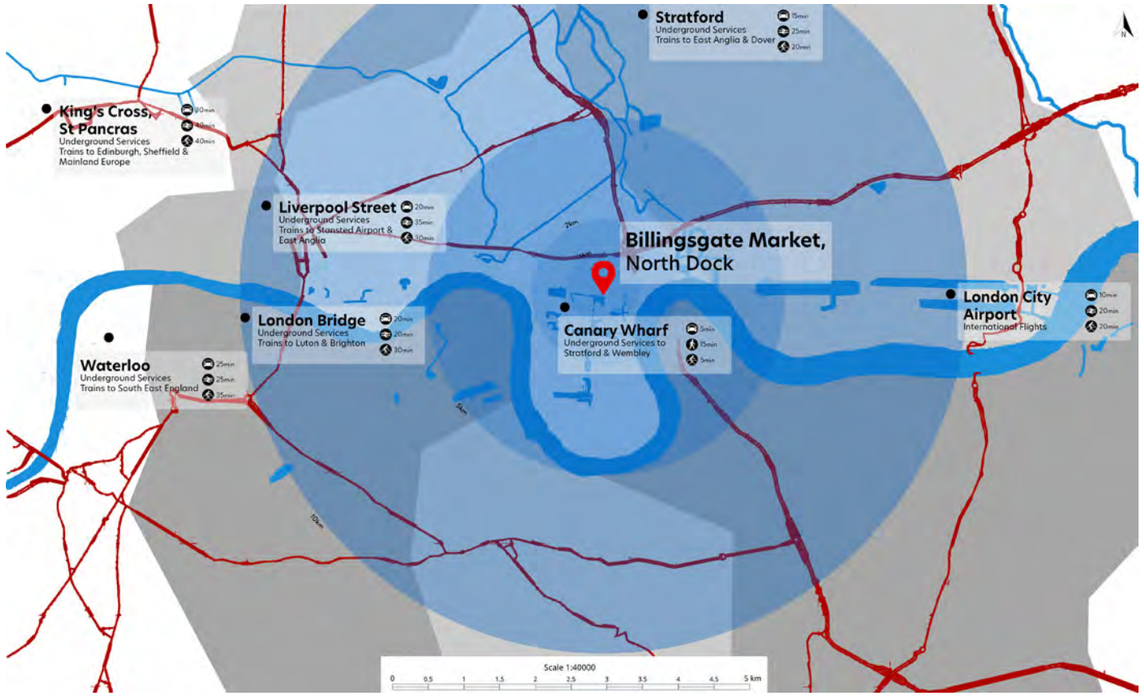


Figure 13: Wider Connectivity of the site to wider London.

The Billingsgate Market Site is positioned adjacent to Canary Wharf, a world-class hub for finance, and as such has excellent regional, national, and international connections.

Canary Wharf has both a DLR and Jubilee Line underground station which connects the site to Stratford and Central London. Within a 10km radius in London Bridge and Liverpool Street stations connecting the site to Stansted Airport and Southern England. With London's extensive cycling, walking and public transport network, these connectors are easy to get to with active/sustainable travel methods.

East of Canary Wharf is London City Airport, strategically located to give the London Docklands direct international connections.

Also within easy reach is St Pancras, which provides international rail links to France, Belgium and the Netherlands.

Having excellent transport connections places importance on delivering employment and business opportunities on-site to help drive economic growth.

local connectivity

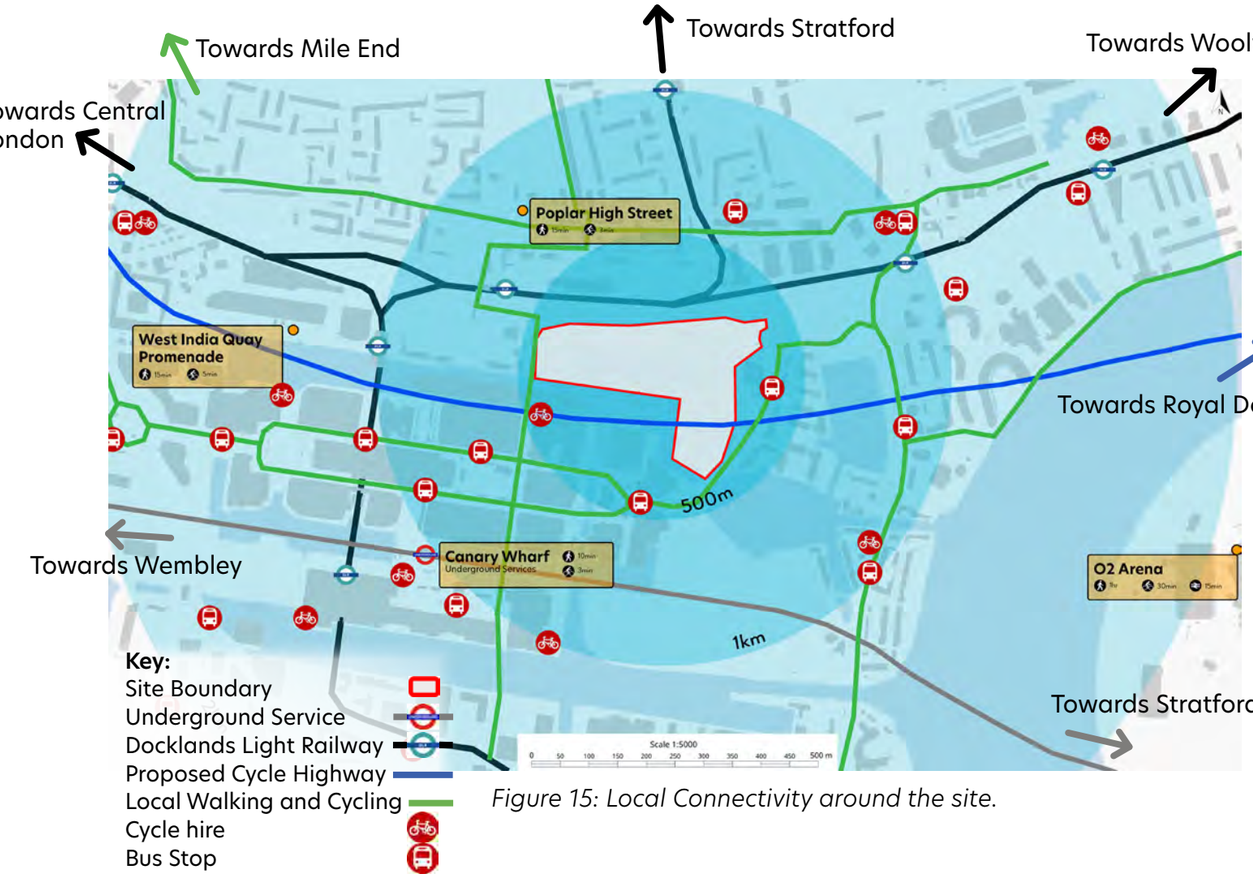


Figure 15: Local Connectivity around the site.

At a local scale, it is evident that Canary Wharf is extremely well-connected with bus, DLR and underground links, as well as featuring multiple bicycle hire stations. However, the North Dock cuts of the Billingsgate Site from these connections.

Similarly, Poplar High Street, which has fewer connections, is also physically and visually separated by Aspen Way and the DLR.

This map reiterates the socio-economic divide, with Canary Wharf being much more accessible than South Poplar.

Despite these connections, the River Thames poses the most significant barrier to movement, making the Greenwich Peninsula almost undesirable to visit, taking 1-hour to walk compared to a quick 10-minute car journey.

Using this information, it is evident that the masterplan should seek to increase accessibility to South Poplar, as well as making the journey to Greenwich more pleasant.

Improved transport is fundamental in achieving The Good Growth efforts to deliver walkable, liveable neighbourhoods with good access to a range of public transport options to encourage healthier communities and cleaner modes of public transport. Set out in the Isle of Dogs and South Poplar OAPF, Policy 4.4.1 Achieving 90% or higher travel by sustainable modes within the OA.

socio-economics

population density

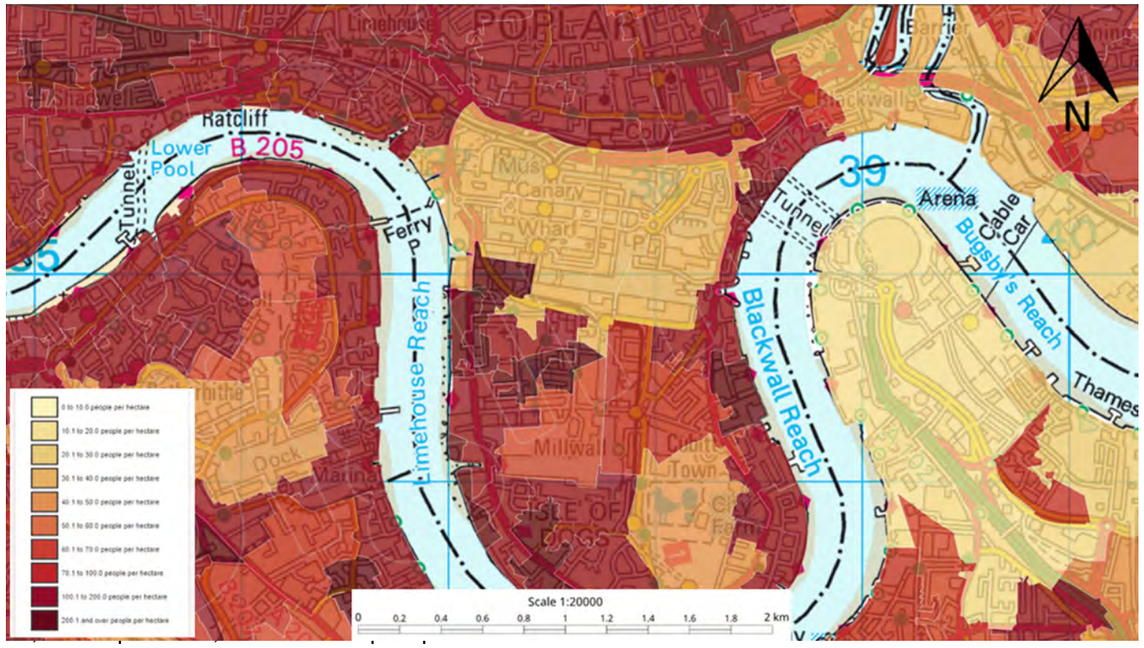


Figure 16: Map of population density around East London.

The surrounding areas of Billingsgate vary from high population density (Poplar) to low population density (Canary Wharf). The reason for such a difference is the fact that Canary wharf is mainly a business district and therefore doesn't accommodate for much housing. As a result in regards to Tower Hamlets meeting their housing need Canary Wharf is a hindrance. The close proximity of Billingsgate to Canary Wharf suggests that development would need to help combat this hindrance. This information has led to our masterplan having the ability to accommodate a relatively large population.

unemployment

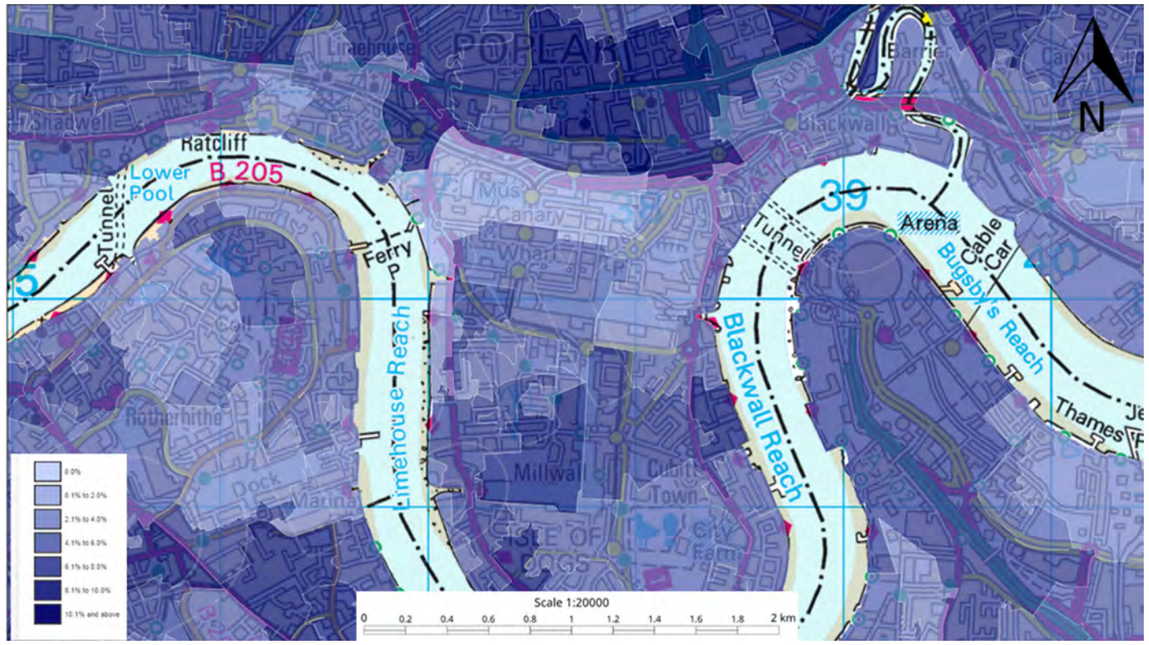


Figure 17: Map of unemployment around East London.

As indicated in the map unemployment in the areas surrounding Billingsgate is high despite there arguably is a wide range of employment in the area. Thus meaning that development of Billingsgate would need to consider incorporating employment that is achievable for the local population. As a result, our masterplan has included office space and commercial plots as these will offer a range of jobs that will respectively combat the unemployment issue with the local area.

households with no car

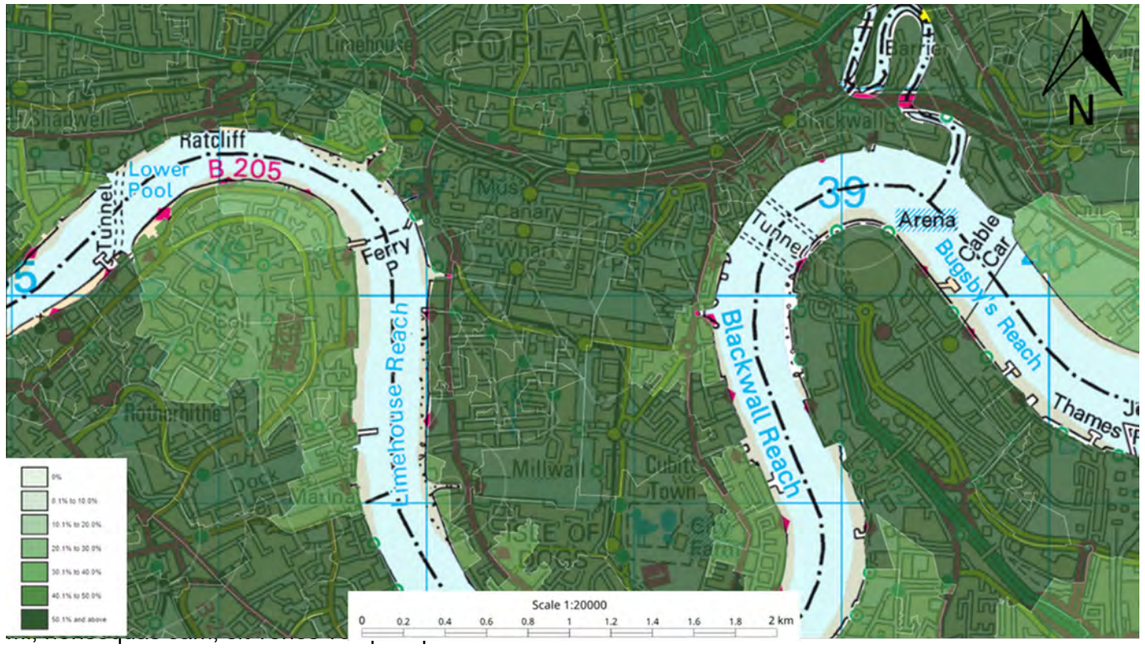
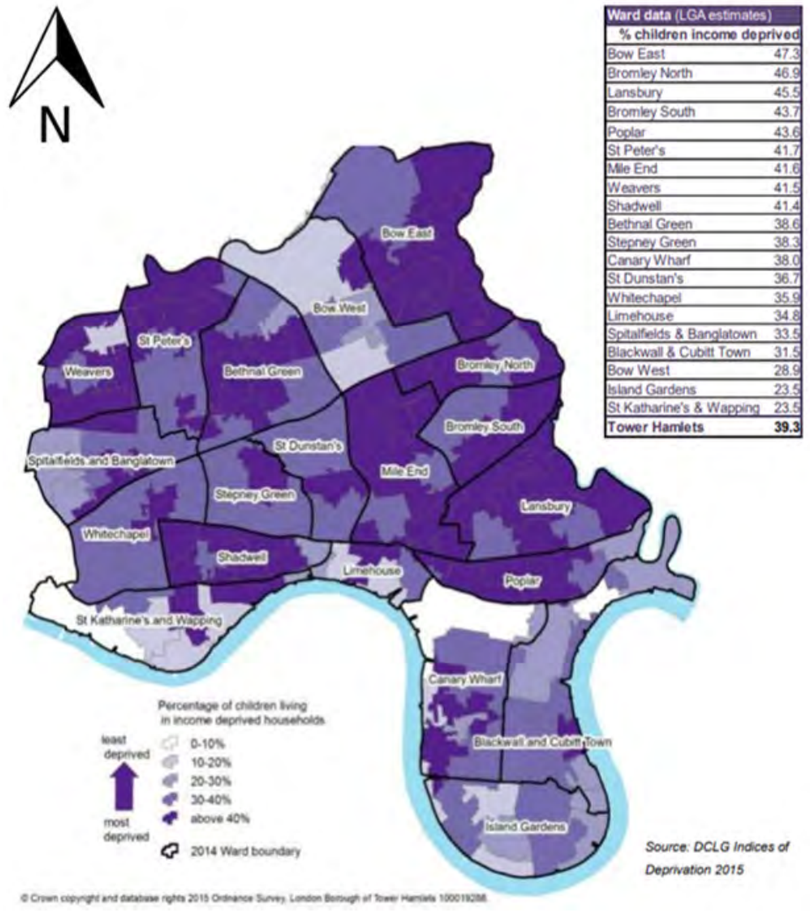


Figure 18: Map of households without a car in East London.

The map shows that within Tower Hamlets access to cars is limited. Therefore development of Billingsgate needs to be easily accessible for pedestrians to allow its benefits to be felt by the people of tower hamlets. Our masterplan is therefore pedestrian centric with improvement in accessibility between the north and the south as well as from east to west.

child poverty



Ward data (LGA estimates)	
% children income deprived	
Bow East	47.3
Bromley North	46.9
Lansbury	45.5
Bromley South	43.7
Poplar	43.6
St Peter's	41.7
Mile End	41.6
Weavers	41.5
Shadwell	41.4
Bethnal Green	38.6
Stepney Green	38.3
Canary Wharf	38.0
St Dunstan's	36.7
Whitechapel	35.9
Limehouse	34.8
Spitalfields & Banglatown	33.5
Blackwall & Cubitt Town	31.5
Bow West	28.9
Island Gardens	23.5
St Katharine's & Wapping	23.5
Tower Hamlets	**39.3**

Figure 19: Map of child poverty in the London Borough of Tower Hamlets.

Child poverty is a real issue within Tower Hamlets as shown on the map. Although the development of Billingsgate may not be able to directly have an impact on this if any aid can be provided it should be. Potential aid in our masterplan will be given in the form of new and improved connectivity the deprived areas will have, further to this the new public realm and job opportunities offered in our masterplan can play a role in reducing the deprivation.

geology and topography

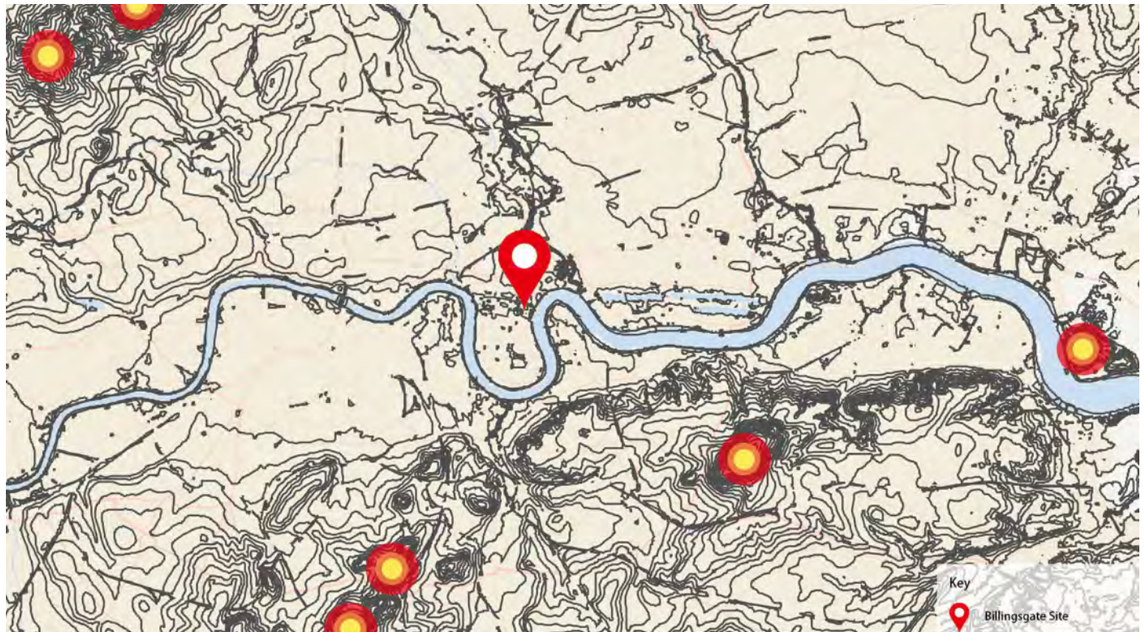


Figure 20: Map showing the topography in London.

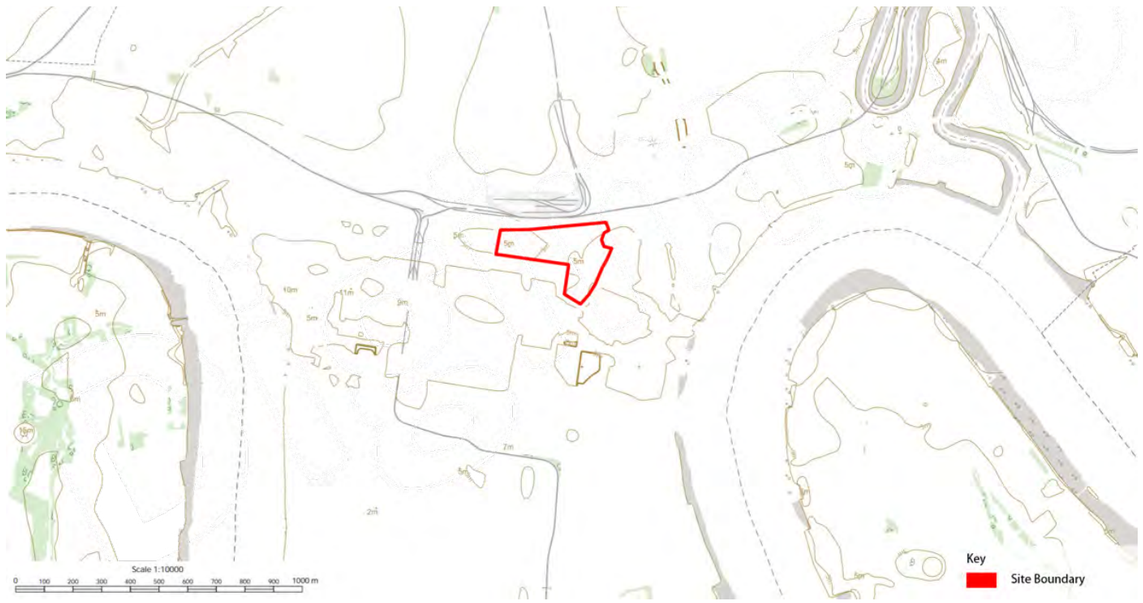


Figure 21: Map showing the topography in the Isle of Dogs.

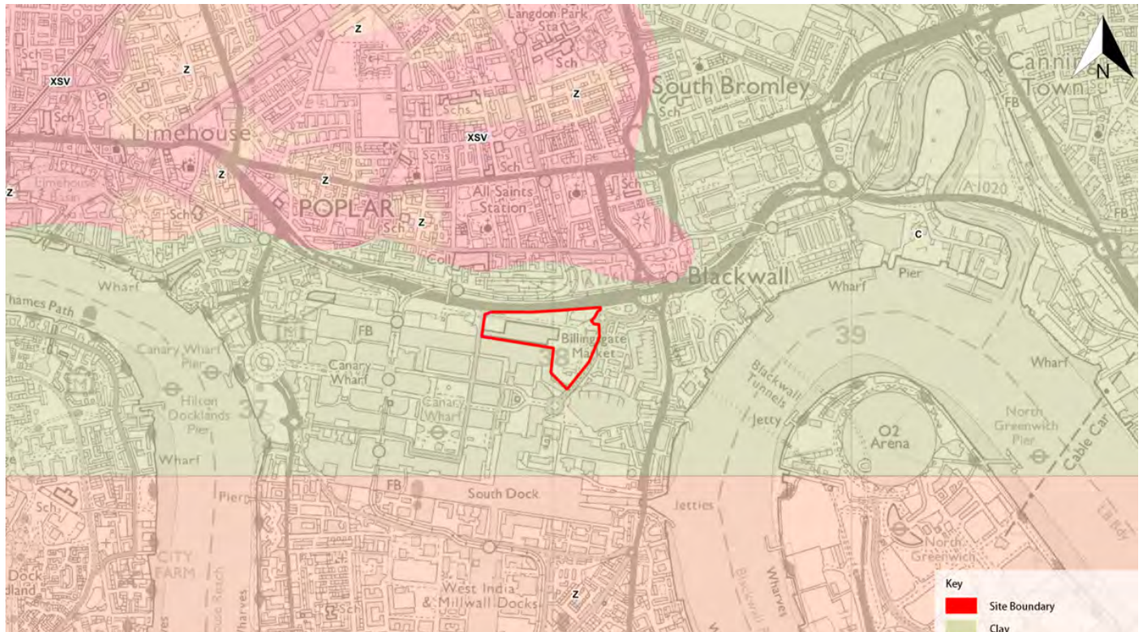


Figure 22: Map showing the geology.

