

ARCHERY - OPTIMISING THE SHOOTING EXPERIENCE

Charlotte Morris - Major Project



AI Generated Video of the Proposed Fit Out

TENSION & RELEASE

PROJECT OVERVIEW

Archery – Optimising the Shooting Experience creates a renovated space specifically for the use of the Scottish Archery Community. This is important as there is only one purpose-built archery facility in the UK – near the Midlands. This means many archery clubs shoot in school sports halls, making for an uninspiring and uncomfortable experience.

The space strives to utilise existing structures and elevates them with new additions, to create a low waste project. The materials and construction methods in this project have been chosen for their recycling and reusable qualities – to assist with longevity and budget.

BRIEF

The purpose of this project is to create a renovated space specifically for the use of the Scottish Archery Community. The space must provide a variety of facilities for archers to practice, prepare for competitions, hold lessons and repair equipment. The space must be designed to optimise the eight month indoor season, making shooting indoors inviting and rewarding. The design must make the experience as comfortable and supportive of the archer. As a high accuracy sport, spikes in adrenaline, heart rate, temperature spikes will all have monumental effect on performance. The interior must take this into consideration, to make sure users feel as comfortable and at ease in the environment as possible.



Concept Sketch - Experiment with Sightlines



Visual - Main Range View from Bleachers



Concept Sketch - Archer Perspective

RESEARCH REPORT

"We can conclude that overall, archers perform better in environments that restrict or completely eradicate any kind of peripheral vision and potential distraction. This aids archers in solely focusing on the target. This in turn creates better grouping - despite a rise in heart rate in some cases. This suggests that a mixture of environment and heart rate will aid the archer, and in some cases one can over-ride the other. However, once an archer becomes comfortable in a more restrictive shooting area, their heart rate in turn should theoretically lessen.

With the above in mind; archery ranges should be re-imagined spatially, to better support the archer in their training, whether that be improving performance and technique, training focus, preparing for competition, or building confidence."

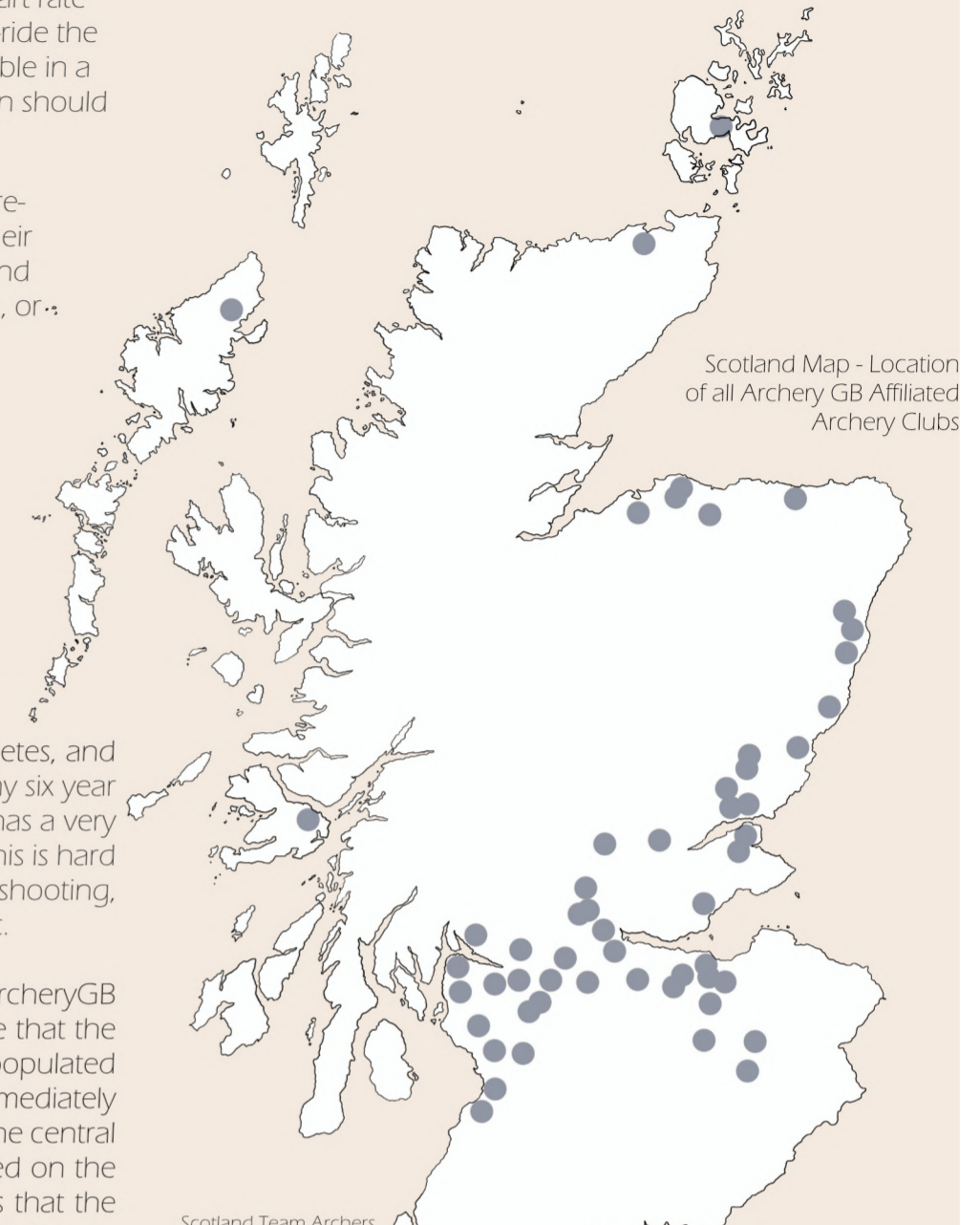
Morris c., 2025, Archery Optimising the Shooting Experience Research Report, Edinburgh Napier University

USER GROUP - SCOTTISH ARCHERS

Archery is currently a growing sport in the UK, with ArcheryGB recording an intake of over 5,000 new members in 2023-2024 and 28,000 returning members. Archery is a very inclusive sport, with people of all ages participating, as well as para-athletes, and people of all backgrounds and ethnicities. During my six year experience as an archer I have found that archery has a very warm and welcoming community surrounding it. This is hard to sustain without adequate facilities for not only shooting, but for socialising, learning, repairing equipment etc.

This diagram on the right shows where all the ArcheryGB affiliated clubs are in Scotland, from this we can see that the central belt, and the east coast of Scotland are populated more heavily by the archery community. This immediately informs us that this facility would be best placed in the central belt of Scotland. As there are far more clubs located on the east coast as opposed to the west, this also implies that the best location for the proposed facility would be in Edinburgh, Fife, or Peebles.

ENDURE - UPLIFT - SUPPORT



Scotland Map - Location of all Archery GB Affiliated Archery Clubs



Short Section - 1:200

EXISTING VS

SITE

The site is located on an offroad of Leith walk, only a twenty minute bus ride from Waverley Station. Drill halls are a term coined by the British Army's Reserve Forces; due to the large intake of rifle and artillery volunteers in 1859-1860. Previous home of the headquarters of the 5th Volunteer Battalion of the Royal Scots, Dalmeny street's drill hall is of special significance due to its high quality interior features, and large size.

The building still contains many early 20th century finishes and fittings. Additions to the hall space have been constructed as timber stud partitions to help divide the space into studios. The rear of the building, on Iona Street Lane; has access lanes to a car park located there. The front of the building, Dalmeny Street; also has car park access.

