

**Govan Ark**  
Shipbuilding Industry  
Research & Heritage Academy

**Design Statement**  
May 2023



**AB419 Design Studies**  
**Year 4**  
Semester II  
Konrad Kolodziej

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## 1.1 Scope of Project To Care

The scope of this project was to create a desing of a Civic Building with floor area arround 3200 m<sup>2</sup>. The design should consider Sustainable Land Use and Enhance biodiversity and ecology To Care

- A civic building
- 3,200m2 in floor area
- Sustainable land use
- An enhanced biodiversity and ecology
- Health and wellbeing
- Community engagement
- Attract tourism – International
- Provide Learning/Educational Space

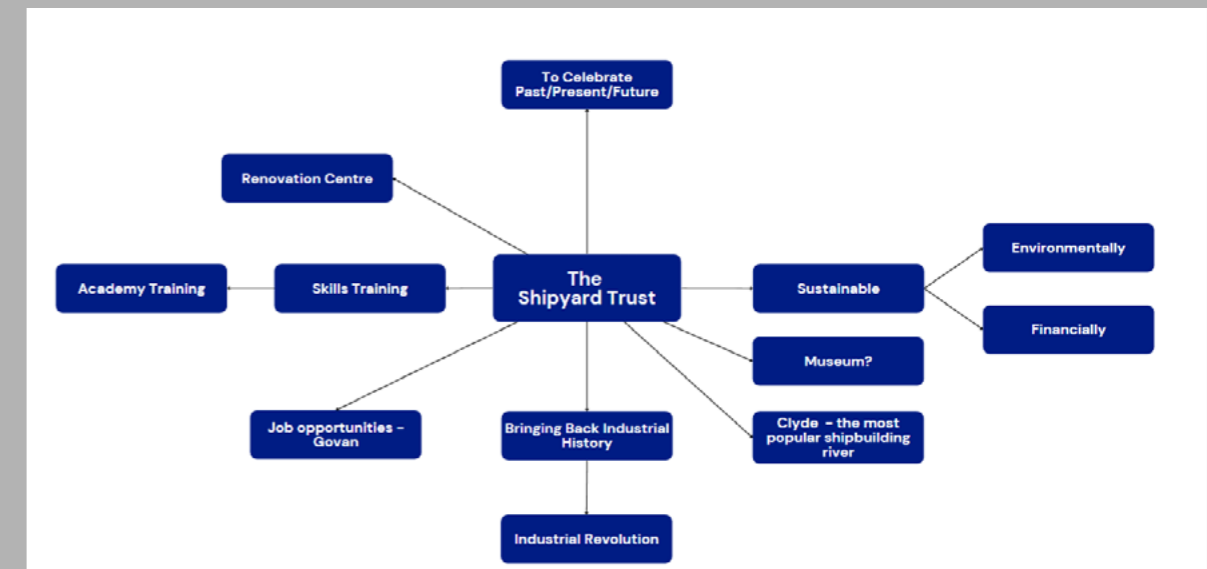
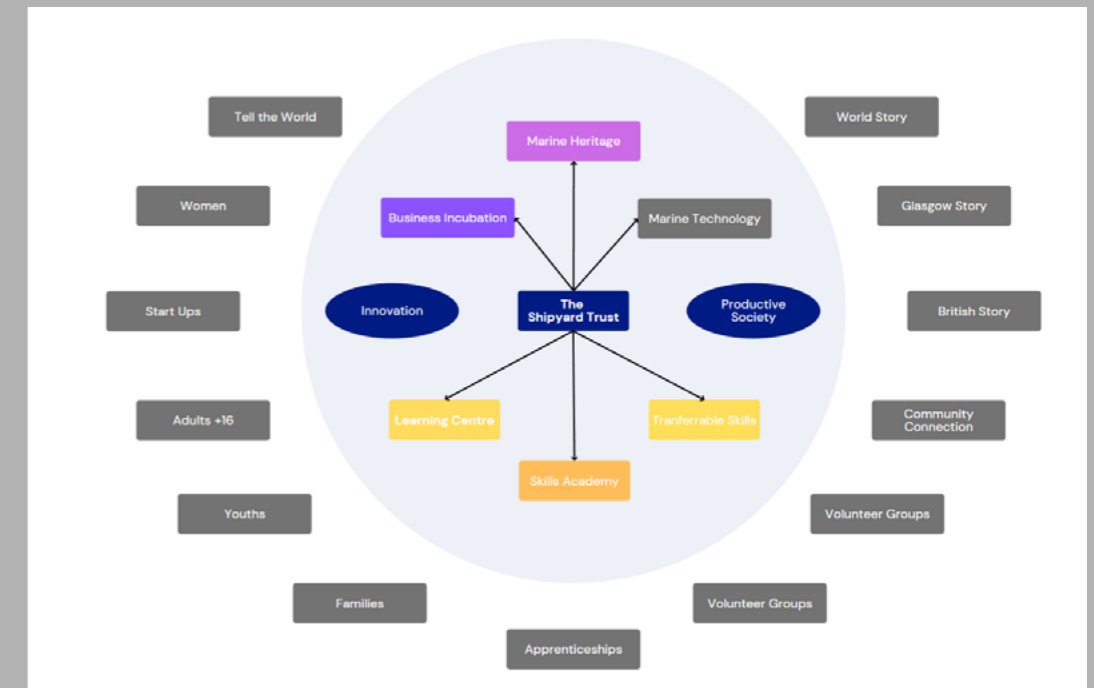
## 1.2 Client - The Shipyard Trust

The ShipYard Trust is a charity organisation founded in June 2018 and was been set up to share and educate people on the River Clyde's story of the industrial achievements through engineering and shipbuilding.

The story of the Clyde is to celebrate the past, present and future. With the hope that it will be a place for education for the surrounding to communities on shipbuilding and to bring the skilled trade back into Glasgow.

## 1.3 Clients Asspirations - Established after 1st meeting

- An iconic venue
- Innovation
- Celebration
- Shipbuilding and marine engineering heritage
- The River Clyde
- Education
- Awareness
- Returning visits to the venue
- Income streams
- Movement & Freedom
- Accessibility
- Physical and digital experiences
- Deposit of stories



## 1.4 Brief

General aims for the project are to create a sustainable skill academy which can accommodate a response for client's aspirations as well as needs of Govan community.

In creating this design I see an opportunity of bringing the history of Govan to its citizens, educating and training local community towards model making skills and design. Such training is aimed to provide citizens with a possibility of gaining new skills and improving chances of being employed as, according to Glasgow Index Project, the Govan community is struggling with technical skills and education levels.

The place will be able to accommodate great collaboration between academy and trainees. People involved in learning process will not only improve their skills but they will contribute to shipyard heritage and local history by redesigning and recreating replicas of ships built in Glasgow.

Building will bring back history of shipyard industry, encourage and provide possibility to deepen people's historical knowledge about thousands of vessels built on the Clyde over hundreds of years, which will bond local citizens with the place, history and each other.

## 1.5 Letter to Client

Dear Mr. Gil Paterson, Mr. Tom McKendrick, Mr. Ian Johnston, and Mr. Ian Mackay,

I am writing to you about our previous meeting. I was delighted to hear your presentation about your project focused on broadening the knowledge about the achievements of Clyde's shipyard industry heritage with the remembrance of the contributions made by thousands of people.

For this project, I was given three different sites located on the bank of the river Clyde – Govan, The Broomielaw, or The Barras and Saltmarket. After the first historical analysis, I realised that the Govan site is the one that we would like to consider more deeply as we could bring back live, derelict grounds after the old Govan Shipyard. The site is located within walkable distance of multiple education buildings which can help us to involve many young people. Govan for hundreds of years was serving as a Centre of the shipbuilding industry. Additionally, the Govan community struggles with poverty and lack of proper development which could bring this community together.

I felt really motivated by meeting such passionate people. I think that Govan Site is the most suitable for your development as it is the site where many important historical events happened. I see the opportunity for your investment but also an opportunity that could uplift the education level and educate the local community about its history.

The next stage of the procurement route will be solving the urban strategy to achieve the best result for you as well as for a local area.

Kind regards,

Konrad Kolodziej

## 2.1 Historical Context

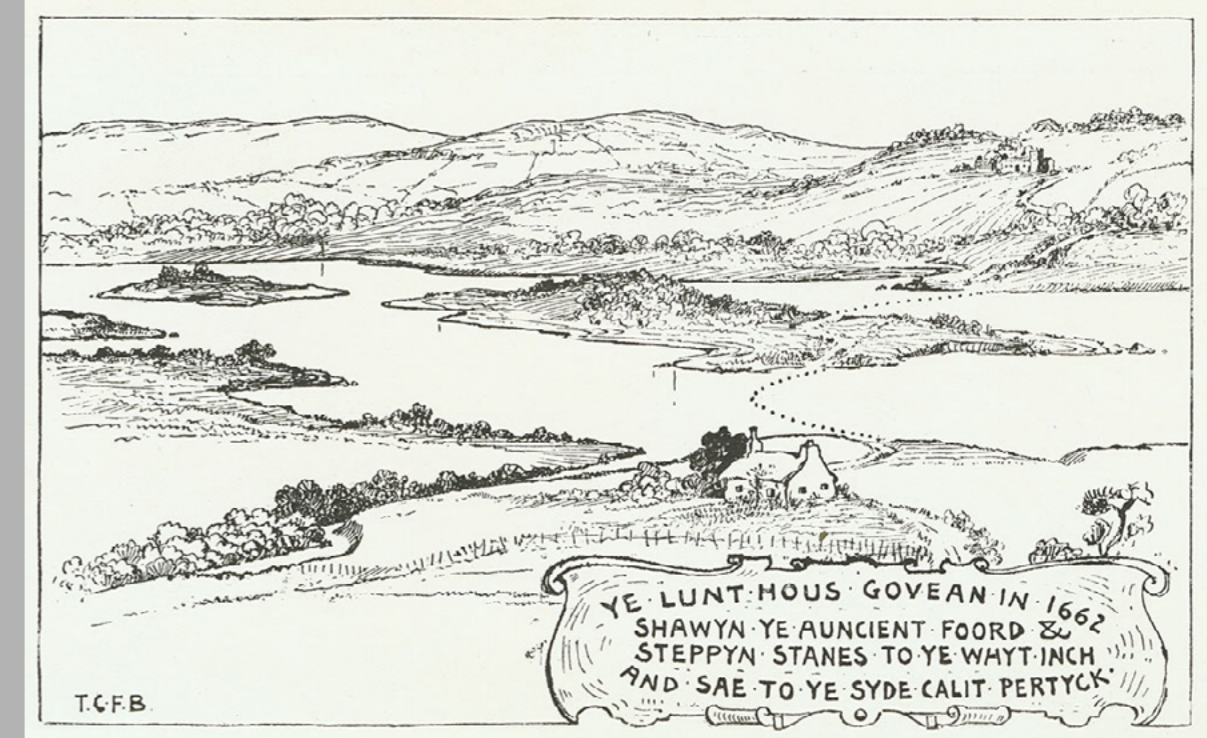
### 2.1 History of Govan

Govan is a historic district located on the south bank of the River Clyde in Glasgow, Scotland. The area has a rich history dating back to the 6th century when it was a major religious site and home to a monastery founded by St. Constantine. In the centuries that followed, Govan grew into an important industrial and shipbuilding center, with shipyards along the river employing thousands of workers. The district also played a significant role in the Scottish Wars of Independence, with the Battle of Langside taking place there in 1568. In the 19th and early 20th centuries, Govan's shipyards produced some of the most famous ocean liners in history, including the RMS Titanic. Despite facing economic challenges in recent decades, Govan remains an important cultural and historic hub in Glasgow, with many notable landmarks and attractions for visitors to explore.

