

PROJECT BRIEF

This project responds to the climate emergency by proposing to convert Gracemount Mansion, a historical building in Edinburgh, into a vibrant community library. The design project proposes a contemporary multipurpose space that promotes learning, creativity and social interaction while preserving its architectural heritage. By conserving resources, reducing waste and extending the building's lifespan, adaptive reuse is a sustainable response to abandoned or underutilised heritage buildings. Aligning with circular economy principles this project seeks to utilise reclaimed materials wherever possible, improve energy efficiency in the building and maximise the use of natural light to reduce the overall environmental impact and preserve the accumulated energy invested in the structure throughout its lifespan. This proposal also focuses on a selected space to propose a creative, energy efficient daylighting and artificial lighting strategy that serves to tell the stories and narrative of the library.



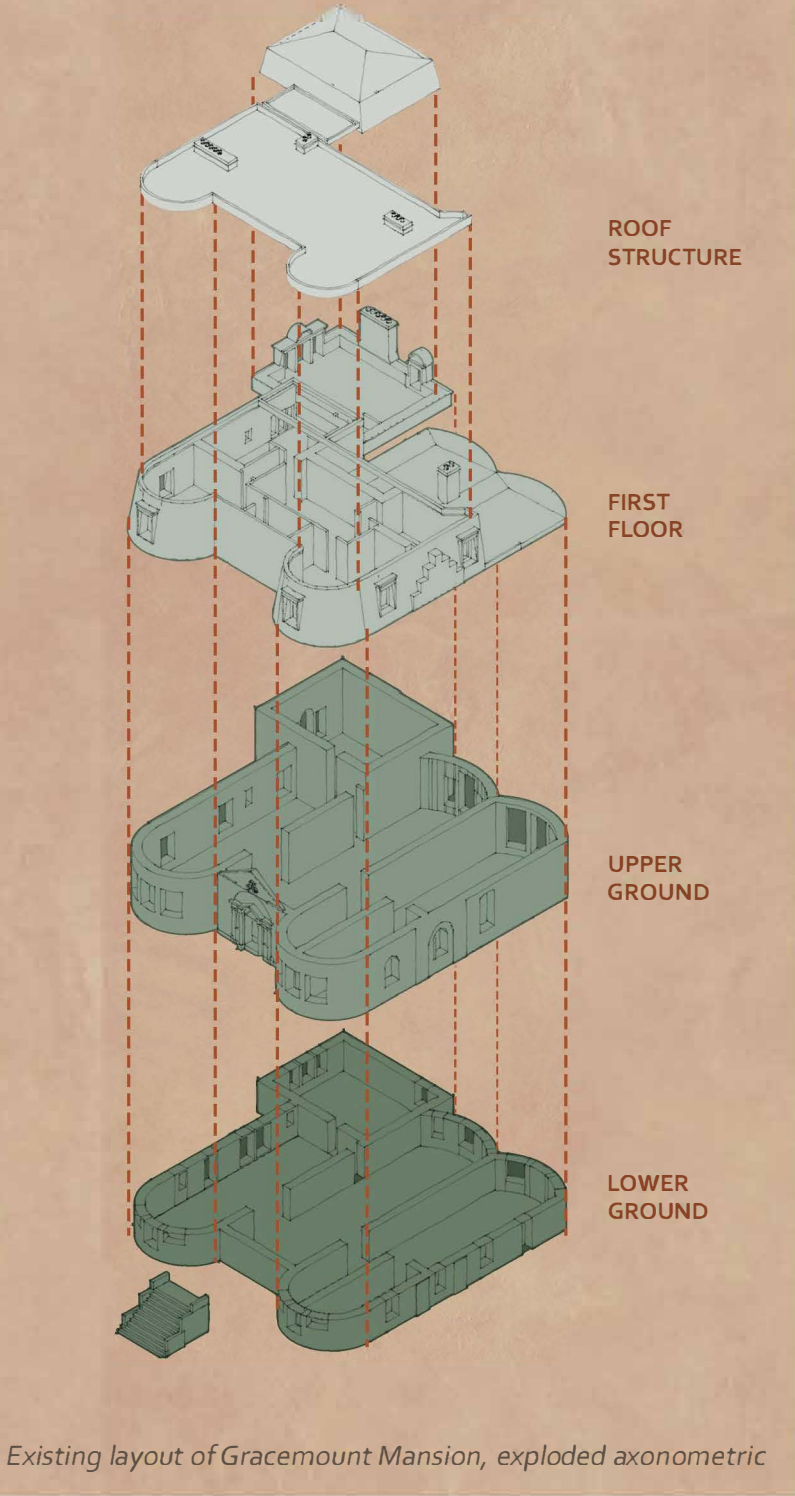
WHAT IS A LIBRARY?

A library is a *Living Story Box*

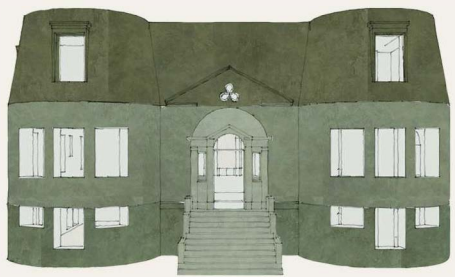
Libraries are custodians of our heritage and knowledge. By empowering the community through knowledge of their past, realities of their present and hopes for their future, we can strengthen community identity and foster understanding and inclusivity thus creating a more holistic future for the people of Gracemount. To me, a library is not a passive space, but an active one that breathes and adapts with the community it serves.

My goal for this project is to establish a library environment that not only houses books but also facilitates moments of reflection and promotes knowledge exchange and collaboration within the community whilst responding to the climate emergency

BACKGROUND



Existing layout of Gracemount Mansion, exploded axonometric



GRACEMOUNT MANSION

Liberton Parish, Edinburgh | 1780s

Locally known as The Mansion, Gracemount House was originally built in 1780 and has undergone numerous alterations while being inhabited by various tenants over the years. It is a B-listed building under Historic Environment Scotland and is considered of national importance. The Mansion was originally a private residence but later changed into a home for nurses and later on turned into the longest running youth club in Scotland- the Gracemount Youth and Community Centre.