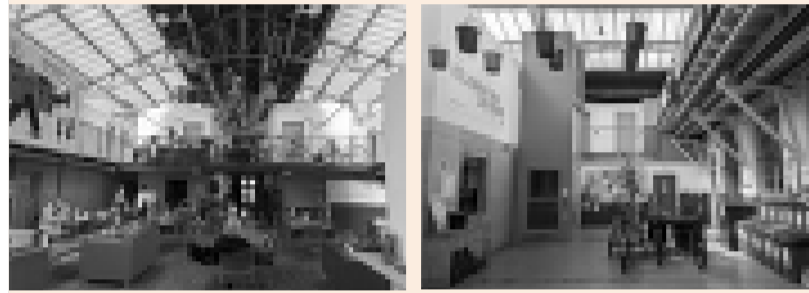
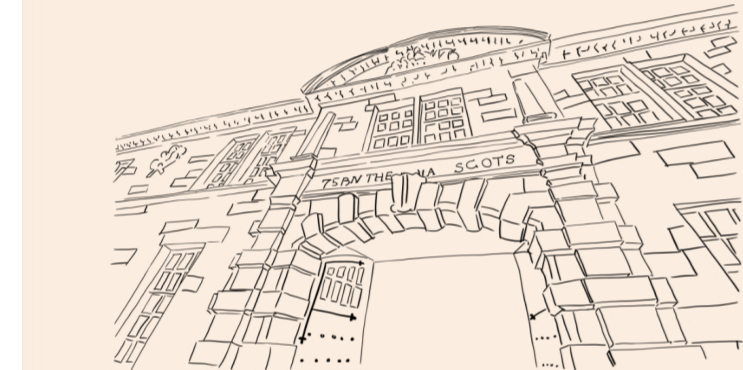


