NearHome

Phase 2 Report May 2022

—

Table of Contents

Executive Summary

NearHome was funded by Transport Scotland under the Work Local Challenge Programme established to tackle issues that have arisen as a result of the COVID-19 pandemic.

Specifically the project was established to support the creation of local work hubs to respond to changes in work and travel patterns. The aims of the project were as follows:

- Demonstrate the potential for local work hubs to enhance local workplace choices by providing safe, hygienic and connected work environments
- Drive the adoption of digital design and offsite manufacturing in Scotland
- Support investment in Scotland's construction and manufacturing base
- Create new markets for Scottish materials and products, creating new employment opportunities.

NearHome presents the opportunity to create high quality spaces closer to home, offering greater flexibility and work-life balance, whilst reducing transport emissions and creating local economic opportunities – All of which is part of the Scottish Government's ambition for 20-minute neighbourhoods.

NearHome can also be a positive contributor to re-energising our communities. It presents an opportunity to repurpose vacant space in our High Streets and town centres. Although NearHome has been largely conceived to be applied within for a retro-fit and refurbishment context, it can equally be delivered as a new build solution.

This report will summarise the key outcomes of the project and explain to project through the 4 key headings: Why, What, Who and How. The following principles have been integrated into the project throughout:

- Support of a sustainable, circular economy approach to construction
- Support of modern methods of construction (MMC) and digitisation
- Use of Scottish timber to form the structure, interiors and potentially furniture
- Adoption of materials and design to help maximise infection control
- Integration of best practice regarding office design
- Incorporation of best practise for physical security
- Adoption of a modular, demountable approach which is mass customisable and designed for deconstruction/ re-use.

—

Why NearHome?

The post-COVID-19 era has presented us with the challenge of re-imagining the workspace, and has accelerated a change in the relationship between employer and employee, as well as landlords and tenants that will require a more flexible approach to the concept of "place of work".

A New Model for Fit-Out Design

Satellite offices and co-working hub concepts have been gaining traction for some time and the idea of re-purposing vacant space is a powerful one. However, without clarity on the viability or long term need for these spaces there is a risk of adopting the typical approach to fit-out that is both wasteful and unsustainable.

The NearHome product seeks to challenge such an approach and propose a new, highly sustainable way of delivering this typology of space.
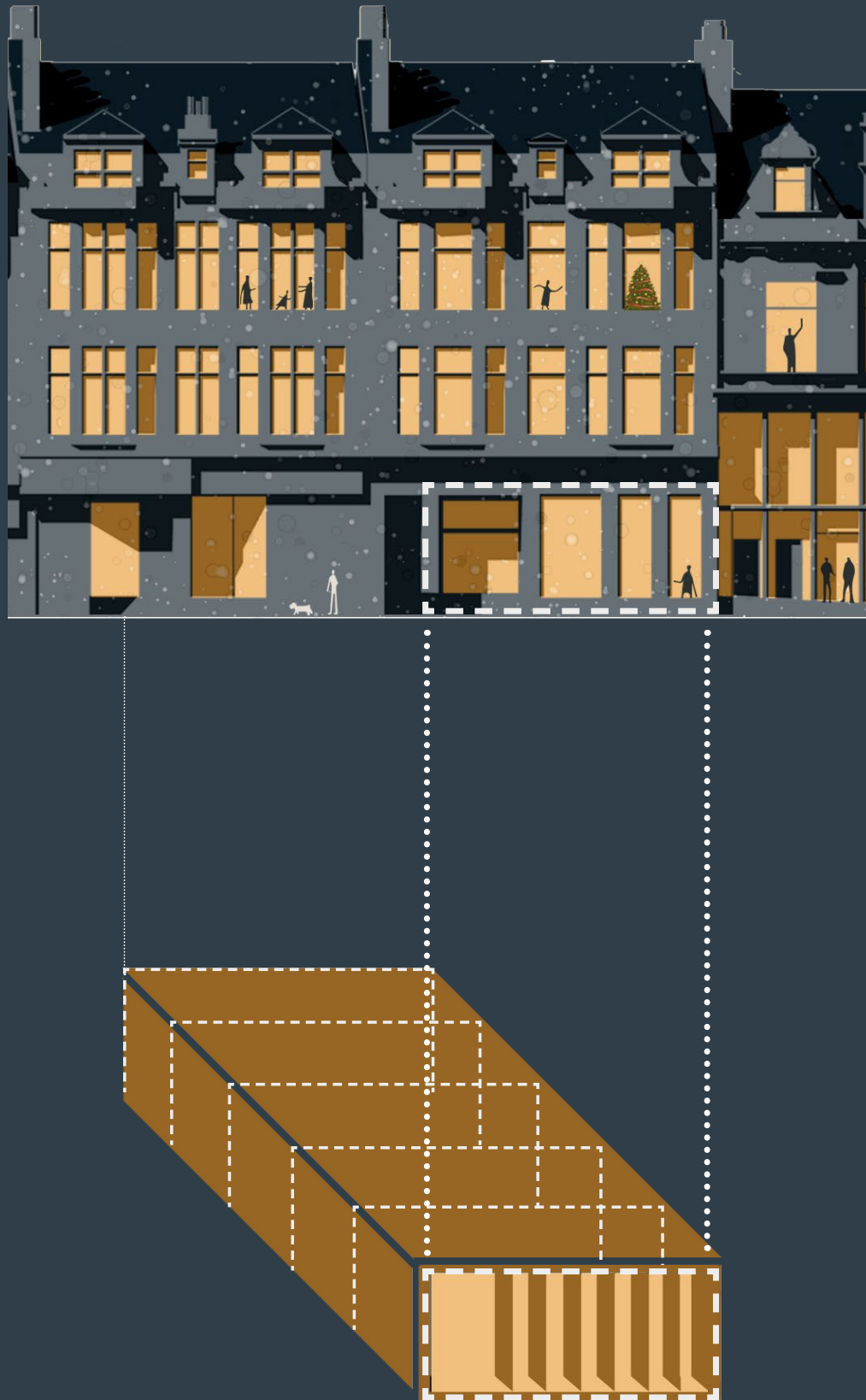
A Catalyst for Change

COVID-19 has exacerbated several social inequalities in terms of access to the workplace and behaviours in our community.

Beyond the significant environmental and sustainability benefits deriving from the physical characteristics of the product, NearHome can also be a positive contributor to social and community agendas.

The way we work is changing and our response to these changes will not only provide an opportunity to improve the work-life balance of individuals and overall business productivity, but also to make a real difference at a local level within the communities we engage with.

Decentralising office space from urban centres, into smaller communities and towns, can positively influence the following:

- Improved access to the workplace
- Regeneration of our High Streets through diversification of offer, that will lead to increased footfall to support and complement other activities
- Re-integration of businesses and commercial activities into the community.

NearHome will allow businesses to provide premises that will improve their employees lifestyles as well as making a positive impact on the wider community.

What is
NearHome

NearHome Explained

NearHome is a product designed as a kit-of-parts. Its core application is withing existing environments, however the product can also be developed as an external stand-alone new-build solution.

