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Draft Plan Stage

Tivoli Docks Urban Density and Building Height Strategy



Comhairle Cathrach Chorcaí
Cork City Council



We are Cork.

TIVOLI DOCKLANDS

URBAN DENSITY & BUILDING HEIGHT STRATEGY

City Architects Department



Comhairle Cathrach Chorcaí
Cork City Council



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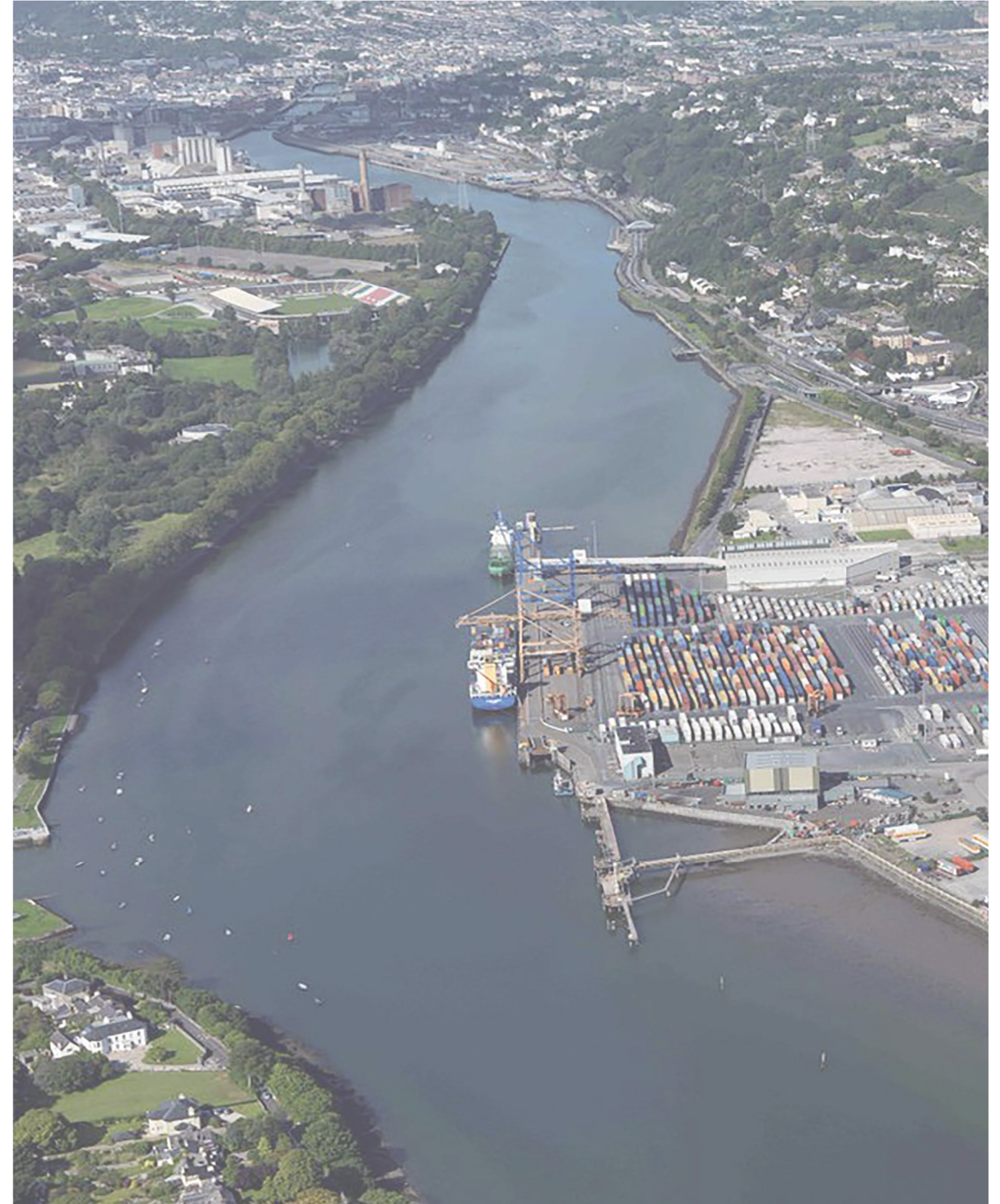
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SECTION 1. Introduction & Context

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- 1.2 - Context & Background
- 1.3 - Programme & Report Structure



1.1 Purpose of Study & Brief

Cork City Council is currently preparing a City Development Plan (CDP) to include Tivoli Docklands. Tivoli Docklands is an area of 61.5 hectares on a flat elongated site, situated approximately 2.5km east of Cork City Centre. The site is bounded by a 3km River Lee frontage to the south, train line and N8 public road to the north and the Glashaboy River to the east. Cork Harbour Special Protection Areas are located due east and southeast of Tivoli.

Tivoli is a regeneration site of national importance and has been identified in the 'Project Ireland 2040 National Planning Framework' (NPF) as a key growth enabler to deliver large scale regeneration in terms of employment, housing and supporting infrastructure. The NPF also identifies:

- A growth target for Cork City of at least 50% by 2040,
- '...enhanced urban environment, including better housing choice and quality, new employment locations, improved public spaces and enhanced public transport as well as safe and pleasant options for walking and cycling.'

The Urban Development and Building Heights Guidelines for Planning Authorities (Dec 2018) requires Plans to identify areas suitable for increased density and building height as per Specific Planning Policy Requirement (SPPR) 1:

- "SPPR1 In accordance with Government policy to **support increased building height and density in locations with good public transport accessibility**,.....
- 2.7... ..Appropriate **identification and siting of areas suitable for increased densities and height** will need to consider the environmental sensitivities of the receiving environment as appropriate....
- 2.12 In this regard, areas to be included in this assessment are central and/or accessible locations and also intermediate urban locations where medium density residential development in **excess of 45 residential units per hectare** would be appropriate.

In light of the above Cork City Council Architects Department in conjunction with the Planning Policy Section, Strategic Planning & Economic Development, have been engaged to develop a **Tivoli Docklands Urban Density & Building Height Strategy (UDBHS)** as a supporting document to the proposed **Cork City Development Plan 2022-2028**.

This strategy aims to:

- **Identify where in Tivoli Docklands upper 'human scale' density is acceptable and where taller buildings can be integrated into the surrounding environment.**
- **Specify density per hectare targets in line with population, homes and employment targets for Tivoli.**
- **Develop a site specific methodology and framework for public realm, density and building height distribution across the future Tivoli Docklands development.**

1.2 Context and Background

The 'Tivoli Docklands Urban Density and Tall Buildings Strategy' further develops and compliments the findings of the following specific reports:

- Area Based Transport Assessment for Tivoli Docklands (2019) by Jacobs.
- Tivoli Docks Issues Paper (May 2017), Cork City Council.
- Tivoli Urban Design & Landscape Framework Plan (UDLFP - March 2019) by AECOM and Butler Cammoranesi Architects.

The Area Based Transport Assessment for Tivoli Docklands forms a significant evidence base which focuses priority on sustainable and active travel to and from Tivoli. The modal shift away from car based travel is critical to Tivoli being an enjoyable place to live, work, visit and play. Key elements of this work are future connections to the city centre:

- Train station central to the site,
- Bus corridor running east-west and
- A pedestrian & cycle green-way along the Quays.

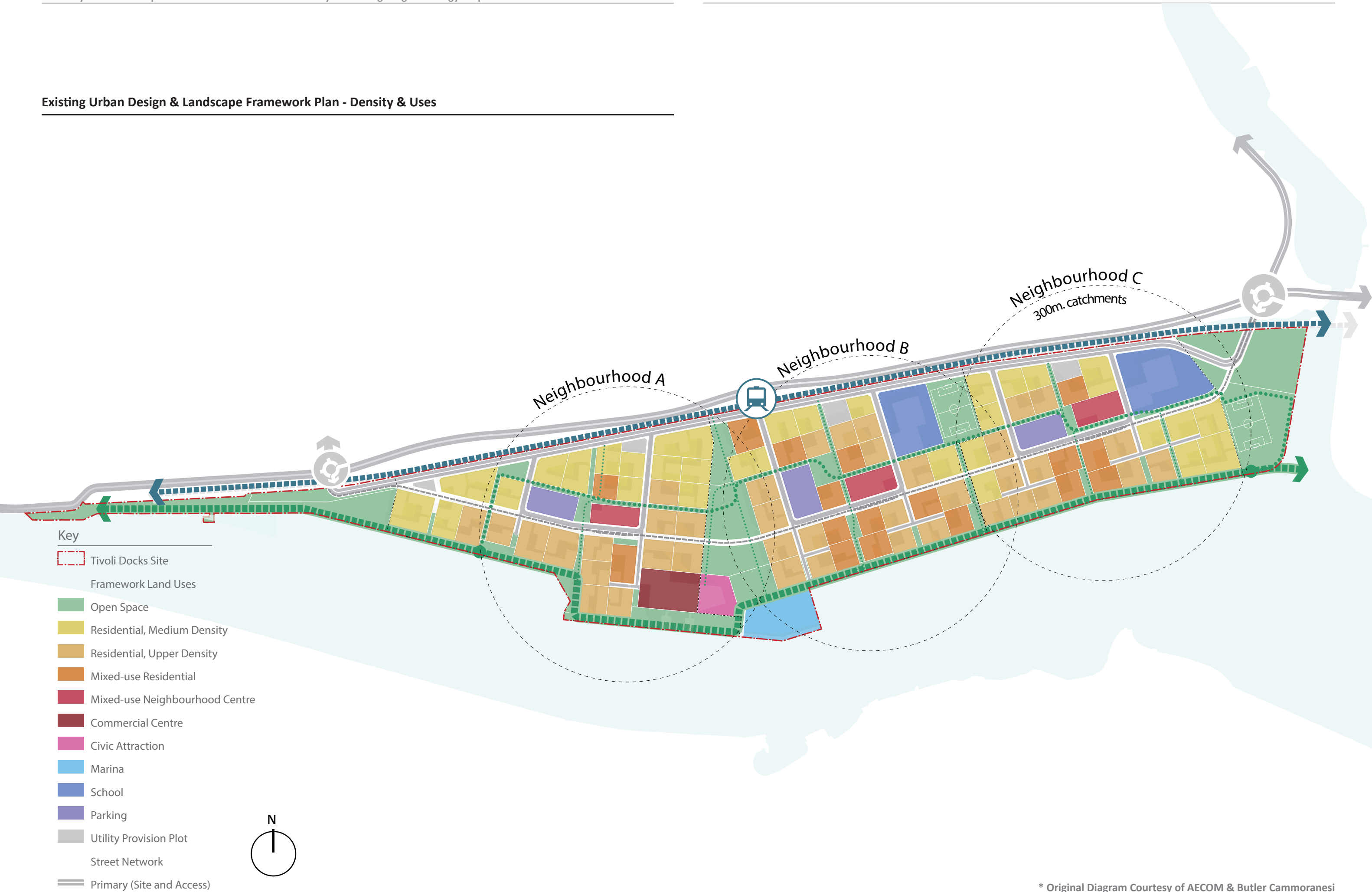
The Tivoli Docks Issues Paper and the subsequent Urban Design & Landscape Framework Plan set-out and developed population and employment targets for the Tivoli site which are further examined in detail within this strategy.

Flood risk is a key issue to be addressed in future plans for the redevelopment of Tivoli Docklands and a flood risk assessment will address this matter as separate to this strategy.

Factors considered within this strategy in assessing and modelling the Tivoli Docklands to identify suitable area(s) to accommodate: **a) 'human scale' upper density, & b) taller building locations include:**

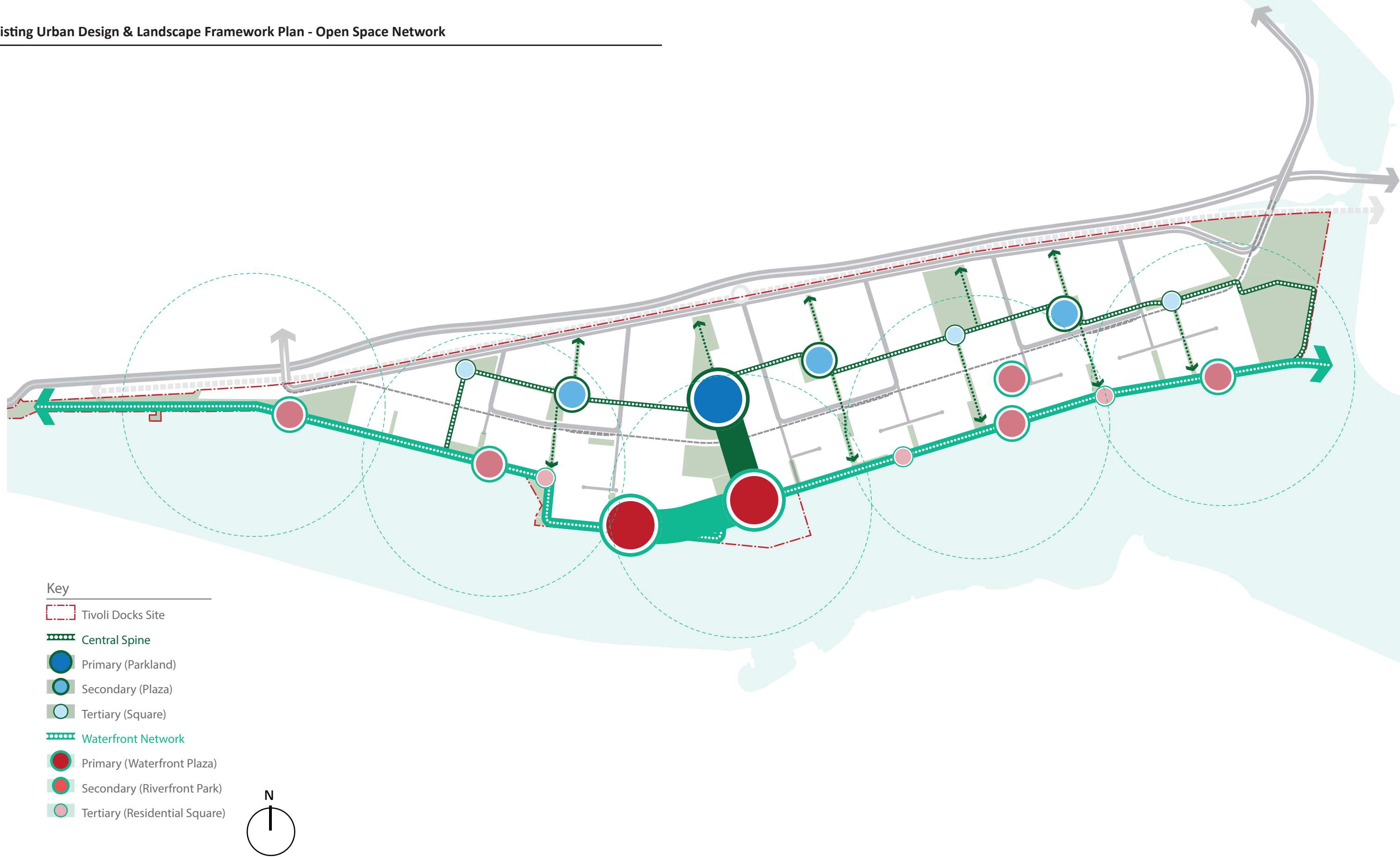
- Layout of proposed key transport infrastructure as per Tivoli Docks ABTA 2019, and Cork Metropolitan Area Transport Strategy 2019.
- Layout of recommended public open space – Tivoli Urban Design & Landscape Framework Plan (UDLFP - March 2019),
- Social, human and environmental impacts of upper density and taller buildings.
- Visual impacts (including cumulative impacts) of upper density and tall buildings on surrounding environment, significant views of skylines including Tivoli ridge, natural topography, street-scape, landmark buildings and their settings (e.g. Blackrock observatory)
- Measures and recommendations on how upper density and tall buildings address/manage climate change, overshadowing, access to daylight and sunlight etc.
- Ability to maximise energy conservation, passive solar design and renewable energy on site.
- Sense of place, respect for cultural heritage, and maximising views and connections to the River Lee-Marina Park, Blackrock Observatory and City Centre.
- Impacts on the immediate and surrounding environments (Micro-climate, River Lee, Glashaboy River, Cork Harbour Special Protection Area, Railway line, N8 public road, Tivoli ridge, Blackrock and Marina Park).

Existing Urban Design & Landscape Framework Plan - Density & Uses



* Original Diagram Courtesy of AECOM & Butler Cammoranesi

Existing Urban Design & Landscape Framework Plan - Open Space Network

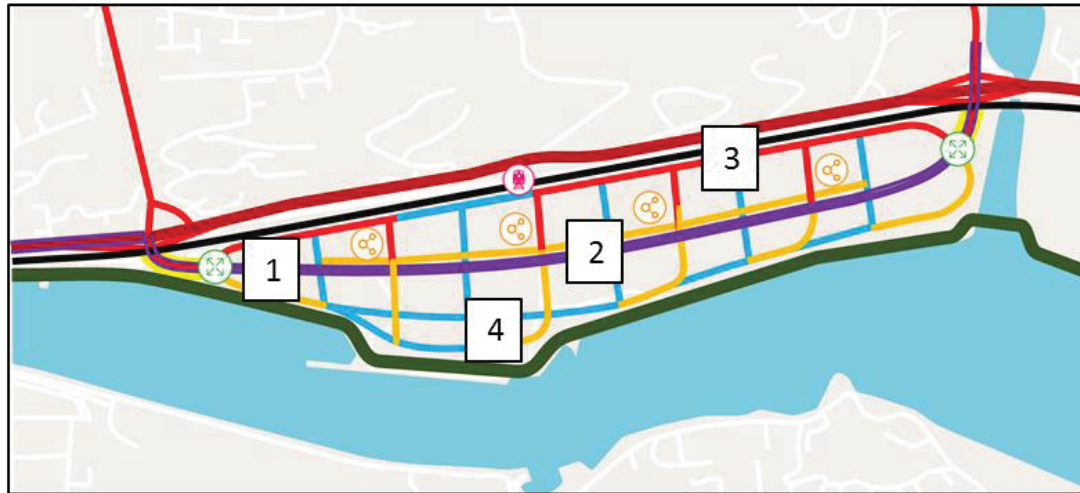


- Key
- Tivoli Docks Site
 - Central Spine
 - Primary (Parkland)
 - Secondary (Plaza)
 - Tertiary (Square)
 - Waterfront Network
 - Primary (Waterfront Plaza)
 - Secondary (Riverfront Park)
 - Tertiary (Residential Square)

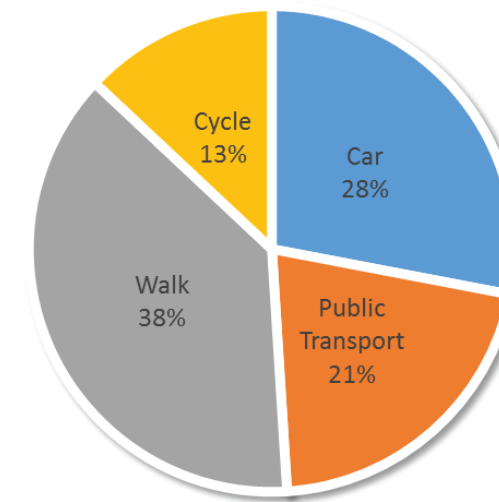
* Original Diagram Courtesy of AECOM & Butler Cammoranesi

Tivoli Area Based Transport Assessment (ABTA) - Proposed Transportation Network and Modal Share

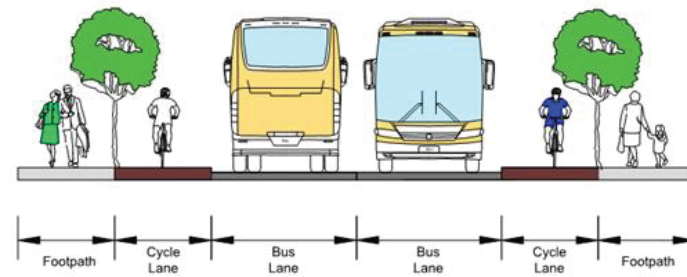
Tivoli Docks: Street Cross Sections



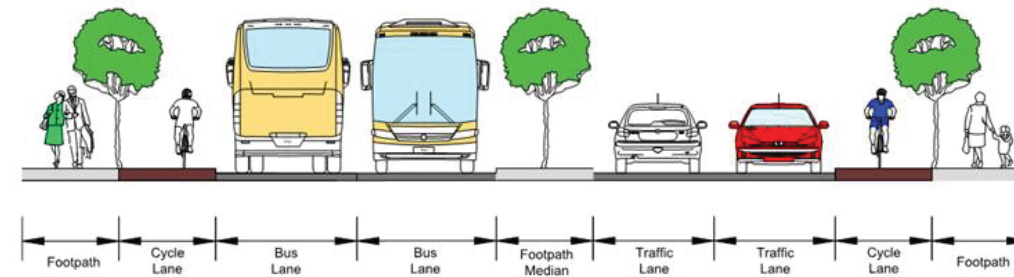
Tivoli Docks AM Peak Mode Share



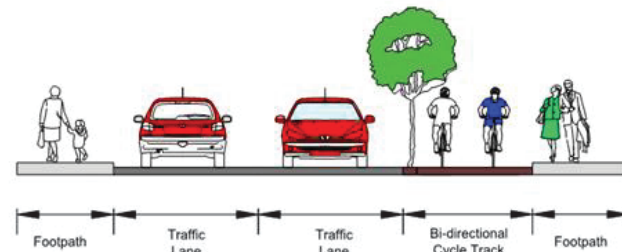
1 Tivoli Public Transport Spine



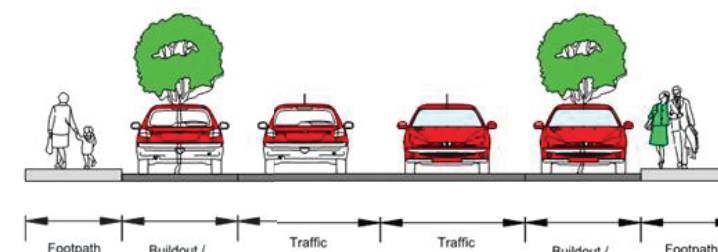
2 Tivoli Public Transport Spine



3 Tivoli Link Street



4 Local Access Street



1.3 Programme & Report Structure

A project working group included members of the City Architects Department (CAD) & Strategic Planning & Economic Development (SPED). The project steering group included the Director of SPED, City Architect & Senior Planner. In the delivery of this strategy a clear project roadmap was structured to include steering group inputs at key stages. The programme for the key project deliverables involved 3 main stages:

Stage 1. Project Set-up

- Review of baseline info, relevant plans, guidelines, assessments, reports, studies & investigations.
- Site visit and compile observations.
- Meeting with Port Authority.
- Initial compiling of all baseline site plans, cross sections, relevant urban framework plans & public transport strategies etc.
- Review of relevant precedent studies, urban height guidelines etc.
- Steering group kick-off meeting. Incorporate steering-group views into overall project plan.

Stage 2. Development Phase

- Prepare options based on Phase 1 studies & evidence lead case studies.
- Agree outline approaches in conjunction with the project working group.
- Overlay baseline info eg. ABTA, proposed densities, public transport, public realm strategy with existing urban framework plan identifying outline site density & height strategies.
- Develop diagrammatic plans sections & typical block 3D modelling of options, outline 3D modelling / massing of key neighbourhood blocks related to building heights strategy.
- Indicative climatic impacts – eg. light & shadow, solar gain, micro-climatic effects etc. referring to best practice examples.
- Typology & Precedent Studies.
- Indicative locations of Landmark / Gateway buildings.
- Select strategic & local views of importance.
- Present findings & preferred option to project steering group.

Stage 3. Final Report

- Incorporate steering group feedback & develop preferred strategy into draft 'Tivoli High Density & Tall Buildings Strategy'.
- Finalize urban layout plan including preferred option indicating integrated density, transportation, public realm strategies, mixed-uses etc.
- Develop 3D model of entire site applying proposed preferred density & heights strategy, with indicative landmark / gateway buildings.
- Demonstrate protection of Strategic & Local Views - Key perspectives from 3D modelling
- Site cross-sections including context / topography
- Present draft report & conclusions to the steering group in advance to tie in with related elements of the draft City Development Plan.
- Finalize publicly accessible report & associated graphic presentation.
- Publish final strategy.

Structure of Strategy Report.

The report is structured into 6 main sections:

Section 1. Introduction & Context

Section 2. Design Principles for Tivoli

- This section addresses our analysis of the of the preceding Tivoli UDLFP & ABTA reports and makes high level recommendations for revisions based on the established 'Key Design Principles for Tivoli'.

Section 3. Proposed Revisions to Urban Design & Landscape Framework Plan

- Applying the findings from Section 2, Section 3 outlines proposed developments from the UDLFP with details and illustrations.

Section 4. Strategic Methodology - 'Reconnecting' Tivoli to the City

- Under the main heading of 'Reconnecting' Tivoli to the City, this section outlines key methodologies with respect to:
 - Key Views & Prospects.
 - Tivoli Landscape & Heritage Character and associated Building Height Parameters.
 - 'Creating a Piece of the City - The Waterfront 'Journey'.

Section 5. Proposed Tivoli Density & Building Heights Framework

- Building upon the development data from the UDLFP, ABTA and subsequent revisions and methodologies proposed under this strategy, specific population, employment and density figures are proposed.
- A hierarchy of upper density and building height locations are identified and modelled in 3D.
- Proposed Landmark buildings are tested against key views and prospects as per methodology identified in Section 4.
- Neighbourhood 'Development Guidelines' are further identified and illustrated via diagrammatic plans, sections, 3D perspectives, shadow studies and precedent images.

Section 6. Conclusions & Recommendations

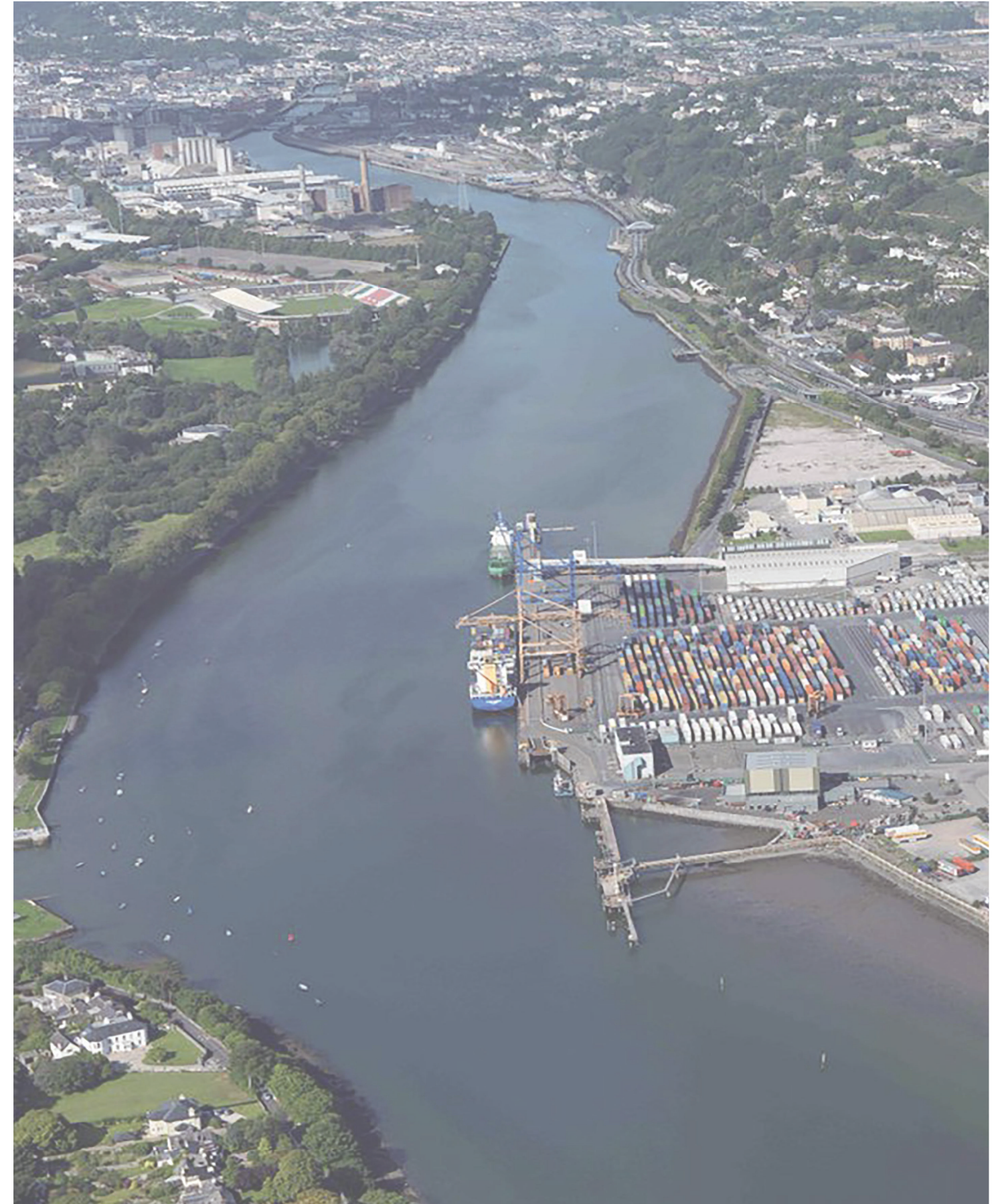
***Exclusions:**

The following elements are not explicitly covered within this report:

- Integrated Urban Drainage / Flood Defence Strategy. This requires further specialist Engineering input. It is assumed that future design levels will be provided from the current ongoing separate drainage / flood defence studies.
- Wind funnelling / tunnel tests. This is a specialist item which should form part of the requirements for any future developments on the site. The proposed strategy assumes best practice guidance only.
- Economic appraisal of Tall Buildings. Requires specialist QS input in conjunction with an Engineering assessment of existing ground conditions etc.

SECTION 2. Design Principles for Tivoli

- 2.1 - 16 Design Principles for Tivoli
- 2.2 (a) - 4no. High Level Design Principles: (A) Resilient Design
- 2.2 (b) - 12no. Principles: (B) Movement & Character
- 2.2 (c) - 12no. Principles: (C) Neighbourhood & Built Form
- 2.2 (d) - 12no. Principles: (B) Places & Spaces
- 2.3 - **Proposed Revisions to UDLFP: Key Recommendations**



2.1 16 Design Principles for Tivoli

16 no. Design Principles (below) for Tivoli were developed as part of the original Urban Design & Landscape Framework Plan (UDLFP).

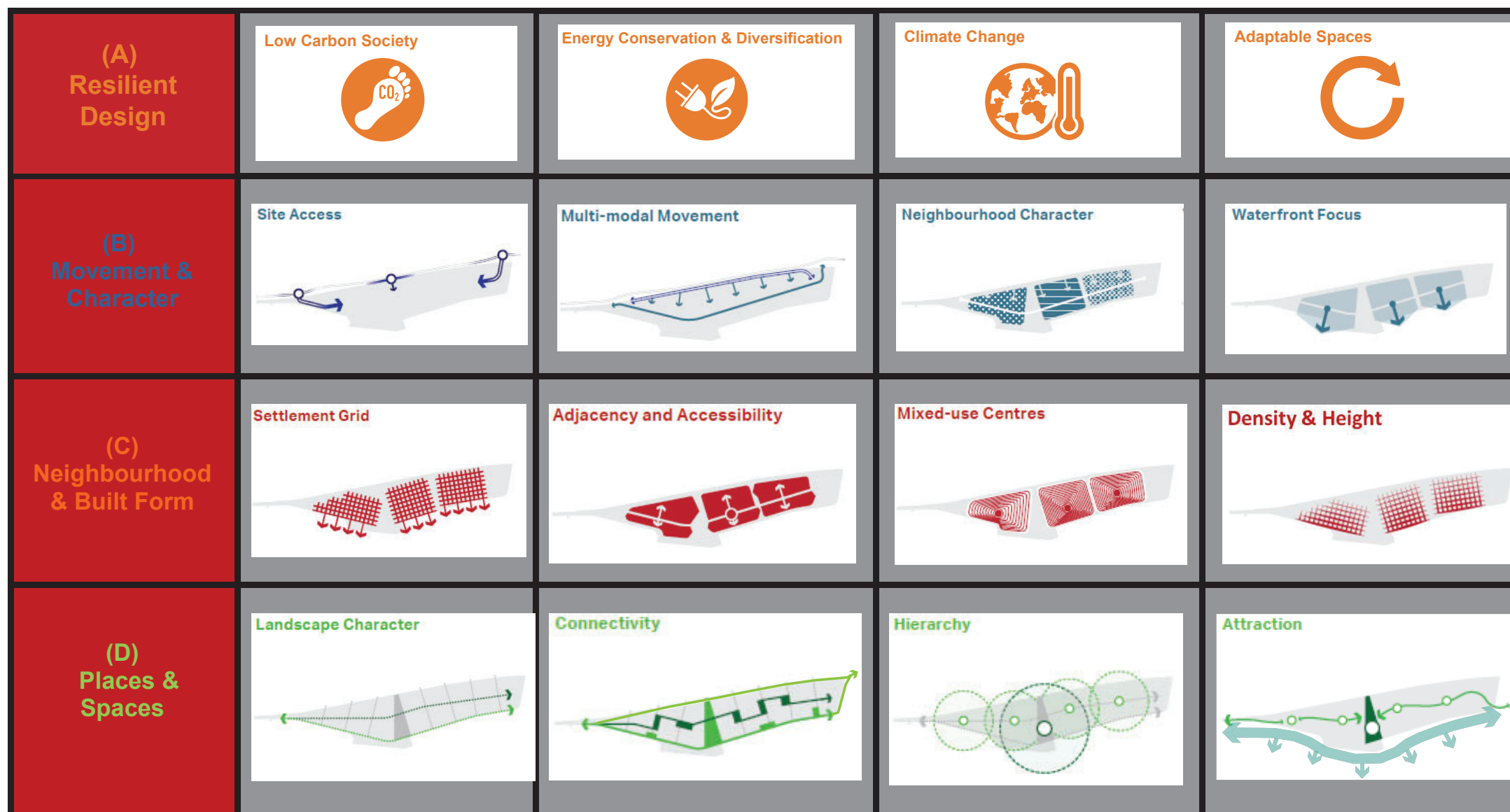
4no. High Level Principles were identified under the heading:

(A) - Resilient Design

12no. Key Design Principles were also identified for Tivoli under the following 3 headings:

- (B) - Movement & Character
- (C) - Neighbourhood & Built Form
- (D) - Places & Spaces

The following sections analyse the existing UDLFP against each of the Design Principles leading to a number of high level recommendations for revisions to the Tivoli Framework Plan.



2.2(a) 4no. High Level Design Principles - (A) Resilient Design



A1. Low Carbon Society

- Dense utilization of a brown field site leading to a Compact city to reflect Climate Action Plan 2019.
- Mixed Mode transportation bringing car trip down to a maximum 30% to reduce car based CO2.
- Dense development and permeable block layouts make local Services and Employment options viable reducing daily trips to the city.

A2. Energy Conservation & Diversification

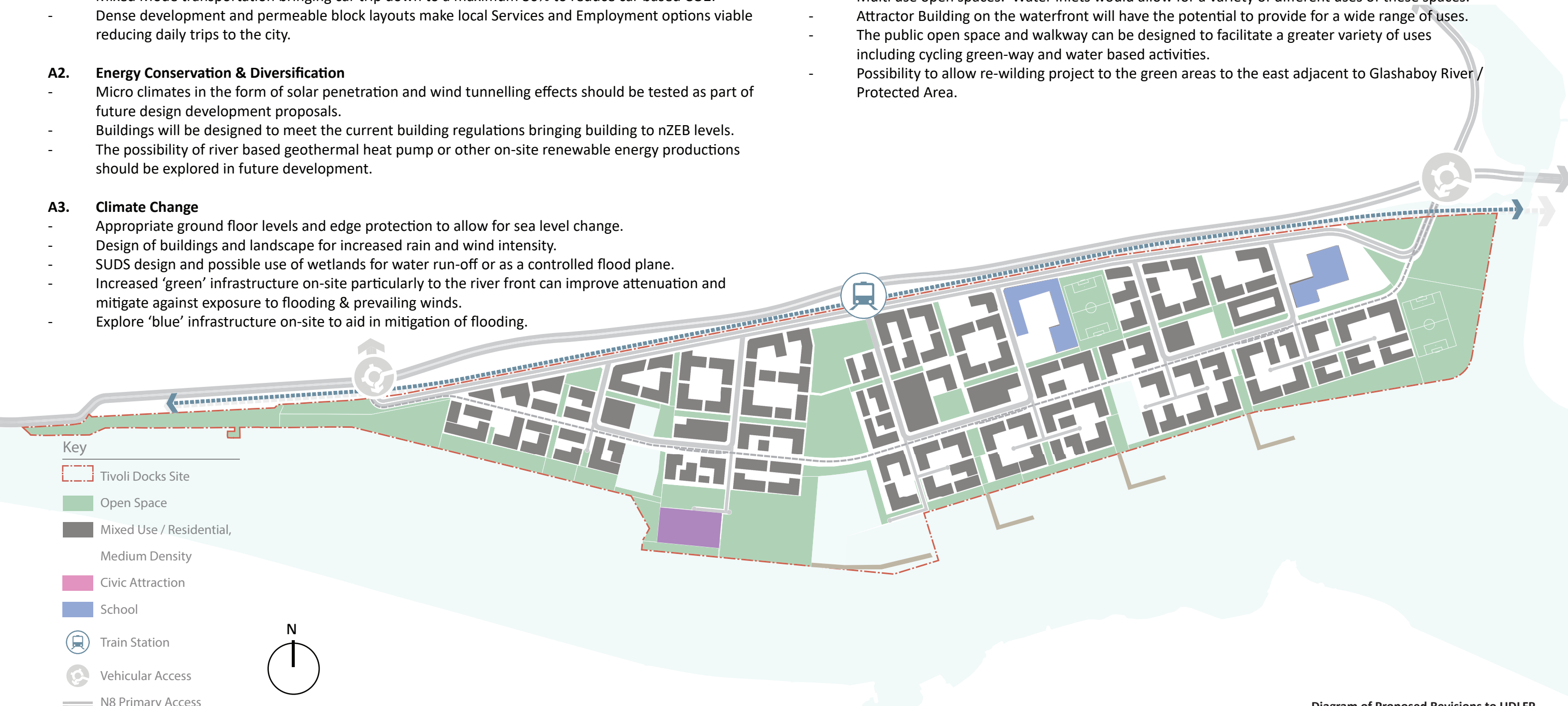
- Micro climates in the form of solar penetration and wind tunnelling effects should be tested as part of future design development proposals.
- Buildings will be designed to meet the current building regulations bringing building to nZEB levels.
- The possibility of river based geothermal heat pump or other on-site renewable energy productions should be explored in future development.

A3. Climate Change

- Appropriate ground floor levels and edge protection to allow for sea level change.
- Design of buildings and landscape for increased rain and wind intensity.
- SUDS design and possible use of wetlands for water run-off or as a controlled flood plane.
- Increased 'green' infrastructure on-site particularly to the river front can improve attenuation and mitigate against exposure to flooding & prevailing winds.
- Explore 'blue' infrastructure on-site to aid in mitigation of flooding.

A4. Adaptable Space

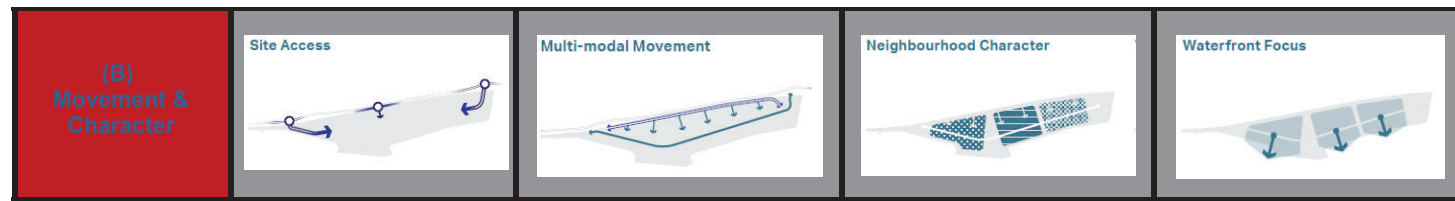
- Zoning of layout allowing change to reflect desires of the community.
- Multi use open spaces. Water inlets would allow for a variety of different uses of these spaces.
- Attractor Building on the waterfront will have the potential to provide for a wide range of uses.
- The public open space and walkway can be designed to facilitate a greater variety of uses including cycling green-way and water based activities.
- Possibility to allow re-wilding project to the green areas to the east adjacent to Glashaboy River / Protected Area.



Key

- Tivoli Docks Site
- Open Space
- Mixed Use / Residential, Medium Density
- Civic Attraction
- School
- Train Station
- Vehicular Access
- N8 Primary Access Medium Density

2.2(b) 12no. Key Design Principles for Tivoli - (B) Movement & Character



B1. Site Access

- Access based on ABTA is well delivered but with potential confusion regarding access road across the north of the site. ABTA road layout eliminated primary vehicle corridor link between Train Station & Neighbourhood A (see link circled below) to prevent Tivoli being used an alternative though route to the adjacent N8.

B2. Multi-modal Movement

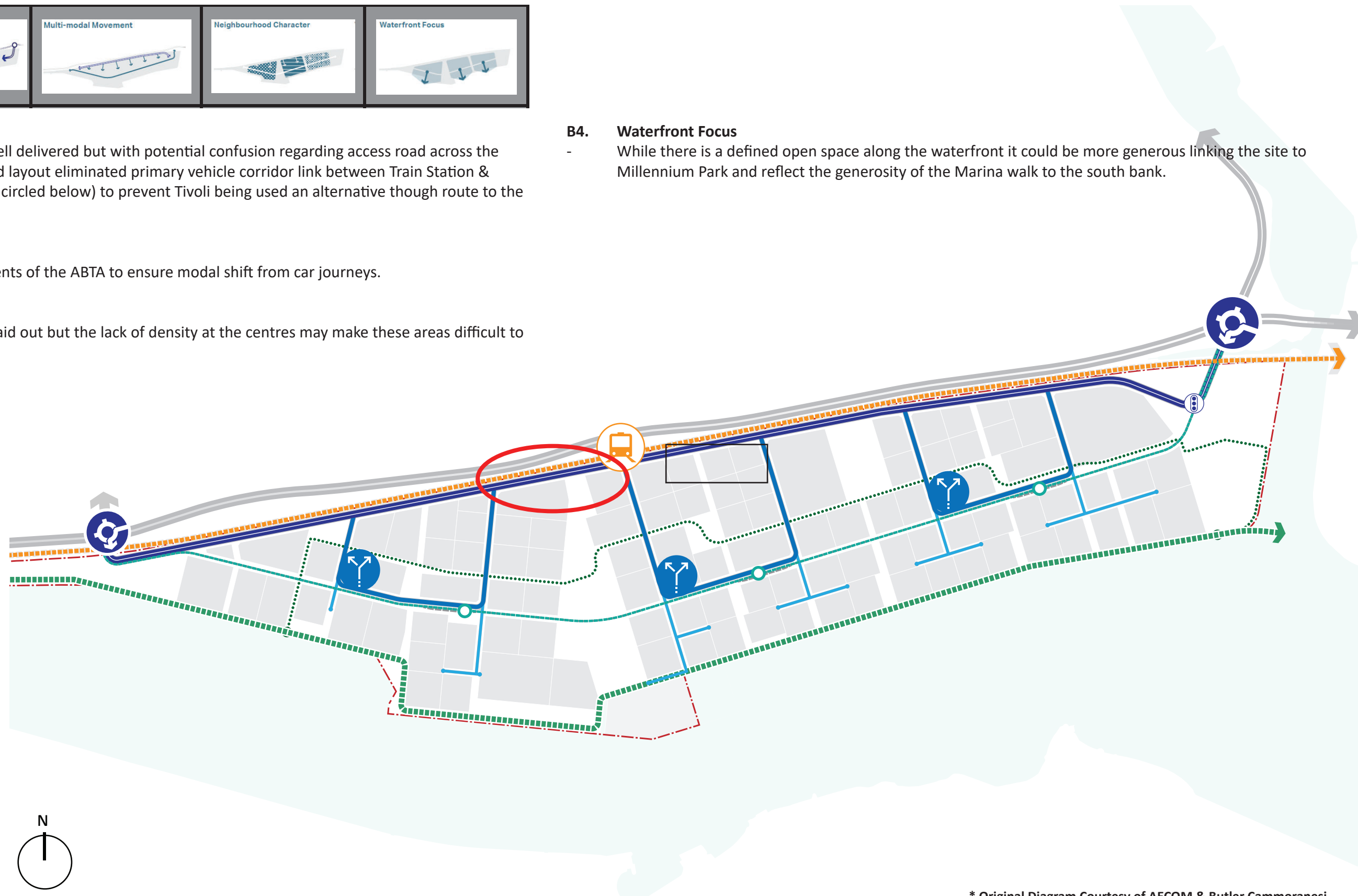
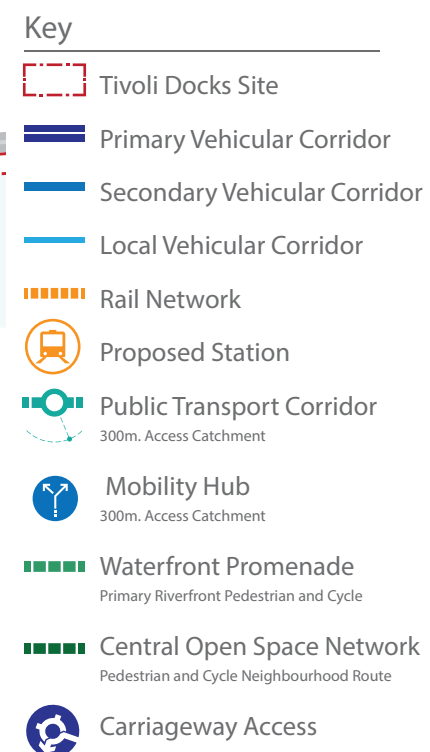
- Plan reflects the requirements of the ABTA to ensure modal shift from car journeys.

