CW2: Groupwork Exercise

CEGE0003: Engineering Design
Dr Luke Lapira
Group 11

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1 Letter to Client

Phase 1 Development at Pool Street East
21st March 2025

Dear UCL Estates,

We are pleased to present our revised design brief for the Pool Street East development, a project that aims to create a dynamic, multi-functional space that bridges academic and non-academic activities. Our team has carefully considered the needs of the site, the surrounding community, and the long-term sustainability of the project to deliver a design that not only meets but exceeds your expectations.

Our design philosophy for Pool Street East is rooted in the belief that a successful development must foster collaboration, inclusivity, and sustainability. The proposed 10-floor building integrates a diverse range of facilities, including academic spaces, student accommodation, and communal areas, all within a single structure. This approach enhances the connection between academic and non-academic groups, creating a vibrant hub for learning, living, and social interaction.

Sustainability is at the heart of our project. Inspired by UCL's "Change Possible" sustainability strategy and the exemplary design of One Pool Street, our project integrates cutting-edge sustainable features to minimise environmental impact and promote well-being. This includes the integration of low-carbon, recycled materials to reduce embodied carbon and enhance thermal efficiency, along with Strategically placed windows and skylights that maximise natural light. These features support UCL's goal to reduce energy consumption by 40% and create a net-zero carbon campus.
Our design features a communally accessible exterior plaza that encourages social interaction and community events

In developing this proposal, we have made several key assumptions:

1. The building will comply with all local planning regulations, including height restrictions and environmental standards.
2. The proposed floor areas and layouts are designed to meet functional requirements while adhering to safety and accessibility standards.
3. The costs provided are a rough estimate and include all necessary tasks for the detailed design phase.

We believe that our design not only meets UCL's needs but also adds significant value to your institution and its wider community. We are confident that our proposal aligns with your vision for Pool Street East and look forward to the opportunity to bring this project to life. Should you have any questions, please feel free to contact us.

Yours sincerely,
Group 11

2 Introduction

This report is a tender document for the second phase of development at Pool Street East. It will be a comprehensive and detailed brief, giving insight on the design philosophy behind the proposal, whilst providing quantifiable metrics on costings, dimensions, and alignment with sustainability principles. As well as this, it will cover and regulations that will be adhered to, and limitations in the construction of this project.

The proposal displays an innovative approach to development, and with sustainability considered in every decision, will set a precedent in the modern era of construction. It aims to meet the needs of all the stakeholders involved; it will balance the needs of the local community and those in UCL, whilst being economically beneficial to investors involved.

3 Site Analysis

3.1 Context and Location

Pool Street East is located in the heart of Stratford, in the London Borough of Newham. This was where the 2012 Olympic games took place, and this site expands on a wider development strategy of pushing sustainable development into London. Its close proximity to Stratford Station, as well as Queen Elizabeth Park and the London Stadium make it a strategically significant location for various purposes such as residential or commercial property.

Major landmarks nearby such as Westfield Stratford and London stadium contributes to high footfall in the area. With this dynamic setting, the site must be designed with public accessibility and movement in mind, ensuring clear pathways and active ground-floor engagement. Given the number of pedestrians, security measures should be put in place such as well-lit pathways and passive surveillance; this would be for the safety of the public as well as members of UCL. Noise pollution would be prominent, therefore dense sound-absorbing materials such as concrete should be used **[1]** and windows should be (at minimum) double glazed. [**2]**

3.2 Physical Characteristics

The building site covers 1918.44 m^2 of the 2400m^2 (80%) site space, which is predominantly flat – maintaining a height of approximately 10m above sea level.**[3]** Equally as beneficial is that the site is comprised mostly of London Clay; its soft, impermeable, high load-bearing capabilities make it ideal to build on. However, this can present some challenges too. It has a high shrink-swell potential **[4]**, resulting in potential ground movement that can weaken foundations. Furthermore, the poor drainage of London Clay allows it to retain water. This increases the risk of instability. These moisture-based issues are exacerbated by the temperate climate of Stratford. To account for these challenges, a piled foundation system may be needed to transfer loads to deeper, more stable strata. [**5]**