NearHome is designed around circular economy principles to:
- Deliver circular economy principles
- Maximise re-use
- Promote the growth and development of Scottish economy and manufacturing.
- Designing for deconstruction and flexibility

Designed as a kit-of-parts, not only can the product be assembled to work in a number of configurations in diverse locations, but it can be disassembled for transfer to a different location or returned to the production line for recovery.
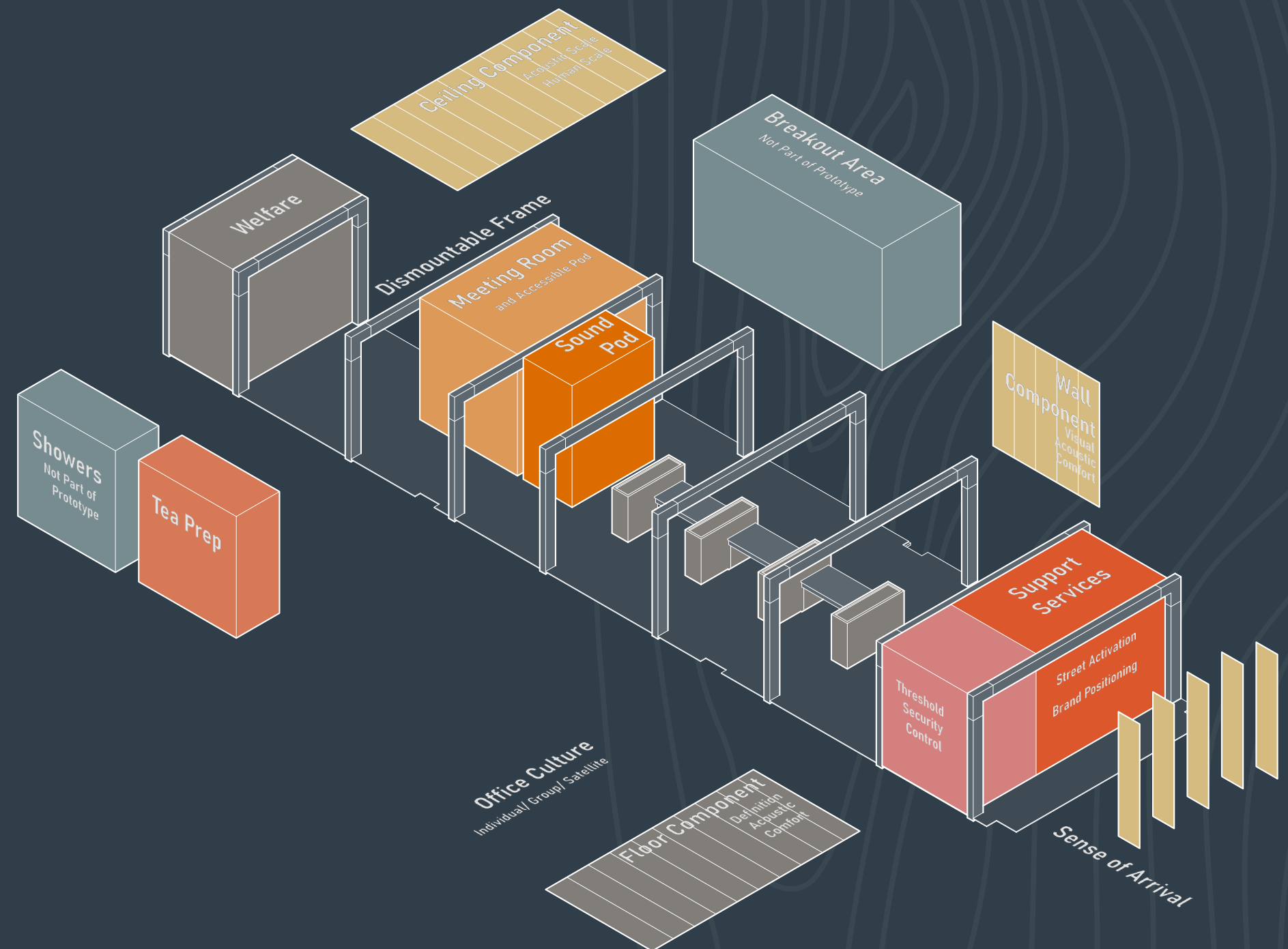
Principles: 8 Stage Manifesto

1. A Sustainable Retrofit

The kit of parts can be reused multiple times and the structure is made of local natural materials with a reduced carbon footprint. Furthermore, at their eventual end of life, the components can be easily disassembled into their constituent parts for full reuse or recycling.

2. A Network of Hubs

Support for the creation of a network of hub offices throughout Scotland, reducing the amount of car travel and providing a workplace option within walking/ cycling distance for users. This will enable healthier lifestyle choices and reduce the amount of car journeys undertaken for commuting.

3. Health and Wellbeing

The latest research in reducing the impact of COVID-19 has been considered as part of the design process. Timber is used as the main material as it has been shown to be beneficial in reducing stress levels in environments where it is applied. All materials have low or no Volatile Organic Compound content, resulting in improved air quality.

4. Prioritise Value

A product that delivers value by prioritising quality as well as cost. NearHome is designed to be in comparable with typical fit out costs, but has the added advantage of a sustainable approach with a greatly reduced carbon footprint. Because of its minimal reliance upon external structure it can also be utilised to retrofit buildings where cost may have been a prohibitive factor.
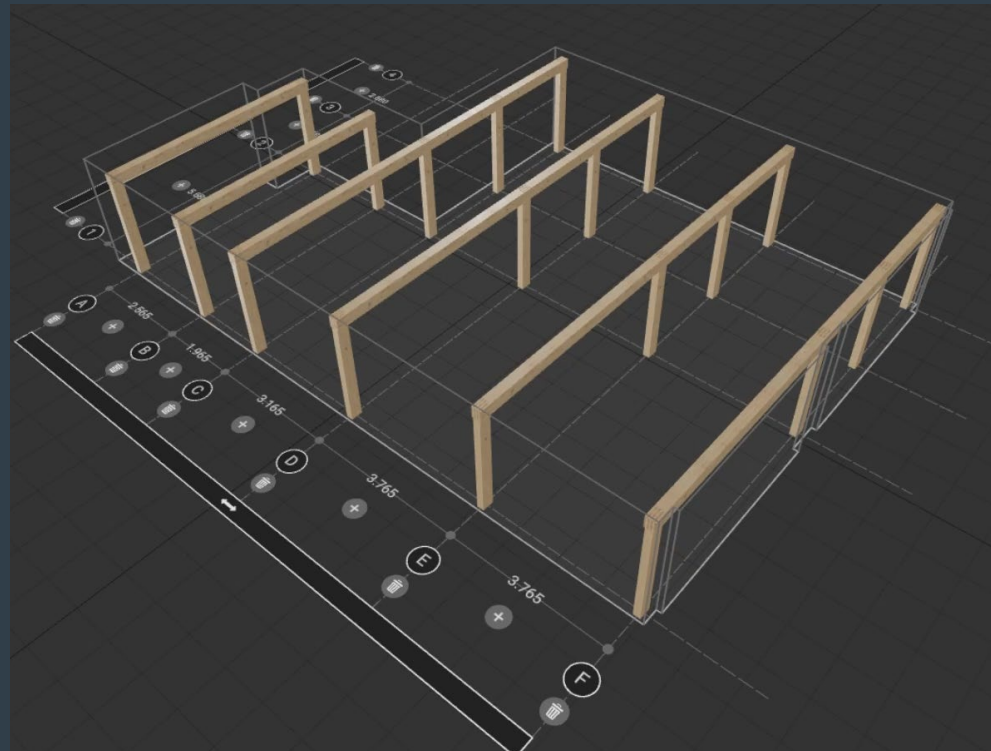
5. A Scottish Product

Recent UKRI funded research has proven the viability of Scottish timber as a building material.

The use of this product provides support to the economy and mitigates for the vagaries of availability and cost fluctuating connected to fluctuating costs of imported alternatives.

Supporting the use of local materials. NearHome makes extensive use of Scottish homegrown timber. This provide the dual benefit of supporting parts of the Scottish economy as well as delivering a significant reduction in terms of embodied carbon. The use of timber in workspaces has also been shown to be beneficial in reducing stress levels.

7. Adaptability

Built-in flexibility means the product can also be used to form a standalone structures or building as well as a part of a retrofit or refurbishment. We recognise that not all locations that would benefit from a hub office may have a suitable existing building to retrofit, so the kit of parts can deliver a new-build office if required.

NearHome is based around MMC principles including offsite manufacturing, increased digitisation and a focus on sustainability.

6. Open Source

An open-source toolkit which has been deliberately designed to be simple to replicate, providing opportunities for potential users and construction firms across the country.

8. Learning in Use

Inclusion of a state of the art, yet low cost, IoT sensor network which will allow non-intrusive and effective monitoring of the building and the occupancy rate. This will provide hard data to help refine the design in further phases and improve the performance.

NearHome is an approach to building, not just a building solution.

Who Can Use NearHome?

Who is NearHome For?