B3. Neighbourhood Character

- Neighbourhoods are well laid out but the lack of density at the centres may make these areas difficult to define.

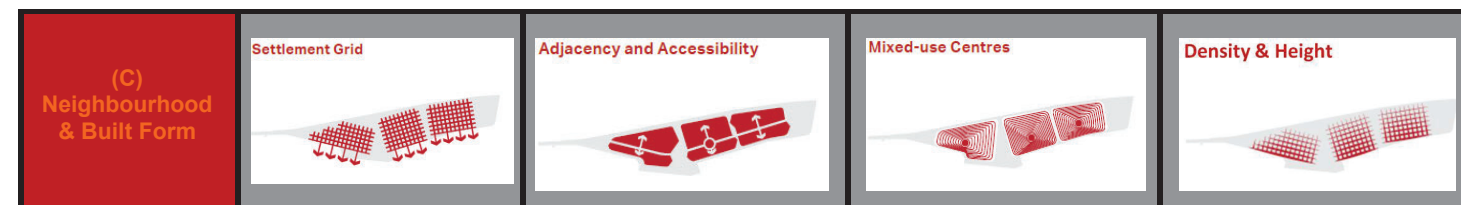
B4. Waterfront Focus

- While there is a defined open space along the waterfront it could be more generous linking the site to Millennium Park and reflect the generosity of the Marina walk to the south bank.



* Original Diagram Courtesy of AECOM & Butler Cammoranesi

2.2(c) 12no. Key Design Principles for Tivoli - (C) Neighbourhood & Built Form



C1. Settlement Grid

- The grid layout reflects well the nature of the site with an appropriate permeability.

C2. Adjacency & Accessibility

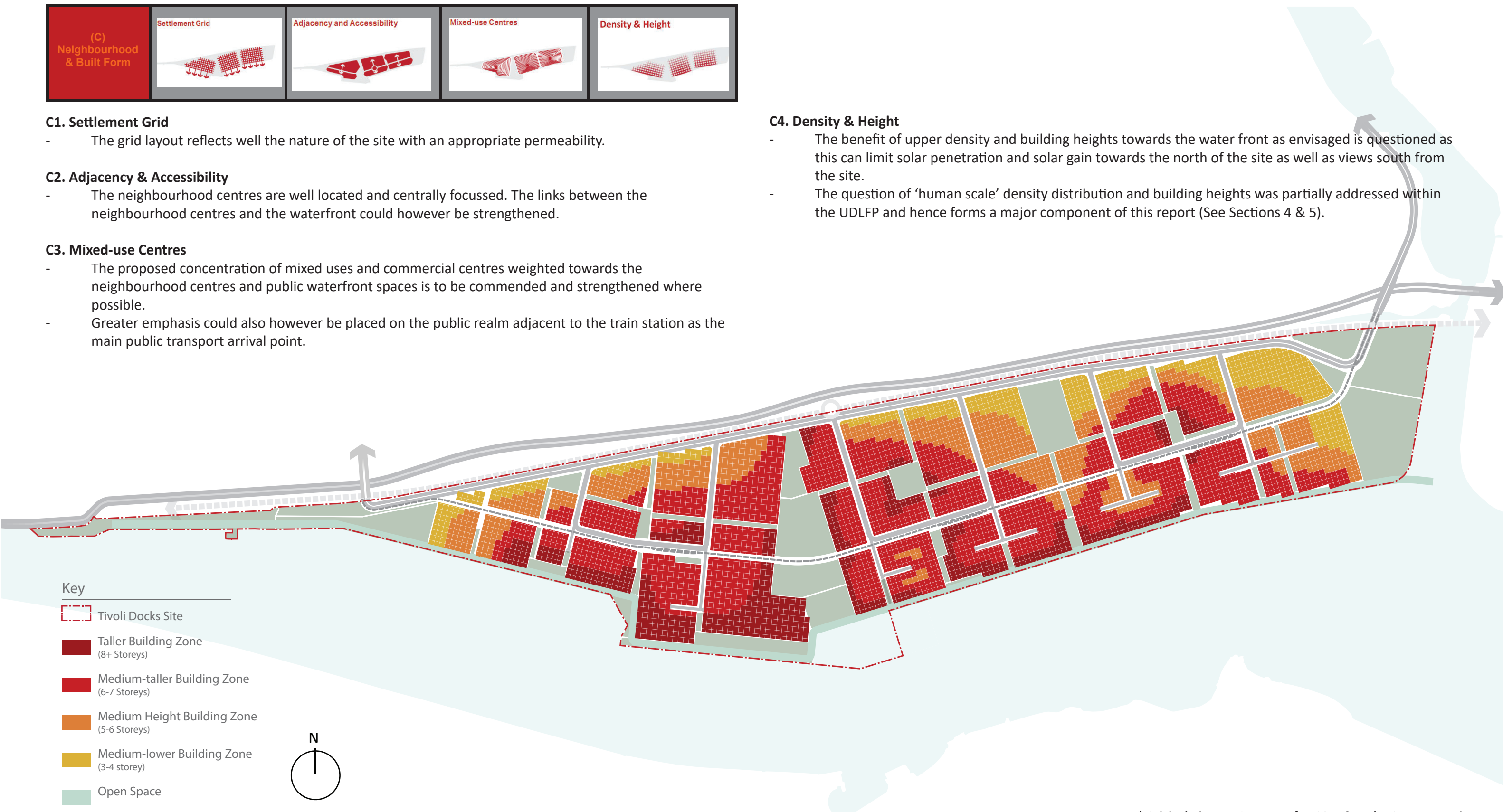
- The neighbourhood centres are well located and centrally focused. The links between the neighbourhood centres and the waterfront could however be strengthened.

C3. Mixed-use Centres

- The proposed concentration of mixed uses and commercial centres weighted towards the neighbourhood centres and public waterfront spaces is to be commended and strengthened where possible.
- Greater emphasis could also however be placed on the public realm adjacent to the train station as the main public transport arrival point.

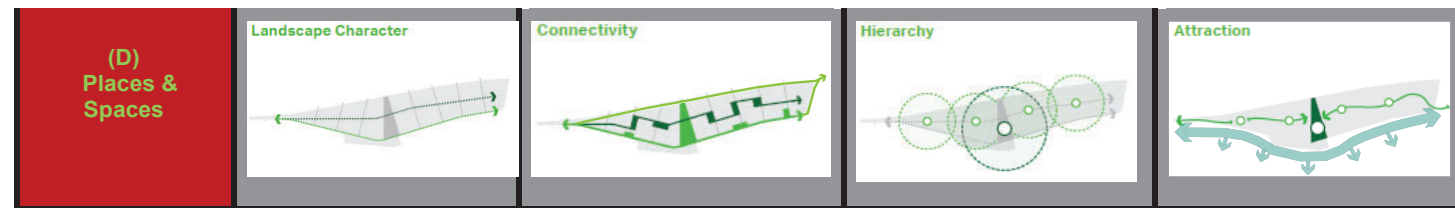
C4. Density & Height

- The benefit of upper density and building heights towards the water front as envisaged is questioned as this can limit solar penetration and solar gain towards the north of the site as well as views south from the site.
- The question of 'human scale' density distribution and building heights was partially addressed within the UDLFP and hence forms a major component of this report (See Sections 4 & 5).



* Original Diagram Courtesy of AECOM & Butler Cammoranesi

2.2(d) 12no. Key Design Principles for Tivoli - (D) Places & Spaces



D1. Landscape Character

- Wider connections to and from surrounding landscapes such as Tivoli Ridge and Blackrock Marina have the potential to be further explored. Strong waterfront focus to be further developed.

D2. Connectivity

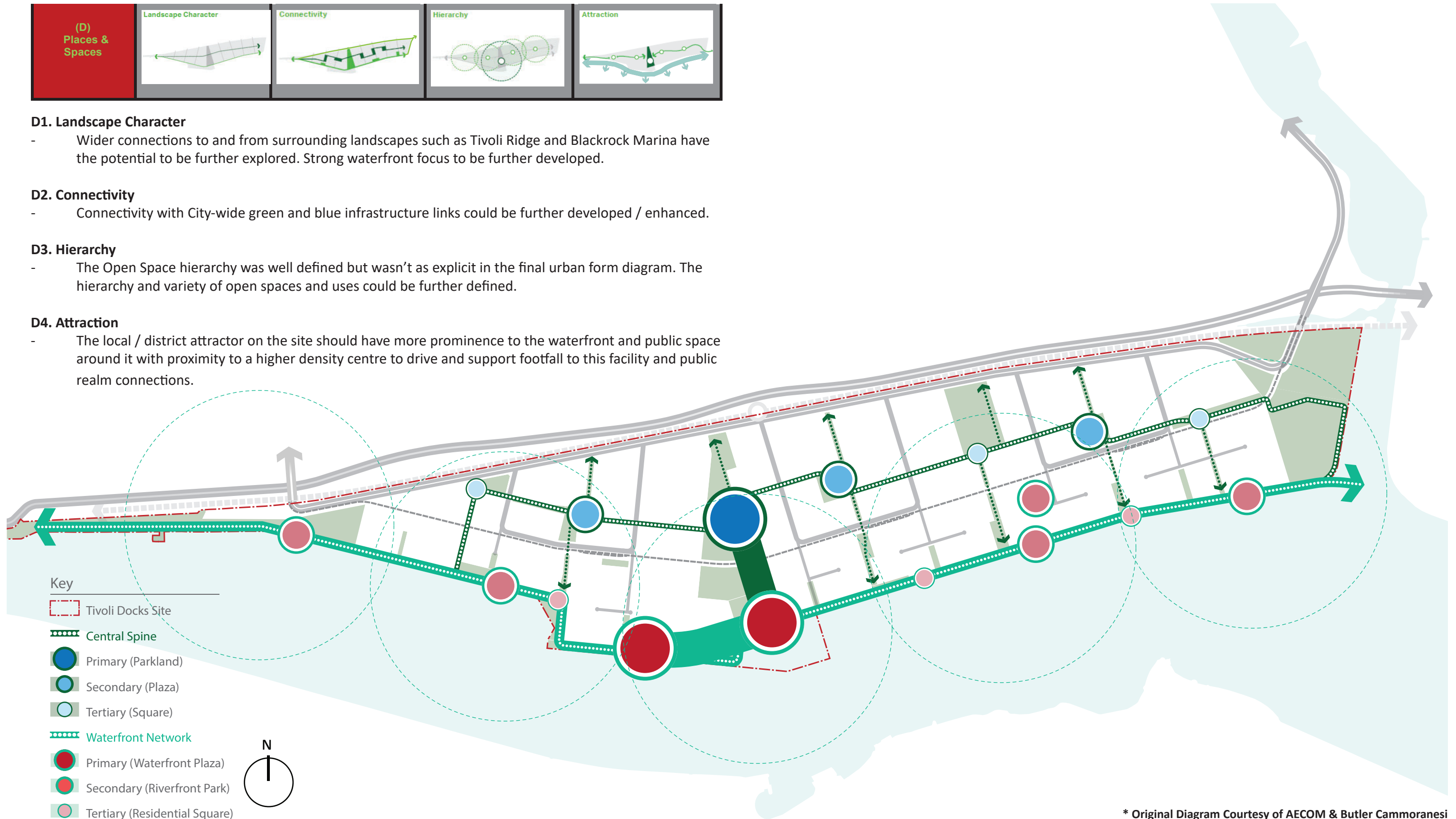
- Connectivity with City-wide green and blue infrastructure links could be further developed / enhanced.

D3. Hierarchy

- The Open Space hierarchy was well defined but wasn't as explicit in the final urban form diagram. The hierarchy and variety of open spaces and uses could be further defined.

D4. Attraction

- The local / district attractor on the site should have more prominence to the waterfront and public space around it with proximity to a higher density centre to drive and support footfall to this facility and public realm connections.



* Original Diagram Courtesy of AECOM & Butler Cammoranesi

2.3 Proposed Revisions to UDLFP: Key Recommendations

(A) Resilient Design

A1. Low Carbon Society

- Increase proposed density. Section 5 of this report addresses in detail the proposed density on-site.

A2. Energy Conservation & Diversification

- The effects of taller buildings to the waterfront is questioned with regard to solar gain throughout the site & potential overshadowing.

A3. Climate Change

- Increase the extent and variety of 'green' and 'blue' infrastructure to increase the potential for biodiversity and flood defence.

A4. Adaptable Space

- We recommend increasing the extent and variety of 'green' and 'blue' infrastructure allowing for a greater variety of uses and social ecosystem.

(B) Movement & Character

B1. Site Access

- Revert to ABTA Primary Vehicle Corridor to the north of the site ie. limit the through access from the proposed train station to Neighbourhood A to public transport and pedestrian / cycling only.

B2. Multi-modal Movement

- ABTA Focus on sustainable travel modes is maintained. No proposed amendments.

B3. Neighbourhood Character

- Look at potential of increasing density at neighbourhood centres.

B4. Waterfront Focus

- Increase buildings set-back in order to strengthen waterfront public realm and 'journey'.
- The potential to bring water features into the site should be examined given the reclaimed nature of the Tivoli site.

(C) Neighbourhood & Built Form

C1. Settlement Grid

- Appropriate permeability. No proposed amendments.

C2. Adjacency & Accessibility

- Reinforce and strengthen public realm linkages between neighbourhood centres and the waterfront.

C3. Mixed-use Centres

- As the main public transport arrival point to the Tivoli site a train station 'plaza' area is identified as having further development potential in terms of both public realm focus and an intensification of mixed and commercial uses.

C4. Density & Height

- Increase 'human scale' density. Stronger methodology required regarding proposed building heights in general. UDLFP provided generic non-hierarchical base study.
- 'Reconnecting' Tivoli to the city via strategic density & landmark building heights.

(D) Places & Spaces

D1. Landscape Character

- Develop tangible connections between proposed built form and the surrounding topography particularly in relation to Tivoli Ridge to the north and Blackrock Marina to the south.

D2. Connectivity

- We recommend mirroring the marina linear park (particularly to the west of Tivoli) and integrating the site as a primary green city link in order to emphasize the unique topography of Cork and reinforce the existing riverside parklands particularly to Tivoli West (opposite Blackrock marina) and Tivoli East (adjacent Glashaboy river). Refer to current City Development Plan, Conceptual Landscape Structure Plan (Page-25).

D3. Hierarchy

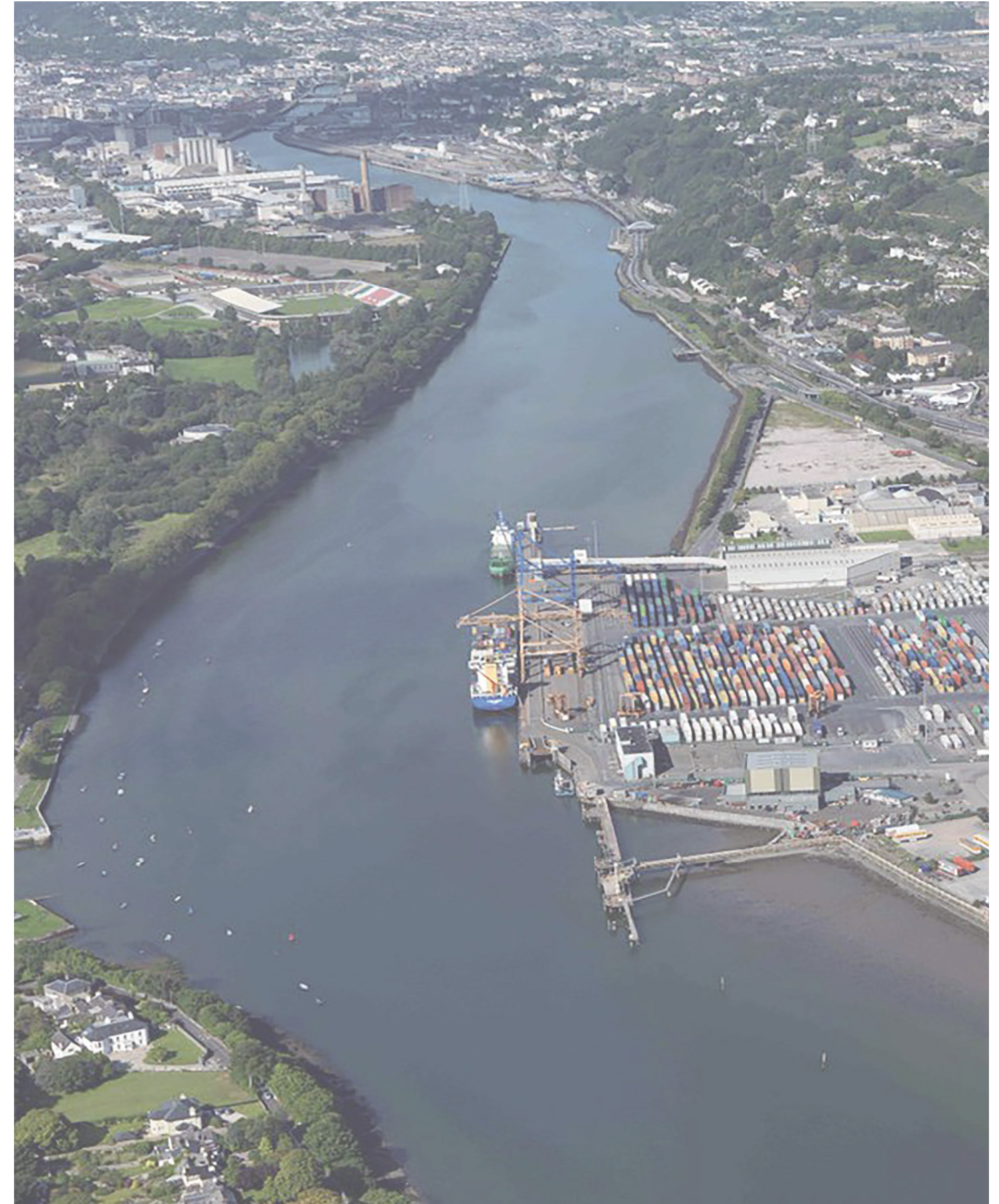
- Greater definition required as to the variety of uses and nature of proposed Open Space Hierarchy.

D4. Attraction

- Civic attraction on-site to be more prominently located with a stronger architectural presence to the waterfront and connection with the wider city.

SECTION 3. Revisions to Urban Design & Landscape Framework Plan(UDLFP)

- 3.1 - Proposed Revisions to Urban Design & Landscape Framework Plan
- 3.2 - Proposed Revisions to UDLFP - Before & After
- 3.3 - Proposed Revisions to UDLFP - SWOT Analysis



3.1 Revisions to Urban Design & Landscape Framework Plan

1. Public waterfront to west doubled in width from 15m to 30m. Offers a continuation of Millennium Park to east and increased linkage to the City centre beyond. Also mirroring Blackrock marina walkway river side parkland to south.
2. Civic attractor of architectural prominence to waterfront with increased surrounding public space / plaza.
3. Increased waterfront plaza for large scale outdoor events and citywide waterside park attraction. Public Realm area increased to circa 0.9Ha in this area.
4. Increased public promenade from circa 12m to 18m wide to Tivoli east.
5. Waterfront park widened to eastern end of site leading to a nature / re-wilding green area adjacent to Glashaboy river conservation area.
6. More generous public plaza created at Train Station as main public transport arrival hub.
7. Neighbourhood centre / public space weighted towards central public transport spine & pedestrian access to waterfront.
8. Widened & strengthened public realm linkages from neighbourhood centres to waterfront.



Above: Proposed Revisions to Urban Design & Landscape Framework Plan

3.1 Revisions to Urban Design & Landscape Framework Plan (continued)

- 9. **2no.** Non tidal water inlets for high quality public space & increased water-frontage. Centred on neighbourhood centre A and between neighbourhood centres B & C as indicated. Potential to be landscaped and incorporated into Tivoli overall flood defence strategy. Diversification of public realm and increased biodiversity.
- 10. Central Marina with direct visual connection to Blackrock Pier / Marina to south. Future river ferry / taxi service connection to Blackrock.



Above: Proposed Revisions to Urban Design & Landscape Framework Plan

3.1 Revisions to Urban Design & Landscape Framework Plan (continued)

10. Central Marina:

Marina water area = approx. 23,000 sq.m
 Potential Berthing = approx. 100+ medium sized yachts & possible larger/ cruise ship docking.

11. 3no. Smaller projecting piers/ marina's to the east of Tivoli:

Marina's water area = approx. 2000 sq.m each
 Potential Berthing = 20+ small yachts each



Key

- Tivoli Docks Site
- Open Space
- Mixed Use / Residential,
- Civic Attraction
- School
- 🚂 Train Station
- 🔄 Vehicular Access
- N8 Primary Access

3.2 Revisions to Urban Design & Landscape Framework Plan - Before & After



3.2 Revisions to UDLFP - Public Space Network - Before & After






Above: Original Urban Design & Landscape Framework Plan - AECOM & Butler Cammoranesi

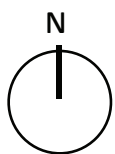
Above: Proposed Revisions to Urban Design & Landscape Framework Plan

3.2 Revisions to UDLFP - Public Space Network - Before & After

Key

-  Tivoli Docks Site
-  Waterfront Network Space
-  Central Spine Space
-  Amenity and Buffer Landscape
-  Primary Pedestrian and Cycle
-  Secondary Pedestrian Link
-  Primary Pedestrian and Cycling Promenade
-  Local Pedestrian Streetscape Connector
-  Dedicated Cycling Lane
-  Tertiary Pedestrian Streetscape Links
-  River Connection Node
Waterfront PLaza/ Riverfront Park / Marina

Above: Original Urban Design & Landscape Framework Plan - AECOM & Butler Cammoranesi



Above: Proposed Revisions to Urban Design & Landscape Framework Plan

3.3 Revisions to Urban Design & Landscape Framework Plan - SWOT Analysis

* Design Principles affected are shown in (brackets) below:

Strengths

- Increases the overall green space without affecting the amount of development - (A3-4/ D1-3)
- Increases the value of some of the site due to increase in waterfront property potential - (B4,C4,D3)
- Works with the ABTA layouts - (B2)
- Gives more space to the waterfront for public access - (B4/ D2&4)
- Grid layout set out to give buildable blocks with adequate permeability - (B1-2)
- Brings a clearer route for cycles and pedestrians to the city centre - (B2/ D2)
- Planting on waterfront will shade prevailing winds from South West - (A3/ D1)
- Increased potential to 'Reconnect' Tivoli to the City - (D2&4)
- Increased green & blue infrastructure on-site can allow improved densification at neighbourhood centres - (B3/ C3&4)

Weaknesses

- Possible difficulty in maintaining the water inlets to the site with silting effect of river. (Mitigated by the two smaller inlets separated from river).

Opportunities

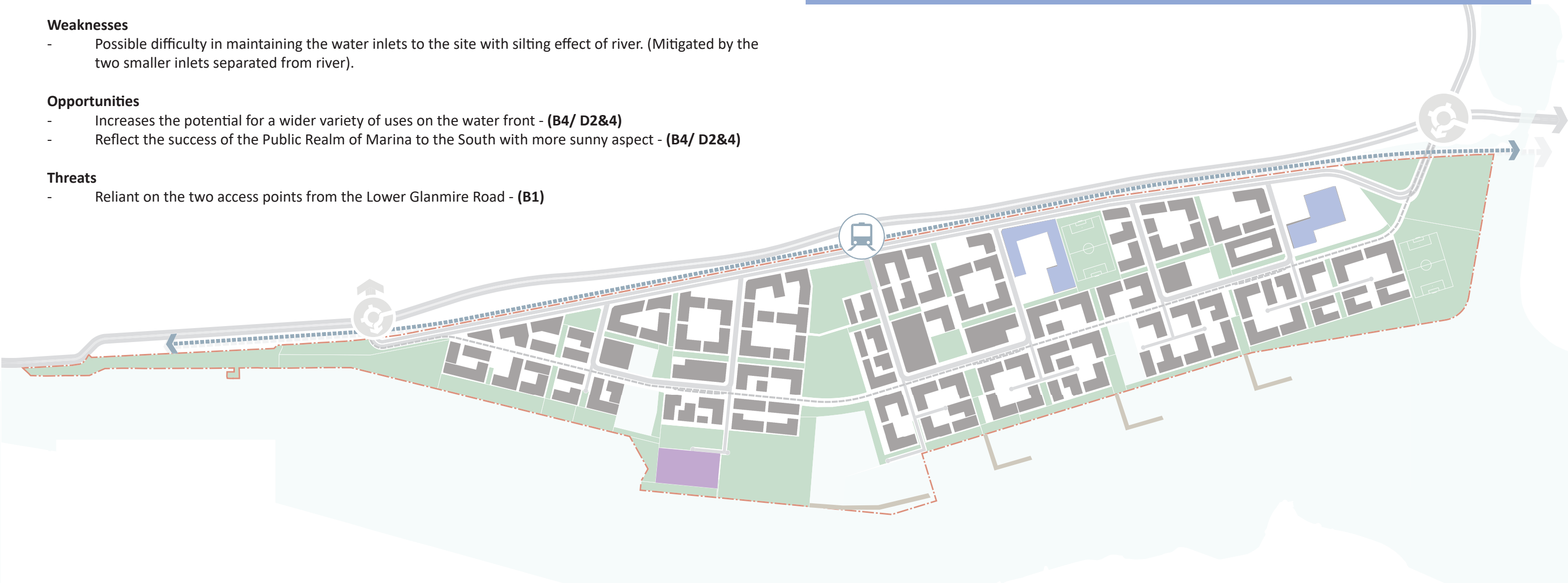
- Increases the potential for a wider variety of uses on the water front - (B4/ D2&4)
- Reflect the success of the Public Realm of Marina to the South with more sunny aspect - (B4/ D2&4)

Threats

- Reliant on the two access points from the Lower Glanmire Road - (B1)

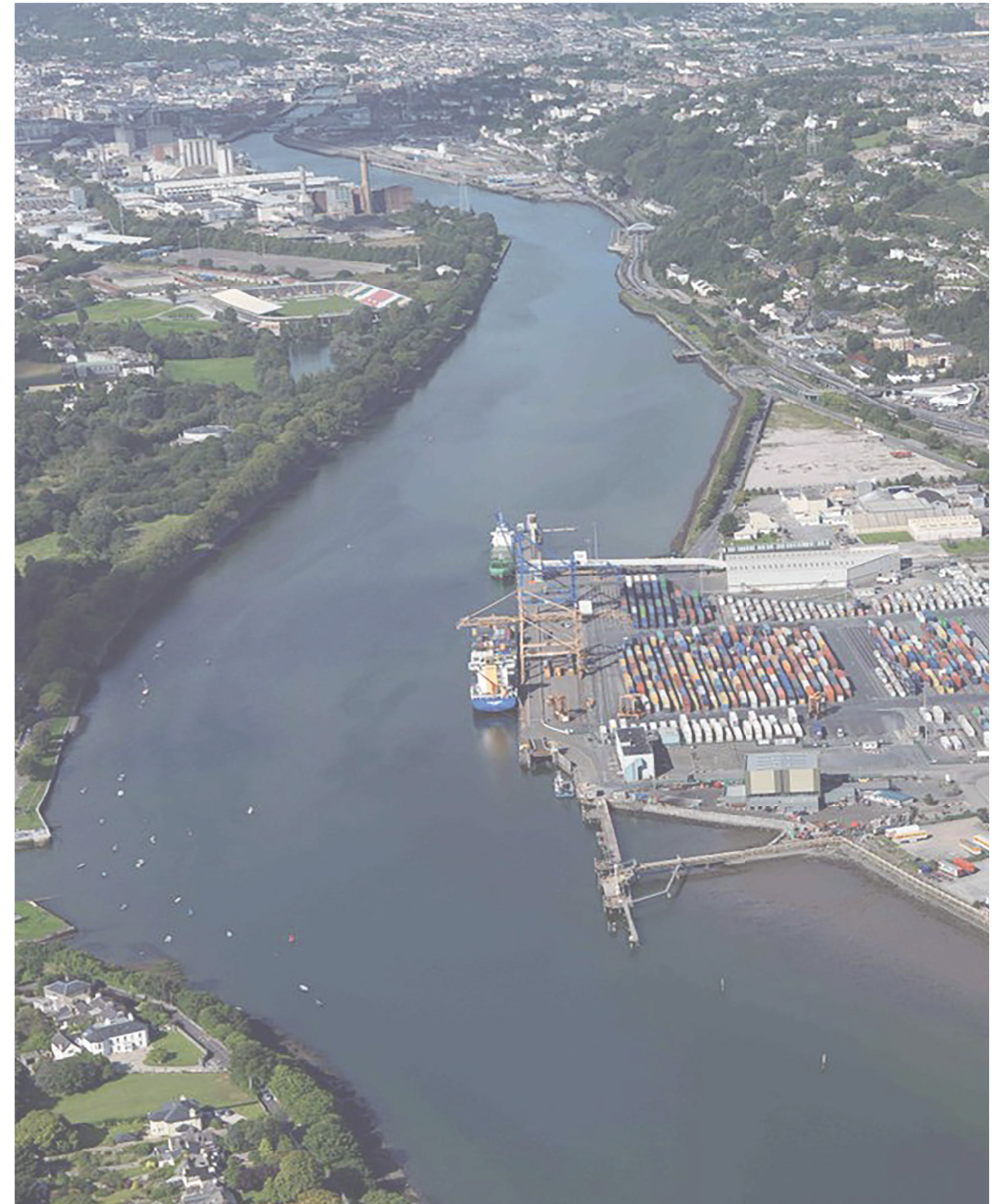
Summary of Key Improvements

- Public Realm / Green Open Space increased by + 3% (1-1.5Ha) of developable area.
- Waterfront frontage increased by circa 0.75km/ 30% (Existing water frontage circa 2.5km).
- Increased linear building frontage onto waterfront by circa 33%.
- Potential for improved Density & Height definition and character to Neighbourhood Centres / Landmark buildings.
- Increased variety of uses and Citywide attractions to waterfront.
- Improved connectivity to the City and attractiveness as a destination.



SECTION 4. Strategic Methodology: 'Reconnecting' Tivoli to the City

- 4.1 - 'Reconnecting' Tivoli to the City
- 4.2 (a) - Tivoli Key Views & Prospects:
Existing CDP Protected Views
- 4.2 (b) - Tivoli Key Views & Prospects:
Proposed Key Landmark Views Towards Tivoli
- 4.2 (c) - Tivoli Key Views & Prospects:
Proposed Key Landmark Views From Tivoli
- 4.3 (a) - Landscape & Heritage Character:
Tivoli Merchant Houses
- 4.3 (b) - Landscape & Heritage Character:
Tivoli Ridge & Building Heights: Tivoli West / Central / East
- 4.2 - Creating a Piece of City - The Waterfront 'Journey'
- 4.5 - 'Reconnecting' Tivoli to the City: **Key Recommendations**



4.1 'Reconnecting' to the City & the Waterfront 'Journey'

Following the proposed revisions to the Tivoli Urban Design & Landscape Framework Plan as outlined in Sections 2&3, and under the overarching theme of 'Reconnecting' Tivoli to the City, Section 4 sets out **3no. High-level Strategic Methodologies** relating to 'Human Scale' Density, Building Heights & Public Realm which can be tested and applied to future developments on Tivoli.

The key aim of the outlined methodologies and recommendations is 'Reconnecting' and unlocking:

- An 'island' site, with industrial port heritage; a central site but physically isolated; with constrained, reserved access etc.
- Reconnecting through infrastructure (train station, new accesses,); Ferry link to Blackrock linking a green-way; mirroring the Blackrock marina; reconnecting to the water (marine, active, passive); and establishing clear visual connections within the harbour.

The above themes are developed under the following **3no. Strategic Methodologies**:

1. Key Views & Prospects:

- Reinforce Existing CDP Protected Views (p.26-28).
- Proposed Key Landmark Views Towards Tivoli (p.30-33).
- Proposed Key Landmark Views From Tivoli (p.34-37).

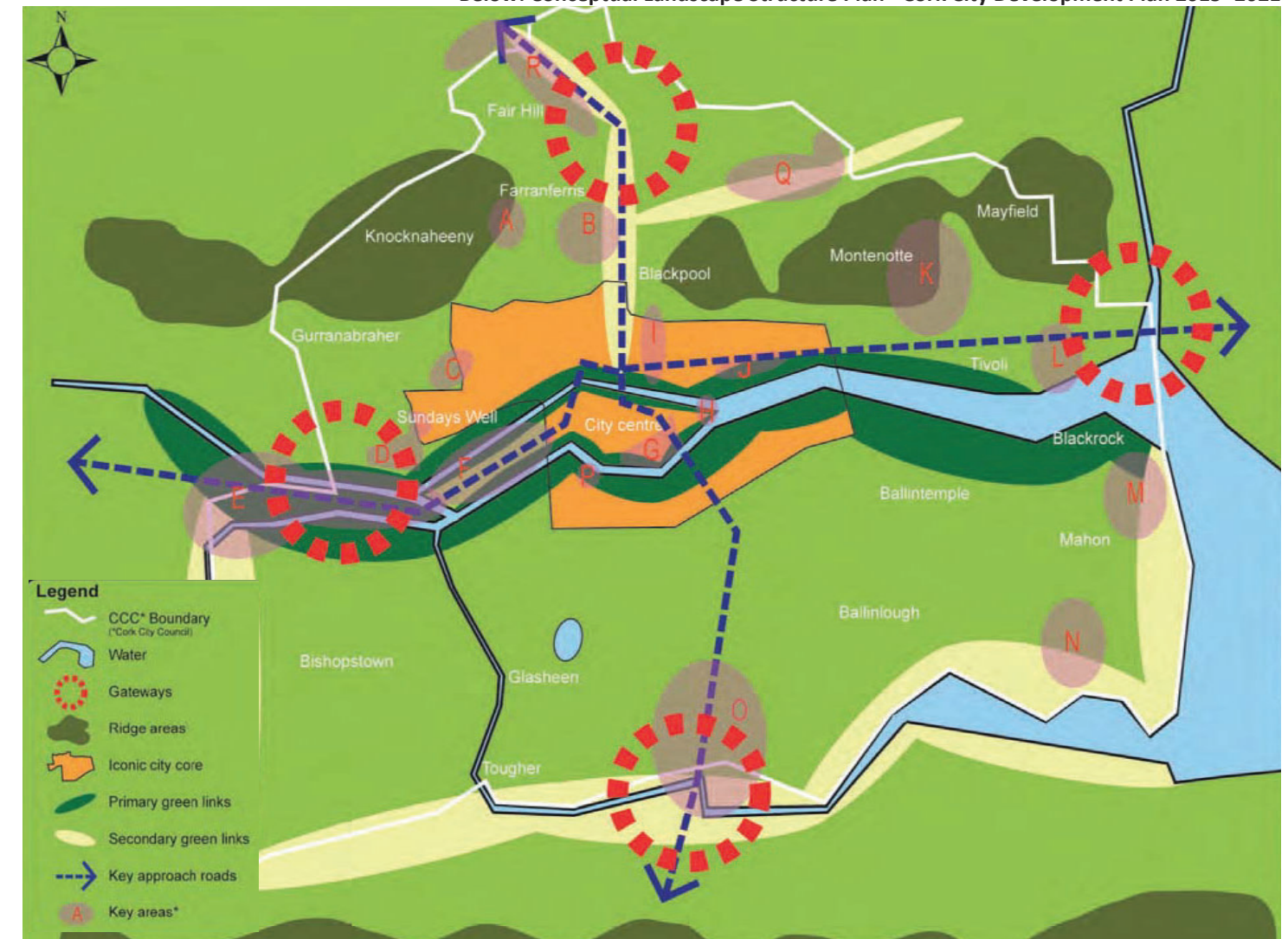
2. Landscape & Heritage Character:

- Tivoli Merchant Houses protected views (p.38-39).
- Tivoli Ridge and Building Height Parameters (p.40-43).

3. Creating a Piece of the City - The Waterfront 'Journey':

- Recognising the site needs to become part of **Cork City's Landscape Structure** (as per CDP Conceptual Landscape Plan - opposite), **mirroring the marina linear park** and integrating the site as a **primary green city link**. All in order to emphasize **Corks unique topography** and reinforce the existing riverside parkland's particularly to Tivoli West (opposite Blackrock marina) and Tivoli East (adjacent Glashaboy river).
- A series of strategic methodologies are proposed to activate and enhance Tivoli's '**Waterfront 'Journey'**' as a **City-wide and regional attraction**. Specific character zones are identified along the waterfront and a variety of public uses / spaces are explored in sectional and precedent studies.

Below: Conceptual Landscape Structure Plan - Cork City Development Plan 2015- 2021



4.2 (a) Tivoli Key Views & Prospects - Existing CDP Protected Views

The following views are protected under the existing City Development Plan:

Views into Tivoli CDP Area:

The two protected views into Tivoli as set out in the Development Plan focus on the cranes. There is currently not a plan in place to retain the cranes (they were recently for sale, the Conservation Officer does not consider that their cultural significance is high enough to justify the cost of maintaining them). Therefore, these views should perhaps be kept in mind in terms of what may be seen from them under the proposed redevelopment of Tivoli. The two views currently are:

AR 5: View of the Tivoli Cranes from Lower Glanmire Road/Dunkettle (The Dev Plan says “The approach roads into Cork City offer visitors the vital ‘first impression’ of the city and glimpse of the unique topography and character of Cork.”)

RP15: View of Tivoli Cranes from Castleview Terrace (Lower)

Views from Tivoli CDP Area:

Both of these views are to Blackrock Castle from the water’s edge in Tivoli Docks, and are unlikely to be affected by Tivoli redevelopment.

BC1: View of Tivoli from Blackrock Castle.

BC 3: View of castle from Tivoli Docks.

Views crossing Tivoli CDP Area:

3 views of the Ridge include:

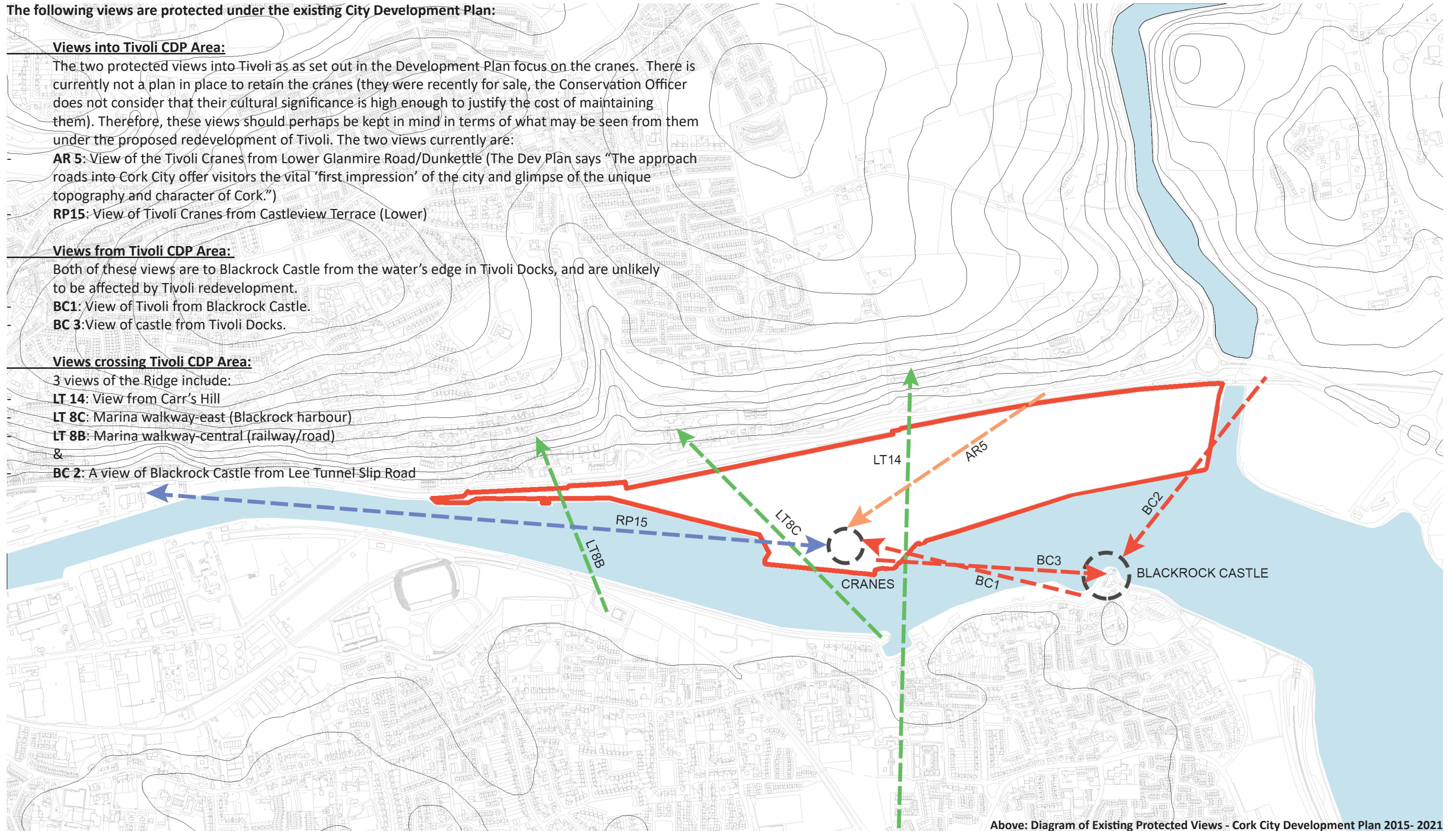
LT 14: View from Carr’s Hill

LT 8C: Marina walkway-east (Blackrock harbour)

LT 8B: Marina walkway-central (railway/road)

&

BC 2: A view of Blackrock Castle from Lee Tunnel Slip Road



Above: Diagram of Existing Protected Views - Cork City Development Plan 2015- 2021

4.2 (a) Tivoli Key Views & Prospects - Existing CDP Protected Views

Below: LT8C - View of Tivoli Ridge - From Marina walkway-east (Blackrock Harbour)



Below: BC1 - View of Tivoli Ridge - From Blackrock Castle



4.2 (a) Tivoli Key Views & Prospects - Existing CDP Protected Views

Below: AR 5 - Views into Tivoli - From Lower Glanmire Road/Dunkettle



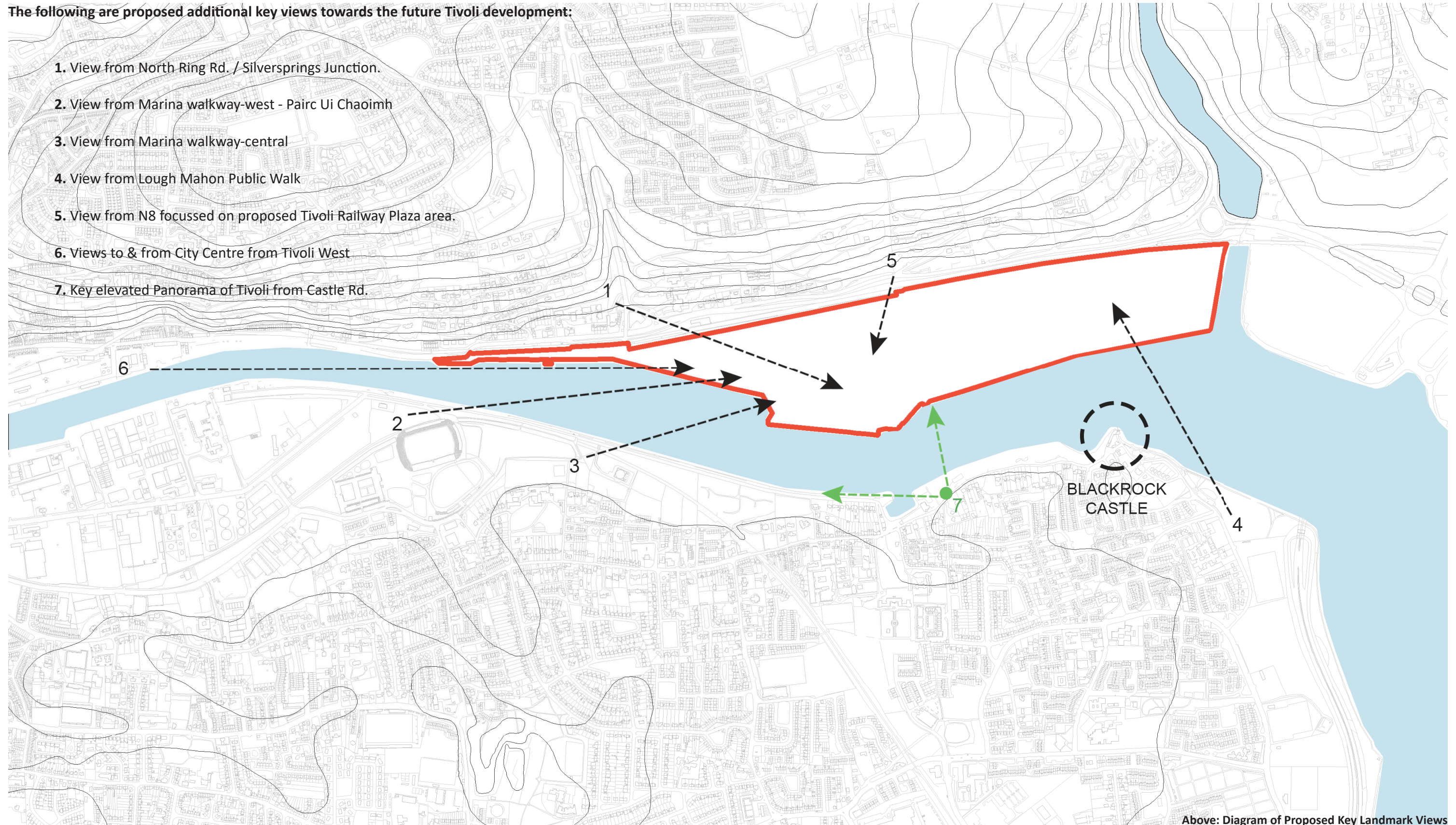
Below: CDP View BC3. Blackrock Castle from Tivoli



4.2 (b) Tivoli Key Views & Prospects - Proposed Key Landmark Views Towards Tivoli

The following are proposed additional key views towards the future Tivoli development:

1. View from North Ring Rd. / Silversprings Junction.
2. View from Marina walkway-west - Pairc Ui Chaoimh
3. View from Marina walkway-central
4. View from Lough Mahon Public Walk
5. View from N8 focussed on proposed Tivoli Railway Plaza area.
6. Views to & from City Centre from Tivoli West
7. Key elevated Panorama of Tivoli from Castle Rd.