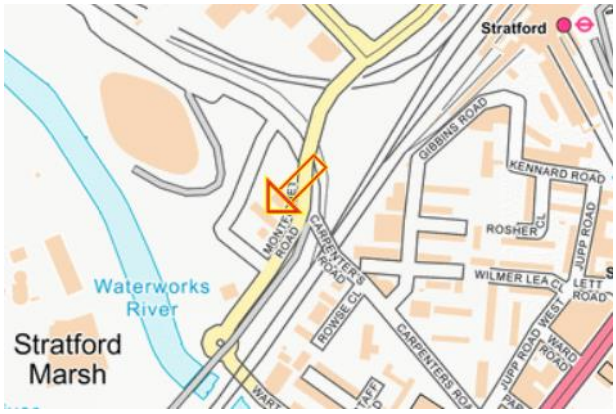

Figure 1: Map of Pool Street East in relation to other parts of Stratford. From streetmap.co.uk

On site, there is a prevailing south-west wind. Therefore, positioning larger inlet openings on this façade allows for an effective capture of these winds. Whereas smaller outlets on the opposite site can facilitate cross-ventilation. Furthermore, incorporating an atrium into the design can enhance airflow by allowing warm air to escape through roof vents, utilising the stack effect. **[6]**

Prior to its regeneration, Stratford was a brownfield site used as a landfill. This led to devastating amounts of environmental degradation, with dangerous levels of Nitrogen Dioxide in the air **[7].** The site's proximity to the River Lea must also be considered. Historically it has bene prone to flooding. Therefore, building close to the banks should not occur as it increases the chances of frequent flooding in the long term.

3.3 Accessibility and Transport Links

Pool Street East is one of the most well-connected locations in London across all scales. Regionally, being connected to Stratford International and the London Underground allows for high-speed travel around and outside of London. Locally too, the high number of buses passing through Stratford allows for flows of people in the area. Buses such as the 97 and 241 allow for movement around the site **[8]**, whilst others such as the 25 and 86 connect the site to other prominent parts of East London e.g. Romford and Whitechapel. These stations are built to be accessible too; the use of level access stands and bus shelters provides facilities for disabled people too. Figure 2 shows this, displaying bus routes and other transport links surrounding the UCL East campus.

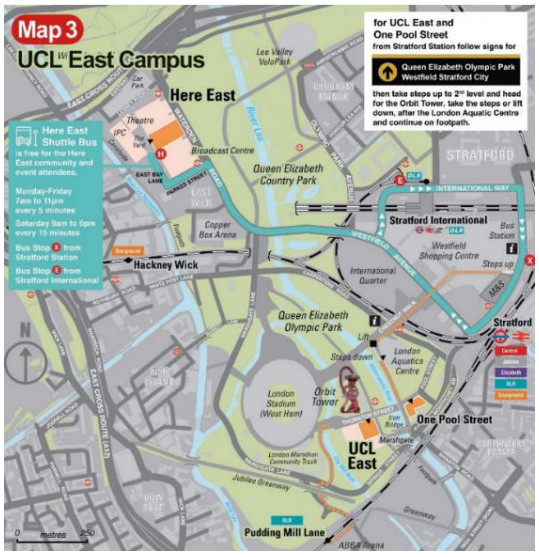

Figure 2: UCL Geography Drawing Office (2022). Transport links around UCL East Campus. https://www.ucl.ac.uk/maps/downloads/

3.4 Socioeconomic Background

Stratford has large economic disparities as shown by the mean salary being £51,800 **[9]** per annum, compared to the median salary of £37,430 [**10]**. This has resulted to the area suffering from some of the highest poverty rates in London, at 38%. The investment into Stratford may have negatively impacted locals too; property prices rapidly increased, which led to drastic gentrification. These vast inequalities has led to a cycle of poverty in the area **[11]**. The construction of major shopping malls such as Westfield Stratford has generated thousands of tertiary-sector retail jobs, however youth unemployment is an issue. Economic issues can still be provided to current and future generations through this site.

To try and combat the cycle of poverty, massive strides were made in the education sector of Newham- such as the opening of prestigious schools like LAE Stratford. However, due to their low-income backgrounds, may students still face financial difficulties and lack an access to resources. This site should provide such an opportunity to them, to ensure that students have access to the same things, no matter their household income.