Interior features of the building:

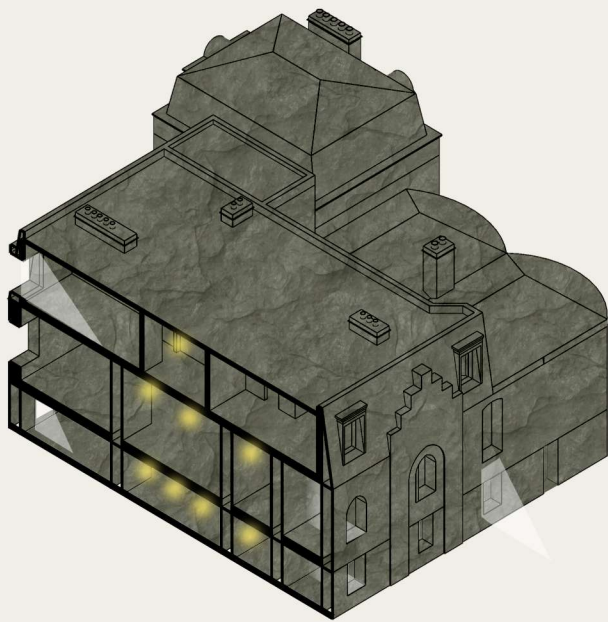
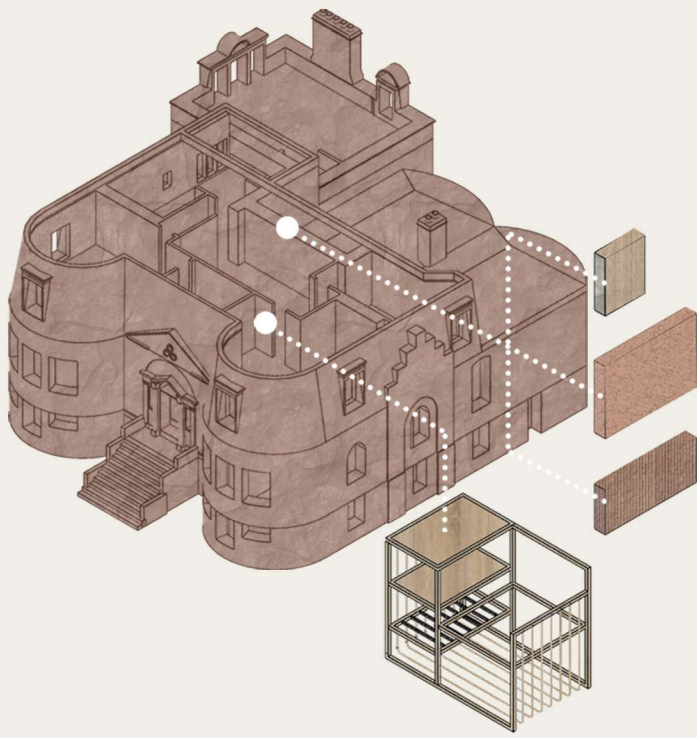
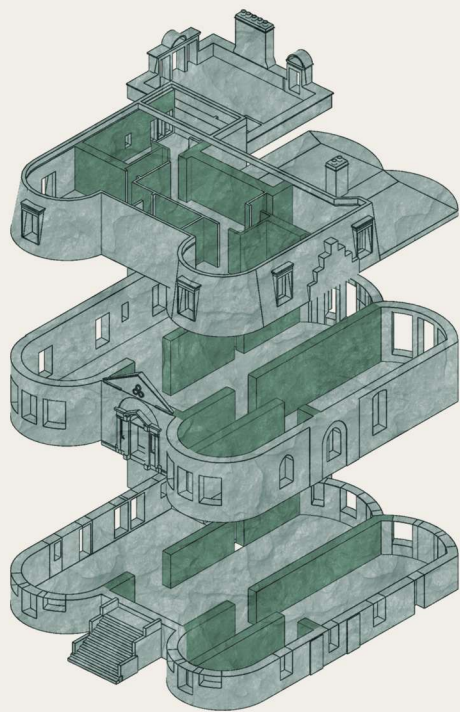
- 1. Main stairs located on upper ground floor
- 2. Original windows and ceiling cornice
- 3. Original skylights around the mansion

GRACEMOUNT MANSION COMMUNITY LIBRARY



DESIGN OBJECTIVES

These design objectives ensure that the project will safeguard the building’s history while providing an adaptable, contemporary and environmental solution to the needs of the local community. It was crucial to change as little as possible for the building to be adaptable and reflect the future needs of the community



Adaptive Reuse of Building

Original layout should be maintained where possible in order to reduce material waste and lower the carbon footprint associated with constructing a new building

Reuse of Construction Waste & Sourcing Local Materials / Interior Finishes

Transforming demolition waste into new, raw materials for construction or furniture in future designs. All new materials required must be procured locally to support the local economy, foster environmental stewardship, and establish a design that is contextually authentic.

Maximizing Daylight & Choosing Sustainable Lighting

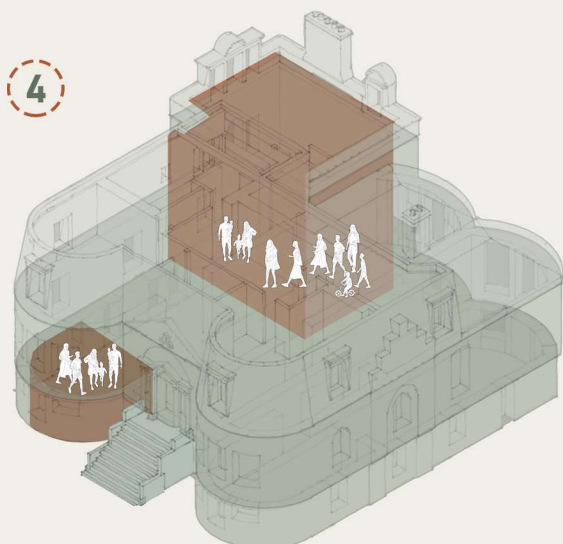
Integration of environmentally friendly artificial lighting with a reliance of natural daylighting by keeping the original openings in the building and opening up smaller spaces to reduce energy consumption that otherwise be needed to light these individual spaces



Gracemount Mansion Library conceptual collage

SITE OBSERVATIONS

To enhance the design, a S.W.O.T analysis was conducted, focussing on the surrounding region, the site and building, and the local community. This analysis will subsequently inform the proposal about the development of activities, initiatives, and the identification of community needs.



1. STRENGTH

The site is a heritage focus area. Gracemount is a 'B' listed building, and the property is home to a variety of protected tree species. The character of the building should be preserved where possible.

2. WEAKNESS

The closure of the Youth and Community Centre in 2018 resulted in numerous organisations and local volunteer groups losing their home base. Despite the proximity to several libraries, these facilities lack sufficient community gathering spaces.

3. OPPORTUNITY

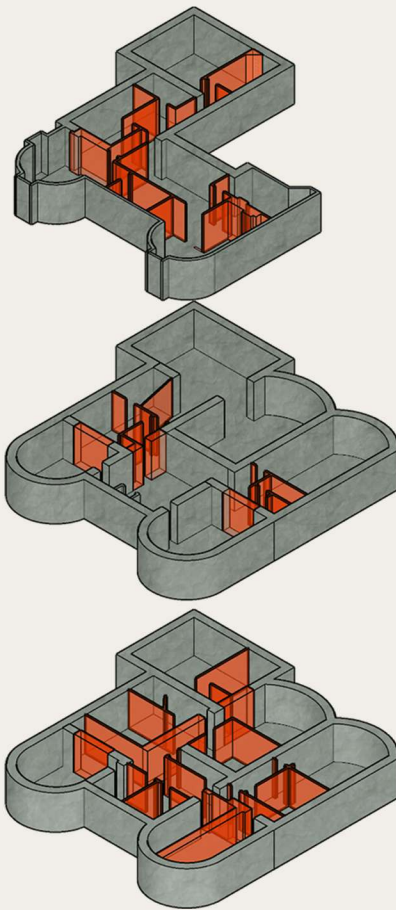
The establishment of a community library enables the Gracemount residents to reclaim and repurpose a previously neglected facility. Community gatherings and storytelling spaces may be established within the mansion. The lifespan of the historical building can also be extended