### 2.2 Govan Density

From 1860 to 1910, the density of buildings increased majorly taking over the agriculture fields and forming the centre of Govan with major infrastructure routes and residential housing. Along the waterfront the shipyards stayed consistent from the 1860s through to the 1950s map. The decline of the shipyards began in the late 1960s and major changes were made changing the waterfront. Thus, left gaps sites along the waterfront and irregular housing layout was built on the former shipyard.

From the 1950s to present, industrial buildings have infiltrated the town centre and large gaps sites have started to form. The change from structured residential building has had a massive effect on the layout with new routes being formed and the town centre lacking in housing.



## 2.3 Historical Context - Shipbuilding Industry

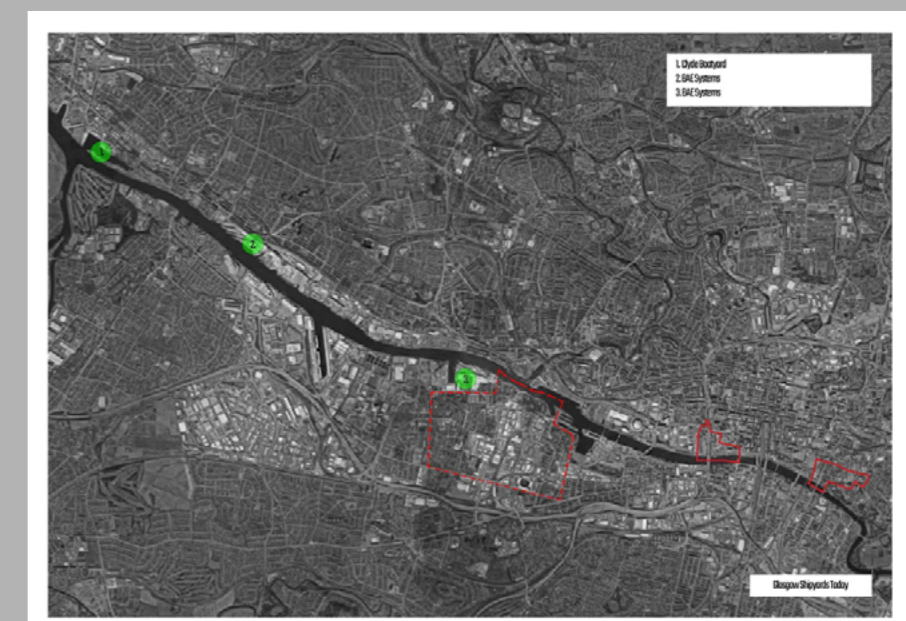
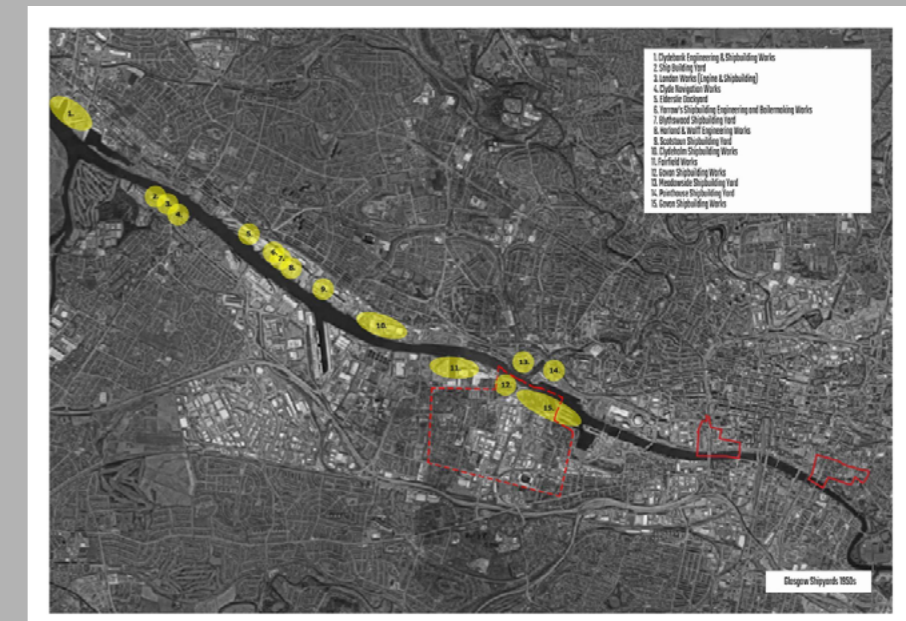
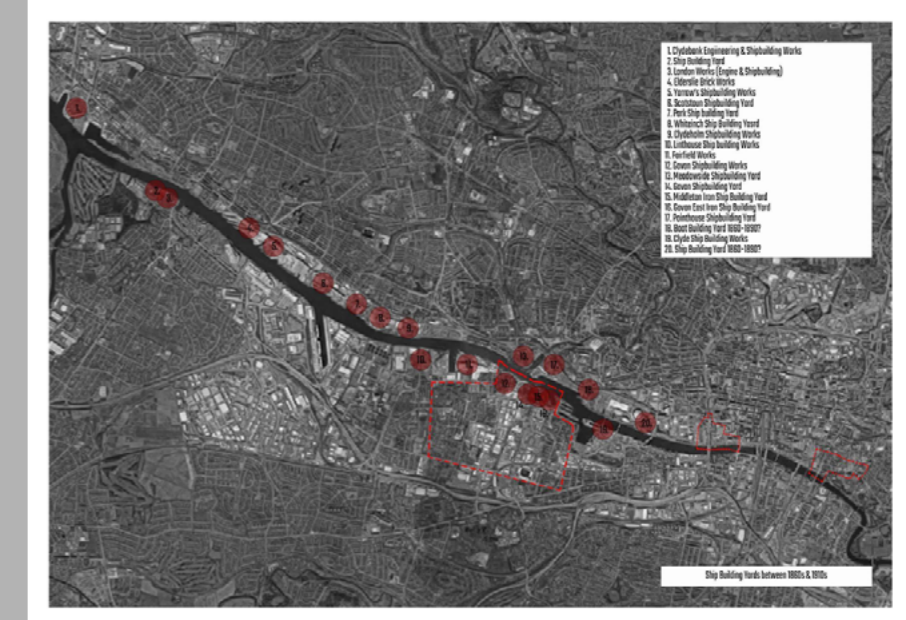
There is possibility that first boats were built in the Upper Clyde area as early as the 15th century. However, the time when the shipbuilding industry has started its rapid growth is dated for 19th century. When in 1841 Robert Napier, who was also being called "The father of shipbuilding on the Clyde" acquired a small wood shipbuilding yard and developed it into a huge enterprise. He was not only an innovator who was able to deliver high quality work notably for the Admiralty and the Cunard Line, but he was also able to train many of the next generation's shipbuilders such as the Thomson brothers responsible for establishing John Brown's Shipyard in Clydebank, John Elder and William Pearce. Rapid growth of the shipbuilding industry was a response for a growing demand for ships.

## 2.4 „Clydeside Shipyards” - 1961

### 'The Red Poppy'

A Clyde shipbuilder expresses pride in his industry:

Gaunt and black against the sky,  
Great lumps o' girder-cradled steel,  
Stoun starkly naked, loomin' high,  
Wi' a still power that you can feel;  
A kind o' loveliness forbye.  
A ship is born in dirt an' din,  
Racket o' rivets, flash o' flame,  
Fae the welder's torch, a clatterin',  
O' blacksmith's hammer, a fretted frame,  
O' tall cranes swingin' oot an' in.



## 2.5 Water Row - Site History

Govan is one of the most historically significant areas in Glasgow; it is a place of great antiquity which grew to become one of Scotland's industrial powerhouses during the 19th Century. Water Row, and the proposed site, is located within Govan's town centre overlooking the River Clyde, Govan Cross, the Riverside Estate and Govan Old Churchyard. It is both physically and historically connected to Glasgow by River

Clyde water front and Govan's town centre.

### 2.5.1 1860

In 1860s the Water Row site was occupied by a large manse, therefore the connection between Govan and North bank of River Clyde was provided by a ferry as a regular service.