NearHome is relevant to a wide variety of key actors within the commercial and workplace sector. The range of hub solutions that can be delivered with the product can bring different benefits to these parties.

Local Authority Landlords: as custodians of our urban centres, Local Authorities are faced with a complex challenge of depopulated high-streets and the management of a multitude of vacant and/or substandard properties. Re-purposing assets with NearHome can help re-purpose vacant units, diversify towncentre and drive footfall.

Private Landlords: The Covid-19 pandemic has accelerated a re-think of the traditional landlord / tenant relationship around rent models and legal agreements. This has compounded the Landlords' challenges in the market around the growing demand for more socially and environmentally sustainable workplaces.

Nearhome offers an agile platform that can support both short-term / meanwhile approaches for space that allow new or vulnerable businesses to incubate and strengthen to become valued partners.

Employers: NearHome will offer a 'decentralised premises approach' for employers that will offer opportunities to create a better work-life balance to existing employees as well introducing a solution that may allow them to access new skills and resources. The approach will also help integrate more remote communities when they might have previously been financially unsustainable.

Third Sector: Communities and community groups are becoming more empowered by central government policy. However, they often lack experience and knowledge to navigate through the development process and achieve funding. NearHome has been deliberately designed to be simple to replicate, adapt and use - breaking down the barriers of adoption.

GIS Report & Ideal Locations

The location of a workplace hub will have a strong impact on its success. As part of phase 2 of the project the University of Edinburgh was commissioned to undertake an exploratory exercise in the potential that Geographic Information Systems (GIS) could have on the selection of the report.

GIS uses a big data approach to combine multiple sources of spatial and demographic data to identify the potential of different locations. The report analysed urban and rural sample areas and was able to quickly identify possible locations for a hub. For further information on the report contact Built Environment – Smarter Transformation.
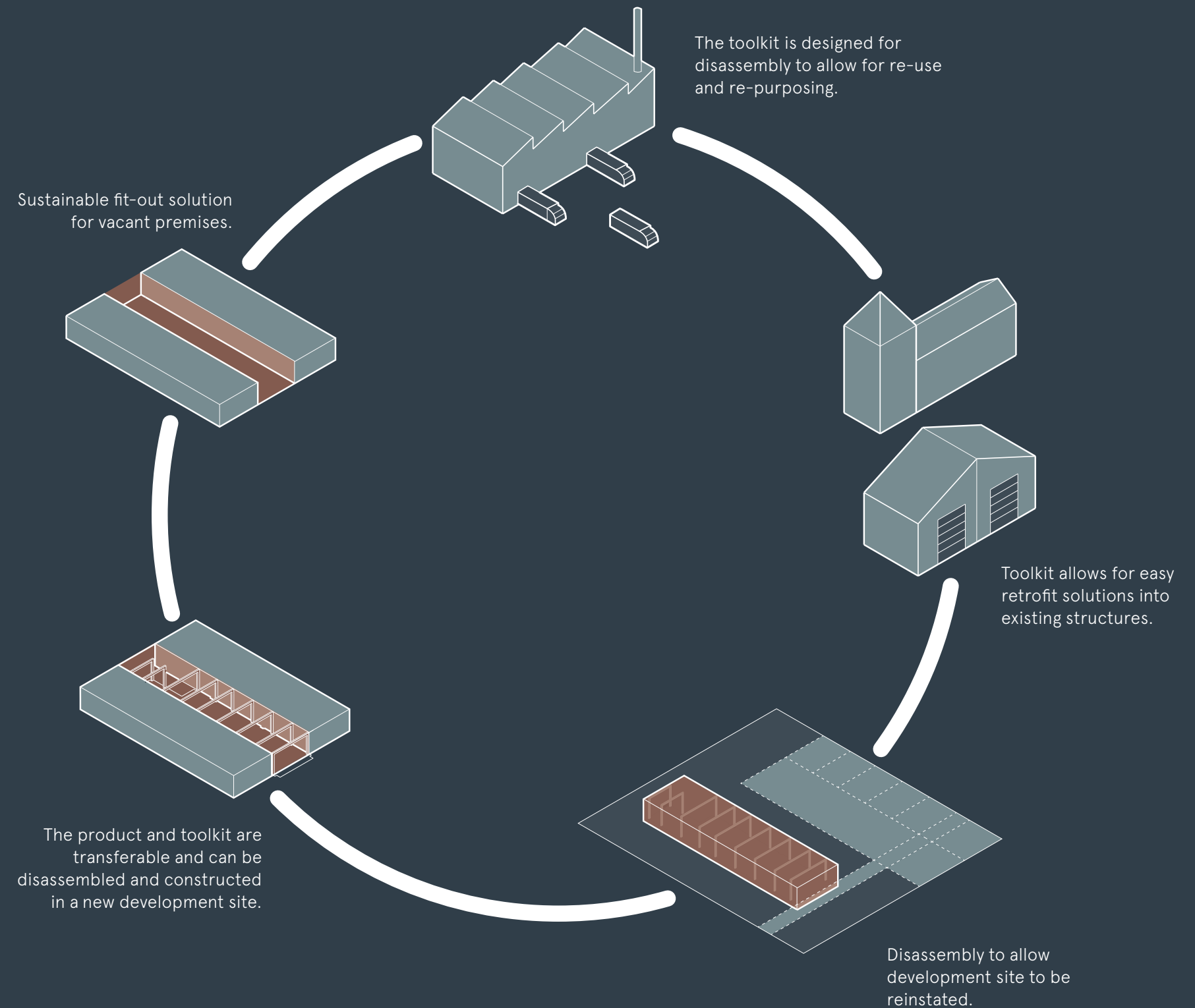
Where Can NearHome be Used?

Where can it be applied?

The flexibility and complexity of the product allow NearHome to be applied in almost any scenario. The key categories we are considering are:

· Repurposing vacant space
· Stand-alone pods
· New build

Built-in flexibility in the component based approach means the structure can also be used to form a standalone building as well as a retrofit. We recognise that not all locations that would benefit from a hub office may have a suitable building in place to retrofit, so the kit of parts can be used to construct a new build office if required.

The toolkit is designed for disassembly to allow for re-use and re-purposing.

Sustainable fit-out solution for vacant premises.

Toolkit allows for easy retrofit solutions into existing structures.

The product and toolkit are transferable and can be disassembled and constructed in a new development site.

Disassembly to allow development site to be reinstated.

Retrofit in Highstreet

A catalyst for Highstreet regeneration

The recent shift in retail patterns has had a profoundly negative impact on the health of the high street. The recent report "A Vision for High Street Regeneration" from Scotland's Town Partnership recommended creating workplaces as one of the necessary steps to help rebuild a vibrant high street.