4. THREAT

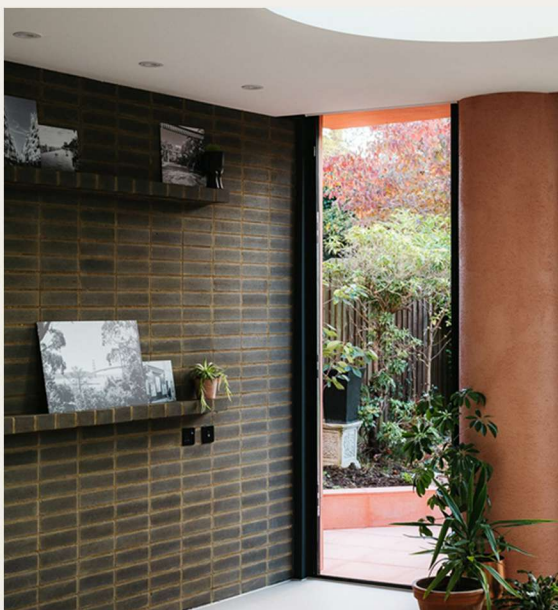
With the possibility of using the space during evenings for community events, there's also the safety concerns that must be considered when designing the space. day and night zones should be established to ensure user safety during low visitation times or evening events

SUSTAINABILITY OF MATERIALS

In 2020, the building environment accounted for around 20% of Scotland's total emissions (The Scottish Government, 2024). A significant portion of this is attributable to the embodied carbon associated with the construction process, as well as the transportation and fabrication of building materials. This design proposes recycling demolition waste to produce new materials & furniture to be repurposed back into the building via local recycling companies and recovery facilities.



Demolition areas of internal walls and floors. Materials include old timber, brick and stone



KENOTEQ Bricks

Produces high-quality bricks that do not undergo the conventional brick-making processes, which generate harmful emissions into the air, by recycling construction waste and utilising the company's patented binder. Their philosophy is to repurpose their products into the industry and to contribute to the local economy by establishing a local supply chain, supporting local partners, and creating job opportunities.



Glasgow Wood

Constructs high-quality furniture and accessories from reclaimed timber, as well as larger projects for residential, commercial, and nonprofit clients. This is achieved by reprocessing and rehousing timber, which also contributes to environmental health.



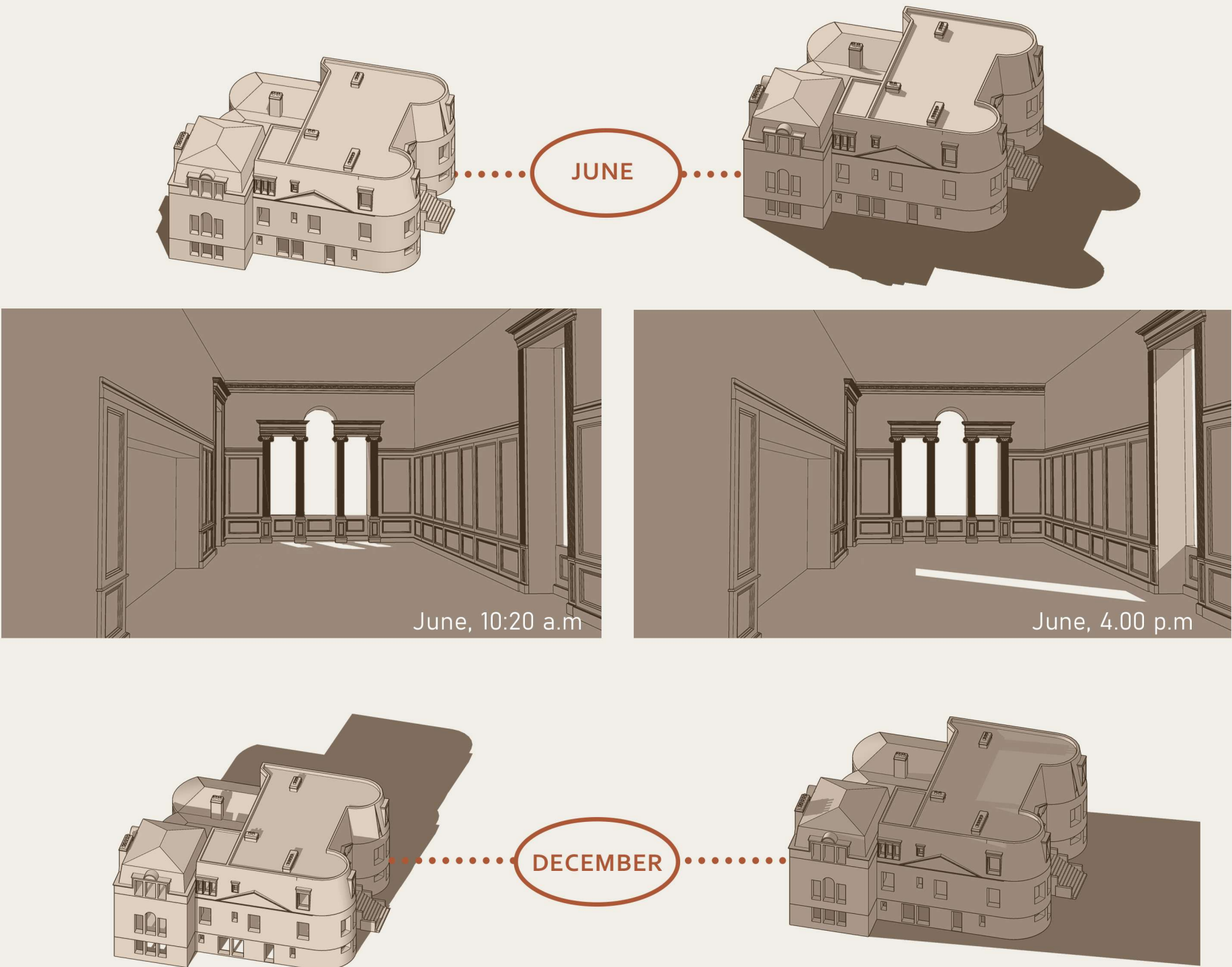
Distance of centres to Gracemount Mansion



Circular economy approach for construction waste from Gracemount

SUNLIGHT AND CHOSEN SPACE ANALYSIS

The initial phase in formulating the lighting strategy for the space was utilising a sun path generator to forecast daylight patterns and optimise natural light within the structure. The boarding of the windows on site rendered a precise examination of the rooms during daylight unfeasible, necessitating a computer reproduction of the interior to examine the ingress of natural light. The structure was orientated based on the image provided by the generator, and a collection of images during different times of the day and different months facilitated the allocation of activities in each space and the quantity and type of artificial lighting required in each place.