Another pressing social issue is that Newham has some of the highest crime rates in London. Per 1000 residents, there were 112.25 offences, higher than the average of 105.26 [**12]**. Having the aforementioned security features is a necessity, and the site should aim to keep children off the streets, so they are not as vulnerable to these crimes. To further improve on social sustainability, public health must also be considered. Stratford suffers from higher-than-average obesity rates in London **[13]**, which indicates a lack of exercise or a poor diet.

3.5 Planning and Regulatory Constraints / Assumptions

A building of this scale has constraints that can hinder the design and production process. Primarily, these arise from UCL Sustainability Building Standards **[14]** and the London Legacy Development Corporation (LLDC). **[15]**

Working in accordance with the UCL Sustainable Building Standards, major challenges are seen. Firstly, the firm sustainability goals and carbon reduction challenges will lead to higher initial costs and cause some design compromises and trade-offs. However, these choices can save costs in the long term, as they reduce energy demands. Moreover, they can be mitigated through the use of passive design strategies. These include the southern orientation of the building, using natural ventilation, and high-quality insulation. This all reduces the building's reliance on carbon emitting systems such as HVAC heating. As well as this, the UCL Inclusive Design Strategy **[16]** must guarantee that the site is accessible for all disabilities. These must be taken into account during the design process. This can be done through step-free access, wheelchair friendly toilets, and using braille for the visually impaired. Those residing in accommodation should have adjustable desks, so they can fit the needs of those with mobility issues too.

When the site space was governed by the Olympic Delivery Authority, they required buildings to be no taller than 154.95m above sea level **[17].** However, this was scrapped in 2014 and taken over by the LLDC, who now actively monitors projects in the areas

surrounding the London Stadium such as this project. One potential issue is that there is no officially specified height limit, only if there is contextual integration and no disruption to the London skyline. The vague nature of this can be problematic; there is no way to ensure the building can fully comply with the LLDC. As a result, this must be kept in mind as in the worst-case scenario of it failing in this metric, flexible adjustments can be made as necessary.

Designing for all will also have some constraints. Having the entire site step-free would have to comply with Approved Document M **[18]**, ramps should have a ratio of 1:12 to 1:20. Toilets should also be inclusive, having gender-neutral options and wheelchair accessible ones too. Corridor widths must also be at 1500mm, whilst doorways must be 900mm. In the event of a fire, evacuation lifts must be installed, whilst fire-resistant materials should be used to reduce the risk of one.

These constraints can lead to potential time setbacks. Figure 3 below shows a Gantt Chart for the expected time taken for each process of development. However, this is under a key assumption of there being no delays once construction permissions have been granted. Working in an efficient time-frame is essential as it means students and locals can access the quality facilities provided. Besides, time must be taken for meticulous planning, as it must comply with the London Plan **[19]** regulations- especially those regarding fire safety standard. Examples of this is adequate and accessible means of fire escape routes that are well placed, usage of fire-resistant materials, and universal fire alarms. Integrating fire suppression systems such as sprinklers and emergency routes for firefighters must also be developed. A clear risk assessment will be provided in Appendix 1 that aim to guarantee occupant safety and compliance.