Figure 20:
There are a few mountains in London. The differences in topography may lead to the becoming of a river which may increase flood risk in the surrounding area, but there is no evidence to show that the Billingsgate site will be affected by the wider topography. The flooding of the Thames River may be one of the influences on the Billingsgate site.

Figure 21:
The east and west side of the site have 5m sloped areas that may cause inconvenience to the elderly and the disabled population. It can even affect the speed of the bicycle and cause danger on the site.

Figure 22:
Clay is the main geologic material in the Billingsgate site. It is a material impermeable to water. For addressing the climate change and flooding risk, permeable material such as sand brick and soft landscape is quite important for the Billingsgate site.

green mobility network

Blue Infrastructure

Strengths

- River Thames is a valuable asset to the site, as it enriches the area with natural infrastructure that is attractive which can promote improved physical and mental wellbeing.
- Water adds vitality and character, as well as increased market value.

Weaknesses

- Dock water is dirty and needs maintenance.
- Water produces unpleasant smells due to a lack of maintenance.
- Dock act as a physical barrier within the site and hinders accessibility.

Opportunities

- Water provides attractive vistas with improved accessibility there is potential for waterside attractions and better pedestrian routes along the riverside.
- Potential to integrate sedum roofs as flood mitigation as well as resulting in a net gain in biodiversity.

Threats

- Risk of flooding and maintenance of the dock is expensive.
- Risk to aquatic life and wildlife

Green Infrastructure

Strengths

- Crossrail Place roof garden (14 mins)
- Jubilee Park (14 mins)
- St John's Park (19 mins)
- Mudchute Park (27 mins)
- Sir John McDougal Gardens (30 mins)
- Millwall Park (32 mins)
- Island Gardens (36 mins)
- Greenwich Park (49 mins)

Weaknesses

- Greenspace is very sparse in Canary Wharf and Isle of Dogs and walking distances may not be reasonable for everyone.
- Jubilee Park is not sufficient for families.
- Mobility is restricted for cyclists as routes are disconnected (map 24) and foot tunnel towards Greenwich is unsafe.

Opportunities

- Garden bridge to improve accessibility and create a green corridor to connect pockets of open space within the area.
- Noise mitigation through urban greening.

Threats

- Potential lack of surveillance could make it unsafe
- Expensive maintenance

Figure 23: Wider green and blue infrastructure map.

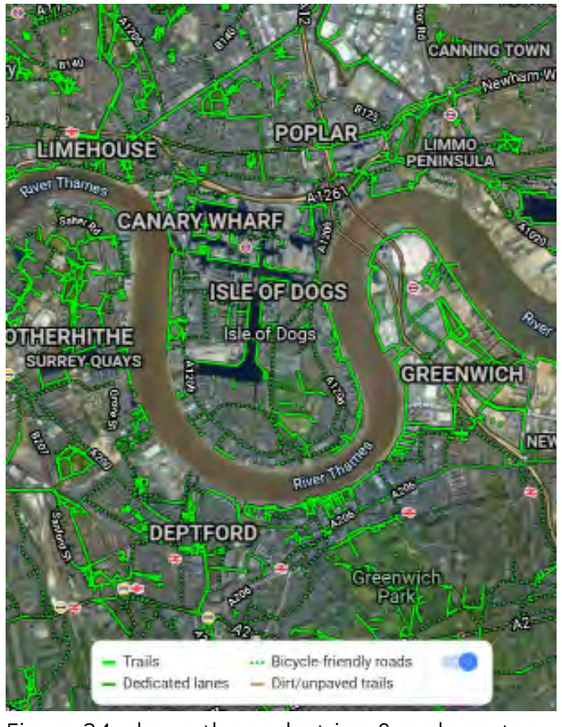


Figure 24: shows the pedestrian & cycle routes in the area that connects open spaces.

Figure 26 (below) diagram of key green and blue spaces. (Tower Hamlets, 2021)

Policy Context

The Good Growth aims to actualise sustainability by enhancing the environment and promoting biodiversity, therefore it is vital to protect existing blue and green infrastructure including the local parks and the riverside. These natural assets should be preserved as they are essential in improving the vitality and air quality of the local community living in this high-density urban area. These aims support the environmental net-gain approach. There is also an opportunity to combat climate change as well as improve biodiversity and ecological resilience through urban greening, which has been outlined in the emerging New London Plan and the London Environment Strategy.

Reflections

It is important that our masterplan improves access to nature and incorporate the use of green roofs, living façades, tree-lined boulevards and a living garden bridge to support net-gain. Also, feature biodiverse swales to mitigate flood risk. Furthermore, conserve and protect new and existing habitats.

spatial analysis

Pedestrian routes
The walkability of Canary Wharf is sufficient, however, from the Billingsgate Market site towards South Poplar the pedestrian connection is very poor. This is due to the severance created by Aspen Way road, which is heavily car dominant. This lack of safe pedestrian crossing disconnects the South Poplar community from the points of interest in Canary Wharf and the Isle of Dogs, resulting in disparities in access to green open space and opportunities.

TFL Cycle Highways route CS3 north of Aspen Way is an East to West movement that connects the site to the City of London. However, this route is subject to congestion during peak times and needs improving. This cycle route caters for a high percentage of users in Tower Hamlets, however, there is a lack of Cycle Highways that connect the area north of the Isle of dogs to the south of the river. TFL are working towards improving existing cycle routes and introducing new ones and will feature a new cycleway from Hackney to Isle of Dogs, a 7.5km route connecting Hackney to the Isle of Dogs via Westferry, Mile End and Victoria Park (extension of C35).

Encouraging cycling as an active mode of transport is essential in combating climate change, especially as figure x shows how far cyclists can travel within 20 mins. This supports the idea of a 20-minute city whereby services are reasonably reachable creating more sustainable neighbourhoods.

Our masterplan must address the connectivity issue that creates the North-South divide, which perpetuates social exclusion and lack of access to services and opportunities.

We will address this by creating a key link over the DLR depot connecting Canary Wharf to South Poplar.

Figure 27: Shows 20 mins radius from site as a cyclist at 12pm.

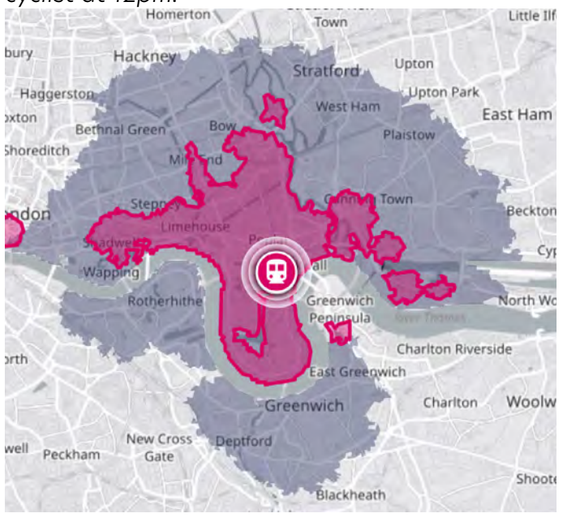


Figure 28: Shows 20 mins radius from site when using public transport at 12pm

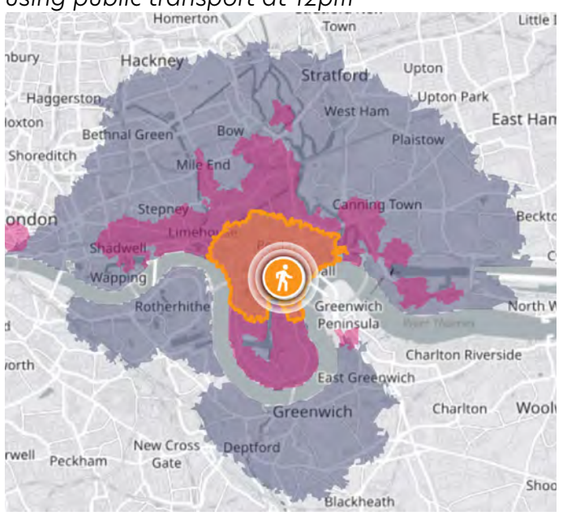


Figure 29: Figure x: Shows 20 mins radius thats walkable from site as a at 12pm

land-use map

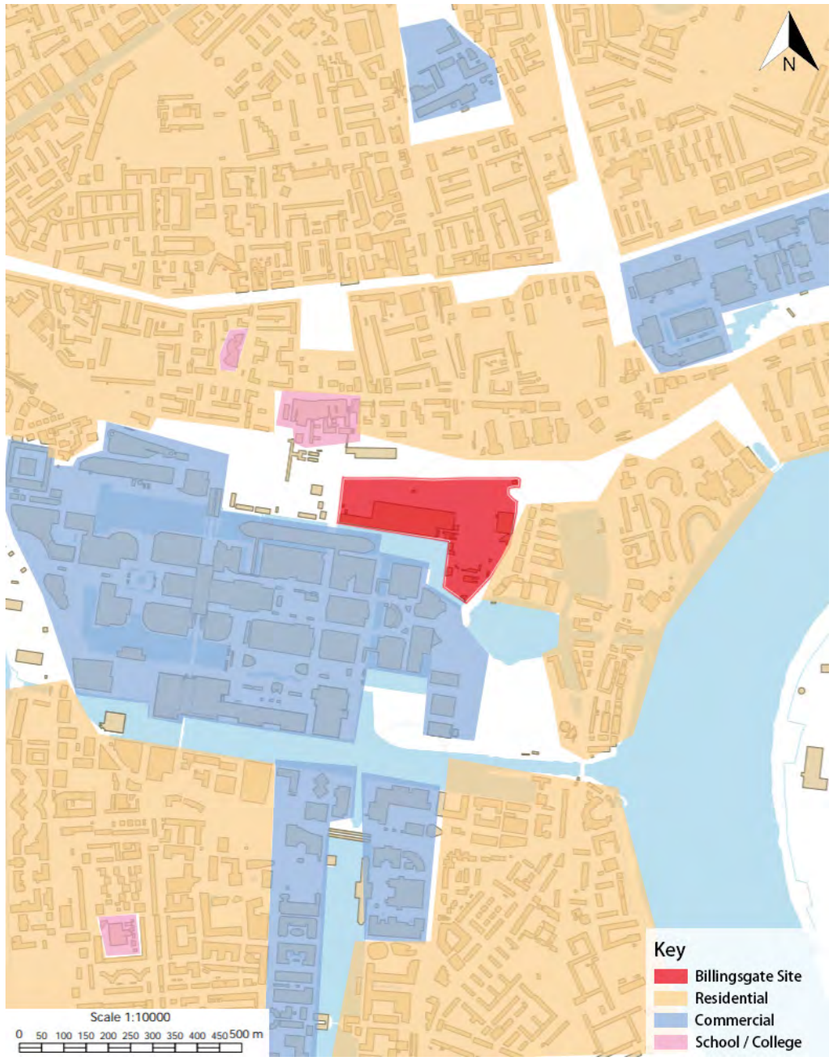


Figure 30: Map showing the land use in the Isle of Dogs.

The immediate context of Canary Wharf is the high density of commercial development and well connection to the rest of London. It should be benefited for surrounding residential, but there are social, economic and environmental disparities between Canary Wharf and South Poplar due to the poor pedestrian and bicycle connection. The Billingsgate site provides the opportunity to improve the existing connection that gives easy access points for residents of South Poplar to Canary Wharf.

building heights

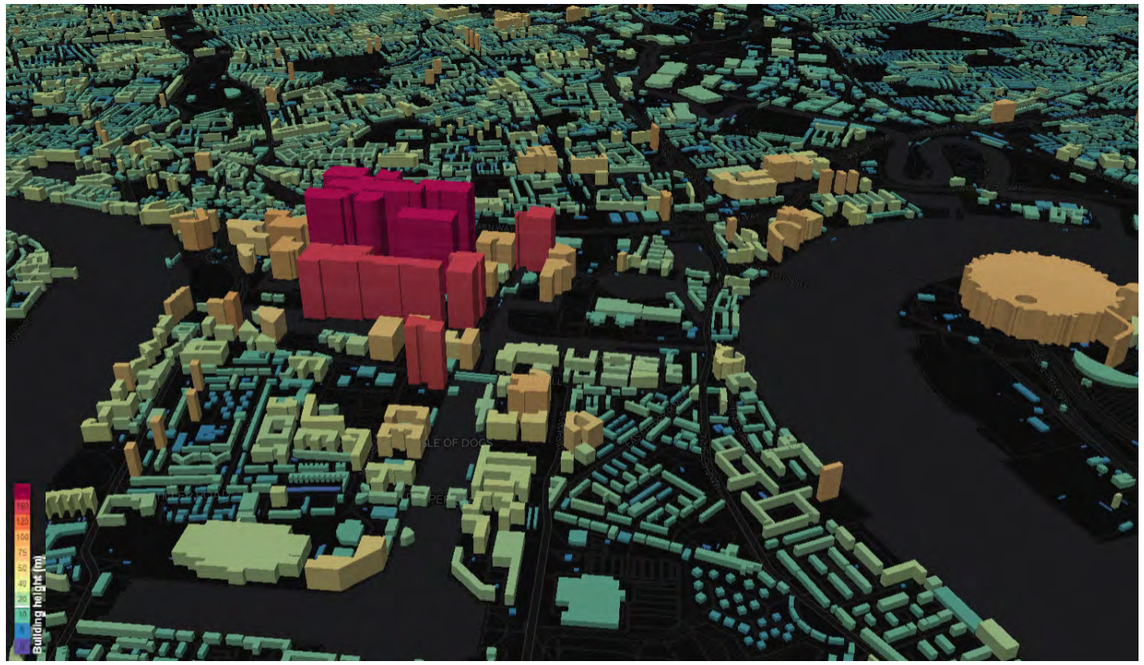


Figure 31: Building height distribution around Canary Wharf, Isle of Dogs and Poplar.

There is a clear divide in building heights between Canary Wharf and South Poplar.

Canary Wharf presents a high density of 150m-200m tall buildings, overshadowing Billingsgate market which stands at just 25m.

In contrast, the Isle of Dogs (south) and South Poplar have buildings heights averaging 10-20m, which as shown on the land-use map is predominantly residential.

The masterplan should respond to this by stepping down the building heights from the heights of Canary Wharf to the smaller scale in South Poplar.

street sections

Poplar High Street is located north of the site, past Aspen Way. It is a key road for South Poplar, containing a variety of shops and services.

The High Street has generous pavement widths - 4m on the southern side and 4-5m on the northern side, taking advantage of sunlight.

The road width is squeezed by traffic calming measures and on-street parking to create a more pleasant pedestrian experience. The roadway is around 6m in width.

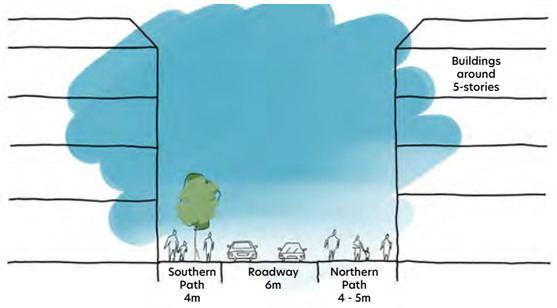


Figure 32: Poplar High Street, Street Section.

Trafalgar Way has a sense of abandonment due to the buildings being set-back from the road. On one side is the Billingsgate site, so little borders the road, and on the eastern side is Fraser Place, which is set-back between 2 - 20m.

The western and eastern pavements are both 3m and the dual-lane roadway is 15m with a 1.5m central buffer with planting.

This is very much a more car-orientated street.

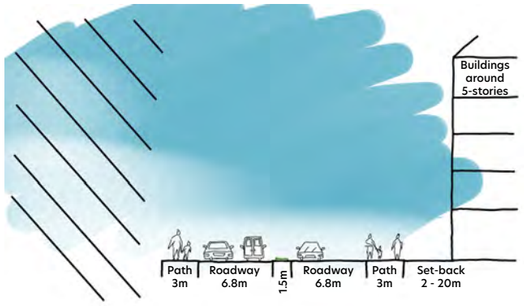


Figure 33: Trafalgar Way Street Section.

The environment in Canary Wharf is staggerinling different to South Poplar. The streets follow a stringent grid structure and are uniform.

The southern side pavement is 3m, whilst the northern side is around 8m with occasional planters to provide a nicer pedestrian experience, taking advantage of sunlight on that side of the street. The roadway is 9m in width, including on-street parking.

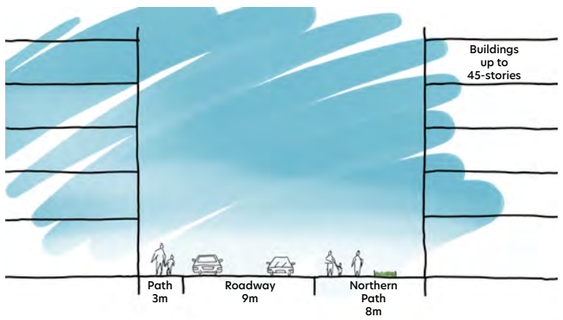


Figure 34: North Colonnade Street Section.

From this, the masterplan should seek to include wide streets, with wider spaces for pedestrians where sunlight is more advantageous. Following the local plan designating this development as car-free, this proposal should seek to implement smaller road widths, like that of Poplar High Street, in order to create an appropriate distance between buildings and allow access for special service vehicles.

sun - wind - sound analysis

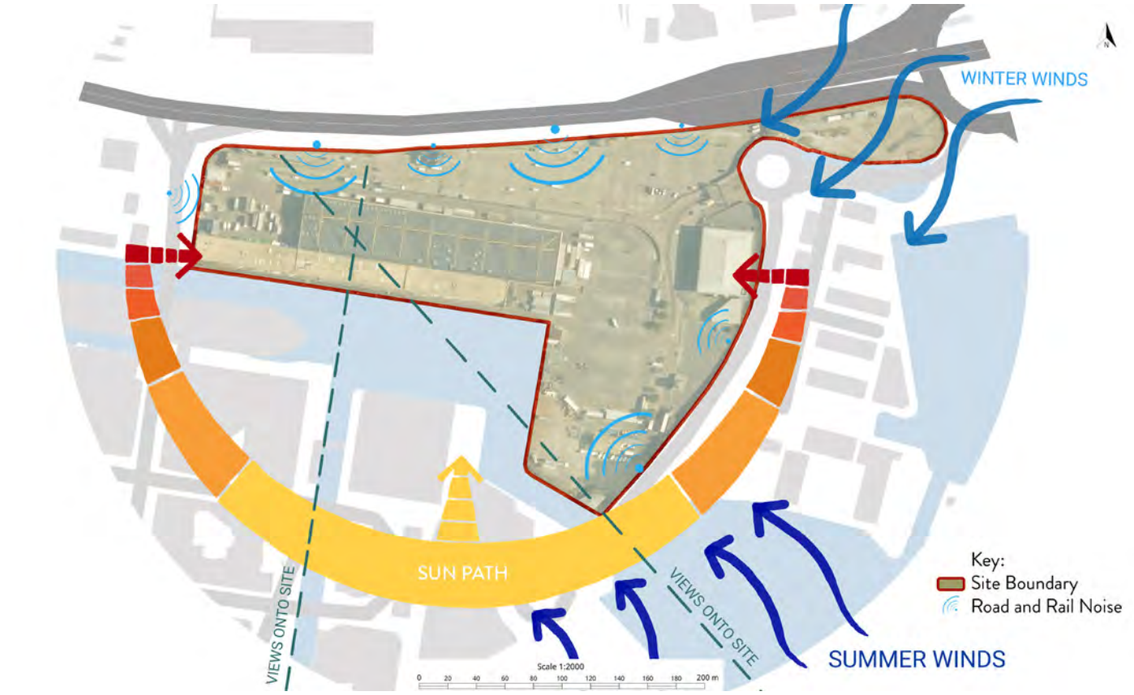


Figure 35: Drawing showing the sun, wind and sound impacts on site.

It is important to gain an understanding of the wind and sun directions within the site to correctly position buildings for solar gain and to prevent wind tunnelling.

Being a south-facing site it is best to position buildings towards the waterfront. Wind also blows from South-Eastern and North-Eastern directions, so tall buildings should not be placed along the eastern boundary.

The diagram also highlights the significant noise and air pollution along Aspen Way and Trafalgar Way. The masterplan would need to find solutions to mitigate this.

The views into the site are also directed by the open air above the dock, and so these view lines should be continued.

noise mapping

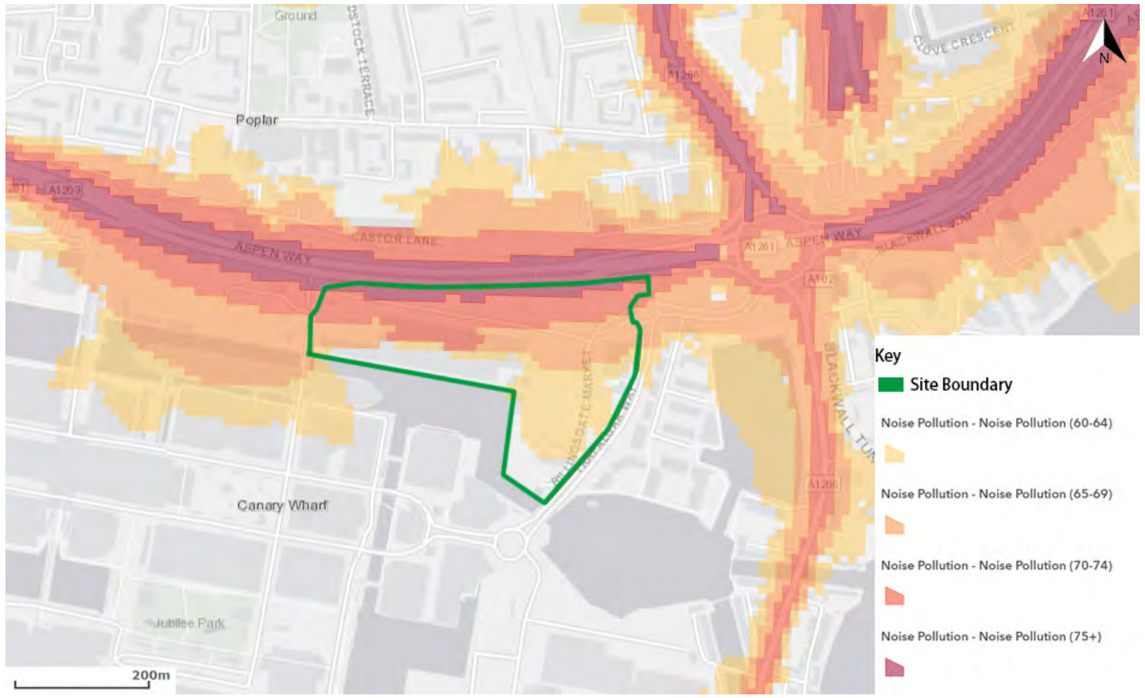


Table 7.21 Proposed Development – Link Flow Analysis

Link	2019 Baseline (Scenario 1)		2031 Baseline Minus (Scenario 2b)		2031 + Proposed Development (Scenario 3)		% Change between 2031 Baseline Minus and 2031 + Proposed Development	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Aspen Way Eastbound	2,049	3,202	2,361	2,956	2,421	2,986	3% (60)	1% (30)
Aspen Way Westbound	3,600	2,699	3,637	3,047	3,775	3,093	4% (138)	2% (46)
Aspen Way 2-Way	**5,649**	**5,901**	**5,998**	**6,003**	**6,196**	**6,079**	3% (198)	1% (76)
Upper Bank Street Northbound	239	502	238	463	274	500	15% (36)	8% (37)
Upper Bank Street Southbound	291	183	312	204	331	212	6% (19)	4% (8)
Upper Bank Street 2-Way	**530**	**685**	**550**	**667**	**605**	**712**	10% (55)	7% (45)
Hertsmere Road Northbound	35	157	54	154	156	205	189% (102)	33% (51)
Hertsmere Road Southbound	370	188	447	224	577	289	29% (130)	29% (65)
Hertsmere Road 2-Way	**405**	**345**	**501**	**378**	**733**	**494**	46% (232)	31% (116)
Limehouse Link	2,178	1,928	2,022	1,981	2,029	1,990	0% (7)	0% (9)
Limehouse Link (1-way only)	**2,178**	**1,928**	**2,022**	**1,981**	**2,029**	**1,990**	0% (7)	0% (9)

Figure 36: Map and associated table displaying the noise pollution generated by Aspen Way.

Aspen way is the leading cause of noise pollution in the Billingsgate site. Nearly half of the site is affected by moderate to high-intensity noise pollution. Environmental Statement Main Report (2020) shows the traffic flow of Aspen Way is expected to reach around 6,000 per hour in 2031, which has 10 times the traffic flow of nearby roads. The reason could be attributed to the connection to the significant locations such as the City of London and London City Airport. Therefore, the design of the north of the site is quite important.

regional policies

London Plan (Mayor of London, 2021)

The London Plan 2021 is a regional Spatial Development Strategy that sets out policies and research to guide appropriate, sustainable development in London over the next 25 years. Listed are the key policies related to this project:

GG1 Building strong and inclusive communities

GG2 Making best use of land

GG3 Creating a healthy city

- Improve air quality
- Improve access and quality of greenspaces.
- Ensure new buildings are well-insulated and ventilated.
- Create a healthy food environment.