Sunpath diagram of Gracemount Mansion, https://www.sunearthtools.com/dp/tools/posun.php#top



Chosen space (Room 7, ground floor)

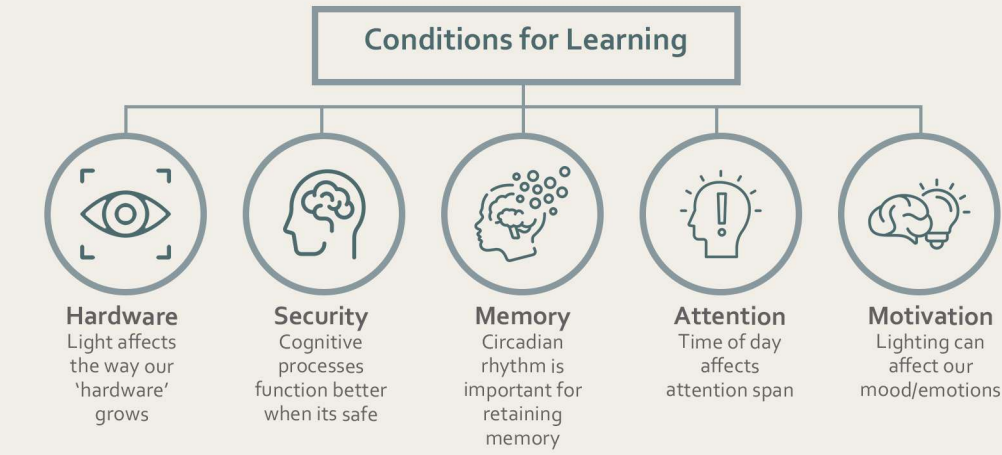
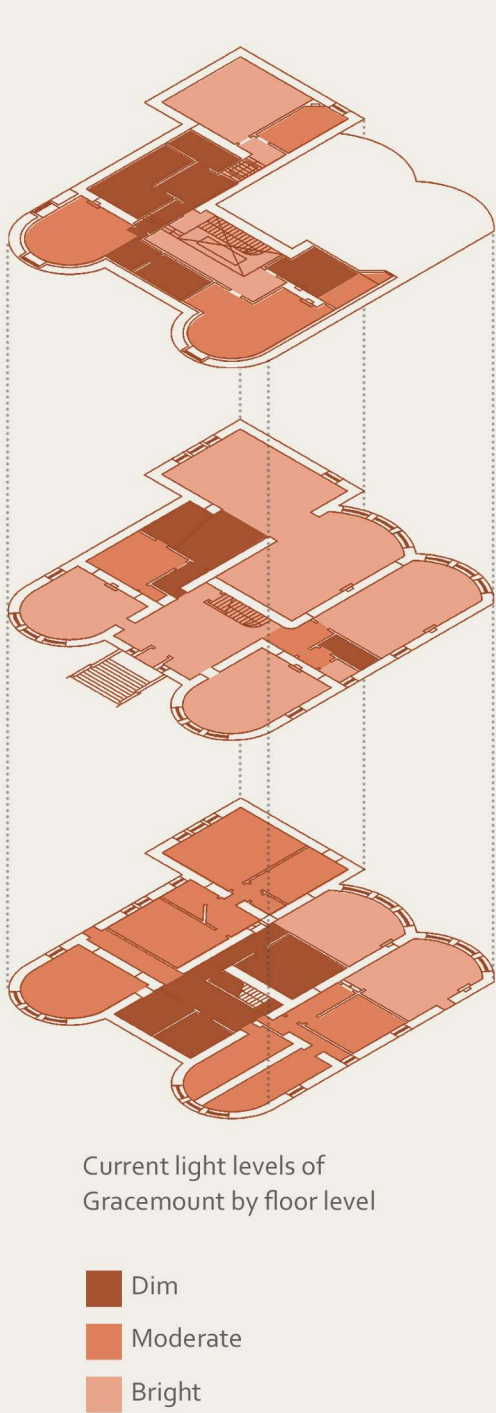


Ceiling detail of chosen space (Room 7, ground floor)

One of the problems in this room is to rebuild the space while preserving the intricate elements such as the ceiling, wall panelling and window wainscoting. These concerns may also complicate the planning of a lighting scheme. The current lights are positioned in the corners to avoid interfering with the ceiling, although the selected luminaire appears to overwhelm the ceiling details. The wall colours used also contributed to a more sombre atmosphere in the room.

LIGHTING STRATEGY

Currently, the lighting conditions of the historic structure varies with some areas receiving plenty of natural light from the large existing windows, high ceilings and skylights while other spaces like the lower ground floor receive low to moderate illumination due to smaller apertures, lower ceilings and older internal finishes. To combat this issue, strategically placed, energy-efficient lighting fixtures are used to illuminate the darker areas in order to not overwhelm the spaces. Rooms near large windows are naturally lit wherever feasible, which helps reduce energy usage while subtly keeping the building's historic charm.

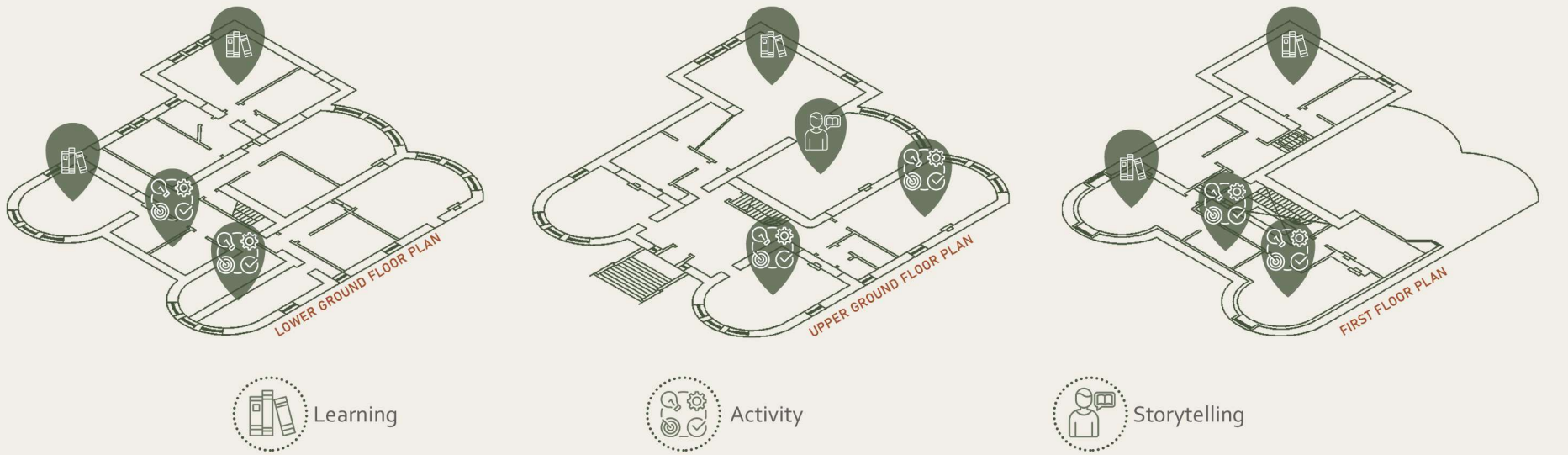


Inspired by Dr. Shelley James' presentation, "Light on the Brain: The Science of Light and Learning in the Lockdown", which examines the direct effects of light on cognitive performance, mood and overall wellbeing particularly in children who will be the main users of the library, a **comprehensive and layered lighting strategy** was devised for the community library, in accordance with the learning conditions outlined in her talk.

