CHAPTER FIVE EXAMINATION OF ALTERNATIVES

5.1 INTRODUCTION

This chapter of the EIAR document provides an outline of the main alternatives examined throughout the masterplanning, project design and consultation process. This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison of the environmental effects.

For clarity, the EPA EIAR Guidelines 2022 state that: "*The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternatives and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required".*[1]

This chapter should be read in conjunction with Chapter 3.0 'Spatial Planning Policy' as this provides the statutory and non-statutory support for development on the subject site, having regard to national, regional and local policy and objectives. It is this policy that dictates the types of use and extent of development on the site.

The Environmental Protection Agency's Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) and, the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) suggests that 'alternatives' to the main reasons for choosing the proposed development, may be described at a number of levels including inter-alia; alternative locations, design/layout, processes and mitigation. The consideration of the main alternatives in respect of the development of the subject lands was undertaken by the Design Team and has occurred throughout an extensive and coordinated decision-making process, over a considerable period of time. The main alternatives considered are identified below.

5.2 RATIONALE FOR THE DEVELOPMENT PROPOSAL

The Cleeves site is identified as a key revitalisation and transformation project under the Limerick 2030 Plan. The strategic site, identified in the Development Plan, is earmarked for redevelopment in Limerick City Centre, and is expected to have transformational effects on the revitalisation of the City. The Development Plan recognises that centrally located and strategic brownfield and underutilised lands, such as Cleeves, presents Limerick City with an opportunity to achieve the economic and social objectives associated with the targeted population growth for the city in a sustainable manner.

The key environmental and practical considerations which influenced the design of the proposed development and alternative locations and layouts on the site included the following:

[1] 8 Ref CJEU Case 461/17

- The protected structures of the Flaxmill and the Chimney are central to the consideration of the development proposal along with the need for the phased stabilisation / restoration and reuse of existing buildings that comprises the industrial heritage that is the Cleeves site.
- Minimise demolition and work with existing buildings where possible.
- The location of development within an industrial heritage site and the need to maintain legibility whilst facilitating compact growth and reuse / regeneration of the site. It is the built and cultural heritage elements of the site that provide the identify and underpin the development proposal.
- Protection and preservation of existing natural habitats and species including bats thereby preserving and enhancing biodiversity on the site.
- The need to achieve sustainable densities in accordance with national policy in the National Planning Framework; national guidelines Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities and the objectives of the Limerick Development Plan 202 – 2028 given the location of the subject site within the city centre, proximate to lower density suburban development.
- Protection of the residential amenities of adjoining housing in Clanmaurice Avenue neighbouring the site to the north and Landsdowne Hall neighbouring the site to the north east, in the interest of human health.
- The need to protect and enhance existing landscape features including the reservoir and quarry face, thereby ensuring preservation and enhancement of the amenity and biodiversity of the area.
- The quality of the urban environment to be delivered and the associated impact on human health.
- Management of flood risk on site and the need to integrate flood measures into ongoing study optioneering for the Limerick Flood Relief Scheme.
- Management of water and potential pathways as a receptor for contaminants, particularly having regard to the sites proximity to the Lower River Shannon SAC and River Shannon & River Fergus Estuaries SPA.
- Access, permeability and connectivity internally within the site having regard to significant level changes but also externally to the public, thereby ensuring access to significant public open space and public realm.
- Reduced on site car parking provision to encourage and facilitate modal shift to more sustainable modes of transport, including walking and cycling given the city centre location.
- Phased delivery in the context of an overall masterplan and constructability of future development as phases become occupied.

5.3 "DO NOTHING" ALTERNATIVE

In the event of the 'do-nothing' scenario, the existing Cleeve's site would remain undeveloped. Whilst the two protected structures on site (the Flaxmill and the Chimney) are afforded legal protection to ensure they are not endangered through neglect, damage, or alteration, there is a risk that other buildings of heritage interest in the Cleeves site could fall into further disrepair. The inefficient use of a

city centre site would continue, with some meanwhile uses occupying buildings. Funding a scheme of this nature would be difficult and uncertain as the site would not have any potential to leverage investment in the short to medium term. The future of cultural heritage buildings would be uncertain having regard to lack of funding streams.

The Limerick Development Plan 2022 - 2028 proposes a framework for the development of the site based on the provision of a high-density urban form that maximises the use of its city centre location and aims to reduce the need to travel. The Development Plan confirms that the land has the potential to accommodate circa 250 residential units. Failure to develop the subject site would result in failure to comply with the core strategy and a key objective of the Development Plan to deliver new housing in the city centre.

The additional pedestrian and vehicular traffic movement that would be generated by the proposed project would not require to be catered for on the local network in a 'do nothing scenario'. Similarly, the additional demand / support for local infrastructure, services, and businesses would not be generated by any new population on site. However, local housing need would not be catered for.

The visual appearance of the site would continue as vacant and brownfield in nature and there would be no opportunity to open the site up to the public. Further the opportunity to develop significant public realm for the benefit of the wider community would be lost.

The brownfield nature of the site would continue and there would be no opportunity to remediate the site including removal of asbestos form both the buildings and soil. This will likely have a positive impact on water quality and run off from the site. Invasive species are currently being treated in anticipation of development and which may not otherwise occur without development on the site.

From an environmental perspective, beyond impact on human health from a failure to deliver sustainable residential development to meet housing and community development needs and further sustainable development based on alternatives to travel by private car, a 'do nothing' approach is otherwise likely to result in a neutral impact on the environment in respect of material assets, land, water, air, climate, cultural heritage, biodiversity and landscape.

Ultimately, a 'do-nothing' scenario was considered to represent an inappropriate, unsustainable and inefficient use of these strategically positioned, zoned, urban lands.

5.4 ALTERNATIVE LOCATIONS

The application site is zoned for city centre use and existing residential use, under the ownership of Limerick Twenty Thirty, a property development company, established as a special purpose vehicle of Limerick City and County Council. The proposed uses are permitted in principle with the land use zoning objectives pertaining to the project site.