GG4 Delivering the homes Londoner's need

- Strategic target of 50% affordable housing.
- Mixed and inclusive communities.

GG5 Growing a good economy

GG6 Increasing efficiency and resilience

- Move towards a low-carbon circular economy
- London to become a zero-carbon city by 2050.
- Adapt to climate change, reduce impacts of flooding, heatwaves and the urban heat island effect.

SD1 Opportunity areas

- Isle of Dogs has capacity to deliver 29,000 homes and 110,000 jobs.

D1 London's form, character and capacity for growth

D3 Optimising site capacity through the design-led approach

- Form and layout -> respond to local distinctiveness; facilitate active travel.
- Experience ->safe and inclusive environments.
- Quality and character

D5 Inclusive design

- Design should account for London's diverse population.
- Provide people-focused spaces that facilitate social interaction.
- Welcoming with no disabling barriers.

D6 Housing quality and standards

Type of dwelling		Minimum gross internal floor areas* and storage (square metres)			
Number of bedrooms (b)	Number of bed spaces (persons(p))	1 storey dwellings	2 storey dwellings	3 storey dwellings	Built-in storage
1b	1p	39 (37) *	N/A	N/A	1
	2p	50	58	N/A	1.5
2b	3p	61	70	N/A	2
	4p	70	79	N/A	2
3b	4p	74	84	90	2.5
	5p	86	93	99	2.5
	6p	95	102	108	2.5
4b	5p	90	97	103	3
	6p	99	106	112	3
	7p	108	115	121	3
	8p	117	124	130	3
5b	6p	103	110	116	3.5
	7p	112	119	125	3.5
	8p	121	128	134	3.5
6b	7p	116	123	129	4
	8p	125	132	138	4

Figure 37: London Plan Space Standards (Mayor of London, 2021)

D7 Accessible housing

- 10% of dwellings to be accessible for wheelchairs.
- All other dwellings must be adaptable.

D8 Public Realm

- Should be well-designed, safe, accessible, inclusive, attractive, well-connected, and related to context.
- Space should contribute to active travel.
- Buildings should define and activate the public realm.
- Incorporate green infrastructure into the public realm.
- Ensure appropriate shade, shelter, seating and direct sunlight.

H6 Affordable housing tenure

- Minimum 30% of affordable housing should be low-cost rented homes (London affordable rent or social rent)
- Minimum 30% of affordable homes to be intermediate products meeting the definition of genuinely affordable housing.

S4 Play and informal recreation

- Development should increase opportunities for play, with good-quality, accessible play provision.

S5 Sports and recreation facilities

- Increase and enhance provision of facilities in accessible locations.
- Maximise multiple use facilities.

E11 Skills and opportunities for all

- Development should support employment, education and training opportunities.

G1 Green infrastructure

- London's green spaces should be protected and enhanced.

G4 Open space

Development should:
- Not result in the loss of protected open space; and
- Create areas of publicly accessible open space.

G5 Urban greening

- Major development should contribute to the greening of London, through high-quality landscaping, green roofs, green walls, and nature-based sustainable drainage.

G6 Biodiversity and access to nature

- Development proposals should mitigate impacts on biodiversity and should secure biodiversity net gain.

SI 1 Improving air quality

SI 2 Minimising greenhouse gas emmissions

- Major development should be zero-carbon.
- Follow energy hierarchy: Be lean; Be clean; Be green; Be seen.

SI 3 Energy infrastructure

- Billingsgate site is identified as a heat network -> district heat and energy potential.

SI 4 Managing heat risk

- Development should minimise adverse impacts on the urban heat island effect through design, layout, orientations, materials and incorporation of green infrastructure.

SI 7 Reducing waste and supporting the circular economy

SI 13 Sustainable drainage

SI 17 Protecting and enhancing London's waterways.

T2 Healthy streets

Promote the healthy streets approach to:
- Improve health;
- Reduce car dominance, severance, vehicle emissions;
- Increase walking and cycling and public transport use; and
- Improve street safety and comfort.

T5 Cycling

- Development should remove barriers to cycling.
- Cycle parking is most appropriate off the highway.
- Finance and professional industry -> 1 space per 175sqm;
- Housing -> 2 spaces per dwellings;
- Schools -> 1 space per 16 people.

T6 Car parking

- Car-free developments should have no general parking, but should provide parking for disabilities.
- Car parking acceptable for electric vehicles.
- Loading spaces permitted.

T6.2 Office parking

- Office developments in the Northern Isle of Dogs should be car-free due to its high connectivity with public transport.

local policies

Tower Hamlets local plan (Tower Hamlets, 2020)

The Tower Hamlets Local Plans sets out the boroughs vision and objectives for the future. Listed below are the key policies related to development on the Billingsgate Site.

S.SG1 Areas of growth and opportunity in Tower Hamlets

- South Poplar and Canary Wharf will deliver a significant portion of the boroughs future housing need.

S.SG2 Delivering sustainable growth

Managed growth through:
- Good design;
- Preserved character and setting.

Shares benefits of growth through:
- Healthy environments;
- Mixed and balanced communities;
- Tenure-blind developments;
- Local training and employment opportunities.

S.DH1 Delivering high quality design

- Appropriate scale, mass and form;
- Coherent building lines and a complementary streetscape rhythm;
- Avoid over-development;
- Architectural language;
- Inclusive and integrated spaces;
- Positive biodiversity.

D.DH2 Attractive streets, spaces and public realm

- Enhance connectivity, permeability and legibility;
- Improve connectivity to public transport hubs
- Maintain existing routes
- Incoporate 'scured by design';
- Optimise active frontages on public streets;
- Clear space definition;
- Public art at gateways;
- Design-out left-over space;
- Reduce visual clutter;
- High-quality surface materials.

S.DH3 Heritage and Historic environment

- Development of heritage asset permitted where the fabric, setting and character is preserved.

D.DH2 Tall buildings

Must demonstrate that they will:
- Be of a height, scale and mass proportionate to their role and function;
- Enhance the character and distinctiveness of the area;
- Positively contribute to the skyline;
- Maintain a high-quality ground floor experience;
- Have no impact on the micro-climate.

S.H1 Meeting housing needs

- Development should contribute to mixed and balanced communities.
- Minimum 35% affordable housing -> mixed rent and intermediate affordable tenures.
- Encouraged to meet needs of elderly, disabled, students and gypsies.

D.H2 Affordable housing and housing mix

- Affordable housing should be 70% rented and 30% intermediate tenure split.

	Market	Intermediate	Affordable rented
1 bed	30%	15%	25%
2 bed	50%	40%	30%
3 bed	20%	45%	30%
4 bed			15%

Figure 38: Local Plan affordable housing requirements (Tower Hamlets, 2020).

D.H3 Housing standards and quality

- Follow London Space Standards.
- 10% of dwellings to be wheelchair accessible.
- Affordable housing should not be distinguishable.
- 5sqm of outdoor private space per 1-2person dwellings.
- Balconies should be a minimum 1.5m x 1.5m.

D.EMP2 New employment space

- Billingsgate is highlighted for office provision.
- Major schemes should have at least 10% affordable employment space.
- Live-work units not supported.

S.TC1 Supporting the network and hierarchy of centres.

- Should support key global employment centre.
- Improve local accessibility to Canary Wharf.
- Should be a transition between scale, activity and character.
- Development is expected to deliver new retail and leisure space.

S.OWS1 Creating a network of open spaces

Proposals must provide accessible, well-connected and sustainable network of open spaces through:
- Character
- Enhance destinations
- Ecological wildlife corridors
- Improve the value and accessibility of open space.

S.OWS2 Enhancing the network of water spaces

- Maximise opportunities to enhance aesthetic, ecological and biodiversity values.
- Improve way-finding
- Promote water spaces for cultural, recreational and leisure activities.

D.OWS3 Open Space and green grid networks

Strategic development should contribute new accessible open space which:
- Is visible and accessible;
- Inclusive and provides facilities for healthy lifestyles and recreation;
- Meets demands for sport facilities;
- Incorporates soft landscaping and sustainable urban drainage systems.

Development of allotments and pocket parks encouraged.

D.ES2 Air quality

- New build development must consider positioning of open space to reduce exposure to air pollution.
- Billingsgate site experiences high levels of nitrogen dioxide emissions.

D.ES3 Urban greening and biodiversity

Development must protect and enhance biodiversity through:
- 'Living building' elements;
- Retaining existing habitats;
- Increasing provision of street trees.

D.ES4 Flood risk

- Billingsgate site is located in Flood Zone 3a - future flood risk in 50years.

D.ES5 Sustainable drainage

- Development must reduce risk of surface water flooding, where possible implementing Sustainable Urban Drainage Systems and Grey Water recycling.

D.ES7 A zero carbon borough

- Residential development to be zero carbon by 2031.
- Non-residential buildings to be BREEAM excellent.
- On-site renewable energy generation would provide a 20% reduction in CO2 emissions.

D.ES10 Overheating

- Buildings should minimise the need for air conditioning.
- New developments must ensure that buildings and spaces do not overheat.

S.TR1 Sustainable travel

Development is expected to:
- Prioritise pedestrians and cyclists;
- Integrate public transport, walking and cycling routes;
- Not hinder transport capacity, safety, or accessibility.

Billingsgate Market Site - Isle of Dogs

Design principles:
- Respond to positively to the existing character;
- Enhance and protect the accumulator tower;
- Improve walking and cycling connections;
- Improve biodiversity;
- Address severance along Trafalgar Way and Aspen Way.
- Prevent excessive overshadowing.
- Maximise accessibility to the waterside.

local policies

Billingsgate Statutory Planning Document (SPD)

The Billingsagte SPD aids development by highlighting appropriate National and Regional Policies, as well as noting site issues. The SPD also provides the following Design and Masterplan Guidance:

SP1 Character and identity

- Design should respect and positively respond to context, townscape, landscape and public realm.

North Dock:

- Focus on strengthening Canary Wharf as a business area and major town centre.
- Accommodate a mix of supporting uses
- Buildings should set down from One Canada Square.

Dockside:

- Hard-landscaped dockside promenade should reflect industrial heritage.
- Step down buildings adjacent to public spaces to improve the microclimate.
- Provide active uses and public spaces adjacent to the North Dock.
- Maximise access and views towards the water.
- Use a pallete of natural materials that reflects industrial heritage.

SP2 Movement and connections

- Should deliver a legible and well-defined network of connections.
- North-south connections should be addressed.

Development should:

- Deliver a clear block pattern that support desire lines
- Link public open spaces;
- Provide appropriate setbacks;
- Improve connectivity to Poplar;
- Create a new cycle-priority route
- Consider the potential of an overbuild above Aspen Way allowing seamless physical and social integrations.

SP3 Public realm and open space

Development should:

- Design open space in coordination with neighbouring sites to ensure efficient use of land.
- Enhance legibility and ensure a clear distinction between public and private spaces.
- Protect and enhance the waterside dock setting.
- Step back from dockside edges to improve quality, character and continuity.
- Ensure open spaces are accessible
- Incorporate elements of greenery including those that support and improve biodiversity.
- Incorporate elements of sustainable urban drainage systems.

Open Space distributions:

- Billingsgate - 0.4hectares
- Aspen Way - 1hectare.

SP4 Massing and heights

Development is encouraged to provide an urban block structure of 3 core components:

- Podium;
- Plinth; and
- Taller elements.

Podium and plinth massing should respond to context:

- Being proportionate in scale
- Decrease in mass away from Canary Wharf
- Provide a human scale sense of enclosure.

SP5 Uses and social infrastructure

- Development should deliver:
- Residential; employment; community and educations uses.

SP6 Liveability and sustainability

Pedestrian priority - scale

- Way-finding
- De-prioritise cars
- Support permeability

Active streets

- Continuous streetscapes
- Mixed-uses along key routes
- Service areas should be minimised.

Views and daylight

- Maximise duel-aspect homes
- Create breaks in residential blocks
- Promote shallow-plan office design.

Good microclimate

- Support public open spaces in locations with good sun conditions.
- Distribute massing so streets have adequate sunlight.

Quality homes

- Integrate mixed typologies
- Private a variety of private and semi-private amenity space.

Water management.

- Contribute to provision of sustainable drainage systems
- Reduce flood risk.

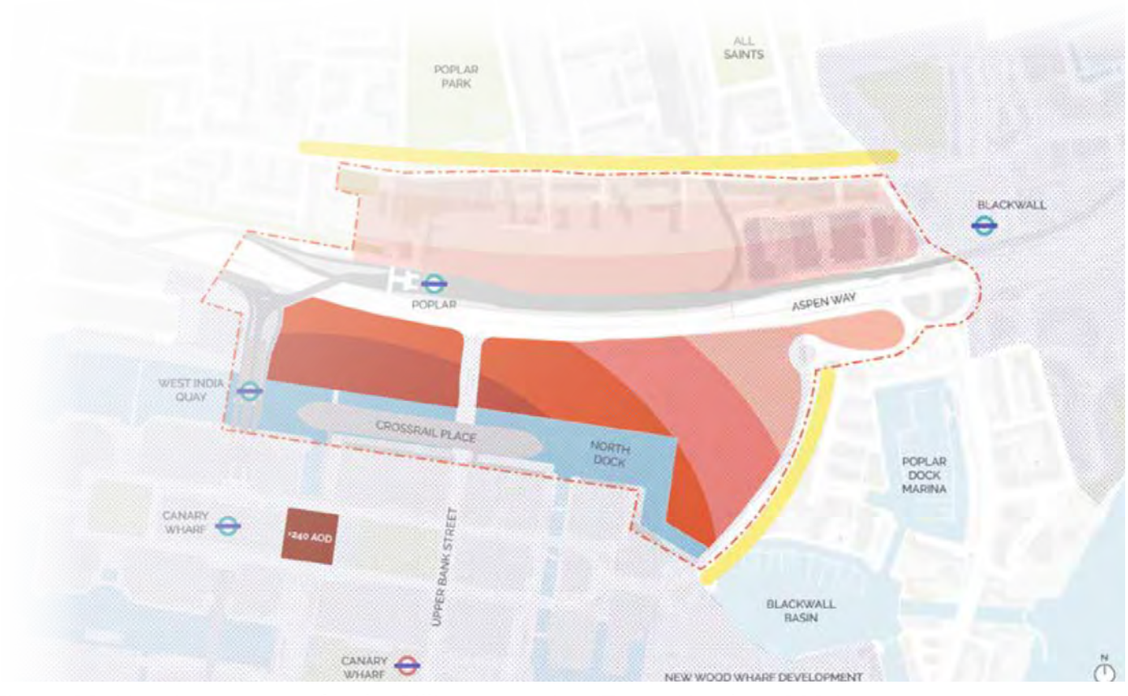


Figure 39: Massing strategy for the Billingsgate site. (Tower Hamlets, 2021)

opportunities and constraints

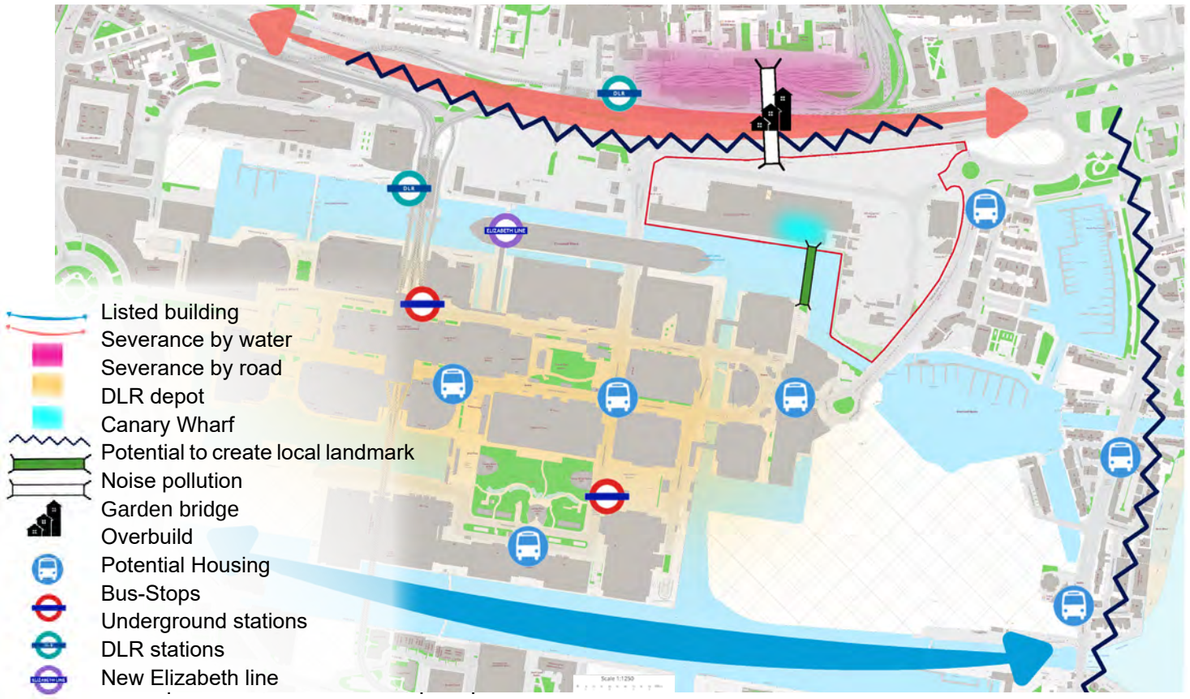


Figure 40: Shows opportunities and constraints of development site.

Opportunities

- Potential to retain market structure frame to be a local landmark - skate park, family spaces and houses under the frame.
- Retain listed structure in a community exhibition, arts, and leisure space.
- Garden bridge with cafe connecting Billingsgate to Canary Wharf.
- Potential to build over Aspen Way and DLR - large overbuild to deliver housing and help finance the development.
- Activate the waterfront by creating pedestrian routes along the riverside that double up as public realm.
- Physical connections connect to major airports, connecting the site globally, which supports the brief of creating a new global district.

Constraints

- Development must not disrupt the DLR depot.
- Air and Noise pollution from Aspen Way.
- Delivering affordable housing may be challenging as the housing market may become expensive and unattainable for the community, perpetuating the socio-economic disparity.
- Connectivity constraints from Aspen Way and the dock - a physical and visual barrier.
- Dock water is dirty and creates unpleasant smells.
- Urban Heat Island Effect.
- Flood risk, although low, the area is largely hard infrastructure and the land is flat on the Billingsgate Site.
- Marine biodiversity must be protected and construction could cause contamination to water harming aquatic life.
- Tall buildings overshadow the site and create wind turbulence.
- The Covid-19 pandemic has made working from home more desirable, leaving offices empty.
- Lack of open green space can make be a threat to the liveability of the area as recent studies show the positive correlation between well-being and access to open space in creating healthier communities.

masterplan

masterplan

Vision:

A vibrant, creative, living and working community that enhances South Poplar through connectivity and urban greening.

This masterplan seeks to create direct connections between South Poplar and Canary Wharf using a deck overbuild strategy and onward bridges. As a car-free development cycling and walking will become a pleasant experience and there is a dedicated east-west cycle lane through the sites key road. The masterplan seamlessly integrates the two areas through its block layout and building heights.

Following the SPD massing guidance, blocks along Poplar High Street have been organised similar to the typologies along that street, with heights of around 5-7 storeys. This gradually builds up to 15storeys along Market Boulevard.

Enhancing green space and connecting the green network of Poplar to the Isle of Dogs has been achieved with the strategic placement of parks and the use of urban greening, creating legible green infrastructure corridors that fulfil Key Objective 1. The establishment of multi-use activity hubs like a sports hub, and creative community facility enhances the distinctiveness of the area.

Situated close to the River Thames, flood risk could be a significant problem in 50years time. Terminus Fields is a natural wild meadow designed to mitigate flood risk. In addition, the ground level of the site has been raised 3m for future protection. Utilising this underground space will be a district heating and energy centre, designed to provide low-carbon energy to the buildings on site.

Delivering affordable creative spaces is needed in this area. A new community arts and exhibition centre has been placed around the listed building as a space for creators to come together in this thriving part of London. The sites locality to the Greenwich Design District also will enhance this facility.

The local plan stresses the demand for offices at this opportunity site to provide new job opportunities. Multiple office structures have been designed and placed to generate mixed uses along streets. These offices will be tall buildings, but designed using sustainable materials that can be disassembled should the land uses need changing.

Housing is the key land use on-site, aiming to deliver the much-need housing that London and the borough needs. The housing has been designed to take advantage of sunlight. Most of the homes have access to a semi-private communal garden, as well as access to private balconies.

Figure 41: Proposed masterplan for the Billingsgate site.

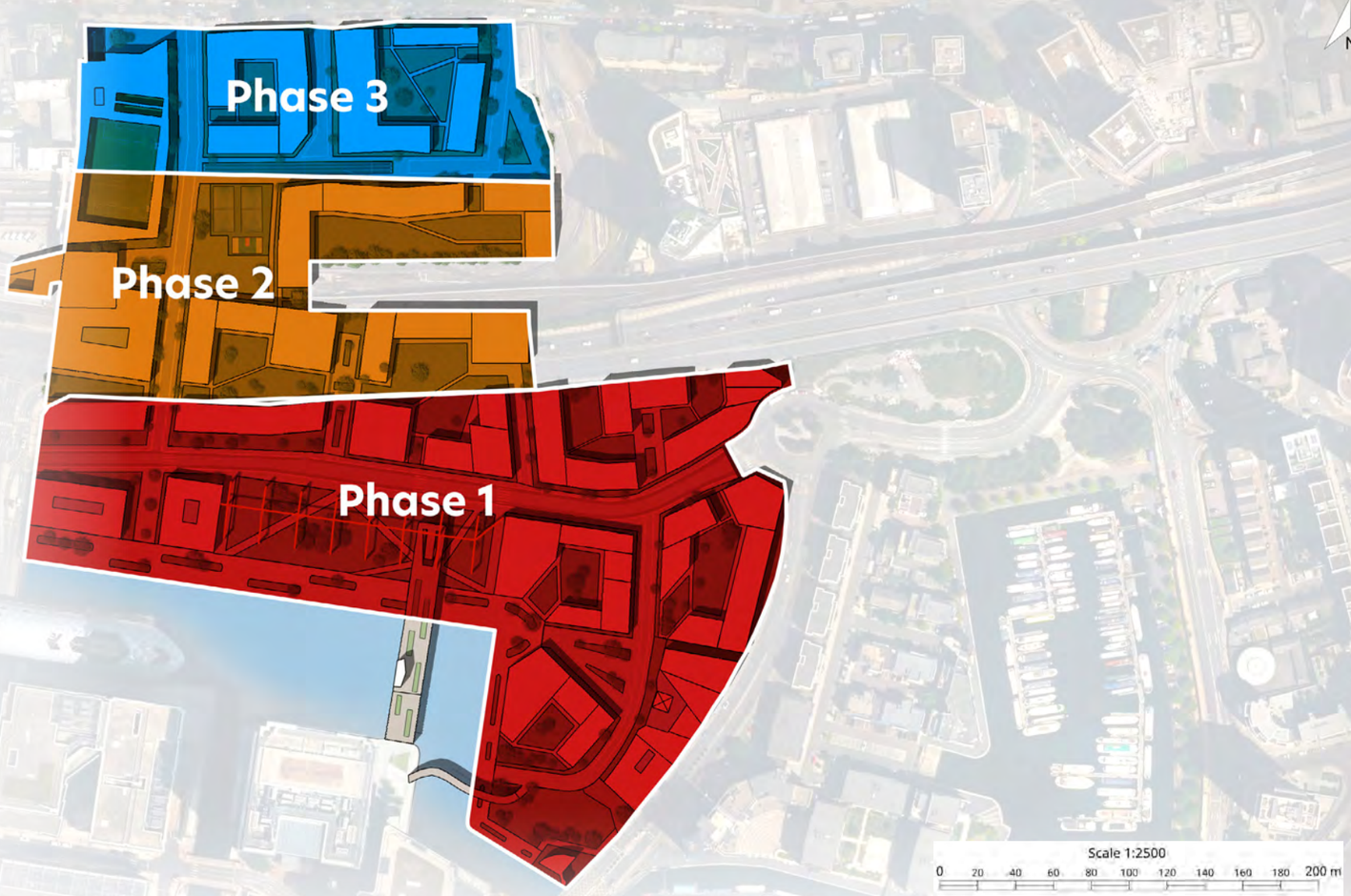
project phasing

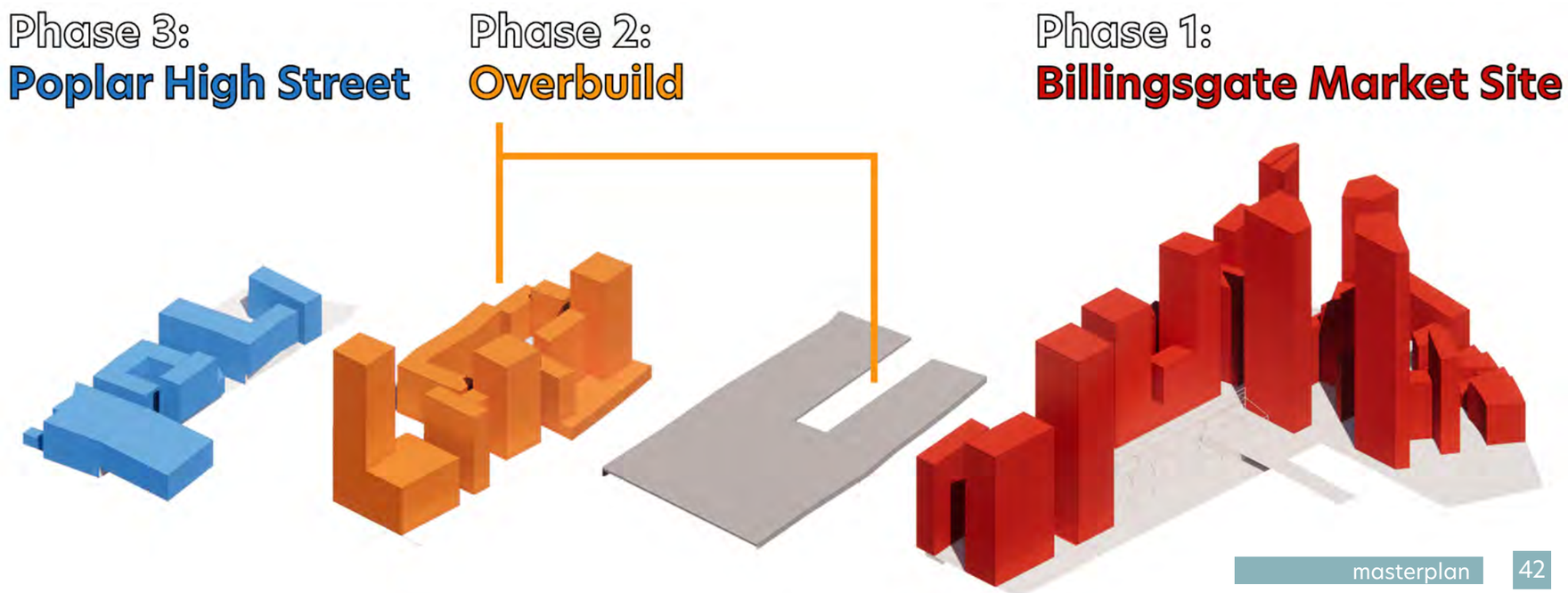
It is integral we have a phasing strategy to ensure the proposed masterplan is viable and can effectively be delivered.