Above: Diagram of Proposed Key Landmark Views

4.2 (b) Tivoli Key Views & Prospects - Proposed Key Landmark Views Towards Tivoli

Below: 1. View East from North Ring Rd. / Silversprings Junction



Below: 5. View from N8 of proposed Railway Plaza



4.2 (b) Tivoli Key Views & Prospects - Proposed Key Landmark Views Towards Tivoli

Below: 2. View from Marina walkway-west - Pairc Ui Chaoimh



Below: 3. View from Marina walkway-central



4.2 (b) Tivoli Key Views & Prospects - Proposed Key Landmark Views Towards Tivoli

Below: 4. View from Lough Mahon Public Walk



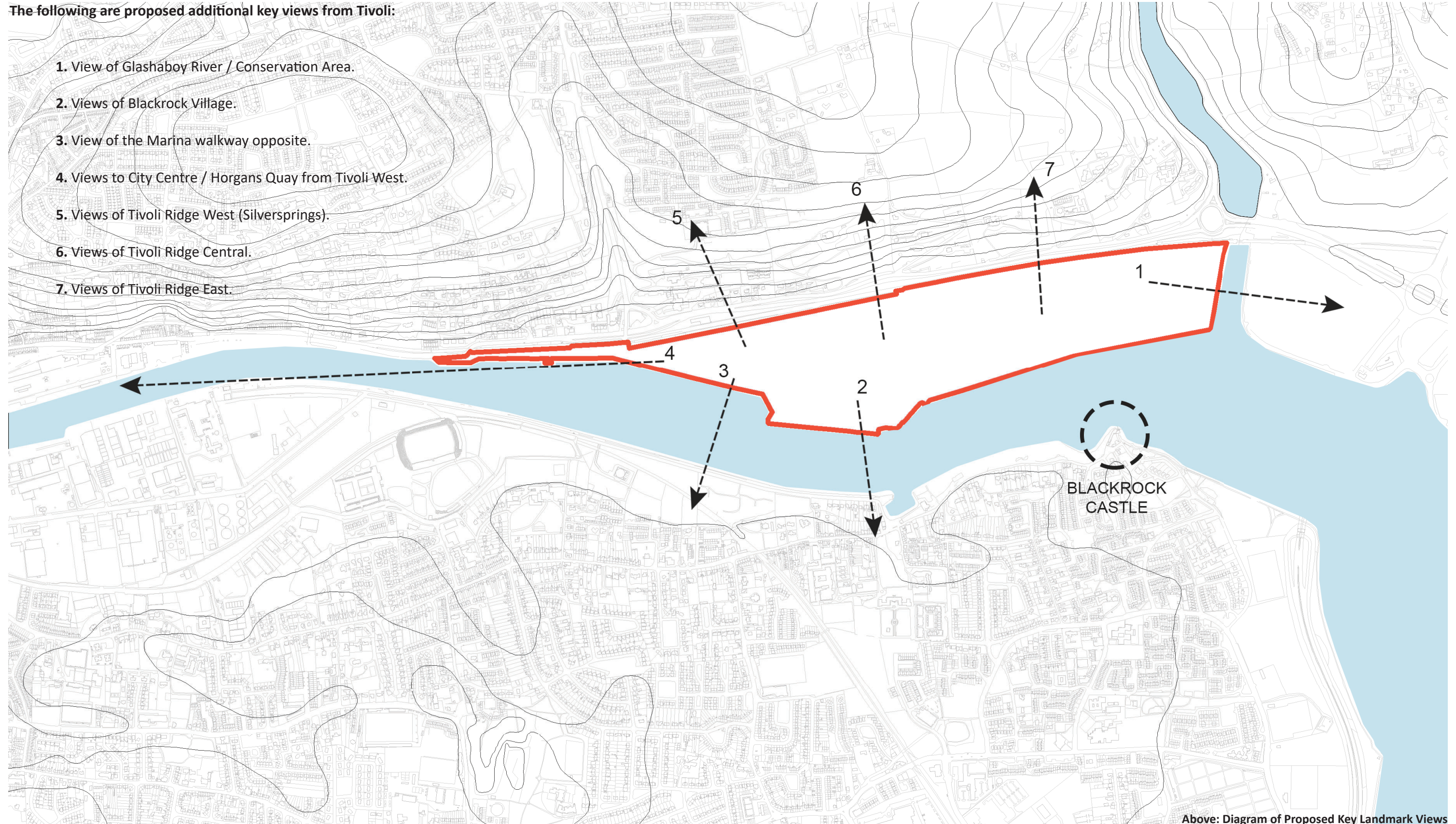
Below: 7. Key Elevated Panorama of Tivoli from Castle Rd.



4.2 (c) Tivoli Key Views & Prospects - Proposed Key Landmark Views From Tivoli

The following are proposed additional key views from Tivoli:

- 1. View of Glashaboy River / Conservation Area.
- 2. Views of Blackrock Village.
- 3. View of the Marina walkway opposite.
- 4. Views to City Centre / Horgans Quay from Tivoli West.
- 5. Views of Tivoli Ridge West (Silversprings).
- 6. Views of Tivoli Ridge Central.
- 7. Views of Tivoli Ridge East.



Above: Diagram of Proposed Key Landmark Views

4.2 (c) Tivoli Key Views & Prospects - Proposed Key Landmark Views From Tivoli

Below: 1. Glashaboy River Protected Area - Natura Site



Below: 2. Blackrock Village from Tivoli



4.2 (c) Tivoli Key Views & Prospects - Proposed Key Landmark Views From Tivoli

Below: 3. Marina Walkway from Tivoli



Below: 4. Views from Tivoli-west / Millenium Park to City Centre / Horgan's Quay



4.2 (c) Tivoli Key Views & Prospects - Proposed Key Landmark Views From Tivoli

Below: 5. Views of Tivoli Ridge West (Silversprings)



Below: 6. Views of Tivoli Ridge Central



Below: 7. Views of Tivoli Ridge East



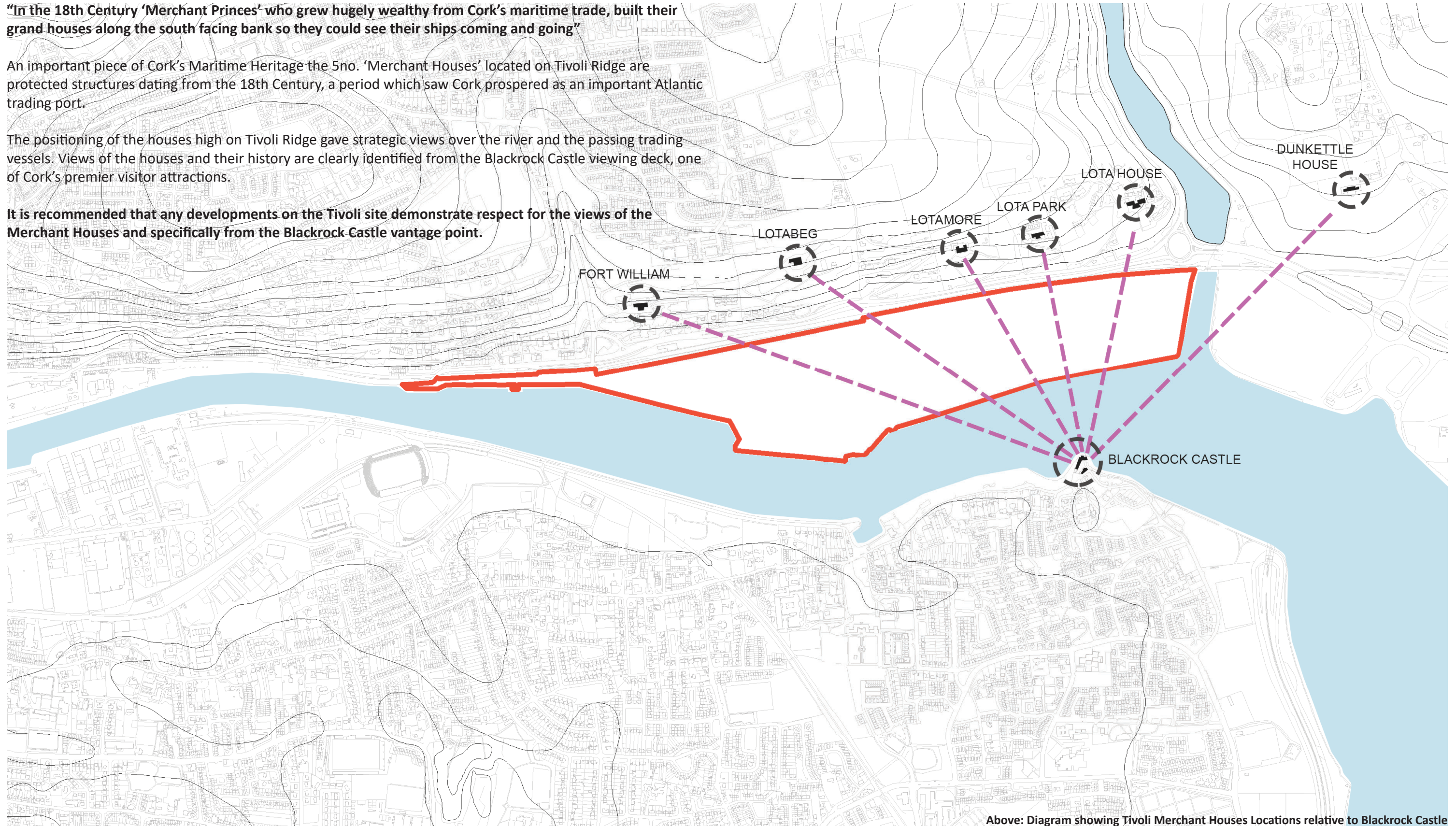
4.3 (a) Landscape & Heritage Character - Tivoli Merchant Houses

“In the 18th Century ‘Merchant Princes’ who grew hugely wealthy from Cork’s maritime trade, built their grand houses along the south facing bank so they could see their ships coming and going”

An important piece of Cork’s Maritime Heritage the 5no. ‘Merchant Houses’ located on Tivoli Ridge are protected structures dating from the 18th Century, a period which saw Cork prospered as an important Atlantic trading port.

The positioning of the houses high on Tivoli Ridge gave strategic views over the river and the passing trading vessels. Views of the houses and their history are clearly identified from the Blackrock Castle viewing deck, one of Cork’s premier visitor attractions.

It is recommended that any developments on the Tivoli site demonstrate respect for the views of the Merchant Houses and specifically from the Blackrock Castle vantage point.



Above: Diagram showing Tivoli Merchant Houses Locations relative to Blackrock Castle

4.3 (a) Landscape & Heritage Character - Tivoli Merchant Houses

Below: Existing View of Protected Structures on Tivoli Ridge from Blackrock Castle

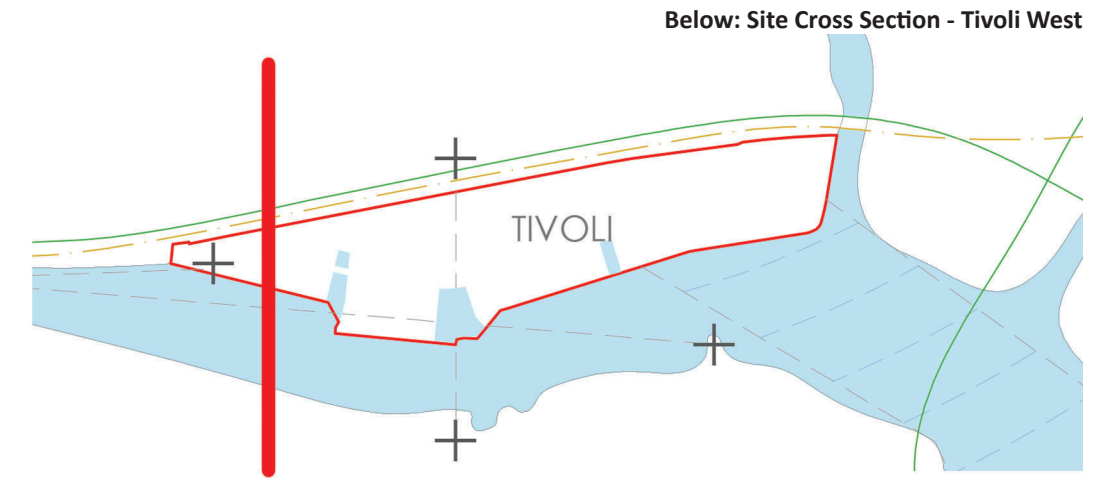


Below Left & Right: Historical Painting & OSI map dated mid-19th century

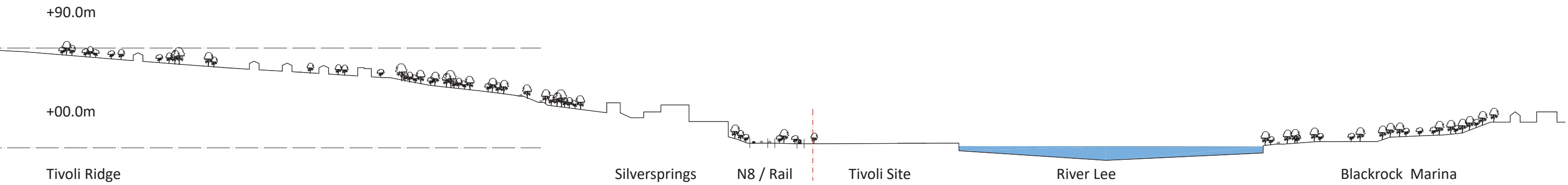


4.3 (b) Landscape & Heritage Character - Tivoli Ridge & Building Heights - Tivoli West

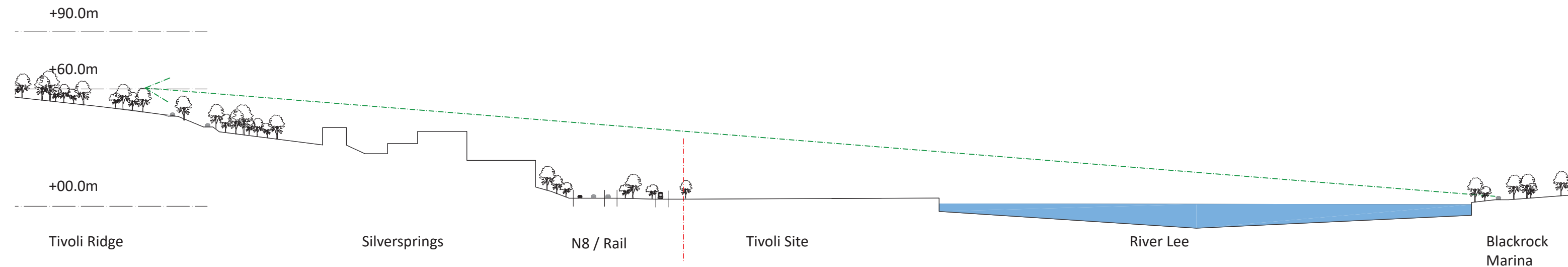
- Tivoli Ridge is identified as a **key landscape of significance** within Cork City and Harbour.
- The Tivoli site poses a **unique riverside urban location** with the backdrop of the tree-lined Tivoli ridge critical to it's topographical context and connection to the wider City.
- In order to preserve this unique context and perspective a building height parameter is generated across the site whereby a **minimum top-third of Tivoli ridge** is maintained when viewed from the opposite side of the river bank at Blackrock Marina.
- Given the undulating nature of both the river Lee (in plan) and the Tivoli ridge (in elevation), a rich variation of potential building heights is generated across the site. A selection of views are demonstrated in the following typical cross-sections at Tivoli West/ Central & East.



Below: Site Cross Section - Tivoli West



Above: Existing Site Cross Section - Scale 1:4000

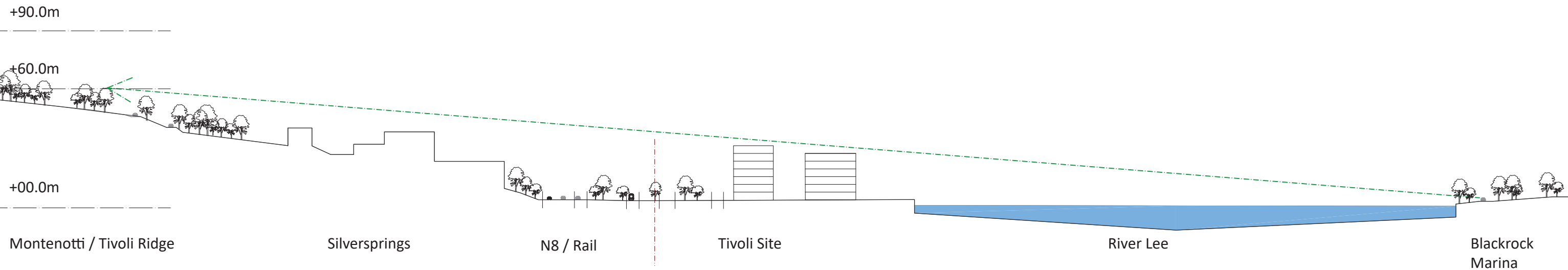
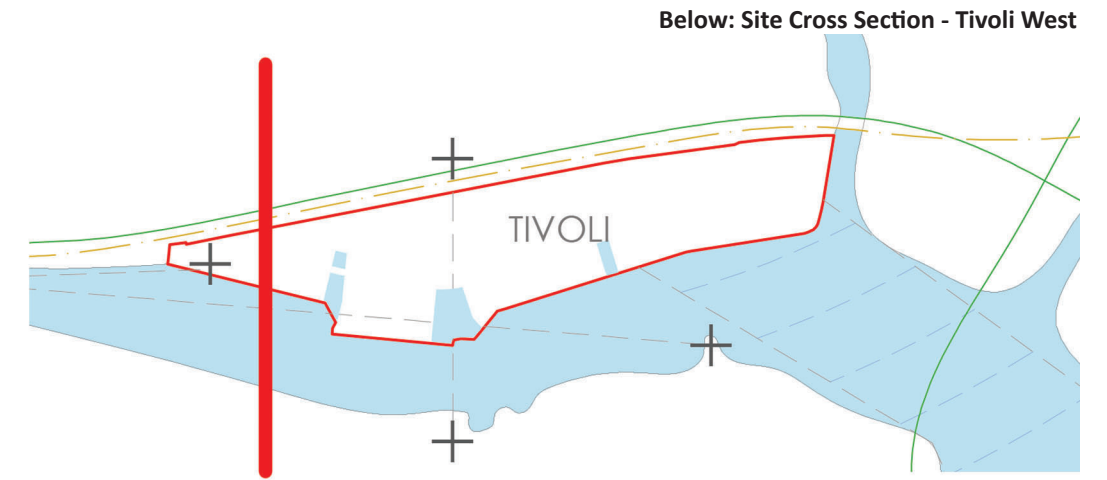


Above: Existing Site Cross Section - Scale 1:2000

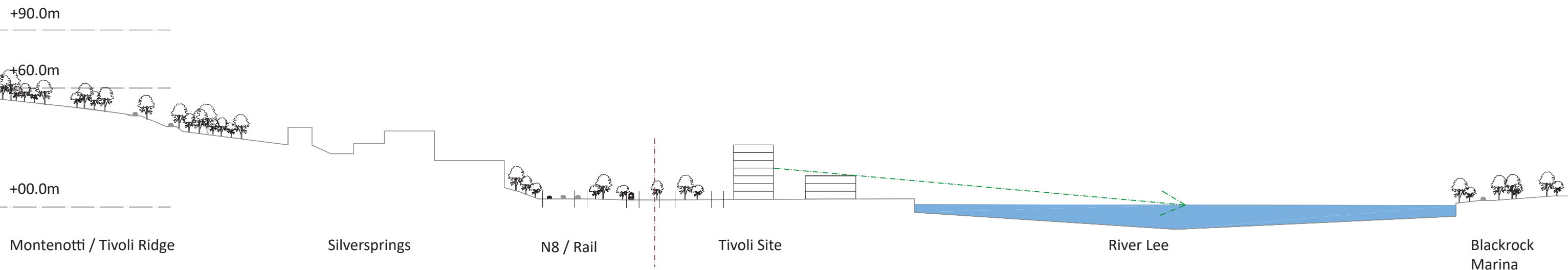
4.3 (b) Landscape & Heritage Character - Tivoli Ridge & Building Heights - Tivoli West

- The cross-sections below define maximum building heights applying the **one-third rule** to Tivoli West where the Tivoli ridge height is approx. **+90m above sea level**.
- General Building Heights of between **6-8 storeys** are easily achievable in this zone.
- The lower of the 2 sections below indicates preferred scenarios where building heights to the waterfront are lowered to circa 3-4 storeys allowing deeper solar penetration/ gain and more accessible views of the river for the buildings situated further to the north.

*NB: Assumed 4m (floor to floor) storey heights allowing for services / max. solar gain / mixed uses.
 *NB: All sections assume riverside set-backs as per proposed amendments to the UDLFP (Section 3).



Above: Site Cross Section - Scale 1:2000

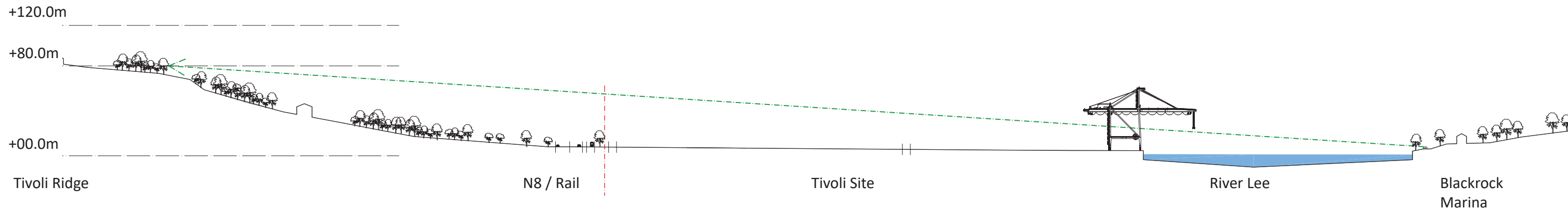
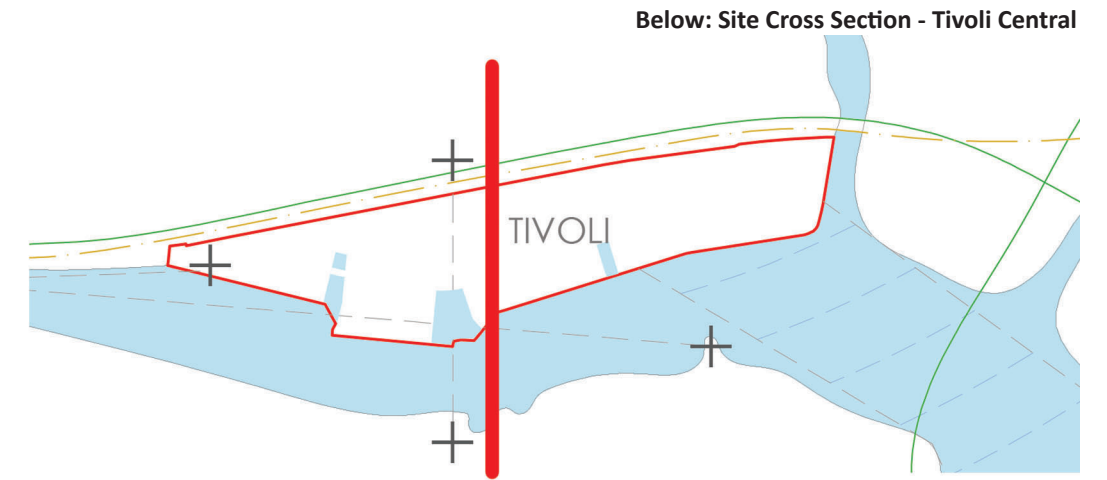


Above: Site Cross Section - Scale 1:2000

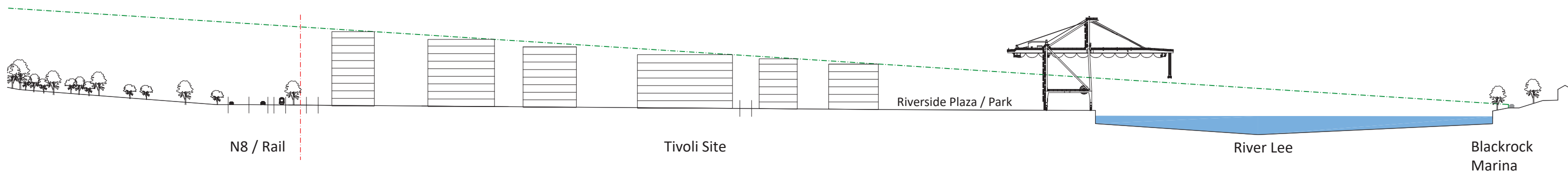
4.3 (b) Landscape & Heritage Character - Tivoli Ridge & Building Heights - Tivoli Central

- The cross-sections below define maximum building heights applying the **one-third rule** to Tivoli Central where the Tivoli ridge height is approx. **+120m above sea level**.
- General Building Heights of between max **6 storeys (to waterfront) & max 10 storeys (to the north)** are easily achievable in this zone. High point of Tivoli ridge relates to central area of development and therefore relatively higher building heights achievable in this zone.

*NB: Assumed 4m (floor to floor) storey heights allowing for services / max. solar gain / mixed uses.
 *NB: All sections assume riverside set-backs as per proposed amendments to the UDLFP (Section 3).
 *NB: Existing Tivoli port cranes included for scale comparisons.
 *NB: Height allowance in these zones does not mean that all buildings of the maximum height would be permissible. Overall site densities will still be a limiting factor.



Above: Existing Site Cross Section - Scale 1:2000



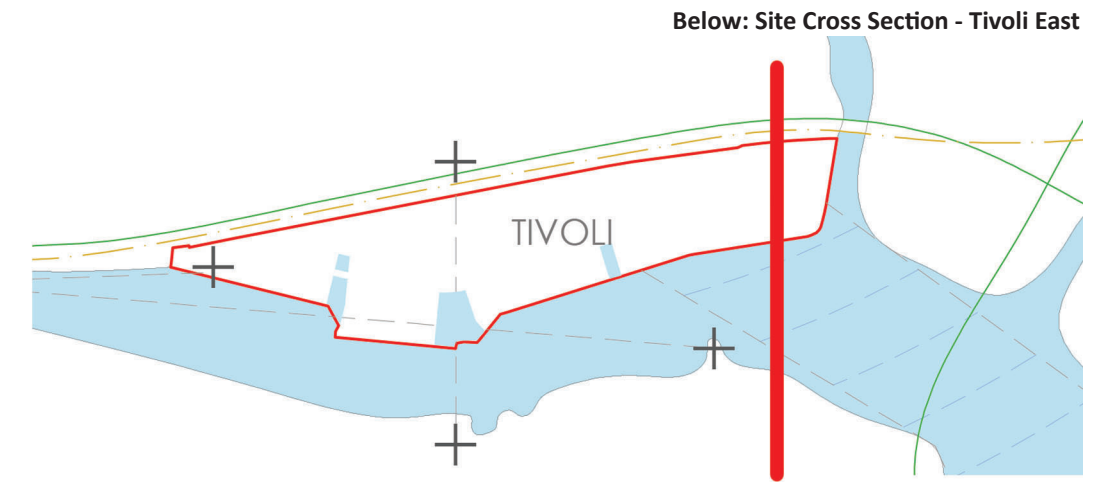
Above: Site Cross Section - Scale 1:2000

4.3 (b) Landscape & Heritage Character - Tivoli Ridge & Building Heights - Tivoli East

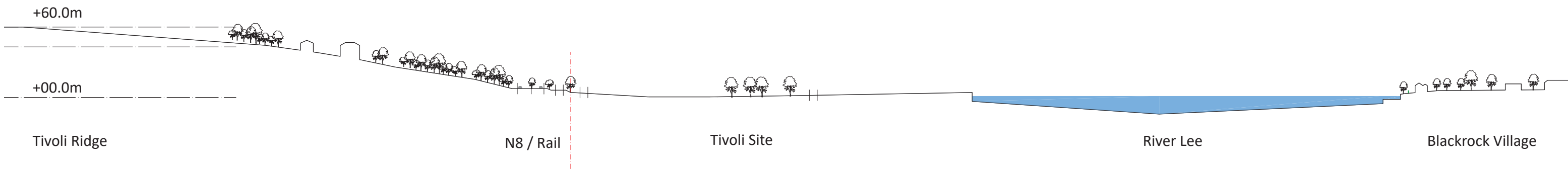
- The cross-sections below define maximum building heights applying the **one-third rule** to Tivoli East where the Tivoli ridge height is approx. **+60m above sea level**.
- General Building Heights of between max **4 storeys (to waterfront) & max 6-7 storeys (to the north)** are easily achievable in this zone. The lowest point of Tivoli ridge relates to the eastern side of the development and therefore relatively lower building heights characterised in this zone.
- Building's highest to the north of the site and to northern sides of Neighbourhood Centres allow for improved passive solar gain within the site and more widespread accessible views of the river.

*NB: Assumed 4m (floor to floor) storey heights allowing for services / max. solar gain / mixed uses.

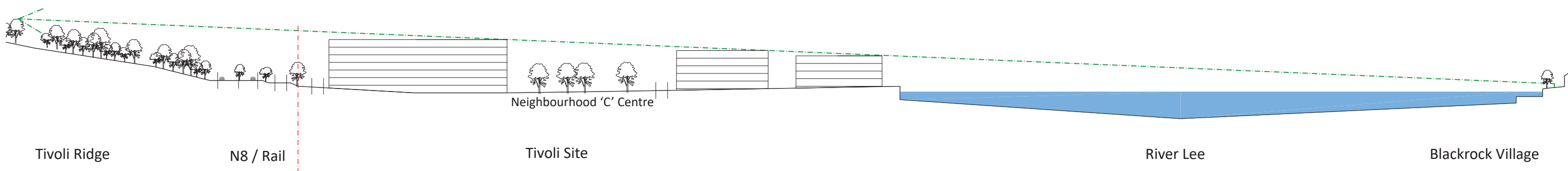
*NB: All sections assume riverside set-backs as per proposed amendments to the UDLFP (Section 3).



Below: Site Cross Section - Tivoli East



Above: Existing Site Cross Section - Scale 1:2000



Above: Site Cross Section - Scale 1:2000

4.4 Creating a Piece of the City - The Waterfront 'Journey' - Section A / Tivoli West

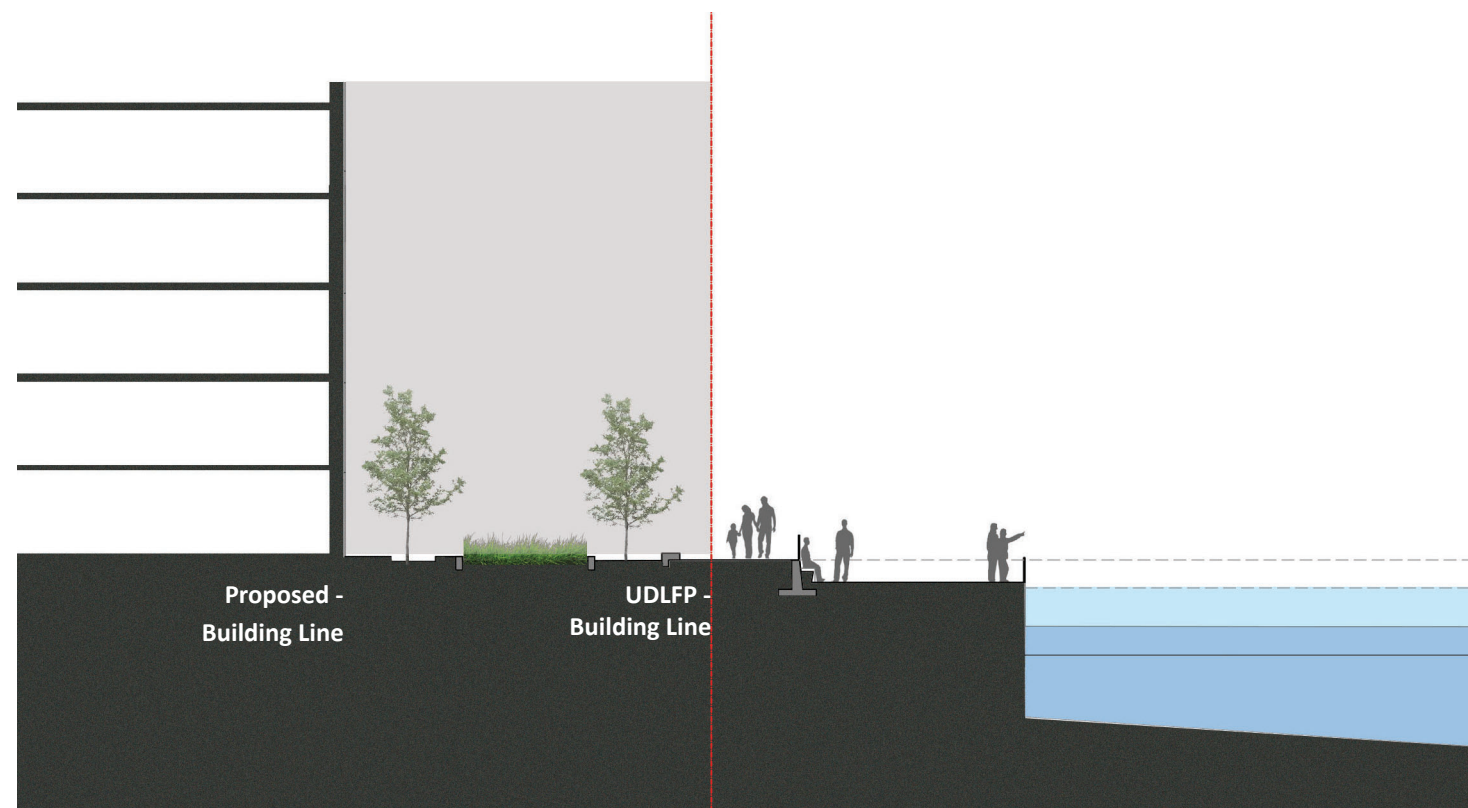
Marina Park - Cork



Kastrup Sea Water Baths - Copenhagen

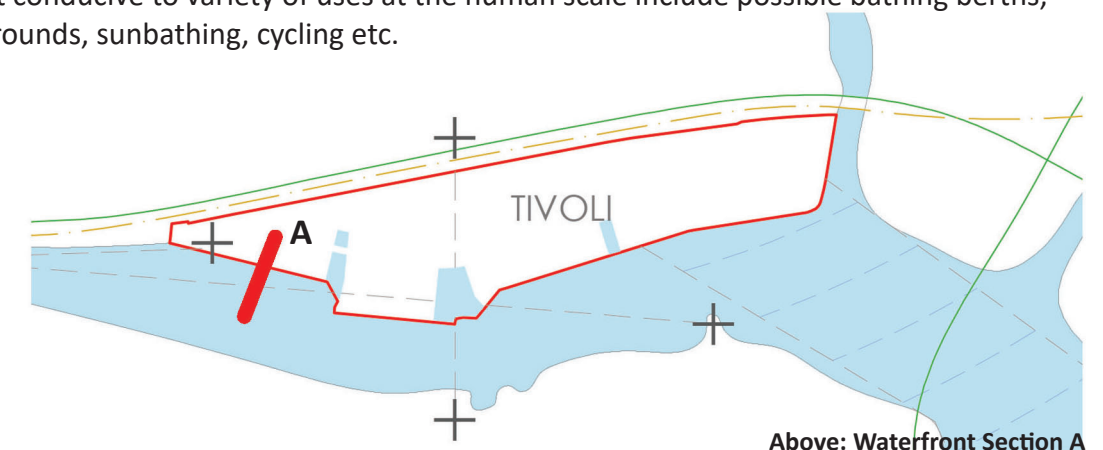


Waterfront Sun-Bathers - Aarhus, Denmark



Left: Waterfront Journey - Section A / Tivoli West

- Proposed Building line set-back circa 30m from waterfront.
- Building Heights to Waterfront reflect balance between **residential 'human scale' / threshold and public realm.**
- Western section of Tivoli Waterfront to reflect **existing tree-lined linear Marina Park** to the opposite southern side of the harbour, extending and maintaining city-wide primary green linkages and riverside **parkland character.**
- South facing prospect conducive to variety of uses at the human scale include possible bathing berths, kiosks, rowing, playgrounds, sunbathing, cycling etc.



Above: Waterfront Section A

4.4 Creating a Piece of the City - The Waterfront 'Journey' - Section B / Tivoli Central

Oslo Waterfront



HafenCity Hamburg Riverside Park

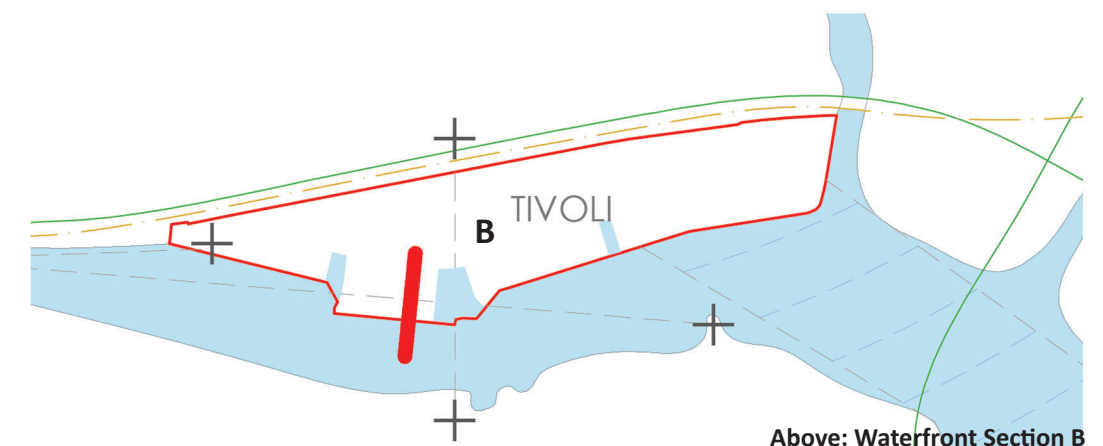
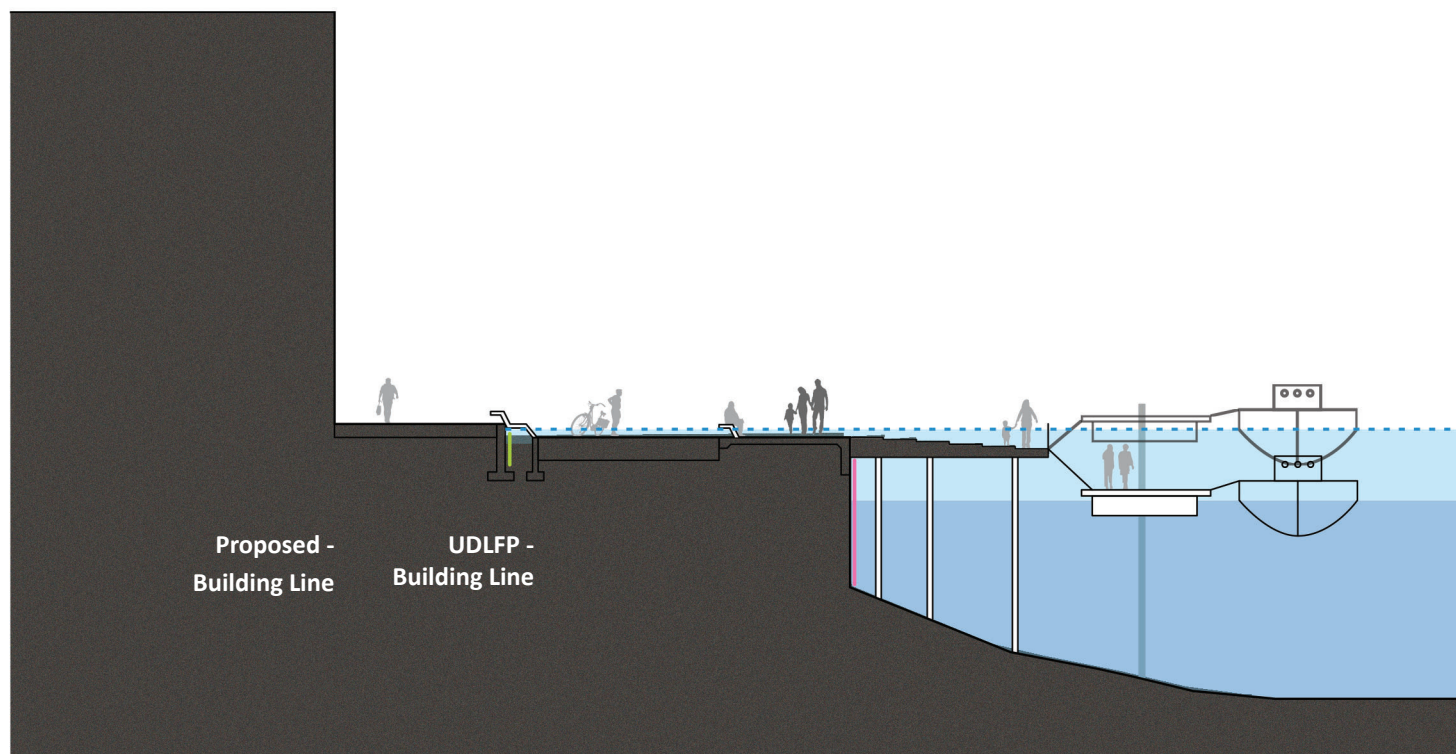


Grand Canal Dock, Dublin



Left / Above : Waterfront Journey - Section B / Tivoli Central

- Central area of Tivoli Waterfront characterised by **larger urban scale public plaza and park.**
- **Large Marina** for leisure boating / cruisers.
- Main **cultural quarter / civic attractor** with possibility for large outdoor gatherings and **public art** display.