The flexibility of NearHome means it is ideally placed to help convert vacant premises into functional workplaces. The cost of refurbishment or upgrade of these assets often represents a key barrier to viability. NearHome, and it's inherent of life-cycle' value can help tip the balance for some of these locations.
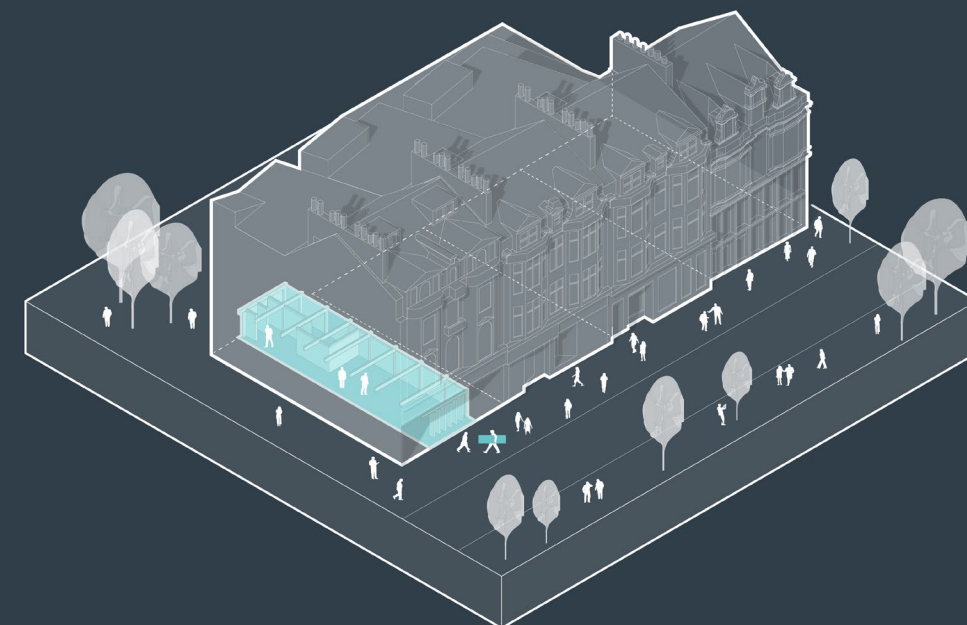
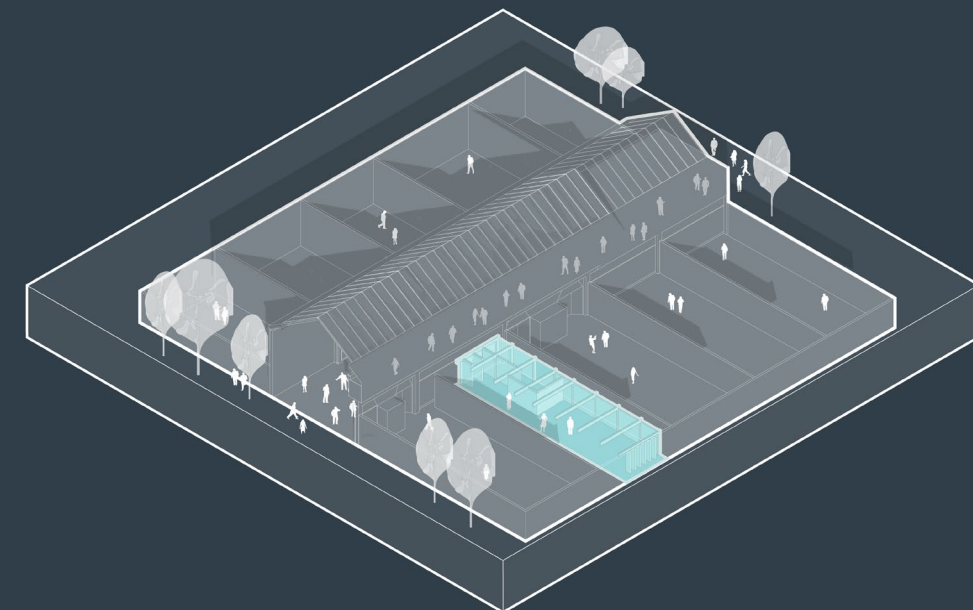Street Activation ▶

Brand ▶

Experience ▶

Retrofit in Malls

Bringing a human scale to internal environments

By using robust, appealing and natural materials NearHome creates a high quality, sustainable fitout solution that can be attractive to individual users and inspire a new model for workplace design. The re-purposing and refurbishment of internalised space presents a number of challenges (visibility, access to daylight and brand positioning). In response NearHome focuses on bringing the following key qualities:

Intriguing – Engage the community.
Identity - Position the business and be recognisable.
Inspiration - Be a welcoming and comfortable place of work for the employees.

Street Activation ▶

Brand ▶

Experience ▶

Retrofit in Industrial

Comfort and Acoustics

The NearHome kit-of-parts can be used to create an insulated environment within larger spaces such as Industrial premises. This simple addition would provide the user a sense of scale, comfort and a degree of privacy within the open-plan layout.

A particular challenge for industrial spaces is managing diverse environmental requirements such as balancing heated vs on-heated areas. NearHome allows to develop base-specification envelopes within which localised (and flexible) high spec spaces can be introduced.
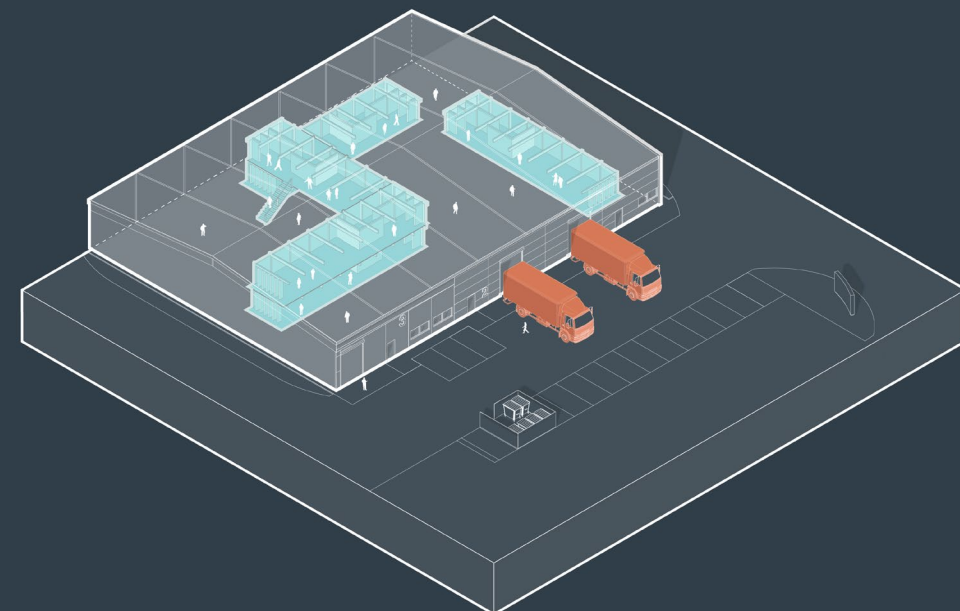
Human Scale ▶

Comfort ▶

Experience ▶

Retrofit in Historic

Re-use and Repair

NearHome design allows a retrofit to be undertaken with minimal reliance upon the existing structure. This is particularly useful for buildings where reuse may have been an impossibility due to the prohibitive costs required to bring them up to speed – for example historic buildings, those with poor sustainability credentials or buildings in a poor state of repair.
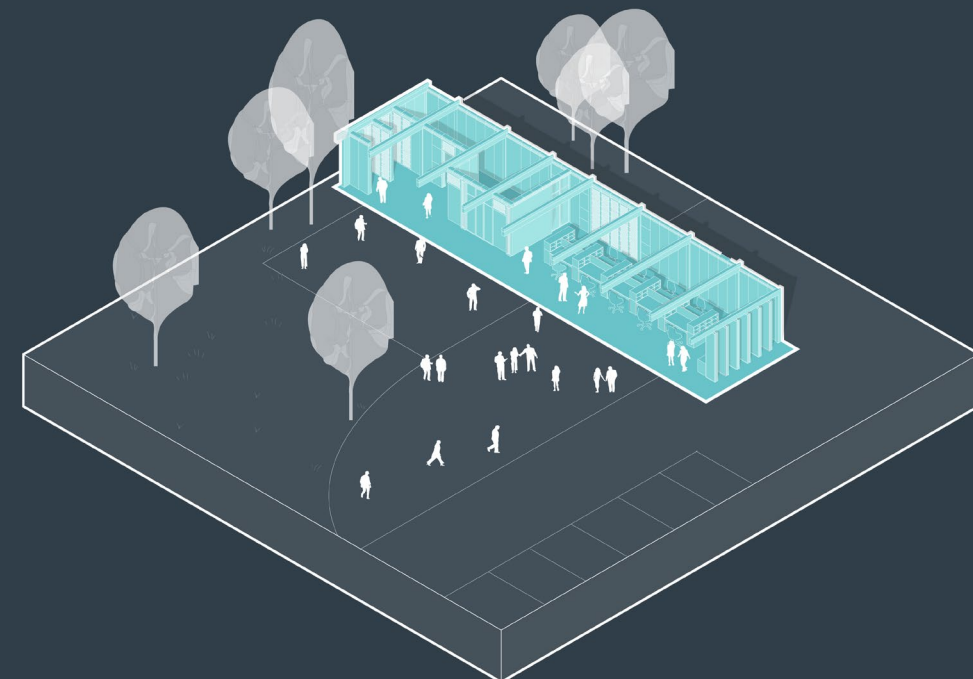
Retrofit ▶