### 2.5.1 1870

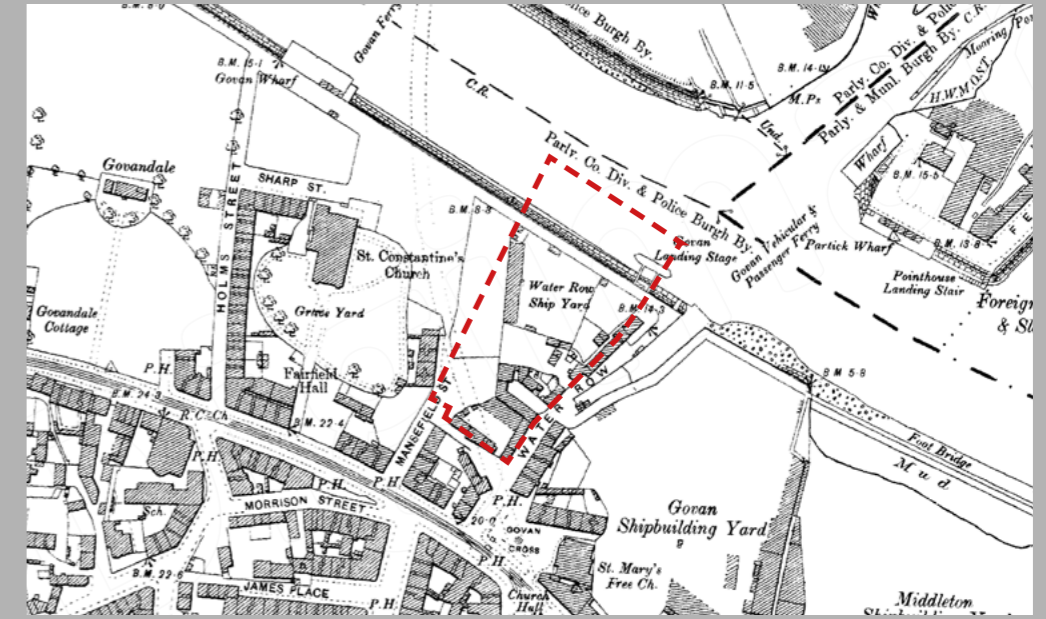
In 1870s yards on the Clyde were occupied by various firms including Hugh Mclean & Co

### 2.5.2 1912 Harland & Wolff Ltd

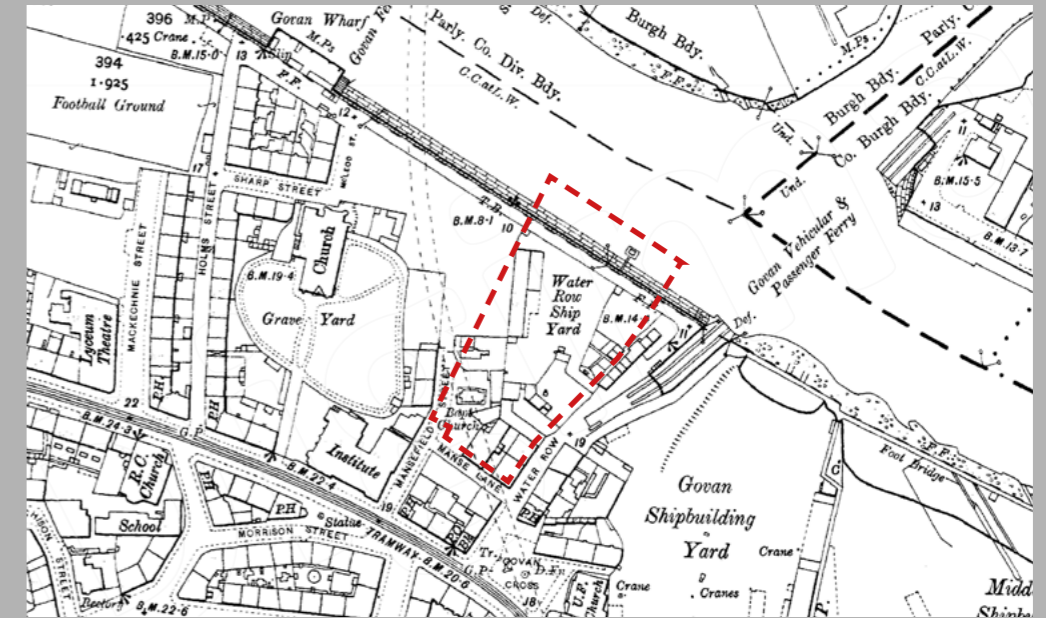
The area around Water Row was swept aside by the rapid industrialisation and the growing Harland & Wolff shipyard. The firm acquired the Govan Old, Middleton and Govan New shipyards in 1912, and in 1914-1915 built an extensive range of workshops on the west side of Water Row.

### 2.5.3 1963 Closed

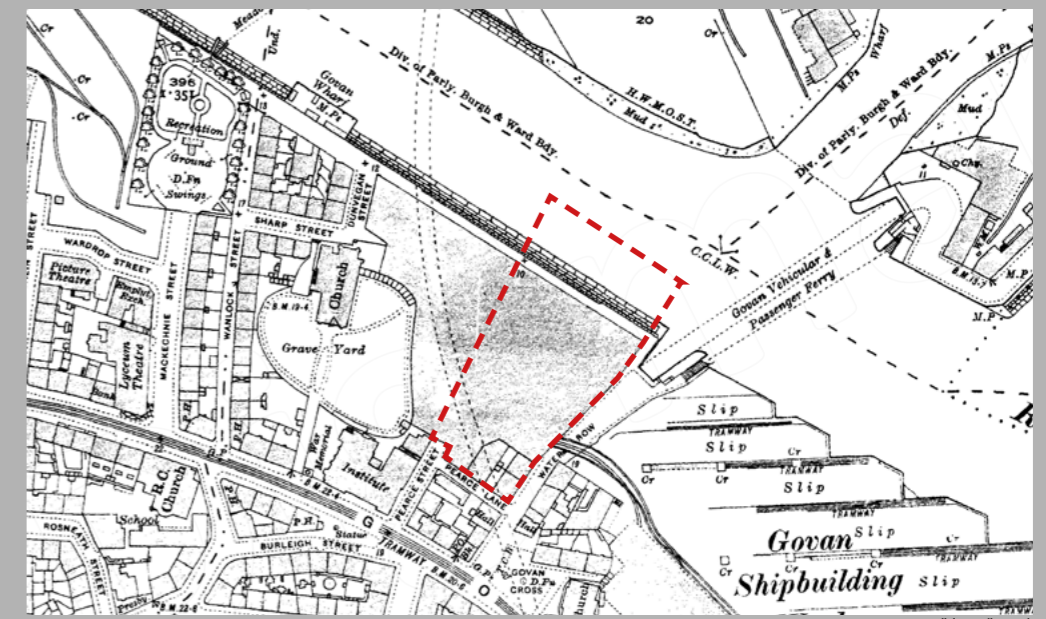
The Govan Shipyard was closed in the early 1960s and Water Row entered a steep economic decline.



Historical Map of Site 1890



Historical Map of Site 1910



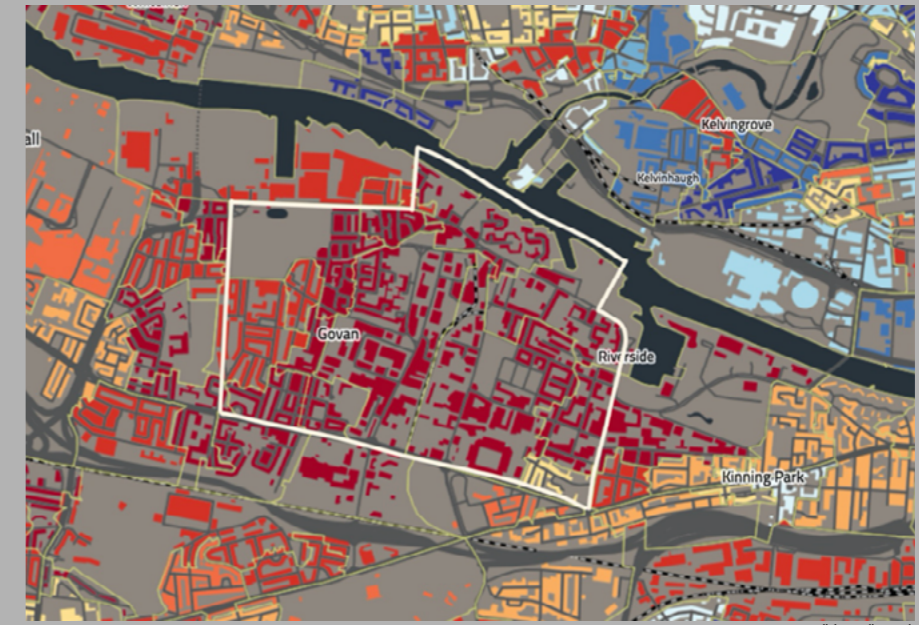
Historical Map of Site 1930

## 2.6 Govan - Demographics

Population:	13509
People Aged 0-15:	17.6%
People Aged 16-54:	68.9%
Single Parent Households:	49.5% (23% more than avg. Glasgow)
People who travelling to work by walking, cycling or using public transport:	51.7%
Overcrowded Households:	19.9%
Children in Poverty:	35.6%
Young people not in education, employment or training	19.9%

## 2.7 Govan - Identified Issues

- Poverty
- Low educational attainment
- Crime
- Poor health and low life expectancy
- Drug Problems
- Gap sites
- Derelict buildings
- Empty shops in the town centre



Govan - Research Area

source: digimap.edina.ac.uk



TYPOLGY

### 3.1 Structure Appraisal

Choice of adequate structural system is one of the most important choices. Structure should be chosen at the early stages of a design as it can have a big impact for later decisions. Structure of the building is a skeleton carrying the whole building influencing a number of factors such as:

- Cost
- Build speed
- Internal layout
- Energy Efficiency

### 3.2 Timber Framed Structure

Use of timber in construction has a long story with evidence of timber framed buildings dating back to the ancient times. The technique was also widely used in medieval Europe to construct different types of building like houses, castles or churches.

In this technology columns and beams are forming a skeletal frame what can reduce amount of load-bearing walls needed to distribute loads within the building. One of the main advantages of timber framed structures is durability. Wood used in the structure which is a renewable resource is making this option more environmental friendly than other types of structure.

Timber Framed structures have a unique aesthetic appeal, exposed timber structure can bring the building a distinctive look impossible or very difficult to achieve with use of different structure in terms of it's materiality. Timber is a good sound and thermal insulator comparing to steel structure.

One of the challenges for timber framed structure is risk of fire, which can be significantly reduced by use of proper fire resistant coating. Additionally timber-framed structures can be more expensive to construct than traditionally build structures.

**Pros:**

- Sustainability
- Design Flexibility
- Speed of Construction
- Aesthetic appeal
- Insulation

**Cons:**

- Fire risk
- Risk of insect and rot damage
- Cost
- Maintenance



source: www.archdaily.com/776871



source: www.archdaily.com/888818/

### 3.3 Steel Structure

Steel Structures due to use of steel as a main material which is making these structures strong and durable. Steel is a non-combustible material and has a high resistance of fire, however it can become more flexible after being exposed for a large amount of heat e.g. fire within the building what can result in loss of load bearing possibilities and further structural failure.