LAYERED LIGHTING

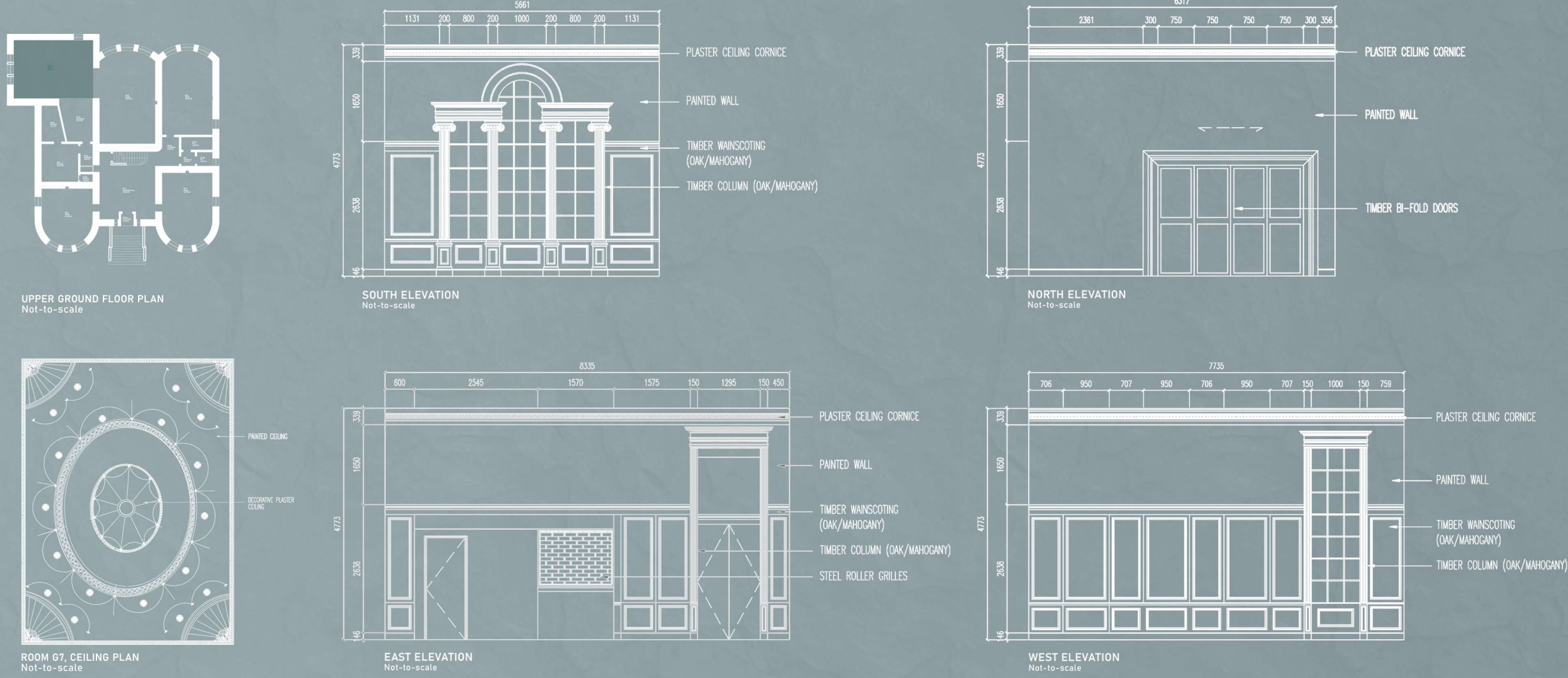
The overall lighting strategy for the building will be shaped by **natural daylight, shadow play visuals and dimmable artificial lighting**. Day time lighting will feature an energizing scheme which will then gradually shift to a warmer and more welcoming scheme suitable for nighttime community events.

Bright natural light during the day will create an energising environment that is ideal for these activities. Dr James stresses the importance of bright natural light to boost alertness and productivity which is why the **libraries and discussion rooms are placed on the East side** of the building. By incorporating **dimmable artificial lighting into activity rooms** such as the computer, music, and art room, as well as the reading spaces and individual study pods, it is possible to create safe spaces for quiet reflection to support a variety of learning modes and accommodate different users, all while making the space more energy-efficient. At night, the **storytelling visuals** will be transformed into a more vivid display as a result of the projectors and rotating lanterns casting images onto the walls, while the natural daylight will move through the space and create soft shadows from the lanterns during the day.



DETAILS OF CHOSEN SPACE

A series of elevation drawings were created to enhance understanding of the space and to document the ceiling features for evaluating the lighting issues. The upper ground floor receives more natural illumination than the lower ground and first floors. The quantity of sunlight penetrating this level enables it to function as a 'active' space where primary activities occur.



LIVING STORY BOX

This concept was inspired by the communal spirit of the Scottish Gaelic people and the residents of Gracemount. Much like the local community that gathers to share stories over meals and reflect on local history and memories, previous societies maintained a strong tradition of oral storytelling. History was not only documented in manuscripts but also experienced and conveyed from individual to individual during fireside gatherings and ceilidhs. This library embodies that essence: a vibrant, multifaceted story box where narratives from the past, present, and future intertwine. It transcends traditional books, serving as a dynamic, developing repository of live narratives and knowledge. A space for stories and experiences conveyed through dialogue, music, artistry, and cuisine.



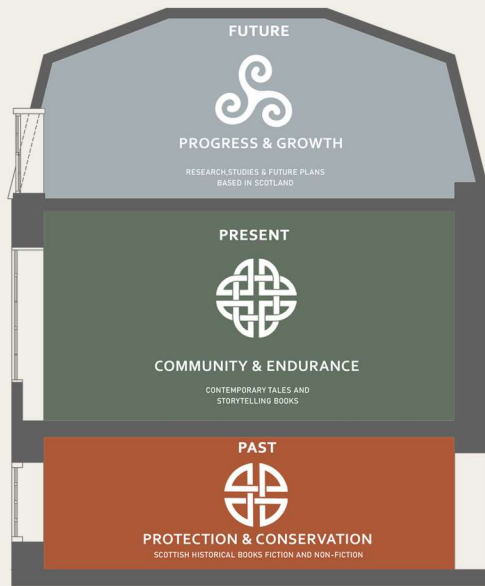
CONTEMPORARY TALES AND STORYTELLING LIBRARY

Daytime

Located within the main zone of Gracemount Mansion, the Contemporary Tales and Storytelling Library celebrates Scottish heritage and history. Crafted to evoke a sense of place and time, the space is bathed in gentle, neutral-toned light that compliments the soft daylight pouring through the original, tall windows of the mansion. The ambient lighting, set at a comfortable 3500k, fosters a calm and productive environment suitable for reading, reflection, and immersion in stories of the past.