Comfort ▶

Experience ▶
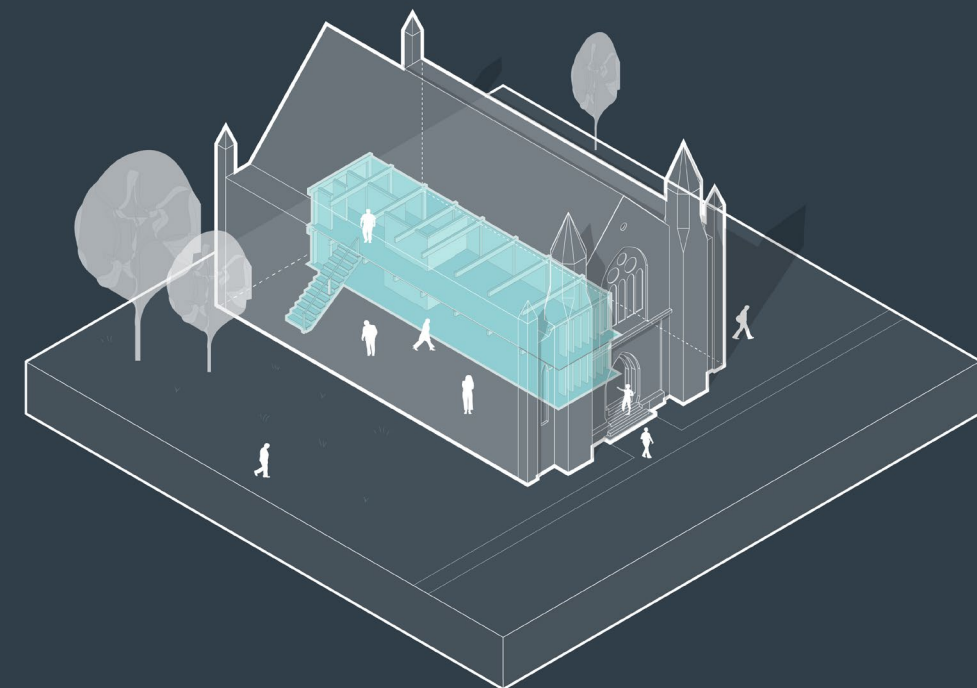
New Build

A Standalone Building

The structure has been designed in a way that if can easily integrate an upgraded envelope to create a free-standing structure or new-build solutions.. This is an extension of the original concept, providing a greater breadth of solutions., particularly in locations where a suitable building or existing premises are not available for retrofit.

How to deliver NearHome

The Structure

The structural solution was designed by ECO Systems Technologies and the Centre for Offsite Construction and Innovative Structures (COCIS) at Edinburgh Napier University, with SER advice provided by Christie Gillespie Consulting Engineers.

This was developed from initial designs developed by ECO Systems and COCIS in an earlier collaboration. The 'Glue Laminated Timber Portal' (GLTP) was first deployed on the Homegrown Mass Timber Demonstrator project, designed and manufactured during the latter part of 2020.

The GLTP maximises the use of home-grown timber and has been enhanced for this project to be able to be assembled from several subcomponents (and subsequently disassembled and reused). The configuration also allows off-cut material to be efficiently used within the knuckle element, minimising waste and further enhancing the project's circular credentials.
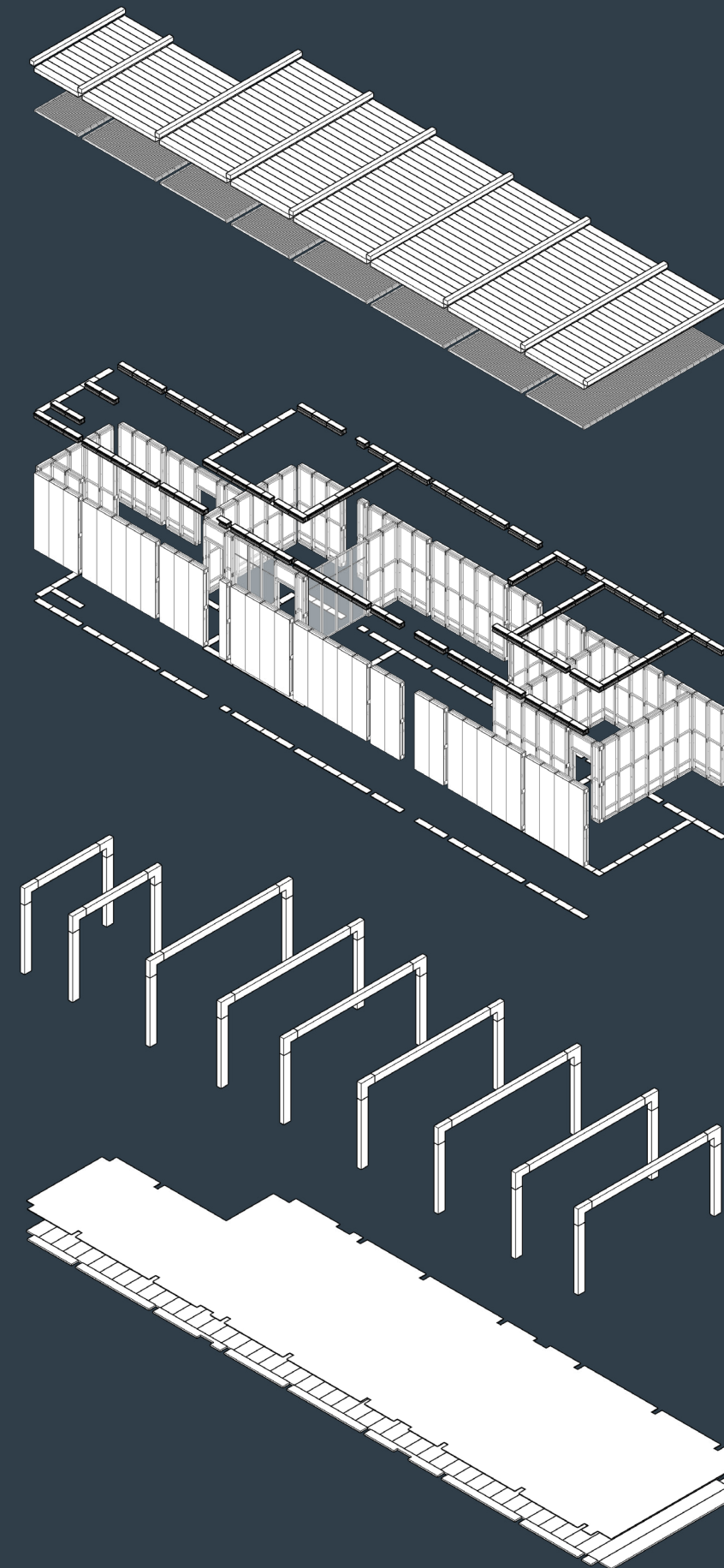
Exploded isometric view of generic design of NearHome structure prototype created in the BE-ST (Built Environment – Smarter Transformation) Inovation Factory