The 2018 Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment notes specifically that the consideration of some types of alternatives, such as alternative locations, may not be appropriate in all cases. EIA is concerned with projects and the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports prepared

by the EPA in 2022 (EPA Guidelines), state that, in some instances, neither the applicant nor the competent authority can be realistically be expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure which are examined by means of a Strategic Environmental Assessment (SEA), the higher tier form of environmental assessment. As the subject site has been identified to accommodate the uses proposed, in the Limerick Development Plan 2022 - 2028 it is not considered appropriate to evaluate alternative locations in the EIAR.

The EPA Guidelines also note that: "*Higher level alternatives may already have been addressed during the strategic environmental assessment of relevant strategies or plans. Assessment at that level is likely to have taken account of environmental considerations associated, for example, with the cumulative impact of an area zoned for industry on a sensitive landscape*". Section 7.0 of the SEA relating to the Limerick Development Plan states that alternative strategies were considered in the preparation of the Development Plan with the plan as adopted the preferred option. The new settlement hierarchy and associated zoning has been ordered to reflect population growth targets and the availability of employment and services.

The issue of alternatives is a critical function of the Strategic Environmental Assessment (SEA) process and is necessary to evaluate the likely environmental consequences of a range of alternative development strategies for the city within the constraints imposed by environmental conditions. The SEA for the Limerick Development Plan 2022 - 2028 considered alternatives at an early stage of the process and through an iterative process selected the most appropriate development scenario.

On the basis of the foregoing, no alternative sites were considered or assessed for the purposes of preparing this EIAR, nor is it considered necessary to do so. Having regard to same and following consideration of environmental and planning factors at a high level, including its established zoning, it was considered that the landholding is an appropriate location for a mixed-use residential development from an environmental perspective. The proposal adopts a plan led approach to development and seeks to provide for much needed housing, in accordance with national, regional and local policy and guidance documents

5.5 ALTERNATIVE PROCESSES

The proposed construction works comprise relatively standard building demolition and construction processes. As such there are no specific alternative demolition or construction processes identified in this EIAR.

No new, unusual or technically challenging operational techniques are required to ensure the development, as designed, can function as a sustainable community. The Energy Strategy for the site did explore a number of alternative processes for the site and this is detailed in Appendix 2.1. The design and layout of the scheme has been optimised by maximising benefits from energy efficient passive measures such as natural ventilation and lighting and reduction of cooling requirement through control of excessive solar gain. There are no other new alternative operational processes to consider.

5.6 ALTERNATIVE DESIGNS

A number of site layout and alternative designs were considered during the design process, with further minor design alterations taking place following receipt of informal consultation opinions from the prescribed bodies and Internal Departments within Limerick City & County Council. Further, the results of technical analysis and surveys presented in the EIAR with respect to in particular Daylight & Sunlight. and Built Heritage resulted in amendments to the development proposal.

In the first instance the overall design of the scheme will be considered with respect to the layout and masterplanning process. Thereafter, alternative detailed design considerations will be presented.

No further alternatives to the nature, design and layout of this project have been identified in the preparation of this EIAR, as being required to mitigate or avoid likely significant adverse effects on the environment. The mitigation measures detailed within the EIAR do not require changes to the design and layout of the proposed development. The EIAR provides evidence that the proposed development can be accommodated on the subject site without predicted risk of significant adverse impact on the environment, subject to the identified mitigation measures at construction and operational stages being implemented.

5.6.1 Extent of Demolition

Building reuse and retention of historic fabric and features is being led by a conservation philosophy, guiding the retention, consolidation, repair and reuse of the historic structures as part of a multi-phase development spread across Phases I, II and III. Demolition is proposed as detailed in Chapter 2.0 Figure 2.7 to enable the regeneration and redevelopment proposal.

Throughout the design process, the significance of each building and structure on the Cleeves site was investigated to determine its significance in the context of the heritage of the site. This study, which evolved over time as information became available, resulted in a Statement of Significance as detailed in Appendix 9.1 Chapter 9.0 Built Heritage – Architecture. This report has informed the removal, adaptation and repair of buildings on site.

Semi-Detached Houses

The selection and retention of buildings and structures along the boundary of the site has been a key challenge as the objective from the outset has been to enhance public access and permeability within and through the site, facilitating access to public amenity space and public realm. Integrating the Salesians site with the rest of the Cleeves development was a particular challenge given the significant change in levels between Salesians and the Quarry site. The provision of pedestrian / cycle access onto North Circular Road is also necessary, to integrate existing housing and provide access to the site for the Fernhill residents. This key objective has resulted in the proposed demolition of a pair of semi-detached houses set back from the North Circular Road and cut into a shelf in the rock. The back gardens are terraced, adjoining the reservoir.

The houses, though of heritage value, are not listed as a protected structure, are not included on the Record of Protected Structures; and are not included on the NIAH inventory. Their demolition is required to facilitate essential components of the masterplan, including pedestrian and cycle circulation.

The evolution of the current design has given significant consideration to an appropriate proposal for the pair of houses. Whilst consideration was given to the retention of the houses, it would not be possible to facilitate universal access at this location onto North Circular Road having regard to the difference in levels across the site relative to North Circular Road. Further, the extension of the existing rear gardens, backing onto the reservoir, would impede access to and the adaptive reuse of the reservoir as a significant amenity space for not only the residents of Cleeves but also the wider community.

Constructability of the Quarry site and a desire to restrict the movement of construction traffic through the Flaxmill plaza, in proximity to protected structures, was also considered in the context of the houses. Demolition of the semi detached houses will facilitate a temporary construction access into the Quarry site with a temporary access over the reservoir facilitating safe and unimpeded access for construction purposes.

The alternative of demolishing or retaining the semi detached houses has impacts on cultural heritage, population and human health and Material Assets – Traffic & Transport. Loss of cultural heritage fabric must be seen in the context of the overall site and the protection of the remaining buildings and protected structures both during construction and operation. There are significant population and human health benefits, facilitating direct universal access from the North Circular Road and the Salesians Site to a significant recreational and amenity facility. Further the universal access ensures direct cycle connectivity can be facilitated to North Circular Road from the Quarry site, promoting modal shift.