Above: Waterfront Section B

4.4 Creating a Piece of the City - The Waterfront 'Journey' - Section C / Tivoli East

Nantes Waterfront

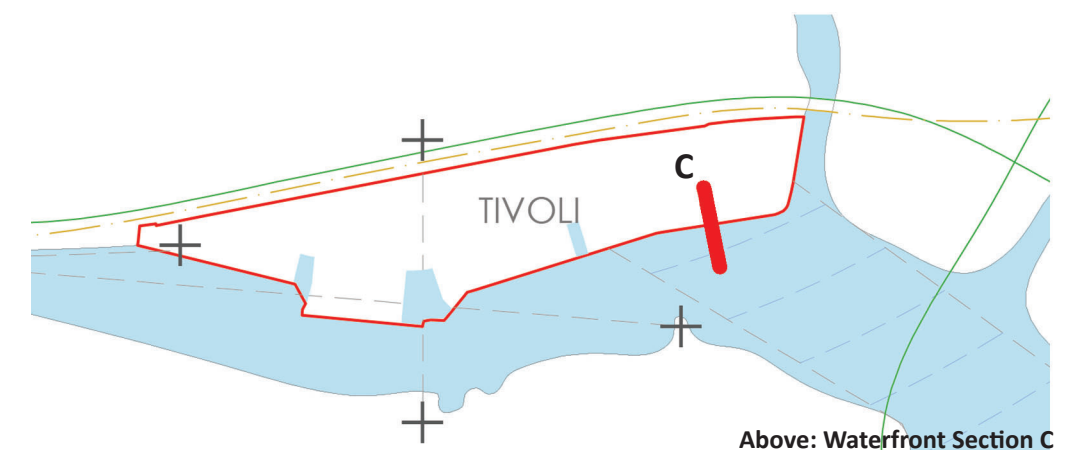
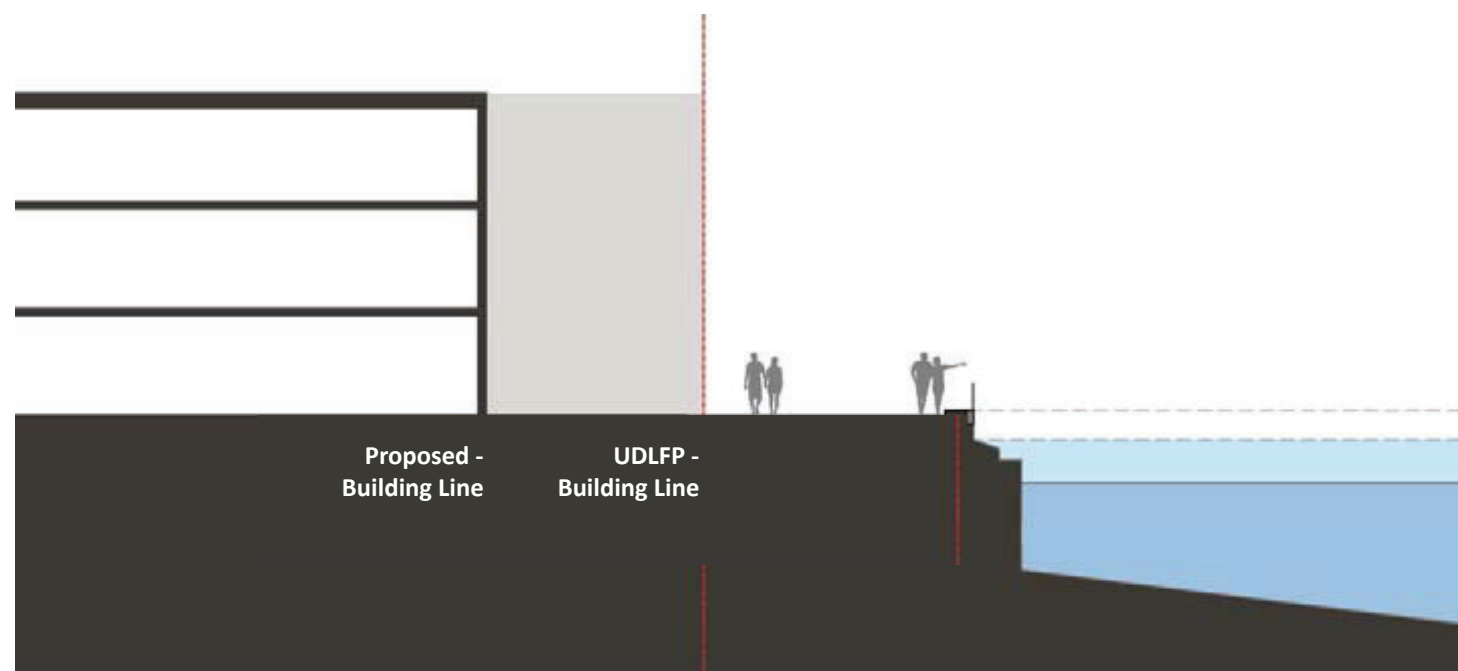


Glashaboy River - Lota Park Bird Sanctuary



Left: Waterfront Journey - Section C / Tivoli East

- Proposed Building line set-back circa 15m from waterfront.
- Eastern end of Tivoli towards Glashaboy Protected Area characterised by more **local residential scale**.
- Continuation of Public Waterfront **green-way & planned Euro Velo Cycle** route towards **re-wilding** green area adjacent to Glashaboy River / Conservation Area/



Above: Waterfront Section C

4.4 Creating a Piece of the City - The Waterfront 'Journey' - Section D / Water Inlets

Urban Waterfront Seating - Aarhus, Denmark

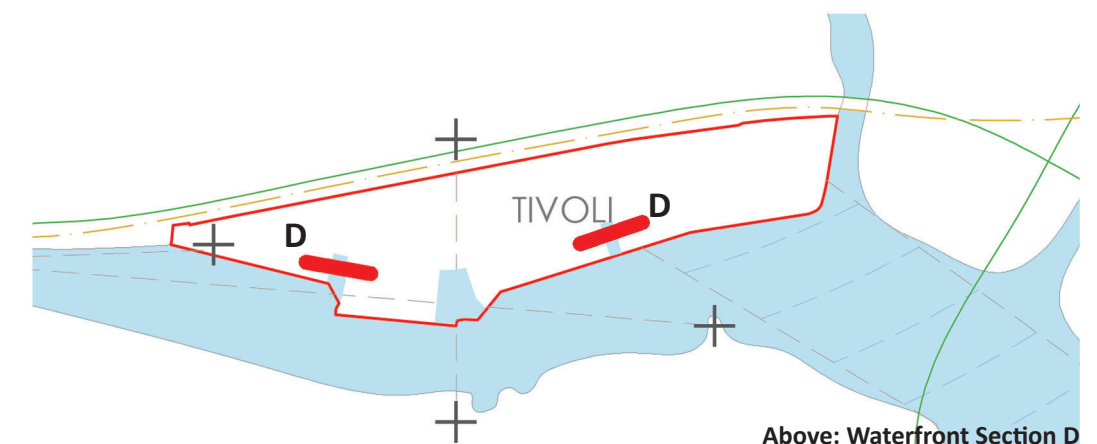
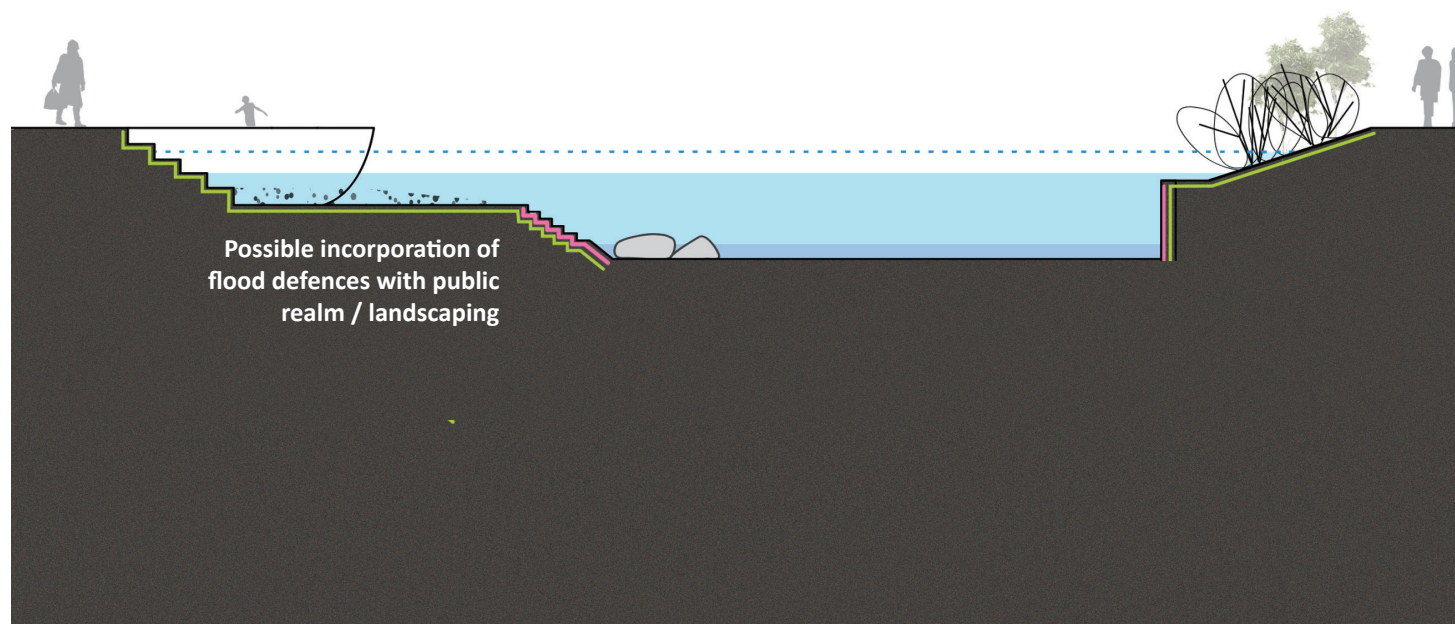


Leipzig, Germany



Left: Waterfront Journey - Section D / Water Inlets

- 2no. Proposed non tidal water inlets create opportunities for **high quality public space, increased water-frontage** & variety to the Tivoli waterfront experience.
- Possibility of incorporating **flood defense** infrastructure with **public realm / landscaping**.



Above: Waterfront Section D

4.4 Creating a Piece of the City - The Waterfront 'Journey'- Civic Attraction

Below - Dokk1 Library, Aarhus, Denmark



Below - Hastings Pier, England

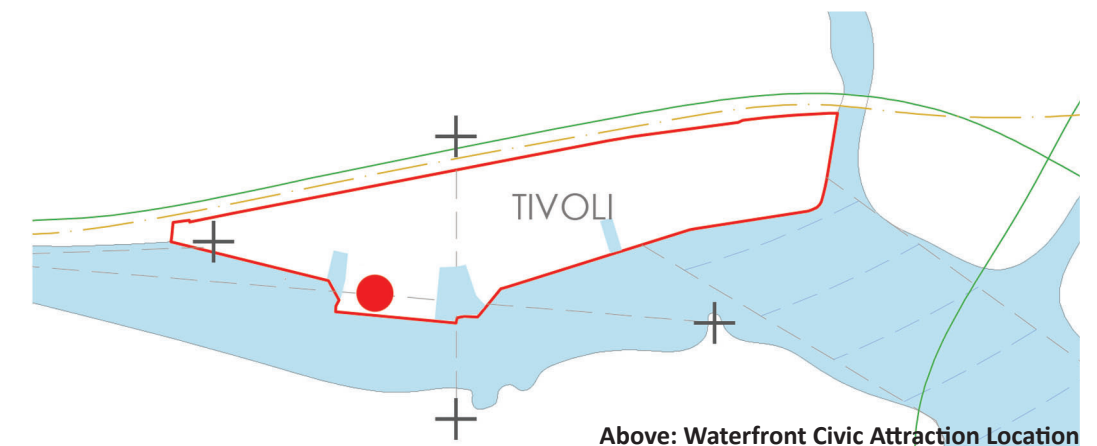


Below: Oslo Concert Hall, Norway



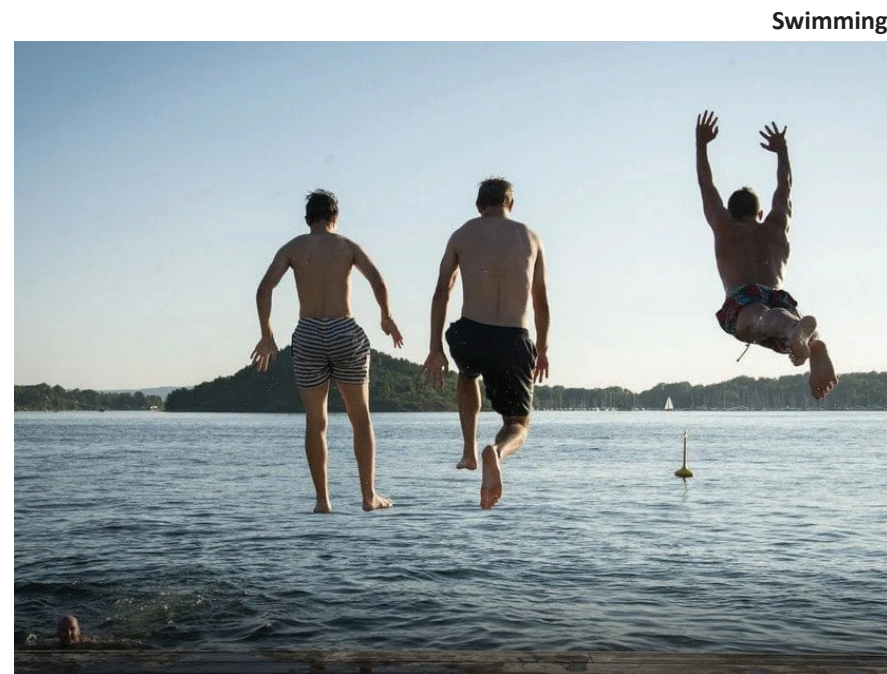
Waterfront Journey - Waterfront Civic Attraction

- Centrally located on the Tivoli Waterfront 'Journey'.
- A **destination 'Civic Attraction'** of cultural significance could facilitate Library, Museum, Theatre, Performance Spaces, Community hub etc.
- Strong standalone **architectural presence** to enhance visual connections south across the river and west to the city centre. In conjunction with large waterfront public space / plaza / park for outdoor gatherings.



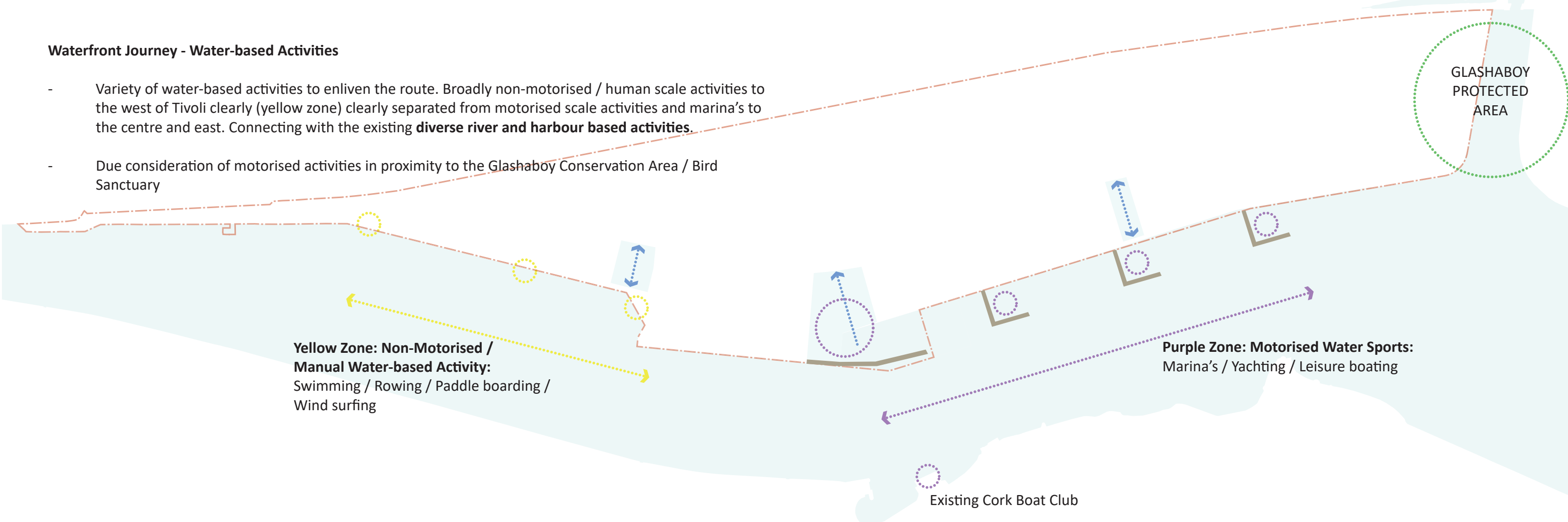
Above: Waterfront Civic Attraction Location

4.4 Creating a Piece of the City - The Waterfront 'Journey' - Water-based Activities



Waterfront Journey - Water-based Activities

- Variety of water-based activities to enliven the route. Broadly non-motorised / human scale activities to the west of Tivoli clearly (yellow zone) clearly separated from motorised scale activities and marina's to the centre and east. Connecting with the existing **diverse river and harbour based activities**.
- Due consideration of motorised activities in proximity to the Glashaboy Conservation Area / Bird Sanctuary



4.5 'Reconnecting' Tivoli to the City - Key Recommendations

Key recommendations and principles are based on the preceding themes in Section 4 developed under the **3no. Strategic Methodologies**. All future developments should measure proposals and impacts against the following:

1. Key Views & Prospects:

Reinforce Existing CDP Protected Views:

- Existing Views of Tivoli Cranes **AR-5** and **RP-15** to be replaced by specific proposed future views of Tivoli train station plaza (eg. Proposed View 5. Page 30) and proposed View 6 (from City Centre / Horgans Quay)
- Existing Views **LT-8C** (Blackrock Marina to Tivoli ridge) and **BC-1** (Tivoli from Blackrock Castle) are deemed to be of critical importance in maintaining strong visual connections with Tivoli Ridge.

Proposed Key Landmark Views Towards & From Tivoli:

- The impacts of all future developments to be measured against proposed relevant views.

2. Landscape & Heritage Character:

Tivoli Merchant Houses protected views:

- The impacts of all future developments to be measured against proposed relevant views specifically from Blackrock Castle (Page 38-39).

2. Landscape & Heritage Character:

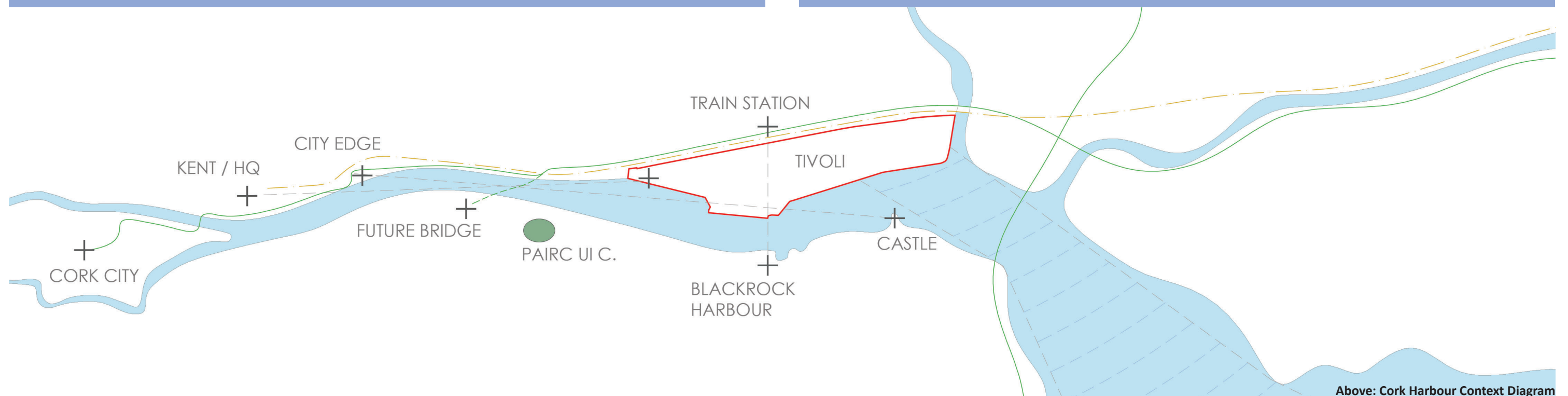
Tivoli Ridge and Building Height Parameters:

- The **minimum top-third rule of Tivoli Ridge** as per site cross sections (p.40-43) to be applied to building heights of future developments apart from exceptional locations as further outlined in this strategy (Section 5) .

3. Creating a Piece of the City - The Waterfront 'Journey':

Waterfront set-backs to be maintained to allow for a diverse range of quality public spaces and uses as outlined:

- **Tivoli West** to mirror the **riverside parkland** of Blackrock Marina.
- **Tivoli Central** to accommodate **large urban scale plaza, park and civic attractor** of architectural significance.
- **Tivoli East** to continue public waterfront journey towards **re-wilding** area adjacent Glashaboy River Conservation Area.
- The opportunity to bring **water inlets** into the site as described should be fully explored.
- Clearly defined areas for **diverse water-based activities**.

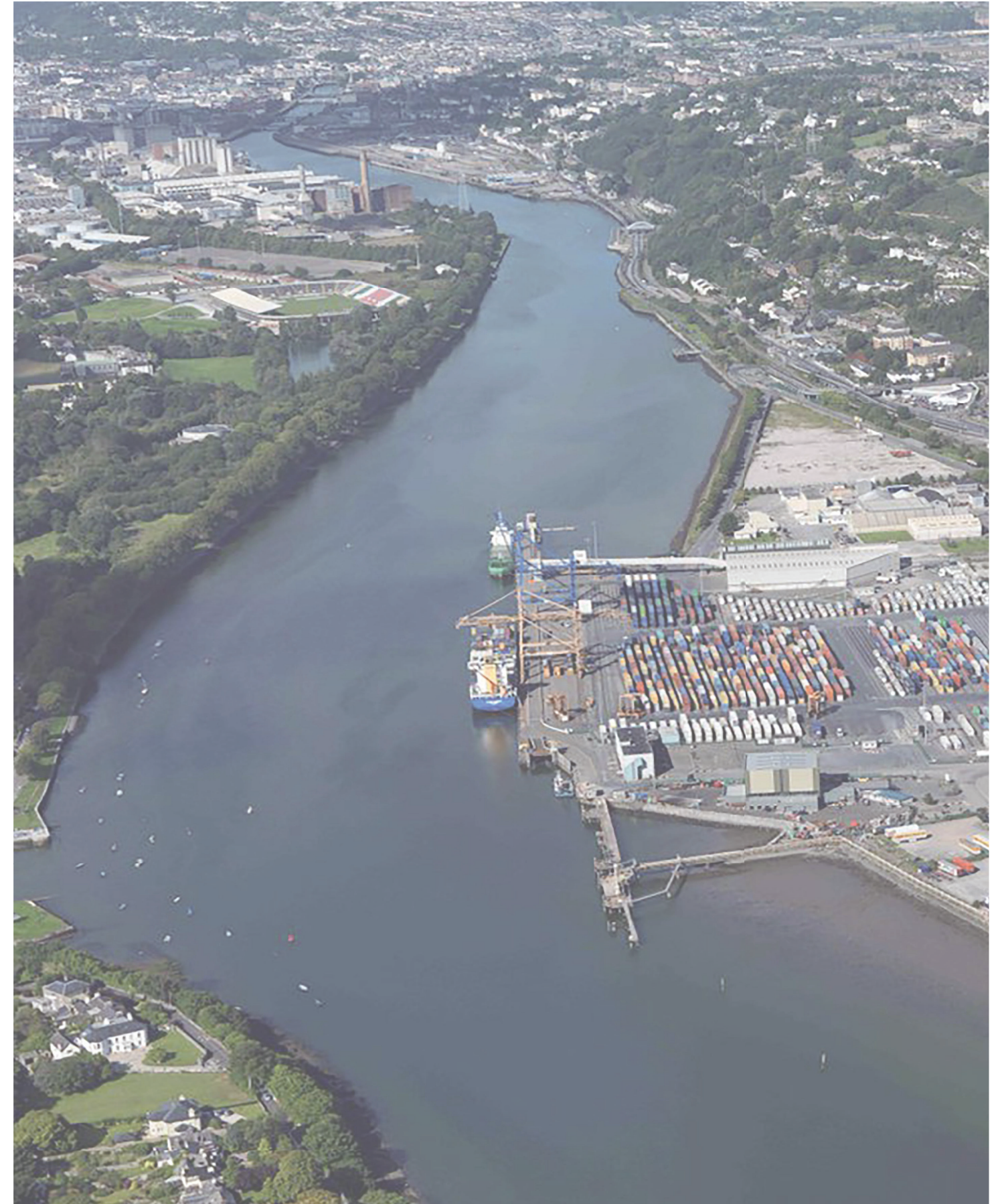


Above: Cork Harbour Context Diagram

SECTION 5. Proposed Tivoli Density & Building Heights Framework

- 5.1 - Existing UDLFP Density & Building Heights Framework: Development Data
- 5.2 - Proposed Density & Building Heights Framework: Development Data
- 5.3 - Proposed Hierarchy of Building Heights & Locations
- 5.4 - Proposed Landmark Building Locations - Key Views & Prospects

- 5.5 (a) - Proposed Development Guidelines: Neighbourhood A
- 5.5 (b) - Proposed Development Guidelines: Neighbourhood B
- 5.5 (c) - Proposed Development Guidelines: Neighbourhood C



5.1 Existing UDLFP Density & Building Heights Framework - Development Data

The Tivoli Docks Issues Paper (May 2017) identified the following targets:

- **8,000 population**
- **4,000 jobs**
- **3,000 homes**

Tivoli Urban Design & Landscape Framework Plan (UDLFP - March 2019) by AECOM and Butler Cammoranesi Architects identified the following (See Development Data diagram page opposite) :

- **10,800 population**
- **4,230 jobs**
- **4,100 homes**
- ***73 Units per Hectare (UPH)**

*NB: Based on a defined 'developable area' - approx. 88% of gross site area.

The Tivoli 3D massing model (below) provides a good indicative picture of the actual building density & height distribution across the site as reflected by the proposed population and site data arising from the UDLFP.

In reviewing the UDLFP proposals a number of issues arise. Most notably the following:

- The proposed building heights create a rather **non-hierarchical site character** of generally 3-4 storeys throughout, 5-storeys max. in limited areas. This makes **defining neighbourhood centres** and other areas of higher density somewhat difficult.
- The relatively low building heights also make for weak visual connections to and from Tivoli to surrounding areas of the City.
- Given the large site area and projected site population etc. scope exists to:
 - (a) **increase public realm** / green / blue infrastructure &
 - (b) explore options to **increase population and 'human scale' densities** within the parameters of the Area Based Transportation Plan (ABTA) as proposed by Jacobs.



* Original Tivoli 3D Massing - Courtesy of AECOM & Butler Cammoranesi

5.1 Existing UDLP Density & Building Heights Framework - Development Data

Sitewide Development Zones		
Categorisation	Area	%
	m ²	of site
Neighbourhood A	184,717.5	28.9%
Neighbourhood B	220,565.1	34.5%
Neighbourhood C	158,279.9	24.7%
Developable Area	563,562.6	88.0%
Exclusion Zones	76,490.4	12.0%
Totals (including Marina zone)	640,053.0	100.00%

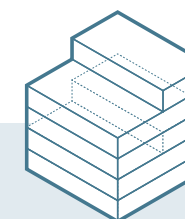
Developable Areas (Net Totals)				
Plot	Categorisation		Area	%
	Land Use		m ²	of developable area
Developable Area	COMMERCIAL	HIGH DENSITY	9,720.56	1.7%
	CIVIC	CULTURAL	55,357.48	9.8%
	RESIDENTIAL	HIGH DENSITY	117,434.59	20.8%
	RESIDENTIAL	MEDIUM DENSITY	84,495.82	15.0%
	MIXED USE	RETAIL & RESI	56,909.52	10.1%
	MIXED USE	TOWN CENTRE	13,979.75	2.5%
	OPEN SPACE	ALL	106,252.88	18.9%
	PARKING	HIGH DENSITY	28,201.44	5.0%
	UTILITIES	LOW DENSITY	5,788.04	1.0%
	ROW		85,422.51	15.2%
	Total		563,562.6	100.0%

Unit data for Tivoli Docks as outlined in this plan:

+4,100 units

Achieving a density of

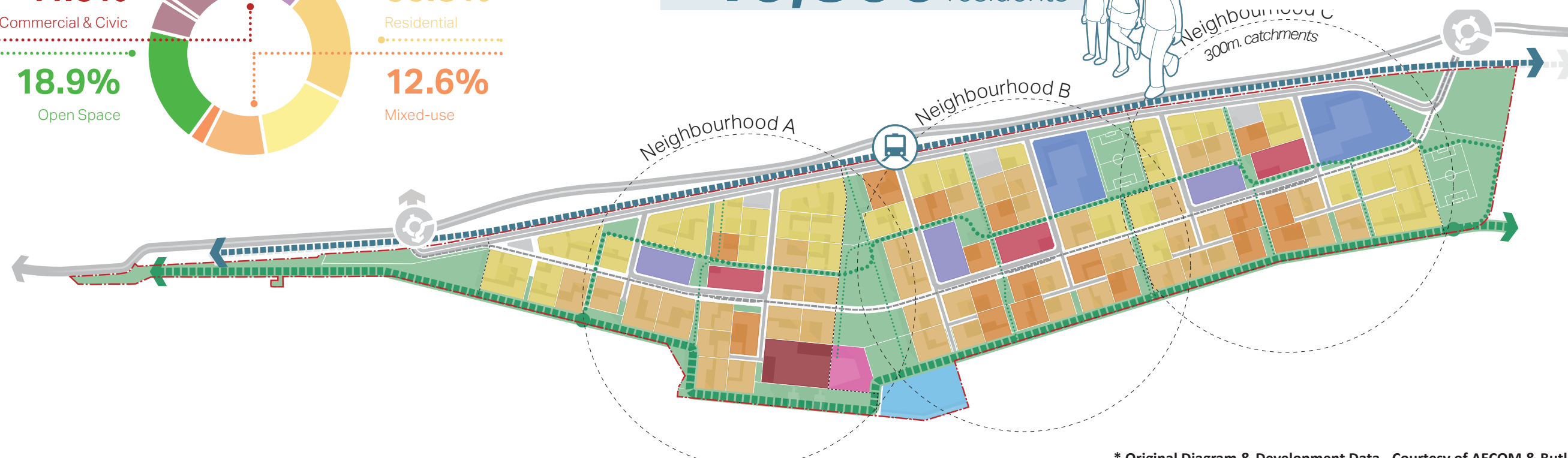
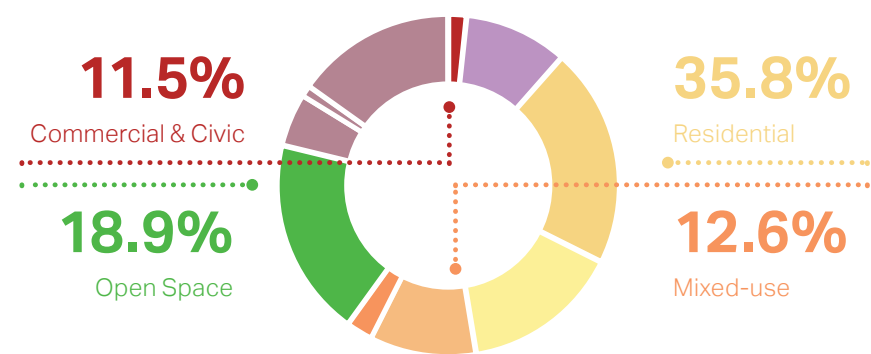
73 UPH of developable area



Development Data								Assumptions		
Plot Data		Building Use Split (%)			GFA Provided			Units (m ²)	Population	Employment
FAR	GFA (m ²)	Residential	Commercial	Other	Residential	Commercial	Other	110	2.6	12.5 m ²
1.5	83,036.23			100%	-	-	83,036.23	-	-	-
2	234,869.17	95%	5%	0%	223,125.71	11,743.46	-	2,028.42	5,273.88	939.48
1.5	126,743.73	100%	0%	0%	126,743.73	-	-	1,152.22	2,995.76	-
2	113,819.04	70%	30%	0%	79,673.33	34,145.71	-	724.30	1,883.19	2,731.66
2.5	34,949.37	80%	20%	0%	27,959.50	6,989.87	-	254.18	660.86	559.19
0	0	0%	0%	0%				-	-	-
2.5	70503.58841	0%	0%	100%				-	-	-
0	0	0%	0%	0%				-	-	-
Total		563,562.6	100.0%		457,502.28	52,879.05	83,036.23	4,159.11	10,813.69	4,230.32

Population data for Tivoli Docks as outlined in this plan:

+10,800 residents



* Original Diagram & Development Data - Courtesy of AECOM & Butler Cammoranesi

5.1 Existing UDLFP Density & Building Heights Framework - Development Data

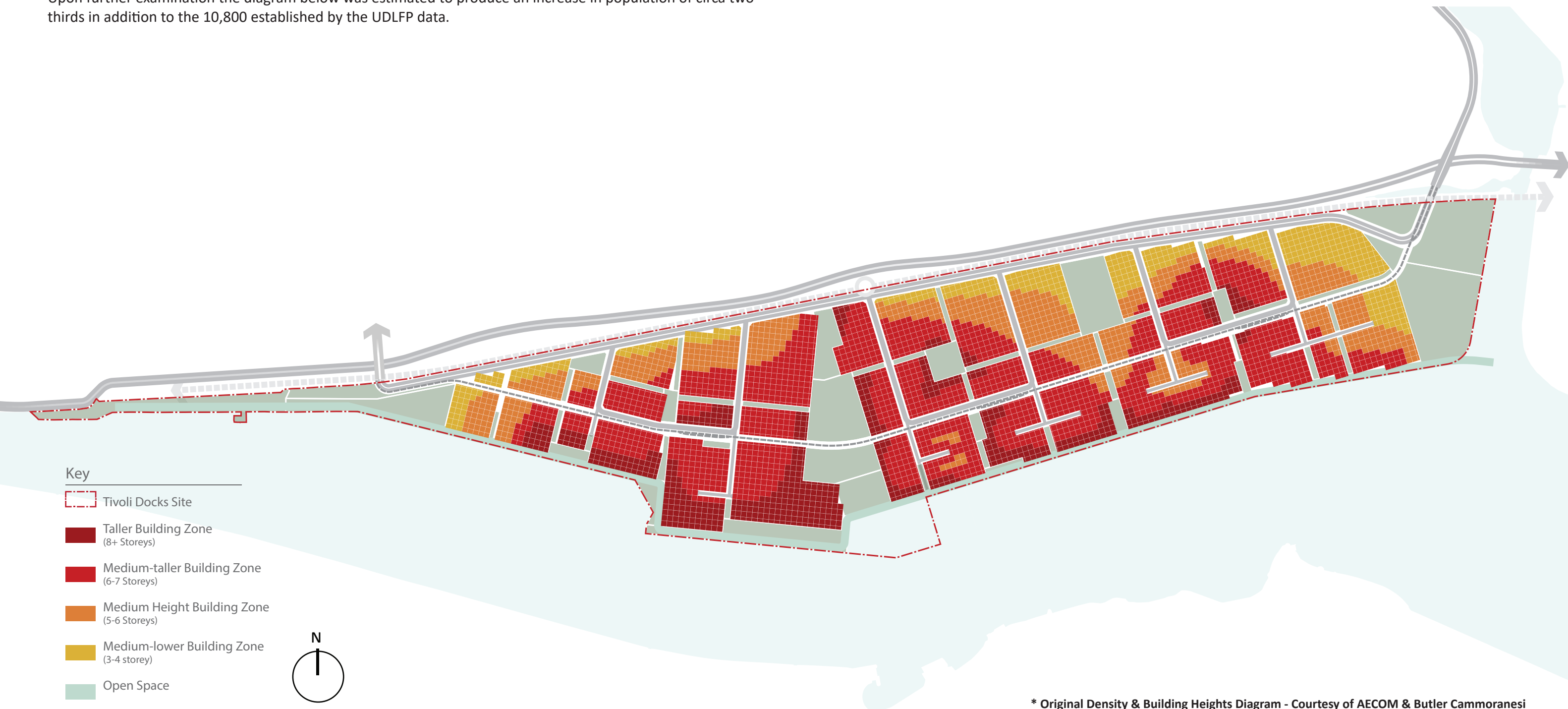
The proposed Tivoli Density & Building Heights diagram below produced as part of the UDLFP provided an indicative approach whereby taller buildings of 8+ storeys were predominantly situated to the waterfront.

The diagram below however is not reflective of the UDLFP development data as presented (page 53). It is worth noting that the 3D massing model (page 52) is a truer reflection of the actual building density and height distribution across the site.

Upon further examination the diagram below was estimated to produce an increase in population of circa two-thirds in addition to the 10,800 established by the UDLFP data.

The **site access constraints and transportation modal shares** modelled in the ABTA provide indicative parameters for projected population and employment data for Tivoli.

In developing a nuanced approach to the proposed density and building height distribution across the site the strategy in this document aims to strike a balance between **sustainable population targets** with **appropriate 'human scale' densities and building heights** arising from the analysis and recommendations contained within.



* Original Density & Building Heights Diagram - Courtesy of AECOM & Butler Cammoranesi

5.2 Proposed Tivoli Density & Building Heights Framework - Development Data

- A number of outline site density & building height strategies were developed based on the proposed changes to the UDLFP (as outlined previously in Sections 2&3) and developed by the City Architects Department in conjunction with Strategic Planning & Economic Development working group.
- Indicative diagrammatic plans, sections & 3D modelling of several proposed options re. density and building heights were developed for Tivoli.
- The options & findings were presented to the project steering group in December 2019 and a preferred option was selected for further detailed development (See diagram below).
In principle the proposal is outlined as follows:

- **Reworking of UDLFP strategy to deliver more open space and a change in the Upper Density Residential layout to raise the Floor Area Ratio's across the development.**

- **Increase building density & height to three main locations (see diagram below):**

1. To Tivoli West giving the opportunity to locate landmark building closest to the city.

2. To Tivoli Centre in relation to the main public open space.

3. Extra density at the Train station to create a commercially viable centre close to the public transport hub.

- **Neighbourhoods A & B located closest to the city and main public transport connections are characterised by medium to upper density development.**

- **Neighbourhood C to the east of the site is characterised by a medium to lower density environment.**

PROPOSED DEVELOPMENT DATA








The Proposed Development Data (opposite) produces the following (increase relative to UDLFP in brackets):

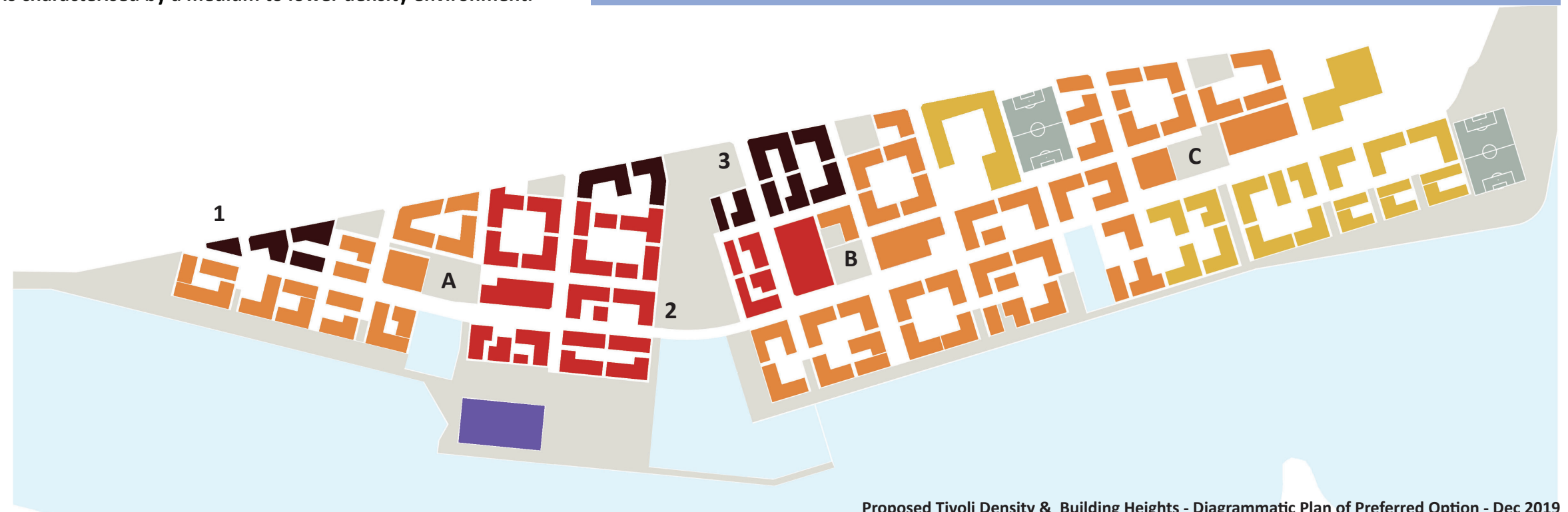
- **12,875 population (+2075)**
- **5,068 jobs (+838)**
- **4,952 homes (+852)**
- ***94 Units per Hectare (+21 UPH)** *NB: Based on a defined 'developable area' - approx. 82% of gross site area.

The proposed figures above are achieved via a variety of measures as outlined and tested in detail within this strategy. Key high-level changes to the UDLFP data are highlighted on the table opposite most notably:

- **Net 'Developable Area' reduced by -6%** (approx. 4Ha) via increases to the 'Exclusion Zones' such as increase to re-wilding areas to Tivoli East and proposed water/marina inlets as outlined within Sections 2&3 of this strategy.
- **Increase to Upper Density Residential +6%** as further examined within Section 5 of this strategy.
- **Increase to Public 'Open Space' +3.1%** (approx. 1Ha of Developable Area) as outlined within Sections 2&3 of this strategy.

The proposed Development Data is further developed with regard to Building Density & Heights in the following Sections 5.3-5.5 and tested against the **3no. Key 'Strategic Methodologies'** as developed in Section 4.

FLOOR AREA RATIO	no. stories @ 50% site coverage	
F . A . R 0.5	1	
1	2	
1.5	3	
2	4	
2.5	5	
3	6	
4	8	



* See Appendix for FAR Description

5.2 Proposed Tivoli Density & Building Heights Framework - Proposed Development Data

Site Wide Development Zones		
Categorisation	Area m ²	% of site
Neighbourhood A	176,596	27.6
Neighbourhood B	192,535	30.1
Neighbourhood C	153,974	24.1
Developable Area	523,105.00	82% -6%
Exclusion Zones	116,948.00	18%
Total (incl Marina Zone)	640,053.00	100%

Unit data for Tivoli Docks as outlined in this plan:
4,952 units

Achieving a density of
94 UPH of developable area

Developable Areas (net Totals)			
Plot	Categorisation	Area m ²	% of developable area
Developable Area	Civic	Cultural & Education	49694.98 9.5%
	Residential	Upper density	31386.30 6.0% +6%
	Residential	Medium / Upper density	86312.33 16.5%
	Residential	Lower/Medium density	52310.50 10.0%
	Mixed Use	Commercial/Retail & Resi	54926.03 10.5%
	Mixed Use	town centre	31386.30 6.0%
	Open Space	All	115083.10 22.0% +3.1%
	Parking	Upper density	18308.68 3.5%
	Utilities	Lower density	5231.05 1.0%
	ROW		78465.75 15.0%
Total		523105.00	100.0%

Development Data								Assumptions		
Plot Data		Building Use Split (%)			GFA Provided (m ²)			Units (m ²)	Population	Employment
FAR	GFA (m ²)	Residential	Commercial	Other	Residential	Commercial	Other	110	2.6	12.5
1.5	74542.46	0%	0%	100%			74542.46			
4	125545.20	100%	0%	0%	125545.20	0.00				
2.5	215780.81	95%	5%	0%	204991.77	10789.04		1863	4843.8	863
1.5	78465.75	95%	5%	0%	74542.46	3923.29		677	1760.2	313
2	109852.05	70%	30%	0%	76896.44	32955.62		699	1817.4	2636
2.5	78465.75	80%	20%	0%	62772.60	15693.15		570	1482	1255
0	0.00	0%	0%	0%						
4.5	82389.04	0%	0%	100%			82389.04			
Total					544748.47	63361.09	156931.50	4952	12875.2	5068

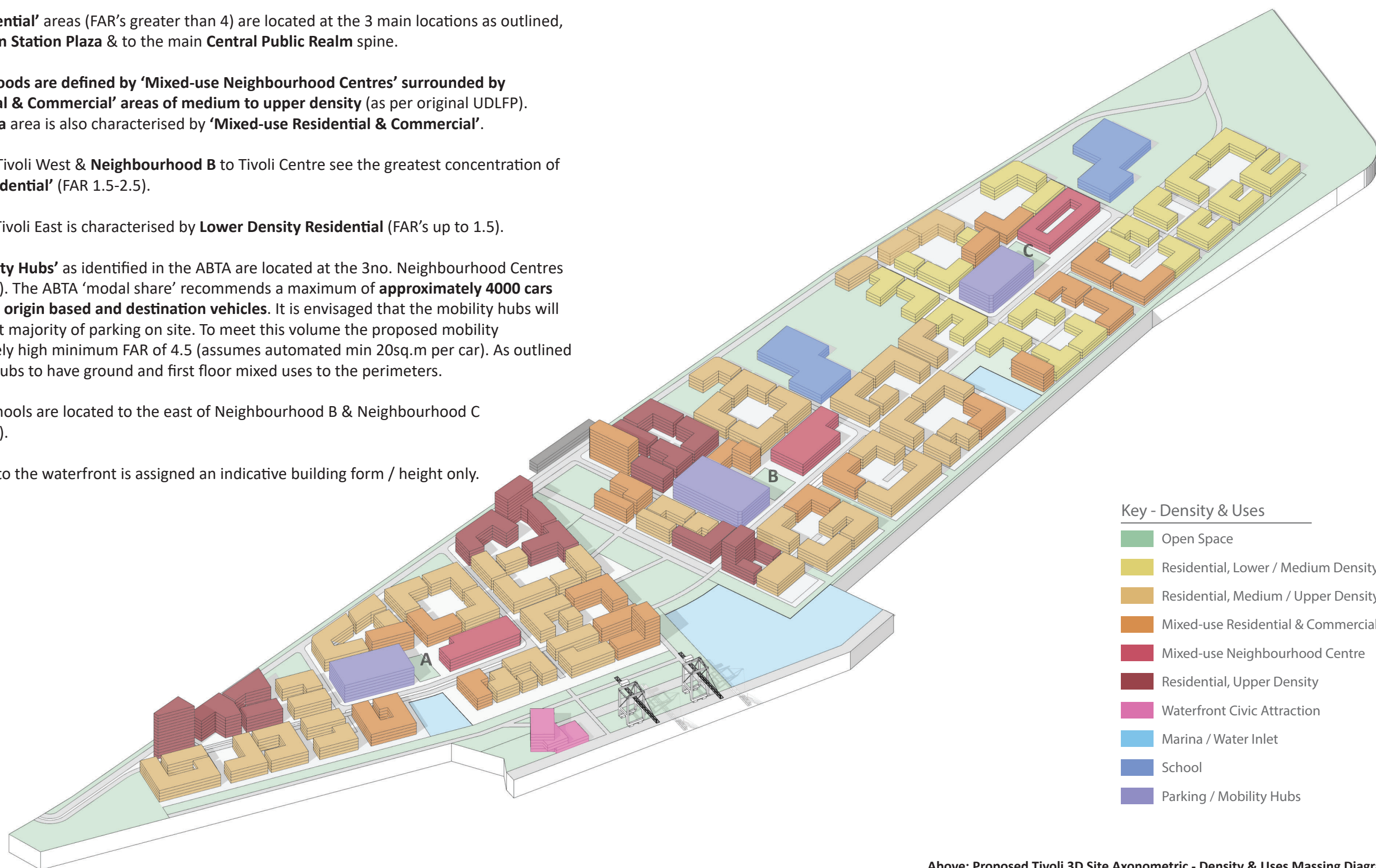
Population data for Tivoli Docks as outlined in this plan:
12,875 residents

Employment data for Tivoli Docks as outlined in this plan:
5,068 jobs

5.2 Proposed Tivoli Density & Building Heights Framework - Proposed Development Data

The 'Proposed Tivoli Site Axonometric - Uses & Densities Massing Diagram' below provides an indicative distributional layout for high level uses & densities as per proposed Development Data as follows:

- 'Upper Density Residential' areas (FAR's greater than 4) are located at the 3 main locations as outlined, ie. to Tivoli West, Train Station Plaza & to the main Central Public Realm spine.
- The 3no. Neighbourhoods are defined by 'Mixed-use Neighbourhood Centres' surrounded by 'Mixed-use Residential & Commercial' areas of medium to upper density (as per original UDLFP). The Train Station Plaza area is also characterised by 'Mixed-use Residential & Commercial'.
- Neighbourhood A to Tivoli West & Neighbourhood B to Tivoli Centre see the greatest concentration of 'Medium/ Upper Residential' (FAR 1.5-2.5).
- Neighbourhood C to Tivoli East is characterised by Lower Density Residential (FAR's up to 1.5).
- The 3no. main 'Mobility Hubs' as identified in the ABTA are located at the 3no. Neighbourhood Centres (as per original UDLFP). The ABTA 'modal share' recommends a maximum of **approximately 4000 cars on site including both origin based and destination vehicles**. It is envisaged that the mobility hubs will accommodate the vast majority of parking on site. To meet this volume the proposed mobility hubs require a relatively high minimum FAR of 4.5 (assumes automated min 20sq.m per car). As outlined in the ABTA mobility hubs to have ground and first floor mixed uses to the perimeters.
- The 2no. proposed schools are located to the east of Neighbourhood B & Neighbourhood C (as per original UDLFP).
- The 'Civic Attraction' to the waterfront is assigned an indicative building form / height only.



