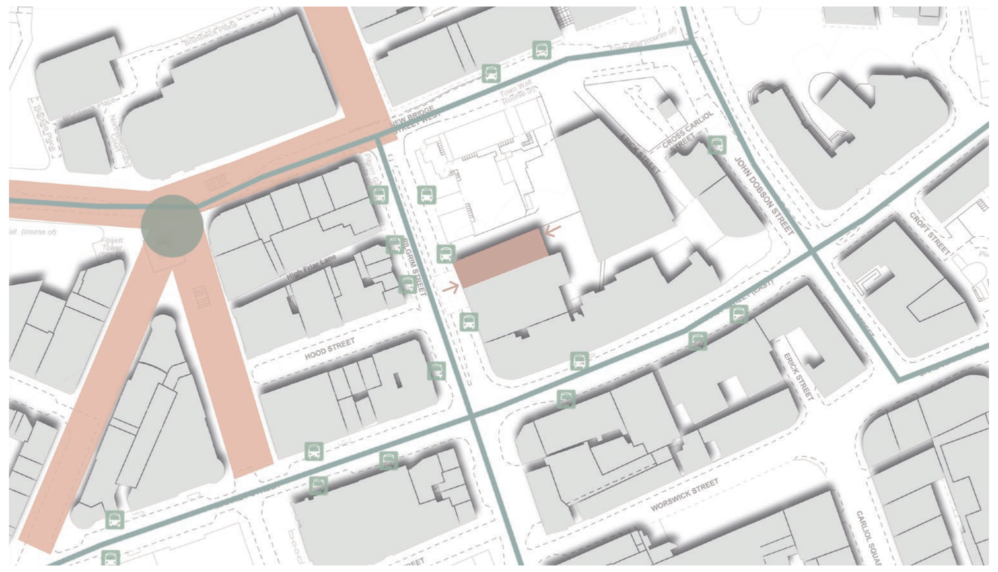
YMCA Circular Clothing Centre

CIRCULAR DESIGN · PRODUCE · LEASE/BUY · USE & RETURN · UPCYCLE · RECYCLE · CIRCULAR DESIGN

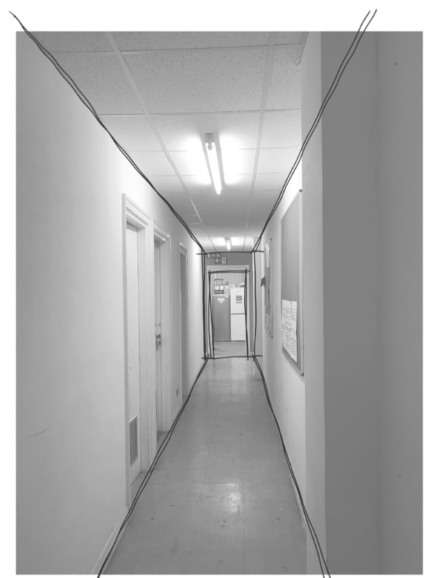
SUSTAINABLE AND CONTEMPORARY REDEFINED CLOTHING CHARITY SHOP IN NEWCASTLE CITY CENTRE

SITE PLAN & CONTEXT



YMCA Site
Site Access
Pedestrianised Areas
Bus Stops
Metro Station
Main Roads/Bus Routes

SITE CONSTRAINTS



Highlighting the low ceilings and narrow corridors

Located in Newcastle city centre, the site houses the **ground floor** and part of the **first floor** of **Commercial Union House**, Pilgrim street. It has great access to transport links being located on a **main bus route**, with a bus stop directly outside, ensuring the site's **accessibility**. It is also in close proximity to **Universities**, having a great market for students. The main access point is on Pilgrim Street, with rear access from John Dobson Street.

The main constraint of the existing site is the **long, narrow corridors** and **lack of internal natural light**. The site is sheltered and surrounded by many tall buildings, which impacts heavily on the **internal daylight lux levels**.

SITE SKETCHES

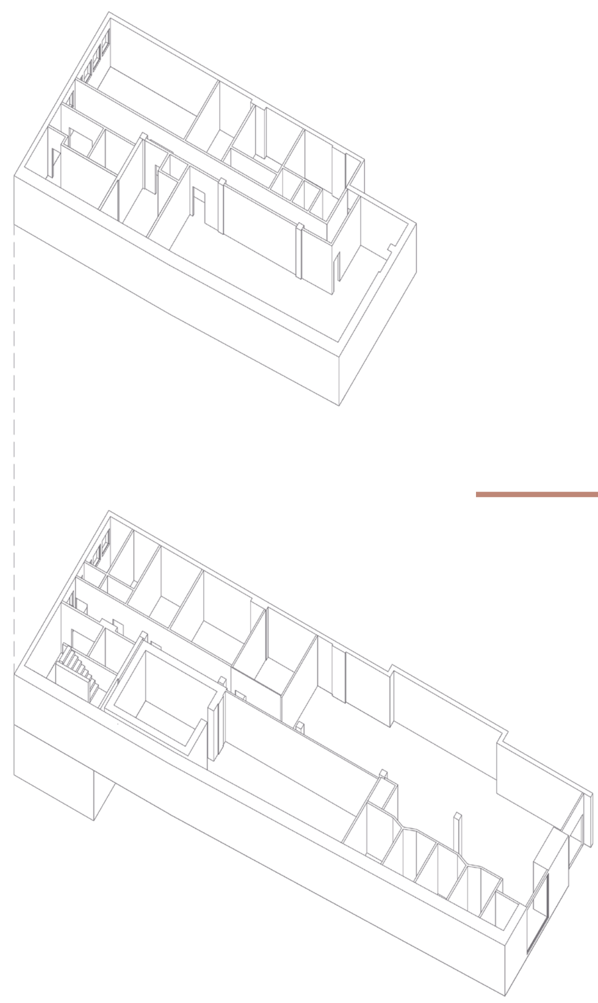
The site's small scale in comparison to Commercial Union House, the building the site sits within