Phase 1: Delivery of our green living wall, promenade, community centre with a rooftop urban farm, residential blocks, office spaces, school retail units. Delivering a diverse mix of services in phase 1 will mean that the new community of the Billingsgate Site is supported and proximity to local services improves social equity. Which will aim to attract a range of users, creating a vibrant area that residents of South Poplar can benefit from.

Phase 2: Delivery of the overbuild will mainly consist of residential buildings, with integrated and standalone office and retail units. To further support the local community and provide public realm to activate the area. To fulfil our landscape and ecology strategy we hope to deliver a sensory garden, that caters for the diverse community, emphasis on making it an inclusive space, accessible for users of all ages, etc. There will be an effort to extend our green infrastructure network further to increase the net gain in biodiversity.

Phase 3: Delivery of our final residential buildings and a school with sports facilities. This phase will aim to physically connect South Poplar to the Billingsgate site, reinforcing our brief to increase connectivity so that access to employment opportunities increases for residents of South Poplar.





deck overbuild strategy

Policies met: GG1; GG3; GG6; SD1; D3; D5; T2; S.SG1; S.SG2; D.DH2; S.OWS1; D.OWS3; S.TR1; SP2; SP4; SP6.

Within our proposal, we have included the erection of an overbuild deck connecting South Poplar to Canary Wharf over Aspen Way. Granted this is ambitious but it can be argued that an overbuild is indeed viable.

In regards to financial viability, TfL has been granted £20 million by the government to unlock new sites that have the potential to deliver homes. Our proposal is perfect for this grant as the overbuild will create an opportunity for homes to be built on land that would previously not offer much.

Further to this the location of the proposal, i.e. near Canary Wharf, means that a world-class overbuild such as the Highline in New York would not be out of place in the area and would add further quality to Canary Wharf and the surrounding areas. Another reason we feel the proposal for an overbuild is that a connection between South Poplar and Canary Wharf is vital in making a successful development in Billingsgate, rather than just allowing a simple bridge connecting the two.

Referring to research by buildoffsite (Price & Fraser, 2019), overbuild development is ‘a restorative urban operation that repairs the source of severance’.

In regards to disruption to Aspen Way and the DLR, rapid assembly can be used. First the enclosure of Aspen Way and the DLR using pre-fabricated concrete. This allows for rapid construction. An overbuild encapsulation has been previously built over the DLR at Royal Mint Gardens, constructed in just a 72-hour period. Once complete, any construction above this deck would have little impact on the operations below.

There are multiple global examples of overbuild projects that have little impact on the operation of rail lines, such as Sunnyside, New York, which is a 180acre structural solution.

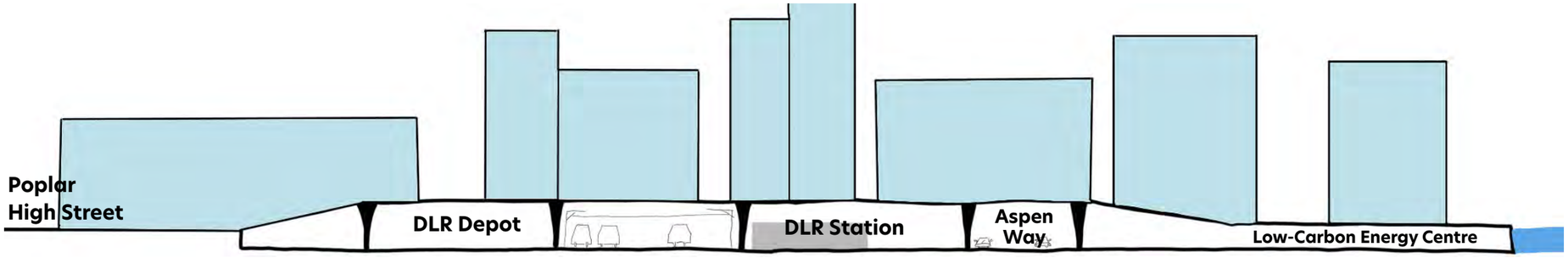


Figure 51: Cross-section of the overbuild deck.

Figure 52: Land-level changes over a railway. (Price & Fraser, 2019)

Figure 53: Deck over railway. (Price & Fraser, 2019).

Stakeholders

To deliver an overbuild, this masterplan must work with key stakeholders who have vested interest in the project:

- Transport for London
- Highways England
- Tower Hamlets Council
- Poplar Social Housing Residents

The first four stakeholders will be able to contribute financially to the construction of the deck, and be repaid with profits from the sale of high density housing.

Each stakeholder is likely to have an influence in the development, such as TfL creating the new DLR station entrance. The overbuild also works with future planned social housing developments on Poplar High Street, offering the expansion of Simpson Road to create greater connection between future developments.

Figure 55 (left): Deck construction above DLR. (Price & Fraser, 2019).

Figure 54: Union Square, Hong Kong, built over a railway. (Moonion, 2007)

street structure

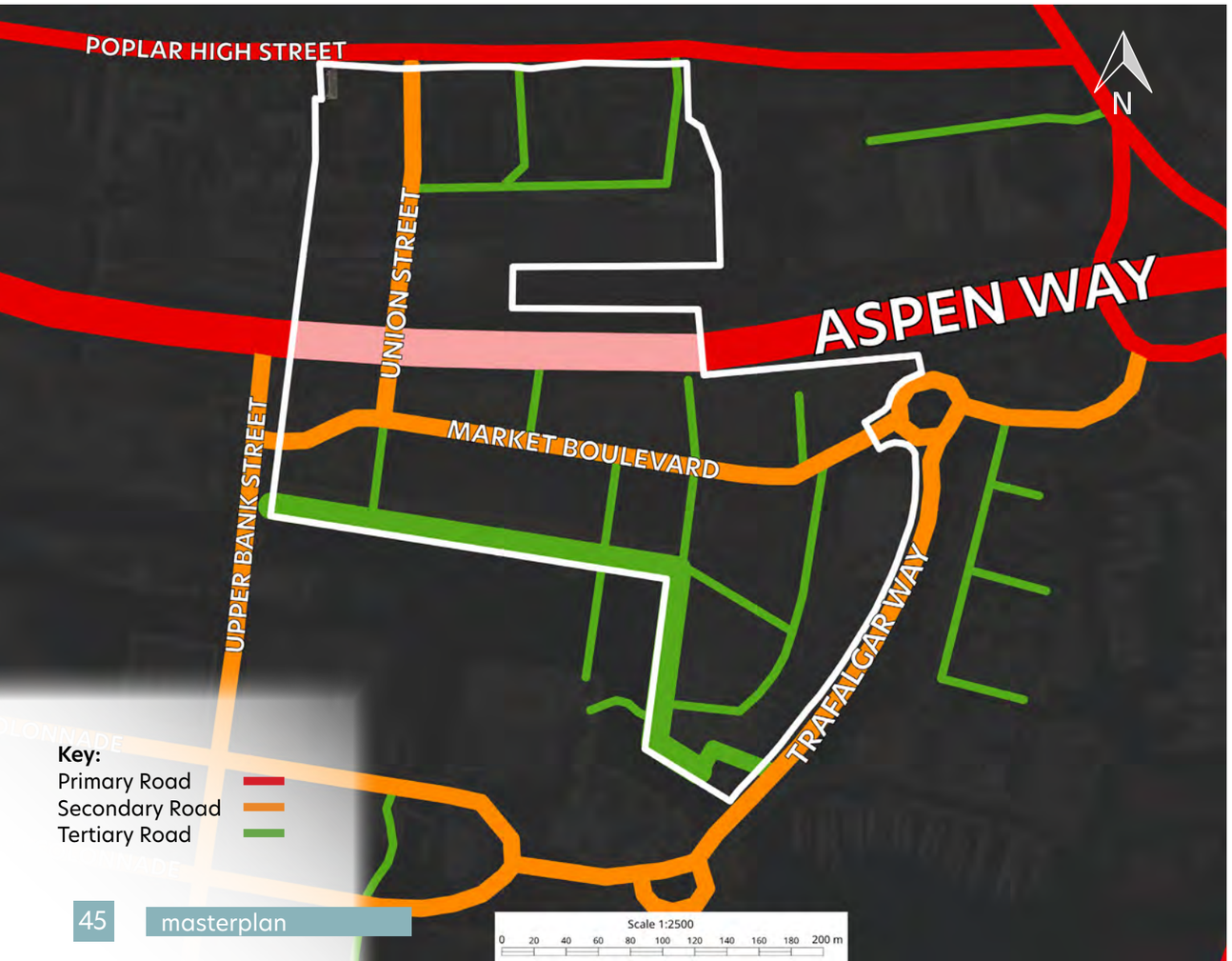
Policies met: D3; T2; T5; T6; D.DH2; S.TC1; S.TR1; SP2

As a car-free development, the site branches off of the primary roads. The masterplan opens up the site to wider connections, creating multiple pedestrian-friendly linkages to Canary Wharf and South Poplar. Therefore increasing accessibility and community cohesion. The simple structure enhances legibility and encourages active travel. It focuses through the site to the DLR entrance and the promenade, where further onward connections exist. An east-west cycle route along Market Boulevard aims to encourage cycling and sustainable mobility.

Eastern access is off of the Secondary Trafalgar Way. Pedestrian access has also been created by continuing the promenade. Western access is achieved through an existing point on Upper Bank Street, but also by extending the pedestrian promenade west. Southern access is created by two bridges linking Canary Wharf to Billingsgate. Northern access has been laid out through the existing street pattern and linked to the overbuild deck. These are people-first streets.

The street hierarchy meets Key Objective 1 to support active travel and create a walkable community.

Figure 42: Street hierarchy of the proposed masterplan.



land use

Policies met: GG2; GG4; GG5; D7; H6; S4; S5; E11; G4; SI 2; SI 3; S.SG1; S.SG2; S.DH3; S.H1; D.H2; D.H3; D.EMP2; D.ES7; SP5.

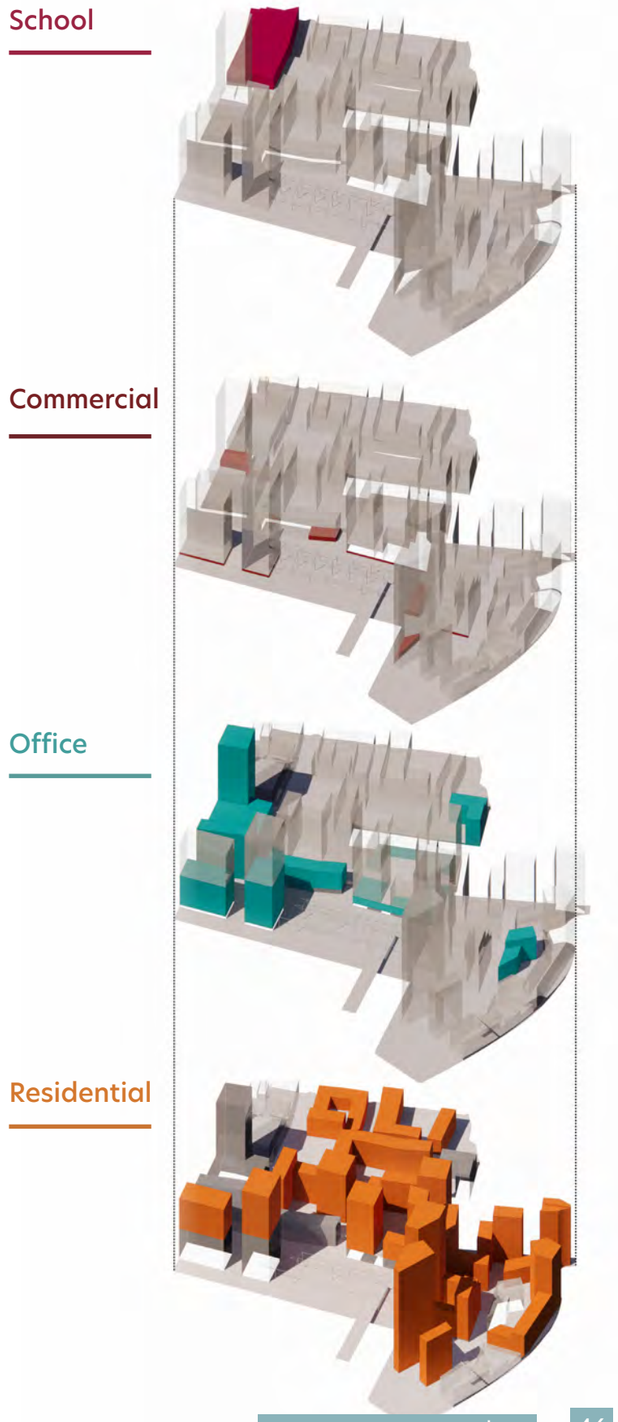
The land use map identifies the mixed-uses across the site. The masterplan is predominantly residential flats, each with a balcony and most with access to a communal garden. Along with key locations such as the promenade and the station square, retail will be located on the ground floors of residential buildings.

Proximity to Canary Wharf, and identified in the local plan, offices are delivered through single buildings and perimeter blocks. The office buildings are taller structures seeking to take advantage of land values and are strategically placed in proximity to connections, such as the promenade, DLR station and the site entrance.

The local plan identifies a need for a secondary school on site. This has been placed adjacent to the Tower Hamlets college. The 8-storey structure will house an open-air rooftop multi-sports court, as well as having access to the public sports facilities in the station square.

Fulfilling the vision, the community arts and exhibition centre provides affordable spaces for creatives to come together.

Figure 43: Land use plan for the Billingsgate site.



massing

Policies met: GG2; GG5; GG6; SD1; D1; D3; SI 4; S.DH1; D.DH2; S.TC1; D.ES10; SP1; SP4.

The buildings have been massed to form a gradual decline in heights from Canary Wharf to South Poplar. Buildings along the waterfront are relatively low, to help create a comfortable environment that is not overbearing. Two landmark buildings stand out along the waterfront, alongside the retained Billingsgate Market roof.

The waterfront has the tallest buildings ranging from 10-50stories, which gradually decline across the site towards Poplar High Street, where buildings stand at 6-stories to match the existing structures along the street. Buildings on the overbuild deck may be taller than noted due to them being raised an additional 6m above ground level.

There is no identifiable variation in building heights between residential and commercial uses. The heights have been created based on the block structure, location and surrounding buildings. For example, the tall structures north of the Billingsgate frame have been designed in a step formation to define the development and take advantage of views towards the water and Canary Wharf.

Figure 44: Proposed buildings heights.

East

Figure 45: Elevation in context with surroundings looking East.

West

Figure 46: Elevation in context with surroundings looking West.

North-West

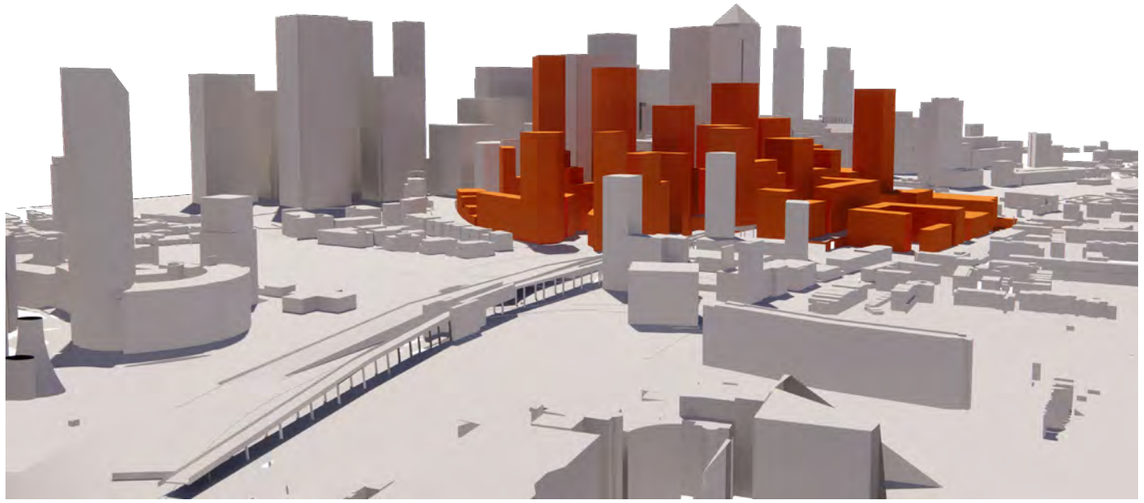


Figure 47: Massing in context of surrounding buildings.

Figure 47 shows how the site responds to its context in terms of its massing. Building heights are generally uniform along the core, with steps down towards the waterfront. It also displays the lower building heights along Trafalgar Way to match the Fraser Place residences. Responding to the low buildings heights along Poplar High Street, the deck overbuild graduates down to 6-stories to match this. The tall building core, with steps down towards the waterfront and Poplar High Street.

The block designs are according to the Billingsgate SPD, noting how a block should have a taller element, and then a uniform block perimeter. Though, this design aimed to limit any significant disparities between building heights in a block.

natural infrastructure

Policies met: GG3; GG6; D1; D5; D8; S4; S5; G1; G4; G5; G6; SI 1; SI 2; SI 4; SI 13; SI 17; T2; S.SG2; S.DH1; D.DH2; S.OWS1; S.OWS2; D.OWS3; D.ES2; D.ES3; D.ES4; D.ES5; SP1; SP3; SP6

In accordance with the All London Green Grid policies, this natural infrastructure plan aims to reduce the severance between South Poplar and Canary Wharf using an urban greening method.

The plan 'maximises synergy' between the spaces through street trees and green setbacks that physically and visually connect the green spaces and activity hubs (Mayor of London, 2012).

This plan responds to the ALGG plan area, identifying a need for green East-West Links. This natural infrastructure plan connects Blackwall to Canary Wharf through green streets and a promenade.

Compliant with policy S.OWS2, this plan enhances the water spaces, providing an attractive promenade.

Figure 48: Proposed green strategy.

public and private space

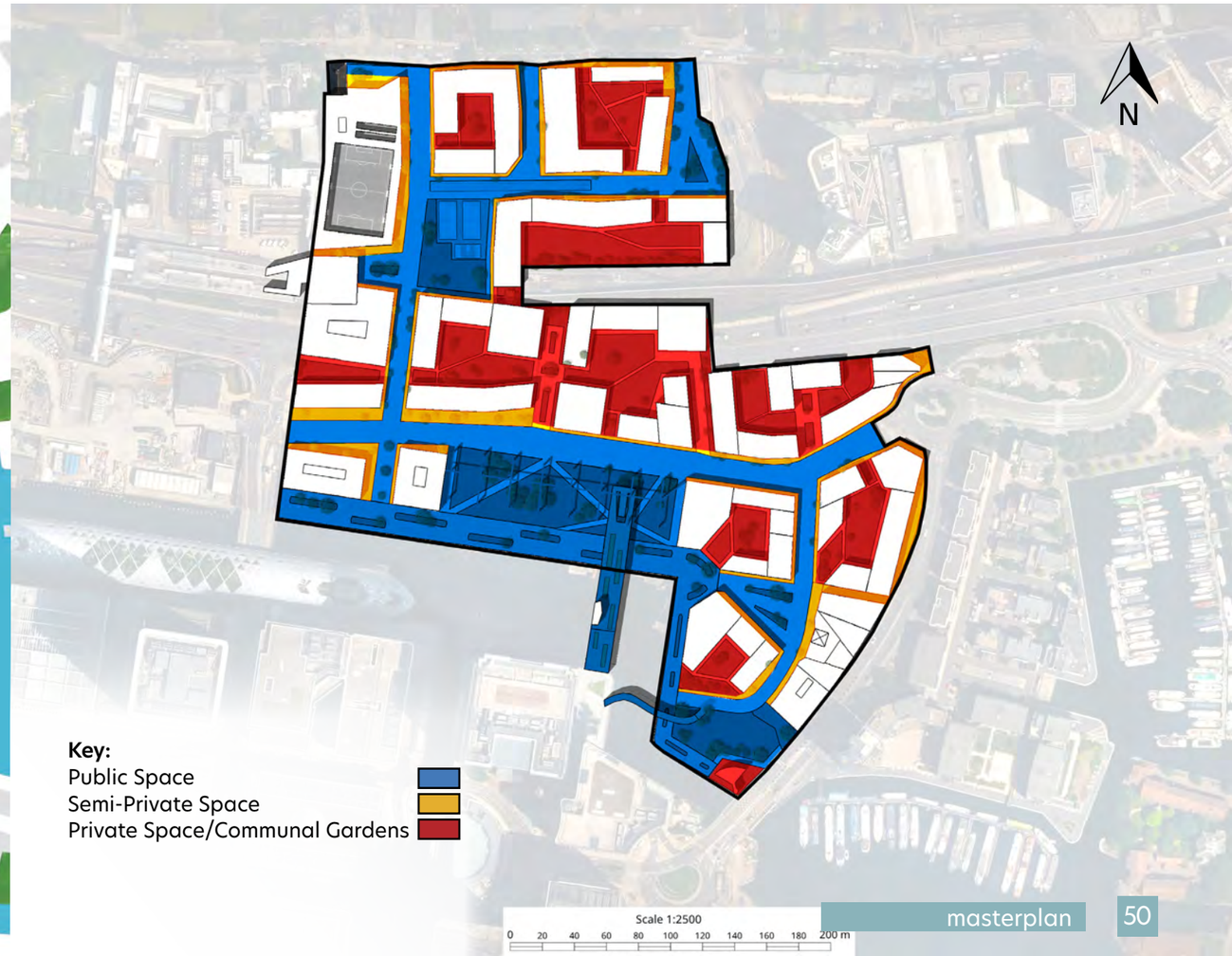
Policies met: GG3; GG6; D1; D5; D8; S4; S5; G1; G4; G5; G6; SI 1; SI 2; SI 4; SI 13; SI 17; T2; S.SG2; S.DH1; D.DH2; S.OWS1; S.OWS2; D.OWS3; D.ES2; D.ES3; D.ES4; D.ES5; SP1; SP3; SP6

As part of creating a wider green network, this masterplan delivers a range of green, open spaces, each with different uses. Each block has a semi-private green buffer of 2 - 3m. These spaces can be personalised by ground-floor flats, creating a sense of ownership and richness. Many residential blocks have access to private communal gardens. This will have opportunities to take ownership and personalise.

Public green space is focused towards the waterfront. These spaces have activity hubs run by the community. The largest open green space is Billingsgate Park, which is partly built on the overbuild deck, so graduates down towards the waterfront. This is not only beneficial for legibility and wayfinding, as a unique landscape, but helps create a distinctive place. Terminus Fields is a nature-based wild meadow and drainage system, designed to mitigate future flood risk.

As part of an urban greening approach, all streets have tree planting. Along the exposed sections of Aspen Way, green 'living' walls will be used to mitigate air pollution.

Figure 49: Proposed public and private space on-site.



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landscape & ecology

Joe Bonomo

introduction

research question

What are the effects of green spaces on deprived neighbourhoods and how can we design landscape and ecology to benefit them?

research aim

The focus of this paper is to identify and understand if and how landscape and ecology have positive and/or negative impacts on deprived neighbourhoods and how we can design them to generate benefits for deprived communities. To do this, this paper will define what makes a neighbourhood be classed as 'deprived', and then go on to use literature to discover the benefit and drawbacks green spaces can have on them. Using this and analysis of exemplar case studies, a set of design principles for how to design landscape and ecology to benefit deprived neighbourhoods will be formed.

research objectives

1. To define what constitutes a 'deprived neighbourhood'.
2. To undertake a literature review to discover the benefits and drawbacks of green spaces felt by derived neighbourhoods.
3. To form a conceptual framework that uses exemplar case studies to identify the key elements to designing landscape and ecology that benefits deprived neighbourhoods.
4. To use the literature review and case study analysis to form a set of design principles for designing landscape and ecology that generates benefits for deprived neighbourhoods.

defining deprivation

The definition of deprivation is based on 'Peter Townsend's pivotal analysis of poverty and deprivation' (Tower Hamlets, 2015, p. 5) which stated:

> ***'Individuals, families and groups can be said to be in poverty if they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved in the societies to which they belong'***

(Townsend, 1979, cited in Tower Hamlets, 2015, p. 5)

However, Townsend also addresses that there is a difference between 'poverty and deprivation', as deprivation is a wider concept (Tower Hamlets, 2015, p. 5). Using this thinking, the Index of Multiple Deprivation (IMD), provides the best measure of deprivation as it combines 37 indicators, with each indicator having a varied influence on the final outcome, as shown in Figure 1. As CABE SPACE (2010, p. 8) notes, it 'combine[s] several indicators, covering a range of economic, social and housing issues, into a single deprivation score'. This gives a clearer picture of the causes of deprivation in a neighbourhood, especially for this research question, which could seek to remedy deprivation through landscape and ecology.