NearHome is a sustainable, circular economy approach to construction.
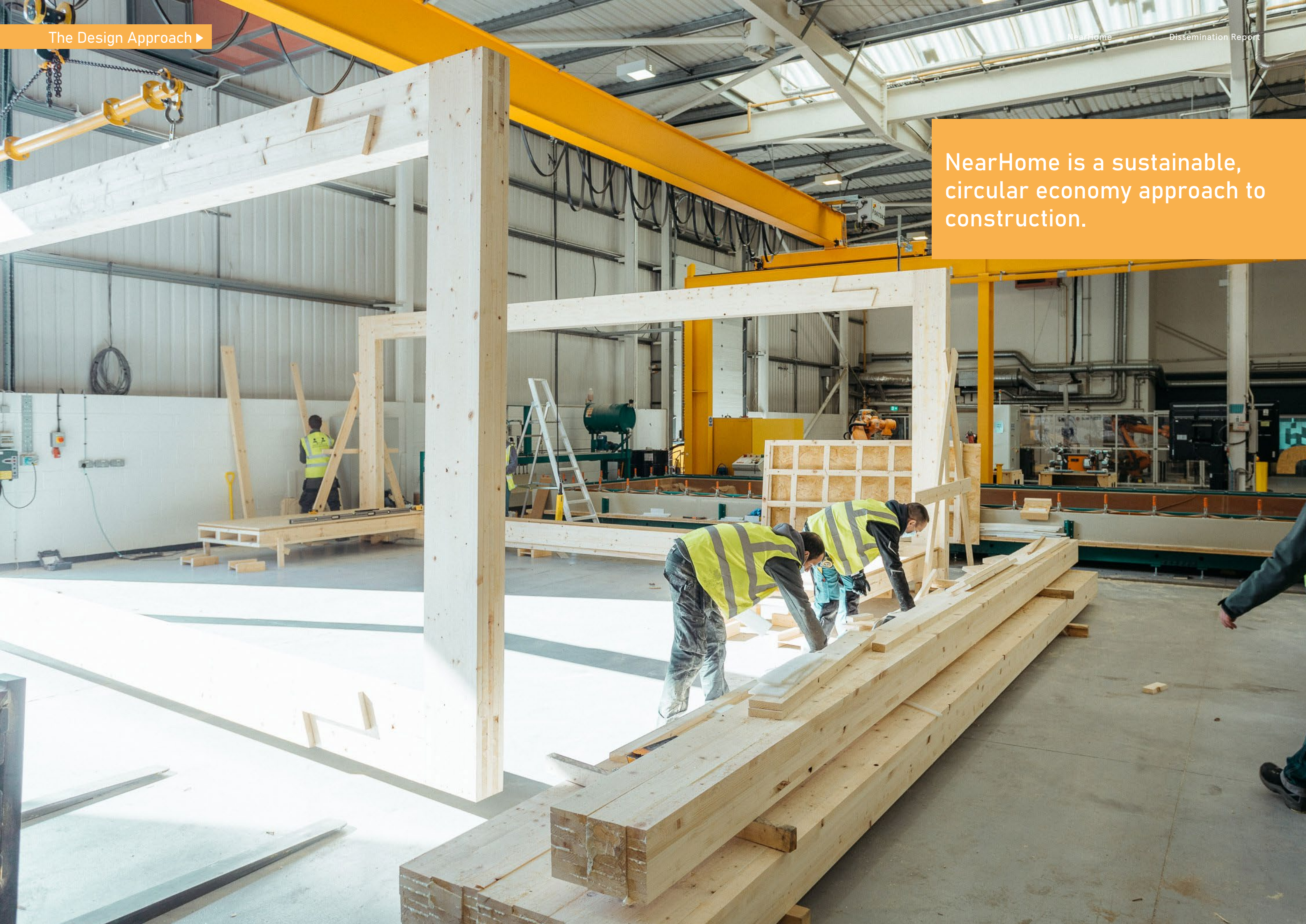
Workplace Design

The approach to the interior design of the space is founded on the same principles that inform the structure: A kit-of-parts solution designed to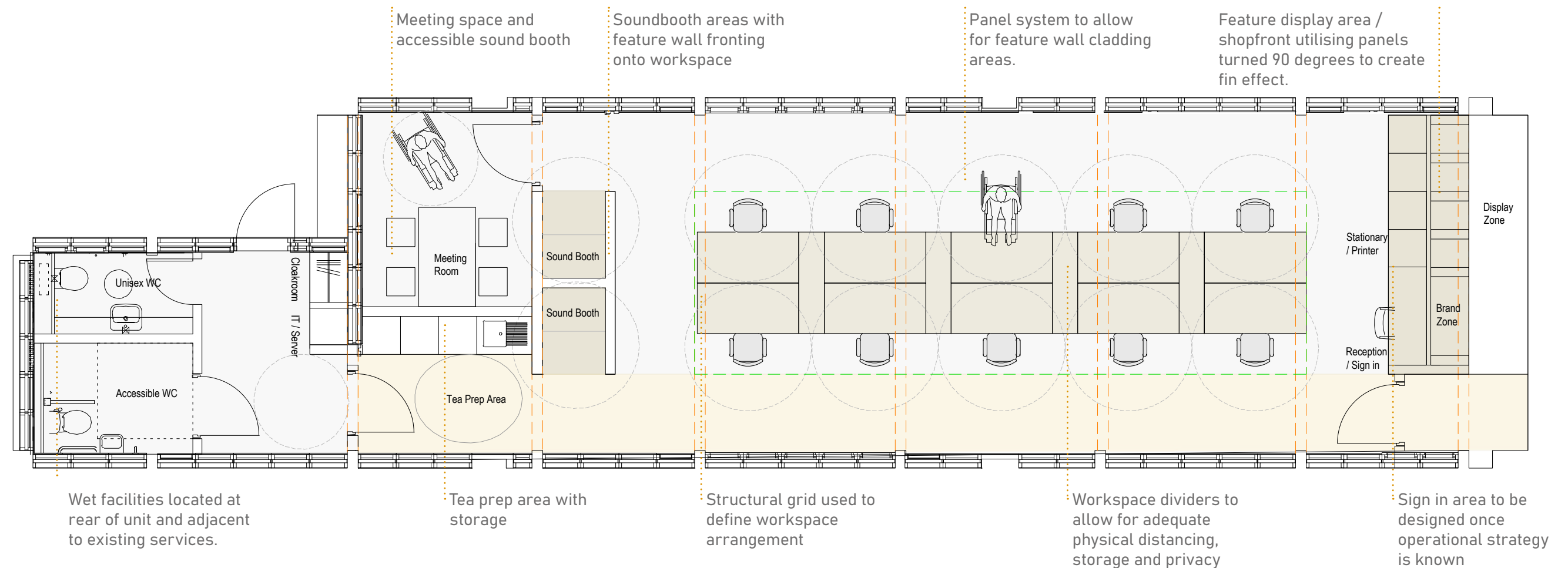 maximise flexibility and be able to adapt to multiple spaces and end-user requirements. The workplace design focuses on the user experience, the overarching appeal of a space and the positioning of a potential brand.

Meeting space and accessible sound booth

Soundbooth areas with feature wall fronting onto workspace

Panel system to allow for feature wall cladding areas.

Feature display area / shopfront utilising panels turned 90 degrees to create fin effect.

Unisex WC

Accessible WC

Cloakroom

IT / Server

Meeting Room

Sound Booth

Sound Booth

Tea Prep Area

Stationary / Printer

Reception / Sign in

Display Zone

Brand Zone

Wet facilities located at rear of unit and adjacent to existing services.

Tea prep area with storage

Structural grid used to define workspace arrangement

Workspace dividers to allow for adequate physical distancing, storage and privacy

Sign in area to be designed once operational strategy is known

Generic Workplace Fit-out Design

Kerb Appeal

The 'shopfront' provides a canvas to position the brand and communicate with the public. It plays a critical role in the activation of the street and defines the threshold between the public and the workspace environment. It is also an opportunity to showcase the product.

The proposed facade will utilise the standard frame of the kit, but dressed with a series of fins. This creates an entrance that balances visual permeability with a degree of solidity to achieve both the desired aesthetic qualities and other functional aspects such as storage.

Typical design features and considerations for the entrance area are:
· Use of standard kit
· Opportunity for colour and brand
· Thoughtful design and management of threshold

Privacy & Accessibility

To provide the level of flexibility expected of a normal office, the individual work stations need to be supported by polyfunctional spaces such as meeting rooms and break-out areas.

The design of the meeting room and sound booth areas has focused on providing a retreat space where lighting and ambience are controlled to create a pleasant and functional environment for meetings and phone calls.

Accessibility is an issue that has resulted in severe inequalities over the years. The risk of these being exacerbated in a post-COVID workplace should not be underestimated.