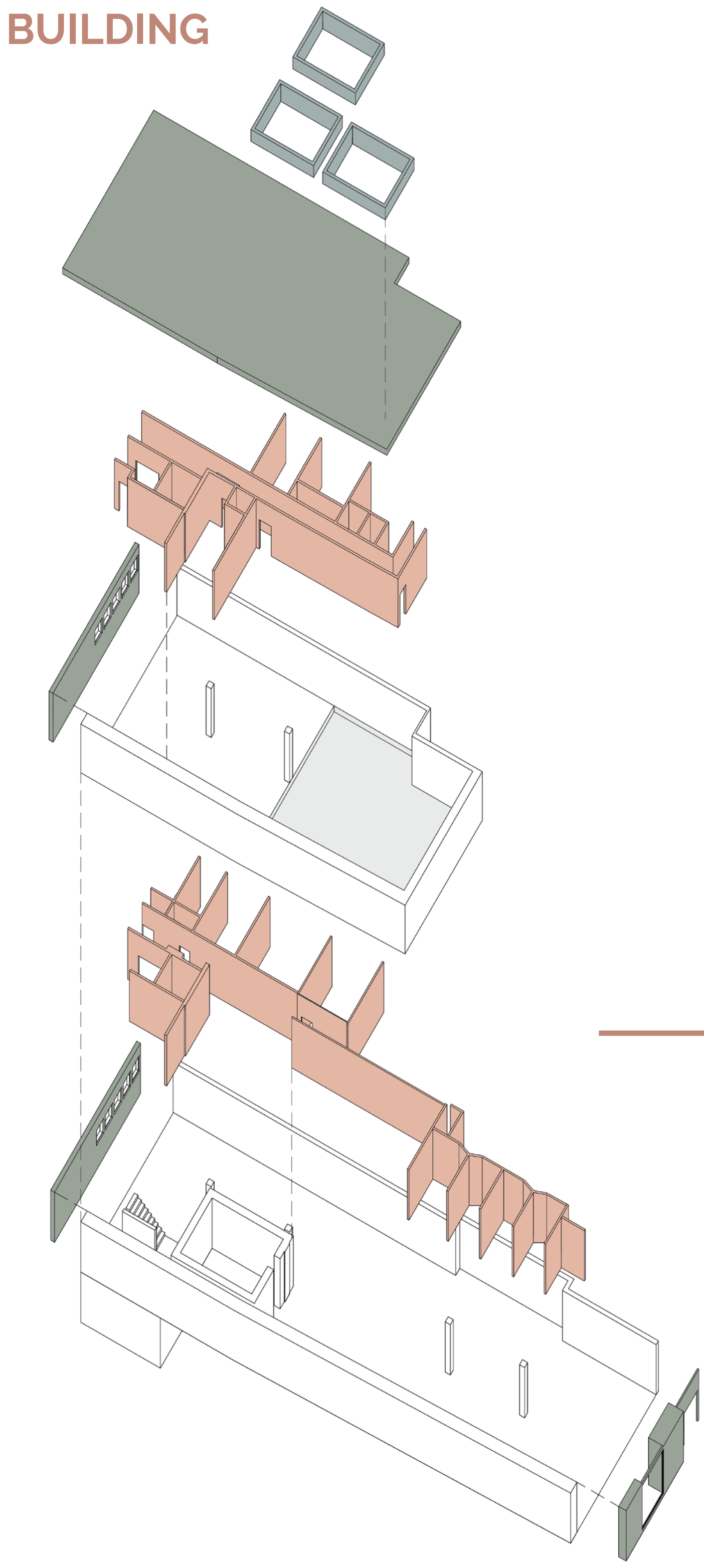
The main facade hidden underneath the overhang of Commercial Union House and bus stop right outside the shop front

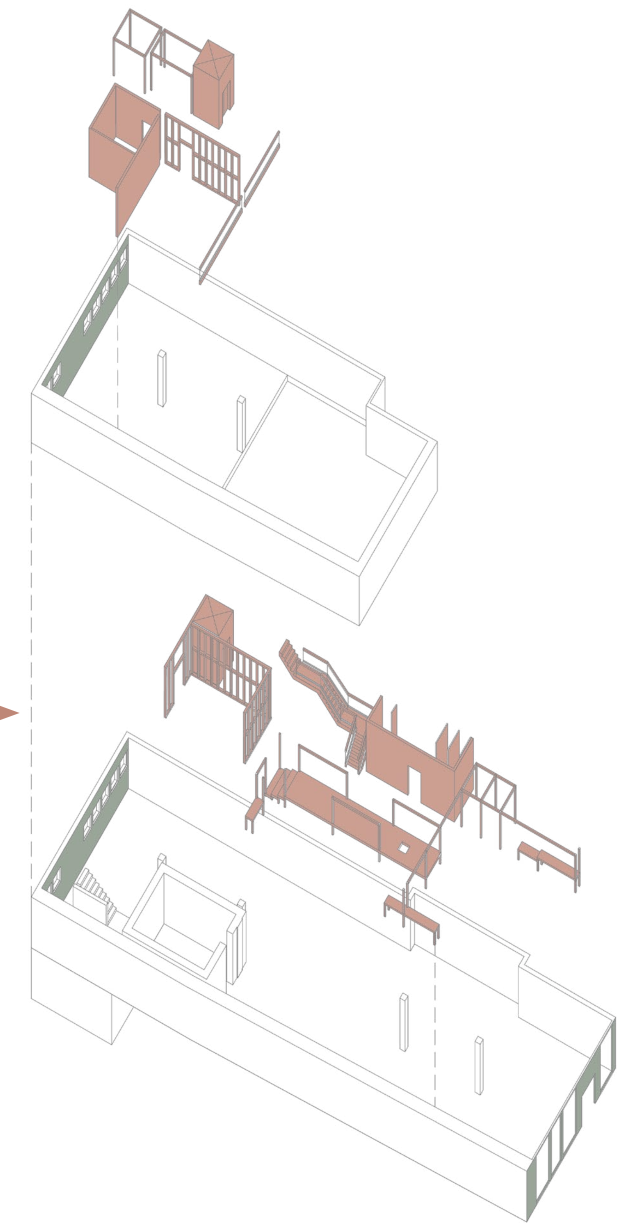
The **YMCA Circular Clothing Centre** uses recycled materials to create a **sustainable building**. The core programme, **up-cycling garments and fabric** from items donated by the public, highlights the importance of **circular fashion** and **sustainability**. This theme is reinforced within the building design by **up-cycling the materials in the existing building** to create this new charity shop.

The design takes the narrow and crowded existing building and strips it back to light, open plan spaces by utilising **open partitions**, which are recycled from the **existing internal partition walls**. The concrete structure which has been removed has been recycled to form part of the poured concrete floor. Upgrading the existing building envelope, by replacing the old insulation with **new insulation** and the existing windows with **new double glazed windows**, reduces cold bridging and creates a more **air tight building**, ensuring the new CHP generator system works to its full potential by not allowing any heat escape. Upgraded ventilation systems allow the air inside the building to keep refreshed throughout the day, through **natural ventilation** and **purge ventilation**, ensuring the building is comfortable for visitors to enjoy.