Salesians School and Fernbank House

The Salesians Site currently comprises a former secondary school (encompassing Fernbank House) currently used for the temporary accommodation of Ukranian refugees and a standalone Sportshall. The house, though of heritage value, is not listed as a protected structure, is not included on the Record of Protected Structures; and is not included on the NIAH inventory.

As detailed in the Statement of Significance, Appendix 9.1 Chapter 9.0, from the 1960s onward Fernbank House and grounds were subject to major change and development up until its sale to the city in 2020. Fernbank House has not been legible as a dwelling for many decades. In its current form the exterior of the building is quite unlike the design of the earlier building. Some of the interiors survive as a mixture of early and adapted fabric. Changes since 1924 would be deemed to be erosive to the building's significance as an historic house. The period of use as a school resulted in changes that have altered the historic building form and use.

Public consultation on the Masterplan in 2023 highlighted the public interest that exists in Fernbank House and a request was made to Limerick City & County Council to include Fernbank House on the Record of Protected Structures. In 2024, a preliminary review by the Conservation Officer determined that Fernbank House did not pass the high bar for designation and the building was not included on the Record of Protected Structures.

Initial consideration was given to the adaptive reuse of Salesians School and Fernbank House. However, early consideration determined that converting the school into housing would present significant challenges due to differing spatial requirements, existing infrastructure, and regulatory hurdles. The Salesian School was designed for a specific educational function, and features large

classrooms, a gym, and specialised spaces that do not easily translate to residential layouts. Additionally, adapting the plumbing, electrical systems, and fire safety measures to meet residential building codes can be complex and costly. These challenges, with resulting low density development over four stories only, would not result in an optimum design or density solution for this city centre site.

The Architectural Design Report accompanying the development proposal explored options for reuse of the building. It demonstrates that with suitable retrofitting to modern building regulations, approximately 72 no. homes could be accommodated within the existing fabric, along with 32 no. new build units in a 4 storey block. This would only yield 104 no. residential units on the site in contrast to the 166 no. units achievable with demolition.

Ultimately, retrofitting the structure would be more expensive and less effective than new construction. Furthermore, the building's footprint and location present a significant constraint to achieving the density and permeability targets necessary to meet housing delivery objectives if retained. Its removal is therefore considered necessary for the successful implementation of the overall Masterplan and to optimise density provision.

Whilst retention and the adaptive reuse of the building would likely contribute to a reduction in waste on the site, the on-site reuse of site-won materials will be prioritised, where feasible. It is proposed that material from buildings (brick, block, plaster etc.) shall be crushed on site to create a 6F2 layer, to be used during construction, as detailed in Chapter 19.0 Material Assets – Waste Management considers the impacts arising from waste generated on site.

With respect to Fernbank House, every effort has been made to reuse and salvage the internal materials and features from Fernbank House in-situ, as detailed further in Chapter 9.0.

5.6.2 Masterplan Optioneering

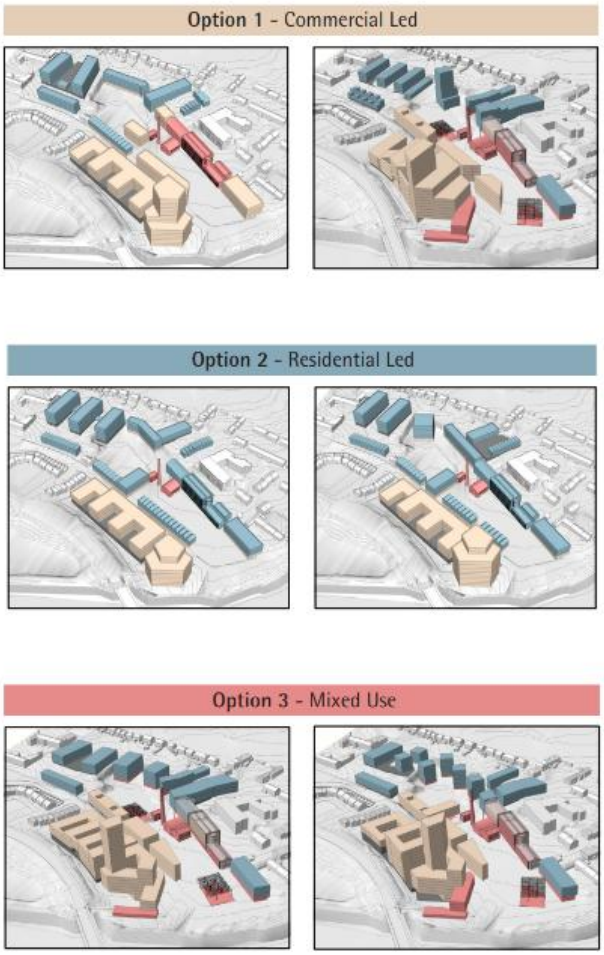

Figure 5.1 Early Masterplan Options

In developing the Masterplan for the site, an options appraisal was undertaken at an early stage to determine the best approach to developing the site. The options commenced with consideration of uses, scale, form and layout as detailed in Figure 5.1. Option 3 comprising a mixed use development was considered most appropriate for the site having regard to the zoning objectives and the objectives for the site as detailed in the Limerick 2030 – An Economic and Spatial Plan for Limerick.

In compliance with the requirements of the Public Spending Code (PSC), a Preliminary Business Case (PBC) was prepared which sought sanction from the Department of Housing, Local Government and Heritage (DHLGH) to proceed to the next "Final Business Case" phase, inclusive of the statutory planning process, detailed design and construction tender preparation.

It is a requirement that the PBC sets out a shortlist of options to meet the project's objectives and determines the single preferred option to be progressed into the next phase. The preferred option should be the most cost-effective means of addressing the project's public policy objectives, based on all relevant qualitative, design, cost and economic considerations.