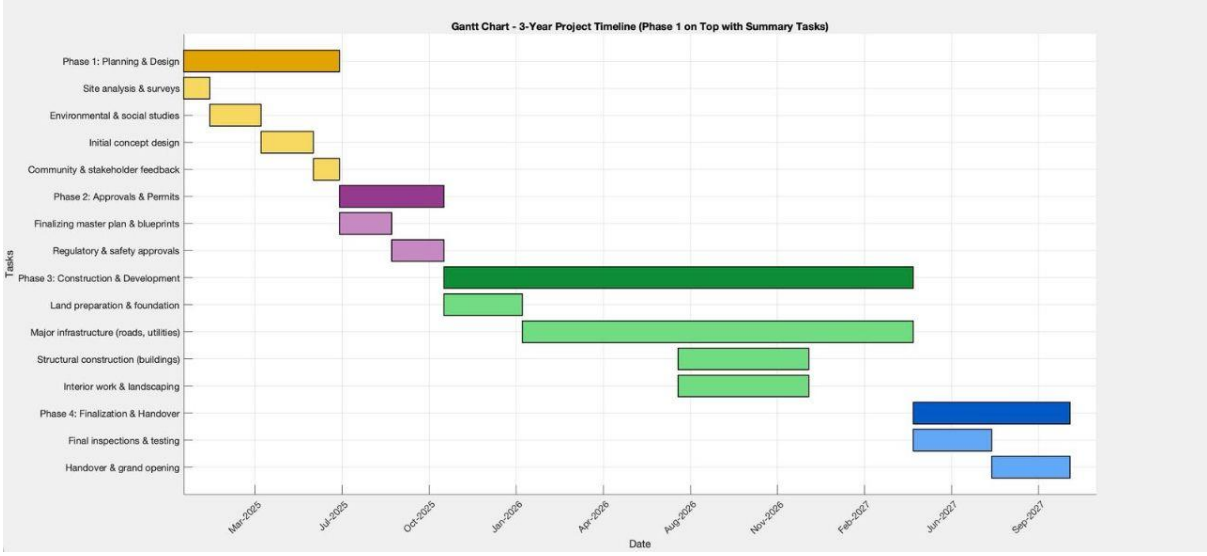

Figure 3- Gantt Chart showing stages of development for this site, along with the 3-year timeframe.

Building on the assumption from earlier, further ones have been embedded throughout our design choices and timescale. COVID caused numerous complications with the construction of Marshgate, and we are assuming that there are no sudden pandemics with the construction of Pool Street East. In the unfortunate event that there was, it would

significantly delay construction across all stages. It would also mean that the number of people using the site would be much lower.
Financially, inflation has caused prices of all materials and services to increase, the assumption is that the market remains stable so the costs of the necessary resources do not change.

Safety regulations are a priority in the design, therefore the proposal aims to go above and beyond in this metric. However, delays can still be occurred if regulations were to suddenly change, and the design would need to be adapted to suit those. The assumption is that the legislation does not change.

Regardless of any timescale and financial issues, the calculation costs found in Figure 7, do show a contingency budget. Therefore, capital would be available to adjust the design as needed.

3.6 Massing Study

The massing study explores three different design iterations, each addressing different spatial and environmental considerations. The first design (left) adopts an L-shaped footprint, where the building utilises the full area of the site, maximising street engagement. While this improves connectivity, the lack of green spaces makes it unappealing. The second design (middle) removes this issue with the addition of an open plaza to foster community integration, while refining the design to a compact block. The final design (right) upgrades this look, with the addition of an open-air atrium to enhance natural ventilation and maximise natural sunlight while reducing reliance on artificial lighting and mechanical cooling. Though this does sacrifice some useful floor space, this choice supports UCL's sustainability vision of ensuring a comfortable, environmentally responsive environment.

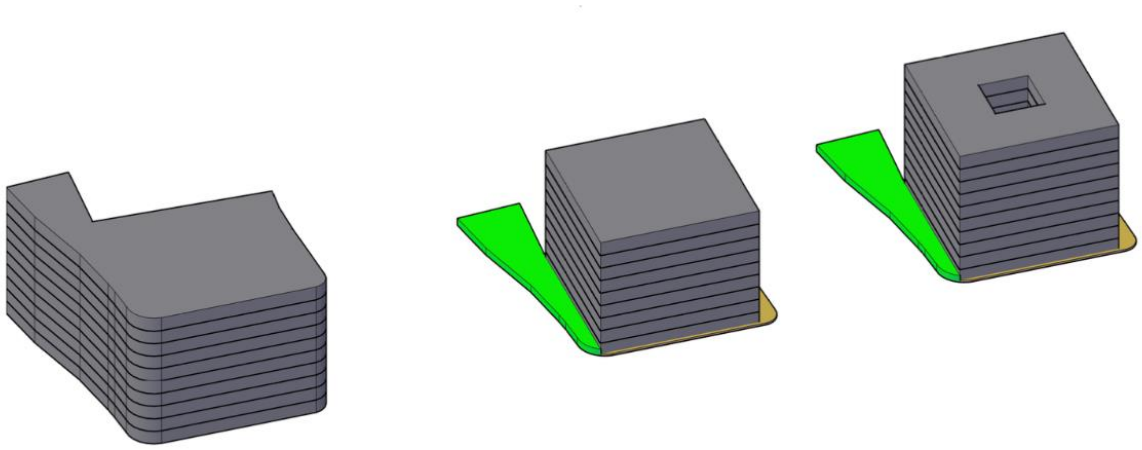

Figure 4: Massing study evaluating different volumetric configurations for proposed site