ALTERATIONS TO THE EXISTING BUILDING







The existing site

Adding large central skylights
Adding a void
Removing the existing internal partitions, whilst keeping and recycling the studwork timber
Replacing the facades and flat roof with upgraded insulation and double glazed windows, making the building more airtight and thermally insulated

Adding my proposal
New external facades and windows

The architectural concept takes the **narrow and crowded existing interior**, stripping it back to **large, open spaces with ample natural light** by utilising a **double height void**. Using **open partitions**, allows viewing throughout the interior extent, enhancing **connection**.

OVERCOMING EXISTING ENVIRONMENTAL ISSUES IN ACCORDANCE TO STATUTORY REGULATIONS

LIGHT - increase the amount of daylight filtered into the building by adding skylights into the flat roof and more windows to the front and rear facades

TEMPERATURE - the lack of existing insulation means the existing building temperature is much lower than recommended. To maintain a standard temperature, replace the existing insulation and replace the existing windows with new double glazing will reduce heat loss. New CHP and underfloor heating system to be installed

VENTILATION - introduce stack ventilation through the new skylights, creating a continuous flow of fresh air throughout the day. Purge ventilation to take place every morning, keeping the internal air fresh and replaced regularly. The existing facades and roof to be replaced, so no cold bridging can occur, resulting in no condensation or mould

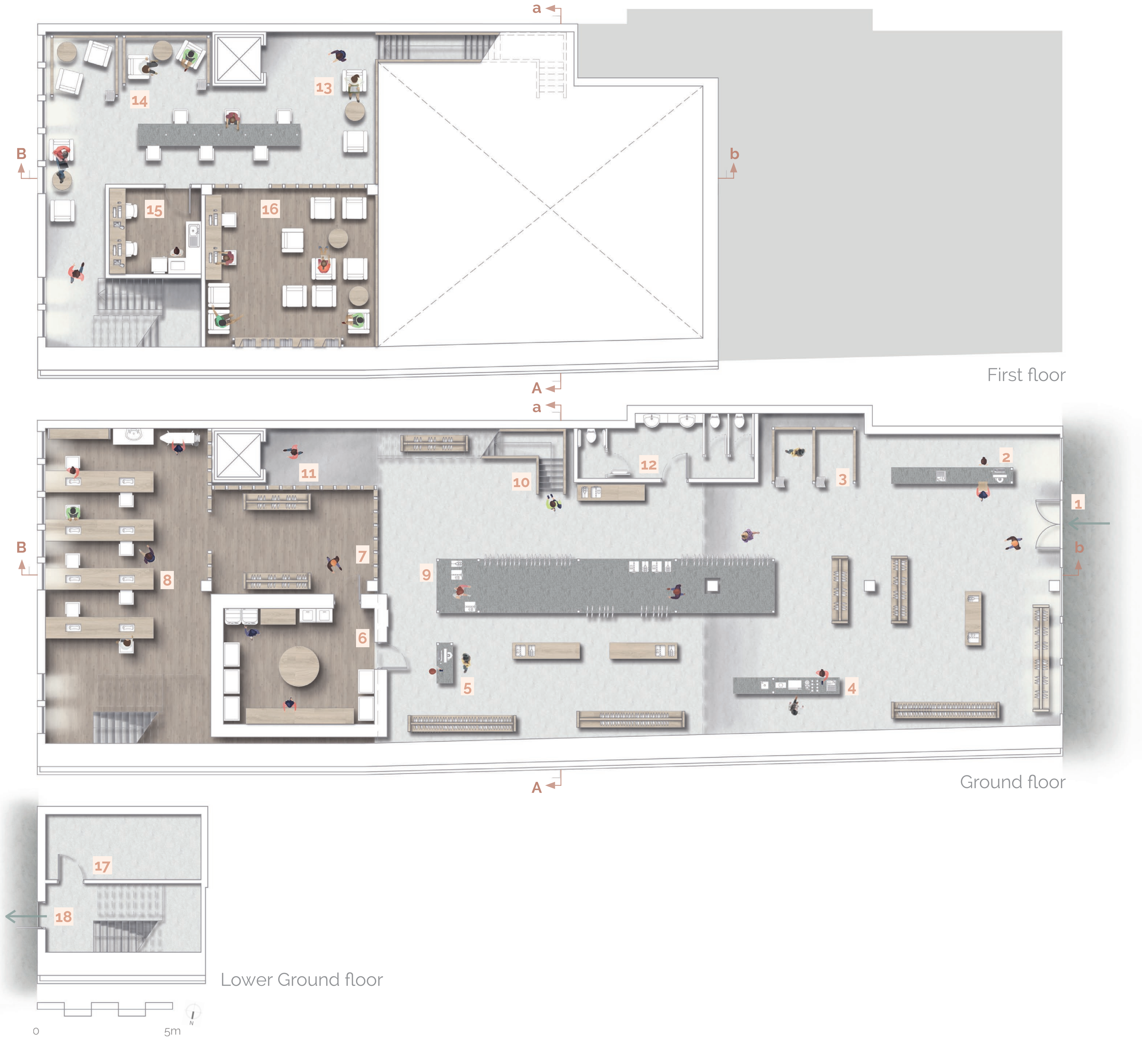
NOISE - locating busier and louder activities at the front of the building, where the noise from the road impacts the most, and quieter activities to the rear of the building

The proposed scheme is a **charity shop** with a focus on **up-cycling garments** from public donations, highlighting the importance of **circular fashion** and **sustainability**.