However, whilst the PBC primarily focuses on cost and economic considerations, it was considered by the applicant that the unique qualities and challenges on the Cleeves site necessitated more in-depth analysis in order to highlight societal benefits not ordinarily captured in the PBC, particularly given the unique qualities of this city centre site and the opportunity to regenerate a site with significant industrial heritage.

Thus, the approach proposed for the PBC was to conduct a weighted Multi-Criteria Analysis (MCA) to include and facilitate comparison of the non-financial and non-economic aspects of the options, as well as financial and economic considerations. An independent panel of experts, including engineers, planners, architects and an estate agent was appointed to conduct the MCA, on five different masterplan options.

Option 2A Commercial

The development proposed 186 no. residential units, 37.199sqm of workspace and 10.039sqm of mixed uses.

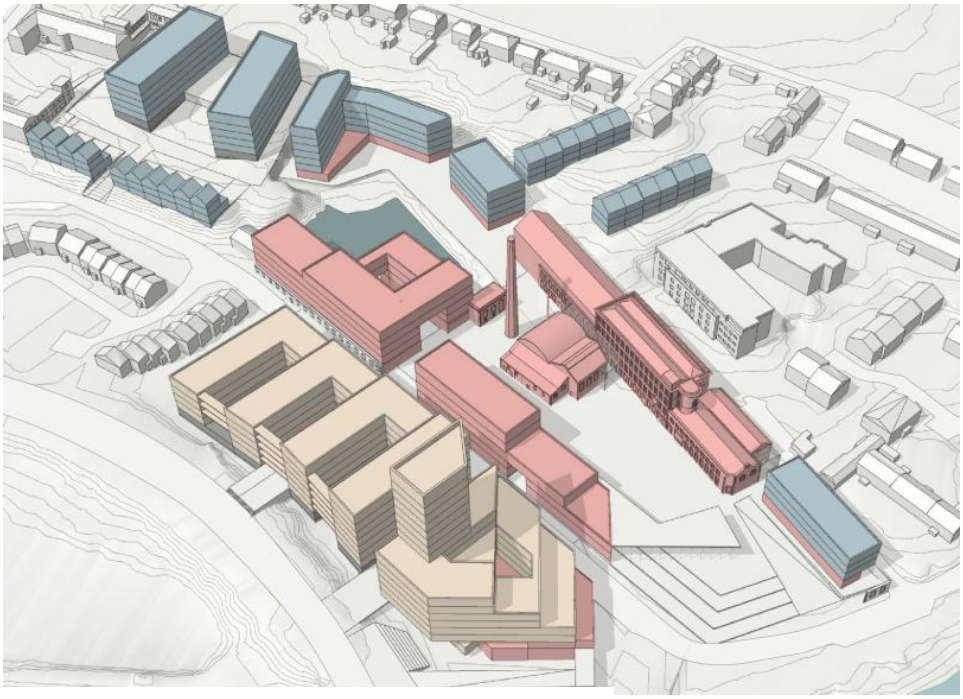

Figure 5.2 Masterplan Option 2A

Key features of the scheme included:

- A larger proportion of the Flaxmill buildings are retained.
- A large area of the curtilage walls are removed including removal of part of the wall along Stonetown Terrace to facilitate emergency access to Stonetown Terrace in the event of a flood.
- St Michaels Rowing Club is relocated and integrated to the Shipyard site development, (outside of the SAC), releasing more of rivers edge for public engagement with the waterside, and facilitating the strengthening of the river walk connection & the marshlands
- Enhanced public realm connection between Condell Rd and the riverside quarter with an upper raised public promenade.
- The arrangements of the housing on the Salesians and Quarry sites optimise the full potential of the areas available and achieve relatively high densities.
- Stonetown Terrace has a lower density of development notwithstanding location of site adjoining Landsdowne Hall.
- The Shipyard workplace configuration offers adaptability for diverse arrangements / tenancies / incremental growth organised around a courtyard garden typology, whilst offering a sustainable amount of parking
- Thin building footprints on the north-south axis facilitate optimum natural daylight & indoor air quality provision and the development of healthy sustainable work environments
- A mixed use adaptable typology along North Circular Rd. which could accommodate diverse workspaces beneath office or residential uses
- An open shared space over the Infiltration Galleries, offers an interactive environment overlooking the reservoir for a work or community hub.

Option 2B Commercial

The development proposed 221 no. residential units, 45,403sqm of workspace and 7,829sqm of mixed uses

Figure 5.3 Masterplan Option 2B

Key features of the scheme included:

- A greater degree of intervention to, and removal of, the heritage buildings which opens up the site more to the city and the river. A large portion of heritage assets are retained and suggested for community use.
- Salesians site remains quite isolated and fails to be integrated into the overall development due to a substantial change in level difference between the Salesian and Quarry site.
- The building on the Quarry site has significant massing when contrasting with the slender form of the Flaxmill.
- Commercial development is prioritised along the North Circular route on the Shipyard, Infiltration Gallery and Flaxmill sites. This approach provides a greater density of development away from the retained existing buildings and in locations deemed unacceptable for residential use due to increased flood risk.

Option 2C Commercial

The development proposed 246 no. residential units, 35,007sqm of workspace and 11,054sqm of mixed uses

Figure 5.4 Masterplan Option 2C

Key features of the scheme included:

- A slightly more enclosed and calibrated civic plaza in the forecourt of the historic Flaxmill is formed and anchored by the heritage buildings, activated by mixed public uses in the heritage and new buildings on its edges.
- Option C proposes keeping the existing levels of the North Circular Road. The implications of this are that ramped, vehicular access is required into the Flaxmill site (for vehicles and pedestrians) and it restricts the type of development that is suitable along the North Circular / Flaxmill site due to the existing flood levels.
- The orientation and location of the residential block on the Quarry site (pulled back from the Quarry edge) provides the opportunity for a Quarry Park to be introduced - a significant external amenity, providing the play provision for the site and a new type of space for the local community. Greater connectivity is facilitated along North Circular Road, providing direct access to the proposed amenity park around the reservoir and facilitating connectivity with the Salesians site.
- The massing of the building neighbouring Landsdowne Hall has been increased, more reflective of its adjoining scale, increasing density in line with national guidance and the Development Plan and providing for additional residential units.