Addressing this issue will play an important part in defining the brief for each NearHome site. A detailed brief should be agreed at the next stage of design and particular consideration given to furniture design and the functionality of shared areas and welfare spaces.

Creating Human Scale

The wellbeing impact and comfort features of the space highlight its quality. As well as some of the more typical opportunities deriving from space planning and furniture design, the study is being supported by a number of specialist designers, while the focus of the next stage will be on coordinating the detail.

Key design themes and opportunities being considered are
·   Furniture design
·   Biophilic features
·   Lighting
·   Sound and thermal comfort
·   DDA and accessibility requirements

Welfare facilities play an important part in modern office life; traditional requirements of WCs and tea prep areas will still be needed as will more recent add-ons such as showers, bicycle facilities, break-out areas, alternative work spaces and many more.

Wellbeing

Ensuring the health and wellbeing of all users is at the core of the NearHome project.

A specialist lighting design system has been incorporated to allow the concept to be deployed to multiple spaces. Research shows that good lighting levels can have a huge impact on user health and wellbeing. The NearHome system has been designed to take users health and wellbeing into account, as well as optimising performance. The system has also been designed to minimise the requirement for touch points to reduce transmission risk

Acoustic design advice was sought to ensure that the design did not adversely impact upon the users through poor acoustics or noise transmission. In addition, the requirements for creating privacy within an open plan setting were considered.

A IoT system has been designed by CENSIS to be incorporated into the NearHome prototype, with the adaptability to be included in future roll outs of the project. This will allow unobtrusive monitoring of environmental aspects, structural elements and utilisation of space. The system has been designed to use low cost, off-the-shelf technologies.
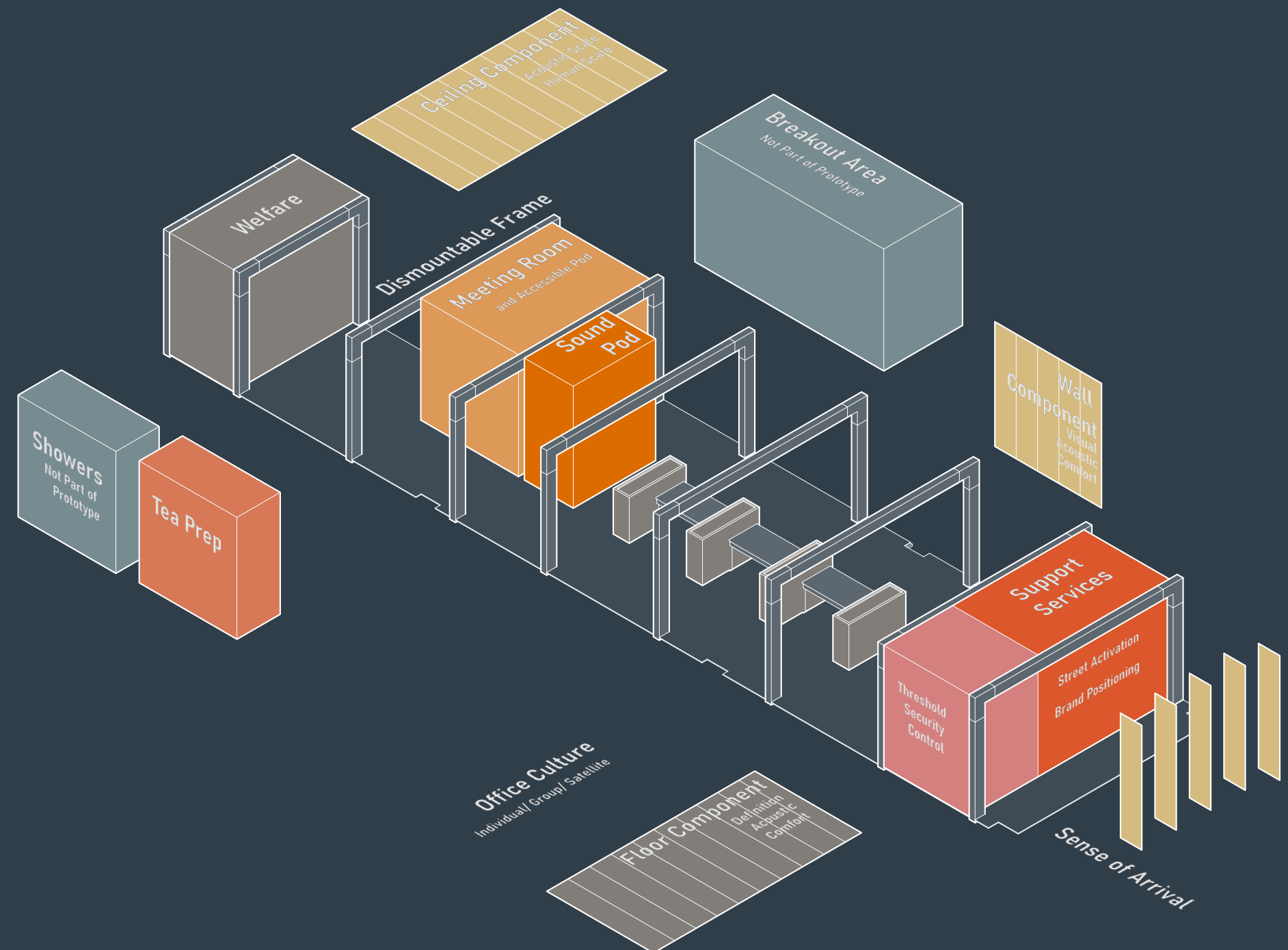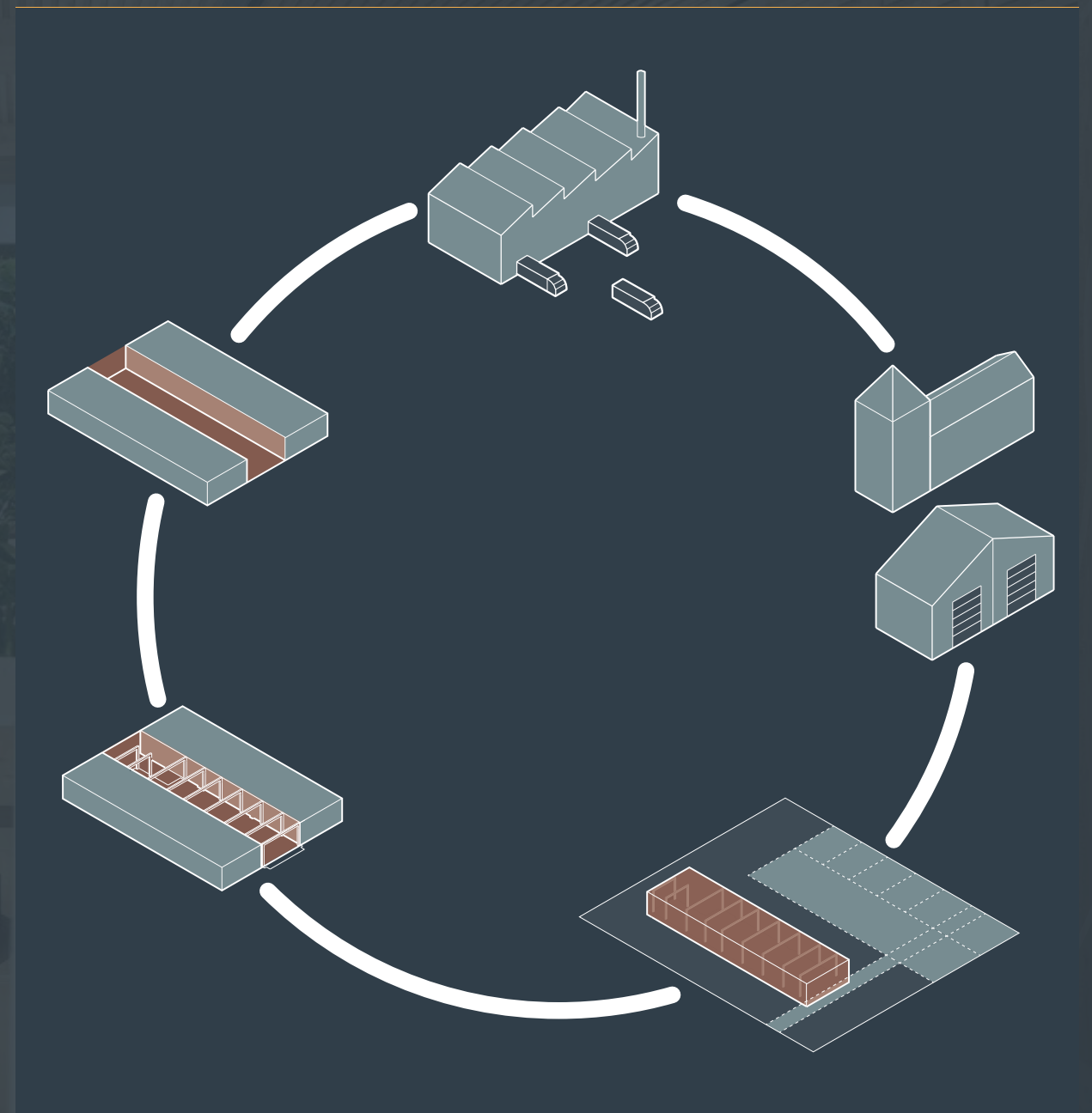
| Data | Design | Delivery |