Steel is resistant to moisture, pests and decay making it a better material for buildings located in harsh environment e.g. close to the river where humidity can be higher. Another advantage of steel structure is a design flexibility as steel can be easily molded and shaped to create unique architectural design. Steel elements are prefabricated and then brought into the site ready to be assembled significantly reducing build time. Elements produced out of steel are widely recycled making steel looking more sustainable, unfortunately with high demand for recycled steel its availability on market is limited and therefore it's not always possible to use them for the entire structure. Steel production emits 1.83 tons of CO2 per each ton of steel produced what is showing how big environmental impact it has.

- Pros:**
- Strength and durability
  - Fire resistance
  - Design flexibility
  - Speed of construction
  - Sustainable (widely recycled)
  - Industrial appeal

- Cons:**
- Cost
  - Corrosion
  - Thermal conductivity
  - Environmental Impact



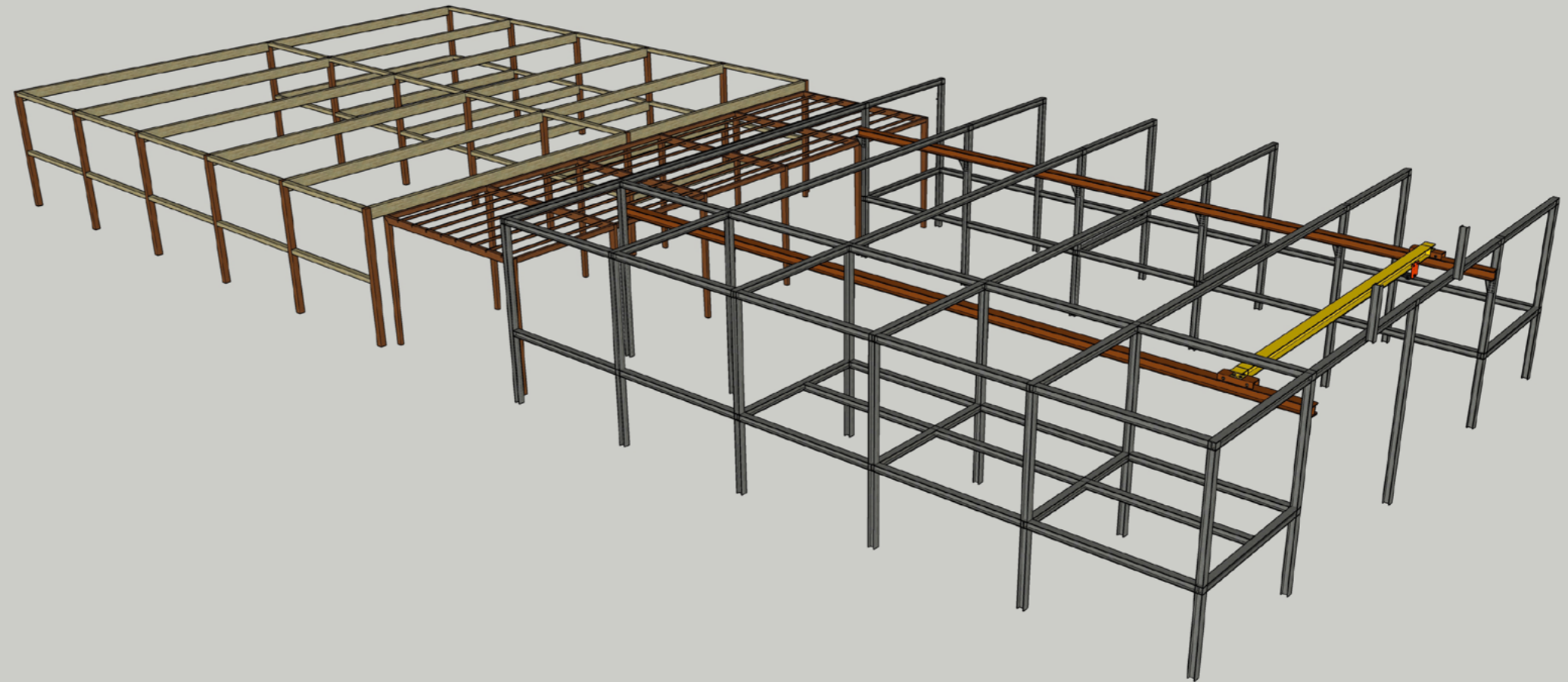
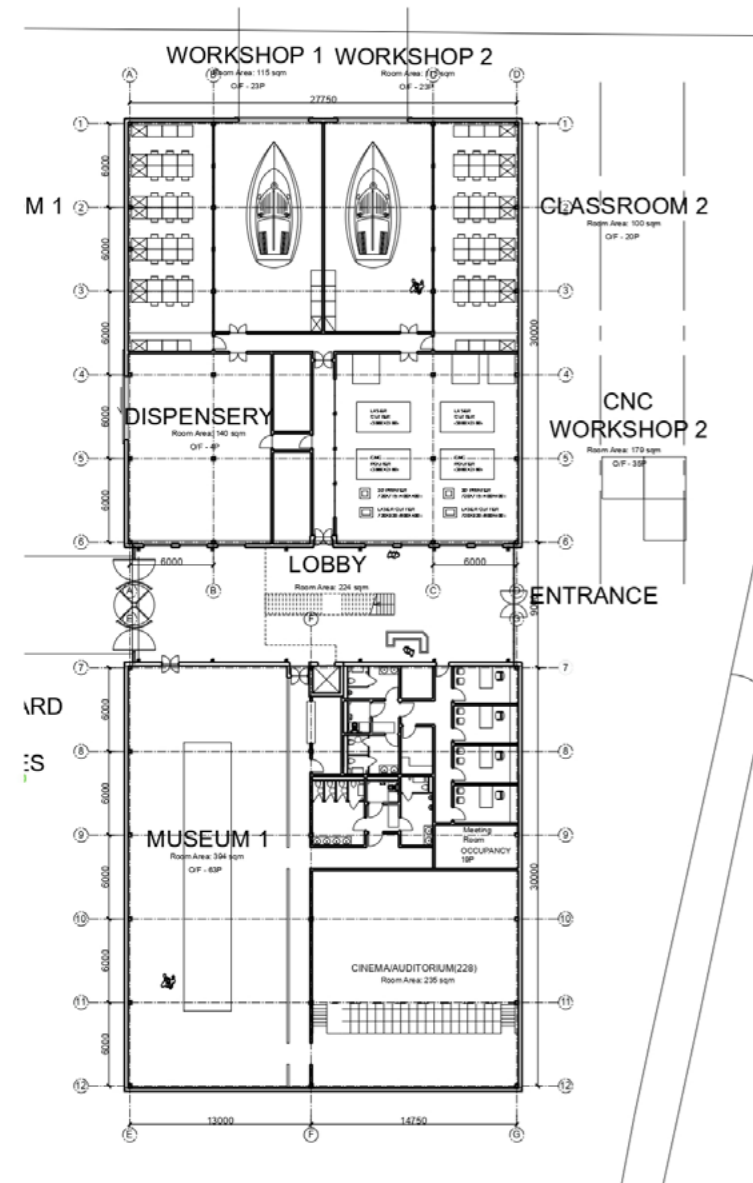
source: bmbsteel.com.vn



source: www.directorsteelstructure.com

### 3.4 Structural Appraisal

#### Column Grid & Structure materiality



## 4.1 Aspirations

Building programme was designed to become self sufficient, workshops can produce parts of exhibition as well as decorations used within the structure providing work and training spaces for local community. However, to minimise carbon footprint and running costs it needs to be fitted with environmental friendly systems to provide energy, sufficient ventilation and heating solutions.

## 4.2 Proposed Systems

### 4.3 Photovoltaic panels

Photovoltaic cells mounted on roof to provide electricity. Well designed systems will be able to generate electric energy to power the building making it almost selfsufficient. Excessove energy produced during the day can be sold to the national grid and be used in any part of the town. At night the energy can be bought back to provide enough electricticity to power designed systems providing heat and ventilation.

### 4.4 Water sourced heat pump

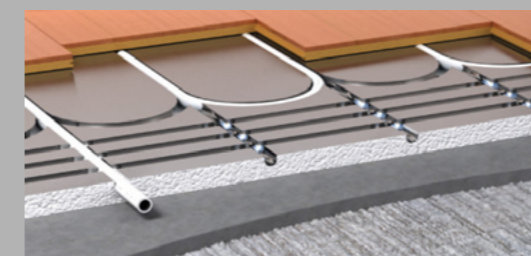
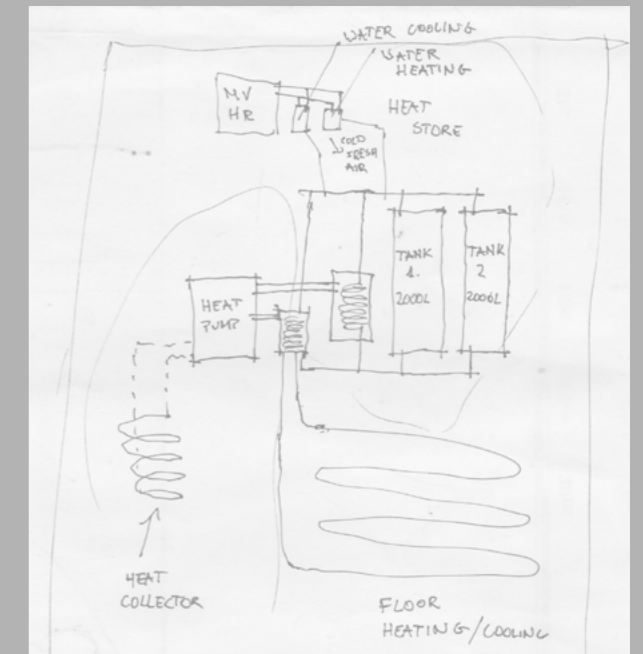
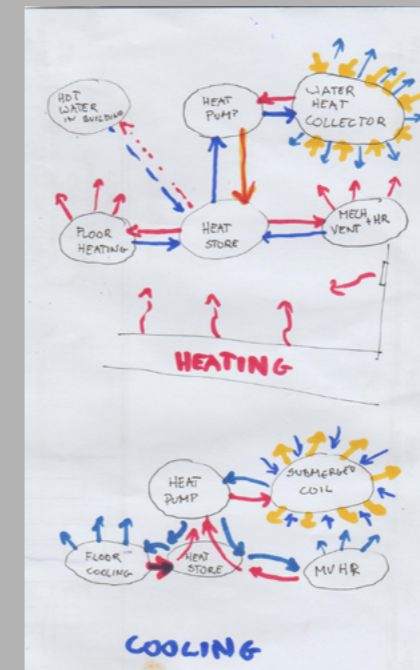
Water sourced heat pump to extract thermal energy from River Clyde (min temperature needed- 5 Celsius, while Clyde's lowest avg. temperature is 7 degrees). Water soruced heat oup provides cooling and heating. Such heat humps provide all-in-one solution making them more reliable as there are less parts to service. Heat pumps improve indoor quality as they do not use combustion, so there is no risk of carbon monoxide leaking into an occupied area. Additionally, they maintain moisture levels and prevents symp-topms such as scratchy throats and itchy eyes, which has a positive impact on health of users. The risk of mold, rot and pest infestations are significantly reduced. The quiet operation of heat pumps offers heat and cool to the building producing noise reduced to minimum. They are quieter than traditional cooling and heating systems. It is easy to connect water sourced heat pumps with underfloor water heating or with MVHR. This type of connection can significantly reduce running cost of the building and provide more comfortable space by eliminating quick temperature changes.