Option 3 Community

The development proposed 142 no. residential units, 3,677sqm of workspace and 16,374sqm of mixed uses

Figure 5.5 Masterplan Option 3

Key features of the scheme included:

- Main Flaxmill buildings are retained to preserve the history of the Cleeves site
- Mixed use Community facilities in heritage & new built fabric support invigoration of local economy & environment
- St Michaels Rowing Club integrated into new Community Boathouse fails to offer a landmark public building as required in the Development Plan.
- Further Education/ Training centre on Shipyard site offers diverse suite of teaching & learning spaces in courtyard garden typology, supporting Community Life-long Learning
- Residential accommodation on the Salesians, Quarry & Stonetown Terrace is limited and does not make efficient use of serviced land.
- No connectivity between Salesians site and the Quarry site with no linkage from the proposed Quarry Park to North Circular Road.

Option 4 Enterprise

The development proposed 114 no. residential units, 18,277sqm of workspace and 11,155sqm of mixed uses

Figure 5.6 Masterplan Option 4

Key features of the scheme included:

- A large portion of heritage assets are retained and suggested for community use.
- No residential development in the Quarry Zone, limits the potential of housing delivery on the site but offers the space as a potential green area..
- The Shipyard workplace configuration offers four discrete buildings for medium and large tenancies, but no landmark feature building.
- A single business tenant is envisaged for the Flaxmill building will create a strong industry character for the retained buildings.
- Emergency access in the event of flooding to Stonetown Terrace is not facilitated as the existing stone boundary wall surrounding the site is retained.

The MCA was conducted on the five masterplan options (2A, 2B, 2C, 3, and 4) in 2021, across nine key criteria and 23 sub-criteria, using a 0–10 scoring scale. Further detail of the process and results of the MCA are provided in Volume III Appendix 5.1. Option 2B consistently scored highly, particularly in heritage integration, commercial density, and return on investment. Option 2A also performed strongly, especially in residential amenity and cultural offerings. Option 2C achieved the highest residential density and demonstrated strong phasing potential with good connectivity. In contrast, Options 3 and 4 generally scored lower, particularly in permeability, workspace diversity, and cultural vibrancy, with Option 4 notably constrained by the full retention of the historic boundary wall. The analysis supports a preference for Options 2A and 2B due to their balanced performance across heritage, mixed-use integration, and urban design quality.

The Masterplan was advanced using the principles of Options 2B but with greater connectivity and permeability within and through sites. Option 2B was chosen because it provided greater opportunities to maximise residential output and to address the urgent need for housing in Limerick city, including student bedspaces.

The public consultation and engagement (as detailed in Chapter 4.0) has resulted in an iterative design process for Phase II that has evolved over time. A number of design iterations evolved since selecting Option 2B at preliminary design stage. The four design options considered below for Phase II demonstrates how an optimum design solution was arrived at for Phase II development.

5.6.3 Phase II Detailed Design Considerations

Design No.1 – Updated Preferred Option

Following preparation of the Masterplan the preferred option was updated to incorporate a number of changes and enhanced environmental considerations.

- Phased approach to development to focus on urgent delivery of housing in Limerick City.
- Accommodate a diversity of educational uses in an active live/work campus environment. This included consideration of future flexibility to suit the new requirememt for teaching and learning environment.
- Incorporation of the Cycle Design Manual 2023 and the more onerous regulations on cycle store layouts.
- Requirement for sprinkler tanks and a second staircase at Salesians.
- Requirement to raise North Circular Road to be reviewed in context of the Limerick Flood Relief Study.
- Car parking strategy to be reviewed in the context of the Sustainable Residential Development and Compact Settlement Guidelines and the proposed Bus Connects Plan.
- Air Source Heat Pumps (ASHP's) introduced at roof level as part of sustainability strategy.
- Greater connectivity and permeability
- Retain existing buildings on Infiltration Gallery, North Circular Road and Shipyard plots until future phase confirmed