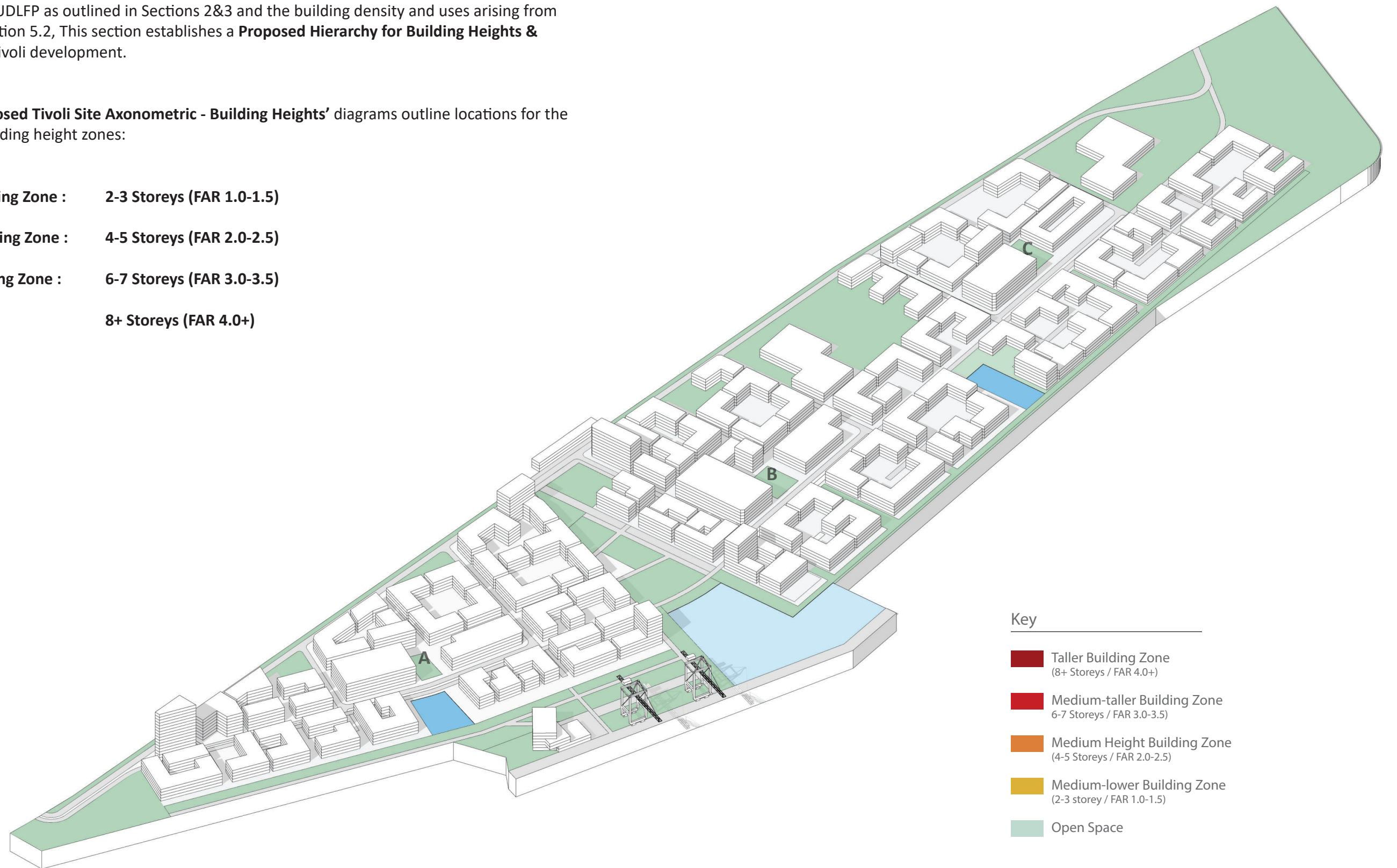
Above: Proposed Tivoli 3D Site Axonometric - Density & Uses Massing Diagram

5.3 Proposed Hierarchy for Building Heights & Locations

Applying the changes to the UDLFP as outlined in Sections 2&3 and the building density and uses arising from the Development Data in Section 5.2, This section establishes a **Proposed Hierarchy for Building Heights & Locations** across the future Tivoli development.

The following series of ‘**Proposed Tivoli Site Axonometric - Building Heights**’ diagrams outline locations for the the each of the following building height zones:

1. **Lower-Medium Building Zone :** 2-3 Storeys (FAR 1.0-1.5)
2. **Medium Height Building Zone :** 4-5 Storeys (FAR 2.0-2.5)
3. **Medium-Taller Building Zone :** 6-7 Storeys (FAR 3.0-3.5)
4. **Taller Building Zone :** 8+ Storeys (FAR 4.0+)

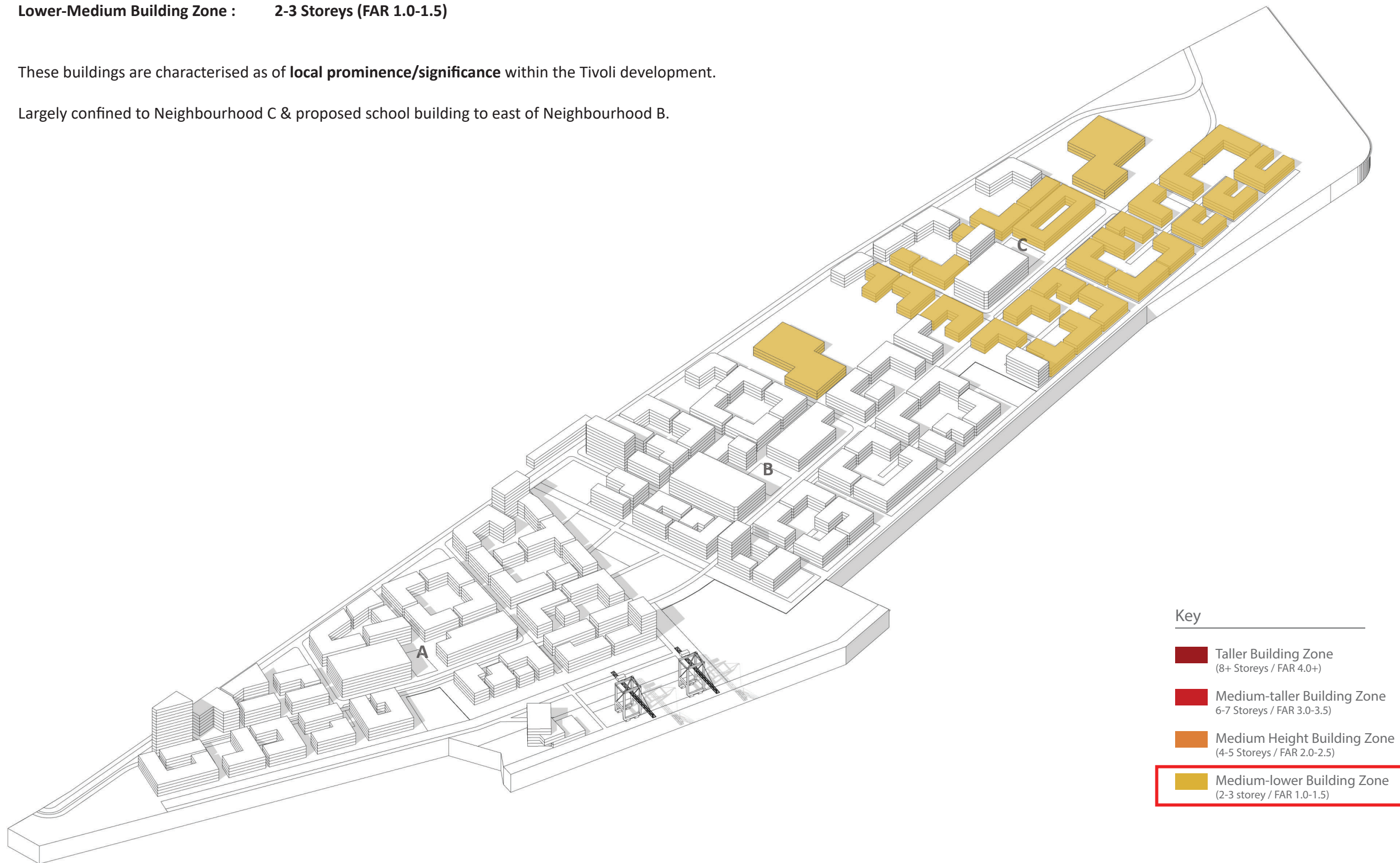


Above: Proposed Tivoli 3D Site Axonometric - Building Heights Site Massing

5.3 Proposed Hierarchy for Building Heights & Locations

1. Lower-Medium Building Zone : 2-3 Storeys (FAR 1.0-1.5)

- These buildings are characterised as of **local prominence/significance** within the Tivoli development.
- Largely confined to Neighbourhood C & proposed school building to east of Neighbourhood B.

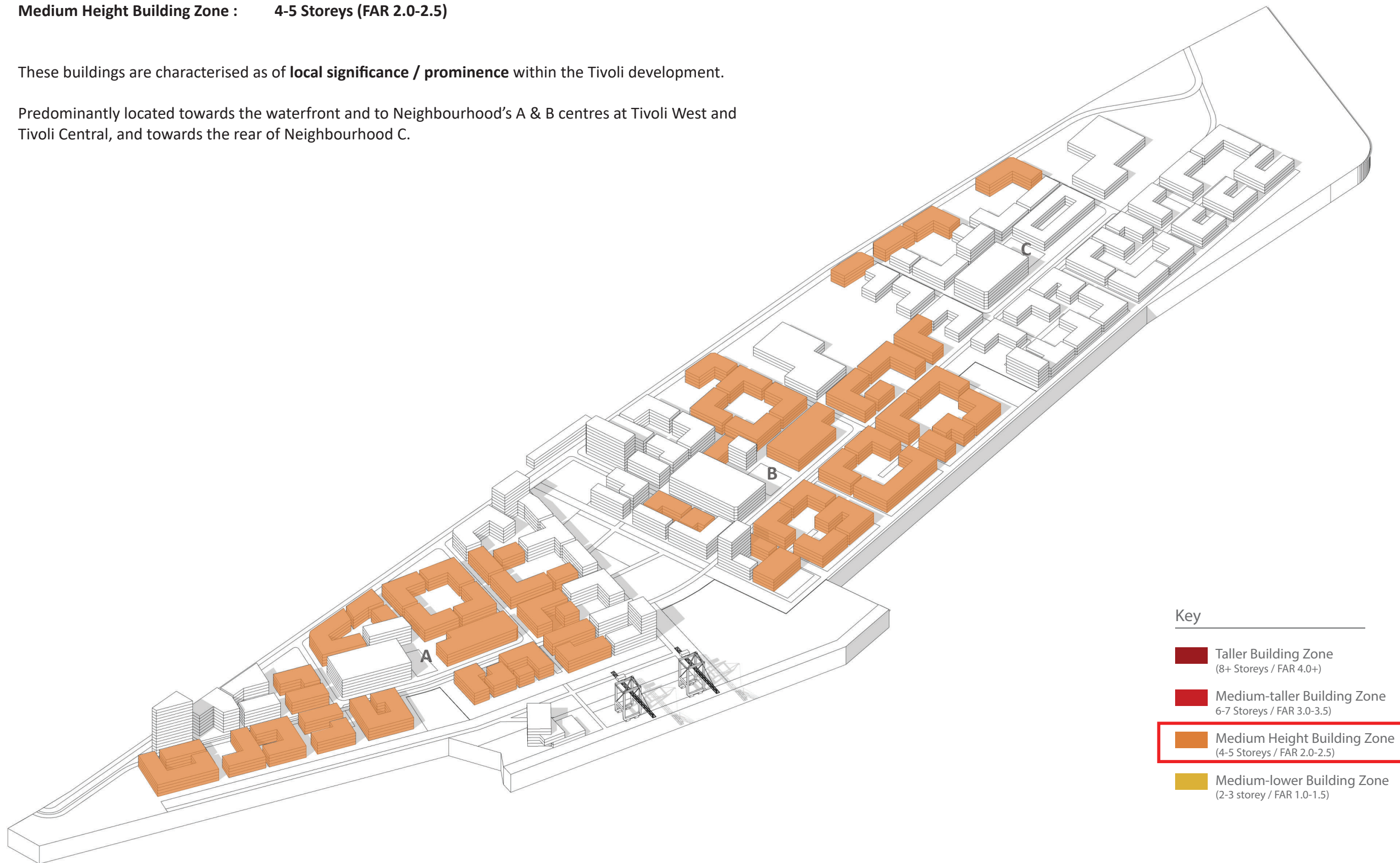


Above: Proposed Tivoli 3D Site Axonometric - Building Heights - Low/Medium Zone

5.3 Proposed Hierarchy for Building Heights & Locations

2. Medium Height Building Zone : 4-5 Storeys (FAR 2.0-2.5)

- These buildings are characterised as of **local significance / prominence** within the Tivoli development.
- Predominantly located towards the waterfront and to Neighbourhood's A & B centres at Tivoli West and Tivoli Central, and towards the rear of Neighbourhood C.



Key

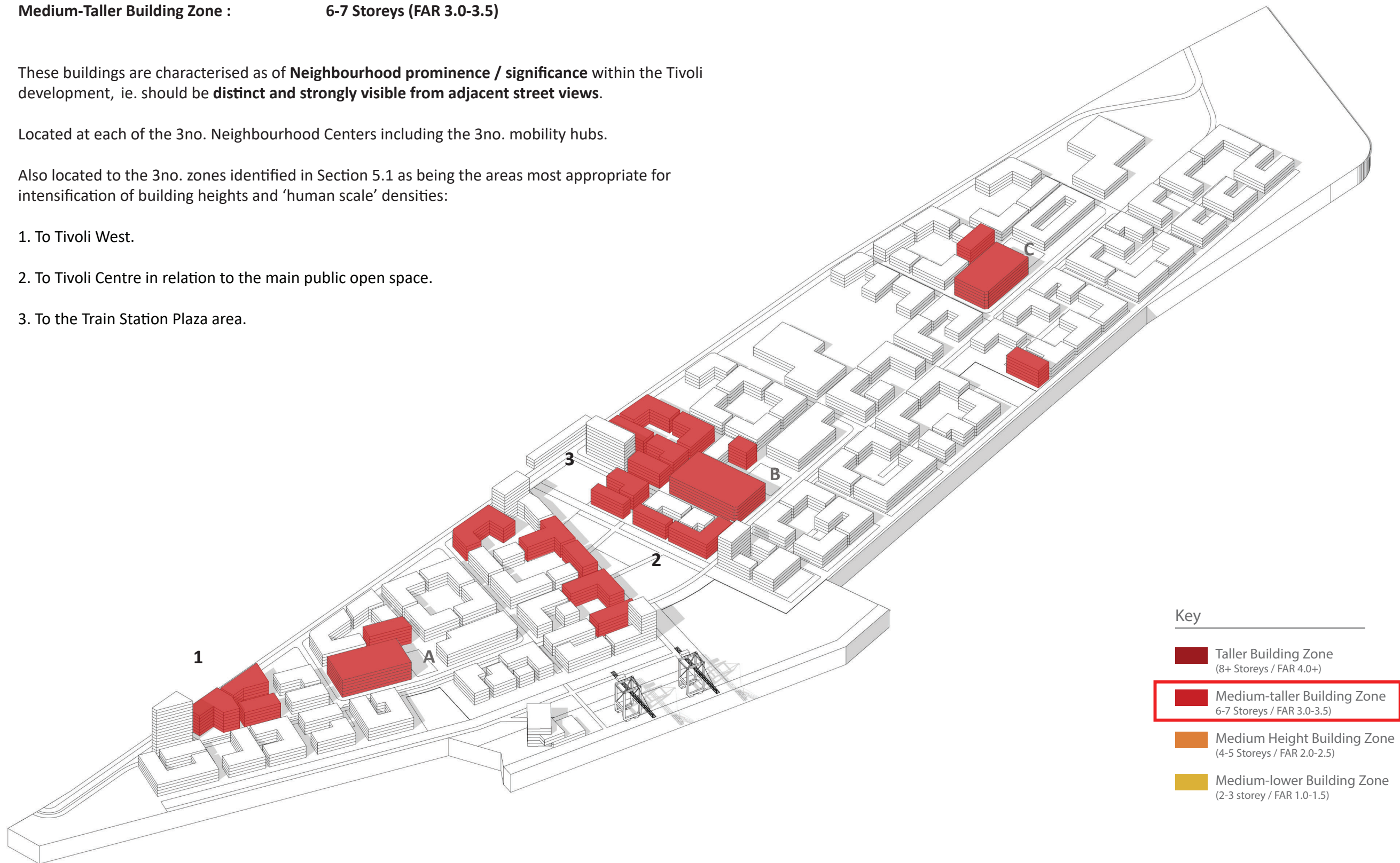
- Taller Building Zone
(8+ Storeys / FAR 4.0+)
- Medium-taller Building Zone
(6-7 Storeys / FAR 3.0-3.5)
- Medium Height Building Zone
(4-5 Storeys / FAR 2.0-2.5)
- Medium-lower Building Zone
(2-3 storey / FAR 1.0-1.5)

Above: Proposed Tivoli 3D Site Axonometric - Building Heights - Medium Zone

5.3 Proposed Hierarchy for Building Heights & Locations

3. Medium-Taller Building Zone : 6-7 Storeys (FAR 3.0-3.5)

- These buildings are characterised as of **Neighbourhood prominence / significance** within the Tivoli development, ie. should be **distinct and strongly visible from adjacent street views**.
- Located at each of the 3no. Neighbourhood Centers including the 3no. mobility hubs.
- Also located to the 3no. zones identified in Section 5.1 as being the areas most appropriate for intensification of building heights and 'human scale' densities:
 1. To Tivoli West.
 2. To Tivoli Centre in relation to the main public open space.
 3. To the Train Station Plaza area.

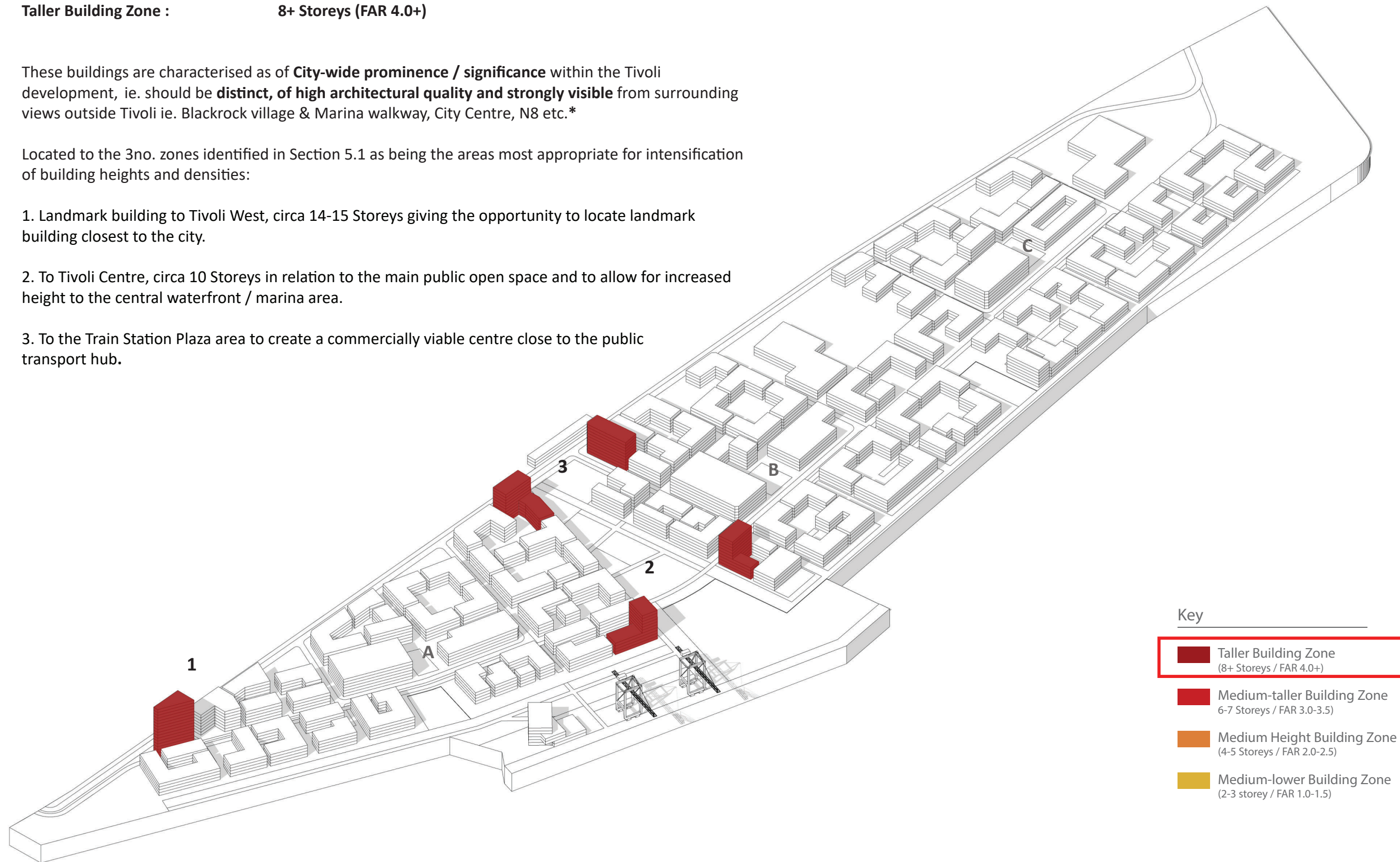


Above: Proposed Tivoli 3D Site Axonometric - Building Heights - Medium/Tall Zone

5.3 Proposed Hierarchy for Building Heights & Locations

4. Taller Building Zone : 8+ Storeys (FAR 4.0+)

- These buildings are characterised as of **City-wide prominence / significance** within the Tivoli development, ie. should be **distinct, of high architectural quality and strongly visible** from surrounding views outside Tivoli ie. Blackrock village & Marina walkway, City Centre, N8 etc.*
- Located to the 3no. zones identified in Section 5.1 as being the areas most appropriate for intensification of building heights and densities:
 1. Landmark building to Tivoli West, circa 14-15 Storeys giving the opportunity to locate landmark building closest to the city.
 2. To Tivoli Centre, circa 10 Storeys in relation to the main public open space and to allow for increased height to the central waterfront / marina area.
 3. To the Train Station Plaza area to create a commercially viable centre close to the public transport hub.



Key

	Taller Building Zone (8+ Storeys / FAR 4.0+)
	Medium-taller Building Zone (6-7 Storeys / FAR 3.0-3.5)
	Medium Height Building Zone (4-5 Storeys / FAR 2.0-2.5)
	Medium-lower Building Zone (2-3 storey / FAR 1.0-1.5)

*Section 5.4 - 'Proposed Landmark Building Locations - Key Views & Prospects' provide 3D massing images in context from selected views as per Section 4.2(b) Proposed Key Landmark Views Towards Tivoli.

Above: Proposed Tivoli 3D Site Axonometric - Building Heights - Tall Zone

5.4 Proposed Landmark Building Locations - Key Views & Prospects

Below: Context 3D Massing - Landmark Building at Silversprings / Tivoli West - See Section 4.2(b) View no.1



Below: Context 3D Massing - Tall Buildings at Train Station Plaza - See Section 4.2(b) View no.5



5.4 Proposed Landmark Building Locations - Key Views & Prospects

The proposed Development Data is further developed with regard to Building Density & Heights and tested against the **3no. Key 'Strategic Methodologies'** as developed in Section 4. Principally Section 5.4 tests the following:

1. **Key Views & Prospects**
- &
2. **Landscape & Heritage Character**

The 'Context 3D Massing' images in this section test the 'Hierarchy for Building Heights & Locations' from section 5.3 against the key landmark views as per Section 4 of this strategy:

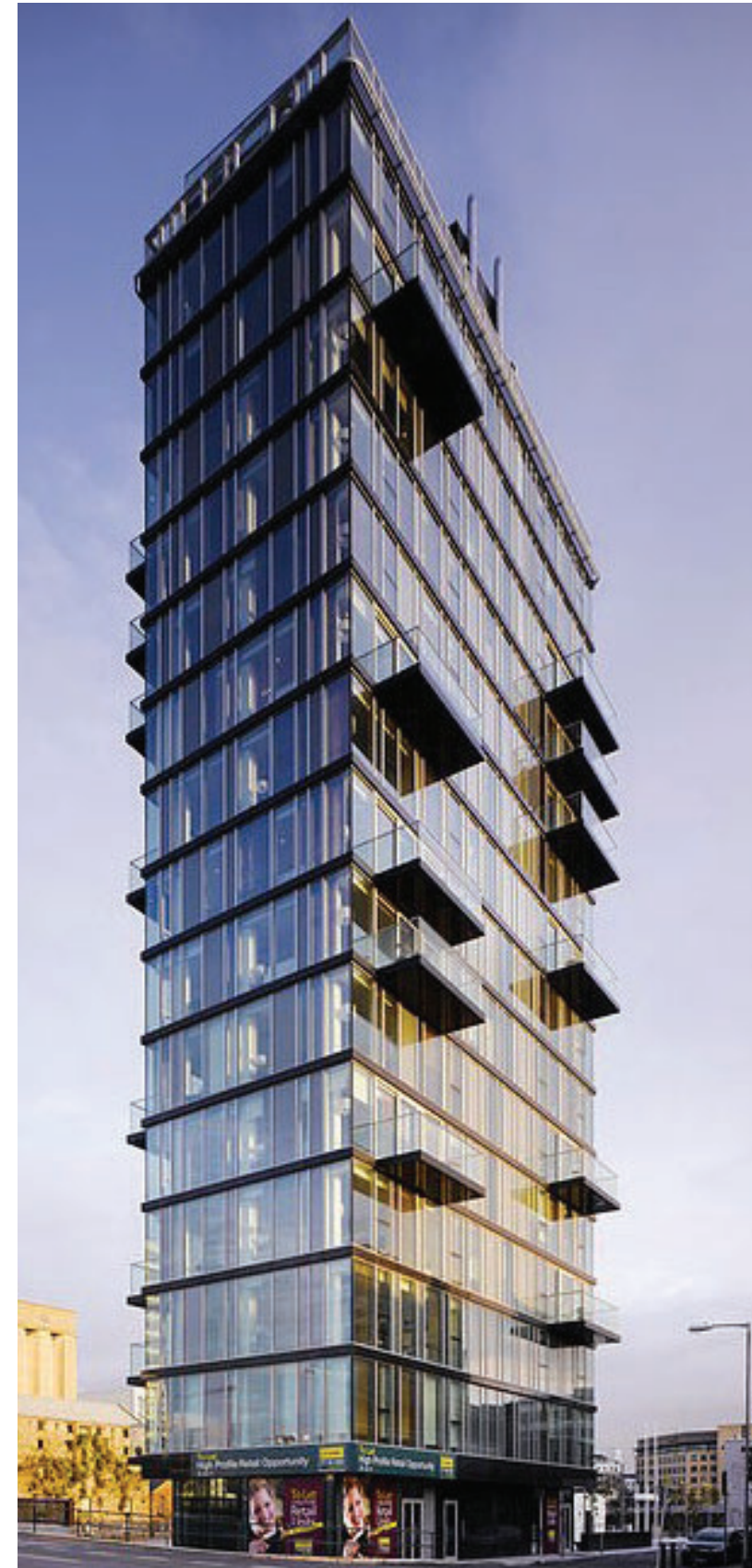
- Page 64 opposite (top image) provides a sample context massing of a 'Landmark' building as designated to Tivoli West. Such a prominent location, closest to the City will act as a **signature 'gateway'** to the Tivoli development and merits a **high quality architectural response** eg. see Altro Vetra image (right) for a precedent residential development of similar scale.
- Page 64 opposite (bottom image) provides a sample context massing of the Train Station Plaza area centrally located along the N8 dual carriageway and **main eastern approach to Cork City**. The siting of taller buildings at this location is justified by creating a strong visual connection from the N8 approach in order to **announce Tivoli as an important urban development** and as part of Cork City.
- Subsequent context massing views (on page 66) from across the river at Blackrock Marina & Castle Rd. provide further evidence that the **minimum top-third rule of Tivoli Ridge** is vital in maintaining the existing strong visual connection and unique landscape identity that is the Tivoli Ridge backdrop.
- It is also interesting to note that 'pop-up' building heights to certain locations as identified do not diminish the overall views to Tivoli ridge and the Merchant Houses (as viewed from Castle Rd.)
- The internal site views and precedent image (page 67) invoke building typologies on-site which can act as visual signifiers of local importance bringing diversity and variation to the built form of future developments.

The subsequent Section 5.5 **Proposed Neighbourhood Development Guidelines** also reviews the site strategy against the final **Key Strategic Methodology**:

3. **Creating a Piece of the City - The Waterfront 'Journey'**

FUTURE DEVELOPMENTS

The sample images, diagrams and precedent studies included in Sections 5.4 & 5.5 are intended as examples for future developments in order to measure any proposals against the 3no. Key 'Strategic Methodologies' & 'Design Principles' for Tivoli established within this strategy.



Left: Altro Vetra Residential Tower - Grand Canal Dock
Dublin - Shay Cleary Architects

5.4 Proposed Landmark Building Locations - Key Views & Prospects

Below: Context 3D Massing - Overall Site Building Heights - See Section 4.2(b) View no.3 - Blackrock Marina Central



Below: Context 3D Massing - Overall Site Building Heights - See Section 4.2(b) View no.7 - Panorama from Castle Rd. Blackrock

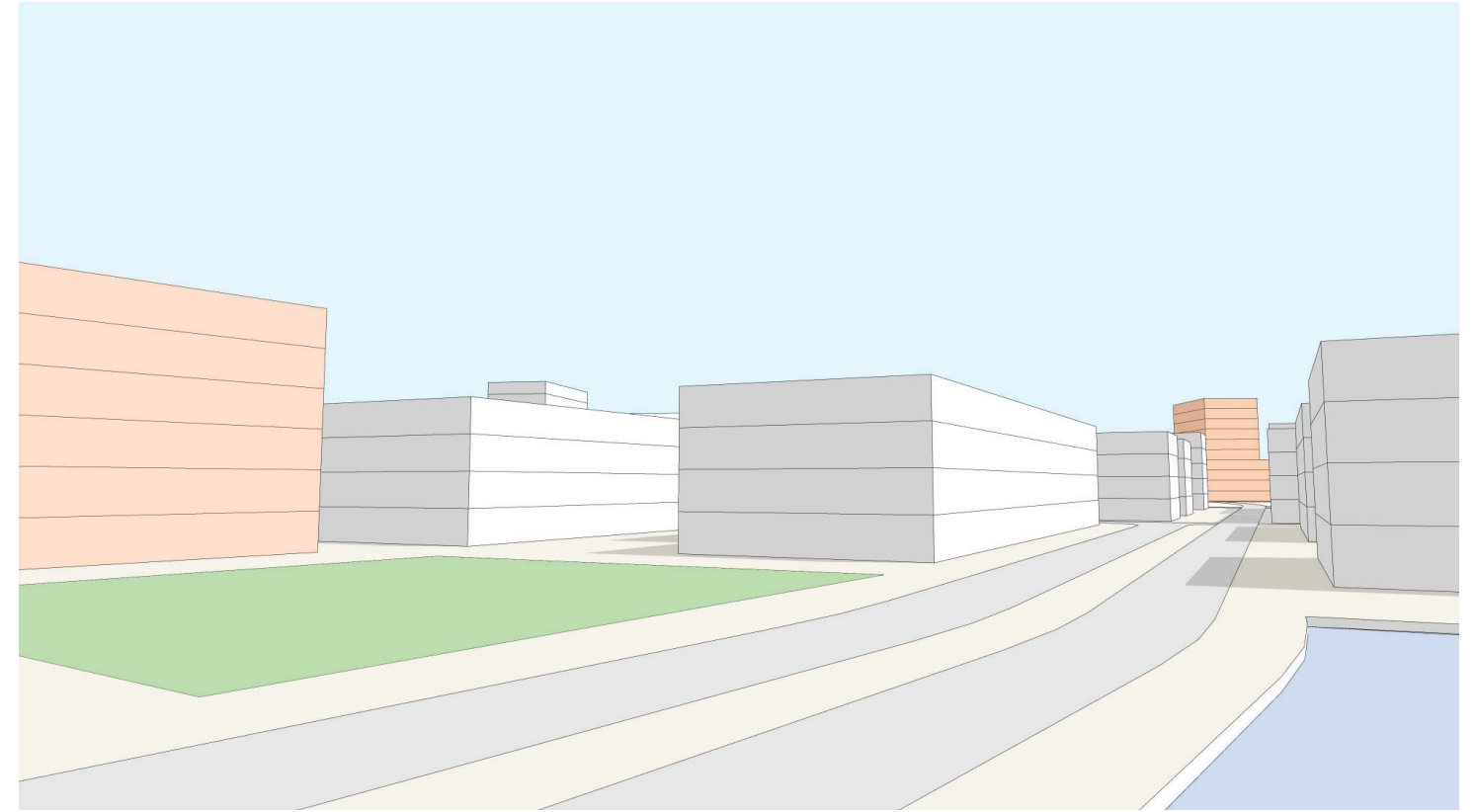


5.4 Proposed Landmark Building Locations - Key Views & Prospects

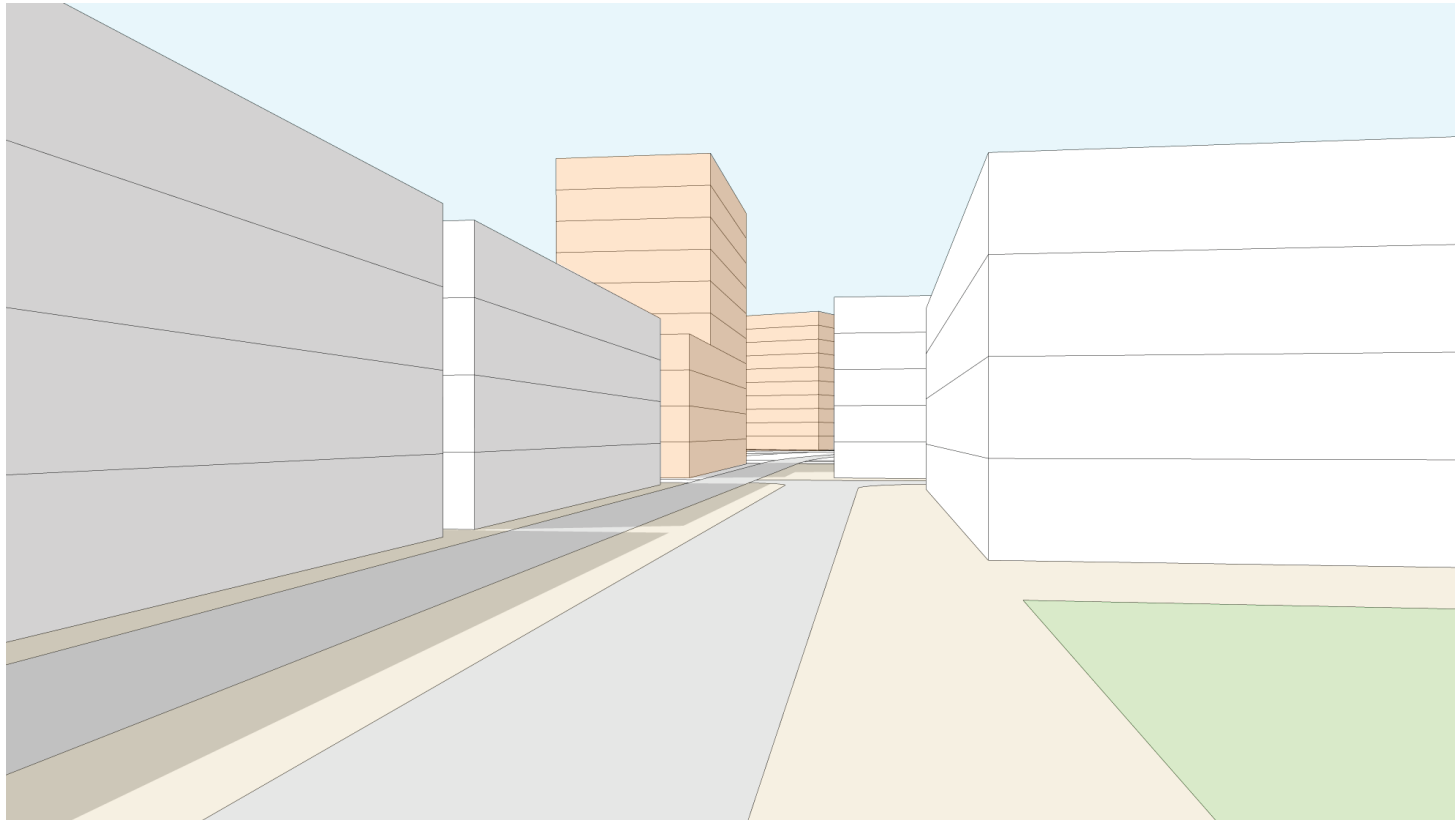
Below: Precedent Image - Kings Crescent , London - KCA



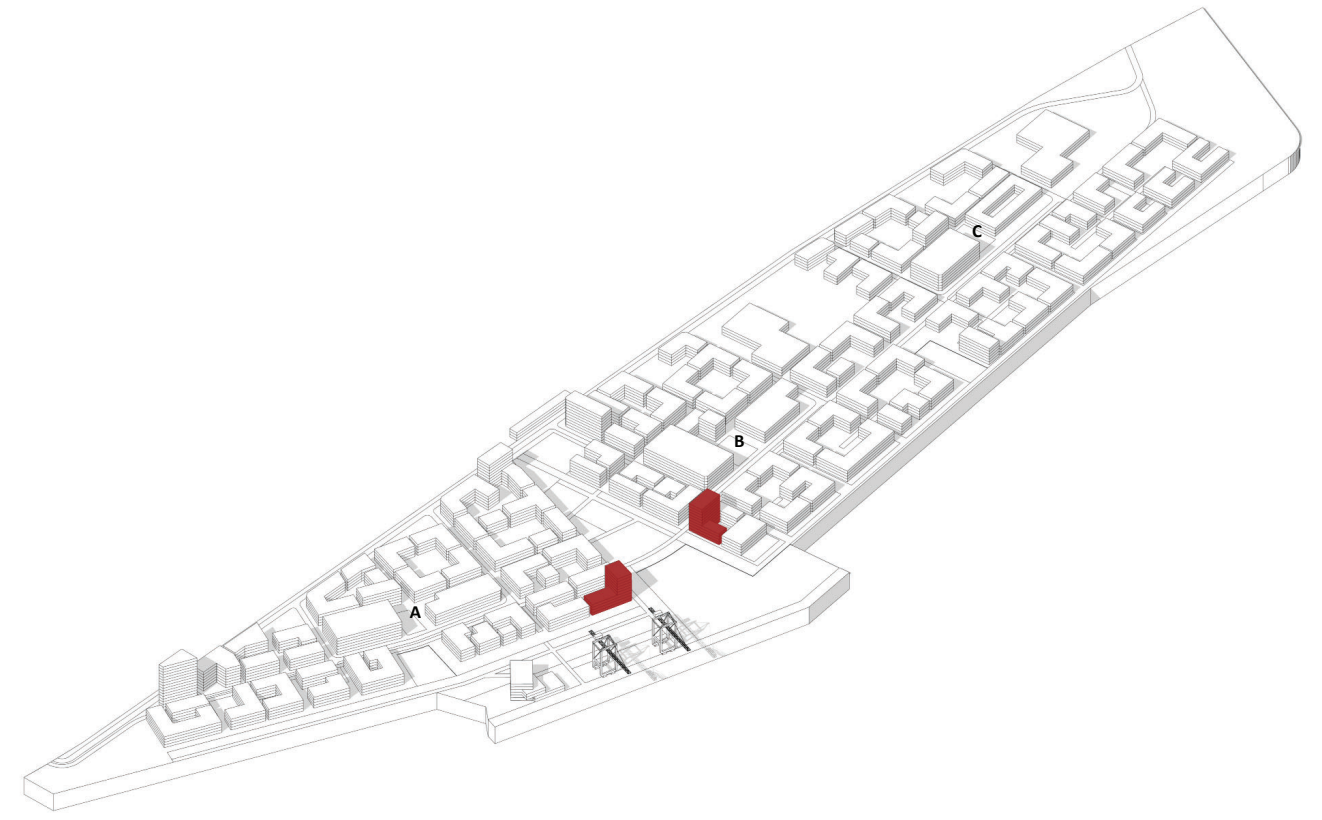
Below: Context 3D Massing - Tall Buildings to Central Waterfront / Public Realm Area - View from Neighbourhood A



Below: Context 3D Massing - Tall Buildings to Central Waterfront / Public Realm Area - View from Neighbourhood B



Below: Tivoli 3D Site Axonometric - Tall Buildings to Central Waterfront / Public Realm Area



5.5(a) Proposed Neighbourhood Development Guidelines - Neighbourhood A

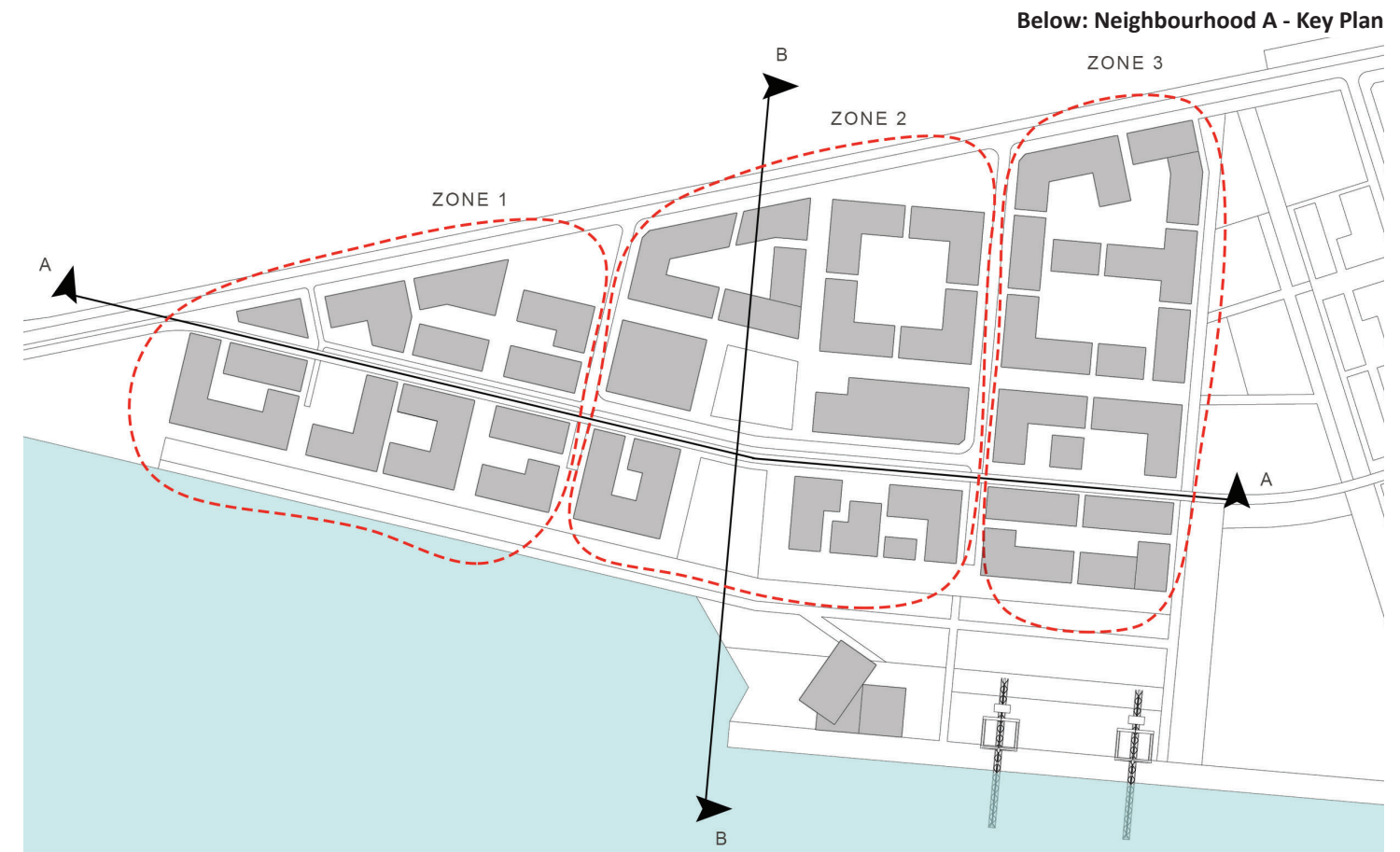
Context

Neighbourhood A is located to the west of Tivoli. It is bounded to the north by the N8 & Rail-line, to the south by the waterfront park/greenway and by the central public realm spine and train station plaza to the east. Neighbourhood A constitutes:

- **27.6%** (176.6Ha) of overall site net 'Developable Area' (As per development data page 57).
- &
- **36.7%** of total built area.