### 4.5 Mechanical Ventilation and Heat Recovery

Mechanical Ventilation and Heat Recovery (MVHR) will provide cleaner air and air control as well as reduce condensation and allow temperature systems. Mechanical ventilation allows for very accurate air-flow control, which helps reduce energy bills and let certain air-flow be regulated to the required health and safety standards. Mechanical Ventilation with Heat Recovery will be fitted to minimize heat-losses caused by ventilation.

### 4.6 Underfloor water heating

Underfloor water heating uses radiant heat without lifting dust and dust mites along with other airborne allergens in the air, meaning improved air quality and reduced risk to people with asthma and other respiratory problems. Underfloor water heating systems operate within much lower temperatures (26C) in comparison to traditional radiators (60-70) which can cause skinburns and injuries.



## 5.0 Fire Strategy

Fire strategy was prepared accordingly to non-domestic building regulations. Following objectives are to protect life; to assist the fire and rescue services, and to further the achievement of sustainable development.

## 5.2 Compartmentation

„Standard 2.1

Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, fire and smoke are inhibited from spreading beyond the compartment of origin until any occupants have had the time to leave that compartment and any fire containment measures have been initiated.”

Compartmentation is commonly used in construction and engineering to create fire-resistant compartments within a building or structure. These compartments are designed to contain fires within a limited area, which can help prevent the spread of flames and smoke to other parts of the building.

Building accommodates areas of different uses, which has to be compartmented following the building regulations.

## 5.2 Travel Distance

„Standard 2.9

Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the occupants, once alerted to the outbreak of the fire, are provided with the opportunity to escape from the building, before being affected by fire or smoke.”

To provide adequate travel distances within the building design refers to the table extracted from non-domestic building regulations which is showing different distances for specific uses.

Table 2.2. Multi-storey buildings

Building Use	Maximum total area of any compartment (m2)	Maximum area of an individual storey within a compartment (m2)	Minimum fire resistance duration for compartmentation and elements of structure (see Standard 2.3) where appropriate			
			Basements	The topmost storey of a building is at a height of not more than 7.5m above ground	The topmost storey of a building is at a height of not more than 18m above ground	The topmost storey of a building is at a height of more than 18m above ground
Assembly building	1,500 [1]	1,500 [1]	Medium	Short	Medium	Long [2]
	3,000 [1]	3,000 [1]	Medium	Medium	Medium	Long [2]
	6,000 [1]	3,000 [1]	Long	Long	Long	Long
Entertainment building	1,000 [1]	1,000 [1]	Medium	Short	Medium	Long [2]
	2,000 [1]	2,000 [1]	Medium	Medium	Medium	Long [2]
Factory (Class 1)	500 [1]	500 [1]	Medium	Medium	Medium	Long [2]
	6,000 [1]	3,000 [1]	Long	Long	Long	Long
Factory (Class 2)	2,000 [1]	2,000 [1]	Medium [4]	Medium [4]	Medium [4]	Medium [4]
	15,000 [1]	7,500 [1]	Long	Long	Long	Long
Office	2,000 [1]	2,000 [1]	Medium [4]	Short	Medium [4]	Long [2]
	4,000 [1]	4,000 [1]	Medium [4]	Medium [4]	Medium [4]	Long [2]
	8,000 [1]	4,000 [1]	Long	Long	Long	Long
Open sided car park	Unlimited	Unlimited	Medium	Short	Short	Medium
Residential care building, hospital	1,500	1,500	Medium	Medium	Medium	Long [2]
Residential building (other than a residential care building and hospital)	1,000	1,000	Medium	Short	Medium	Long [2]
	2,000	2,000	Medium	Medium	Medium	Long [2]
Shop	500 [1]	500 [1]	Medium [4]	Short	Medium [4]	Long [2]
	1,000 [1]	1,000 [1]	Medium [4]	Medium [4]	Medium [4]	Long [2]
	2,000 [3]	1,000 [3]	Long	Long	Long	Long
Storage building (Class 1)	200 [1]	200 [1]	Medium	Medium	Medium	Long [2]
	1,000 [1]	500 [1]	Long	Long	Long	Long
Storage building (Class 2)	500 [1]	500 [1]	Medium [4]	Medium [4]	Medium [4]	Medium [4]
	5,000 [1]	2,500 [1]	Long	Long	Long	Long

Table 2.11. Recommended travel distance (m)

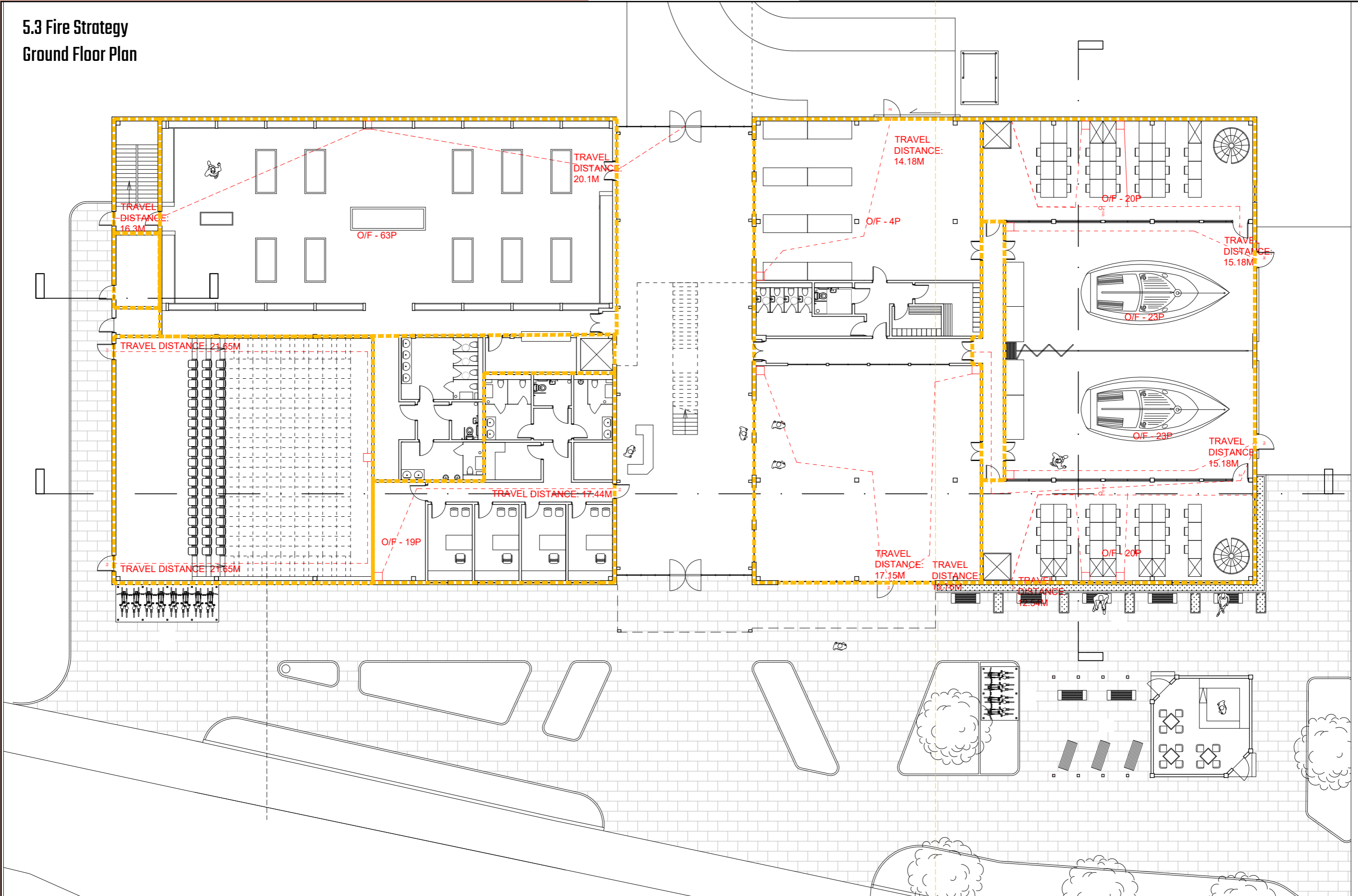
Occupancy profile	Building use [1] [2] [3]	One direction of travel	More than one direction of travel
Very slow evacuation	Residential care buildings (e.g. nursing homes and residential schools for children etc). Buildings primarily for disabled people, or people with learning difficulties. Swimming pools in air supported structures	9 [4]	18 [4]
Slow evacuation	Residential buildings (other than residential care buildings and hospitals) (e.g. hotels, hostels etc), entertainment buildings, assembly buildings, shops, room or auditorium with provision for fixed seating, storage building (Class 1) other than a bonded warehouse containing spirituous liquor	15	32
Medium evacuation	Offices, storage building (Class 2), open sided car parks, bonded warehouse containing spirituous liquor and factories	18 [5]	45
Other	From a roof top plant room in the open air	60	100
Other	Within plant rooms or within roof top plant rooms	18	45
Other	Within a place of special fire risk	9	18
Other	Within a protected zone to a place of safety	100	unlimited

Table 2.1. Single-storey buildings and compartmentation between single-storey and multi-storey buildings where appropriate