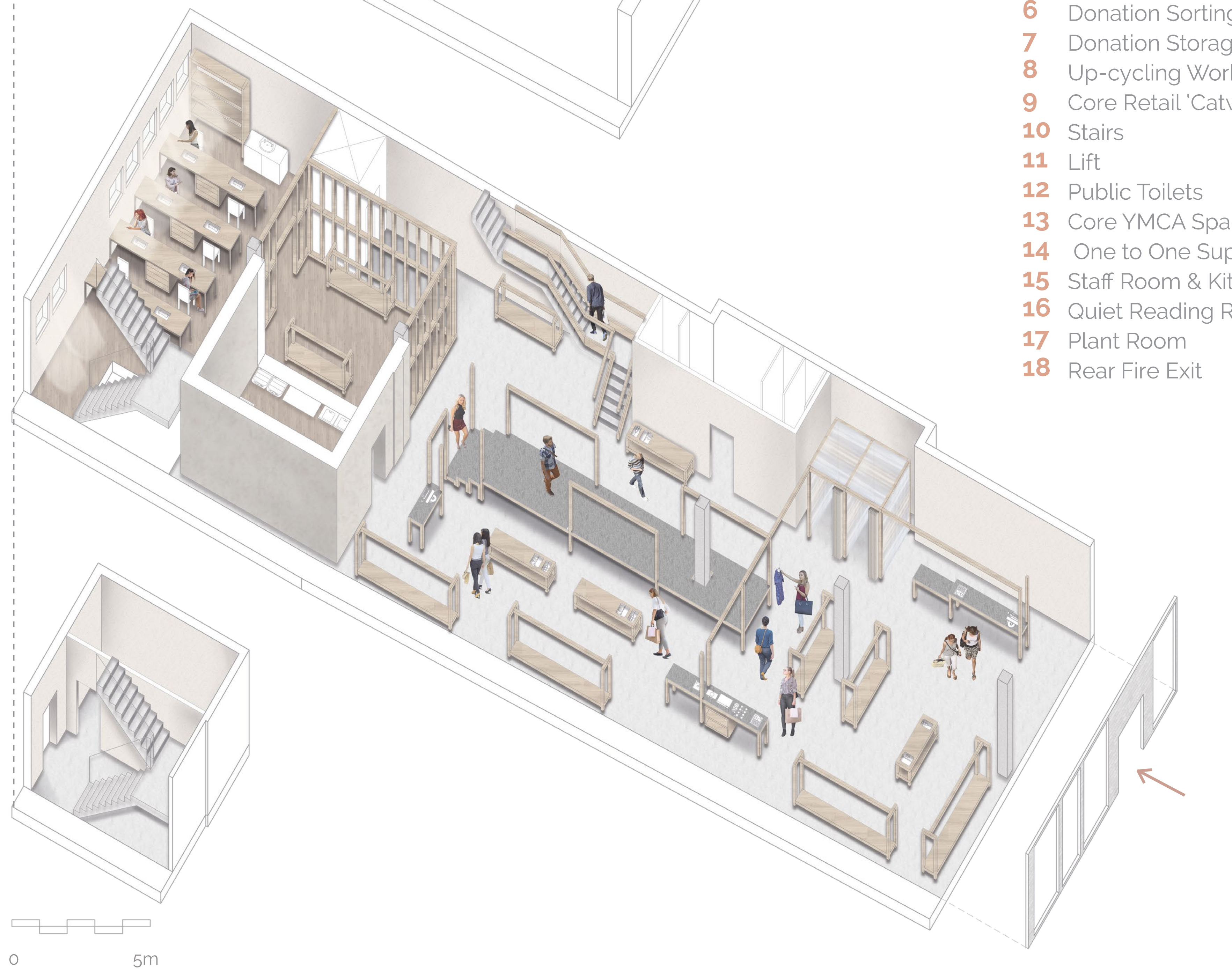
A **public retail space** displays the up-cycled items and a **private workshop** allows young volunteers of the YMCA to learn, design and create these pieces.

Central to this charity shop are the core themes of the YMCA - **helping and supporting young people**. Much like the garments being up-cycled, **young people are also being up-cycled by the YMCA** - being taught new skills, supported and cared for, leaving the YMCA an improved and up-skilled person.

FLOOR PLANS



AXONOMETRIC



1. Main Entrance from Pilgrim Street
2. Transaction/till Point
3. Changing Rooms
4. Coffee Point
5. Donation Drop Off Point
6. Donation Sorting and Cleaning Room
7. Donation Storage
8. Up-cycling Workshop
9. Core Retail 'Catwalk' Space
10. Stairs
11. Lift
12. Public Toilets
13. Core YMCA Space
14. One to One Support Pods
15. Staff Room & Kitchenette
16. Quiet Reading Room
17. Plant Room
18. Rear Fire Exit

EXTERNAL PERSPECTIVE

FAST FASHION - THE TOXIC SYSTEM OF OVERPRODUCTION AND CONSUMPTION

'More than 500 million kilograms of unwanted clothes end up in landfill every year, and only 0.1% of all clothing collected by charities and take back programs is recycled into new textile fibres'

Fast fashion is **cheap clothing** that samples ideas from the catwalk, and turns them into garments in high street stores in **breakneck speed** to meet **consumer demand**. The idea is to get the newest styles on the market as quick as possible, so they can be bought at the height of popularity and discarded when the trend is over. It is the key part of the toxic **system of overproduction and consumption** that makes fashion a large polluter.

Reduced costs and sped up production means **environmental corners are cut**. Cheap textiles are derived from **fossil fuels** and contributes to **global warming**, which sheds microfibres that add **plastic to the oceans**. Cotton requires **large amounts of water** in developing countries, creating risk of **drought** and **competition of water resources**. The speed at which garments are being produced means more are being disposed of, creating **textile waste**. Workers work in **dangerous environments** for **low wages** and **without basic human rights**.

MATERIALITY

Ductal Reinforced Concrete

Key properties:
- Compressive strength
- Ductility
- Impact resistant
- Abrasion resistant
- Waterproof
- Reduced passive reinforcing
- M0 - Non combustible fire classification

Cemfree Concrete

Key properties:
- Ultra-low carbon alternative to traditional cement that can save up to 80% in embodied CO_2, compared to a conventional mix

Dulux Easycare Washable & Tough Matte in Pure Brilliant White

Key properties:
- Matt Finish
- 20x tougher than standard Dulux Matt
- Unique stain repellent technology

Recycled CLS Studwork Timber

Key properties:
- Recycled from the existing building's internal partition, making it very cheap to use in the construction process
- CLS Studwork is strength graded
- FSC certified

VILLA Peterson Oak Vinyl Floor

Key properties:
- 12mm thickness - stable and durable
- AC5 (Class 33)
- Low maintenance
- Scratch resistant
- Stain guard
- Compatible with underfloor heating systems
- Moisture resistant

DAY-TIME CONDITIONS

PUBLIC RETAIL SPACE

Where up-cycled garments are displayed. A **central catwalk** invites customers to browse items, feeling like they are walking the catwalk themselves.

PRIVATE WORKSHOP

Where young people of the YMCA **learn skills in up-cycling garments**. Views in and out stretch the entirety of the ground floor.

CORE YMCA SPACE

Where people seeking help can dwell. Similar to the retail space, a **central desk** encourages people to socialise. A **quiet reading room** provides books for young people to learn literacy and attend **book clubs**.

EVENING CONDITIONS

PUBLIC RETAIL SPACE

The central catwalk space hosts events such as **fashion shows and public talks,** allowing young people of the YMCA to showcase their skills. Timber benches can be moved for viewers to watch. The first floor balcony allows a viewing platform.