Building Use Mix

- **70-80%** of the net built area is to be used for **residential purposes**. Zones 1&3 contain upper and medium/upper density residential developments. Upper density residential is concentrated to the far west and to the east adjacent to the Train Station Plaza.
- **10-15%** of the net built area is to be used for **commercial & retail** purposes preferably at the ground and lower floor levels with residential above. Mixed Resi-Commercial uses are mainly located in Zone 2 around the neighbourhood centre.
- **15-20%** of net developable area is assigned for **other uses including community, cultural, utility & parking / mobility hub**.



Below: Neighbourhood A - Key Plan



Below: Neighbourhood A - Section BB

5.5(a) Proposed Neighbourhood Development Guidelines - Neighbourhood A

Character & Built Form

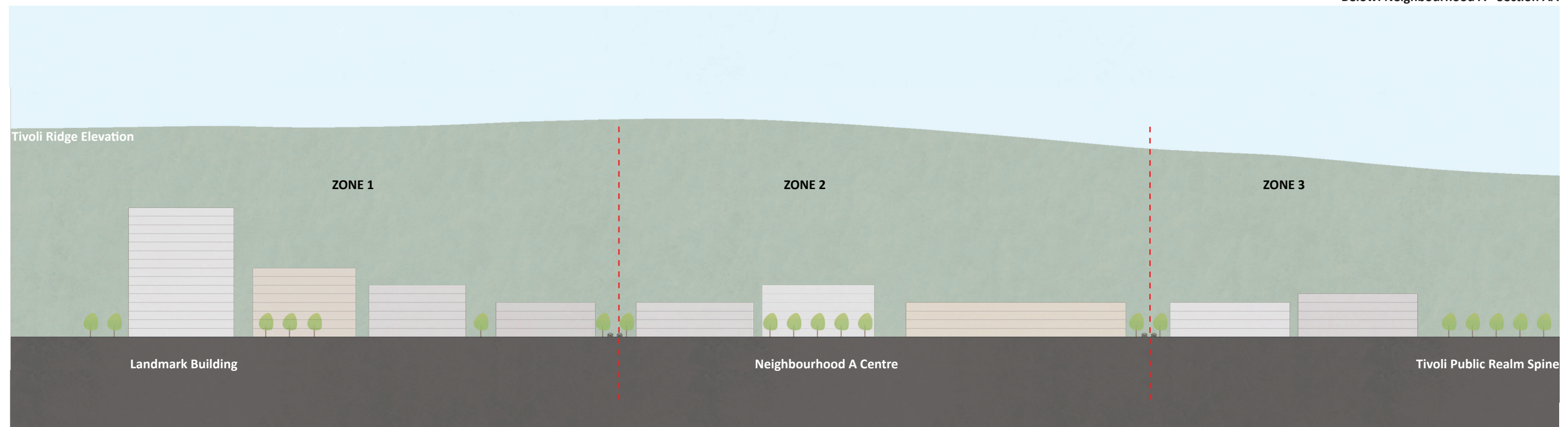
Neighbourhood A is characterised by 3 distinct zones:

- **Zone 1** closest to the narrow western tip of the site and main vehicular access point to include **upper and medium/upper residential development**. As a prime location closest to the city and main public realm waterfront greenway, it is deemed a suitable location for a **landmark building** of up to 16 storeys as indicated.
- **Zone 2** is characterised by the **mixed-use neighbourhood centre** and connection with the waterfront park via potential water-inlet. As per Section BB (opposite page 68) a strong link is established between the neighbourhood centre and **waterfront civic attraction**.
- **Zone 3** is bounded by the Tivoli main public realm spine to the east, train station plaza to the north east and waterfront park/ civic attraction to the south. Zone 3 is characterised by **upper and medium/upper residential development** with some mixed-use resi-commercial building to the south east **adjacent to the public realm spine**.

Below: Precedent Image - Sluseholmen Copenhagen, Denmark



Below: Neighbourhood A - Section AA

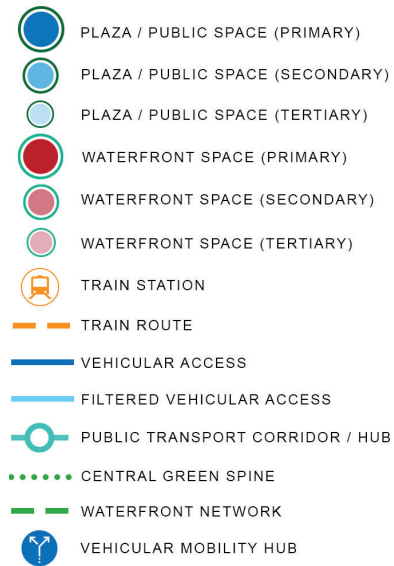


5.5(a) Proposed Neighbourhood Development Guidelines - Neighbourhood A

Public Realm Infrastructure - The Waterfront 'Journey'

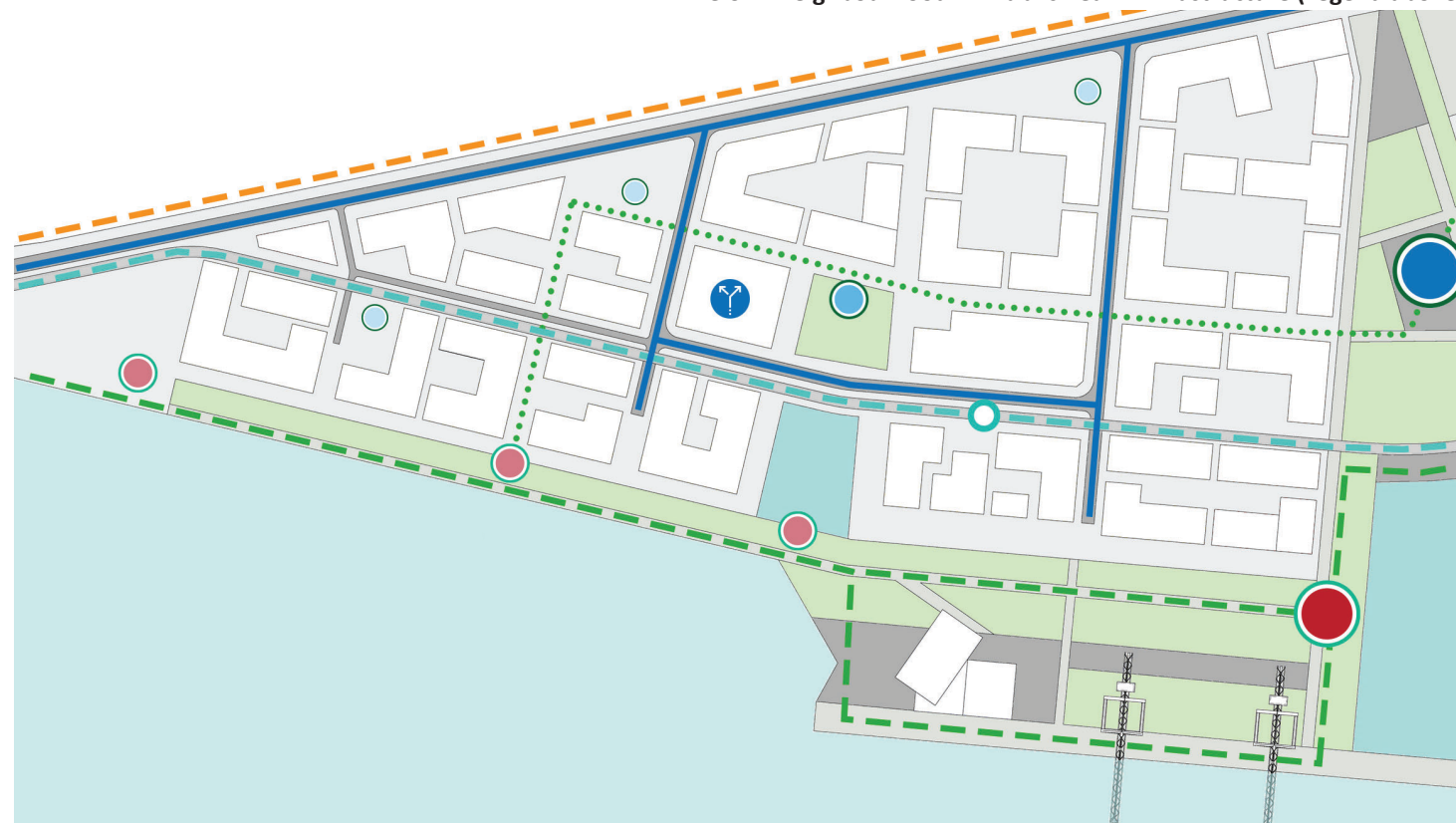
Neighbourhood A encompasses the **tree-lined waterfront network** of parkland character mirroring the existing Blackrock Marina park to the opposite side of the river. This is a vital piece of **green infrastructure** forming a **primary green linkage** with the City as outlined previously in this strategy.

- All developments should **detail phasing of the public realm** to ensure coherent build-out.
- South facing prospect conducive to **variety of uses** at the human scale include possible bathing berths, kiosks, rowing, playgrounds, sunbathing, cycling etc.
- Concentration of **mixed-uses at ground and first floor levels** and residential above particularly to built frontages onto the public realm neighbourhood centre, potential water inlet and connection to waterfront network / civic attractor (See 3D Diagram opposite).

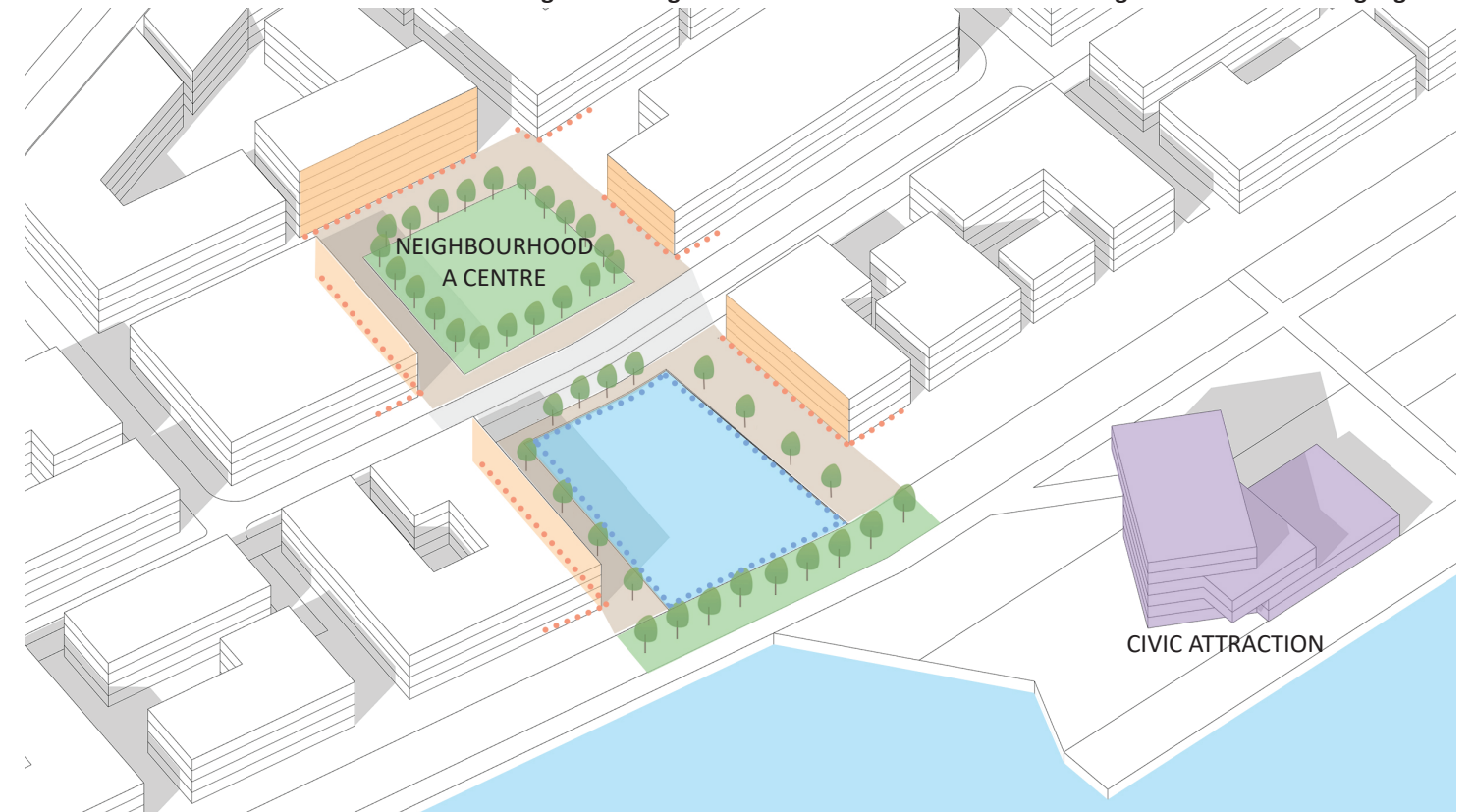


Following pages 71-72 examine the effect of the built-form and **building height parameters** on the surrounding streets and public realm via **3D shadow studies**.

Below: Neighbourhood A - Public Realm Infrastructure (Legend above)



Below: 3D Diagram of Neighbourhood A Centre - Mixed-Use Frontages to Public Realm Highlighted

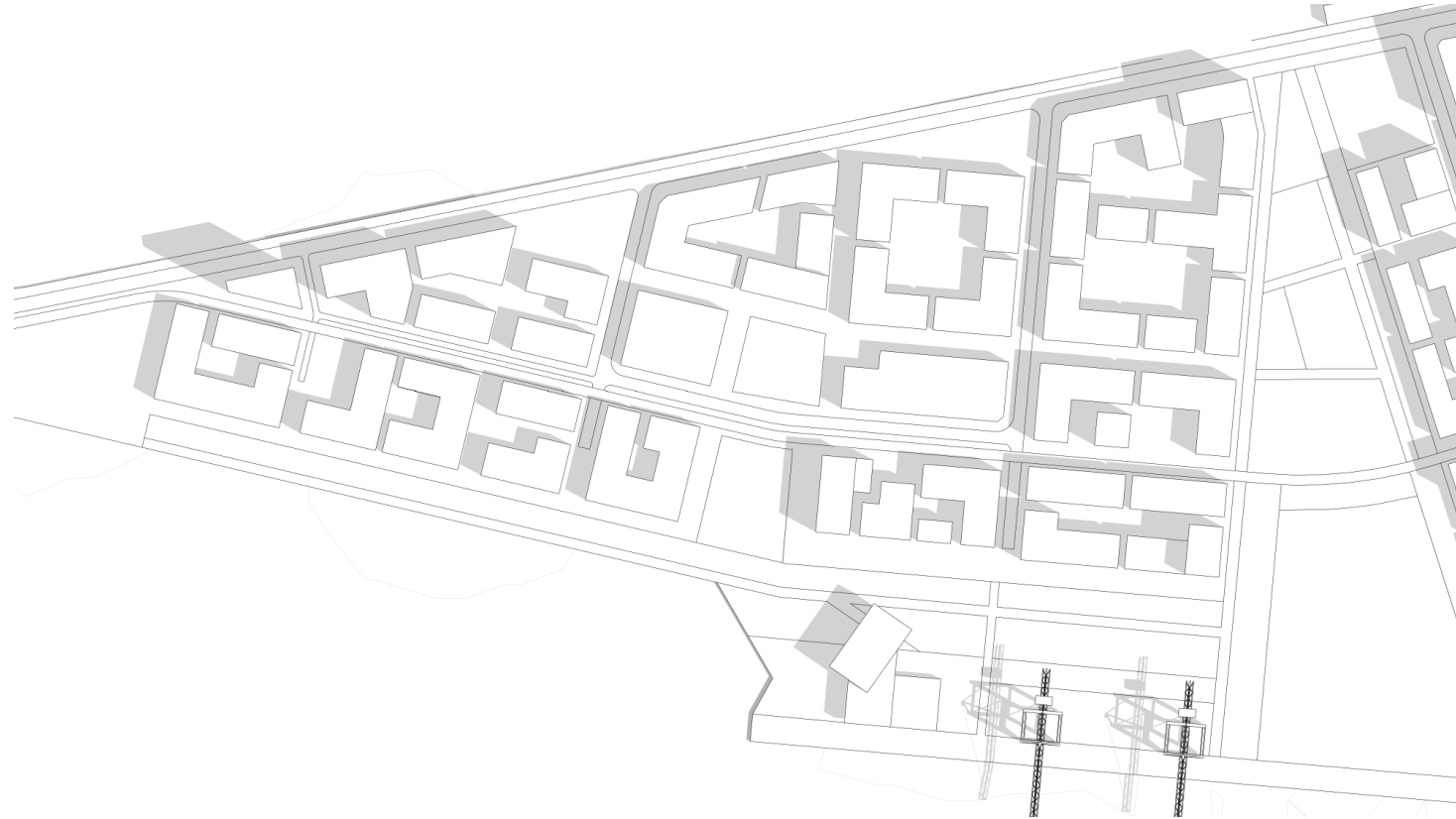


Below: Precedent Image - Proposed Norrkoping Waterfront, Sweden

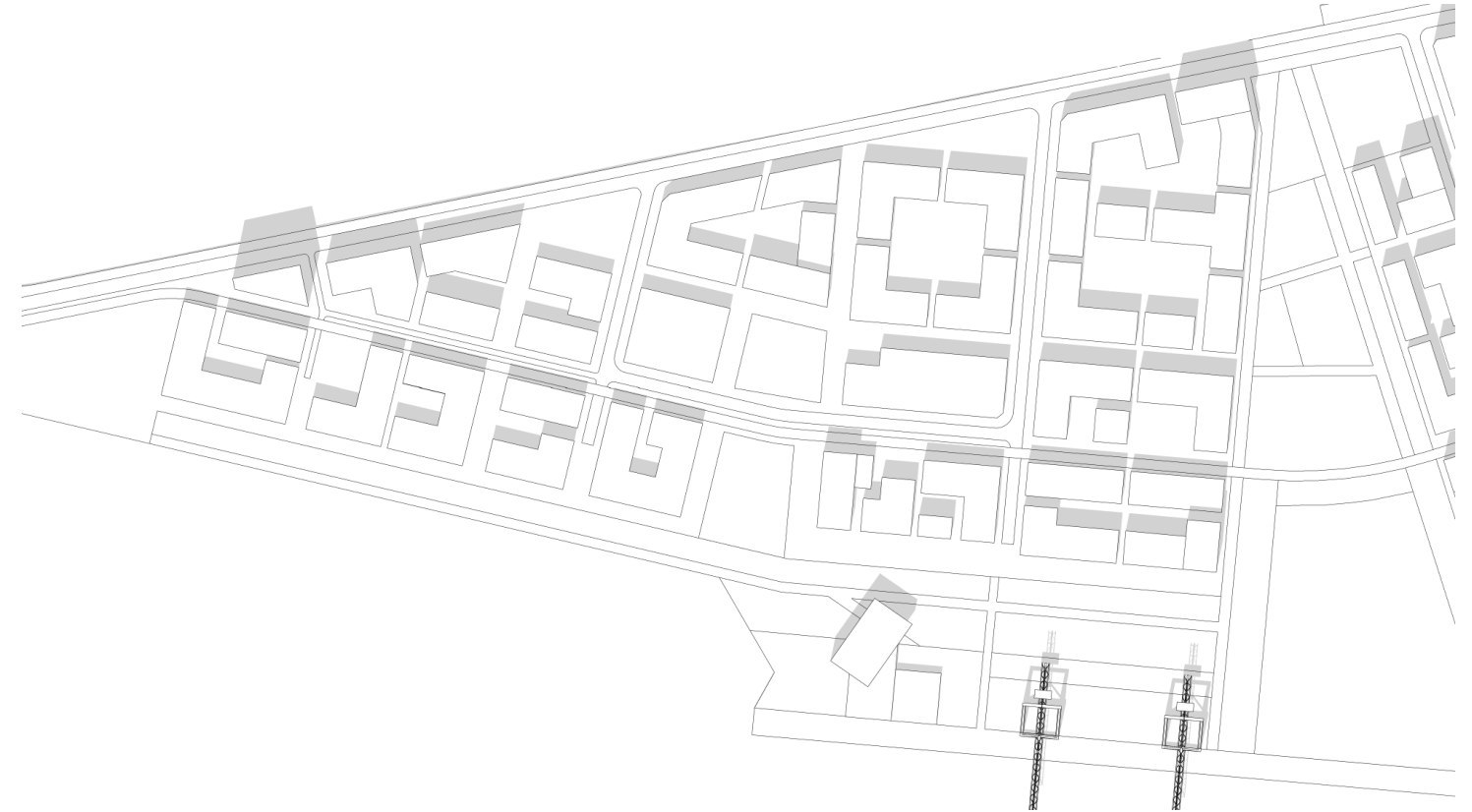


5.5(a) Proposed Neighbourhood Development Guidelines - Neighbourhood A

Below: Shadow Study - 9am Summer Solstice



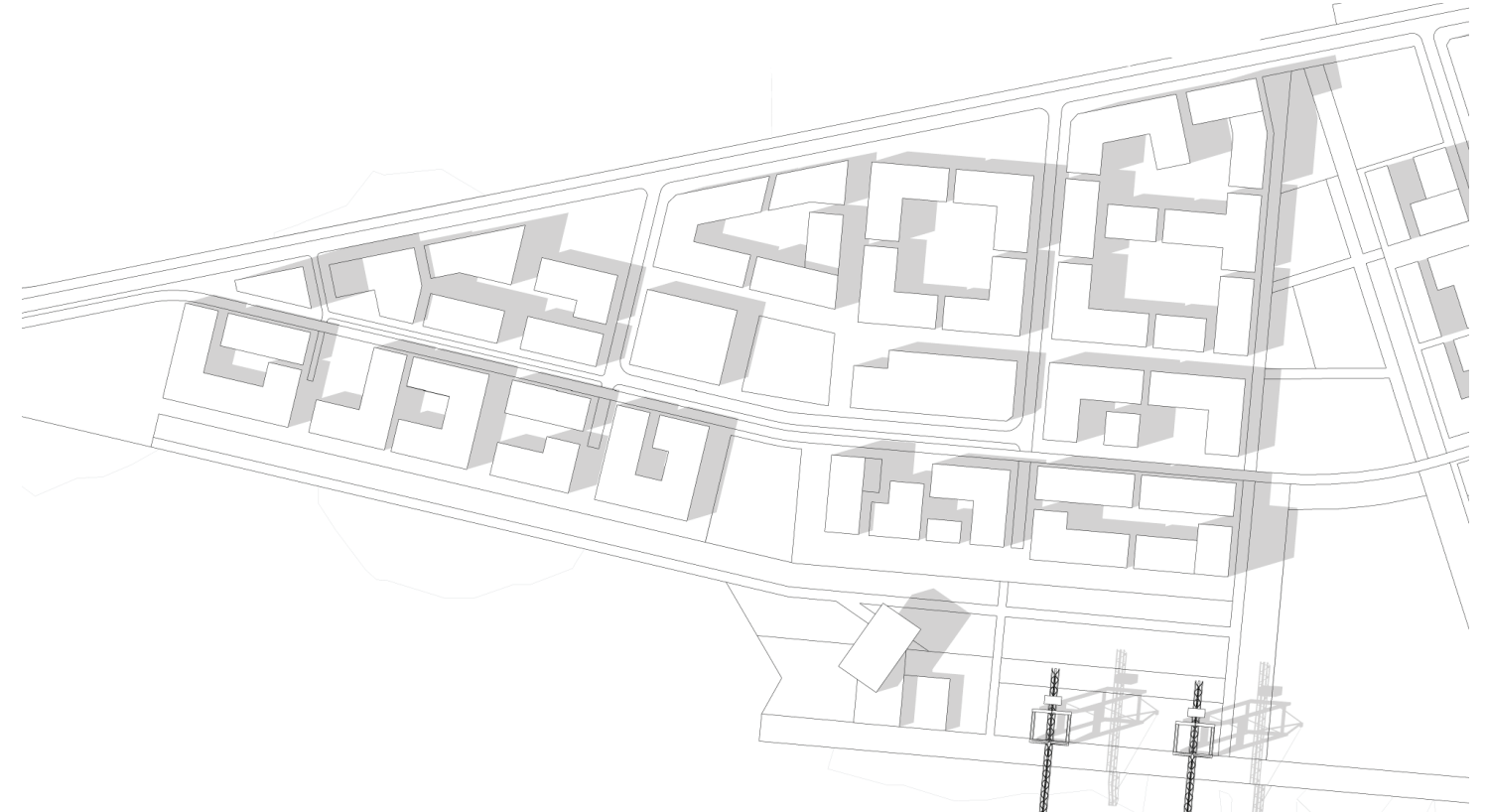
Below: Shadow Study - Midday Summer Solstice



Below: Neighbourhood A - Building Heights

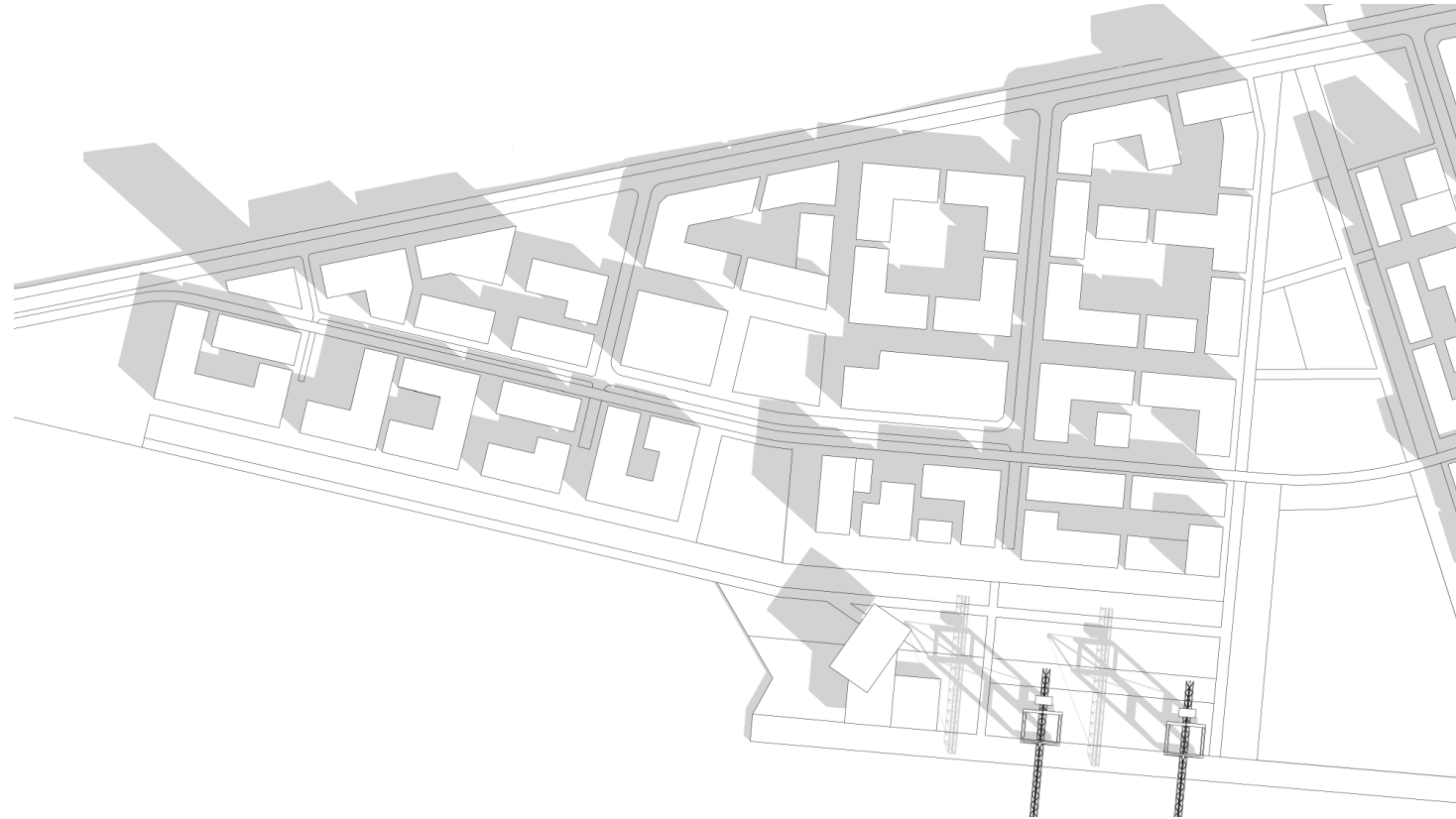


Below: Shadow Study - 3pm Summer Solstice

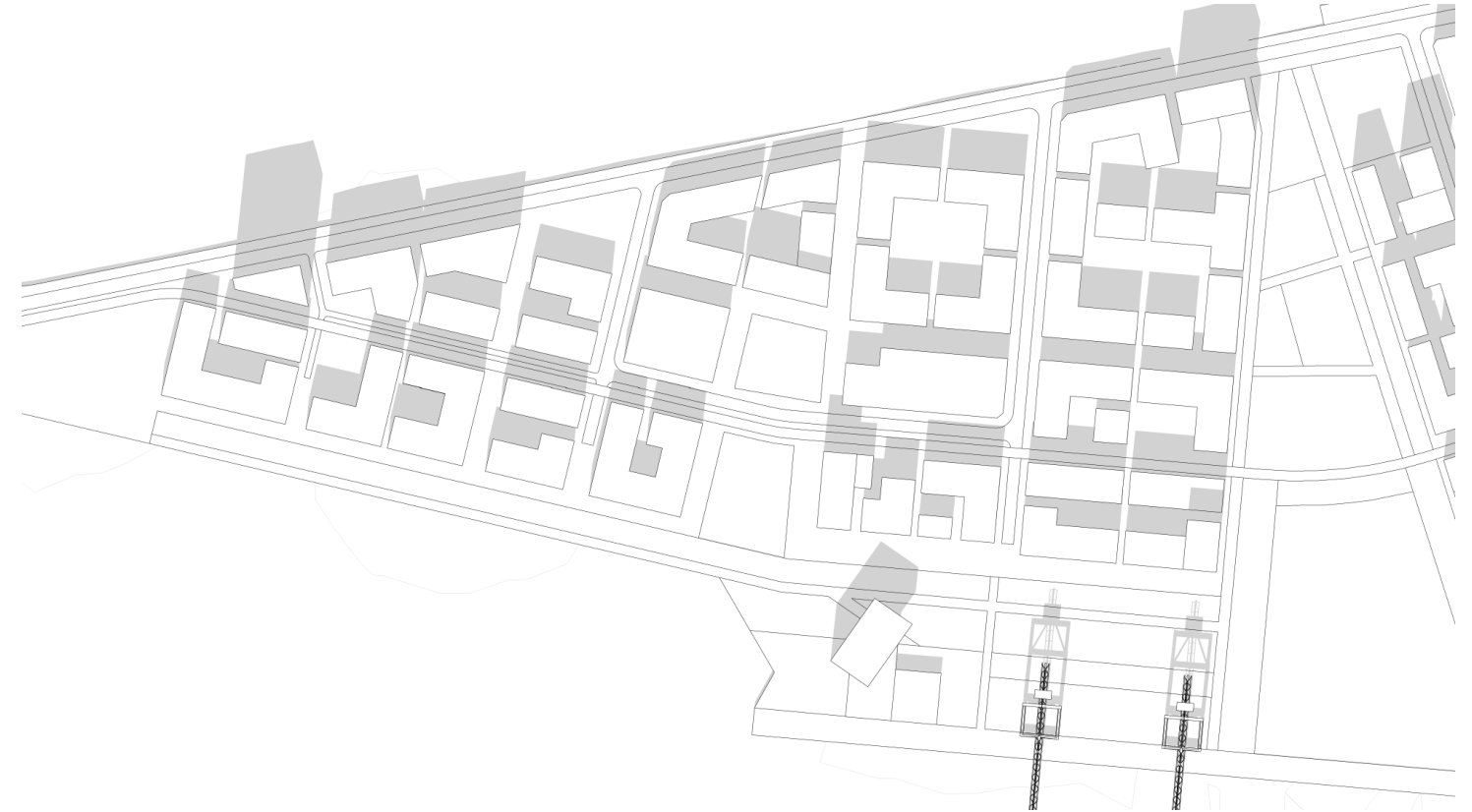


5.5(a) Proposed Neighbourhood Development Guidelines - Neighbourhood A

Below: Shadow Study - 9am Spring/Autumn Equinox



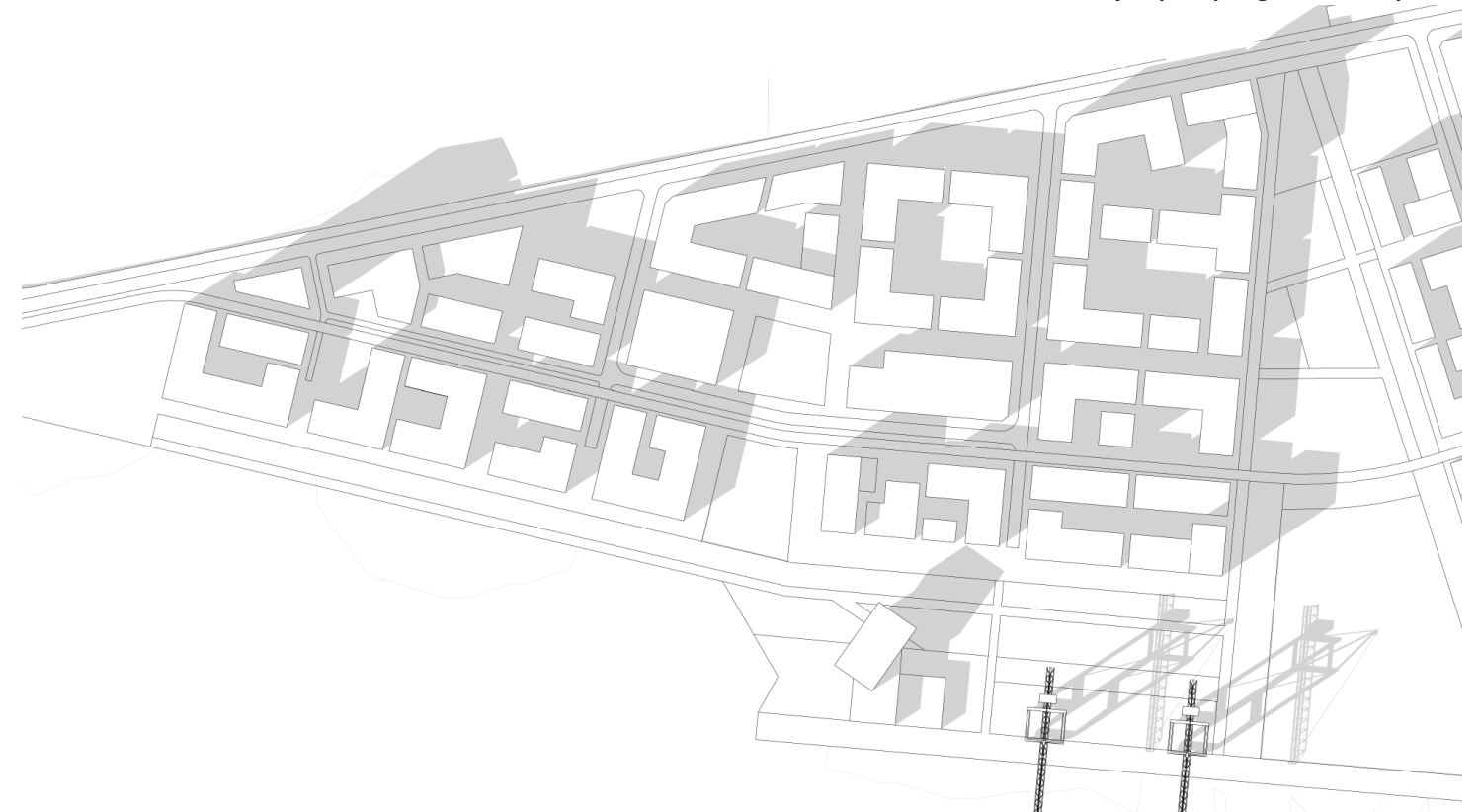
Below: Shadow Study - Midday Spring/Autumn Equinox



Below: Neighbourhood A - Building Heights



Below: Shadow Study - 3pm Spring/Autumn Equinox



5.5(b) Proposed Neighbourhood Development Guidelines - Neighbourhood B

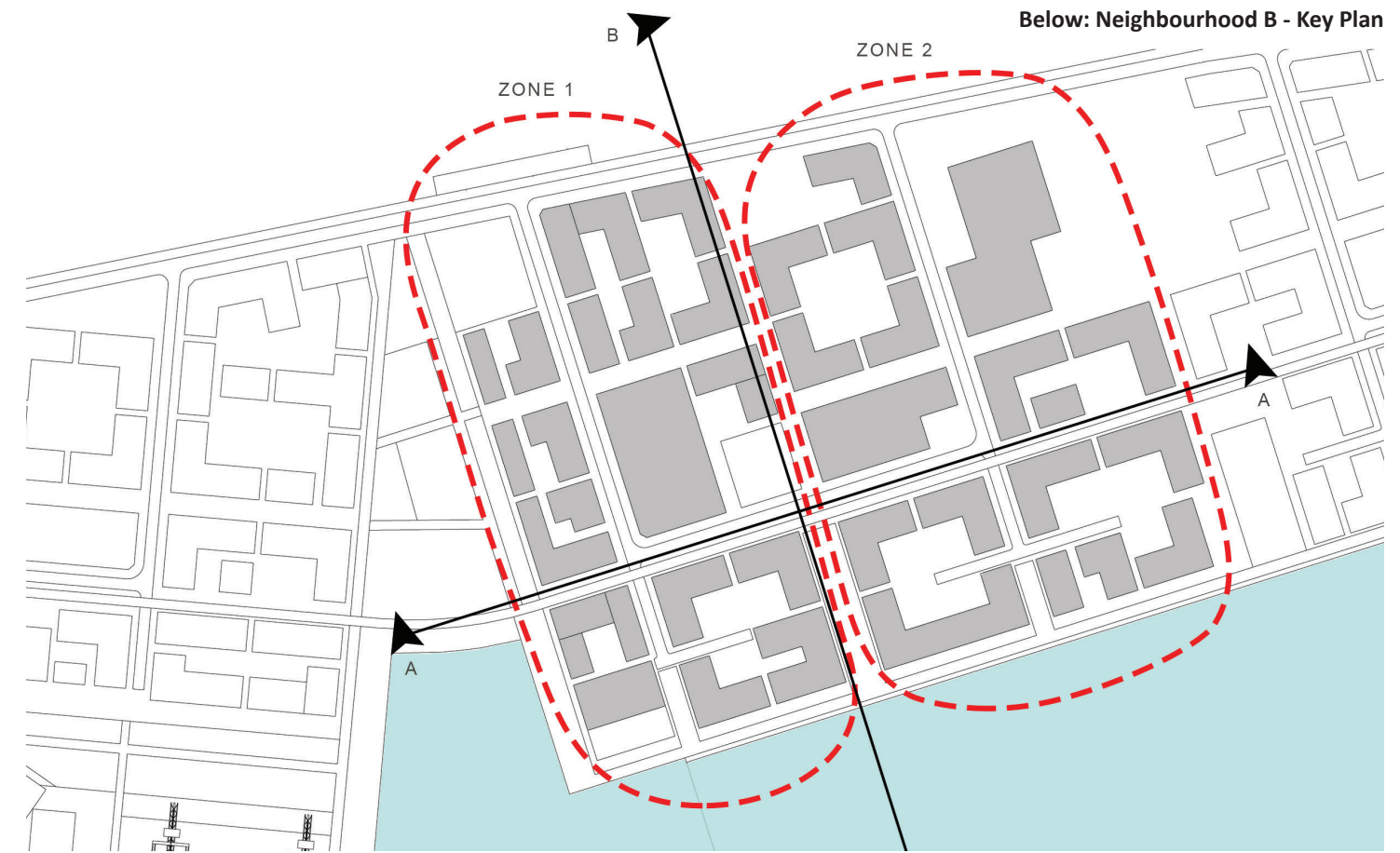
Context

Neighbourhood B is located at the centre of Tivoli. It is bounded to the north by the N8 & Rail-line, to the south by the waterfront greenway / marina and by the central public realm spine and train station plaza to the west. Neighbourhood B constitutes:

- **30.1%** (192.5Ha) of overall site net 'Developable Area' (As per development data page 57).
- &
- **37%** of total built area.

Building Use Mix

- **70-80%** of the net built area is to be used for **residential purposes**. Zones 1&2 contain upper and medium/upper density residential developments. Upper density residential is concentrated adjacent to train station plaza to the north and the Marina to the south.
- Mixed Resi-Commercial uses are predominantly located in Zone 1 around the neighbourhood centre and train station plaza. **10-15%** of the net built area is to be used for **commercial & retail** purposes preferably at the ground and lower floor levels with residential above.
- **15-20%** of net developable area is assigned for **other uses including community, cultural, utility & parking/mobility hub**, a school to accommodate circa 1000 pupils is located in Zone 2 to the north east.



Below: Neighbourhood B - Key Plan



Below: Neighbourhood B - Section BB

5.5(b) Proposed Neighbourhood Development Guidelines - Neighbourhood B

Character & Built Form

Neighbourhood B is characterised by 2 distinct zones:

- **Zone 1** adjacent to the **public realm spine & marina** to the west/south, and **train station plaza** to the north includes **upper and medium/upper residential development**. Buildings of up to 10-12 storeys may be permissible in selected areas as indicated.
- **Zone 2** is characterised by the **mixed-use neighbourhood centre** and strong public realm connection with the waterfront as per Section BB (opposite page 74). The remainder of Zone 2 is characterised by **medium/upper density development**.