Image of Site

Image of Site

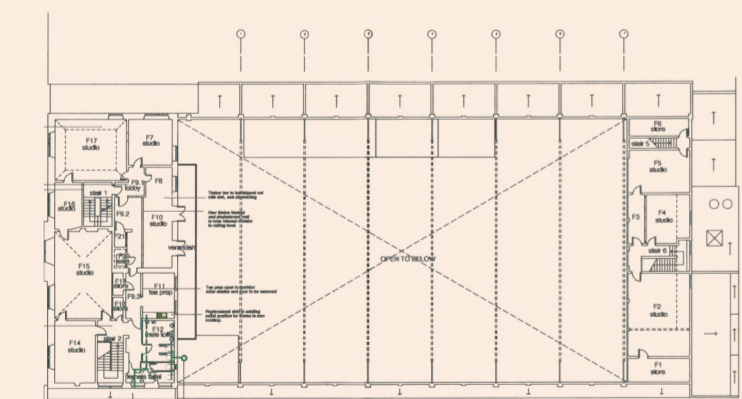


Sketch of Site Facade

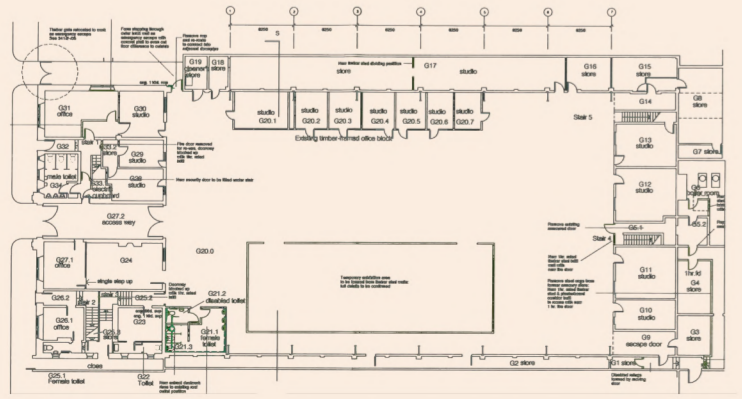
ORIGINAL SITE DRAWINGS



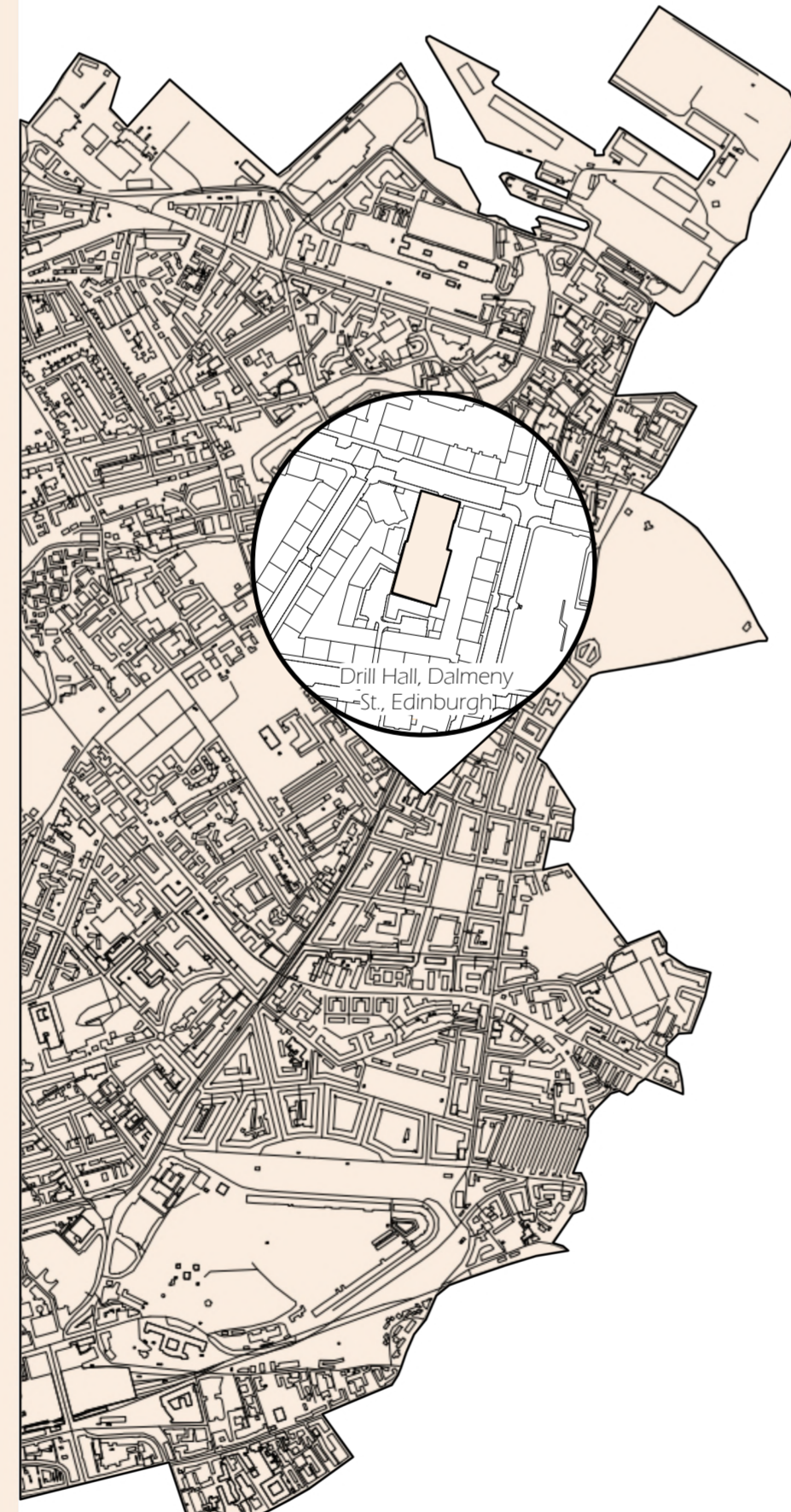
Existing Section - 1:250



Existing First Floor Plan - 1:500



Existing Ground Floor Plan - 1:750



Central Edinburgh - 1:25,000

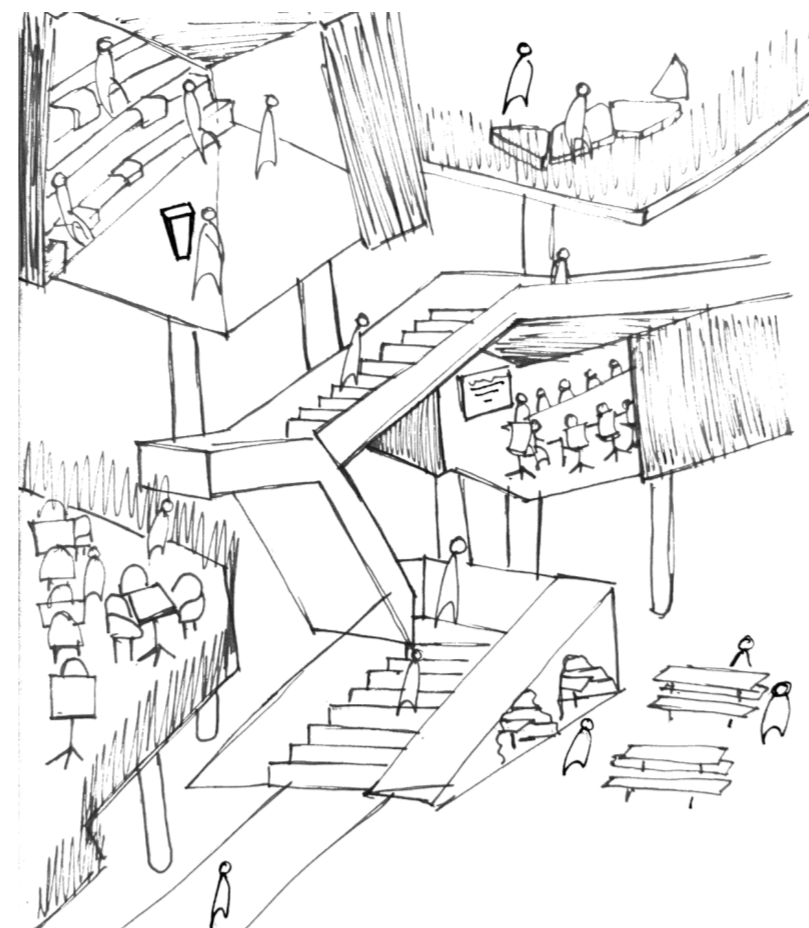
NEW SPACE

VISION FOR THE SPACE

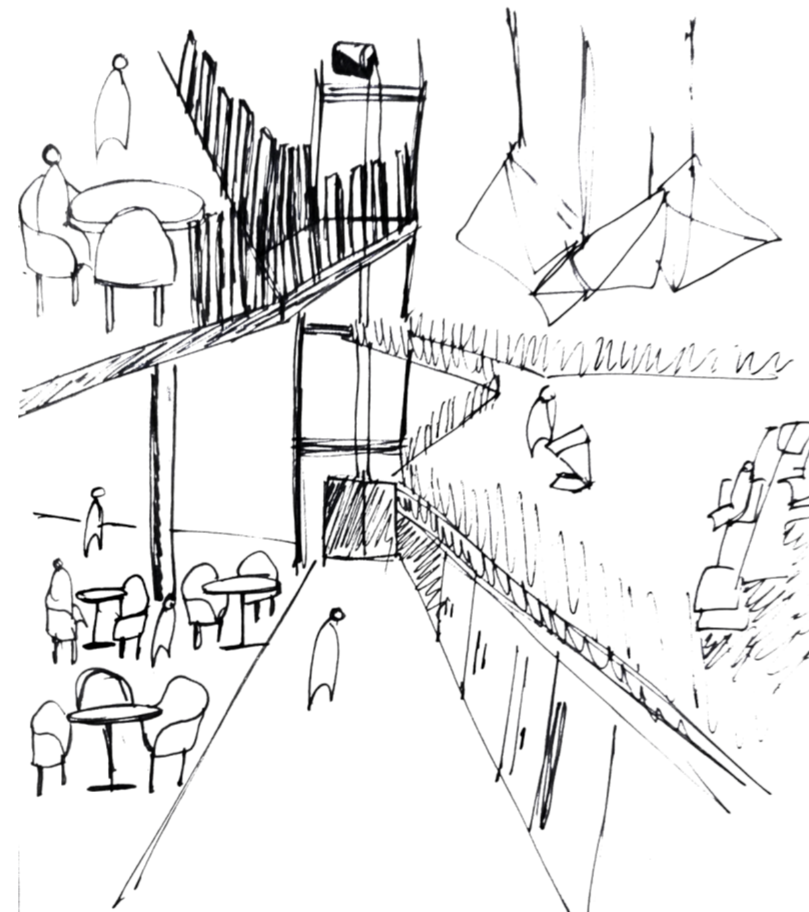
Archery is becoming an inaccessible sport for people looking to join the community. Between the expense of the sport, the lack of equipped facilities in Scotland, and how hard it can be to find qualified coaches and people with knowledge of equipment - it can be hard to immerse oneself in the sport.