4 The Stakeholders involved and their needs

The main stakeholders would have various needs, and it must be ensured that a compromise is made so all of them are satisfied. Some stakeholders include: the public, the environment, researchers, and students from UCL.

4.1 Local Community Needs

Locals require Pool Street East to be accessible both physically and financially. Measures should be added to ensure equitable access, especially for those from lower-income background and those with mobility challenges. It should prioritise local hiring and partner with local businesses, whilst integrating the local culture in the design; this would help create a sense of community ownership. Public amenities such as the ones in the proposal serve all residents and addresses concerns about crime through safe spaces and collaboration with local youth programs. In the long term, it should be a strategy to mitigate potential gentrification and conserve community identity that has been fading from Stratford.

4.2 Environmental Needs

Given the proximity to the Waterworks River, it is essential to minimise environmental impact. The environment needs Pool Street East to adhere to the sustainability principles to reduce embodied and operational carbon, as well as improving, not just maintaining, the quality of biodiversity and water.

Creating green roofs and planting native species can help develop the biodiversity at Pool Street East, whilst providing benefits to the community. Permeable surfaces and energy-efficient designs helps climate resilience in the long term, which can protect against flooding. The materials used as well should be sustainably sourced, for example low cast concrete can help reduce the amount of embodied CO_2 in the structure.

4.3 UCL and Student Faculty Needs

To serve as a premier research and educational facility, Pool Street East must meet the needs of UCL's academic community, Research hubs and flexible classrooms provide sufficient space for faculty and students alike. To improve on student well-being, quiet study spaces and wellness facilities will be provided, such as the QCRs (quiet contemplation rooms). These can also be a space to accommodate for neurodiverse students, making the overall site more accessible. Given the digitisation of the average student, high speed internet and computer clusters must be added to facilitate this. Accommodation must be affordable so that diverse student bodies can develop and not restrict some students from quality housing. Furthermore, community engagement and social spaces must be added for both parties; this can be seen in the integration of green spaces, and the development of places to do sport.

5 Design Objectives and Features of the Building

5.1 General Overview

Pool Street East will serve as a multipurpose building with four main objectives: providing a public plaza for community engagement and cultural events, establishing a youth centre under the London Borough of Newham to support youth development, expanding UCL's academic infrastructure with additional study and lecture spaces, and creating new accommodation to alleviate UCL's overcapacity issues while solidifying UCL East as a comprehensive campus.