Based on an analysis of Deprivation in Tower Hamlets, a neighbourhood will be classed as deprived if it sits amongst the 20% most deprived neighbourhoods in England, for the purpose of this paper. South Poplar lies within this category.

Figure 50: Influence of 37 indicators on the IMD. (Tower Hamlets, 2015).

literature review

Introduction
There has been much research into the effects of green space, whether that be for urban contexts, related to health, or based on the accessibility. This literature review seeks to join up these research papers to identify inequalities in green space provision, and the benefits and drawbacks attached to them.

Inequalities in the provision of green space
There is a recognised link in the literature between socioeconomic inequalities and the 'unequal distribution of healthy environments' (Jarvis, et al., 2020, p. 2). Research by CABE SPACE (2010, p. 10) found that urban areas with ethnically diverse communities typically have less local green space, which is of poorer quality. They noted that deprived communities 'receive a far worse provision of parks and green spaces than their affluent neighbours', a trend that McIntyre (et al., 2008, cited in CABE SPACE, 2010, p. 10) reiterated in Glasgow discovering that wealthier communities had greater access to green space and recreational facilities compared to poorer communities.

The Urban Parks Forum notes that public parks can help to reduce inequalities in deprived areas and strengthen the sense of community (Tibbatts, 2002, p. 6). However, it is important to consider what green space is provided, as increased accessibility and quality of park space does not necessarily link to nature exposure and recreational spaces, which much of the literature highlights as key to health benefits (Jarvis, et al., 2020, p. 2).

Access and use of green space
The consensus of access and use of green spaces in deprived neighbourhoods between literature is not joined up. Research by Jones (et al., 2009) saw no evidence that access to green space is poorer in deprived neighbourhoods, but instead, there is a perceived lack of access, noting that 'residents from more deprived areas were much more likely to report access as difficult'.

To further this, CABE SPACE (2010, p. 38) found that 'less than 1 per cent of those living in social housing … reported using the green spaces in the housing estate they lived in'. This again ties in with research by Jarvis (et al., 2020) which highlighted that the presence and accessibility of green space do not always link to natural exposure which generates benefits for health.

A detailed report by Friends of the Earth, 2020, analysed how to eliminate green space deprivation in England. By classing neighbourhoods A – E (D and E being the most deprived neighbourhoods) they were able to determine that E-rated areas (9.6million residents) lacked the most green space (de Zylva, et al., 2020, p. 38). Concerning Tower Hamlets, one of the most divergent councils in terms of income, out of 32 neighbourhoods, 30 are class D and E (de Zylva, et al., 2020, p. 41).

Benefits of green space
Much of the literature understands that the 'provision of public parks helps to reduce inequalities, poor health and social exclusion', with Tibbatts (2002, p. 5) even highlighting this benefit for deprived neighbourhoods, which also experience reduced social tensions as a result. Furthermore, Mitchell & Popham (2007, p. 683) discovered this association between green space and health, but learnt the 'level of urbanity and income deprivation' influences the strength of this association, with dense urban, low-income areas, receiving fewer health benefits.

Improvements to air quality is a widely recognised benefit of green space, giving 'respite from air and noise pollution', whilst also 'locally mitigating the urban heat island effect through shade provision and evapotranspirative cooling' (Mears, et al., 2021, p. 2). It is recognised that dense, car-reliant communities typically suffer from poorer air quality, 'heat-related stress and health effects', and so green spaces help to alleviate this (de Zylva, et al., 2020, p. 21).

Alongside physical health benefits, there is also an identified link between green space and better mental and general wellbeing. WHO (2021, cited in CABE SPACE, 2010, p. 8) defines wellbeing as:

> ***'health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'***,

This is especially important in terms of perception of green space quality and accessibility, as the public is more likely to then visit the green spaces and

natural environments to reap the benefits. Research by CABE SPACE (2010, p. 16) analysed 50 projects to understand how communities use green space. The study found that the green spaces 'improved mental health and opportunity for relaxation', 'improved physical health and motivation' and reduced anti-social behaviour.

A study by Friends of the Earth summarised the key benefits that access to nature can provide, such as 'healthy childhood development', 'reduced health-related costs to society', 'social cohesion', reduced flood risk, 'boosting wild animal and plant species', reduced crime, and boosting overall quality of life (CABE SPACE, 2010, pp. 16 - 17). Tibbatts (2002, p. 5) highlighted that social exclusion is reduced in deprived neighbourhoods, building 'social ties and sense of community' (CABE SPACE, 2010, p. 13). One reason for this, as Montgomery (2015, p. 111 - 113) indicates, is that green spaces provide hubs for social activity and reduce crime. Montgomery's (2015, p. 112) work with the BMW Guggenheim Lab also identified behavioural changes associated with a lack of green space, observing that 'nature deprivation … left people feeling more raw and aggressive'. CABE SPACE (2010, p. 13, 16) builds on this, indicating that the presence of nature lowers crime and agression, from a study in Chicago.

Among these benefits, there is also expanding literature on the economic savings green space can generate for health and wellbeing, and its influence on the NHS.

Drawbacks of green space
Whilst deprived can communities' benefit from green spaces, as identified, manicured grass, fertilised, and over-cared for gardens could cause environmental harm to the local wildlife and biodiversity. A study by Czimczik (cited in Bhanoo, 2010) found that many manicured green spaces emit more carbon dioxide than they absorb due to the use of lawnmowers, fertilisers and pest killers.

Conclusion
This literature review has identified that deprived communities generally have less access to green spaces, and the spaces they do have is often of poorer quality, with a greater sense of lack of safety. However, when presented with appropriate natural environments, these communities strengthen, experience social cohesion, improve physical and mental health, as well as bolstering local biodiversity, improve air quality and contribute to a reduction in the heat stress, which often negatively impacts deprived urban communities.

This review shows that green space should be implemented in deprived neighbourhoods as a way of building social ties, and improving local safety and environmental quality.

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framework

The literature review raised the key issues around accessibility and quality of green spaces for deprived neighbourhoods, as well as the benefits that can be generated from the provision, engagement and exposure with the natural environment.

Using this as a basis, the following framework has been formed to analyse exemplar case studies, which will help to develop a set of design principles for designing landscape and ecology that creates benefits for deprived communities.

case studies

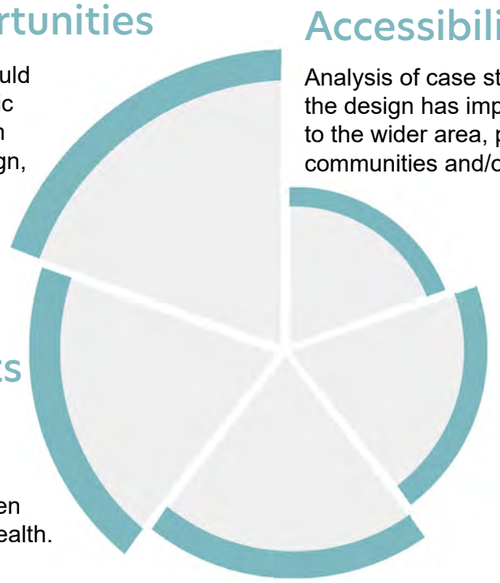
1. Queen Elizabeth Olympic Park, Stratford
2. Rotterdam Sterker Door (Onwards Stronger)
3. Tees Heritage Park

Economic opportunities

Analysis of case studies should aim to discover any economic opportunities associated with landscape and ecology design, such as increased property values.

Accessibility and connectivity

Analysis of case studies should seek to identify how the design has improved accessibility and connectivity to the wider area, particularly connecting deprived communities and/or areas which lack green spaces.



Societal benefits

Analysis of case studies should seek to uncover any social benefits created with the provision of different green spaces, such as improved health.

Enhanced green network and biodiversity

Analysis of case studies should look to learn how the designers have built on existing biodiversity and green/blue networks and the types of green spaces that contribute to this.

Placemaking

Analysis of case studies should identify how the design has created a sense of place that the local community can take ownership of, as well as how the design builds social ties.

*Figure 51: Case Study Framework. *pie slice size not representative of importance.*

Queen Elizabeth Olympic Park, Stratford

summary

- Creation of Europe's largest parkland in 150-years.
- Transformed brownfield/industrial land.
- Flat, accessible surfaces.
- Within walking distance to surrounding communities
- Provides active travel options and is located near public transport.
- Variety of diverse landscapes and uses.
- Design that follows the watercourse and topography, connecting with surrounding green spaces
- Formation of a biodiversity action plan

Figure 52: Location of the Queen Elizabeth Olympic Park within Greater London.

introduction

The Queen Elizabeth Olympic Park, Stratford, is one of the largest urban regeneration projects in the UK, delivering a 560acre park (Europe's largest for 150years), around 10,000 new homes across five new neighbourhoods, world-class sporting venues, and approximately 25,000 jobs over the lifetime of the project. It is set, and has, radically transformed the built and natural environments of East London over the last decade. The Olympics were viewed as a success, partly because of the legacy promised. The set-up of the London Legacy Development Corporation and Olympic Delivery Authority promised a vibrant legacy of growth, homes, community, and sustainability to this deprived part of East London.

The Olympic Park site ranks in the 30% most deprived neighbourhoods. Whilst it is still in this bracket, there has been improvements since 2015 (when data was last available). Since 2015, much of the park has matured, and new developments such as International Quarter London have been opening (DLUHC, 2021).

accessibility and connectivity

Formally brownfield/industrial land the development of the Olympic Park has opened up green space for the local and wider area. Residents of Stratford and Hackney can easily access the parkland and marshes through a series of bridges and underpasses. As the site is a strategic location, there are key road and rail lines that would hinder connectivity, yet the development has ensured that adjacent communities have easy access.

The Park Authority claim that the parkland is 'the most accessible in the UK', with 'good step-free access, hard-standing surfaces, [and] regular seating' (LLDC, 2021). A park mobility service also allows everyone access to the park and experience. The park also features multiple cycle hire stations, offering cycling opportunities and supporting wider connectivity and active travel.

The park has regular signage to aid wayfinding. Iconic venues, such as the Lea Valley Velodrome and Here East are positioned at nodes around the park, support legibility.

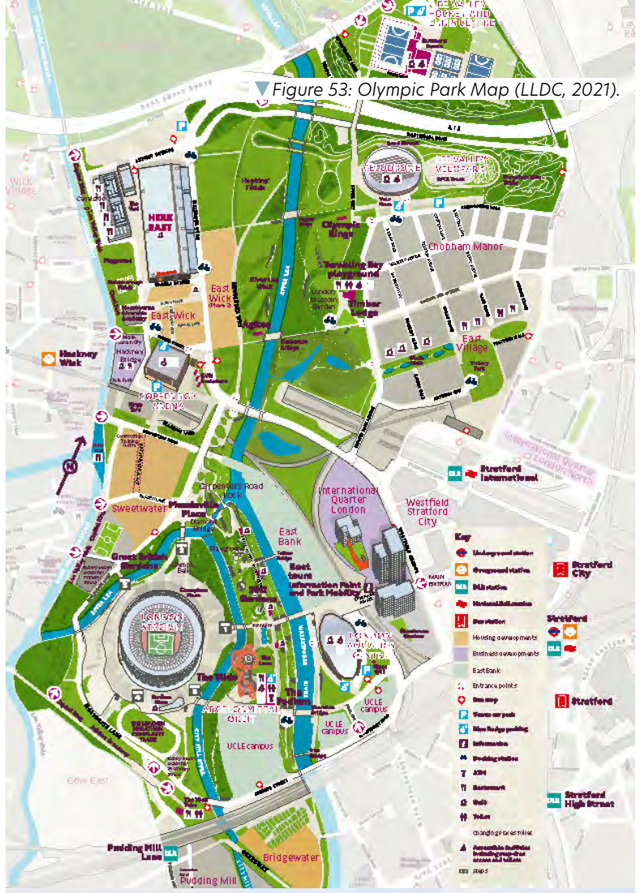


Figure 53: Olympic Park Map (LLDC, 2021).

Figure 54: Velopark (Todisco, 2015).

Figure 55: Accessible pathways (Todisco, 2015).

Figure 56: Variety of plants (Todisco, 2015).

enhanced green network and biodiversity

Around 246ha of land had to be remediated in 3 years from industrial pollution. This significant project converted heavily contaminated soils into one of London's biggest green spaces.

The park provides a variety of biodiverse and recreational green spaces, including:

- London Blossom Garden (33 blossom trees planted to recognise the pandemic, showing that even post-games the parkland is versatile)
- 2012 Gardens (70,000 plants from across the world, showing Earth's climatic zones)
- Great British Gardens (showcasing plants from the British landscape)
- Park Meadows (a biodiverse space of wildflowers along the river)
- Wetlands (which protects over 5,000 homes from flooding, features 300,000 plants, and supports birds, amphibians and waterfowl)
- Mandeville Place (a small orchard designed with schools and local disabled people).

By providing a variety of landscapes, the designers looked to meet the needs of the local community, providing spaces for recreation and relaxation, for example, but also delivering the needs of the natural environment, such as creating 25 wetlands.

A biodiversity action plan ensured the legacy of the games is delivered. This plan totalled 112 acres of the park, including '15 acres of woodlands, hedgerows and wildlife habitats, 4 miles of waterways, and 4,300 new trees' (Todisco, 2015).

To park connects north towards Hackney Marshes and Walthamstow Wetlands to ensure it is fully connected with London's green grid.

Figure 57: River Lea.

Rotterdam Sterker Door

summary

- 8 City-wide projects to transform the urban environment.
- Formation of an attractive business environment.
- Employment and entrepreneurship programs.
- Tackle climate change challenges, such as heat stress.
- New parkland.
- Urban greening.
- Public spaces will multiple uses.
- Green space development creates densification and wider development opportunities.

Figure 58: Location of Rotterdam within The Netherlands.

introduction

Rotterdam, Netherlands, is a city known for its concrete-jungle aesthetics. Following the Coronavirus pandemic, awareness grew about the importance of the natural environment and attractive public spaces.

Rotterdam Sterker Door (Onwards Stronger) is a forward-thinking plan to give the city 'Green Lungs' to not only benefit residents, build the economy, and support the natural environment; but to also increase city resilience by using the environment as a tool to tackle urban problems such as air pollution, flooding, and the urban heat island effect. The city aims to give all citizens access to attractive public places where residents and visitors meet, move, and recreate, as well as to attract business and innovation. Rotterdam plans to achieve this through 8 stand out city projects.

There is no IMD for Rotterdam, but a report by Statistics Netherlands found nine poor neighbourhoods in the city, the third highest out of all Dutch cities (CBS, 2007).

economic opportunities

Sterker Door is set to transform Rotterdam. The city government will pump €279million into the project, creating over 2800 jobs across the 10year lifespan of the project.

The city government hopes that by creating a more attractive and desirable environment, more people will be inclined to live and work in Rotterdam. Furthermore, they hope the green space can create an attractive business climate.

It is noted that the scheme will open up opportunities for development previously not possible, such as through densification, which allows the opportunity for business space creation. Hofbogenpark, which will convert a former viaduct into a roof-park, will convert the arches below into business units.

By increasing resilience through water storage, increased biodiversity, planting, and cycle parking, Rotterdam are making long-term saving costs from the potential threats of climate change.

Figure 59: Park Maashaven (Municipiality of Rotterdam, 2021).

Figure 60: Westblaak Green Lung (Municipiality of Rotterdam, 2021).

Figure 61: Prins Alexanderplein (Municipiality of Rotterdam, 2021).

Figure 62: Hofbogenpark (Municipiality of Rotterdam,

societal benefits

Many residents of Rotterdam will be gaining green space closer to home, as well as transforming existing urban areas. By doing so, the residents can reap the benefits of green space noted in the literature review.

The new green space will create environmental benefits that in turn benefit residents, such as a reduction in the urban heat island effect creating more liveable environments, reduced risk of flooding, and better air quality. Greening of adjacent streets and roofs of developments will ensure benefits have a wider impact.

Residents will also gain new cultural, education and art facilities, such Riverside Park Feyenoord, which will create recreational opportunities alongside a 3ha waterside park.

Park Maashaven will have significant benefits for the adjacent community, which is notably deprived of green space. A new 7ha park will offer opportunities for relaxation, nature exposure and activity.

Figure 63: Feyenoord Park (Municipiality of Rotterdam, 2021).

Figure 64: Rijnhaven Park (Municipiality of Rotterdam, 2021).

Tees Heritage Park

summary

- Community engagement to form identity.
- Involvement of schools with wildlife and landscape design.
- Accessibility and connectivity between disjointed housing estates and separate green spaces.
- Defining the green space boundary.
- Aid wayfinding.
- Restore and promote heritage.

Figure 65: Location of Tees Heritage Park within the Tees Valley.

introduction

'A renaissance of the river valley' describes the transformation of the Tees Heritage park from waste dumping grounds and neglected green spaces into a unified park, focused on building identity and restoring heritage (de Zylva, et al., 2020). At a size of 101ha, the Tees Heritage Park has enhanced a river corridor through art and landscaping, defining the parkland, improving accessibility between green spaces and housing, and engaging the community throughout.

Some communities around the park are among the most deprived in England. In the 2010 IMD, out of 326 districts, Stockton-on-Tees has the 47th highest proportion of deprived communities, and nearby Middlesbrough is 1st. Whilst this has not improved much, it can be noted that boroughs adjacent to park experienced less deprivation in 2015 and 2019.

Figure 66: Landscape art designed with schools highlight heritage (FTHP, 2021).

placemaking

To create a clear identity, community involvement was key. Friends of the Tees Heritage Park was set up in 2007, formed of representatives of stakeholder organisations and departments, a multi-disciplinary approach ensured community involved and secures long-term strategy for the park. Engagement with schools includes site visits and wildlife cameras for education and working with artists to form much of the landscape artwork, which is central to marking heritage and forming identity.

Community access way key. The scheme creates a strategic green corridor and accessible pathways within a legally and physically defined parkland. Artist designed signal posts aid wayfinding.

Figure 67: Park Map (FTHP, 2021)

Figure 68: Signal Post (FTHP, 2021)

design principles

1. Accessible and connected spaces.

- Flat, hard paving.
- Active travel options.
- Wayfinding signs.
- Landmarks/art along nodes.

2. Increase natural environments.

- Natural, biodiverse landscapes over manicured gardens.
- Water storage and food production spaces.
- Variety of landscape types, e.g. orchard/ meadow.
- Design that follows watercourse, landscape and heritage.
- Maintenance and management plan.

3. Social cohesion and activities.

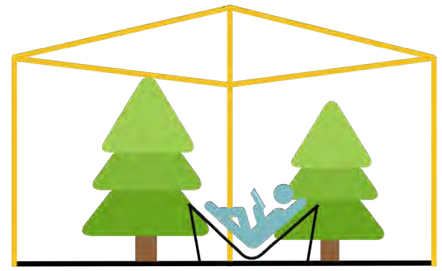
- Space for events
- Spaces to relax
- Activity and recreation.
- Urban greening along adjacent streets creates visual connectedness to green spaces.

4. Supporting economic growth

- Attractive business environment.
- Social entrepreneurship programs.
- Protection from long term climate effects

5. Distinctive environment and identity

- Define various park spaces - signal posts.
- Wayfinding signs.
- Community engagement during design.
- Promote heritage.
- Fully accessible and connected spaces.



Figures 69 - 73: Related Icons

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individual masterplan

Joe Bonomo

design principles

The thematic research laid out design principles for landscape and ecology design which has informed the illustrative masterplan. This design and access statement is presented through the following principles.

Accessible and connected spaces

Creating a well-connected, and fully accessible, place for everyone.

Increase natural environments

Boosting the biodiversity value and quality of the wider area.

Social cohesion and activities

Creating multi-use spaces that are physically and visually connected to the wider area.

Supporting economic growth

Delivering an attractive environment to support surrounding business activities.

Distinctive environment and identity

Designing a place with a strong sense of identity, that respects and integrates with its context.

design development

The area being designed in 7.2acres in size. The initial design stuck to the group masterplan, exploring how building interiors would work and function. it also explored the possibilities of the public open space, looking at potential flows through the site and creating a series of biodiversity natural spaces that have continuity and visual

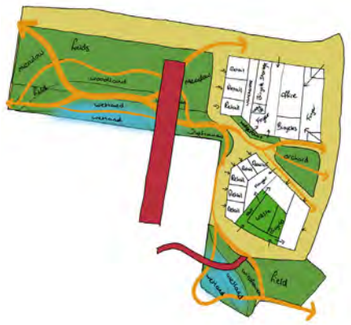


Figure 74: Design concept 1.

Still very much in line with the group masterplan, this plan looked to increase the density of housing by filling the communal garden with two-storey homes and shared gardens. However, when testing this possibility, space constraints and a sun-angle analysis, this vision was not possible.

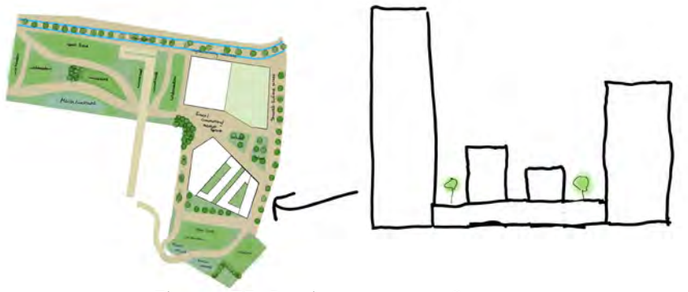


Figure 75: Design concept 2.

With the realisation that space was tight, the decision was meade to take away the bottom park, as the proposed Billingsgate park will provide sufficient open amenity, and instead move to a block structure. However, this initial proposal had issues around fronts and backs, privacy and pseudo spaces. It also created multiple public spaces that would be competing, rather than creating a focal point.

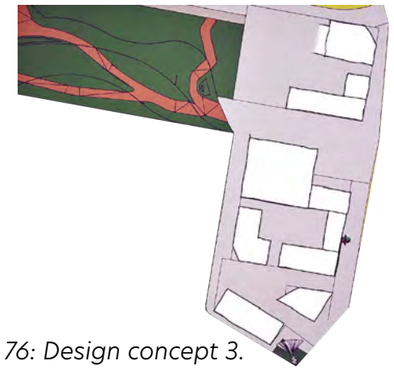


Figure 76: Design concept 3.

The begginings of the final masterplan were then put together. The final plan creates strong sightlines, has clearly defined public/private spaces, and has a unique range of amenity spaces. This is possible due to a strong block structure. This sketch explored the possibilities of the block, looking at access points, corridors and orientation of flats.

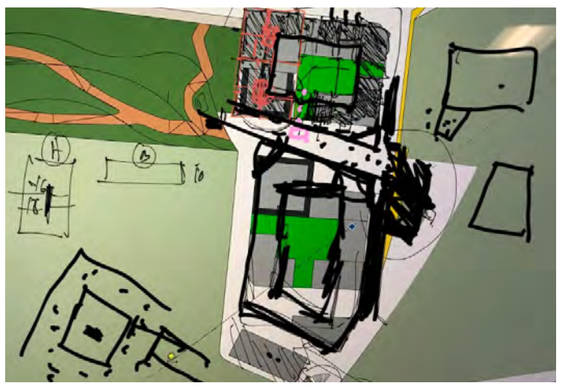


Figure 77: Design concept 5.

illustrative masterplan

Vision:

Using natural landscape design to form a dynamic community that benefits from social integration and accessibility to nature.

1. Billingsgate Park
2. Promenade
3. Sports space
4. Seating area
5. North Dock Bridge
6. Wildmeadow
7. Play space
8. Community garden
9. Market Boulevard (cycle priority)
10. Residential courtyard
11. Shared-space street
12. Hertitage Plaza

Key:

- Natural planting
- Promenade
- Cycle-priority lane
- Lane marking
- Disabled parking/loading bay
- Grass
- Land slope
- Bins/Cycle parking
- Street furniture
- Tree
- Planter

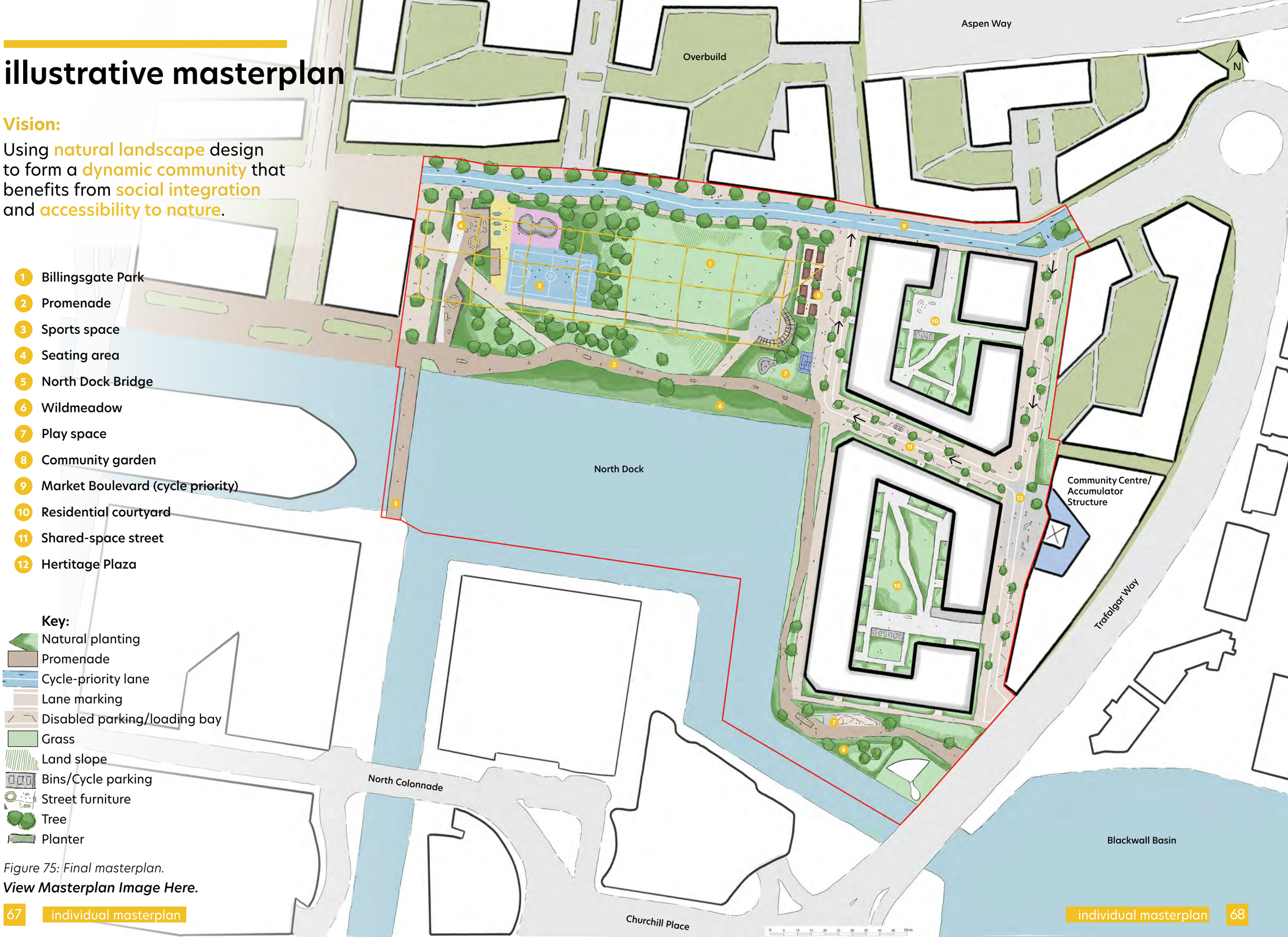


Figure 75: Final masterplan.