Through my six years in the sport - two of which I was president of Edinburgh Napier Archery Club - I have seen beginners struggle to stay engaged and become frustrated with a lack of facilities to practice, making self progression difficult. The long indoor season experienced by archers in the UK can also be a deterrent for engagement with the sport. More often than not, indoor ranges are school sports halls, or long white corridors with harsh fluorescent lighting and no acoustics to dampen conversation. This leads to an uncomfortable experience, juggling between trying to have conversation, but not disturbing other archers shooting experience.

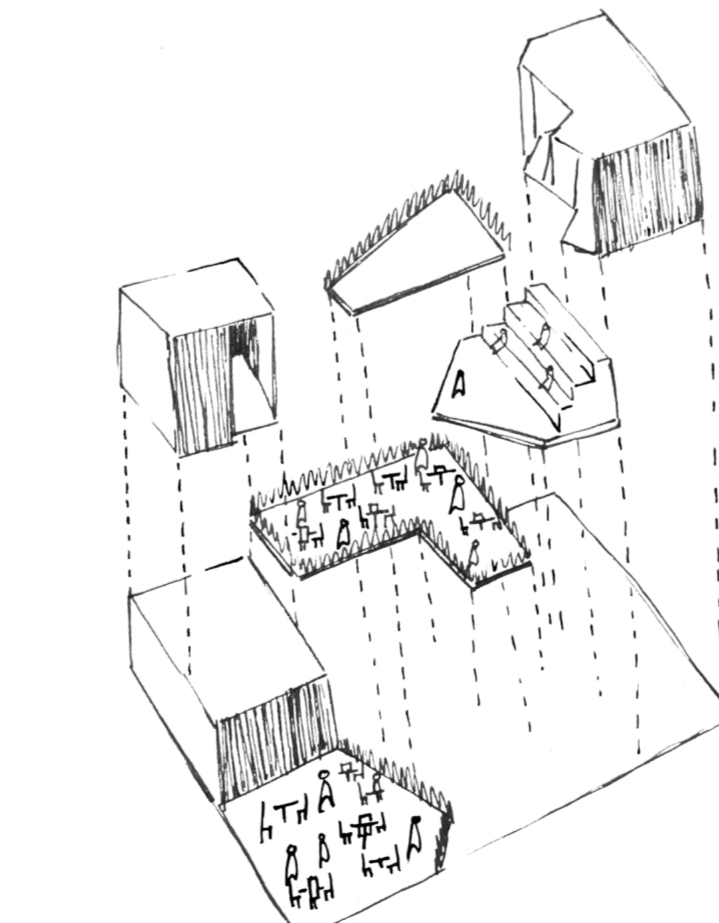
The vision for the space is to wrap the facility around the shooting range - and to connect all the spaces together though it. This is to accentuate the feeling of community and togetherness.