Briefing Stage

The purpose of the briefing stage period is to create alignment and provide clarity to all parties involved. This should be captured in a published brief that sets out the client's vision, objectives, and requirements. The brief should also set out the desired outcomes, as well as recording the key information on the site/context/existing constraints and opportunities, and anticipated project budget.

Location Analysis

At the start of the project the Design Team should visit the site to establish and record the opportunities and constraints. This will include developing an understanding of the site and surrounding context. For both new build and refurbishment projects, the Design Team should brief and advise on the selection of experts to carry out necessary surveys required to support the process.
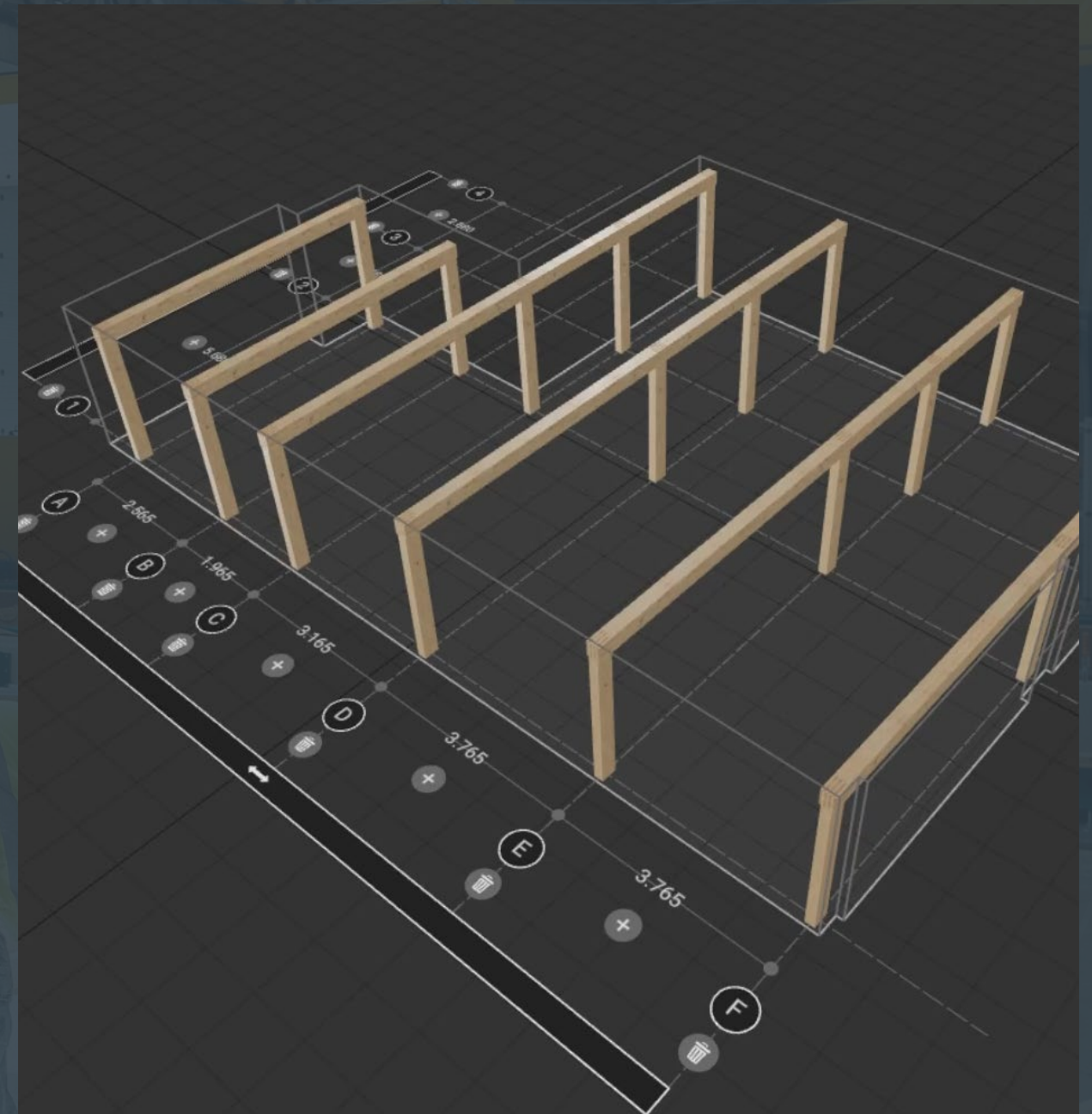
Data	Design	Delivery

Design Development

Following an options appraisal, the preferred solution is adopted and the design developed and co-ordinated with the input of all the designers. Key technical and design issues are considered to propose a solution that is finally approved by the Client. The EcoSystems component design tool (as illustrated on this page) will allow for a rapid assessment of the layouts providing an understanding of quantities and component breakdown. At this stage the design team is encouraged to present their proposal through a clear and highly graphical narrative. This can be used to engage and excite stakeholders and compel them to buy in to the project. The final step in this stage is the submission of a Planning Application.

Planning

A planning review for each NearHome site should consider planning implications such as:

- Change of use
- Listed building consents and heritage
- Signage applications
- General policy review

Data   **Design**   **Delivery**

Building Control

It is important for each site to establish at an early stage, the relevant building standards to be applied.

Typically for refurbishment projects, a key risk to be assessed is the potential impact of a "change of use" of the space. This can result in the application of onerous standards such as the need for upgrading the existing envelope to improve thermal performance. NearHome's 'box within a box' approach allows to reduce the risk, limiting the area of space where certain building standards will apply.

For example, rather than upgrading the existing fabric of a whole building, NearHome provides an upgraded and compliant environment only where required. Equally, issues around access and comfort can be managed locally, resulting in a more efficient use of materials and continuing to promote circular design principles that support disassembly and re-use. It is important to engage early with the local Building Standards authority to agree this approach.

As part of the product development, the opportunity for Building Standards Type Approval is being considered to de-risk the product to simplify Building Control discussions and also resulting in increased certainty around cost and improved procurement and programme.

| Data | Design | Delivery |

Manufacturing

The open-source toolkit has been deliberately designed to be simple and easy to replicate, providing a platform that can be adopted and delivered by a variety of potential users, landlords and construction firms. NearHome is founded on MMC principles including offsite manufacturing, increased digitisation and a focus on sustainability.

In Use Learning

As the NearHome product is delivered, it will be important to carry out a "lessons learnt" review to assess what worked well and what could have been done differently. This review would cover all aspects of the design with an initial focus on:

- Improving the kit-of-parts
- Opportunities for further standardisation of details
- Layout and environmental considerations.

TRANSPORT
SCOTLAND
CÒMHDHAIL ALBA

Find out more

NearHome: Getting to work on retrofit
be-st.build/case-studies/nearhome-getting-to-work-on-retrofit