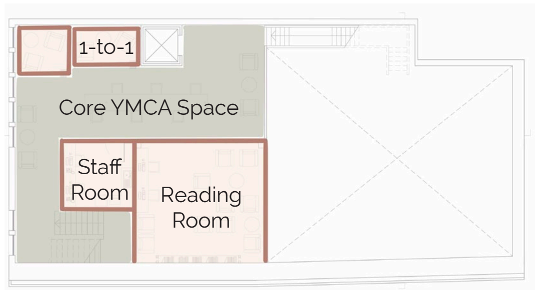
PRIVATE WORKSHOP

The private workshop becomes a **sewing and textile class space for the public** to learn skills in up-cycling garments. The YMCA volunteers host these, transferring their skills on to others and gaining further skills whilst teaching.

LONG SECTION - Bb

ACOUSTIC STRATEGY

ACOUSTIC ZONING



Quiet, dwelling spaces

Louder, social/activity spaces

Noisiest, busiest spaces

Acoustically insulated partitions

Noise from the main road

The retail space is located towards the front of the site, due to being the loudest and busiest space and receiving the most impact from the main road noise. The donation cleaning is located in the safe room, which is highly acoustically insulated, due to it being the loudest activity.

The quietest spaces are the reading room and support pods, which are located on the first floor, with acoustically laminated glass and acoustic curtains to block out noise, and to stop noise travelling for privacy in the support pods.

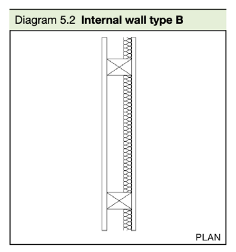


Image 1 - internal wall type B, Building Regulations Part E (Ministry of Housing, Communities & Local Government, 2015)

All the internal partition walls fit to the 5.18 Building Regulations Part E standard describing 'internal wall Type B: a timber frame with plasterboard linings on each side of the frame and absorbent material within' to keep rooms acoustically insulated. (Ministry of Housing, Communities & Local Government, 2015)

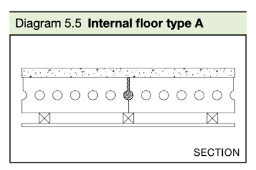


Image 2 -internal floor type A, Building Regulations Part E (Ministry of Housing, Communities & Local Government, 2015)

All the internal floors fit to the 5.21 Building Regulations Part E standard describing 'concrete planks' to stop noise travelling through the floors. (Ministry of Housing, Communities & Local Government, 2015)

The furniture on the first floor acts as an acoustic absorbent, allowing the reading room to remain quiet. The clothes in the retail space also act as an acoustic absorbent, ensuring sound doesn't echo around the shop.

ACOUSTIC ABSORBERS

Acoustic absorbers, including furniture and clothes

Acoustic barriers

LIGHTING STRATEGY

ARTIFICIAL LIGHTING

Locations of the suspended timber frames - the workshop, retail catwalk and YMCA core desk.

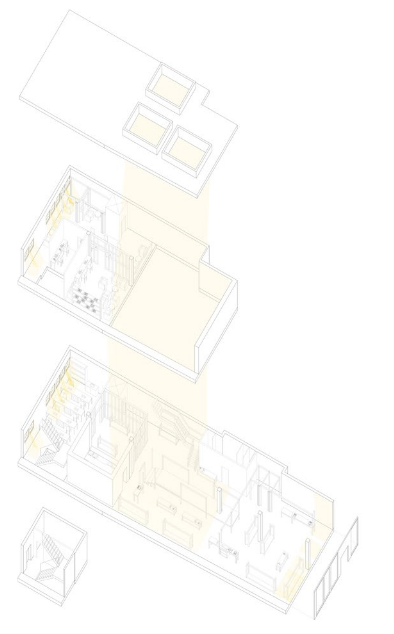
Timber frame suspended from the ceiling to hang lights

Spotlights

Hanging lights from suspended ceiling timber frame

Natural light entering the space

NATURAL LIGHTING



3 skylights added to the flat roof allow natural daylight to enter the double height void. Increased windows on the rear facade opens up the view to the exterior and brings light in. A new front facade with large windows increases daylight and views in the shop front.

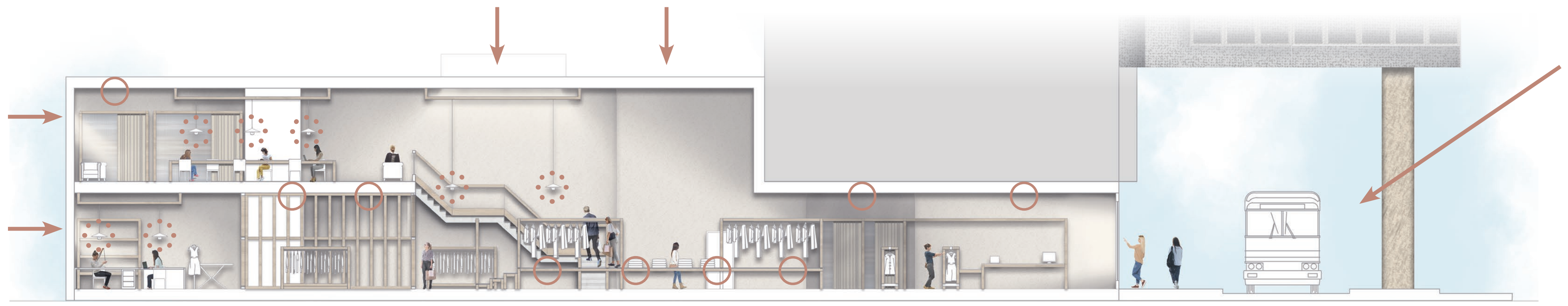
Adding in 3 large skylights on the existing flat roof along with additional windows in the rear and front facade will bring in huge amounts of natural light which is needed in the site.