Concept Sketch of Proposed



Concept Sketch of Proposed



Concept Sketch of Proposed



Long Section - 1:400



Sectional Model of Main Range Sapce - 1:50



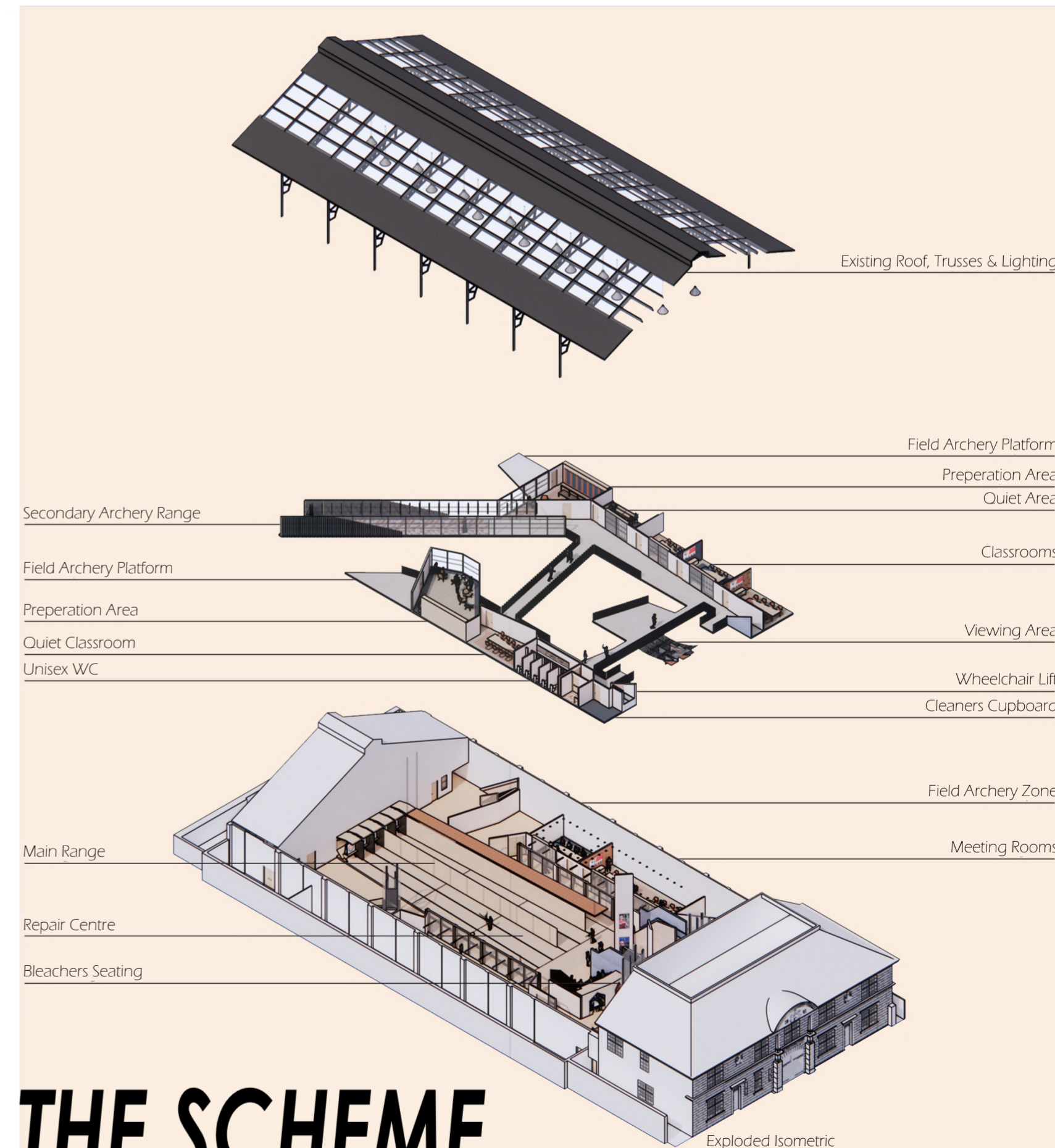
Sectional Model of Main Range Sapce - 1:50



Sectional Model of Main Range Sapce - 1:50



Sectional Model of Main Range Sapce - 1:50



Existing Roof, Trusses & Lighting

Field Archery Platform

Preparation Area

Quiet Area

Secondary Archery Range

Field Archery Platform

Preparation Area

Quiet Classroom

Unisex WC

Classrooms

Viewing Area

Wheelchair Lift

Cleaners Cupboard

Main Range

Repair Centre

Bleachers Seating

Field Archery Zone

Meeting Rooms

Exploded Isometric

THE SCHEME



THE SPACE & 'SLIDING BLINKERS'

Visual - Up Main Range



Visual - Secondary Range



Visual - Main Range Blinker Archer Perspective



Visual - Entrance with Bespoke Banquette Seating



Visual - Typical Meeting Room

MAIN RANGE - 'SLIDING BLINKERS'

As my research had revealed that experimenting with forced perspective and removing peripheral was beneficial to archers, I then explored how this could manifest itself into my design.

After creating different prototypes and recording how that affected archers 'grouping', I found that the most effective method was positioning to boards in front and behind the archer on the line. Archers recorded the more confined space made them more aware of their stance and their body, which improved all archers forms and created a better environment for focus.

This data led me to investigate how best to construct a range that gives archers the opportunity to shoot with blinkers, and how to create a smaller point of focus visually with lighting.

The main range sits on a 300mm elevated podium, braced with C16 construction grade timber at 600mm centres. Within this is a recessed rail system from which the blinker partitions can be slid as desired.

*'Grouping' - how close together an archers arrows are. A 'tight group' means all arrows shot are close together - meaning that the archer is shooting consistently.

THE PLANS

First Floor Proposed - 1:400

Ground Floor Proposed - 1:400

KEY:

1. Entrance & Reception Space
2. Unisex Locker & Changing Room
3. Quiet Space
4. Prayer Room with WC and Sink
5. Unisex Toilet
6. VC Room
7. Pods
8. Meeting Rooms
9. Field Archery Podium
10. Storage
11. Practice Range
12. Repair Centre
13. Prep. Area
14. Staff Facilities
15. CC
16. Cafe
17. Teapoint
18. Classrooms
19. Main Range
20. Secondary Range
21. Shop

Control Results - Standard Shooting Conditions

Blinker Results - Boards Both Sides of the Archer

Analysis of Archer Stance & Technique in Research Report

BESPOKE JOINERY - BLEACHERS SEATING/STAIRS/BOOTHES

PURPOSE

This bespoke joinery piece integrates three functionalities into one - aiding a reduction in material usage and cost. Due to compact nature of the piece, it also takes up less area in plan, which is vital to the success of the feel and comfort of the archer on the main range.

SMILE PLASTICS 12MM SHEET - MARLIAS

This product was chosen in favour of a standard plasterboard finish around a dividing partition, due to its unique texture and colour and low carbon footprint. This particular product is created from recycled packaging, taken directly from existing waste streams within industry.