Building Use	Maximum total area of any compartment (m2)	Minimum fire resistance duration for compartmentation (if any)
Assembly building	6,000 [1]	Long
Entertainment building	2,000 [1]	Medium
Factory (Class 1)	33,000 [1]	Long [3]
Factory (Class 2)	93,000 [1]	Long [3]
Office	4,000 [1]	Medium
Open sided car park	Unlimited	Not relevant
Residential care building, hospital	1,500	Medium
Residential building (other than a residential care building and hospital)	2,000	Medium
Shop	2,000 [2]	Long
Storage building (Class 1)	1,000 [1]	Long
Storage building (Class 2)	14,000 [1]	Long [3]

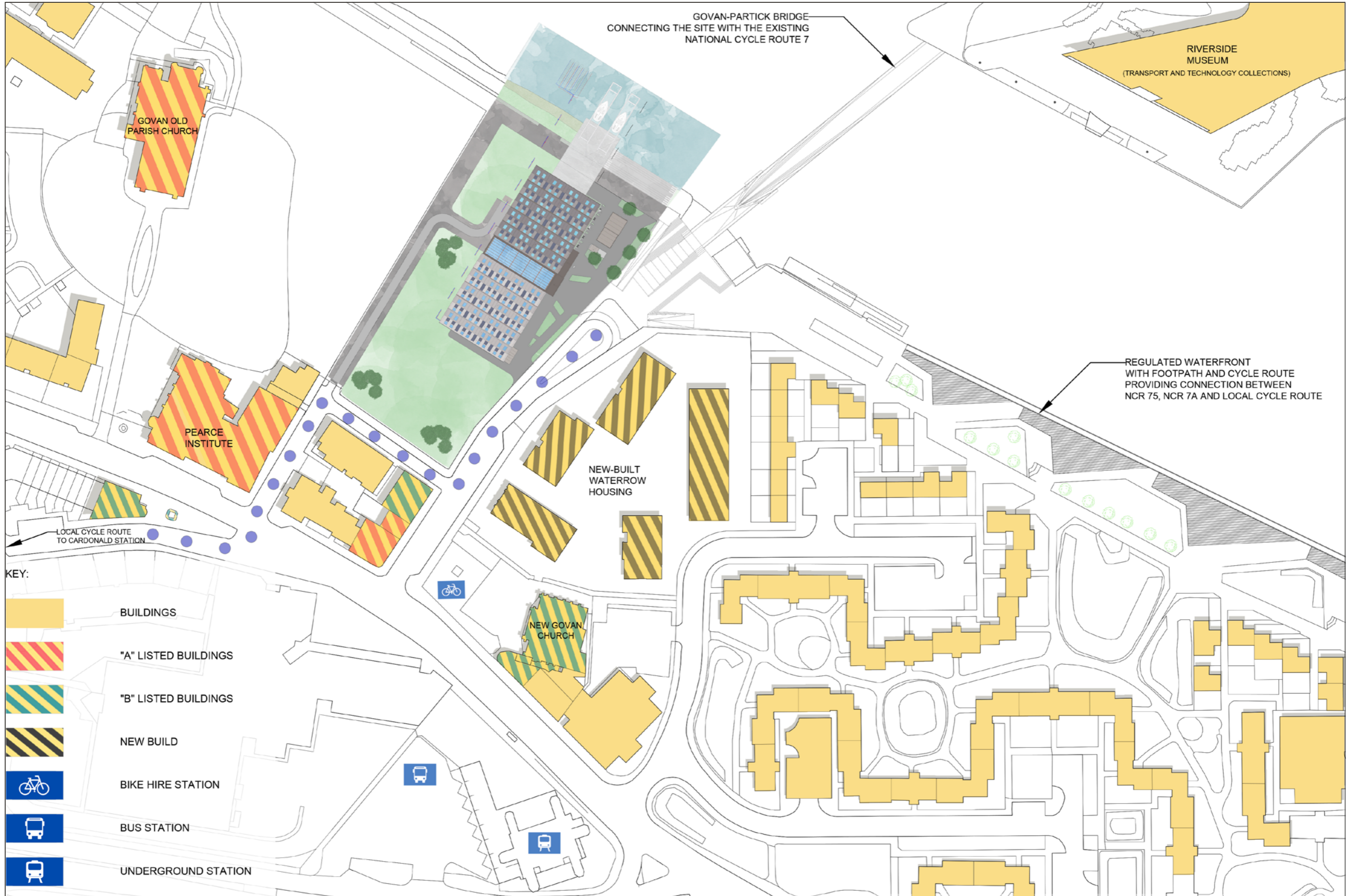
source: Non-Domestic Building Regulations








### 5.3 Fire Strategy Ground Floor Plan



A1  
GROUND FLOOR PLAN  
SCALE:1:100



- KEY:**
-  BUILDINGS
  -  "A" LISTED BUILDINGS
  -  "B" LISTED BUILDINGS
  -  NEW BUILD
  -  BIKE HIRE STATION
  -  BUS STATION
  -  UNDERGROUND STATION

A3  
LOCATION PLAN  
SCALE:1:1250



SCALE 1:1250



A1  
SITE PLAN  
SCALE: 1:200

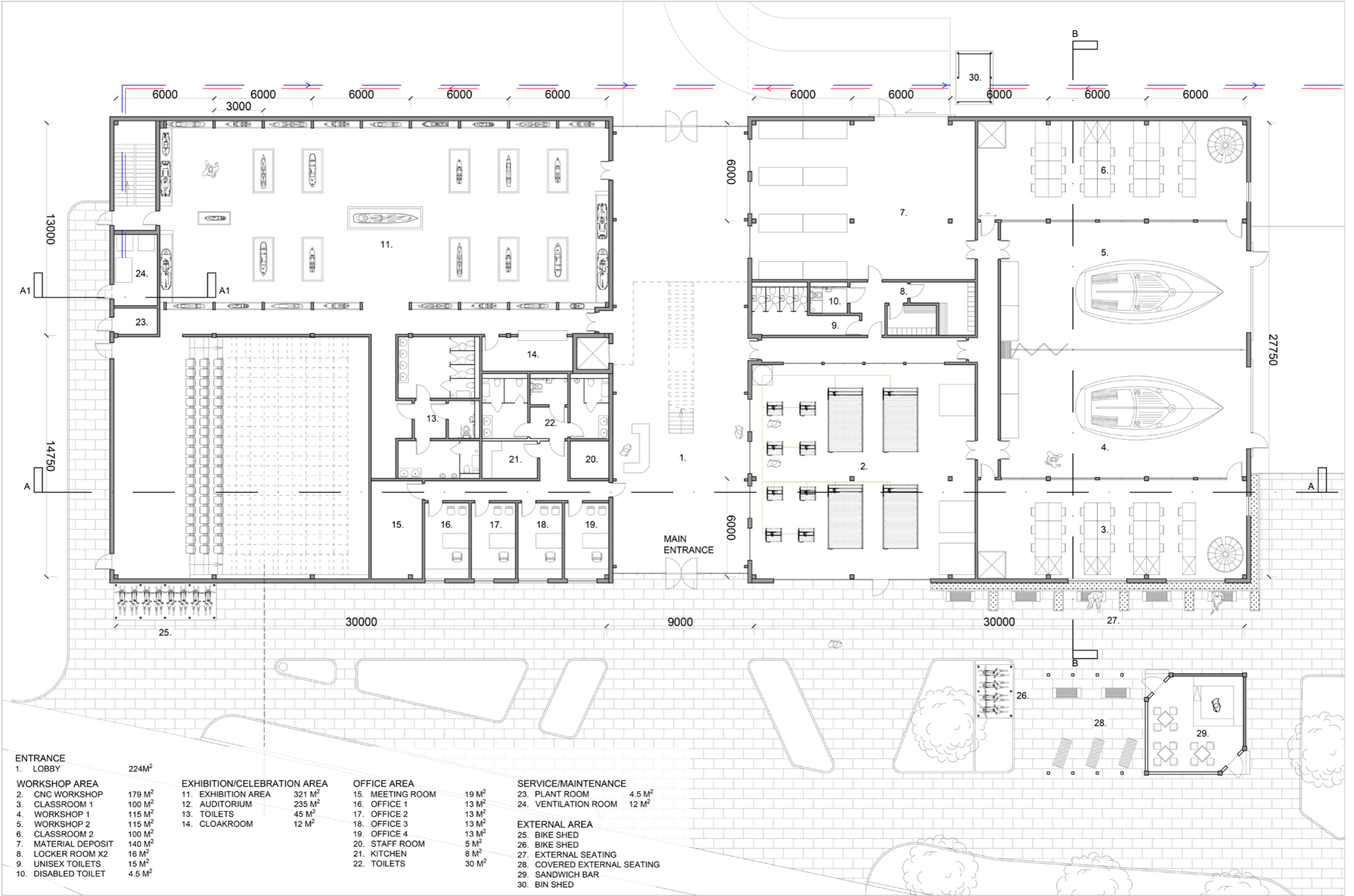


SCALE 1:200



A1  
 CURTILAGE PLAN  
 SCALE: 1:200



ENTRANCE		EXHIBITION/CELEBRATION AREA		OFFICE AREA		SERVICE/MAINTENANCE	
1. LOBBY	224 M <sup>2</sup>	11. EXHIBITION AREA	321 M <sup>2</sup>	15. MEETING ROOM	19 M <sup>2</sup>	23. PLANT ROOM	4.5 M <sup>2</sup>
<b>WORKSHOP AREA</b>		12. AUDITORIUM	235 M <sup>2</sup>	16. OFFICE 1	13 M <sup>2</sup>	24. VENTILATION ROOM	12 M <sup>2</sup>
2. CNC WORKSHOP	179 M <sup>2</sup>	13. TOILETS	45 M <sup>2</sup>	17. OFFICE 2	13 M <sup>2</sup>	<b>EXTERNAL AREA</b>	
3. CLASSROOM 1	100 M <sup>2</sup>	14. CLOAKROOM	12 M <sup>2</sup>	18. OFFICE 3	13 M <sup>2</sup>	25. BIKE SHED	
4. WORKSHOP 1	115 M <sup>2</sup>			19. OFFICE 4	13 M <sup>2</sup>	26. BIKE SHED	
5. WORKSHOP 2	115 M <sup>2</sup>			20. STAFF ROOM	5 M <sup>2</sup>	27. EXTERNAL SEATING	
6. CLASSROOM 2	100 M <sup>2</sup>			21. KITCHEN	8 M <sup>2</sup>	28. COVERED EXTERNAL SEATING	
7. MATERIAL DEPOSIT	140 M <sup>2</sup>			22. TOILETS	30 M <sup>2</sup>	29. SANDWICH BAR	
8. LOCKER ROOM X2	16 M <sup>2</sup>					30. BIN SHED	
9. UNISEX TOILETS	15 M <sup>2</sup>						
10. DISABLED TOILET	4.5 M <sup>2</sup>						