Table 2 **Opening areas in the extension**		
Building type	**Windows and personnel doors as % of exposed wall**	**Rooflights as % of area of roof**
Residential buildings where people temporarily or permanently reside	30	20
Places of assembly, offices and shops	40	20
Industrial and storage buildings	15	20
Vehicle access doors and display windows and similar glazing	As required	N/A
Smoke vents	N/A	As required

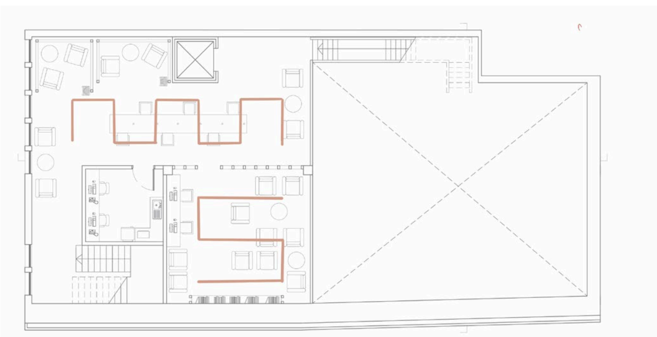
Image 5 - opening areas in the extension, Building Regulations Part L2B (Ministry of Housing, Communities & Local Government, 2018)

Part 4.24 of the L2B Building Regulations states 'if a window, pedestrian door or roof-light is enlarged or a new one created, then the area of the windows, pedestrian doors and roof-lights expressed as a percentage of the total floor area of the building should not exceed the relevant value from Table 2, or should be compensated for in some other a way.' (Ministry of Housing, Communities & Local Government, 2018)

Additionally, suspended timber frames hang artificial lights over the workshop, YMCA core desk, and the retail catwalk. Elsewhere, simple spotlights will light up the spaces.

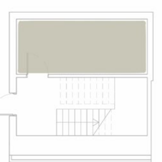


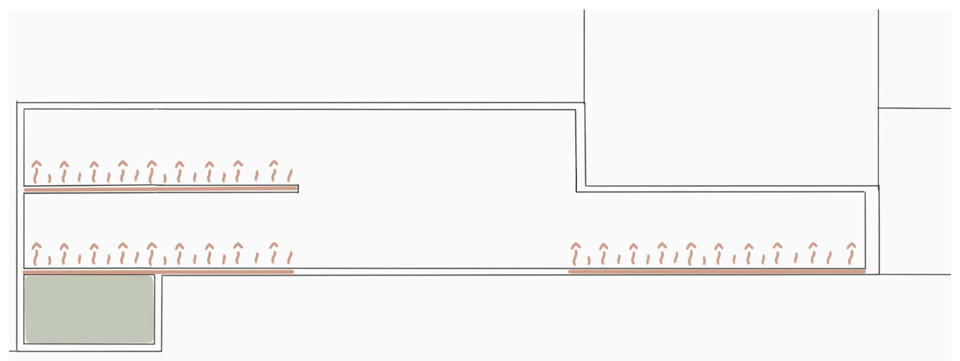
HEATING STRATEGY



Location of underfloor heating pipes

CHP generator in the plant room





The proposed scheme will contain underfloor heating pipes to heat the building. A CHP (combined heat and power) generator will be located in the plant room on the lower ground floor. The by-product of heat produced from generating power will be used to heat water, which will flow through the pipes in the concrete floor slabs. Underfloor heating pipes will be placed in groups, so if there is ever a problem the pipes will be easy to locate.

Table 5 **Upgrading retained thermal elements**		
Element[1]	**U-value W/(m².K)**	
	(a) Threshold	**(b) Improved**
Wall – cavity insulation	0.70	0.55[2]
Wall – external or internal insulation	0.70	0.30[3]
Floors[4,5]	0.70	0.25
Pitched roof – insulation at ceiling level	0.35	0.16
Pitched roof – insulation at rafter level[6]	0.35	0.18
Flat roof or roof with integral insulation[7]	0.35	0.18

Image 3 - Upgrading retained thermal elements, Building Regulations Part L2B (Ministry of Housing, Communities & Local Government, 2016)

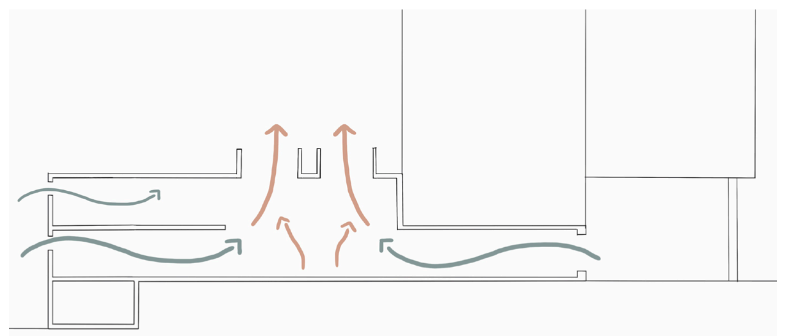
To reduce heat loss, upgrading of the building envelope including the roof and external walls. Part 5.13 of the L2B Building Regulations states 'reasonable provisions would be to upgrade those thermal elements whose U-value is worse than the threshold value in column (a) of Table 3 to achieve the U-values given in column (b) of Table 3, provided this is technically, functionally and economically feasible' (Ministry of Housing, Communities & Local Government, 2016)

Table 3 **Standards for controlled fittings**	
Fitting	**Standard**
Windows in buildings that are essentially domestic in character[2]	Window Energy Rating[3] of Band C or 1.6 W/(m².K)
All other windows and roof windows and rooflights[1,4]	U-value 1.8 W/(m².K) for the whole unit
Curtain walling	See paragraph 4.28
Pedestrian doors where the door has more than 60% of its external face area glazed	U-value 1.8 W/(m².K)
All other pedestrian doors	U-value 1.8 W/(m².K)
High usage entrance doors for people	U-value 3.5 W/(m².K)
Vehicle access and similar large doors	U-value 1.5 W/(m².K)
Roof ventilators (including smoke extract ventilation)	U-value 3.5 W/(m².K)

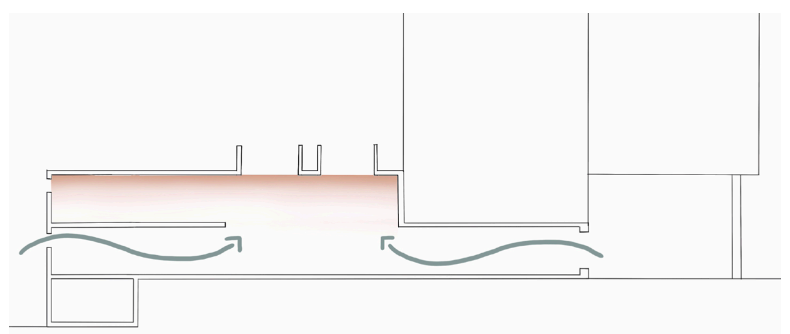
Image 4 - Standards for controlled fittings, Building Regulations Part L2B (Ministry of Housing, Communities & Local Government, 2016)