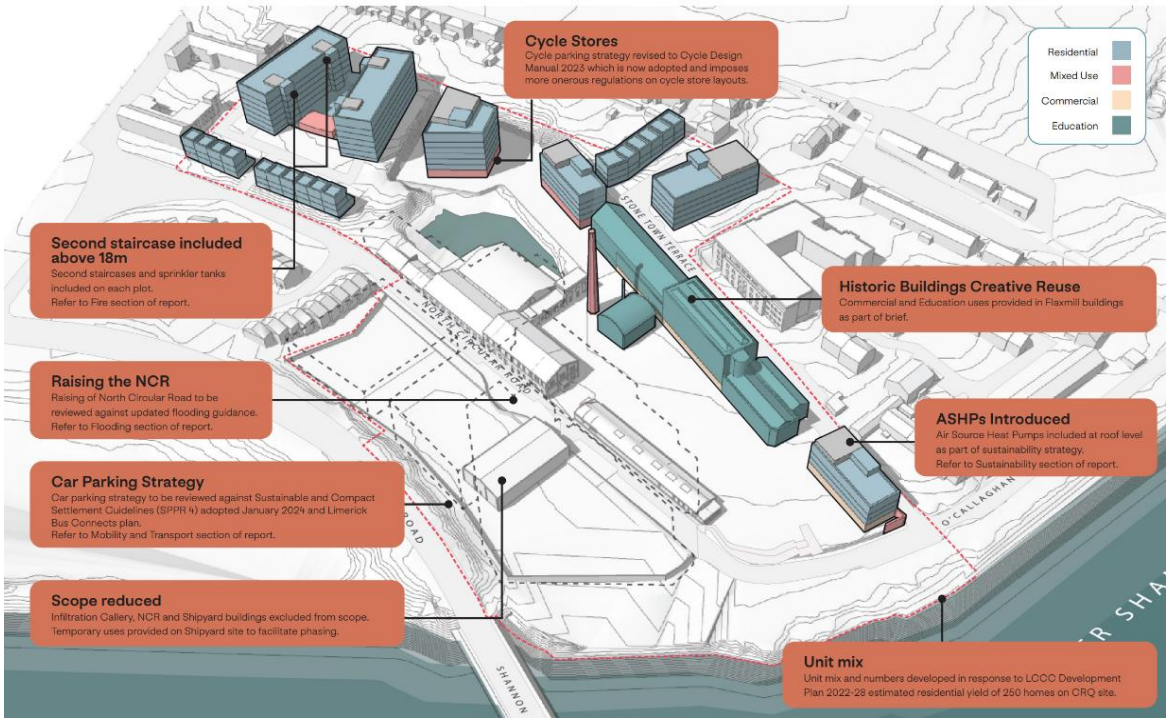

Figure 5.7 Detailed Design Alternative – Option 1

Design No.2 – Greater Efficiencies

Delivery of the scheme, viability and the urgent need for housing in the city was more fully considered and led to further changes in the development proposal. This stage followed a signed Memorandum of Understanding between Limerick Twenty Thirty and the Technological University of the Shannon (TUS) to deliver an educational campus. The educational campus will form a separate planning application and is likely to advance whilst the proposed development is being advanced. The Flaxmill and associated historical buildings will undergo a change of use, renovation works and be extended to accommodate commercial uses at the ground floor level with educational use at upper floors. Significant new educational buildings are proposed along North Circular Road as detailed in the Masterplan.

For the purposes of the proposed development (Phase II), the design was amended to accommodate:

- Units with larger floor areas with the sizes of individual units increased by approximately 10sqm.
- Provision of Purpose Built Student Accommodation (PBSA) on the Quarry site to complement the proposed TUS campus.
- A greater mix of one and two bed units at Stonetown Terrace to meet market demand in the city and in compliance with the Housing Needs Demand Assessment in the Limerick Development Plan 2022 – 2028.
- Enhance development to incorporate nature based SUDs measures within the proposed public realm, notwithstanding disposal of surface water to the reservoir on site.
- Optimise the layout and siting of buildings to maximise daylight and sunlight and reduced overshadowing in accordance with relevant guidelines.
- Maintain biodiversity and integrate bat houses into the design proposal.

- Exclude the Flaxmill building from the development proposal having regard to separate advanced, ongoing stabilisation and repair works and the proposed Phase III application by TUS.

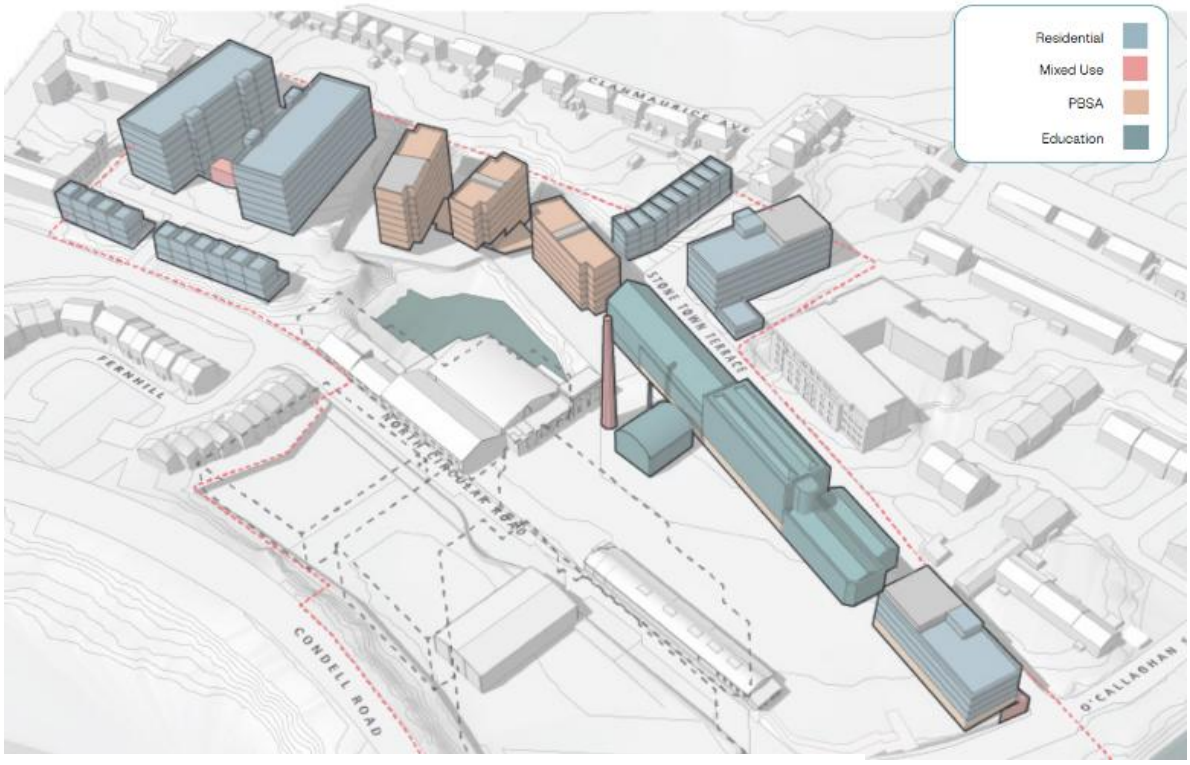

Figure 5.8 Detailed Design Alternative – Option 2

Design No.3 – Further Refinement Proposed Development

Following detailed consideration of the development proposal which included St. Michael's Rowing Club and relocation of the club's premises to facilitate public realm enhancement works along the riverside, it was concluded that it would be necessary to apply for a Marine Area Consent (MAC) in advance of seeking consent from An Coimisiun Pleanála. Given the timescale associated with securing a MAC and the urgency associated with the delivery of housing in the city, it was agreed to delay this element of the development proposal to Phase III and the application associated with the advancement of the TUS Campus

This design scenario sought to further optimise the proposal by:

- Reducing the height of buildings in proximity to Clanmaurice Avenue, from seven to six storeys, but yet maximising the number of residential units on site to facilitate compact growth.
- Incorporate Meanwhile Uses on the Shipyard site pending delivery of Phase IV of the Masterplan.
- Reduce car parking provision to a rate of 0.3 spaces per unit having regard to the city centre location, thereby promoting more sustainable modal choices.
- Reduce the finished floor level of the buildings at Stonetown Terrace by 1.5m to +9.5m and relocate the apartment building 2.5m further to the west to ensure adequate daylight and sunlight to the existing apartments in Landsdowne Hall and the houses in Clanmaurice Gardens / Terrace, thereby ensuring no adverse impact on the residential amenity of the area.
- Minimise and control provision of lighting along bat foraging routes in the interests of maintaining biodiversity and to ensure no impact on protected species.