Below: Precedent Image - Oslo Waterfront



Below: Neighbourhood B - Section AA



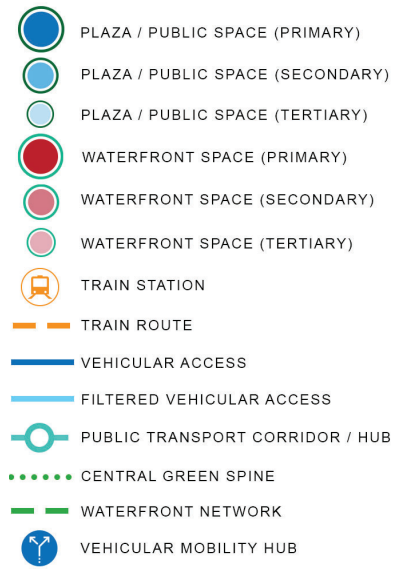
5.5(b) Proposed Neighbourhood Development Guidelines - Neighbourhood B

Public Realm Infrastructure - The Waterfront 'Journey'

Neighbourhood B encompasses the **main public realm spine** which connects the **marina and waterfront** to the **train station plaza**. The **neighbourhood centre** is also strongly connected to the **waterfront greenway** via a **public realm corridor**.

- All developments should **detail phasing of the public realm** to ensure coherent build-out.
- To the southeast of Neighbourhood B potential space is provided for a water inlet adjacent to the waterside greenway.
- Concentration of **mixed-uses at ground and first floor levels** and residential above particularly to built frontages onto the public realm neighbourhood centre, public realm spine and train station plaza (See 3D Diagrams opposite).

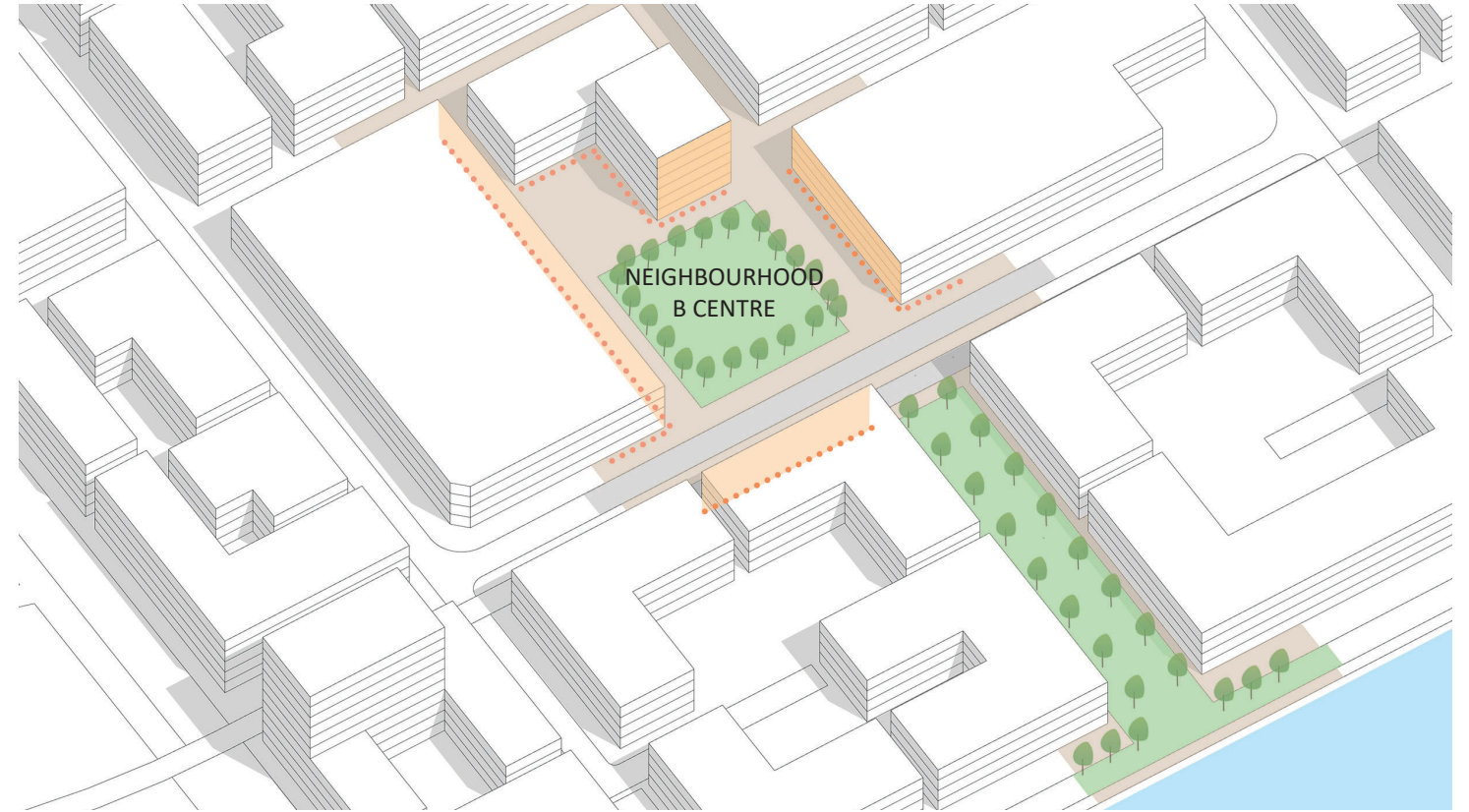
Following pages 77-78 examine the effect of the built-form and **building height parameters** on the surrounding streets and public realm via **3D shadow studies**.



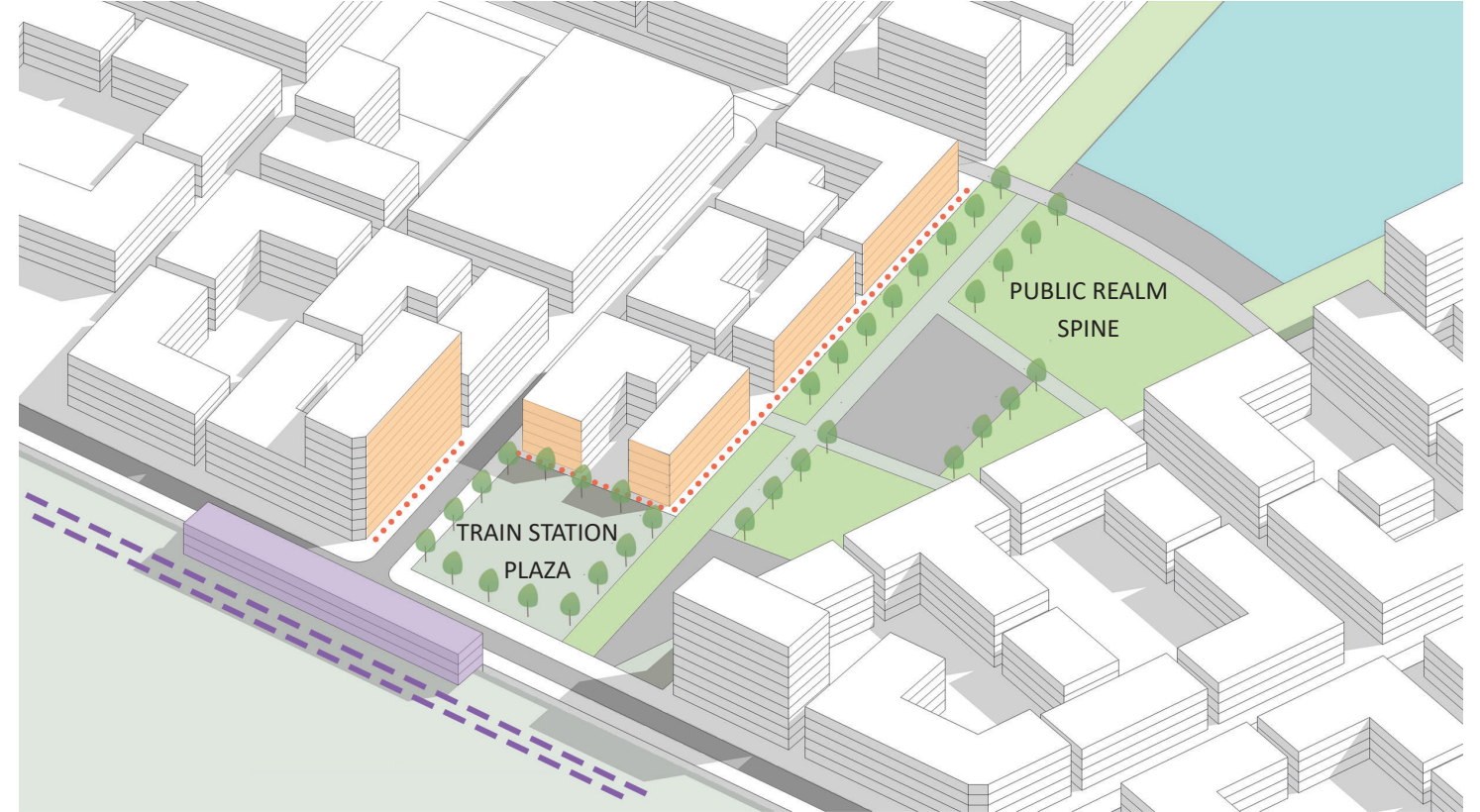
Below: Neighbourhood B - Public Realm Infrastructure (Legend above)



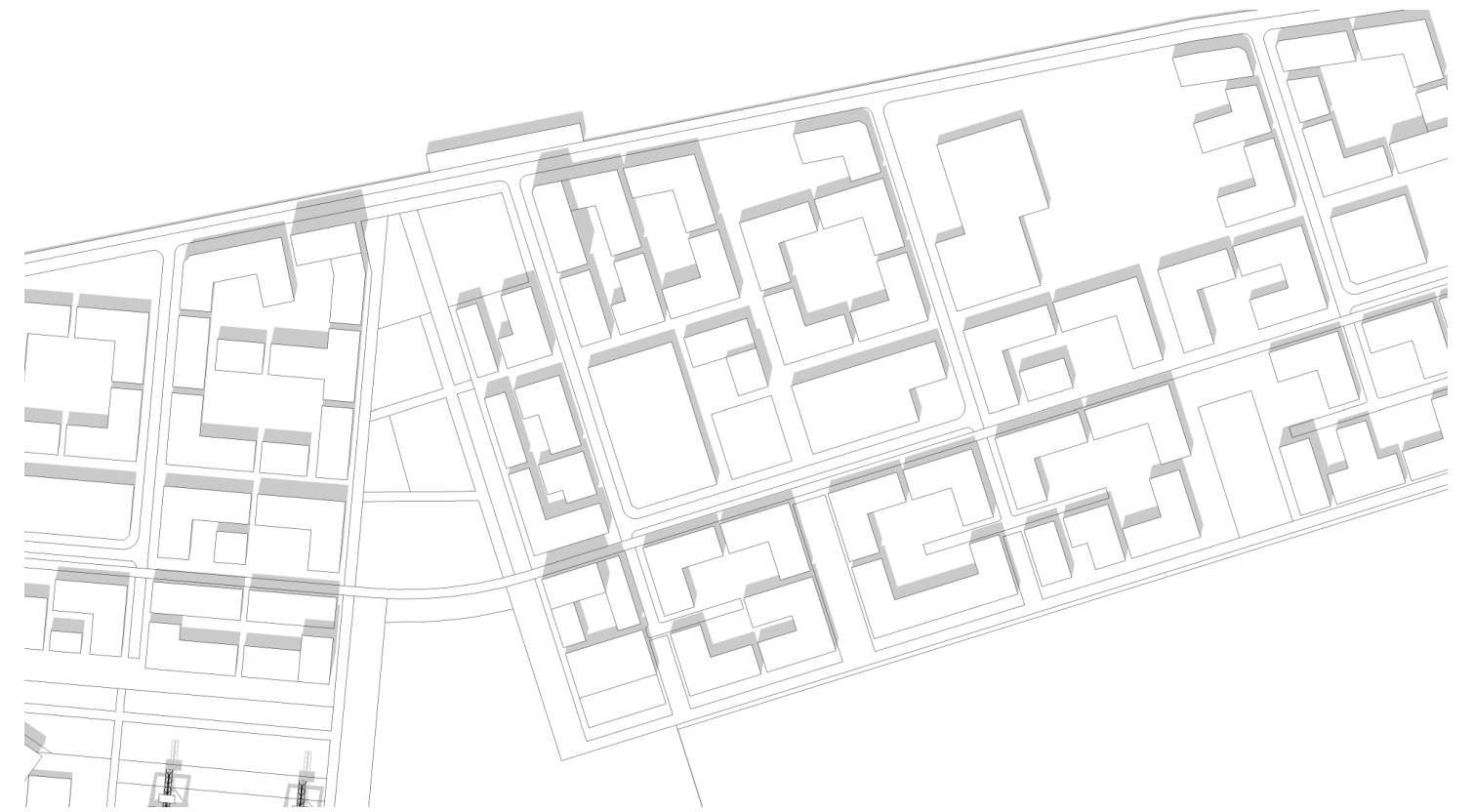
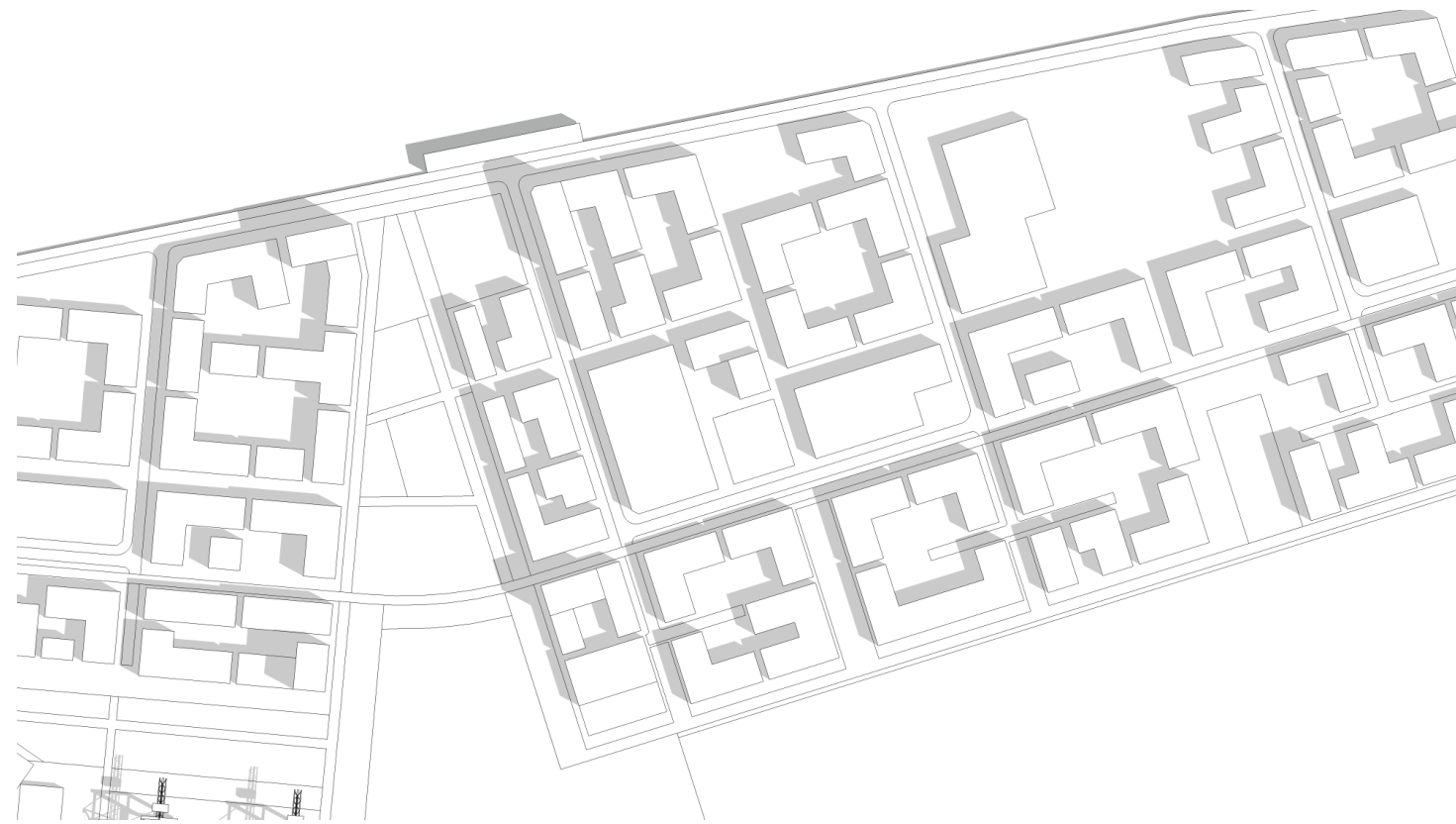
Below: 3D Diagram of Neighbourhood B Centre - Mixed-Use Frontages to Public Realm Highlighted



Below: 3D Diagram of Train Station Plaza - Mixed-Use Frontages to Public Realm Highlighted

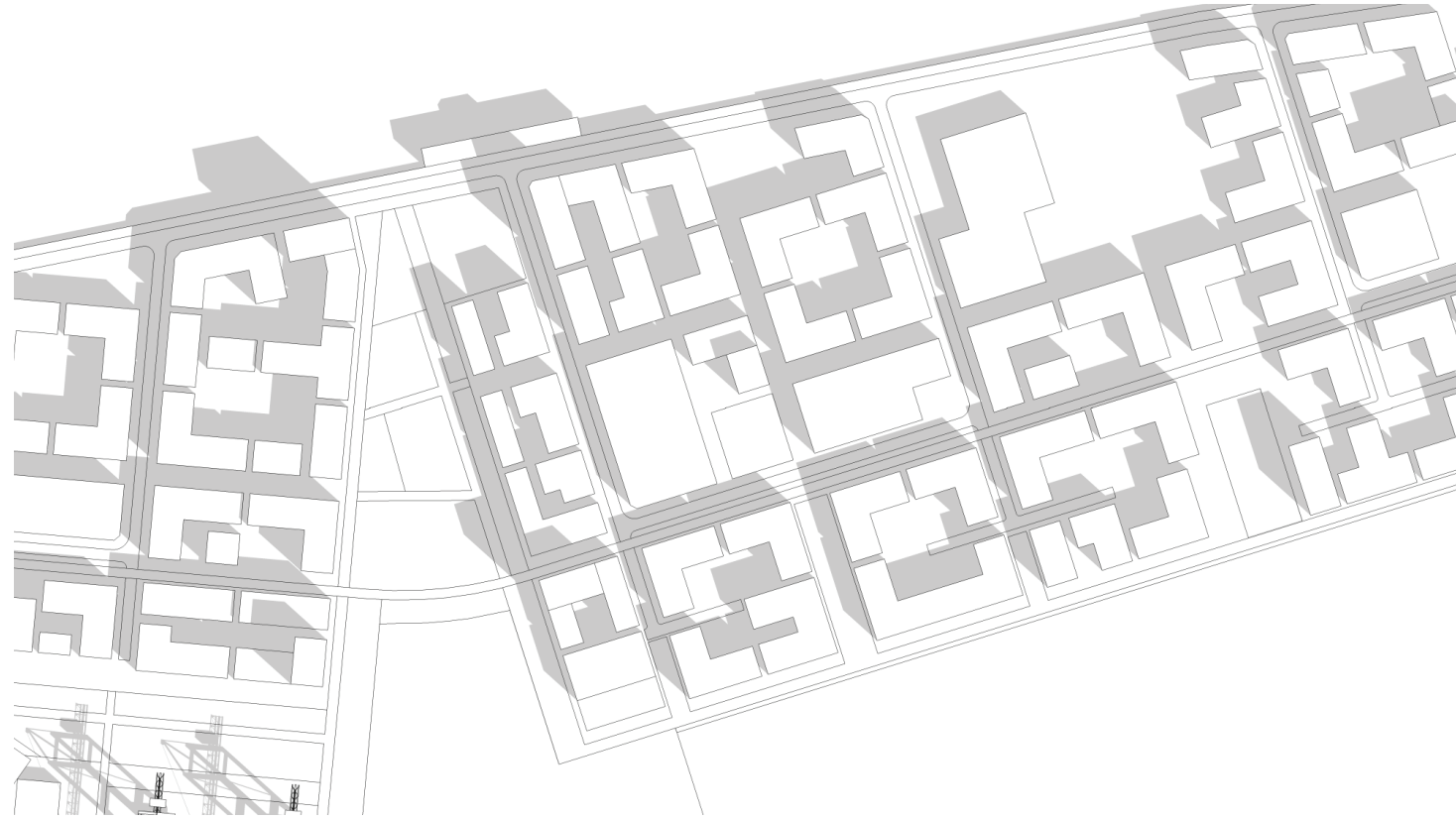


5.5(b) Proposed Neighbourhood Development Guidelines - Neighbourhood B

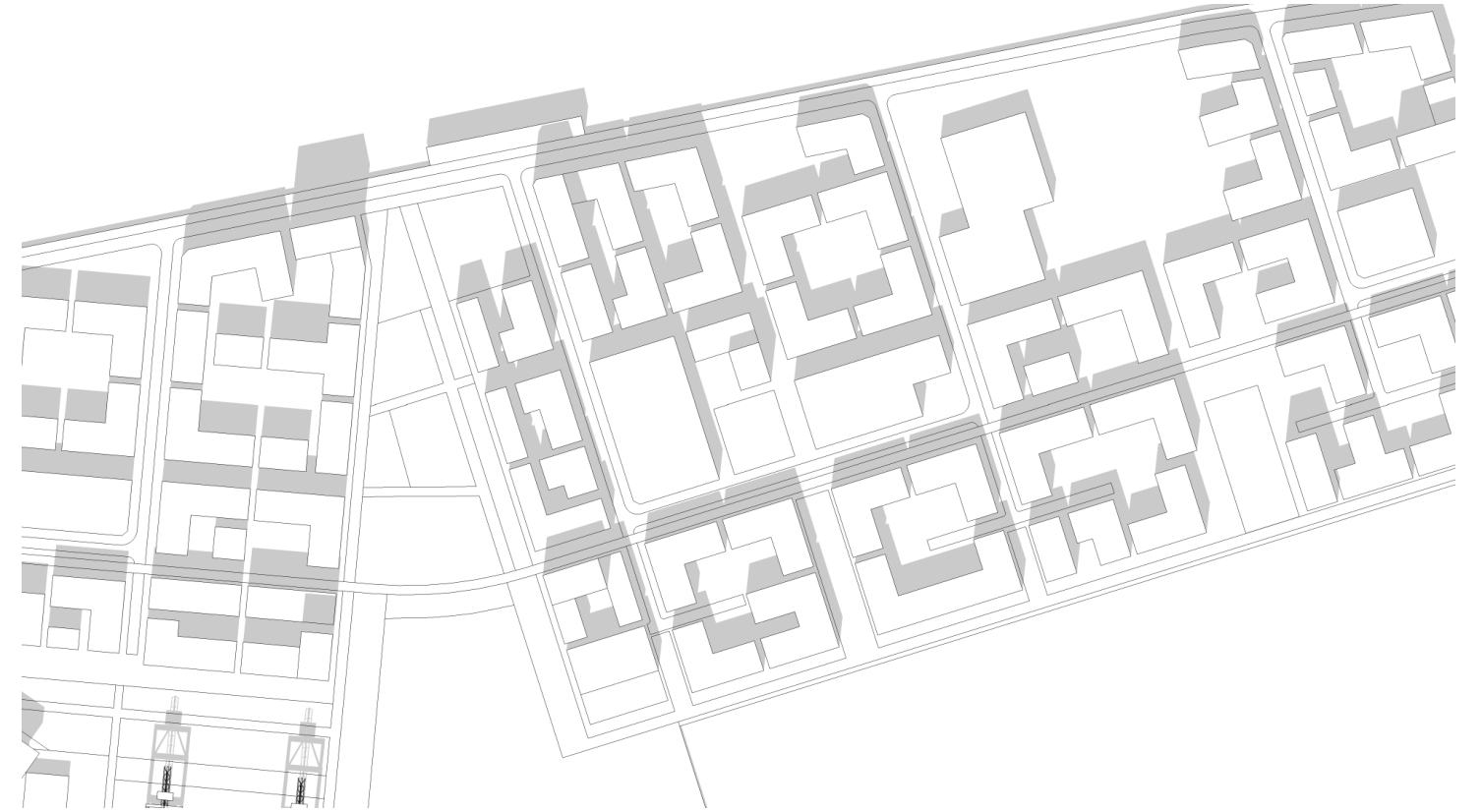


5.5(b) Proposed Neighbourhood Development Guidelines - Neighbourhood B

Below: Shadow Study - 9am Spring/Autumn Equinox



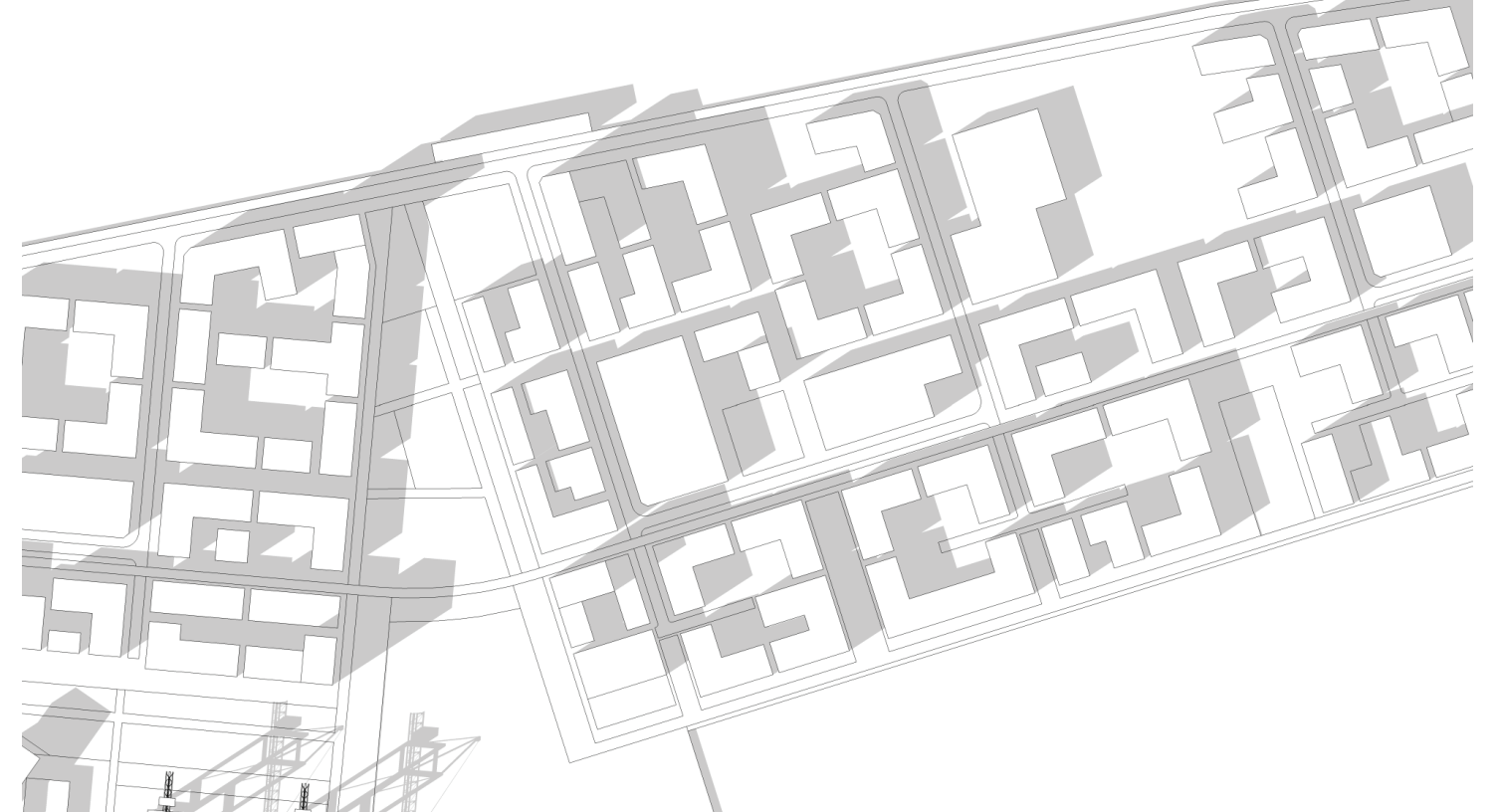
Below: Shadow Study - Midday Spring/Autumn Equinox



Below: Neighbourhood B - Building Heights



Below: Shadow Study - 3pm Spring/Autumn Equinox



5.5(c) Proposed Neighbourhood Development Guidelines - Neighbourhood C

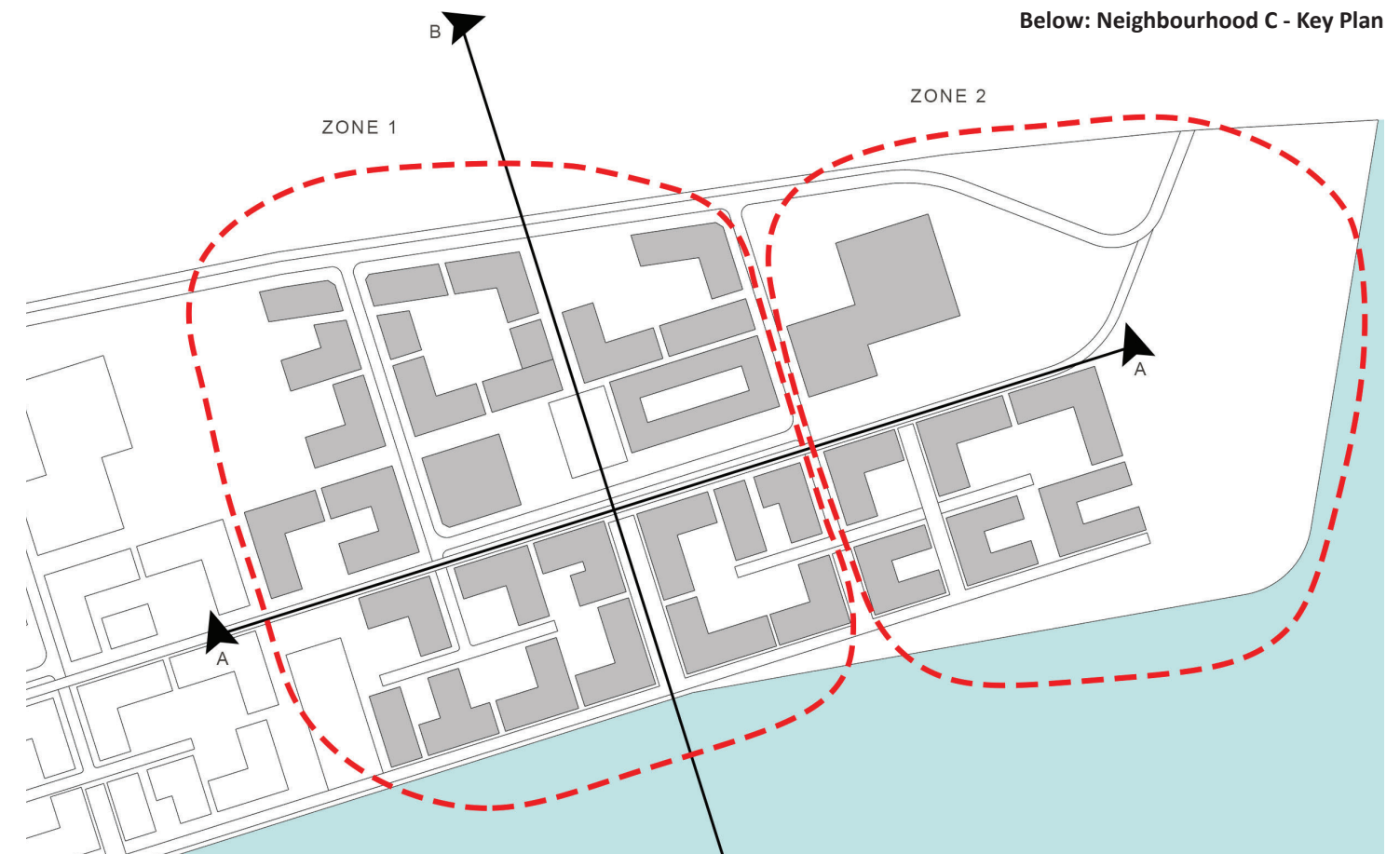
Context

Neighbourhood C is bounded to the north by the N8 & Rail-line, and eastern vehicular access point (location TBC), to the south by the waterfront greenway, and to the east by green re-wilding areas adjacent to Glashaboy River and Conservation Area. Neighbourhood C constitutes the following:

- **24.1%** (154Ha) of overall site net **'Developable Area'** (As per development data page 57).
- &
- **25.8%** of **total built area**.

Building Use Mix

- **80-90%** of the net built area is to be used for **residential purposes**. Zones 1 contains some medium/high density residential developments to the north. Most of Neighbourhood C is characterised by **lower/medium density residential development**.
- **Mixed Resi-Commercial** uses are predominantly located in Zone 1 around the neighbourhood centre. Up to **10%** of the net built area is to be used for **commercial & retail** purposes preferably at the ground and lower floor levels with residential above.
- Up to **10%** of net developable area is assigned for **other uses including community, cultural, utility & parking/mobility hub**, a **school to accommodate circa 1000 pupils** is located in Zone 2 to the north east.



Below: Neighbourhood C - Key Plan



Below: Neighbourhood C - Section BB

5.5(c) Proposed Neighbourhood Development Guidelines - Neighbourhood C

Character & Built Form

Neighbourhood C is characterised by 2 distinct zones:

- **Zone 1** to the west is characterised by the **mixed-use neighbourhood centre** and connection with the waterfront greenway. As per Section BB (opposite page 68) a strong link is established between the neighbourhood centre and **waterfront**.
- **Zone 2** is characterised by **lower/medium density residential development** towards the green areas to the east adjacent Glashaboy river and the proposed school location to the north east.
- Neighbourhood C is defined as being the **least dense and most residential** in nature of the 3no. neighbourhoods largely due to it's location at the furthest point east most distant from the Tivoli and City centres.

Below: Precedent Image - Walthamstow Housing London - Levitt Berstein Architects



Below: Neighbourhood C - Section AA



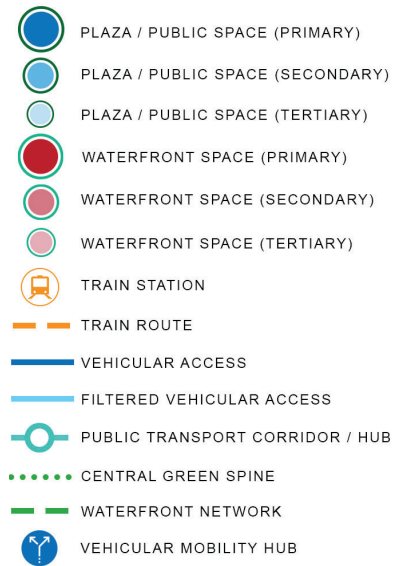
5.5(c) Proposed Neighbourhood Development Guidelines - Neighbourhood C

Public Realm Infrastructure - The Waterfront 'Journey'

Neighbourhood C encompasses the **waterfront greenway** connection with the **re-wilding green areas** to the east adjacent to Glashaboy river. The **neighbourhood centre** is also strongly connected to the **waterfront green-way via a public realm corridor** and **visual connection across the River Lee to Blackrock Castle** (see 3D perspective below right).

- All developments should **detail phasing of the public realm** to ensure coherent build-out.
- To the southwest of Neighbourhood C potential space is provided for a water inlet adjacent to the waterside greenway.
- Concentration of **mixed-uses at ground and first floor levels** and residential above particularly to built frontages onto the public realm neighbourhood centre (See 3D Diagram above right).

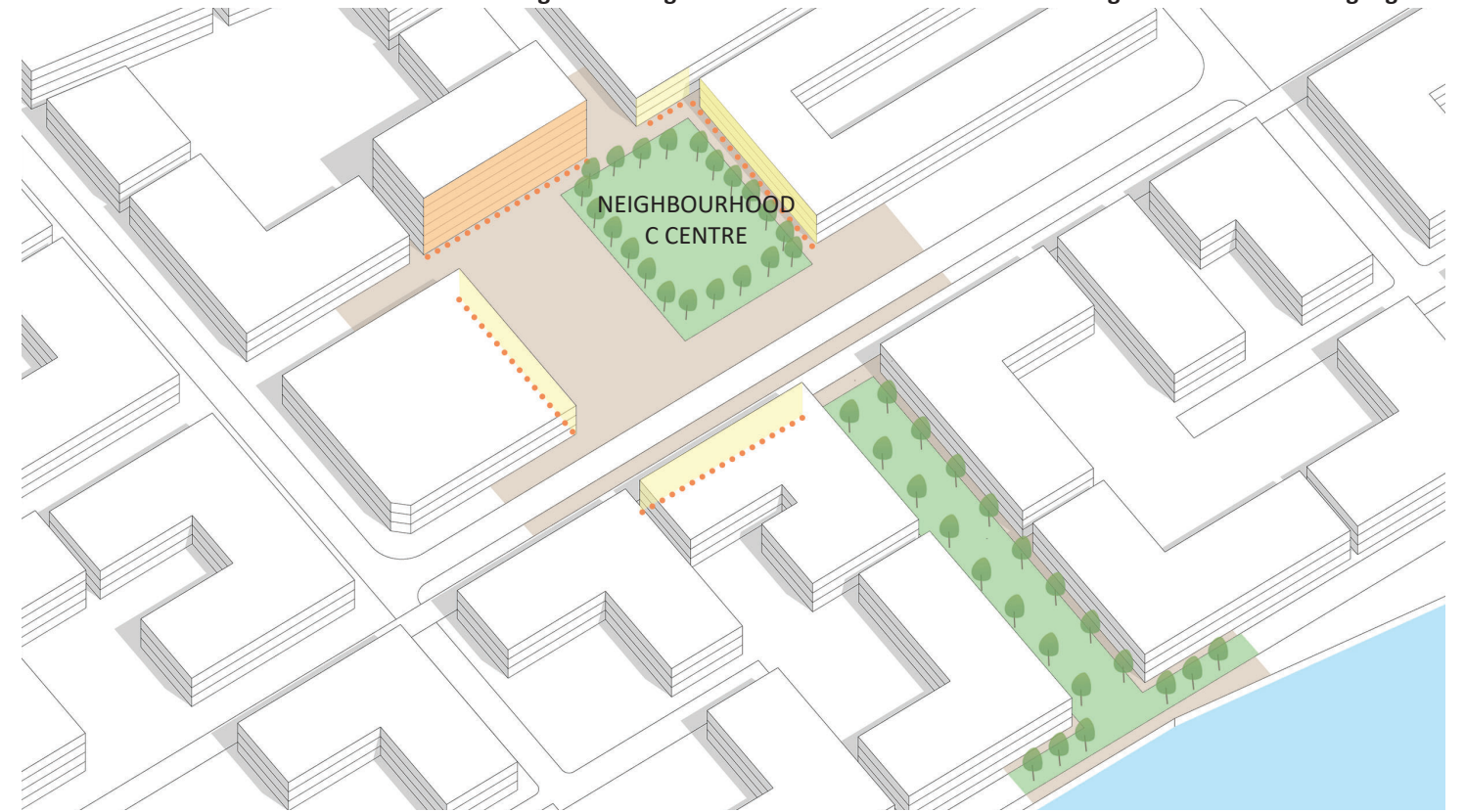
Following pages 83-84 examine the effect of the built-form and **building height parameters** on the surrounding streets and public realm via **3D shadow studies**.