EGGER LAMINATE - LIGHT VICENZA OAK/SOLID SOFT BLACK

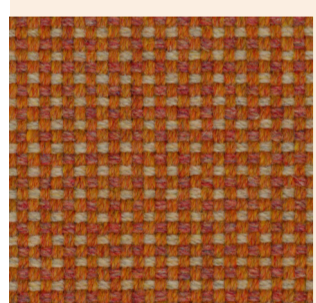
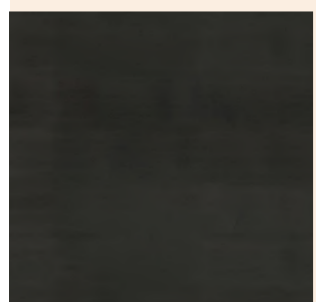
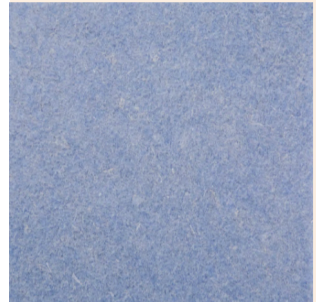
Egger laminate is an industry staple, providing a high quality finish, and budget friendly price point. This laminate will be applied to a 12mm plywood substrate in this application. This is a cost friendly and time efficient alternative for this construction, as it is used over the majority of the surface of this design.

POWDERCOATED STEEL - PANTONE GUNPOWDER

Powdercoated steel was chosen as the handrail material due to its long lasting and smooth finish. Powder coating the steel makes it more resistant to rusting, chipping and wear and tear from being used as a hand rail.

CAMIRA RESKU.20 - REDEEM/REAWAKEN/REWIND

The ReSKU2.0 range is created from recycled wool from Camira's own manufacturing waste as well as harvested flax to create a durable and textural upholstery material. Specifying this material keeps carbon footprint low and aids the longevity of the fit out. The seat pad upholstery is also specified to be removable from the upholstery foam - for ease of cleaning and replaceability in future.



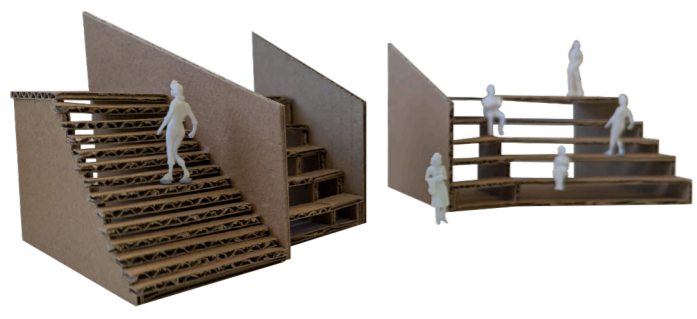
Sketch Model Exploration of Bleachers



Sketch Model Exploration of Bleachers



Maquette Model of Bleachers Concept - 1:50



Maquette Model of Bleachers Concept - 1:50

CONCEPT

Kyudo Archery Hall - FT Architects

Joinery inspired by nocking an arrow on a bow. No fixtures or fittings are used, only carpentry joints and gravity. Reflects the tension of the sport.

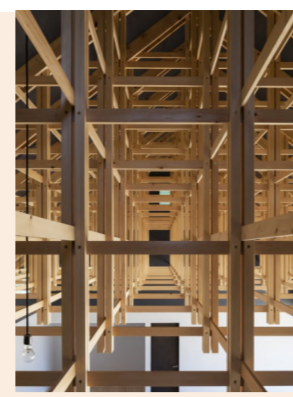


Image of Kyudo Hall

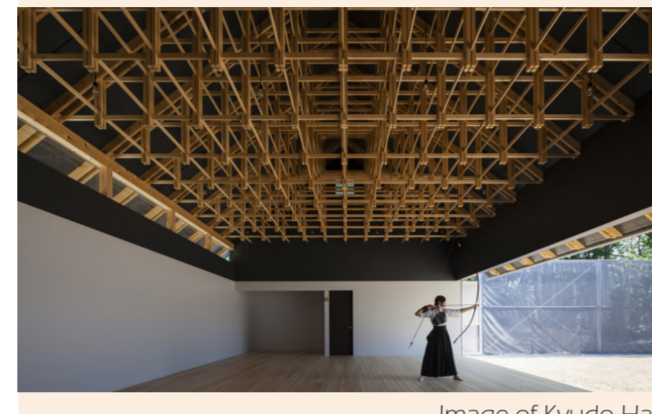
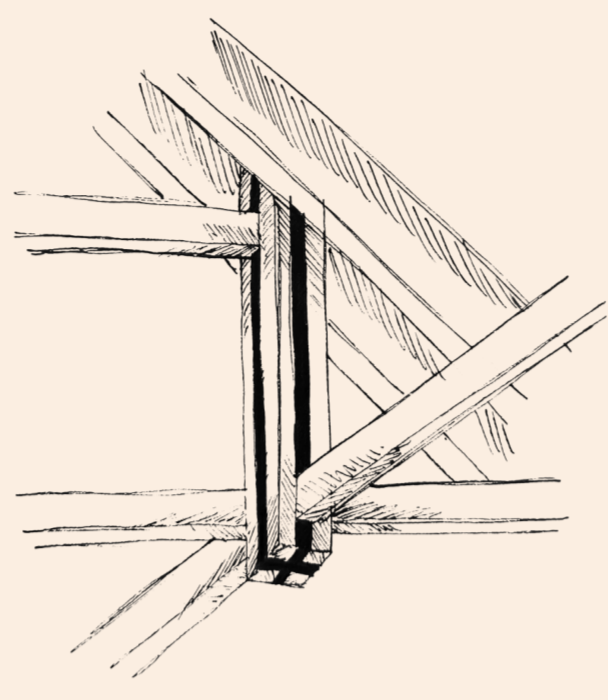