Removal of the existing windows and replacing with new double glazed windows on the front and rear facades will also reduce heat loss. Part 4.24 of the L2B Building regulations states 'where windows, roof windows, roof-lights or doors are to be provided, reasonable provision in normal cases would be the installation of draught-proofed units whose performance is no worse than that given in Table 1' (Ministry of Housing, Communities & Local Government, 2016)

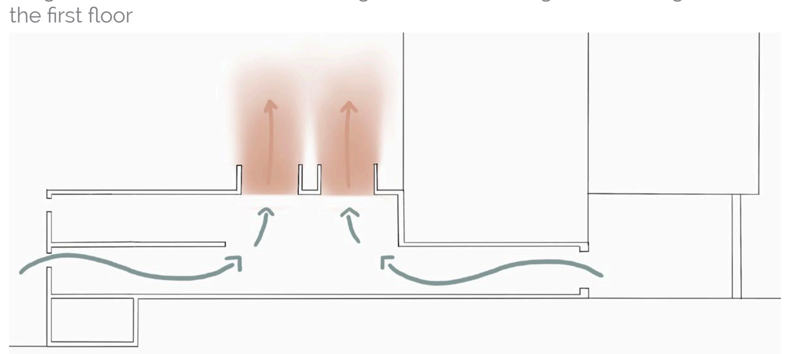
VENTILATION STRATEGY



Stack ventilation - hot, stale air rising escaping as the new cool, fresh air pushes it out



Purge ventilation - hot, stale air rising and accumulating at the ceiling level of the first floor



Purge ventilation - hot, stale air escaping as the skylights are opened and the new cool, fresh air pushes it out

During the day, stack ventilation will keep the air quality at a comfortable level. Cool, fresh air will enter through trickle vents and open windows, which will push the hot, stale air up and out of the protruding mechanical skylights, constantly replacing and refreshing the air.

Part 4.18 of the document F Building Regulations, 'it is important that ventilation is controllable so that it can maintain reasonable indoor air quality and avoid waste of energy. These controls can be either manual or automatic'. Part 4.19 states 'manually controlled trickle ventilators can be located over window frames, in window frames ... positioned typically 1.7m above the floor level to avoid discomfort with cold draughts. They incorporate a simple flap which allows users to shut off the ventilation' (Ministry of Housing, Communities & Local Government, 2013)

Overnight, hot air will accumulate at the ceiling level of the first floor. First thing in the morning, purge ventilation will take place, where the mechanical skylights are opened so hot air can be pushed out by the entering cool, fresh air, refreshing the internal air for the day.

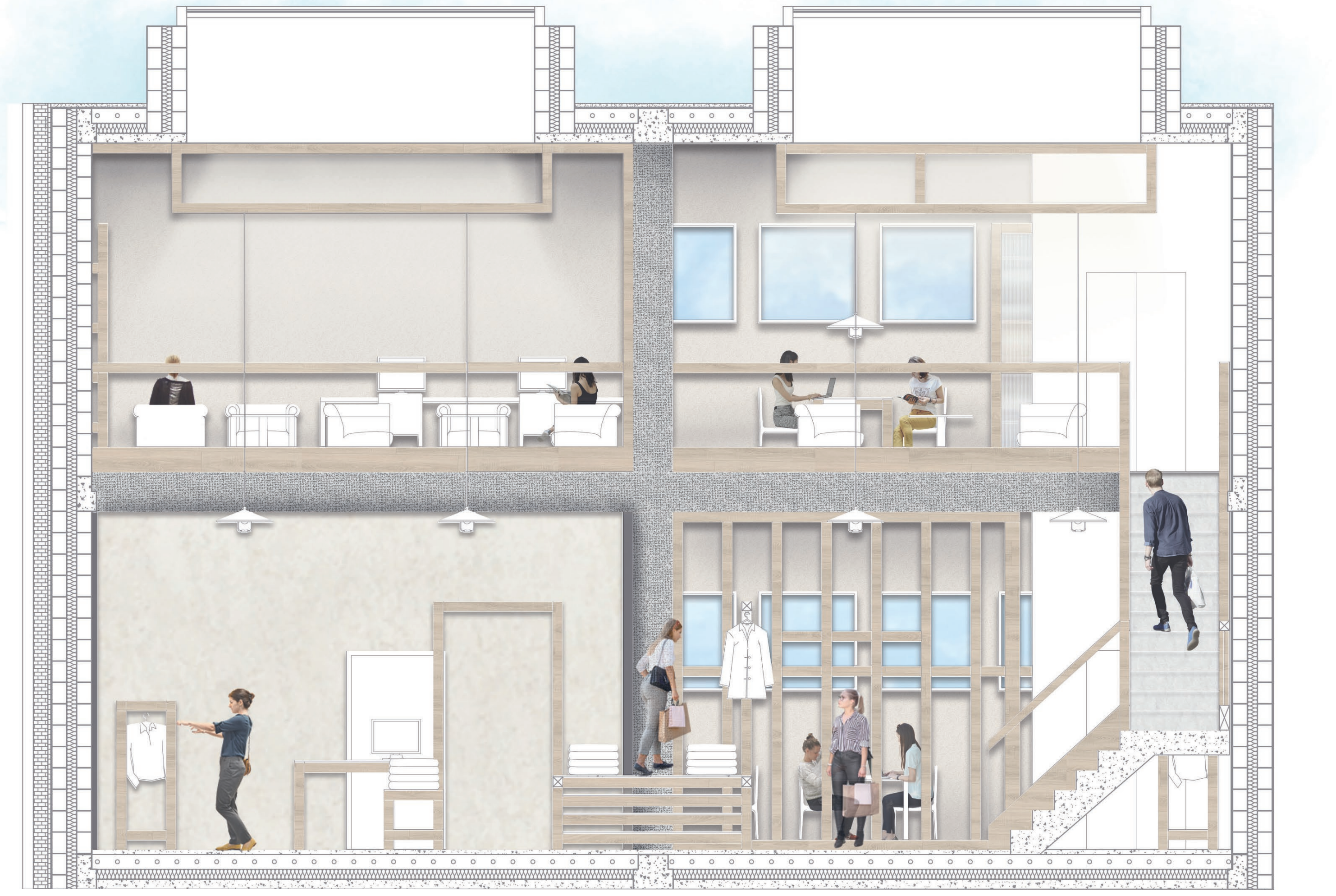
According to Part 4.15 of the document F Building Regulations, 'purge ventilation throughout the building to aid removal of high concentrations of pollutants and water vapour released from occasional activities'. Part 4.16 states 'this ventilation method can be delivered by a natural ventilation systems ... trickles ventilators for whole dwelling ventilations and windows for purge ventilation' (Ministry of Housing, Communities & Local Government, 2013)

The charity shop's theme of sustainability is reinforced within the building design by **up-cycling materials in the existing building** in construction. The **open partitions** are constructed from recycled **internal partition walls**, and the **removed concrete structure** has been recycled to form part of the **poured concrete floor.**

Upgrading the existing building envelope, by replacing the old insulation with **new insulation** and the existing windows with **new double glazed windows**, reduces cold bridging and creates a more **air tight building,** ensuring the new CHP generator works to its full potential by not allowing any heat escape. This will ensure there is no build up of damp and mould, like there is in the existing site. Underfloor heating systems ensure the building is kept to a **comfortable** level for visitors.