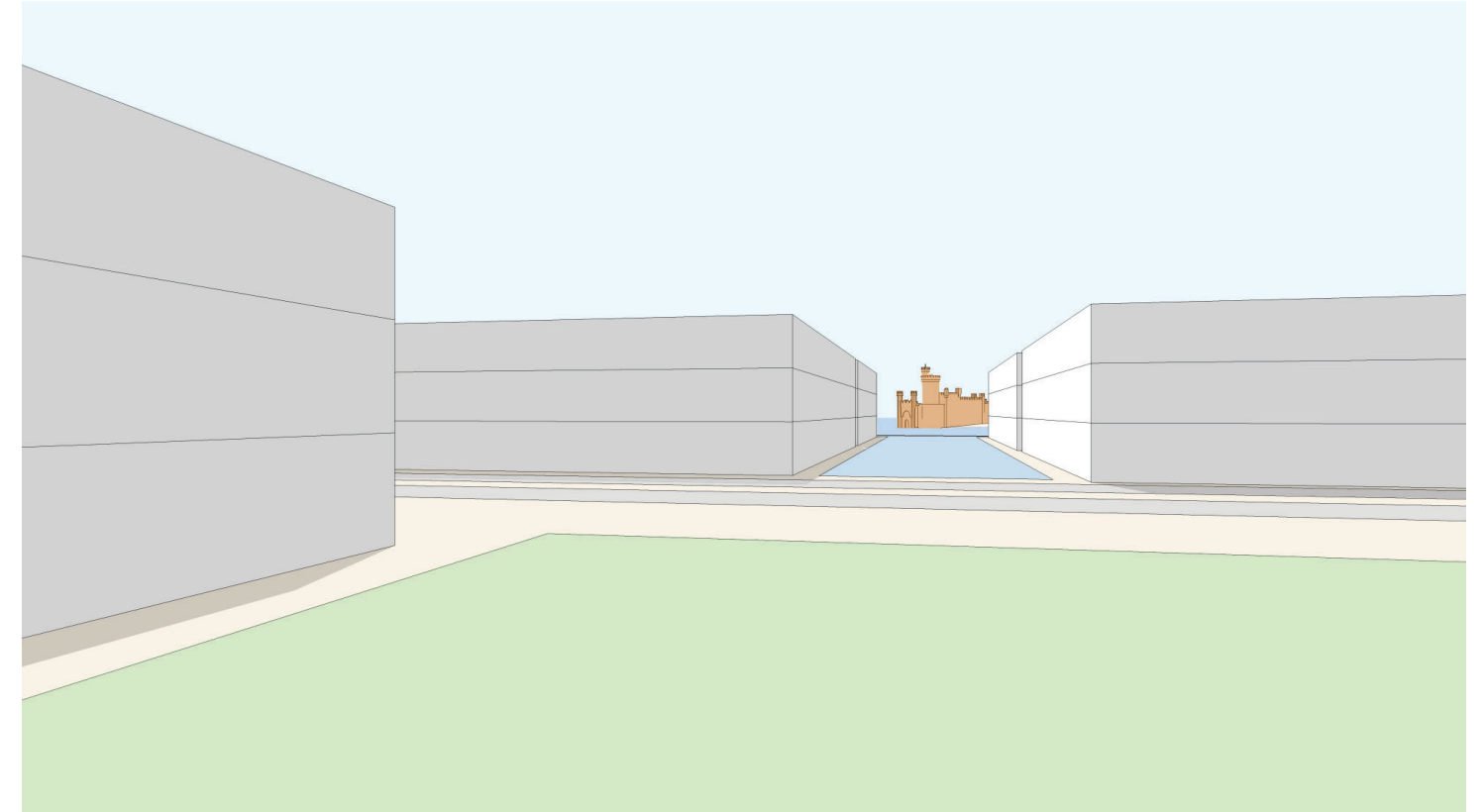
Below: Neighbourhood C - Public Realm Infrastructure (Legend above)



Below: 3D Diagram of Neighbourhood C Centre - Mixed-Use Frontages to Public Realm Highlighted

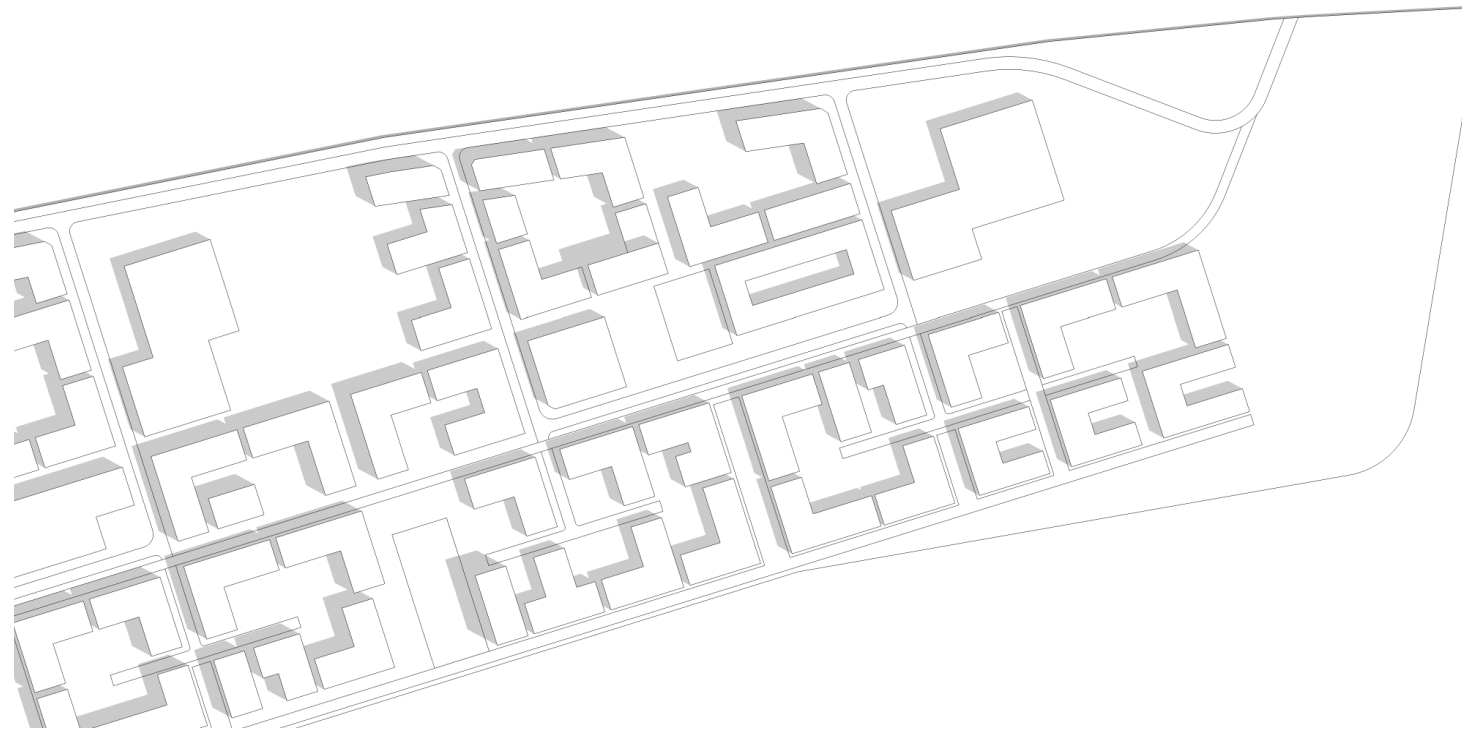


Below: 3D Perspective - Visual Connection from Neighbourhood C Centre to Blackrock Castle

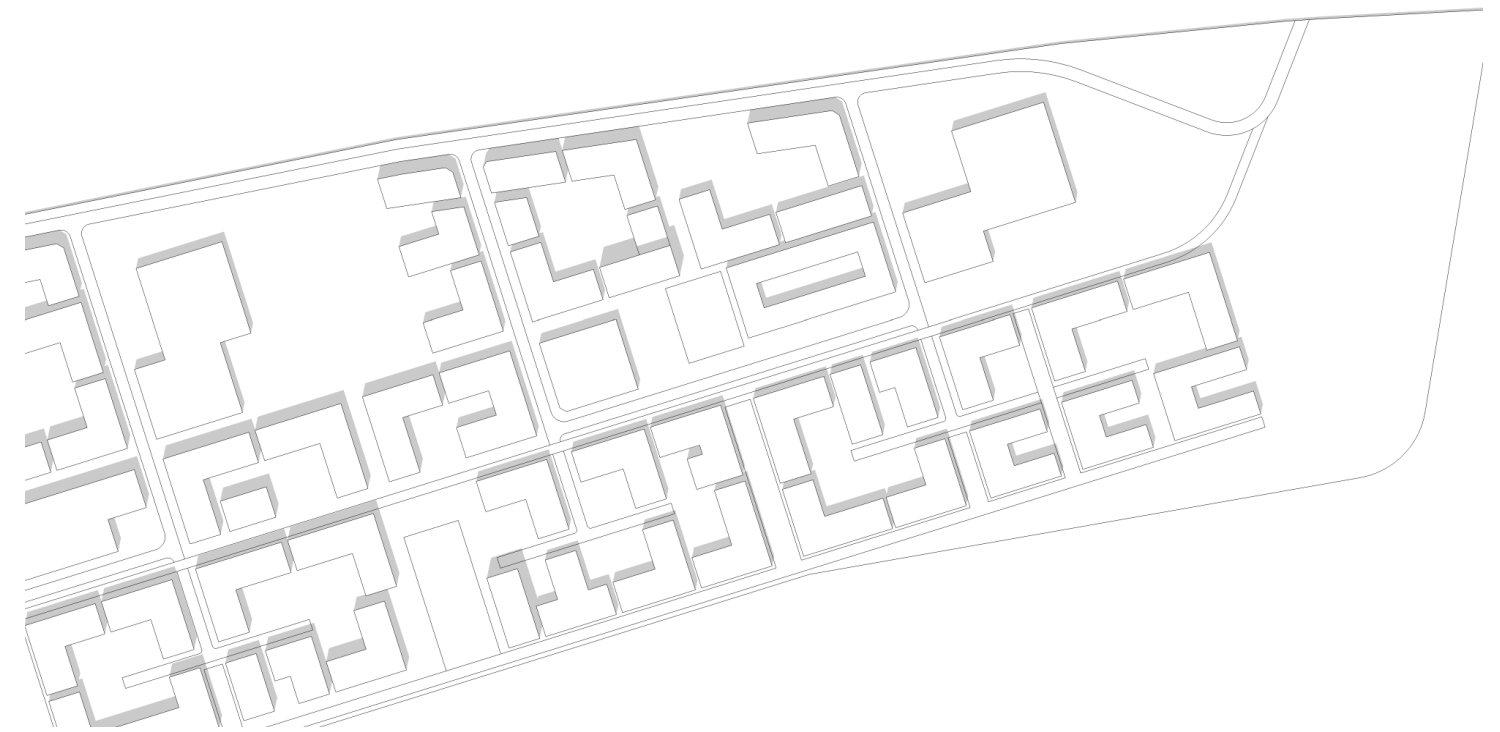


5.5(c) Proposed Neighbourhood Development Guidelines - Neighbourhood C






Below: Shadow Study - 9am Summer Solstice



Below: Shadow Study - Midday Summer Solstice

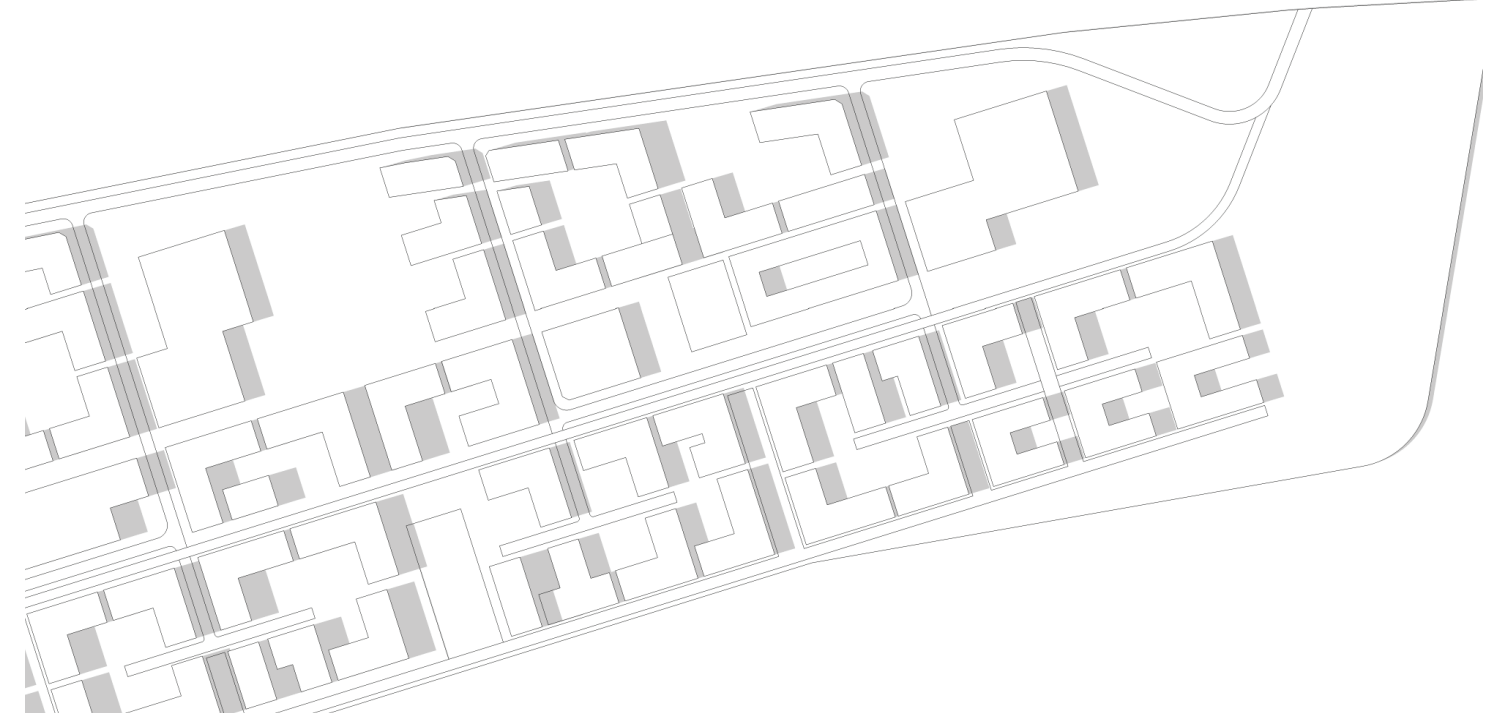


Below: Neighbourhood C - Building Heights

-  TIVOLI URBAN LANDMARK 9-10 STOREYS
-  NEIGHBOURHOOD LANDMARK 6-7 STOREYS
-  3 STOREYS
-  4 STOREYS
-  5-7 STOREYS
-  8+ STOREYS

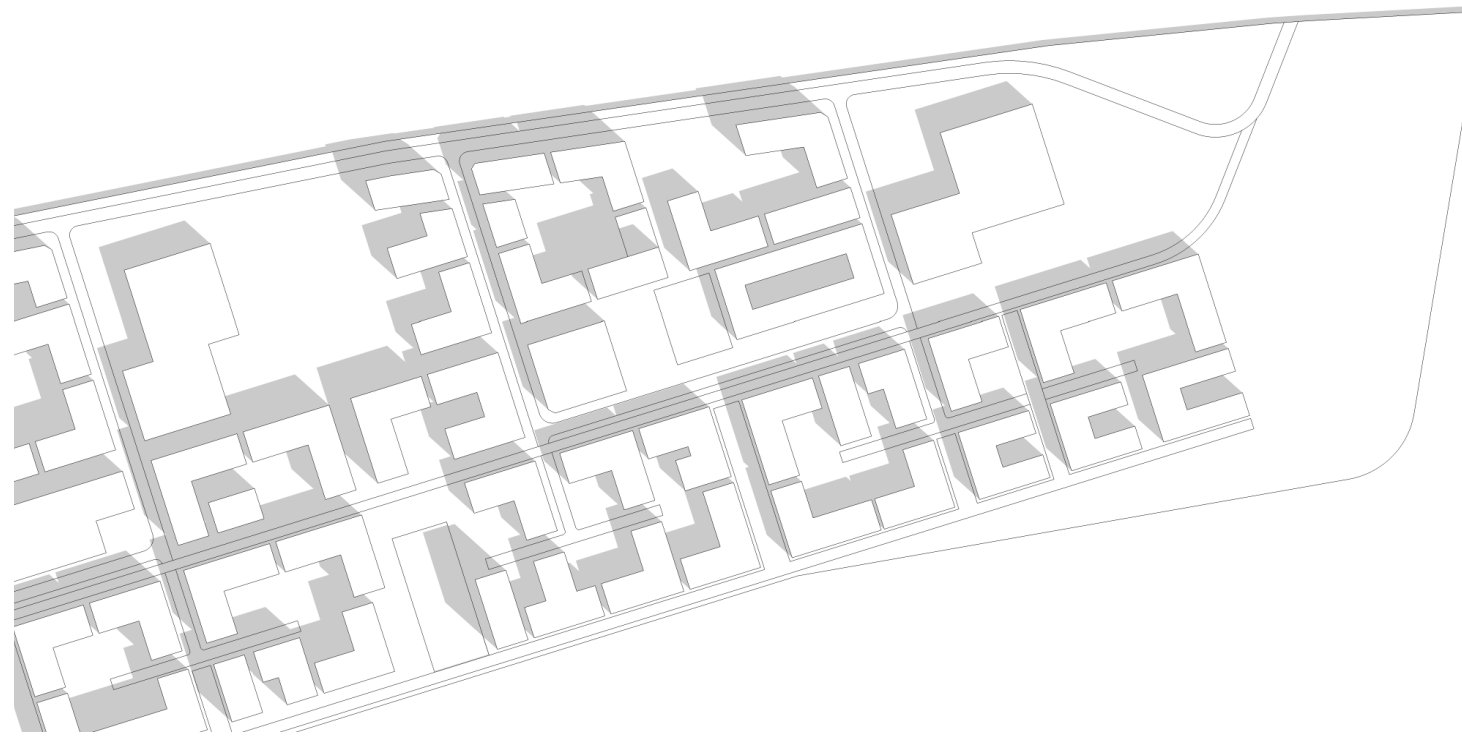


Below: Shadow Study - 3pm Summer Solstice

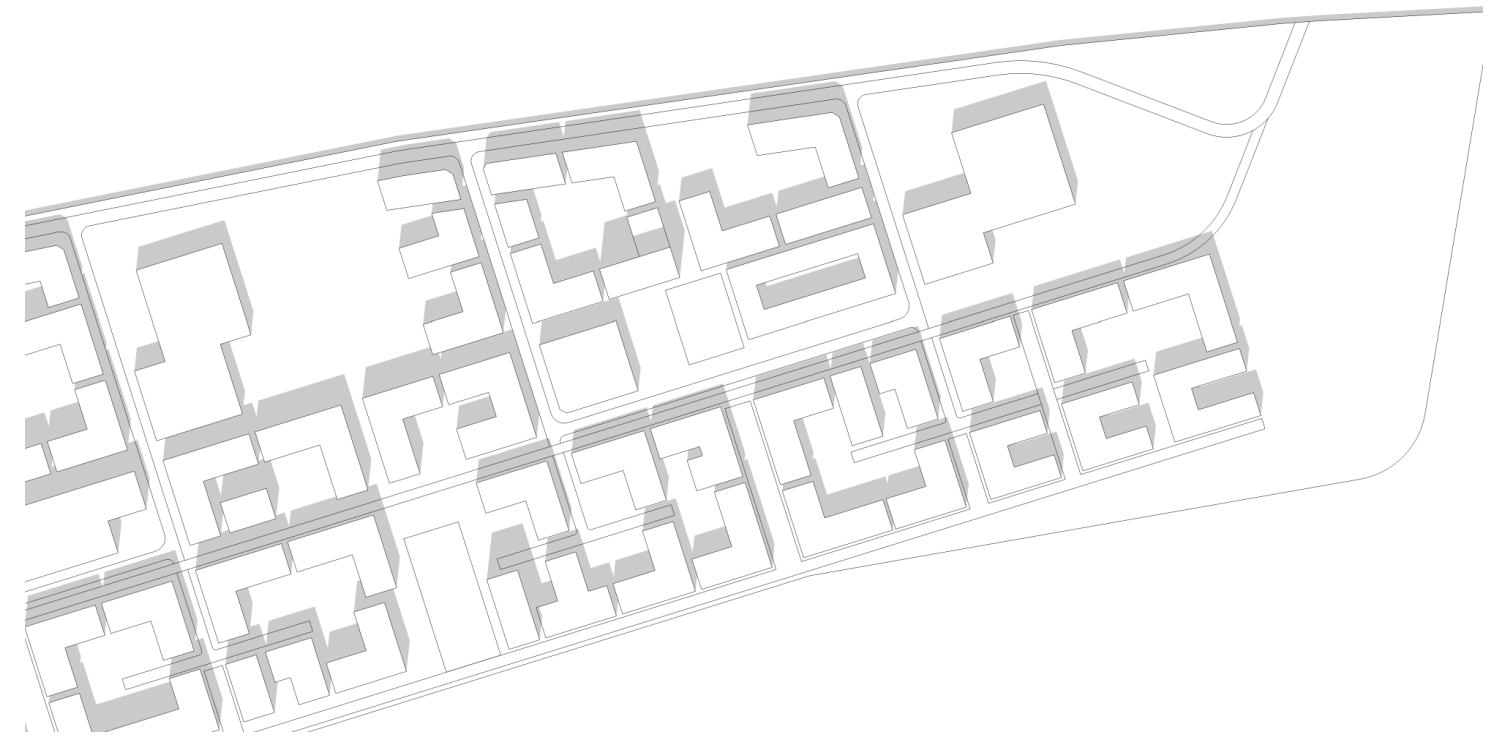


5.5(c) Proposed Neighbourhood Development Guidelines - Neighbourhood c







Below: Shadow Study - 9am Spring/Autumn Equinox



Below: Shadow Study - Midday Spring/Autumn Equinox

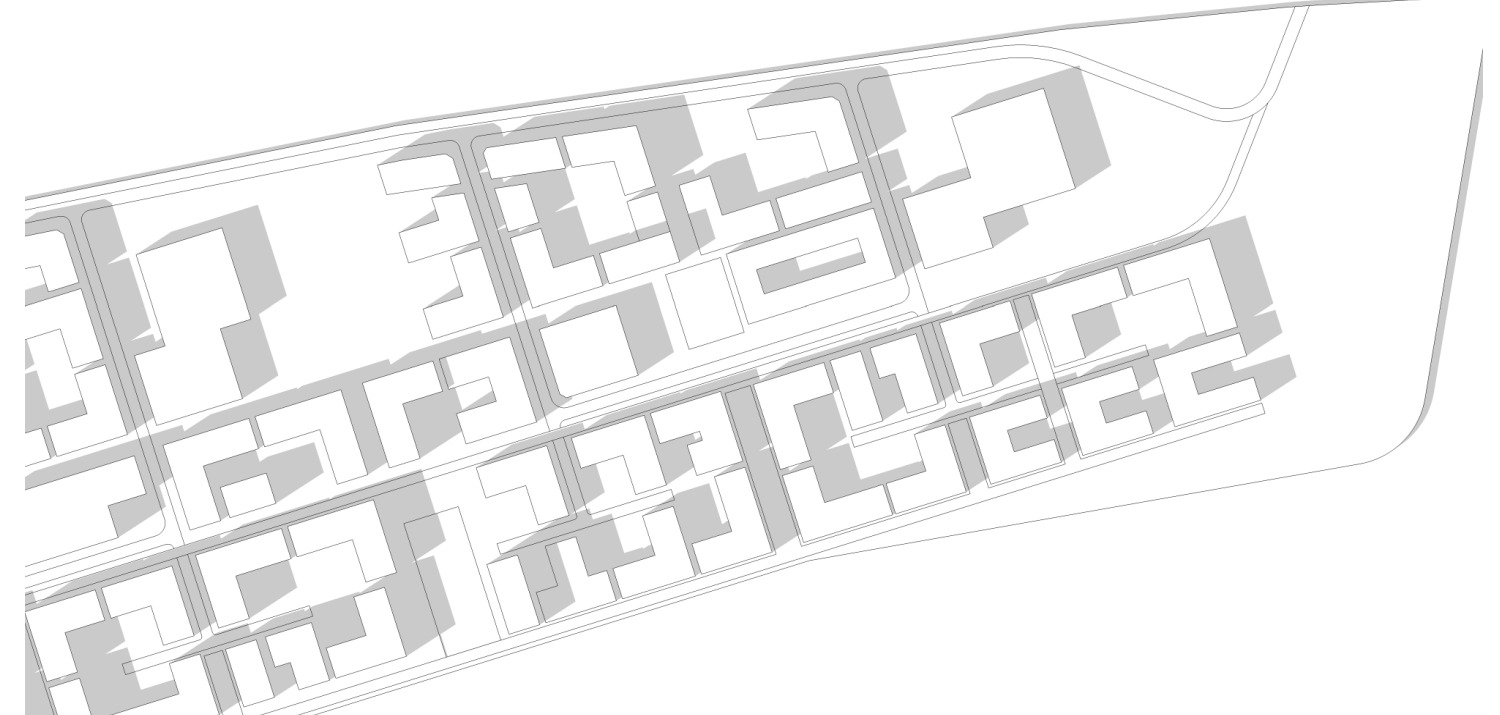


Below: Neighbourhood C - Building Heights

-  TIVOLI URBAN LANDMARK 9-10 STOREYS
-  NEIGHBOURHOOD LANDMARK 6-7 STOREYS
-  3 STOREYS
-  4 STOREYS
-  5-7 STOREYS
-  8+ STOREYS



Below: Shadow Study - 3pm Spring/Autumn Equinox



SECTION 6. Conclusion & Recommendations

- 6.1 Conclusion & Recommendations
- 6.2 Proposed Tivoli 3D Site Axonometric
- 6.3 Tivoli Density Comparison Study



6.1 Conclusion & Recommendations

The **Tivoli Docklands Urban Density Building Height Strategy** sets out a ‘**Vision for Tivoli**’ as a supporting document to the proposed **Cork City Development Plan 2022-2028**. The strategies therein set out to:

- **Identify where in Tivoli Docklands upper density is acceptable and where taller buildings can be integrated into the surrounding environment.**
- **Specify density per hectare targets in line with population, homes and employment targets for Tivoli.**
- **Develop a site specific methodology and framework for public realm, density and building height distribution across the future Tivoli Docklands development.**

In this strategy we have developed upon the Tivoli Urban Design & Landscape Framework Plan (UDLFP) by AECOM and Butler Cammoranesi Architects. This strategy is also supported by the Area Based Transport Assessment (ABTA) for Tivoli Docklands by Jacobs and the original Tivoli Docks Issues Paper by Cork City Council, to more clearly outline how this site may be developed.

Following analysis in Section 2 of this strategy we have increased the overall development leading to an increase in **Public Realm / Green Open Space** and **Waterfront Frontage** (linear building frontage). We have improved the capacity for Density & Height and clarified the nature and character of Neighbourhood Centres and Landmark buildings. We increased the variety of uses and Citywide attractions to the waterfront and improved connectivity to the City while working within the limitations of the ABTA.

Applying the **Design Principles for Tivoli** as set out in the UDLFP, including the **4no. High-level principles** and **12no. Key design principles**, a Resilient Framework with clear Movement & Character guidance has been developed via the proposed revisions to the UDLFP in Section 3 of this strategy. Increased Neighbourhood definition with specific Built Forms provide a variety of high quality Places & Spaces for the people who will live, work and visit the future Tivoli development.

In Section 4, 3no. High-level **Key Strategic Methodologies** in relation to building heights and public realm are developed under the main theme of ‘**Reconnecting**’ Tivoli to the City. These methodologies are intended as templates which can be tested and applied by future developments:

- 1. Key Views & Prospects.** Enhancing key views & prospects to reinforce the **existing Protected Views** and proposed **future key views towards and from the Tivoli development**.
- 2. Landscape & Heritage Character.** These proposals consider the Landscape & Heritage Character of the area particularly the views of the **Tivoli Merchant Houses** from Blackrock Castle, and preserving views of the Tivoli Ridge via the **top-third rule** hence providing parameters for future building heights distribution across the site.
- 3. Creating a Piece of the City - The Waterfront ‘Journey’.** Three distinct neighbourhoods create variety with proposed **increases to waterfront set-backs to be maintained where possible** allowing for a diverse range of **quality public spaces mirroring the riverside parkland** of Blackrock Marina to **Tivoli West**. **Tivoli Central** neighbourhood accommodates a large urban scale plaza, park and **civic attraction of architectural significance**. **Tivoli East** continues the public water-front journey towards re-wilding areas adjacent Glashaboy River Conservation Area. The possibility of bringing **water inlets** into the site is recommended as is encouraging **diverse water-based activities**.

The **modal shift away from car-based travel** as outlined in the ABTA is critical to Tivoli being an enjoyable place to live, work, visit and play. This will be achieved by establishing connections to the city centre via a **new train station** central to the site, a **central bus corridor** running east-west and a **waterfront pedestrian & cycle greenway** (See page opposite - Proposed Tivoli 3D Site Axonometric).

The waterfront has been further **activated by clearly designated motorized and non-motorized** areas and an enlarged marina serves as an entry point to the city. The increased water frontage has given room for an enhanced public space around a **waterfront feature building and civic attraction** connected to the city via the **primary river-side green route** and future cross river transport such as the planned bridge and water taxi/ferry services.

Applying the proposed revisions to the UDLFP and the key strategic methodologies in Sections 3&4 respectively, Section 5 of this strategy outlines **Proposed Development Data** and the resultant **Hierarchy of Building Heights** distribution across the site with potential **Landmark Building Locations**. The framework for building heights has been adjusted to improve solar access and views of the river from deeper into the site whilst preserving views of the proposed key landmark views from Blackrock and surrounding context.

The proposed **Neighbourhood Development Guidelines** highlight the various character areas possible across the site, giving each building zone a unique sense of place within this new area of the city and acts as a **template and vision** for future developments.

This strategy provides sufficient evidence of the potential for building height and ‘human scale density’ distribution across the site to inform the CDP for the Tivoli Docklands, enabling an adaptable, low carbon, energy conservative and diverse area of the city, which lessens the potential impact on climate change.

Below: Duisburg-Nord Landscape Park - River Rhine, Germany



6.2 Proposed Tivoli 3D Site Axonometric

Key - Density & Uses

- Open Space
- Residential, Lower / Medium Density
- Residential, Medium / Upper Density
- Mixed-use Residential & Commercial
- Mixed-use Neighbourhood Centre
- Residential, Upper Density
- Waterfront Civic Attraction
- Marina / Water Inlet
- School
- Parking / Mobility Hubs



NB: *Location of Eastern N8 Dunkettle Access TBC

Key - Transport

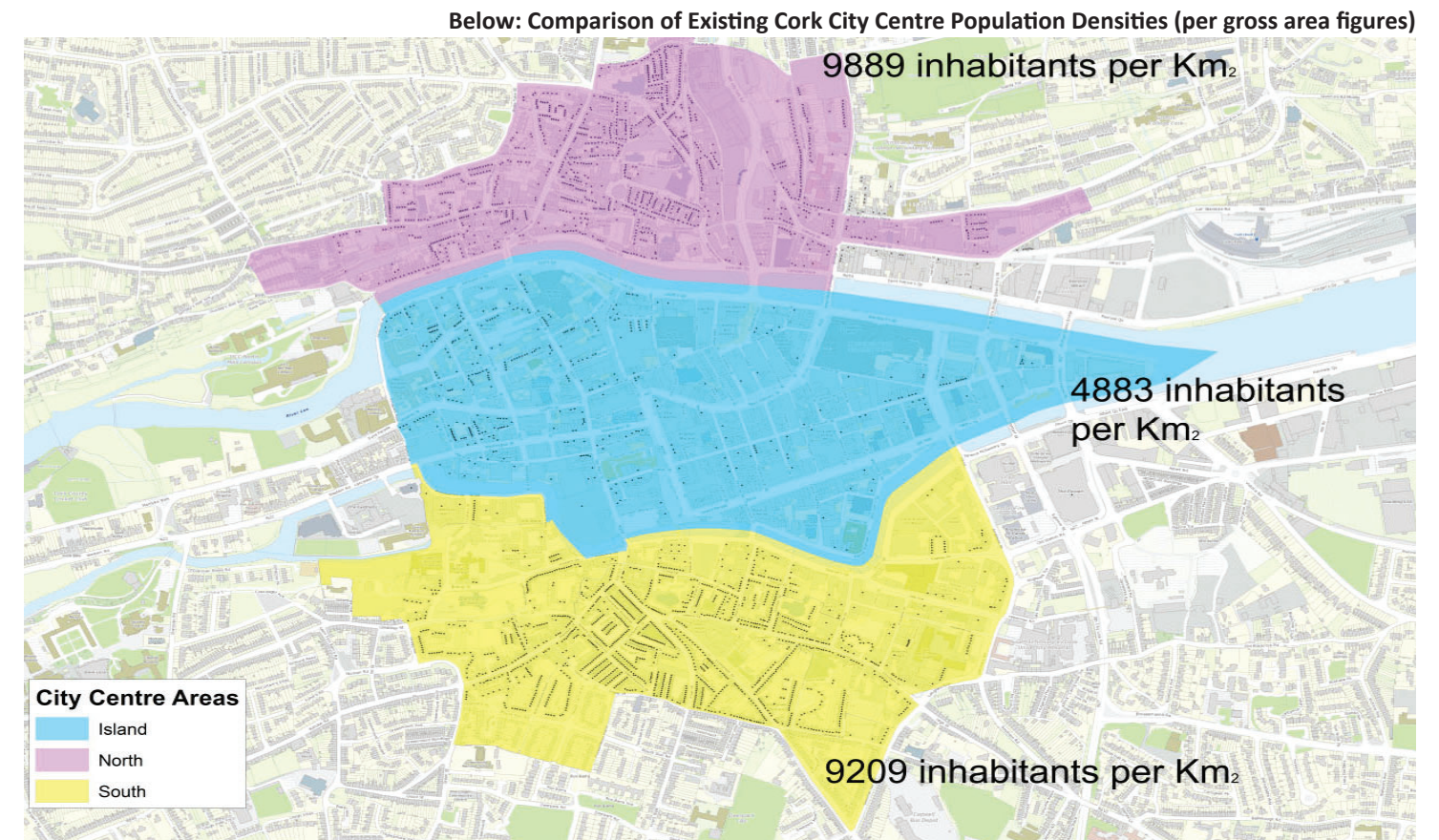
- Rail Network
- 🚂 Proposed Station
- 🚶 Public Transport Corridor
300m. Access Catchment
- 🚶 Mobility Hub
300m. Access Catchment
- Waterfront Promenade
Primary Riverfront Pedestrian and Cycle
- 🚶 Carriageway Access

6.3 Tivoli Density Comparison Study

In conclusion a density comparison study for Tivoli against existing and proposed areas of Cork City is also informative. The diagram to the right provides population density breakdowns (per gross sq.km) for Cork inner city areas including **Cork North**, **Cork South** and the **City Centre Island** (See Appendix for more detailed breakdown of area populations and densities).

- **The 3no. City Centre areas vary in size from approximately 0.5sq.km to 0.7sq.km.**
- **The Tivoli site's gross area of 0.64sq.km with proposed population of 12,875 provides a density measure of 20,117 inhabitants per sq.km.**

From the data above it can be seen that the proposed Tivoli population density is approximately **over twice the density of the nearest most dense existing area** being Cork North. Given the relatively low population density nature of Cork City Centre (and indeed most Irish Towns and Cities) and considering future trends for greater urban densification and best practice as aspired to in the 'Project Ireland 2040 National Planning Framework (NPF)', **the proposed Tivoli density should be considered a realistic and sustainable target.**



The proposed Cork South Docks development as per Cork City Council's 'Cork City Docks - Issues Paper' from May 2017 outlines a target population of 22,620 on a gross site area of 86.23Ha:

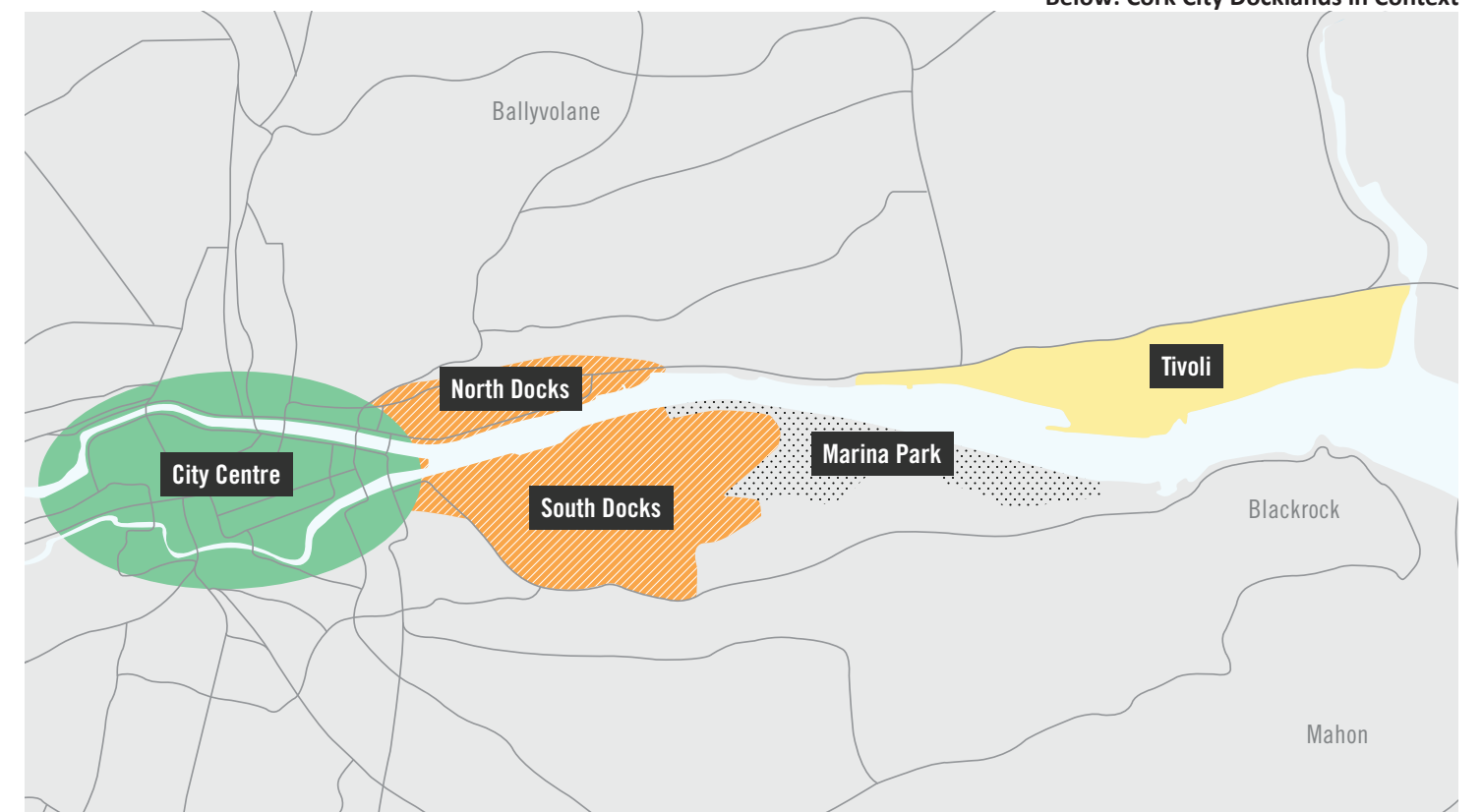
- **Producing a density of 26,232 inhabitants per sq.km**
- &
- **Approx. 100 units per Hectare (UPH) compared to approx. 94 UPH estimated for Tivoli in this strategy.**

However the above figures should also take into account that South Docks proposes as much higher proportion of employment figures on site of approximately 25,000 (290 per Ha) compared to circa 5000 (78 per Ha) at Tivoli.

While the Tivoli site has obvious constraints due to it's location which will require substantial infrastructural investment, the proposed population density targets are in line with similarly situated developments in the European context such as Hammarby in Stockholm and Copenhagen's Inner Nordhavn.

If Cork City is to reach it's potential as a major population and growth centre for Ireland outside of Dublin's orbit, it is developments such as the above-mentioned of medium to upper 'human scale' densities, high quality design and exceptional public realm, to which Tivoli should aspire, and as outlined within this strategy.

Below: Cork City Docklands in Context



BIBLIOGRAPHY & APPENDIX

NATIONAL / HIGH LEVEL POLICY & GUIDANCE:

- Project Ireland 2040 National Planning Framework (February 2018)
- Urban Development and Building Heights Guidelines for Planning Authorities (Dec 2018)
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines 28 for Planning Authorities (March 2018)
- Sustainable Residential Development in Urban Areas Guidelines 19 for Planning Authorities (May 2009)
- Best practice guidelines Quality Housing for Sustainable Communities (2007)
- Design Manual for Urban Roads and Streets or 'DMURS' (2013)
- Retail Design Manual (2012)
- Urban Design Manual (2009)
- Flood Risk maps Ireland (<https://www.floodinfo.ie/map/floodmaps/>)
- Performance standards such as: WELL Community Standard, Breeam In Use standard, LEED standard for Cities and Communities, Home Performance Index
- SCSi's 'Annual Commercial Property Review and Outlook Report'

REGIONAL / CORK:

- Southern Regional Assembly - Regional Spatial and Economic Strategy (2019-2031)
- Cork Metropolitan Area Strategic Plan (2019-2031)
- Cork Metropolitan Area Transport Strategy DRAFT (2019)
- Building Height Strategy for Cork – (2002 Urban Initiatives)

DOCKLANDS GENERAL:

- Cork Docks Area Based Transport Assessment (2019 - JACOBS)
- Cork Docks Phasing of Development & Public Transport Memorandum (July 2019 – JACOBS)
- South Docks LAP 2008
- Cork City Docks - Issues Paper, Cork City Council - 2017
- South Docklands – Level Strategy Review (July 2019 – Civic Engineers) – For the purpose of this study it is assumed the same strategy will be applied to Tivoli. Latest version we

TIVOLI:

- Tivoli Area Based Transport Assessment (2019- JACOBS)
- Tivoli Local Area Plan Progress Report (April 2019 – SPED SPC)
- Urban Design & Landscape Framework Plan for Tivoli Docklands (March 2019 - Stage I/II/III – AECOM / Butler Cammoranesi Architects)
- Tivoli – A New Perspective – RIAI Development Strategy + Design Review for Port of Cork – (July 2017)
- Tivoli Docks – Issues Paper (2017 – CCC)
- Tivoli Capacity Constraints Study (2016 – Port of Cork - RPS Consulting Engineers)

PRECEDENT STUDIES:

- Poolbeg West SDZ Planning Scheme (April 2019 – DCC)
- Dublin Docklands
- Reading & Bath Tall Bldgs Strategies – Whilst different contexts, provides some useful back-ground & sample modelling done etc.
- Relevant European examples eg. Arhus, Oslo, Malmo, Copenhagen, Hamburg etc. Relevant examples of docklands developments etc.
- River Space Design. Planning Strategies, Methods & Projects for Urban Rivers. Birkhauser / Basel.

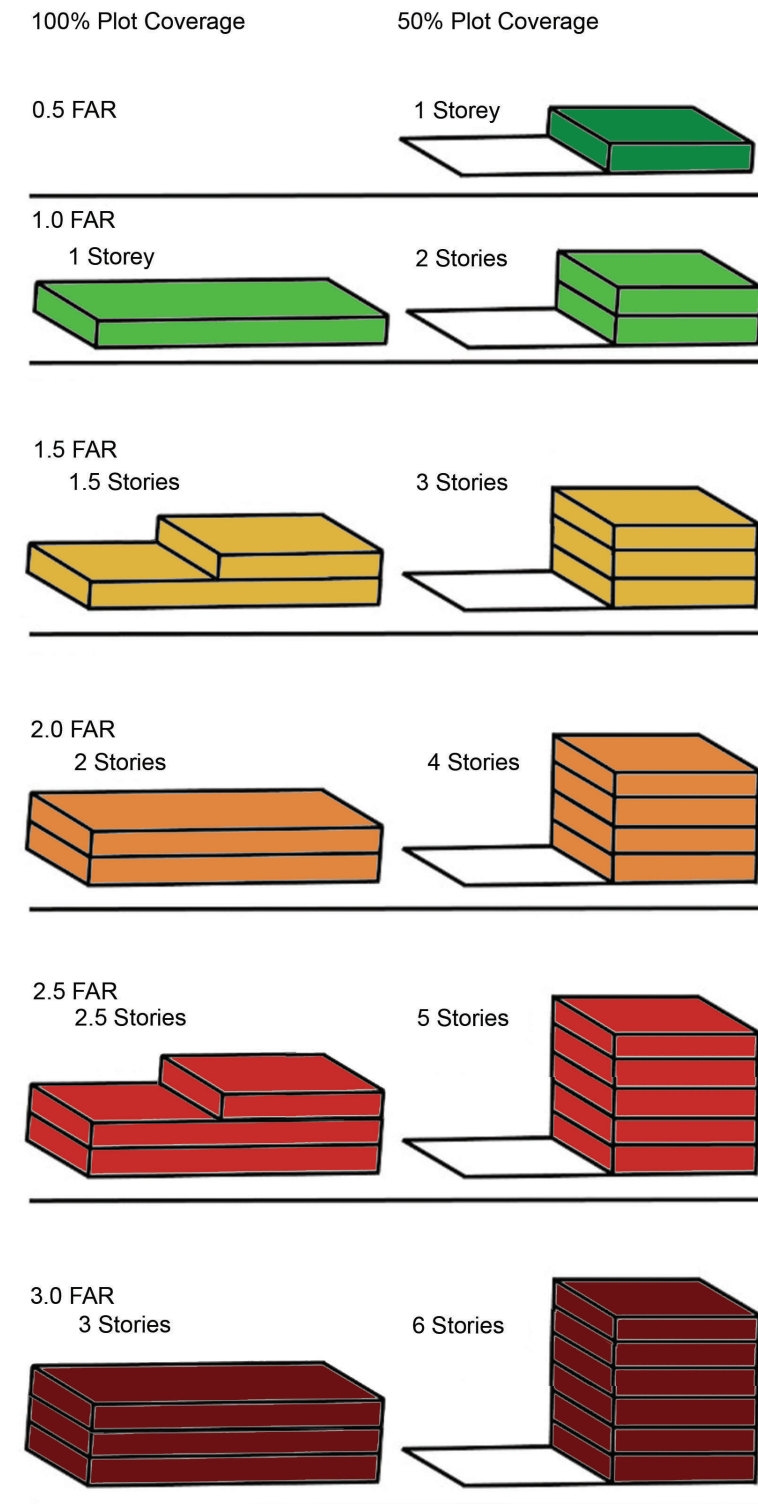
APPENDIX A

FAR RATIO

FLOOR AREA RATIO	no. stories @ 50% site coverage
F . A . R 0.5	1
1	2
1.5	3
2	4
2.5	5
3	6
4	8

$$\text{Floor Area Ratio} = \frac{\text{Floor Area in all floors}}{\text{Area of the Site}}$$

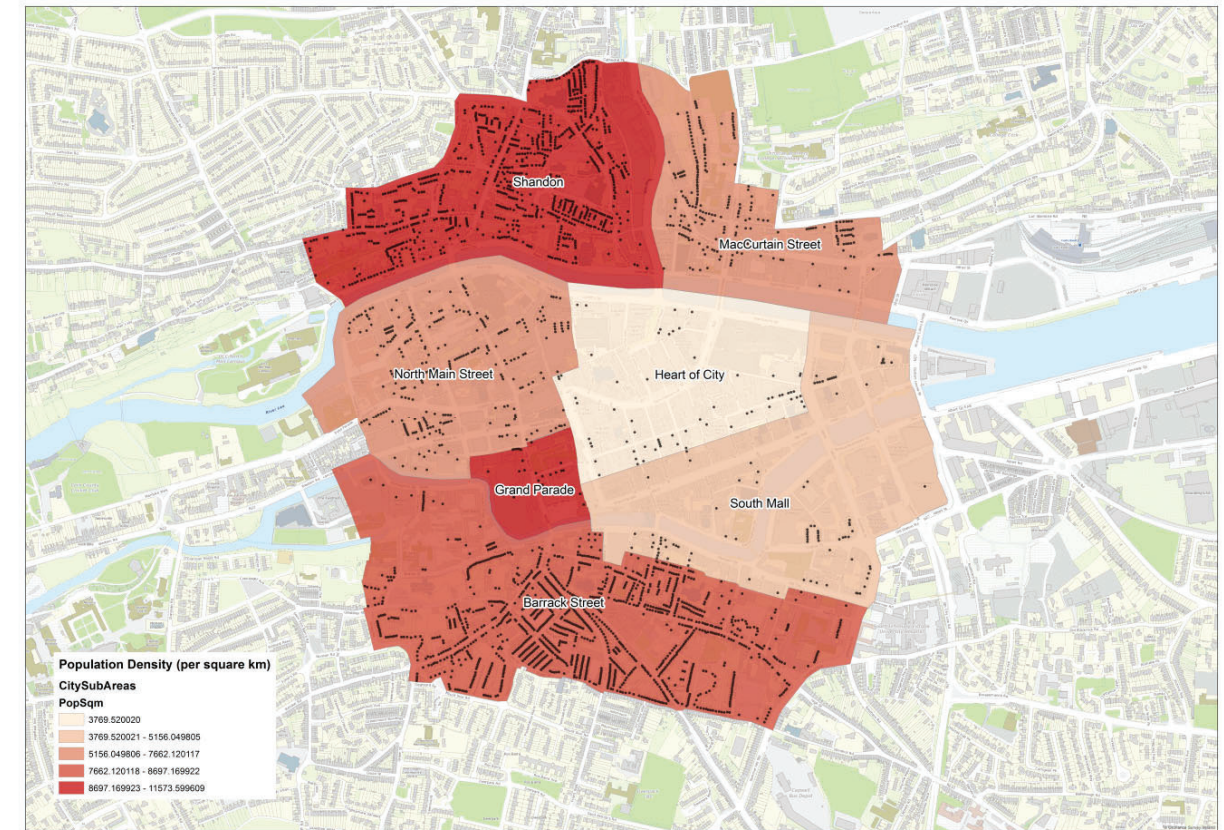
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APPENDIX B

Cork City Centre Sub-areas: Population Density:

- Population density here is calculated using gross area figures. It's important to note that this has an effect on the output, as some areas contain water bodies, are more densely built, etc.
- Points on the image represent residential units for reference.



City Centre Sub Area	Population	Area (in km ²)	Effective Population Density (per km ²)
MacCurtain Street	1261	0.181167	6,960
Barrack Street / South Parish	3594	0.413238	8,697
Grand Parade	543	0.047635	11,399
Heart of the City	774	0.205331	3,770
South Mall	1640	0.318073	5,156
North Main Street	1855	0.2421	7,662
Shandon	3413	0.294894	11,574

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