Image of Kyudo Hall

INSPIRATION



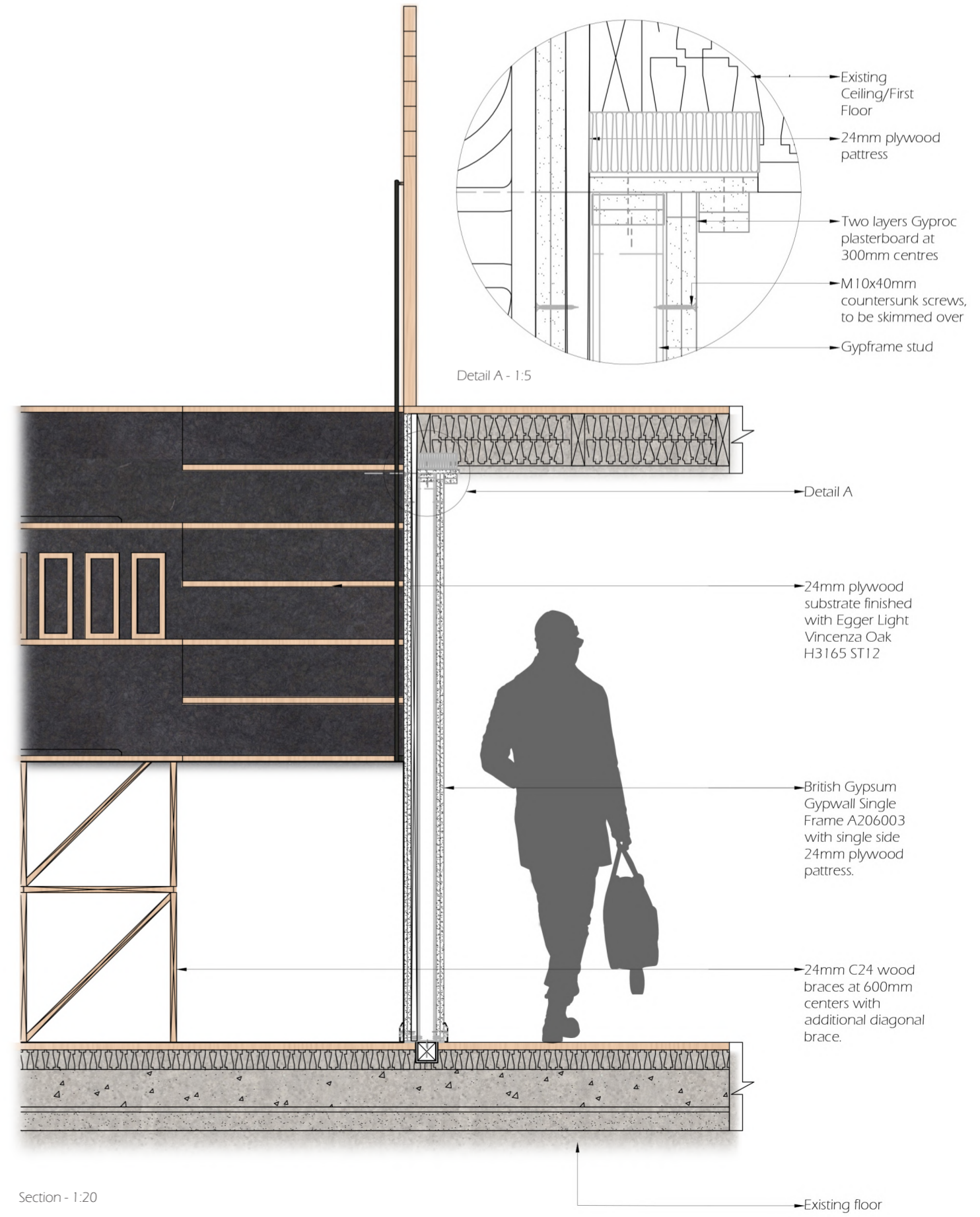
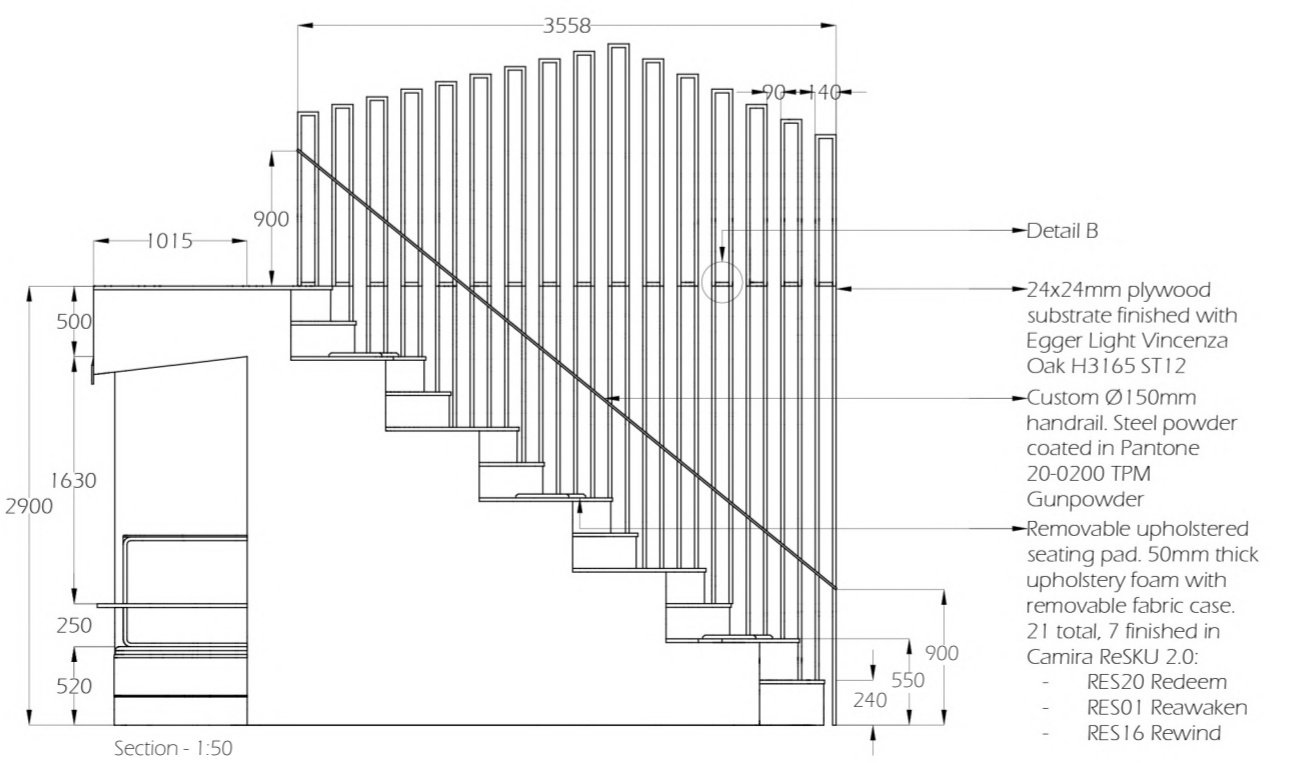
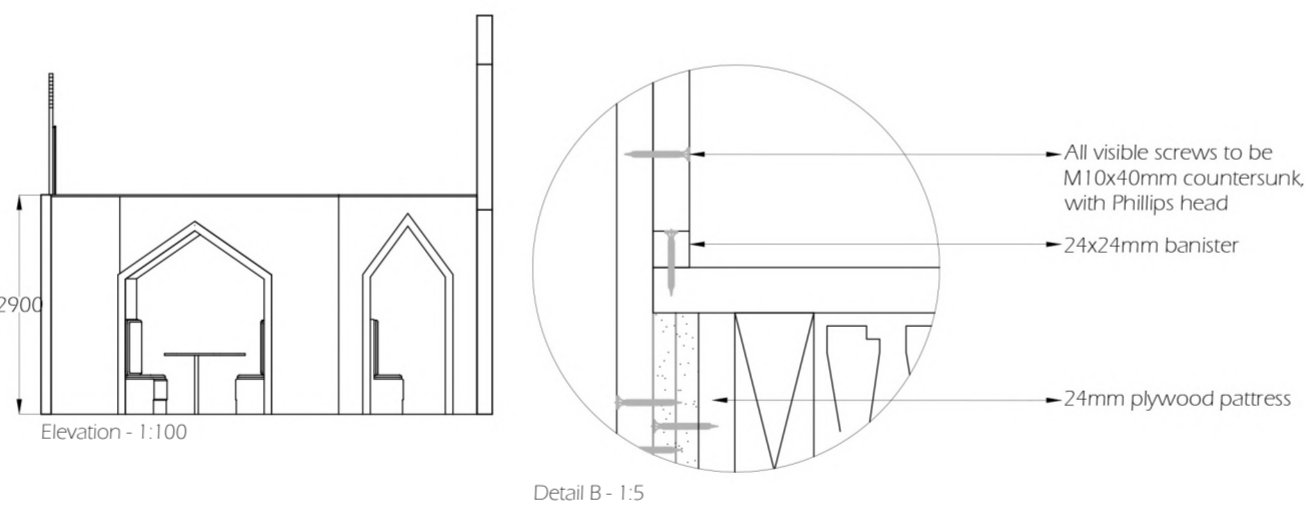
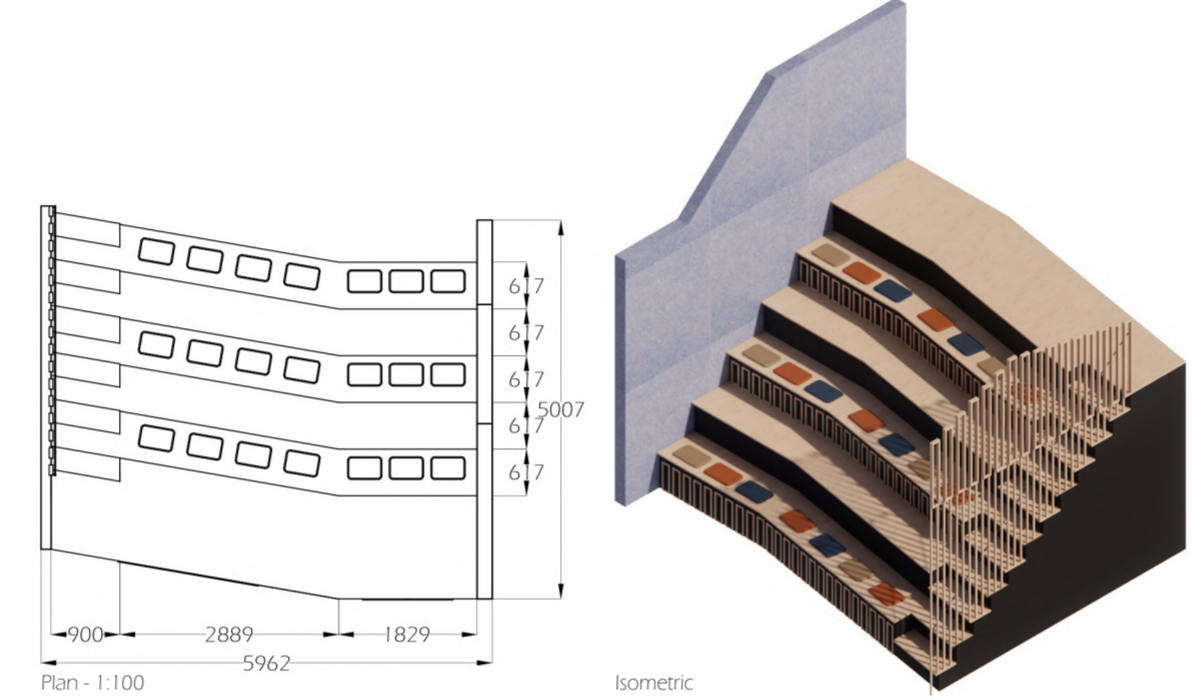
Sketch Analysing Joinery