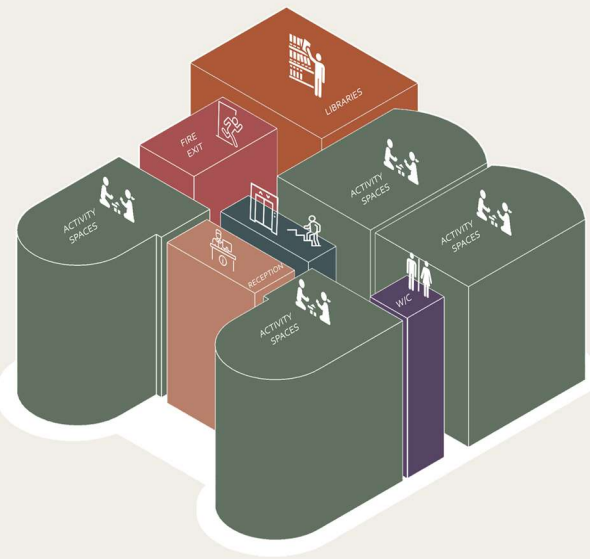
During the day, natural daylight dances across the warm timber floors and textured lime wash walls, bringing an organic atmosphere to the space. As evening falls, the lighting subtly shifts to a deeper, warmer hue, inspired by the glow of a bonfire — an intimate transformation that invites listeners to gather close, as though around a fire, to hear ancient tales retold. From the raw materials to the adaptable lighting, every design element allows the users to immerse themselves in the rhythm of Scotland's timeless story, where history lives not just in books but in the actual ambiance of the space and the users that engages with it.

ZONING OF LIBRARY CATEGORIES



The furniture and lighting strategies are influenced by the art form and meaning behind each Gaelic knot

GENERAL ZONING OF ACTIVITIES



Adjacency of spaces influenced by natural daylight, noise levels of activities and safety