View Masterplan Image Here.

key design changes

The section summarises the key design changes made from the group masterplan to the initial masterplan. The key changes have been made:

Street Alignments and Vistas

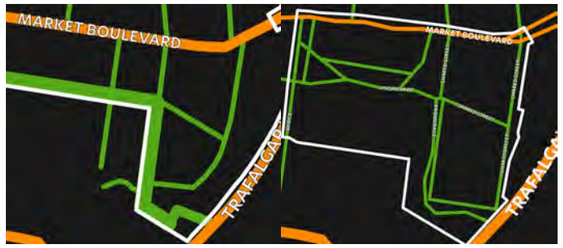


Figure 76: Initial street structure (left) and final street structure (right).

The initial street alignment has been straightened and moved move in line with its surrounding context to create greater integration and clear visual connectivity to aid wayfinding and sense of security. These straighter streets create greater efficient land use, but there are still a few angles along the street to create a sense of interest. The promenade is angular to create a sense of discovery and enjoyment along its route. The new street structure is a woven together and walkable fabric that encourages people to walk and cycle through the permeable design and shared streets that put pedestrians first in the user hierarchy (DfT, 2007, p. 28).

Public Spaces

Figure 78: Public open spaces and public streets in the group (left) and individual masterplan (right).

The new masterplan has greater definition of its spaces and fewer competing spaces. The masterplan creates an open space network with multi-use outdoor space that are versatile for everyone and offer visual amenity, recreation and biodiversity. This versatility creates a mix between nodes of activity where key movement flows intersect, and quiet spaces in the parks and streets. The new masterplan ensures that Billingsgate Park it a key hub central to the overall Billingsgate development, with smaller spaces providing local, quieter amenity.

Block Layout

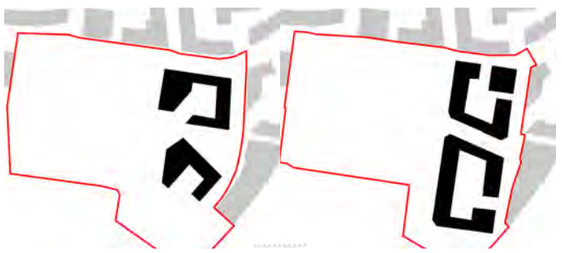


Figure 77: Initial block structure (left) and final structure (right).

The initial block layout was angular and lacked definition. The new layout is more respectful to its context, in line with the linear street structure and creating greater definition of fronts and backs, and stronger enclosure along the street. The rectangular blocks form larger internal courtyards, giving room for gardens and serving.

floorplans

To ensure maximum natural light into internal spaces all flats are dual aspect. The buildings have been laid out in a series of ‘modules’. Each module comprises of two flats (5m wide each) and a shared corridor (3m wide) between them, with each corridor housing a stairwell and lift. By doing so, the properties are dual aspect, which are easier to sell as they maximise natural light and ventilation throughout the day. To ensure robustness of these properties north-south flats are 10m deep and east-west flats are 16m deep. Using this ‘module’ approach further animates the street, placing multiple entrances along the street. Ground floor flats have private gardens (3m x 5m) which is necessary to create a privacy buffer between the property and internal courtyard. Above flats have balconies on either side to ensure the provision of direct outdoor private space.

The internal courtyard can be accessed from the module corridors, as well as exterior access points, wide enough for service and emergency vehicles. This is key as communal underground bins are located in the internal courtyard to provide easy servicing and to eliminate rubbish from the public street. Sheltered cycle parking is also provided here to support active travel, but if security were to become a concern, there is flexibility to deliver cycle parking in the communal corridors. The internal courtyard also provides communal garden space. A mix between a manicured lawn and natural vegetation. This space offers opportunity for the buildings community to come together.

The office building has been positioned with easy accessibility to the boulevard and onwards to Aspen Way. It is robust and flexible in its design, with two cores, offering potential for conversion into residential modules should office space become unviable.

Figure 79: Proposed floorplans showing context with internal courtyards and external streets.

seamless integrations and connections

The street network has been designed to create internal and external permeability and connectivity that enhances the existing movement network. It is vital to ensure ease of movement and legibility, so direct routes have been created in and out of the site to Trafalgar Way, Aspen Way, Canary Wharf, Upper Bank Street, and Poplar High Street. Not only does this create visual connectivity it is advantageous to service vehicles and is more appealing for cyclists and pedestrians. Figure 80 shows the proposed movement framework that will create seamless connections between South Poplar and Canary Wharf, as well as strengthening east-west pedestrian and cycle connections, as noted in the local plan (Tower Hamlets, 2021).

The proposals encourage walking and cycling through shared streets and cycle-priority roads that have clear connections and destinations. These destinations offer further transport options, such as buses along Trafalgar Way. The Manual for Streets (DfT, 2008) recommends all road users be accommodated as it is beneficial for security and sense of safety. This has been achieved through the street design that places pedestrians at the top of the movement hierarchy. The movement network seeks to reduce reliance on the car, providing walkability to Poplar High Street through an overbuild scheme, rather than an unattractive, and possibly crime-attracting footbridge. An open-air, low-level, bridge over the dock provides cycle and pedestrian connectivity to Canary Wharf, cutting journey times across the dock to onward transport.

Each route has a function, whether to access and service residential units, provide onward external connectivity, or to increase accessibility to green space. There are multiple car-free linkages throughout the proposal, most giving access to nature and the waterfront. These car-free routes are highly permeable and legible, helping to tackle possible antisocial behaviour.

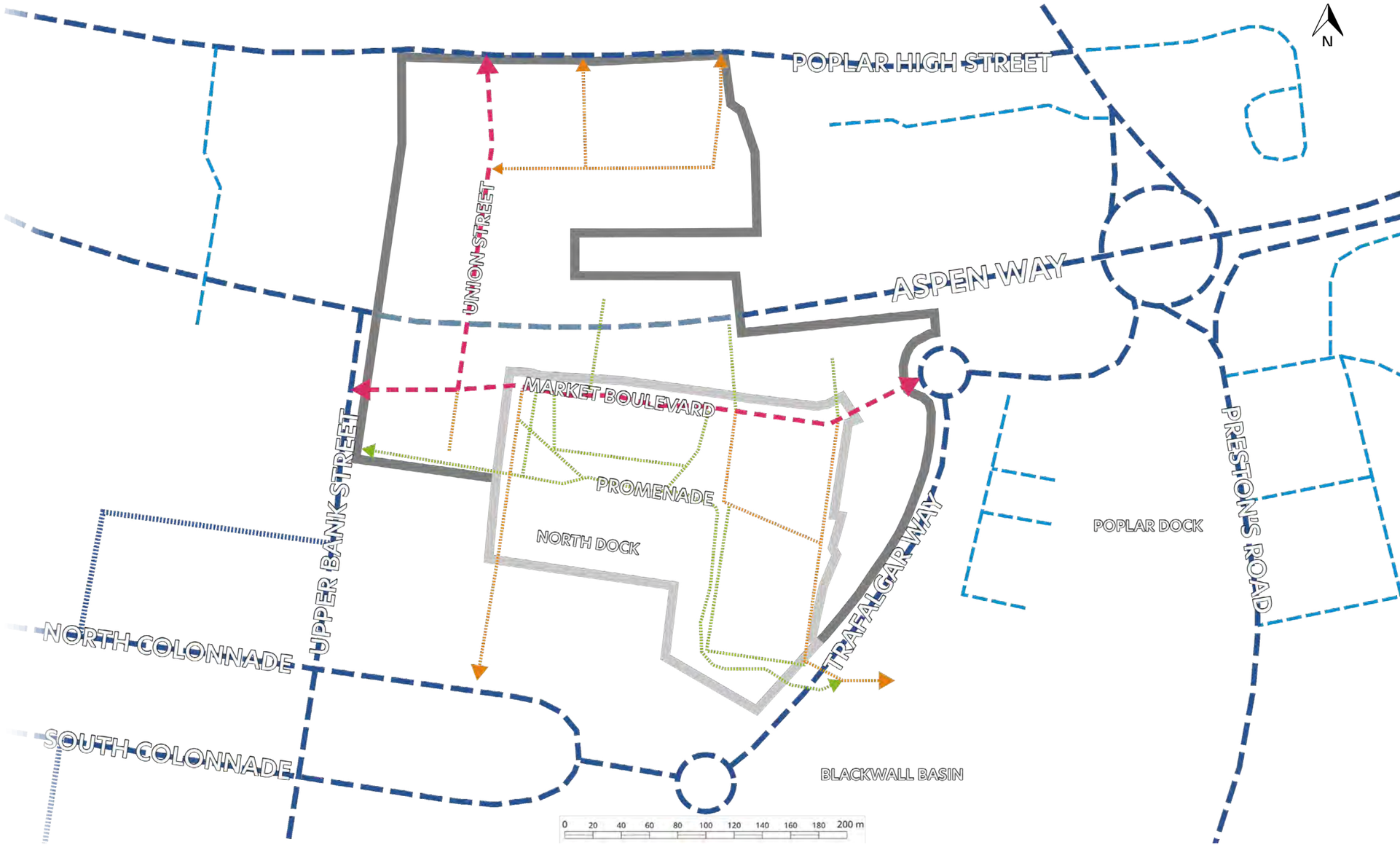


Figure 80: Proposed wider movement framework with highlighted existing streets and proposed streets in the group and individual masterplan.

Key:

- Existing principal route
- Existing route
- Existing key pedestrian route
- Proposed key cycle-priority street
- Proposed shared street
- Proposed pedestrian route
- Group site boundary
- Individual site boundary

masterplan layout

street framework

The foundation of this street network is to create streets that are easily navigable and create direct external connections. The layout is grid like with an angular design, which helps bind Canary Wharf's strong grid structure to South Poplars tighter urban grain. The masterplan further strengthens this bind with a bridge connection over the North Dock, leading towards the overbuild. Eastwards, a connection has been made from ground level to the upper level Trafalgar Way through a set of stairs and lift, helping to reduce travel times and encourage walking and cycling.

The proposed street network also considers desire lines with direct east-west and north-south connections. This wider connectivity means that the residential streets do not become an isolated enclave, but are well-connected to their context.

open space network

The open space network works to serve the wider urban fabric, creating connections through the street framework and urban greening. This is vital for boosting the local green space provision for South Poplar. This network flows towards the open space, sometimes running through it, designed to balance public access and biodiversity through the provision of multiple landscaping and natural elements, such as meadows, woodland, lawns, plaza's and playgrounds. This adds variation and interest to the street framework. The new district park is focused on the waterfront, creating visual amenity, supporting wildlife, and encouraging recreation.

resulting urban grain

Looking at the surrounding block structures and the site analysis, it can be identified that Canary Wharf has a looser block structure, focused on large buildings and 'big box' building typologies. South Poplar has a tighter urban grain, so this proposal seeks to bind the two areas, using a clear block structure with a tight urban grain. This is also fitting with the group masterplan, helping form local identity and character. The proposed blocks are 62m x 78-93m and 62m x 57-73m, which are large enough to sustain biodiversity within the blocks, yet small enough to make the neighbourhood walkable.

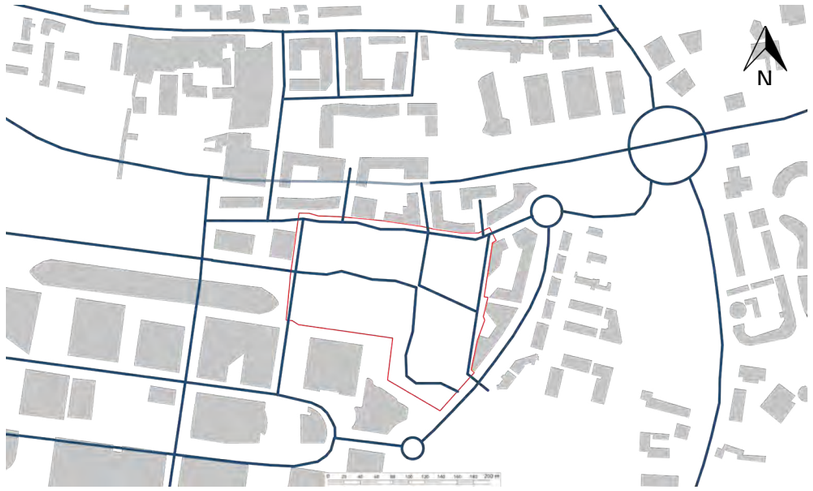


Figure 81: Street framework within and outside the site boundary (marked red). Key pedestrian routes are also highlighted.

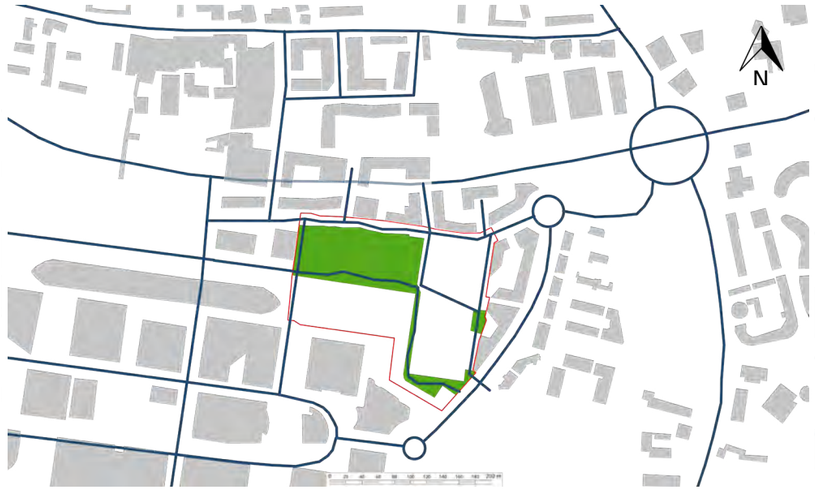


Figure 82: Network of open spaces within the site boundary.

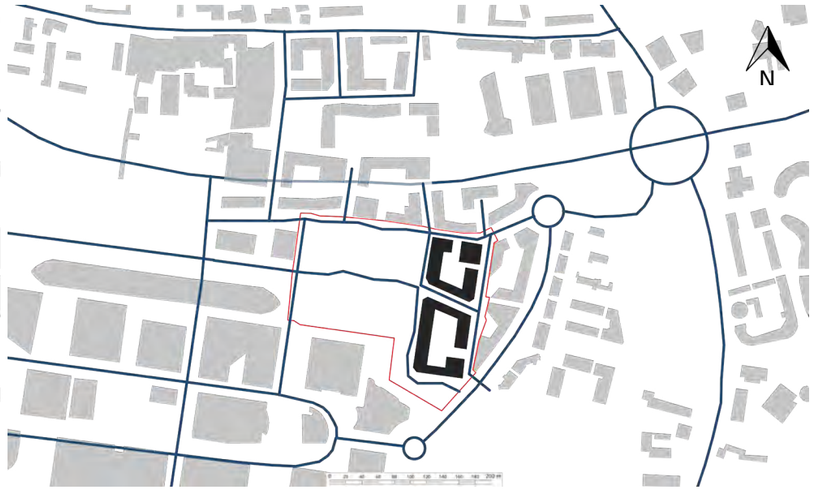


Figure 83: Resulting urban grain → the blocks.

street hierarchy + character

shared street

All the residential streets are designed using this shared surface style. The paving slabs surface material slows vehicle speeds, as well as identifying the space as a shared street. Using the Manual for Streets (DfT, 2008) the lane width designed is 3m to support service vehicles and the total street width is 15m, enabling eyes on the street through the active residential edges, to create a sense of safety and vitality. However, the spatial definition of the street is tightened by the street trees, helping to also create a sense of privacy for the residents and creating a comfortable environment for social interaction. Primary access to the residences is from the street, with high levels of transparency created through multiple windows, doors and balconies. Front gardens do provide a small buffer of 2m, serving to deliver a sense of ownership and personalisation to the street neighbourhood.

As a multi-functional public space, the shared streets aim to support a range of users and create visual interest and amenity. Space for play, rest, and conversation is encouraged with street trees and movable planters, which add flexibility to the street scape. The landscaping also acts to soften place, forming a varied sequence through the street, but also adds to biodiversity, with fruit trees attracting wildlife, improving the micro-climate, and create local distinctiveness - fruit trees can be used to identify a street. Planting also serves to mitigate the Urban Heat Island Effect, providing shade and a cooler micro-climate. The surface materials add to this, with light paving and brick to minimise heat absorbtion.

On-street car parking serves accessible accommodation and service vehicles. Parking can eliven the street, but to ensure it does not overwhelm the scene, it is broken up with planters. Each parking bay has electric car charging.

Designed at a human scale, the shared streets aim to deliver high-quality city living, with a local neighbourhood experience.

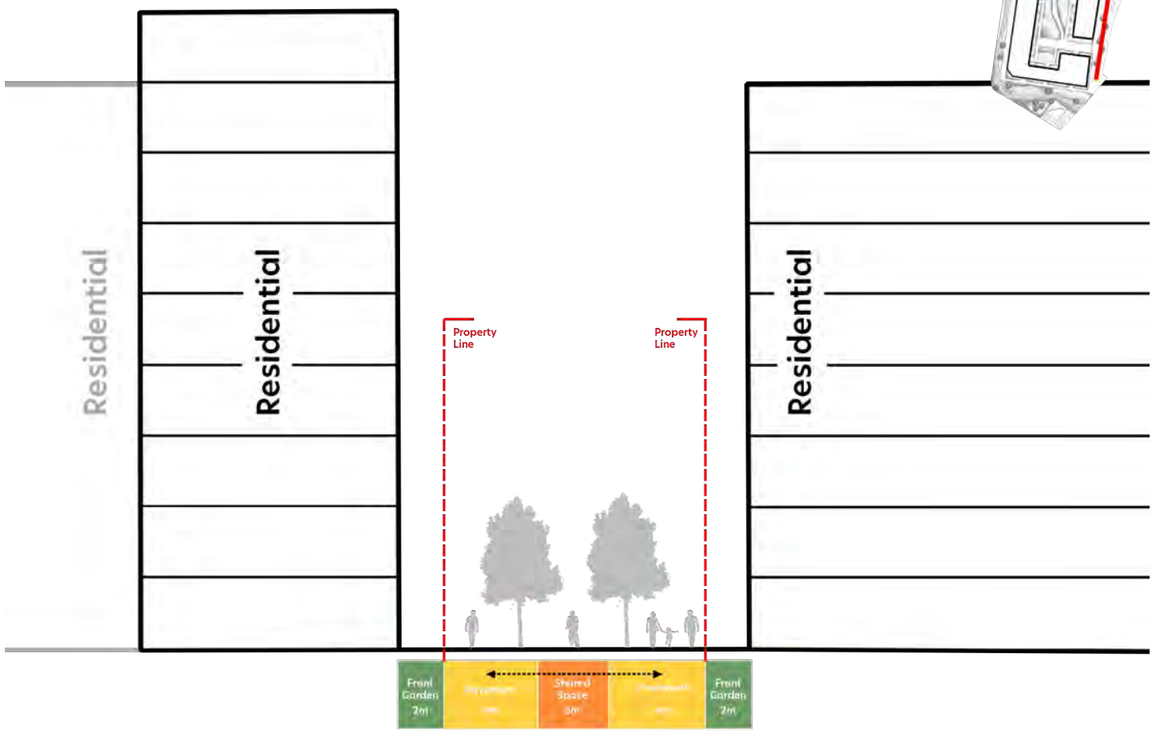
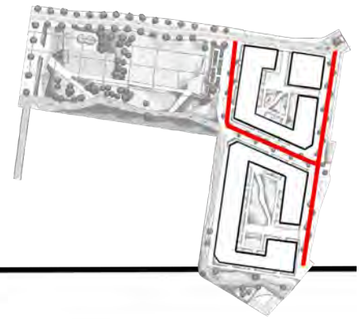


Figure 84: Street section of the shared streets.

Figure 85: Sketch of a shared street scene.



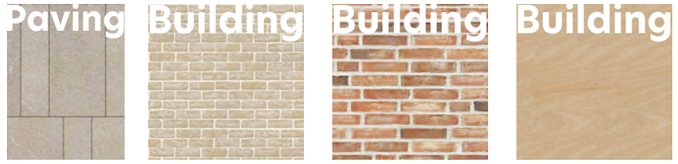


Figure 86: Surface materials used.

Figure 87: 3D render of the shared street design.

Figure 88: Retained viewline towards the community centre and onward to the o2 Arena.

Figure 89: Eye-level view of a shared street.

Market Boulevard - cycle-priority street

Market boulevard is the key east-west distributor road through the site, but the car-free design of the wider masterplan, and mostly residential land-use of the individual masterplan offers the opportunity to designated the street as a cycle-priority street.

The blue asphalt surface identifies the road lanes to prioritise cyclists over private vehicles, minimising the need for visual clutter that street signs can bring. Creating a street scene that has minimal visual clutter has delivered a more attractive environment and footpaths clear from highway signage and equipment. Each lane is 6m wide to support all modes of traffic. Being designed for low traffic speeds of 20MPH, all road users can integrate safely. On the theme of safety, the absence of vehicle parking along this key route aims to increase safety and convenience for cyclists. Convenience is enhanced with cycle parking stands at regular intervals along the edge of Billingsgate Park.

Billingsgate Park is clearly defined along this street with a soft hedgerow boundary. This clear boundary visually aids road users, focusing view lines through the angular street lane. Street greening through native tree planting along the street extends the biodiversity of the park into the street, which is beneficial for wildlife and provides a more comfortable cycling experience, providing shade and a reduction in the Urban Heat Island Effect.

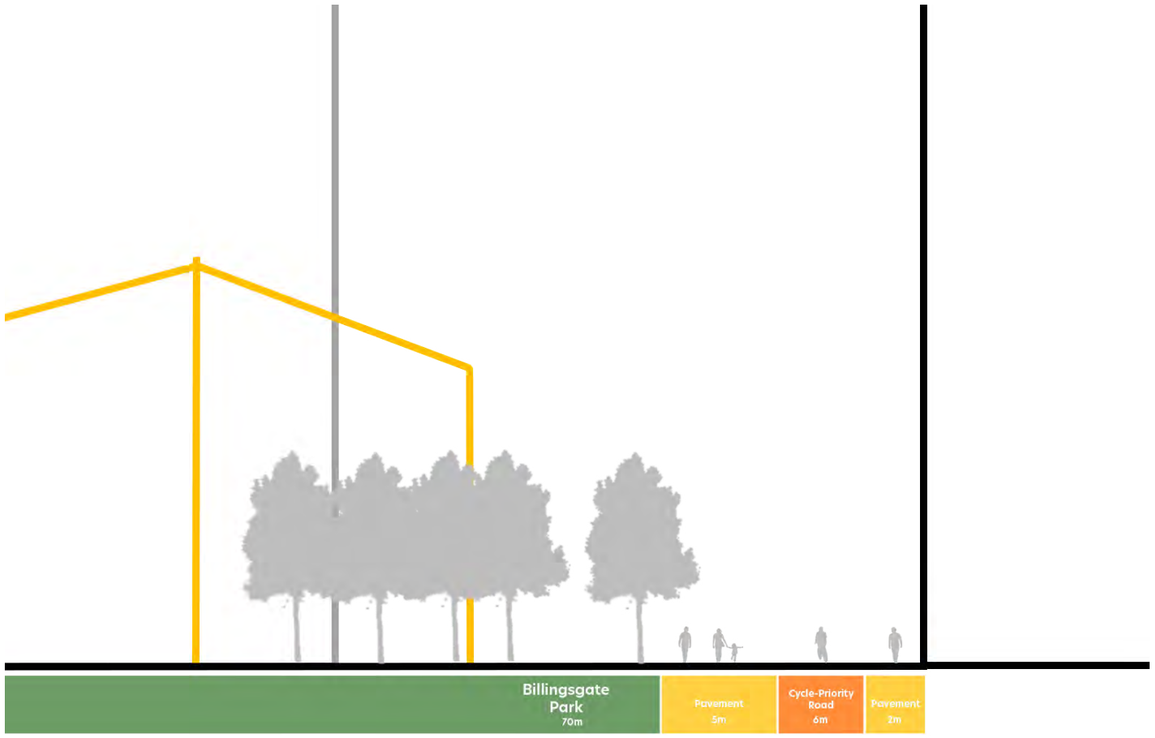


Figure 90: Street section of market boulevard along Billingsgate Park.