Upgraded ventilation systems allow the air inside the building to keep refreshed throughout the day, through **natural ventilation** and **purge ventilation**, allowing no damp or mould to occur.

SHORT SECTION - Aa



SUSTAINABLE APPROACH

RECYCLING EXISTING TIMBER STUD PARTITIONS

The existing stud partitions have been recycled and transformed into new, open partitions. This is a sustainable way of sourcing materials and avoiding waste, encouring designers to use what construction materials already exist.

RECYCLING EXISTING CONCRETE

The removed structural concrete columns and beams have been recycled to form part of the new poured concrete floor. Therefore, not as much concrete flooring has had to be made, reducing costs and increasing sustainable sourcing.

CEMFREE CONCRETE

Alongside recycling the existing concrete in the flooring, CemFree concrete is used, which is an ultra-low carbon alternative to traditional cement that can save up to 80% in embodied CO2.
CemFree is a proprietary Alkali-Activated Cementitious Material (AACM) that activates pozzolanic materials such as Ground Granulated Blast-furnace Slag (GGBS) and Pulverised Fly Ash (PFA) to create a Cemfree Binder which can replace a variety of cement types. The reaction between GGBS and Cemfree Binder forms a solid material comparable to OPC, making it an ideal replacement. Replacing 100% of the OPC with a Cemfree binder results in an 80% lower embodied CO2. Cemfree-based binder is a safe, easy to handle, dry powder product that allows the use of existing plant infrastructure.

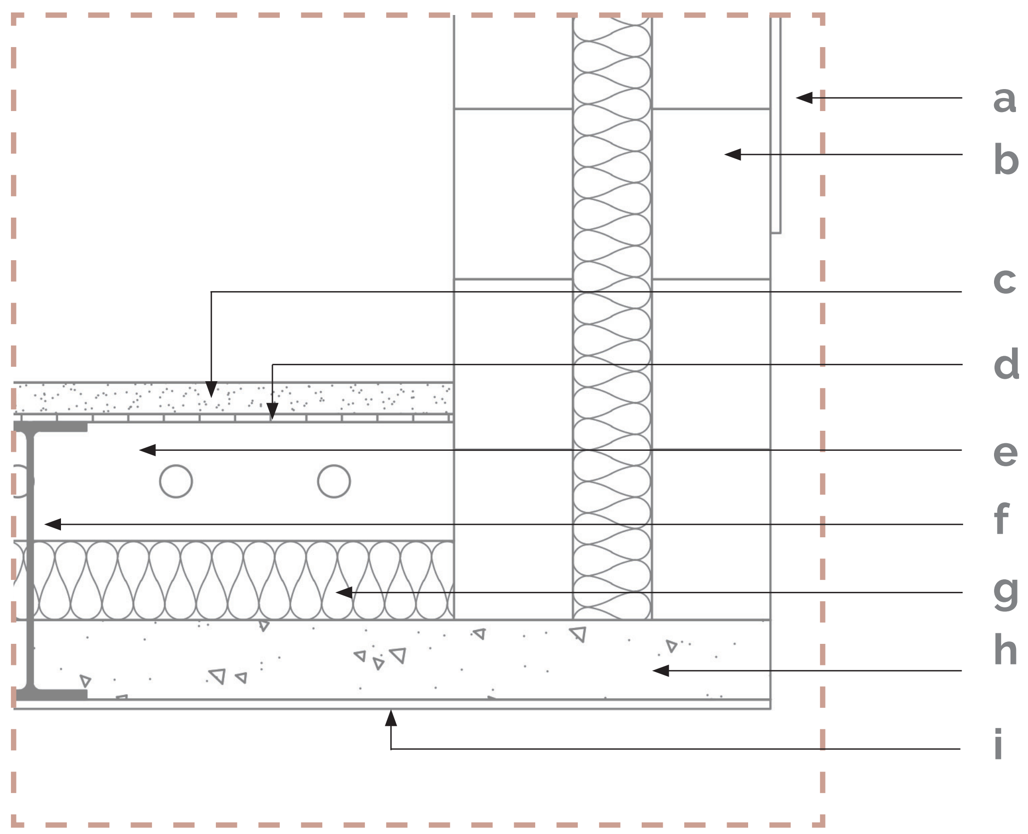
CHP GENERATOR

Using a CHP generator to produce both heat and power on site in the plant room. This is a sustainable generator to use, as the CHP uses the by-product of heat to provide hot water to the underfloor heating pipes.
Combined heat and power (CHP) captures and utilises the heat that is a by-product of the electricity generation process. By generating heat and power simultaneously, CHP can reduce carbon emissions by up to 30% compared to the separate means of conventional generation. CHP systems have an efficiency of over 80%, making use of the heat which would otherwise be wasted. This allows heat requirements to be met that would otherwise require additional fuel to be burnt. CHP is the measure that offers the most significant opportunity to reduce energy costs and to improve environmental performance, saving around 20% of energy costs.

STACK AND PURGE VENTILATION

Using natural ventilation methods removes the need for mechanical ventilation, reducing the energy consumption in the building.

DETAIL ILLUSTRATION



a - New extended concrete block wall to raise skylights up for stack ventilation to occur
b - 215x150mm double cavity blocks with cavity insulation within
c - 40mm screed to protect roof materials
d - 10mm damp proof membrane
e - 150mm existing hollow core pre-cast concrete roof slab
300mm RSJ beam inserted into new roof to compensate for
f - loss of support in double height void
100mm rigid ceiling insulation to reduce heat loss out of the
g - roof
100mm concrete ceiling slab
h - 9mm plasterboard, 3mm scrim coat, 0.5mm coat of paint to
i - cover concrete roof panel and finish

Section and illustration showing a raised parapet skylight for stack ventilation to occur, with the build up of exterior walls keeping the building air tight and thermally insulated

DETAIL SECTION