STORYTELLING METHODS



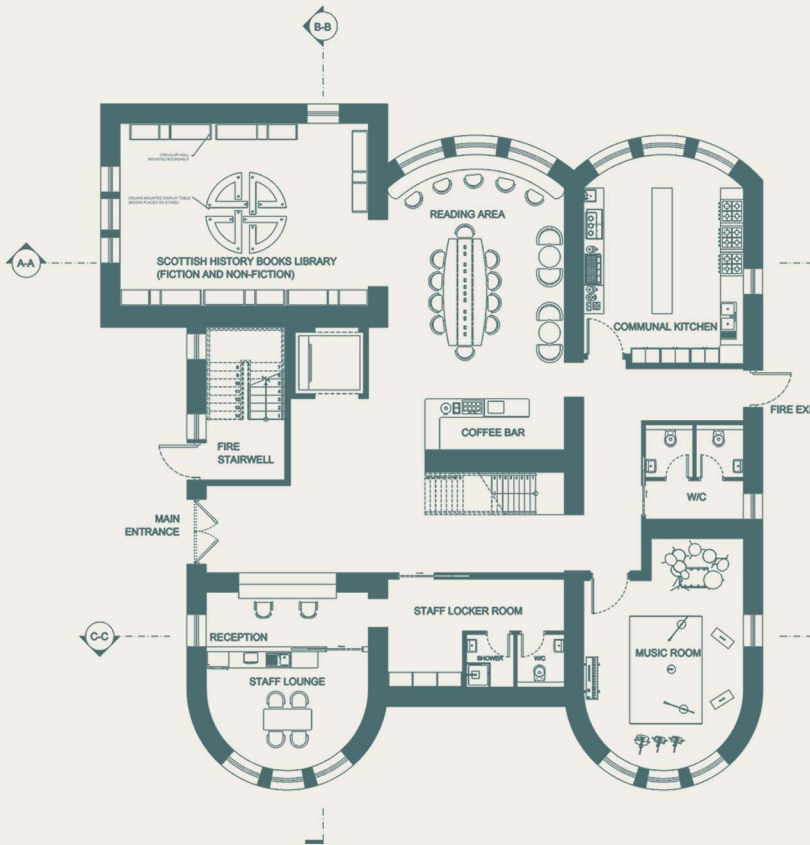
Storytelling through Art



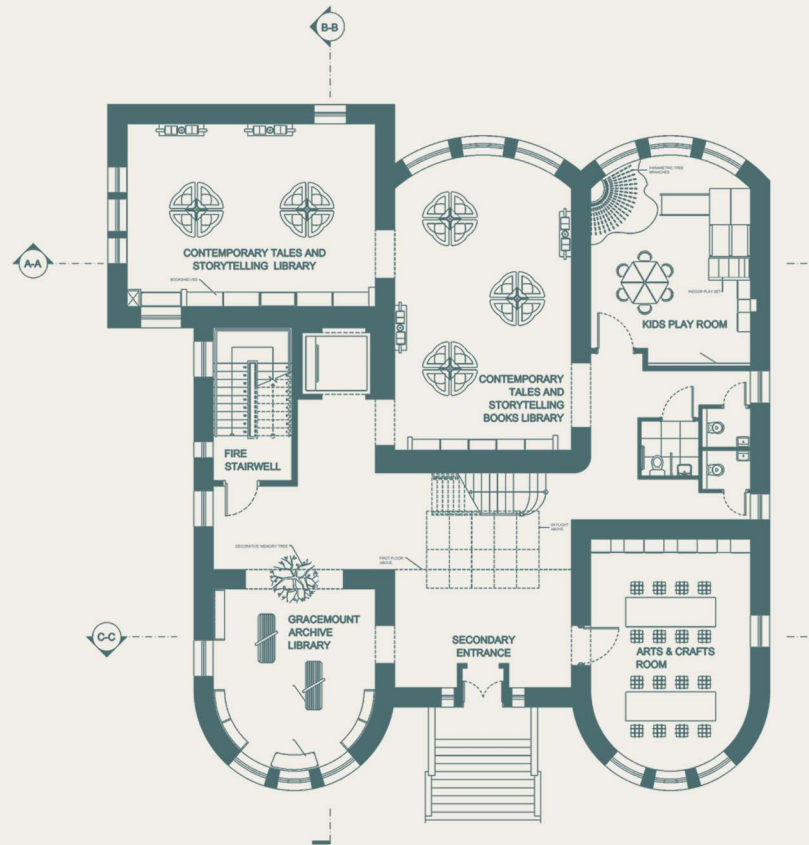
Storytelling through Music



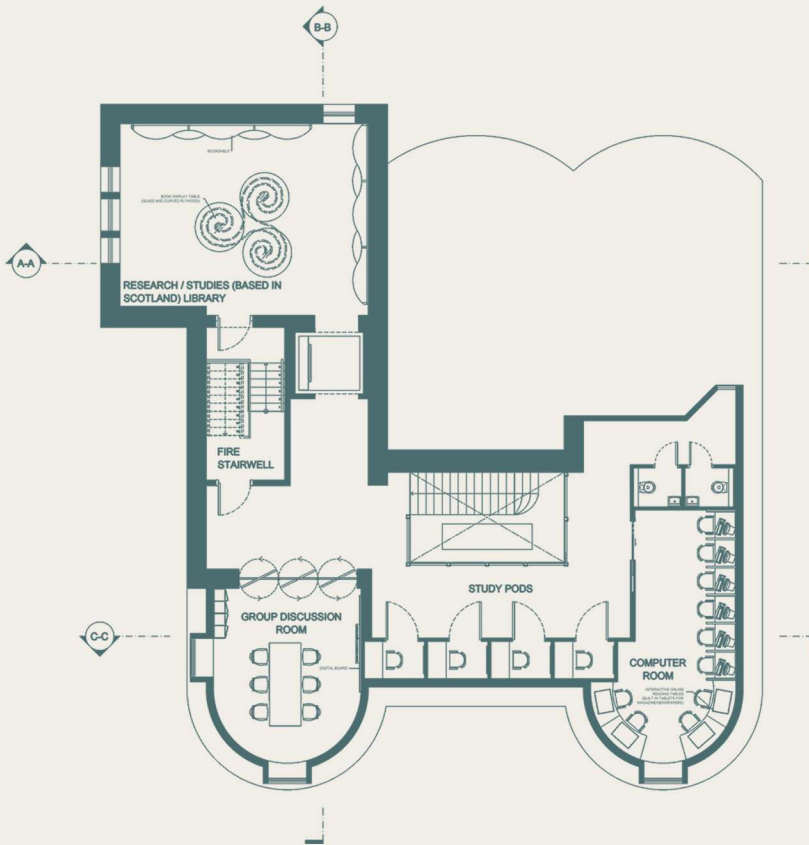
Storytelling through Food



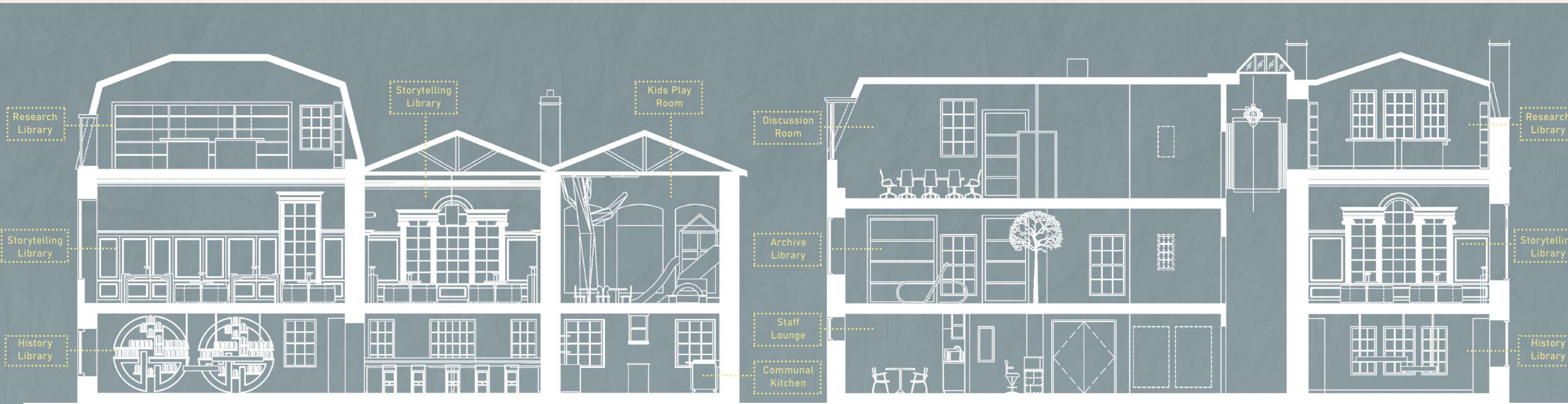
LOWER GROUND FLOOR PLAN
Not-to-scale



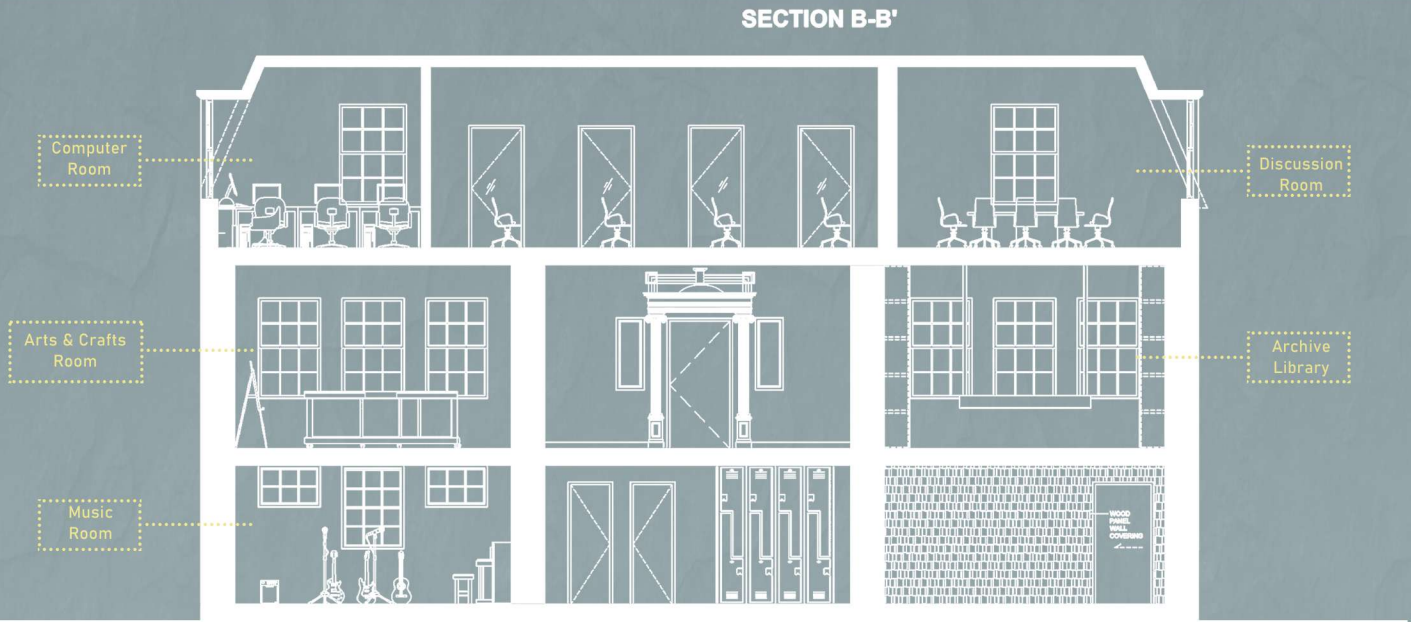
UPPER GROUND FLOOR PLAN
Not-to-scale



FIRST FLOOR PLAN
Not-to-scale



SECTION A-A'