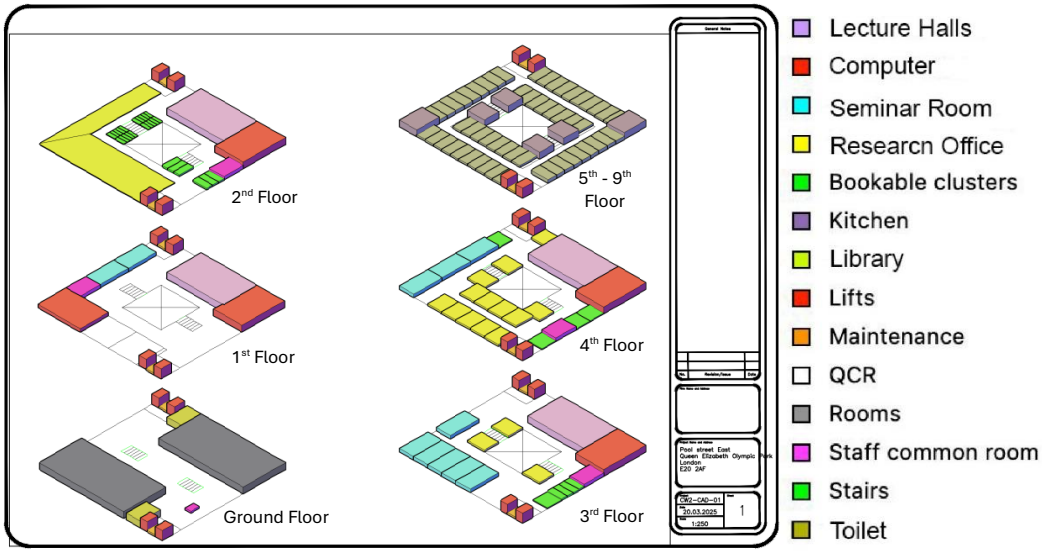

Figure 5: Layouts of each floor of the building

5.2 Academic Section

The three lecture theatres will be able to host up to 100 students each, allowing for easy pathfinding around the system. Tiered seating systems supports visibility and folding tables on the first one ensures inclusivity.

The new site will offer 10 new seminar rooms, facilitating small classes of up to 30 students. This will counteract Marshgate's lack of seminar rooms, providing more facilities for humanities-oriented courses. Seating will be in a U-shaped layout, providing better means for discussion amongst students.

The building will emphasise space specifically for UCL researchers and collaborators, containing 20 research offices. Including this should address UCL's current lack of designated spaces for researchers, potentially also growing UCL as a research hub for multiple disciplines. The design includes research offices with boardroom-style tables and shared screens, fostering collaboration among researchers and supporting UCL's research goals

Moreover, the building will feature staff common rooms to allow staff members to rest during their break and potentially separate themselves from students. The room next to the walls will feature a kitchen, providing a means for staff members to prepare, store and heat their food. Moreover, lockers will be provided to allow staff members to store

personal items. The inner area of the room will have sofas to allow staff to sit and collaborate in comfort.

The building will feature 4 computer clusters, each providing capacity for 60 students. This will provide a monitor desk hub setup for students who may require multiple screens for their studies. Each computer will contain specifications which are suitable for all UCL course-related applications. The room will also feature adjustable chairs, allowing each desk space to be suitable for all sizes, whilst also facilitating any back problems people may face whilst seated.

There will be three sizes of study spaces, to allow for both individual and group work. Individual study pods are soundproofed and enclosed, free from all distraction which can cater to those with ADHD. Small group study rooms facilitate between 4-6 people. They would have a boardroom-style table and a common screen for collaborative work. Large group study rooms will also be available, hosting between 6-12 people. This has monitor desk hubs and follows the design as the small study room. It can also be used for physical projects involving creating and testing.

The building will feature two quiet contemplation rooms. It will be used for spiritual needs, being an open space for religious rituals. Minimal furniture and dim lighting can help create a reflective atmosphere. It can also contribute to UCL's diversity standards

The main study hub of UCL Pool Street East will feature a silent library, facilitating a maximum capacity of 200 students. The library will have retractable shelves of academic books for space-maximising purposes and organization.
The canteen will be where students will receive catered, healthy global food from Monday to Friday. The canteen will follow a banqueting hall layout, containing multiple rows of console tables. On the opposite side of the catered food section, a counter featuring multiple microwaves will be provided to facilitate those who have brought a packed lunch.

5.3 Residential Section

The residential section of the building will feature 270 en-suite individual rooms. The bathrooms inside each en-suite space will be 1.2m by 2.5m. All rooms will border an exterior window near bedside, allowing maximal natural lighting during rest and study.
The residential section will have 30 kitchens, with different sizes. All-in-all this should leave a ratio of one kitchen per 9 students. Each room will provide space for cooking, storage and washing next to the walls, with all the features a typical kitchen would have.

5.4 Community Section

As previously mentioned, Pool Street East will feature a youth centre that will be open to the public. This will feature a multi-use indoor sports court suitable for sports. The remaining space can be used as a subsidised canteen for teenagers, whilst be a large common room for teenagers to converse comfortably with youth workers.