- Accommodates noise attenuation measures around roof plant to ensure appropriate operational noise limits can be achieved.
- Incorporate green roofs in roof space not occupied by roof plant.

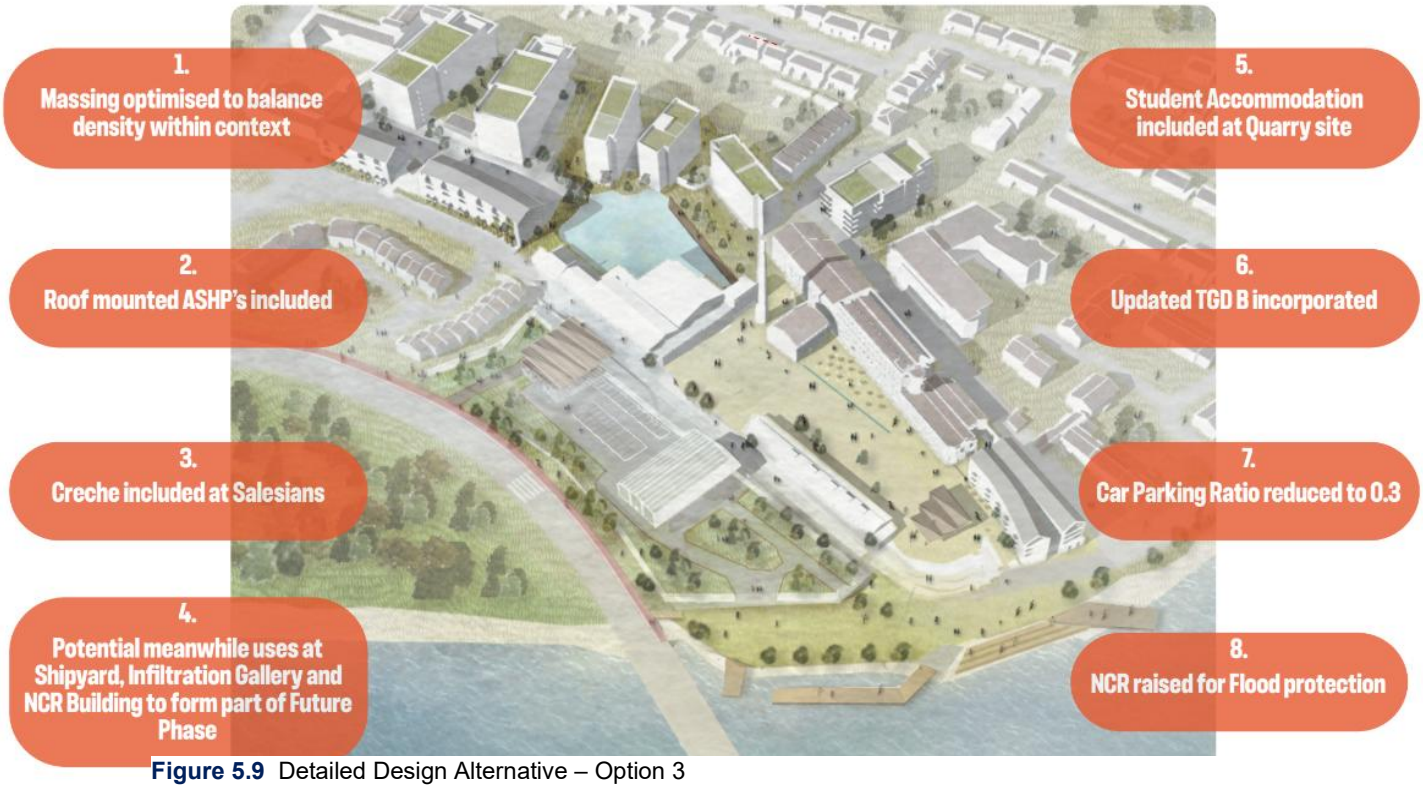

Figure 5.9 Detailed Design Alternative – Option 3

Final Design

The final design of Phase II presents the most effective utilisation of this significant site, fulfils the requirements of the Limerick Development Plan 2022 – 2026 with respect to Objective CGR03 and provides for much needed housing in the city, whilst realising a phased approach to development on a strategic, city centre site, all in accordance with the principles set out in the Cleeves Masterplan. To summarise it is considered that the final layout:

- Advances the strategic and statutory objectives applicable to these lands and the wider area.
- Provides and enables significant stabilisation and repair work to protected structures and significant heritage buildings on site.
- Peels back and demolishes buildings of less significance, which currently hinder the appearance and functionality of the site.
- Optimises development space within the overall site, in an efficient and sustainable manner.
- Facilitates and promotes greater modal choice through minimising on site car parking and permitting / developing connectivity and permeability throughout and within the development.
- Facilitates ready access to all parts (character areas) of the development and the future development of Phase III and Phase IV works as detailed in the Masterplan.
- Enables extensive economic development through employment created at construction stage and enables future employment on the site with Phase III and Phase IV works.

- Provides much-needed housing in the city centre which is characterised by slow housing growth; and

The final iteration of the scheme is not considered to give rise to any significant adverse environmental impacts. Mitigation measures to be implemented at construction and operation stages of the project are detailed within each Chapter of this EIAR and are summarised in Chapter 23.0 Summary of Mitigation Measures.