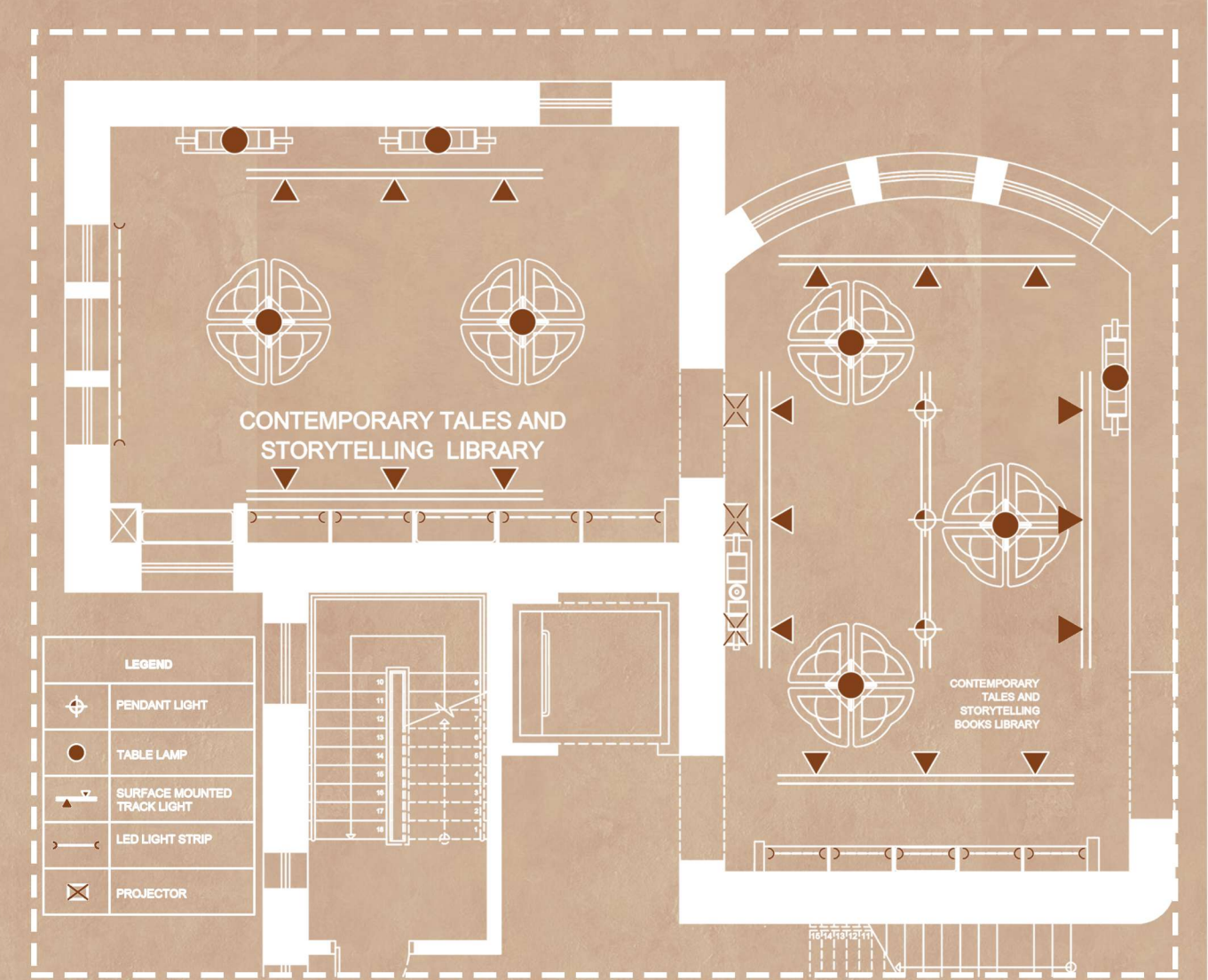


SECTION B-B'

SECTION C-C'

CONTEMPORARY TALES AND STORYTELLING LIBRARY

Daytime



LIGHTING PLAN
Not-to-scale



Lighting strategy inspired by Video Shadow / Play by Nalini Malani

CONTEMPORARY TALES AND STORYTELLING LIBRARY

Storytelling mode



SPECIFICATIONS OF ARTIFICIAL LIGHTING

For the Storytelling Library, a sustainable lighting strategy was created to minimise the use of energy without sacrificing user comfort. In order to achieve complete control over brightness levels according to the time of day, dimmable, ceiling-mounted track lights were selected as one of the primary sources of artificial light, thereby minimising any superfluous energy consumption. High-efficiency LED strips and portable lamps were chosen to illuminate the bookshelves and enhance the ambiance of the room, due to their minimal heat emission, energy efficiency, and extended lifespan. This lighting selection is particularly appropriate for a heritage structure like Gracemount Mansion. Eco-friendly projectors constructed from recyclable materials, with reusable components and intelligent eco-attributes to minimise energy consumption, were utilised to produce the storytelling visuals on the walls.

Despite the presence of artificial light in these spaces, the original large windows of Gracemount Mansion allows natural daylight to be the primary light source during the day. The natural and artificial lights can reflect and be diffused throughout the space thanks to the neutral colour and material palette of the interior. This strategy effectively aligns with the project's sustainability and adaptive reuse themes by reducing the amount of artificial light required in the space while still fostering a warm and inviting ambiance through the selection of neutral and warm light temperatures for the luminaires.



Type: dimmable spotlight
Finish: all white
Mounting type: surface mount
Lamp source: replaceable LED
Gear: integrated driver, track
Colour temperature: 3500k
CRI: >90
Brightness: 2986 lm
Orientation: adjustable
Rotation: 360°
Beam angle: 56°

UT PRO 175 LENS GA-69 ON BOARD
DIMMER ALL WHITE

by FLOS Architectural
(2017)



ARTO LED
STRIP

by Orluna
(2023)

Type: accent light, LED strip
Size: 8mm wide
Mounting type: self-adhesive
Lamp source: replaceable LED
Gear: integrated driver, track
Colour temperature: 3000k
CRI: 98
Brightness: 625 lm/m
Lit effect: soft beam
Finish: unpainted aluminium



LCD MZ882 SERIES AT
ISE 2024

by Panasonic
(2024)

Type: LCD projector
Finish: all white
Resolution: WUXGA(1920x1200 pixels)
Light source: Laser diodes
Gear: reusable Eco filter
Max. power consumption: 465 W
(5.0~2.0 A) (475 VA)
Operating temp: 0~45°C



TRIP PORTABLE
ILLUMINATION LAMP

by Design By Us
(2015)

Type: accent light
Colour: moss (body), amber (shade)
Material: marble, glass, brass
Lamp source: LED
Power: rechargeable, 7500mAh
Colour temperature: 2700k
CRI: >80
Brightness: 20lm, 40lm, 100lm
Dimmable function: 3 levels, Low
(10%), Mid (40%), High (100%)