A1 GROUND FLOOR PLAN  
SCALE: 1:100





**CAD TEACHING CLASSES**

- 1. CAD LAB 1 33 M<sup>2</sup>
- 2. CAD LAB 2 33 M<sup>2</sup>
- 3. SMALL KITCHEN 8 M<sup>2</sup>
- 4. STORAGE 2 M<sup>2</sup>
- 5. TOILETS 30 M<sup>2</sup>

**EXHIBITION/CELEBRATION AREA**

- 6. AUDITORIUM 235 M<sup>2</sup>
- 7. EXHIBITION AREA 321 M<sup>2</sup>
- 8. TOILETS 45 M<sup>2</sup>

**WORKSHOP AREA**

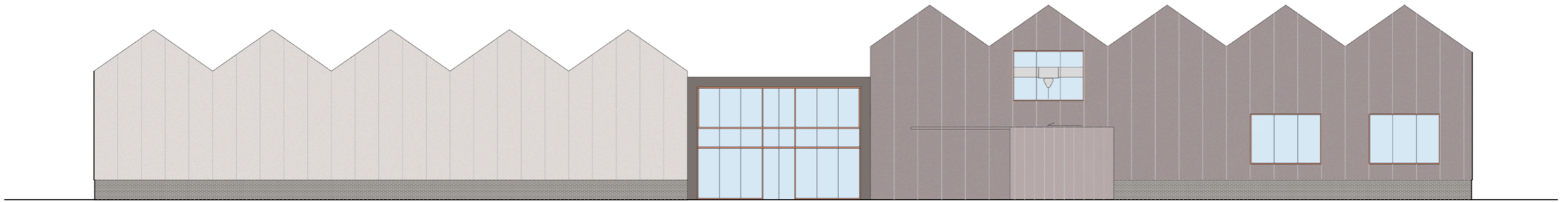
- 6. AUDITORIUM 235 M<sup>2</sup>
- 7. EXHIBITION AREA 321 M<sup>2</sup>
- 8. TOILETS 45 M<sup>2</sup>

**SERVICE/MAINTENANCE**

- 12. PLANT ROOM 12 M<sup>2</sup>
- 13. VENTILATION ROOM 17 M<sup>2</sup>

A1  
FIRST FLOOR PLAN  
SCALE: 1:100





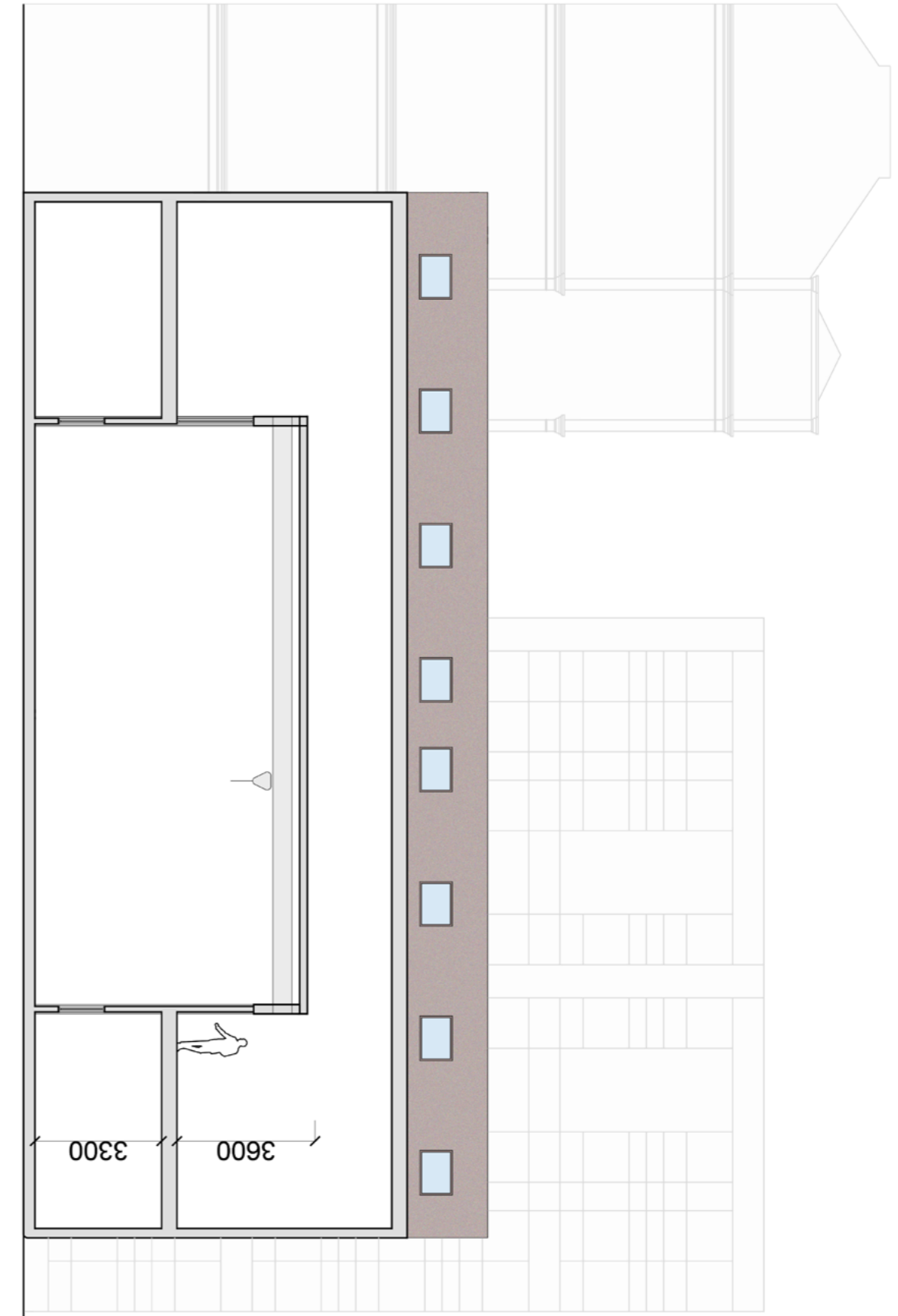
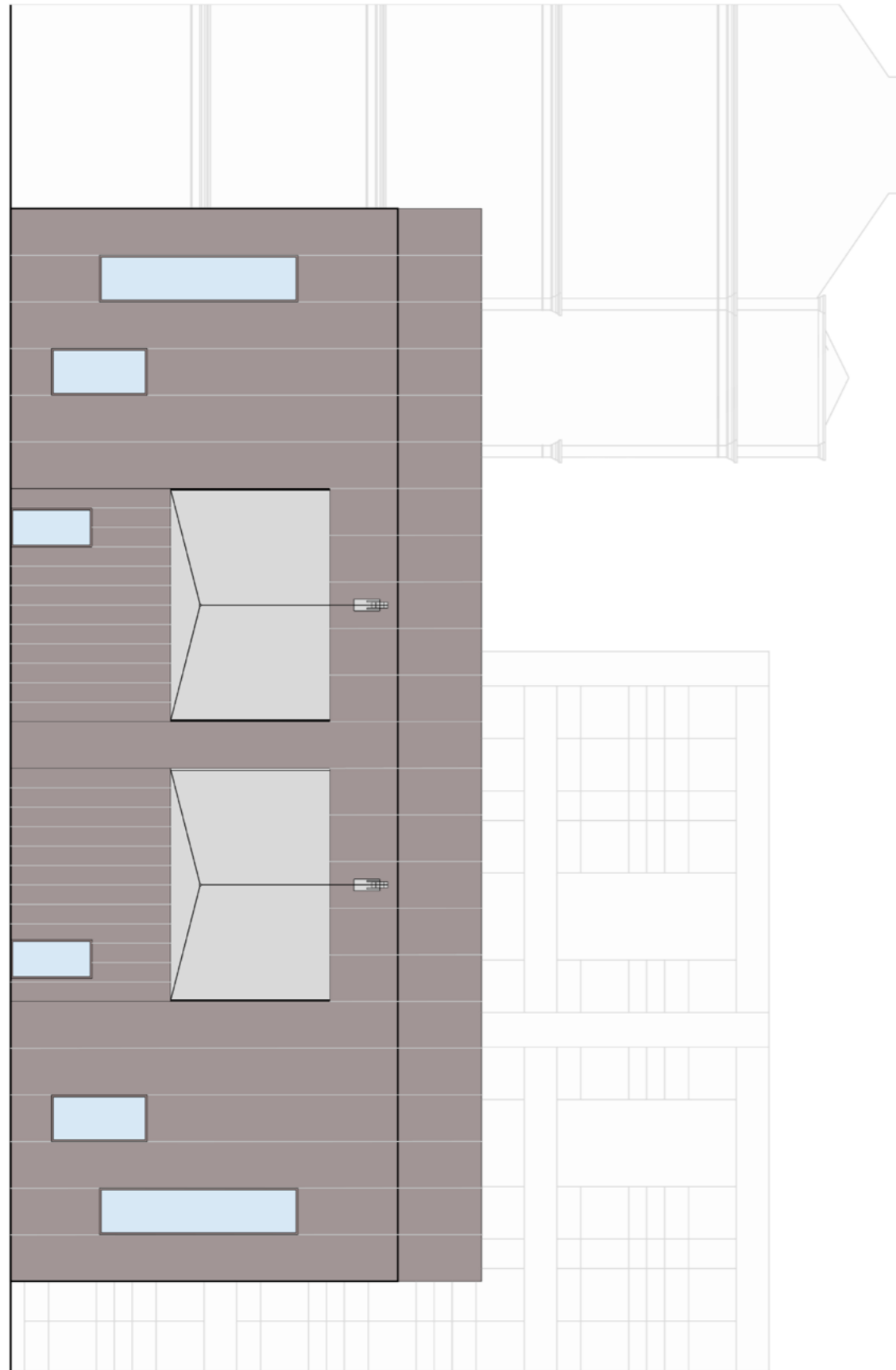
WEST ELEVATION