Figure 91: Sketch of a shared street scene.

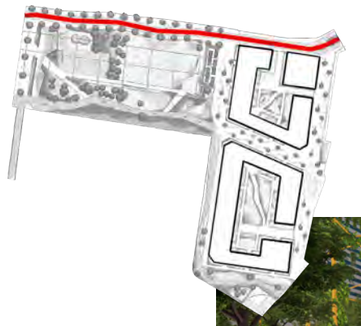


Figure 92: Surface materials used.

Figure 93: Eye level view west along the cycle-priority street.

Figure 94: Eye level view West along the tree-lined street.

Figure 95: View of junction between Market Boulevard and a shared street.

waterfront promenade

The waterfront promenade extends from Billingsgate Park East towards the residential blocks and Trafalgar Way. A wooden boardwalk of 1.5 to 3m is surrounded by varied landscaping varying between 1 and 3m in width that creates a visually attractive destination. Creating a naturally biodiversity space was vital for the promenade, helping form a stronger connection to nature and the waterscape.

Housing adjacent to the promenade provides natural surveillance through the live building edge delivers a sense of safety, as well as creating continuity along the route and directing viewlines.

The material choices seek to emphasise the natural environment, with a mix of woods and light colours. These material choices also minimise the Urban Heat Island effect.

The promenade acts as a multifunctional destination. It is easily accessible via East-West and North-South connections, and has multiple spaces for play and social interaction. The promenade is accessible to all users, featuring frequent benches for rest and a flat ground surface for the visually and physically impaired.

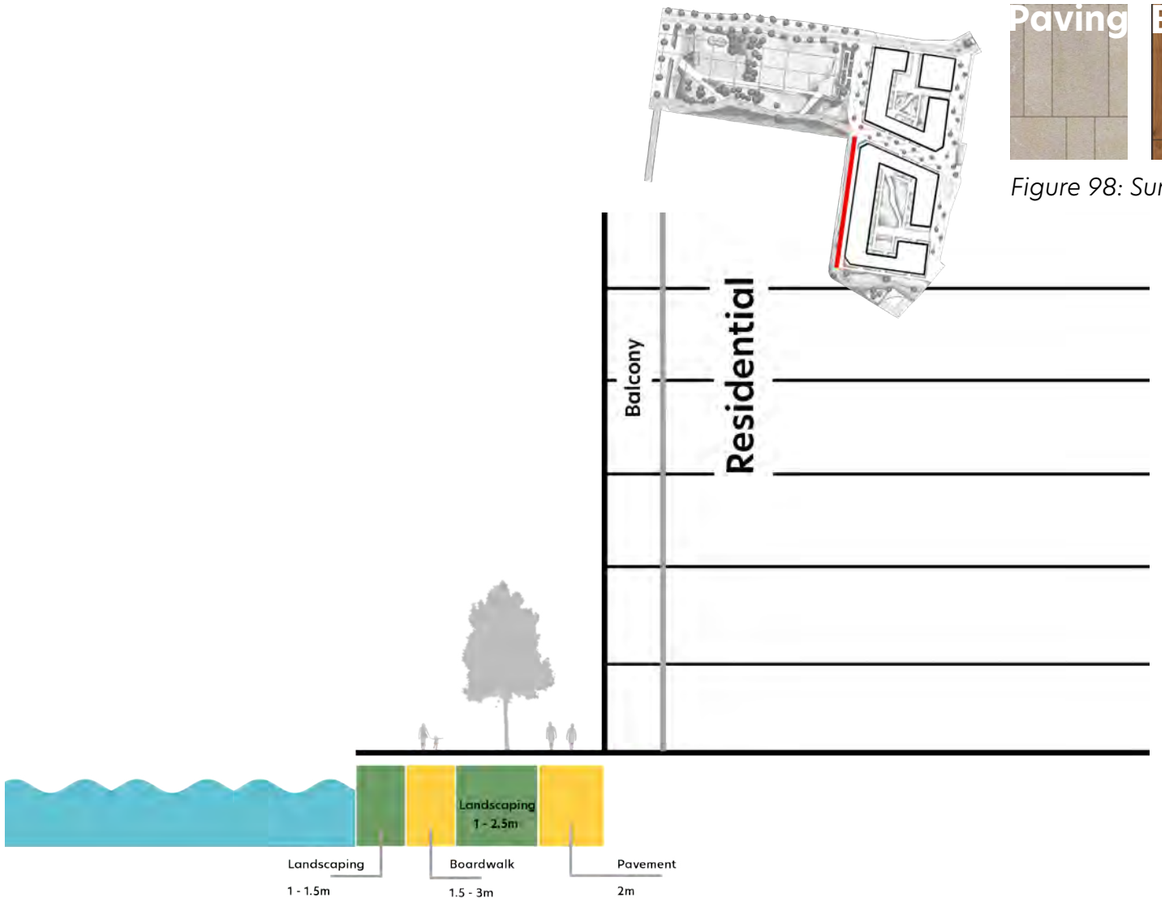


Figure 96: Street section of the waterfront promenade.

Figure 97: Sketch of a shared street scene.

Figure 98: Surface materials used.

Figure 99: Eye level view North along the promenade.

Figure 100: Eye level view South along the promenade.

Figure 101: The most Southerly section of the promenade includes a play area and natural planting.

green links

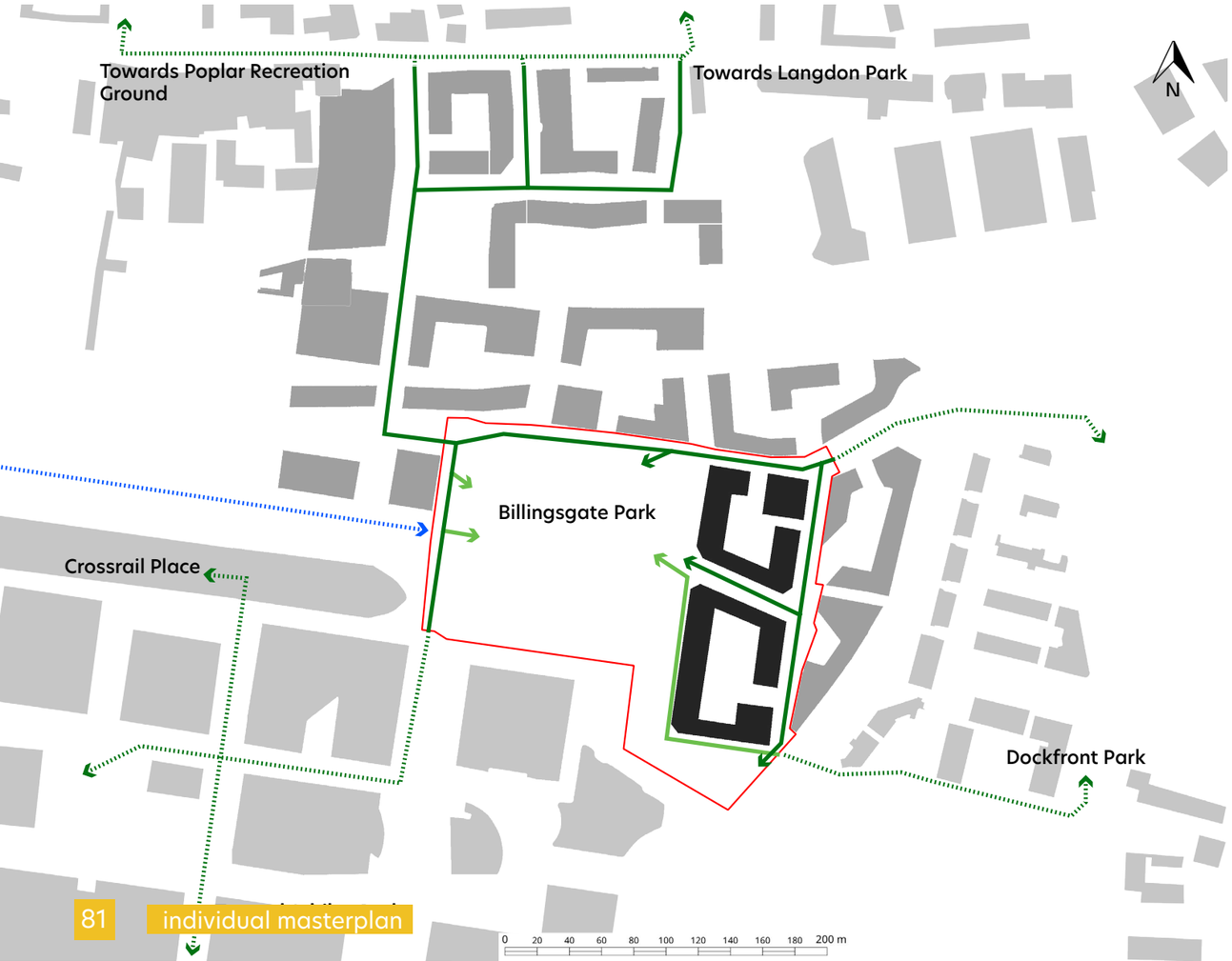
A wider green network has been achieved creating direct visual and physical connections East-West and North-South. The surrounding green spaces are varied in style, such as the manicured Crossrail Place roof gardens to the more biodiverse Poplar Recreation Ground, but one thing they have in common is their small size. The proposed Billingsgate Park is a 2.3acre park that will bind the green network together.

The masterplan has been designed with a focused on green space access, aiming to increase accessibility for benefits for well-being and physical health to be achieved and to support the biodiversity and wildlife in the area. Internally, routes flows towards Billingsgate Park and the waterfront spaces. There is also the possibility to join the green promenade West with the North Dock Masterplan to create further green connectivity.

Key:

- Internal Green Link
- External Green Link
- Green Link within a green space
- Future Green Link.

Figure 102: Proposed green strategy.



urban greening

The green spaces have been weaved into the urban fabric to create a connection between the natural and built environments. Street trees and planters support the urban greening approach, creating a green corridor through the shared streets, joining the open green spaces within the site and supporting the wider green network. This approach also has benefits for health and local biodiversity and wildlife, with the fruit trees along the shared streets particularly supporting this.

The use of soft boundary hedgerows around the front gardens, parks, verges and courtyard entrances help to define the public and private spaces, improving safety.

Figure 104: Clear definition of Billingsgate Park (above).

Figure 103: Detailed green space network across the site (below).

Figure 105: Street trees and planters.

Figure 106: Greening of Billingsgate Market frame.

landscaping + open spaces

Billingsgate Park

Billingsgate Park is a local park that seeks to blend the natural environment into a multi-functional space that delivers a variety of activities and supports various needs. It is a low-maintenance space, due to its natural design. In its current state, the Billingsgate Market Site is highly deficient in natural assets, so the 2.3acre Billingsgate Park seeks to rectify this, introducing extensive vegetation and man-made habitats.

The lawn is an informal space at the centre of the park. It is largely covered by the Billingsgate Market yellow frame, which has been integrated into the natural design with vines twisted round its structure. This frame also serves to add flexibility to the lawn, offering opportunities for shelter and activities, such as cinema screenings pictured in Figure 112. Space for informal play has been created close to the housing, allowing it to be well overlooked. Formal play has been created through the sports activity hub, offering table tennis, skateboarding and basketball. The Billingsgate Market Frame allows this hub to become a community event space, offering the potential for shelter and temporary spectator stands for sport events. As a highly connected space, acting as a bond between the Overbuild and North Dock Bridge, space to rest has been implemented on the Western boundary, allowing opportunities for social interaction, as well as being spaces to just watch the world go by. The wildmeadow creates an attractive natural promenade, but also serves to mitigate future flood risk. A performance space seeks to support community activity and a food garden, with potential use by the community centre, supports biodiversity, cohesion and health.

Together these varied spaces not only create a web of habitats, but supports the quality of place, enhances biodiversity, promotes health, wellbeing and civil inclusion, as well as being safe and accessible for everyone.

Figure 107: Park Plan.

Figure 112: Market frame is multi-functional.

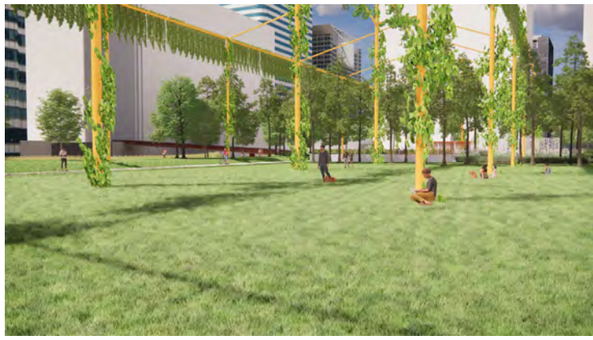


Figure 113: Expansive lawn.

Figure 108: Rest Space.

Figure 110: Sports activity hub.

Figure 114: Performance circle.

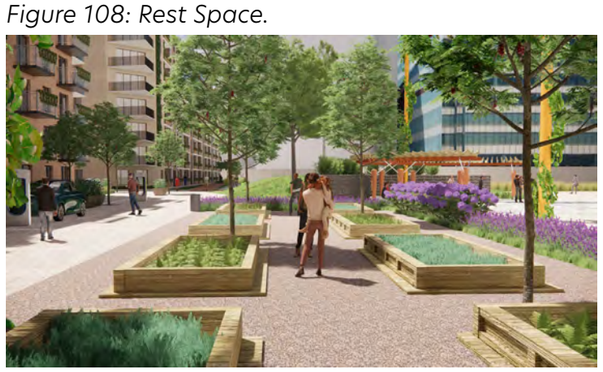


Figure 109: Community food garden.

Figure 111: Wide, green, promenade.

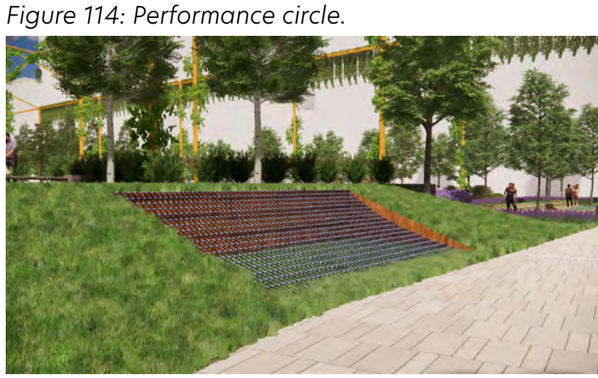


Figure 115: Natural play.

Waterfront Play

The waterfront park is a highly connected local park that focuses on child's play and the natural environment. The space delivers a varied landscape to support biodiversity. Meadows aid flood mitigation by slowing surface run-off and soft boundary hedges help to define the natural environment and private spaces. It is a natural space which requires low maintenance in the long-term. Play equipment is integrated into the boardwalk, but there are also spaces for families to meet, which is overlooked by housing, helping to create a naturally safe space.

Landscape is also used as a tool to hide the Trafalgar Way Bridge Control Building, using planting that gradually increases in height to blur the hard boundary.

Figure 117: Meadow and Boardwalk.

Figure 118: Integrated play features.

Figure 119: Attractive waterfront play.

Figure 116: Waterfront park plan.

Heritage Plaza

Heritage Plaza is a flexible, attractive public space that focuses on the listed Accumulator Tower and Community Centre. The tower is enclosed by an atrium and the plaza serves as an extension to this atrium offering rest areas, and spaces for events and use by the community centre. The space is marked by two tall trees, acting as a focal point through the shared streets. They create a sense of arrival along the linear connections that flow across the plaza.

In comparison to Billingsgate Park and the waterfront, this space has formal planting and vegetation that requires more maintenance. This is to promote it as a formal space, fitting with the vernacular of public space in Canary Wharf..

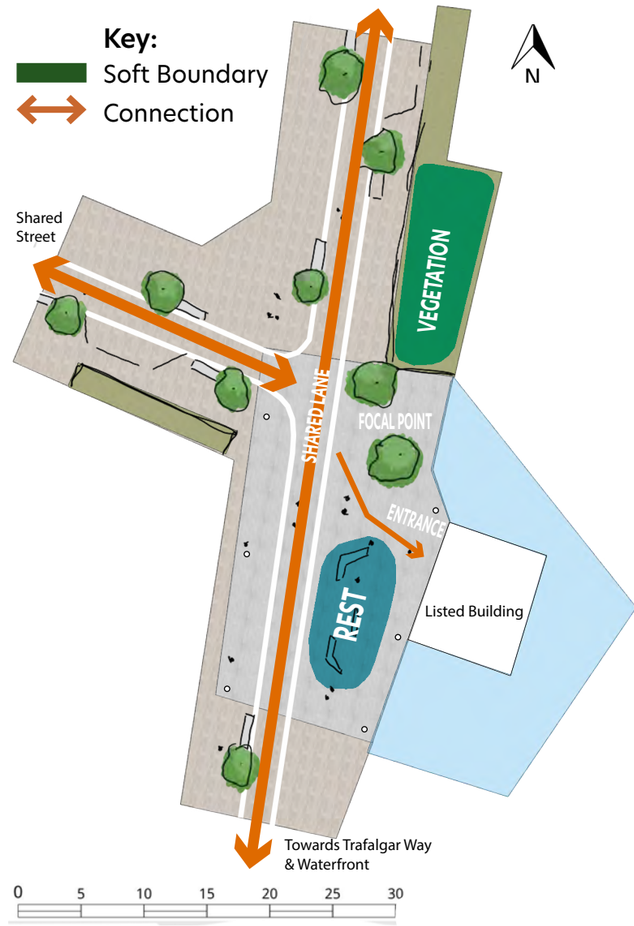


Figure 121: Heritage Plaza Plan

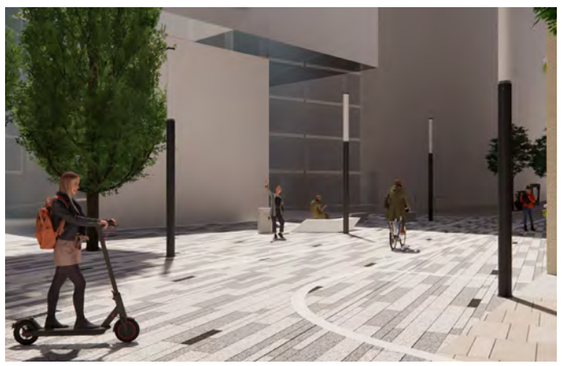


Figure 120: View of the square looking towards the listed building.

Figure 122: Wide spaces in the plaza.

social cohesion + site accessibility

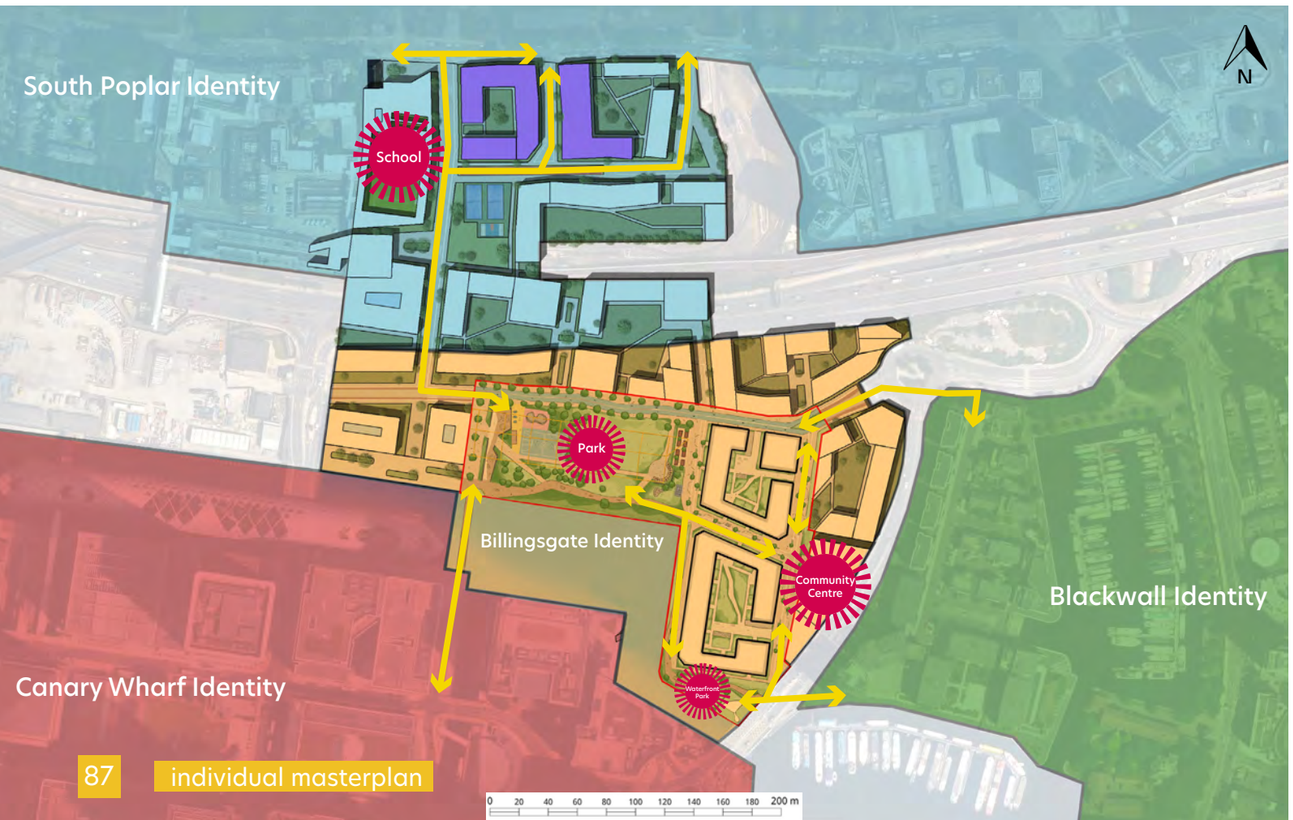
To deliver a scheme that seeks to reduce deprivation through landscape and ecology, the area needs to be socially cohesive. The masterplan achieved this through the overbuild and the creation of a school and community centre, acting as social hubs at either end of the site to create a social bind.

The individual proposal adds to this by acting as a connection between the four highlighted place identities. The North Dock Bridge provides a direct connection to Canary Wharf, and the Waterfront Park is connected under Trafalgar Way to Blackwall. The parks are the main focus of social cohesion. These spaces foster social interaction with their varied spaces, such as the community garden. Their features, primarily the Billingsgate Market Frame, are key to making this proposal distinctive and forming place identity.

Figure 123: Social Cohesion and Accessibility Map.

Within the individual proposal, a high destiny of 165.23 dwellings/m2 ensures the viability of community services and promote positive civil integration. The perimeter block layout reinforces the Billingsgate identity as a binder between South Poplar and Canary Wharf.

Key:
- South Poplar Place Identity
- Billingsgate Place Identity
- Canary Wharf Place Identity
- Blackwall Place Identity
- Movement
- Social Hub



street animation

The perimeter block layout has allowed for a clear distinction between fronts and backs. This has been emphasised with 1.5m front gardens, creating a soft boundary definition of public-private space.

The fronts have been animated with frequent windows and doors directly onto the street, as shown on page 70. Balconies for every flat project outward or are enclosed within the building, further activating the edge. A vertical rhythm has been created, with building corners heighted and the building line rotated to emphasise street entrances and focal points.

Rear courtyards house bins and cycle storage for greater security and to reduce clutter along the street. Service vehicles can gain access to these courtyards.

Figure 124: Balconies project outwards.

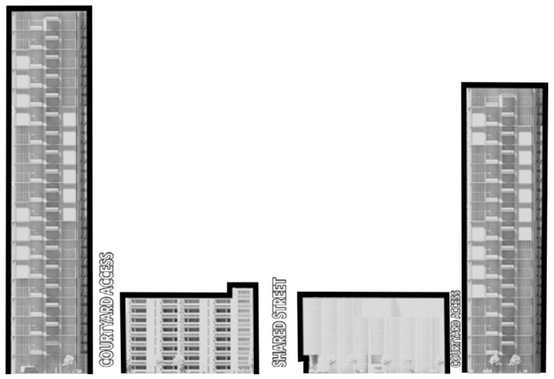


Figure 125: Eastern elevation.

Figure 126: Proposed green strategy.