Visual - Reception Featuring Intergrated Booths in Bleachers Seating

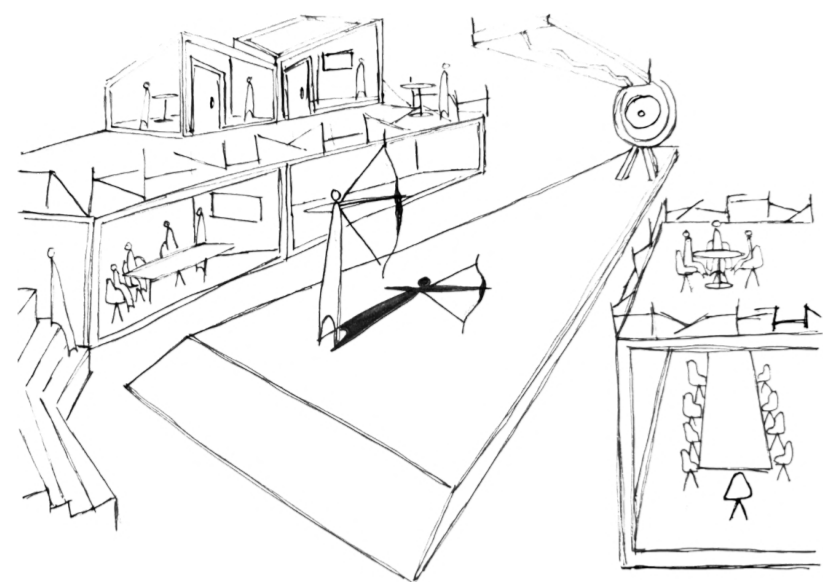


Visual - View from First Floor Mezzanine



Section - 1:20

CONCEPT

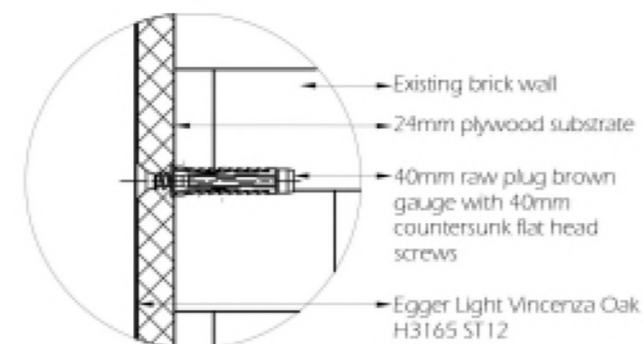


Concept Sketch of Range

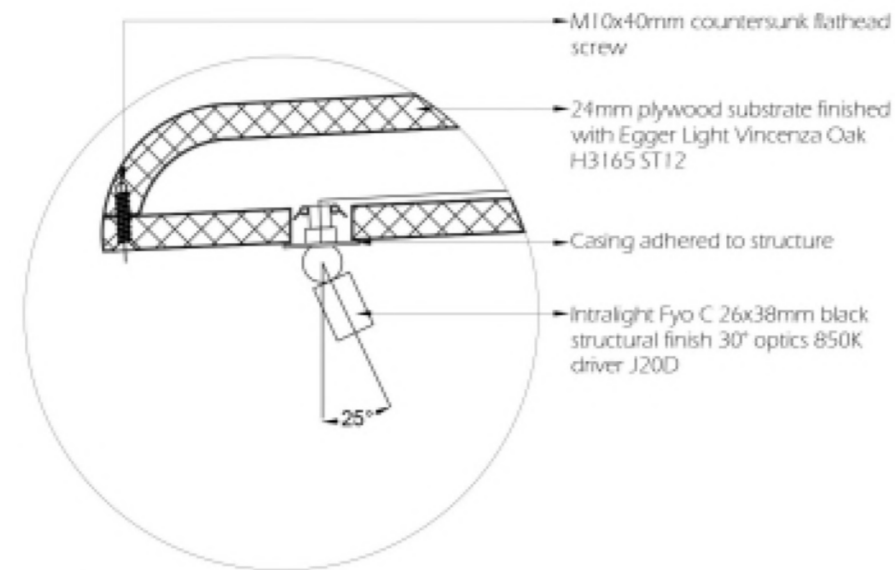


Concept Sketch of Range

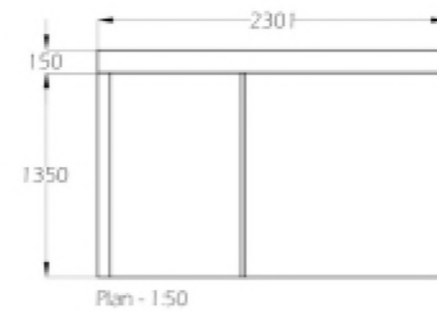
Concept Model of Range - 1:50



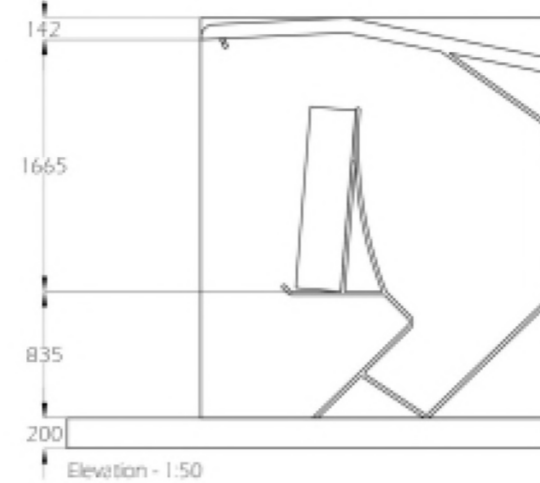
Detail A - 1:5



Detail B - 1:5



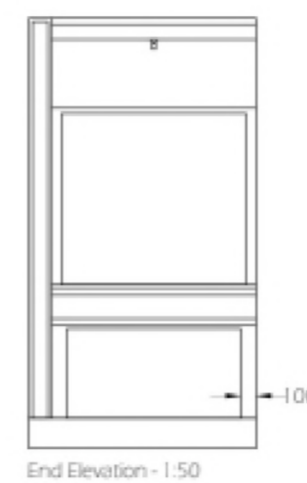
Plan - 1:50



Elevation - 1:50



Isometric



End Elevation - 1:50

BESPOKE JOINERY - TARGET STAND

PURPOSE

Targets within an archery range are usually designed for compactability rather than ergonomics or safety. This design - due to being set in an interior - does not have the constraint of needing to be transported. That then allowed me to explore a design that would be a permanent fixture of the space. This led me to explore how a target stand can roll missed arrows towards the user, instead of having to go behind the target to pick them up. This is a safety risk as on occasion there have been archers who have injured themselves on arrows in the target while reaching for ones on the floor.

Having a permanently fixed target also gave me the opportunity to integrate a spotlight in the stand, to aid archer consistency - by creating more contrast and a smaller point of focus.

EGGER LAMINATE - LIGHT VICENZA OAK

Laminate was used in this joinery piece firstly to be cohesive with the rest of the finishes in the design, but also for its durability. Although the laminate will not be placed on any surfaces that are parallel to the target, it is still important for the longevity of the piece to have durable finishes as to not get scratched by arrows.

INTRALIGHT FYO C - BLACK STRUCTURAL FINISH

A durable commercial grade spot light was chosen to be integrated into the stand to help create a smaller point of focus - to assist archers in performance. Through a research report I conducted and wrote, I discovered archers perform more consistently when a smaller point of focus is created - in some cases it also assisted in reducing heart rate, which aids consistency also.

6MM CHIPBOARD

Chipboard has been specified on all faces of the design that run parallel to the target surface. This is to protect the design from any missed arrows. The chipboard has been put in place to be easily removed and replaced once it has been 'shot out' by missed arrows. The discarded chipboard can then be put into a recycling waste stream to be recycled into new boards.

24MM SOFT BLACK FOAM

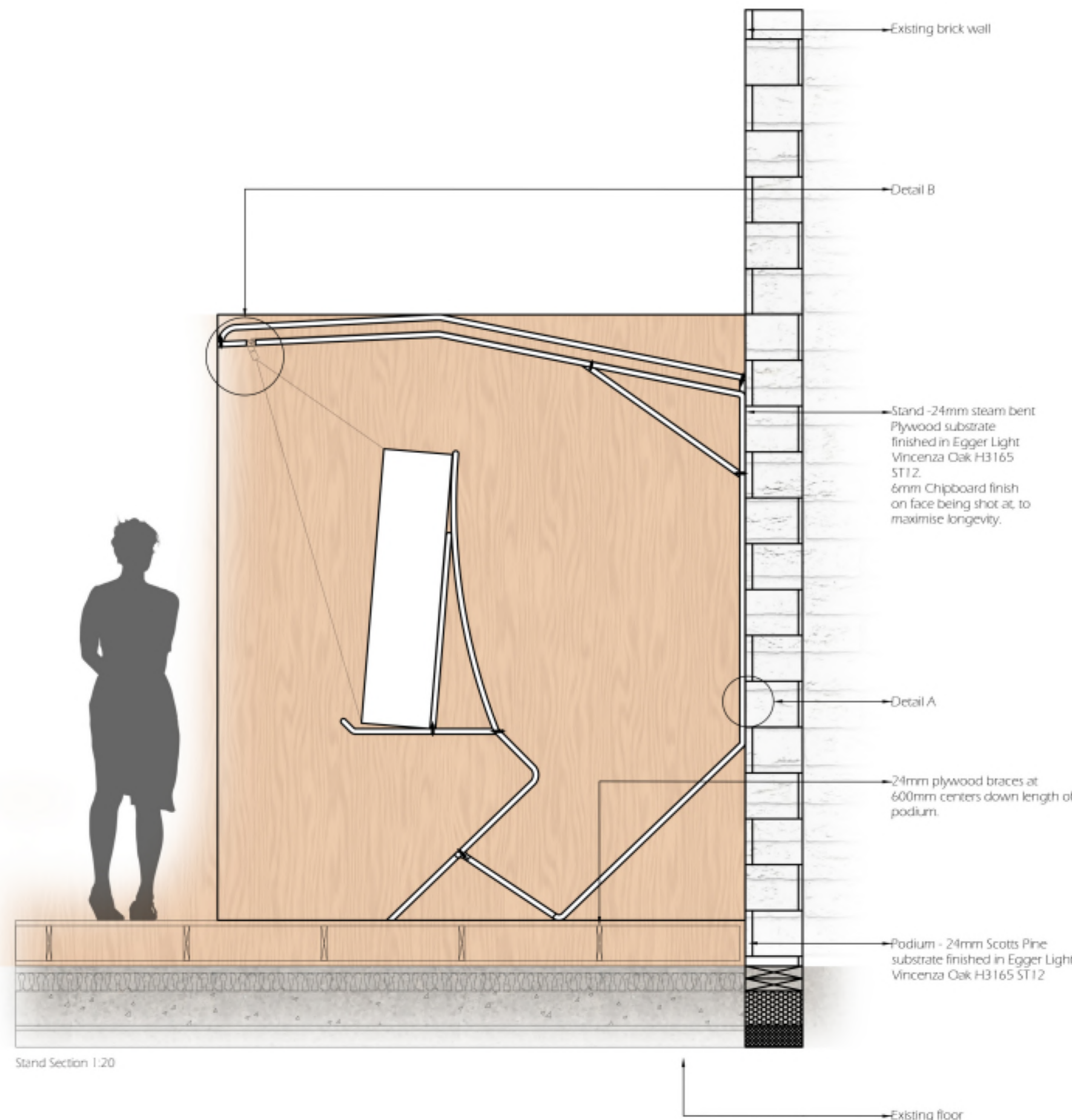
Sheets of 30x1200x24mm foam are commonly used as indoor 'bosses' (bosses are the foam/straw surfaces that target faces are pinned to). This material was chosen, as it is easiest to replace when the material is 'shot out'. The foam sheets are layer to a height of 1200mm - and are then strapped together with ratchet straps. This is the best alternative to straw or solid foam blocks, as it is easiest to transport, store and replace. It is also most cost effective, as when the other alternatives need replaced, a whole new boss must be purchased.



Visual - Workshop with View of Main Range



Visual - Stands in Main Range



Stand Section 1:20

INSPIRATION

Scottish Parliament Lectern - Ben Dawson

This steam bent laminated oak and sycamore lectern has become an iconic piece of furniture design in Scotland. I wanted to incorporate this pride of heritage into the design.



Scottish Parliament Lectern