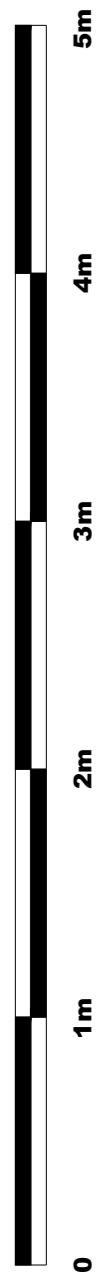
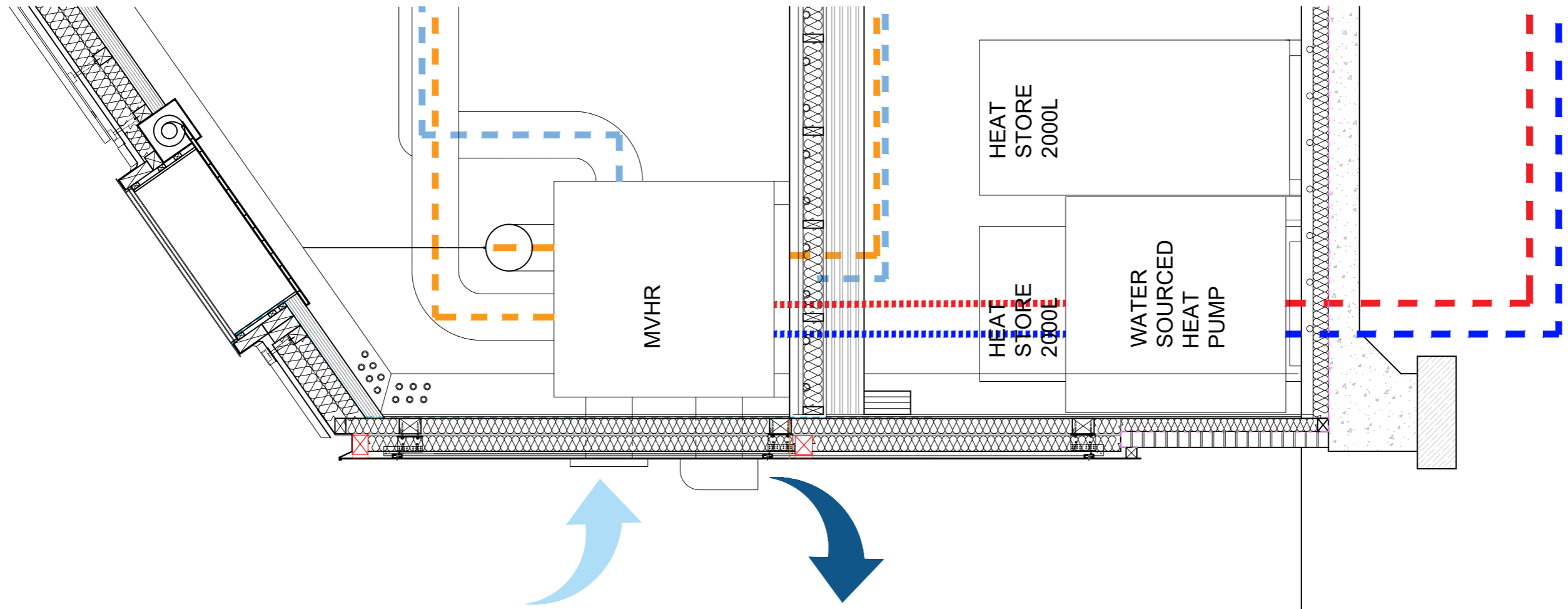
EAST ELEVATION

A1  
LONG ELEVATIONS  
SCALE: 1:100

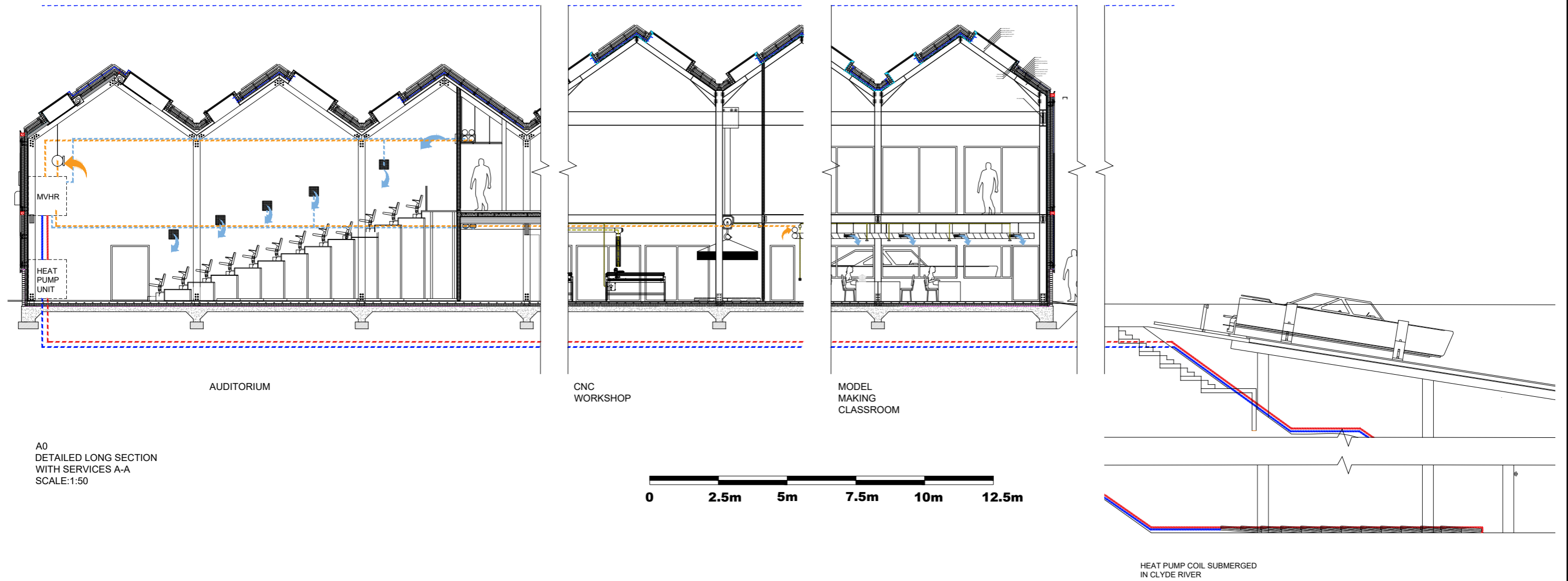




A2  
WATERFRONT ELEVATION AND SECTION  
SCALE:1:100

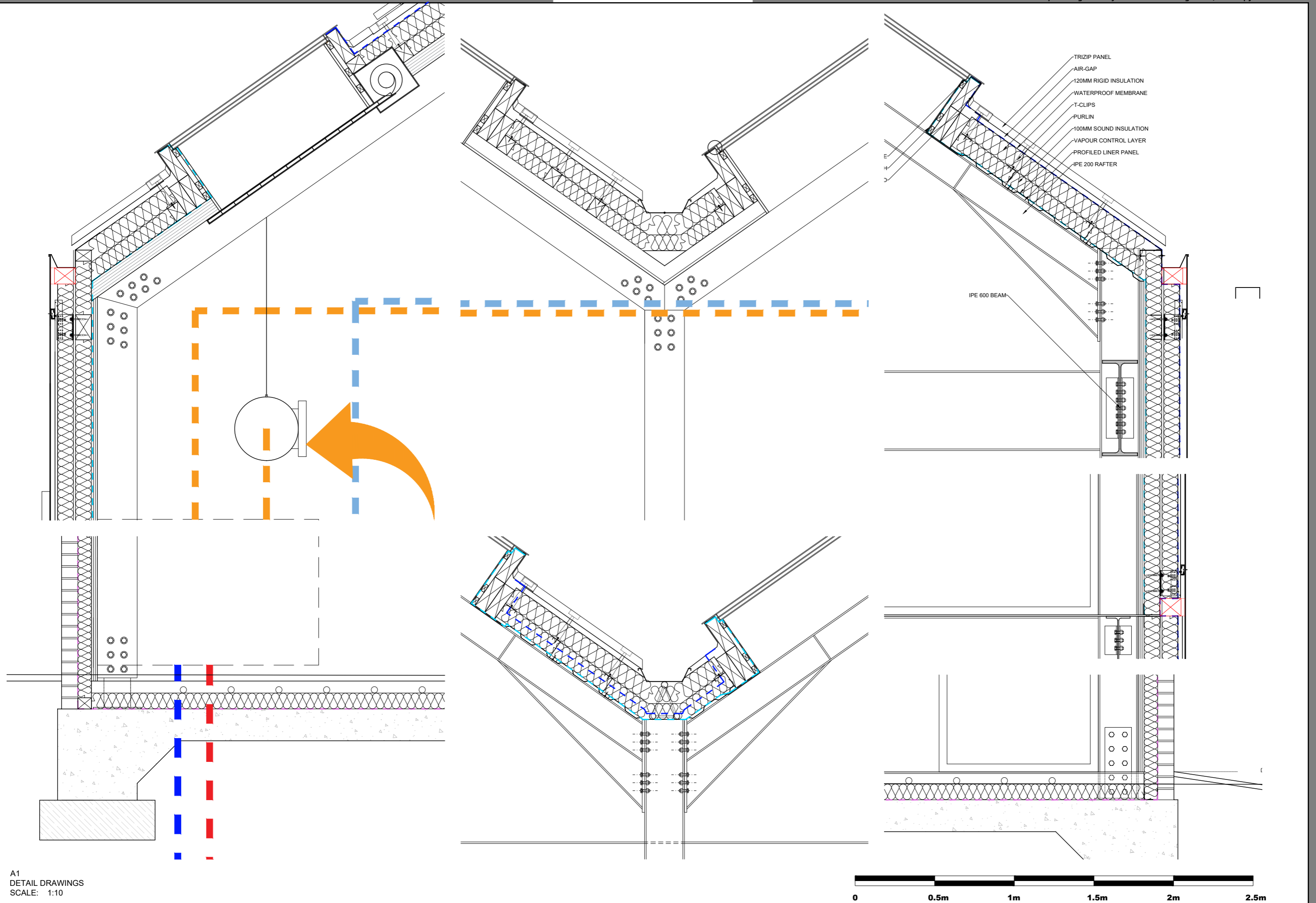


A2 SECTION A1-A1 PLANT ROOM AND ELEVATION  
SCALE: 1:20



A0  
DETAILED LONG SECTION  
WITH SERVICES A-A  
SCALE: 1:50

0 2.5m 5m 7.5m 10m 12.5m



A1  
DETAIL DRAWINGS  
SCALE: 1:10