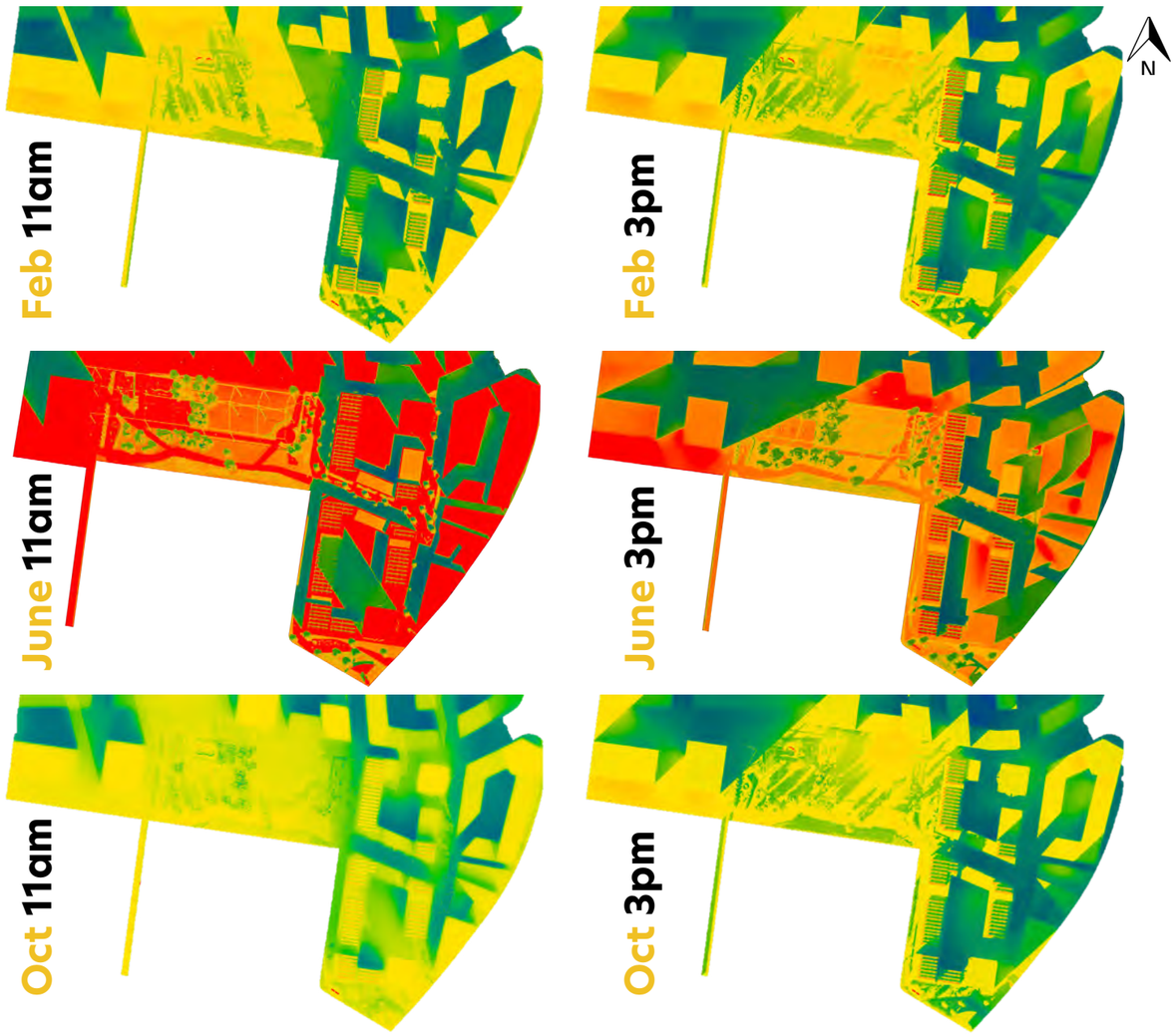
Key:
- Frontage animated by residential use
- Frontage animated by non-residential use
- Property Backs

Figure 127: Western elevation showing vertical rhythm.

shadow analysis

Excluding the towers, the proposed buildings are largely medium-rise, ranging from 5 - 13 storeys. This is more energy efficient and has minimal impact on wind, creating a comfortable microclimate. Two towers have been proposed, and have been positioned to pose a minimal threat to the microclimate. With space around the towers, extensive tree planting, and their location in the Northern-most and Southern-most Eastern corners of the site, overshadowing can occur over Trafalgar Way and Market Boulevard. The diagram in Figure 127 shows that in the winter months the overshadowing impact looks severe, and even with medium-rise buildings, this could not be avoided, but each property receives a sufficient amount of light. It is evident in the summer months that the vegetation and light surface materials has a cooling effect, creating shaded areas to be exploited during the summer.

Figure 128: Shadow analysis 4 months apart.



land-use

The land-use plan is largely residential. This was strategic as it was deemed not economically viable to incoporate commercial uses. This is because the primary movement across the site will be North-South, via the overbuild and North Dock Bridge. The focus has then been on creating a dynamic neighbourhood that is socially cohesive. To support this, a small office has been proposed centred around the Heritage Plaza, helping to create a mix of office, residential and community use. This location is easily accessible by foot, bicycle, bus and car from Trafalgar Way via Market Boulevard. It is also a short walk from Canary Wharf. Cycle parking has been delivered outside and inside the building.

As noted on page 70, the office is flexible in its design. Were the office to become unviable, to prevent dereliction, the two cores allow the potential for conversion into residential modules, protecting to vibrancy and sense of safety along the street.

Figure 128: Design of the office building, seen from the community centre.

Figure 129: Entrance to the office, with adjacent cycle parking.

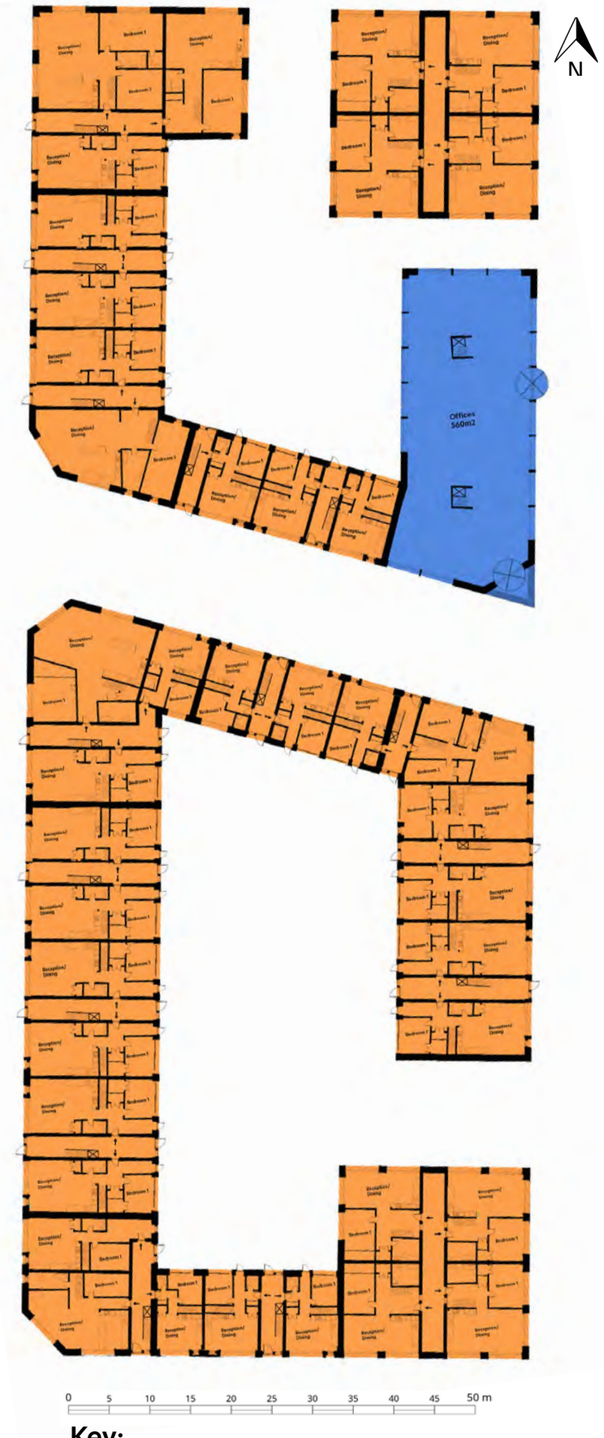


Figure 130: Land-use plan overlay on floorplans.

building typologies

There are three proposed building typologies, that are mixed in size and tenure to help blur the distinction between affordable and private sale housing. Having variety helps to create a distinctive place that is more reisilient to changing future needs, such as the ability to convert the office to residential use.

The key characteristics of the building typologies are:

Tower:

Two tall buildings are 33 and 40 floors high. They have a distinctive white tile and glass design, aiming to reduce the urban heat island effect by using light materials. The buildings are structured around a single core with four flats per floor. Most flats have access to a private balcony, and there is access to a shared garden from the ground floor. The towers have two access points, one from the public street, and one from the rear courtyard.

Flats:

The flats are medium rise ranging from 5 to 13 floors. The flats are laid out in modules, explained further on page 70. By limiting 2 flats to share a corridor per floor, a degree of personalisation and ownership can be achieved. Ground floor flats have 1.5m front gardens to create a soft boundary between the private and public space, but to also add vitality and personalisation to the street scene.

Office:

Accessed from two entrances from street level, the offices are 8 floors high and provide much needed office space. The open floor plan is well-suited for small to medium sized businesses.

Figure 131: Building materials across the typologies.

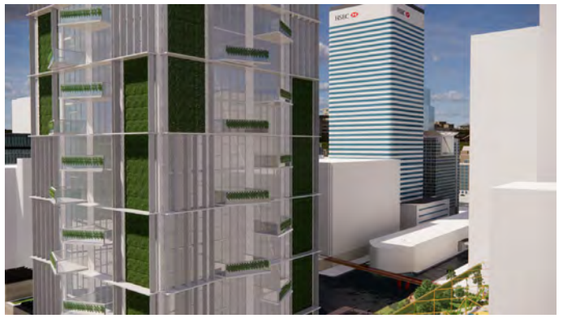


Figure 132: Tower design in the backdrop of Canary Wharf.

Figure 133: Flats overlooking the promenade.

Figure 134: Mix of typologies creates a unique roofscape and building design to links well to the public spaces.

housing mix

New Market Housing

346 units

New Affordable Rented Housing

131 units

New Intermediate Tenure Split Housing

56 units

New Public Park and Play Spaces

1.2hecatres

Key:

- 25 Market Homes
- 25 Affordable Rent Homes
- 25 Intermediate Tenure Split Housing
- 1hecatre of public park and play space

Detailed Mix

	Market	Rented		Total
		Affordable Rented	Intermediate Tenure Split	
1 bed	104	33	9	146
2 bed	173	39	22	234
3 bed	52	39	14	105
4 bed	17	20	11	48
Total	**346**	**131**	**56**	**533**

Figure 135: Table demonstrating the housing mix. Compliant with Local Plan Policy D.H2.

Housing Density

533 ÷3.22hecatres=

165.23dwellings/ hectare

The housing distribution meets Policy D.H2 in the Local Plan, delivering the appropriate housing distribution and meeting the target of 35% affordable housing. This proposal meets the minimum 35% affordable housing requirement, rather than the 50% aim, to ensure the viability of the scheme when factors such as the North Dock Bridge and overbuild are factored in.

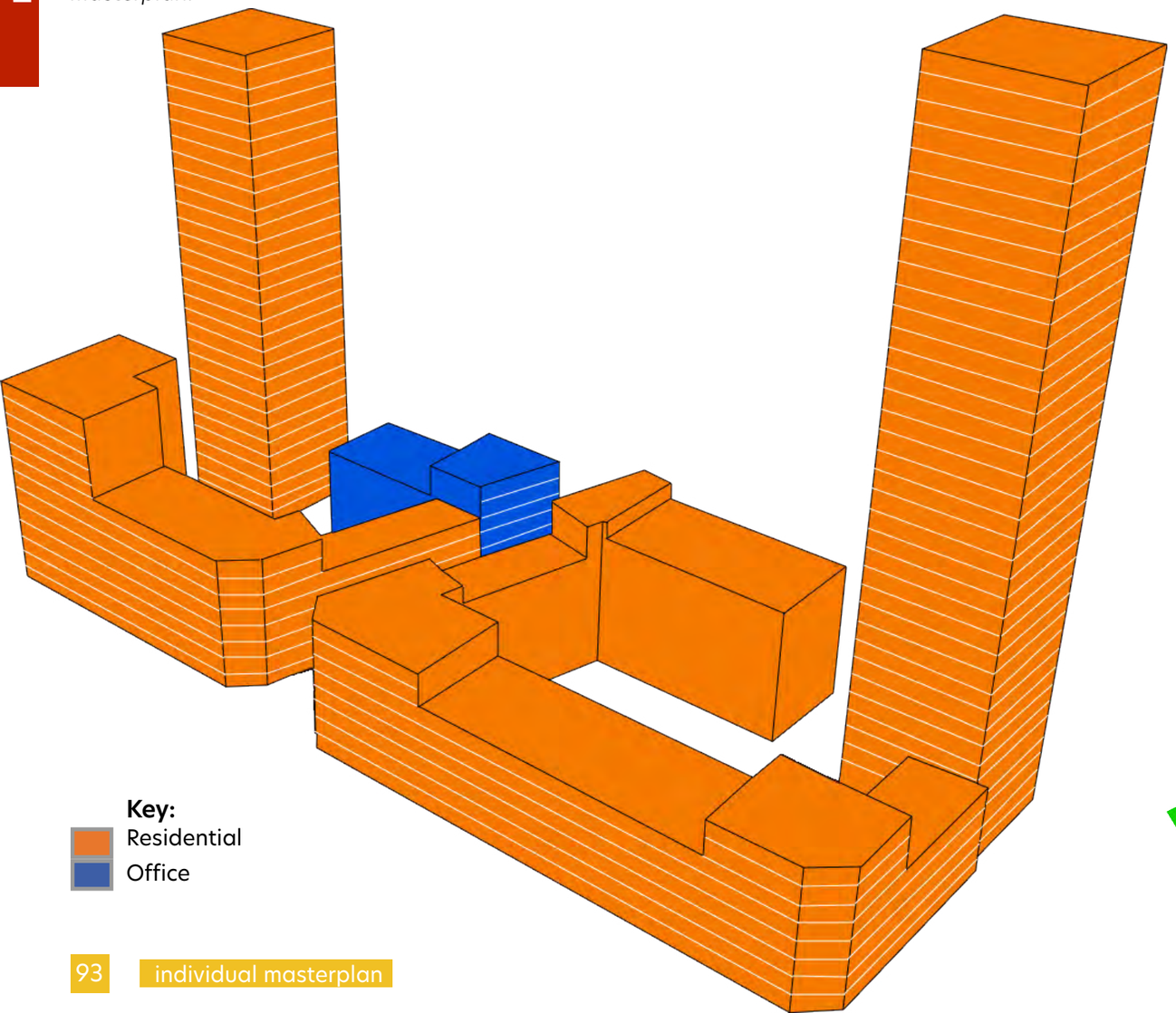
With this in mind, and a combination of a high housing density and high average sale prices for market homes in this strategic Central London location, this proposal **is viable**.

massing

The building heights are a factor that define the public spaces. The building heights are appropriate, as to not overbear the public space, and are to scale with the size of public space provision. These heights create closure along the street and add richness through the varied roofscape and heightened corners.

The two towers are of visual importance among the other buildings. They act as markers for Market Boulevard and the waterfront/Trafalgar Way. This aids legibility and distinctiveness, as well as contributing to gradual building height decline, proposed in the group masterplan, to visually bind South Poplar and Canary Wharf.

Figure 136: Proposed massing of the individual masterplan.



landmarks

Many focal points have been created to emphasise the urban structure and connections to create visual interest and distinctiveness of place. Social and sport hubs across the site act as key focal points, with connections and flows cutting through these spaces. Billingsgate Park is a centre of activity that houses multiple social hubs and public spaces to accommodate different needs and activities. It acts as a space that provides natural and social flows. The key social flow leads towards Heritage Square. The building line and street design creates a sequence that ends with the historic Accumulator Tower that has become a landmark in this proposal. This framed vista extends through the built environment through to the park, respecting and enhancing the heritage structure.

As noted in page 93, the residential towers act as reference points to create legibility and to mark key connections and destinations.

Figure 137: Landmarks across the site.

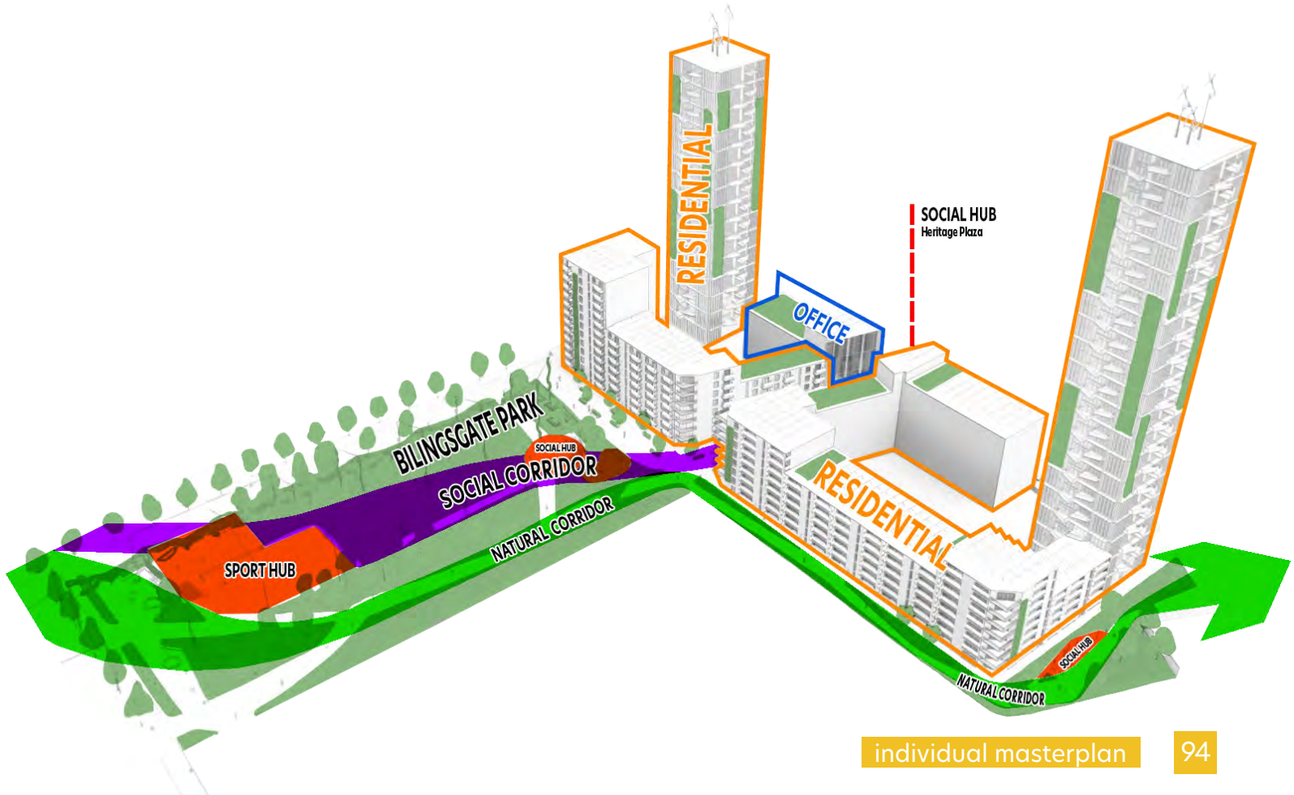


Figure 138: Billingsgate Market frame has been greened, acting as a landmark in its own right, but also housing multiple hubs below.

Figure 139: Flexible basketball court offering potential for community events.

townscape

Behaviour: the proposal creates a range of experiences for users. The view towards Heritage Plaza is a key viewline that changes along its approach, with the Accumulator Tower appearing as you turn a corner. Building lines are defined through soft borders, clarifying the public and private spaces.
Contact: The shared spaces create a greater sense of experience, encouraging active travel and social cohesion. These streets deliver an attractive and usable residential environment, with allowances for personalisation on balconies and front gardens, supporting the vibrancy of place. Billingsgate Park supports movement flows, but also acts as a landmark with unique open spaces and a public realm coherent with the residential area.
Memorability: The proposal contains many icons and landmarks to create legibility and aid navigation. The Billingsgate Market frame is covered in vegetation to plant it firmly within Billingsgate Park, but also to add individuality and sense of place.

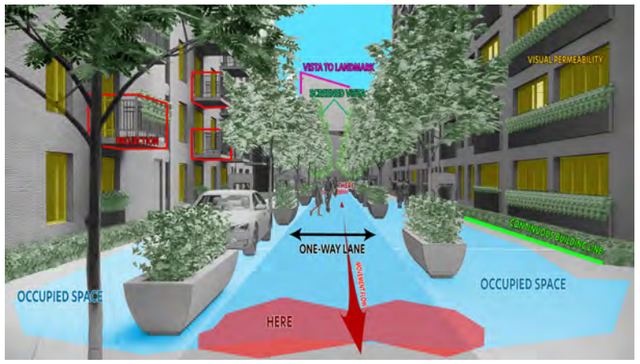
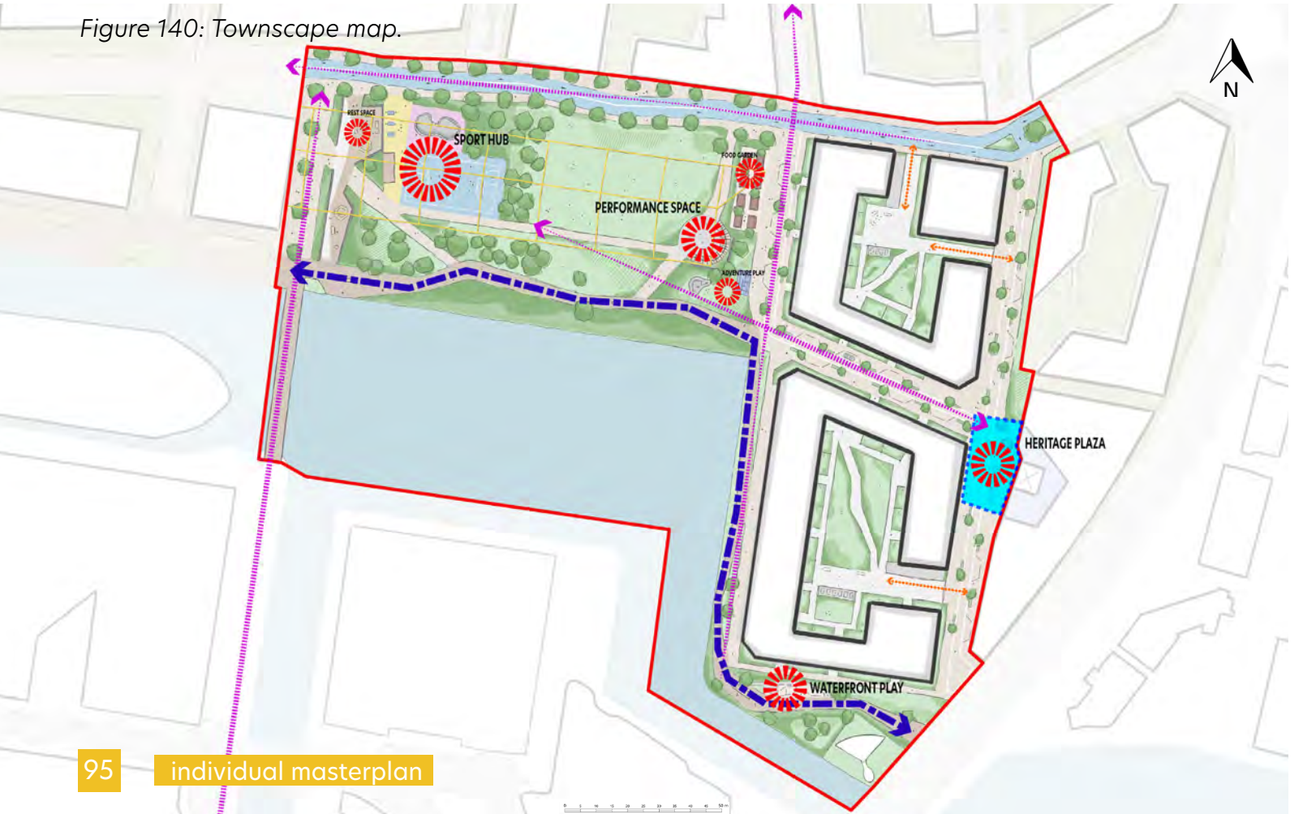


Figure 141: Townscape analysis of the shared street.

Key:
- Vista
- Landmark/Focal Point
- Promenade
- Civic/Spill-Out Space
- Rear Residential Access

Figure 140: Townscape map.



summary

Overall, this proposed masterplan achieves the group and individual vision and appropriate policies, delivering mixed-use hubs in a place that is designed around the natural environment. The proposal creates a high-quality, distinctive neighbourhood, with landmark features that act to visually bind South Poplar and Canary Wharf. The proposal supports the growth of Canary Wharf, creating connections, delivering much-needed housing, and offering office space for small or medium business. The masterplan creates a sense of place and identity, creating natural open spaces, with varied uses, to support the wider needs of the population and to support social cohesion.

Principles achieved by:

Principle 1: Accessible and Connected Spaces

- North Dock Bridge and Trafalgar Way Access supports wider connectivity.
- Billingsgate Park design supports flow towards the overbuild.
- Flat surfacing to support accessibility.
- Landmark spaces that are well connected to the wider site.
- Shared surface streets encourage active ravel and create an attractive residential environment.

Principe 2: Increase natural environments

- Various natural spaces, such as meadows, play space, lawns and street trees supports biodiversity, wildlife, and different needs of users. Food production is built into the shared streets.
- There are few manicured spaces to reduce maintenance costs.
- Food production is built into the shared streets to support wildlife and to foster social cohesion.

Principle 3: Social cohesion and activities

- The site binds South Poplar and Canary Wharf through the North Dock Bridge and proximity to the overbuild.
- Mixed public spaces like Heritage Plaza, performance space and play spaces support social cohesion and community interaction, meeting needs of different users, and support varied activities.
- Urban greening along the streets and with many park spaces supports visual connectedness that the group masterplan will extend into South Poplar.

Principle 4: Supporting economic growth

- Delivery of a small office space supports the economic centre.
- Urban greening supports the resilience of the proposal against climate change, as well as creating an attractive streetscene.
- Delivery of 533 homes and 35% affordable homes brings in a mixed population with different skills and experience.

Principle 5: Distinctive environment and identity

- Park spaces are defined by soft boundaries. Residential areas also use soft boundaries to define the public and private spaces.
- Landmarks, such as the Billingsgate Market Frame and Accumulator Tower aid wayfinding and promote the heritage of the area.
- Varied natural environment supports the new Billingsgate identity.

bibliography

subtitle if needed?

Unless otherwise stated, all images and graphics are my own.

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