5.6.4 Summary of Design Amendments and Environmental Improvements

Throughout the iterative design process a number of issues were highlighted that are relevant to the environmental performance of the scheme. These are set out in Table 5.1 below.

Issues Raised	Design Response	Environmental Improvements
Requirement for increased density and maximise number of units to be balanced with protection of architectural and cultural heritage and enhancement of the public realm	Increase in number of apartments achieved on Salesians site through more efficient layout and on Stonetown Terrace site through the replacement of townhouses with apartments. Reconfiguration of layout and design on the Quarry site to afford a greater buffer to the reservoir and connectivity through the Quarry site, Salesians site and North Circular Road.	**Population & Human Health** The design amendments resulted in; ✓Additional units, in particular one and two bedroom units, to meet housing demand. ✓Increased provision of localised play areas and public spaces which creates a sense of security and identity for future occupants and the public. ✓ enhanced quality of place and animation of the public realm and open space. **Landscape & Visual** ✓ The reorientation of buildings on the Quarry site provides a greater buffer to the reservoir enabling integration into the overall landscape scheme and wider public realm works ✓ Ensures the new build element is subservient to the Flaxmill and chimney, facilitating their continued dominance in the landscape **Cultural Heritage** ✓Reinforces and strengthens the relationship between the new build elements and existing cultural heritage buildings of significance through massing, scale and materiality. **Biodiversity** ✓ Facilitates and maintains the existing bat foraging route along the Quarry face ✓Facilitates greater retention of biodiversity on site
Reorientation and reconsideration of massing of residential blocks to maximise residential amenity and energy efficiency	Reduction of seven storey buildings on Salesians to partial six storey at northern end neighbouring Clanmaurice Avenue.	**Population & Human Health** The design amendments resulted in; ✓ Ensures adequate daylight and sunlight to neighbouring houses, gardens and apartments

	Repositioning of apartment block on Stonetown Terrace to the west and reduction in finished floor level to 9.5m Reduction in height of one of the student blocks closest to the Flaxmill to 6 storeys and repositioning of other two blocks on a north south axis to reduce visual impact from Clanmaurice Avenue and permit intermittent views through the building,	**Landscape & Visual Impact** ✓ Mitigates visual impact when viewed from Clanmaurice Avenue by positioning blocks on a north south axis on the Salesians and Quarry site and affording intermittent views through the buildings. **Climate Change** ✓ The incorporated design amendment improves solar gain within the proposed scheme. This in turn improves the energy efficiency of the development thus minimising energy use and in turn decreasing Greenhouse Gas Emissions associated with the combustion of fossil fuels. **Cultural Heritage** ✓ Reduction in height in proximity to Flaxmill respects the dominance, massing and scale of the Flaxmill Building on site
Provide for greater connectivity between the character areas, proposed Quarry Park (reservoir), the Mobility Hub and the surrounding area.	Connectivity between the Salesians site and Quarry site facilitated with provision for universal pedestrian and cycle connectivity to North Circular Road, enabling access to the Quarry Park for residents from Fernhill. Provide openings in the boundary wall to open the site up to the river and facilitate access to the Mobility Hub	**Human Health** ✓ Improved linkages and increased permeability promote walking and cycling. ✓ Integrates the development into the city and provides for new public spaces for the benefit of all **Climate Change/Air Quality** ✓ Increased connectivity allows for greater walking and cycling thus reducing the need for trips by car which in turn reduces emissions and benefits local air quality.
Reconsideration of the landscaping and public realm to provide a neighbourhood with good legibility, respective of its surrounds in an area of cultural heritage and rich biodiversity significance.	Retention of parts of the existing boundary wall facing the river, rather than full removal thereby acknowledging the functioning of the historical industrial complex. Provision of a riverside canopy to enable utilisation of the Flaxmill Plaza for formal / informal meetings and events thereby ensuring vibrancy. Inclusion of a network of pedestrian routes through the scheme. Balancing utilisation of the quarry reservoir with the protection and enhancement of biodiversity.	**Population & Human Health** ✓Inclusion of a well considered and active public urban square will contribute a sense of identity and place to the proposed scheme thereby enhancing quality of life for future users. ✓Inclusion of a network of pedestrian routes through the scheme and connecting with the wider area will have direct public health benefits. **Biodiversity** ✓ The inclusion of extensive tree planting within the Quarry site in particular and the retention of growth on the quarry face will maintain the foraging habitat for bats and will enhance biodiversity within the proposed development.

		Cultural Heritage ✓ Respects the setting and context of Flaxmill and chimney and the historic industrial landscape.
Reduction in car parking provision to encourage more sustainable forms of modal choice / transport choices.	Reduced car parking provision within proposed Phase II site with significant provision (572 no. spaces) of bicycle parking spaces, well in excess of required quantum as per the Development Plan.	**Climate Change** ✓ Increased connectivity allows for greater walking and cycling thus reducing the need for trips by car which in turn reduces emissions and benefits local air quality.

Table 5.1 Design Amendments & Environmental Improvements

In summary, the scheme has evolved from its original form and the consideration of alternative designs has resulted in significant environmental improvements that the proposed development will contribute.

5.7 ALTERNATIVE MITIGATION MEASURES

The mitigation measures outlined in the various chapters are considered appropriate to the location, nature and extent of the project and its potential impacts. As such, no alternative mitigation measures were considered.

5.8 CONCLUSION

Having examined various reasonable alternative designs, it is considered that the proposed design is a preferable option in terms of the sustainable development of the subject site.

The juxtaposition of blocks of development settled within an industrial heritage complex within an overall riverine landscape will assist in the place-making of the proposal and will contribute to fostering strong connections between the new population on site and the wider community. The current design achieves a strong mix of residential units capable of accommodating a diversity of tenures, integrated with future phases of mixed use development. The development presents a strong urban form and facilitates compact growth with appropriate higher density, but yet reconnects the site with the city and the river.

5.9 REFERENCES

- National Planning Framework First Revision, Department of Housing, Local Government & Heritage
- Limerick Development Plan 2022 - 2028
- Environmental Protection Agency's Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022