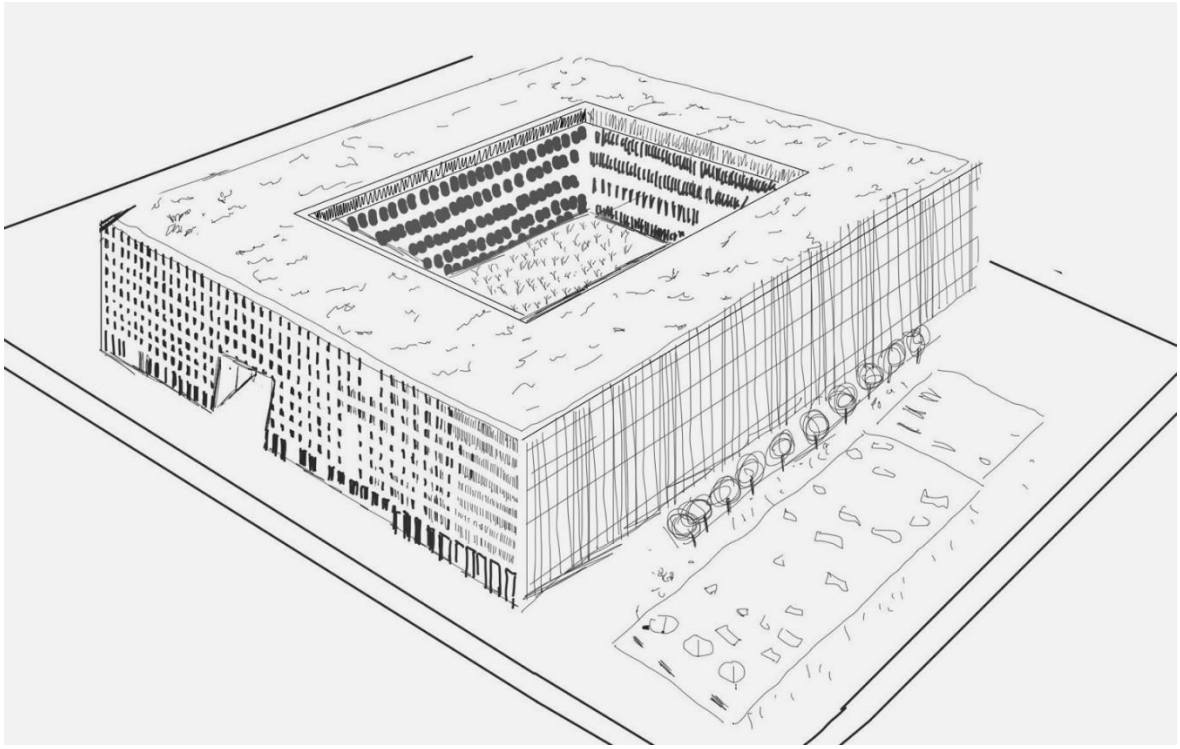

Figure 6: An artistic impression of UCL Pool Street East

5.5 Miscellaneous

The centrepiece of the entire Pool Street East building will feature an open glass atrium for ventilation purposes. For this to work, the ground floor will have a generally open concept to draw in cold air, whilst letting hot air rise upwards and out, Furthermore, the atrium provides more natural light inside the building as it allows the centre of the building to border exterior walls. This provides space for the residential section on the upper floors, since regulatory requirements require residential rooms to border an exterior wall.

Excluding the en-suites, the site will feature multi-gender bathrooms around the building to facilitate UCL's inclusivity requirements.

Each elevator will be designed to facilitate up to 12 persons at a time, allowing for efficient use of travel around the building, and meeting inclusivity requirements for the disabled. To access specific floors, a fob will be needed to ensure only those with clearance can reach them.

6 Sustainability Principles

The design of our building includes several sustainability features, adhering to environmental regulations and produce long-term ecological and social benefits. This section provides comprehensive details on each aspect:

6.1 Green Spaces

Green spaces such as rooftop gardens, vertical green walls and landscaped courtyards create better environmental conditions while improving building occupants' wellness. Natural cooling systems created by these spaces help lower urban heat island effects and enhance local air quality. Additionally, these spaces create habitats in the city for biodiversity by offering essential support for pollinating species like birds and bees.

Regulatory Compliance:

- Ensure that it aligns with BREEAM **[20]** and LEED requirements **[21]** for sustainable site development.
- The project should fulfil local urban greening mandates by integrating green infrastructure into building design. **[22]**
- The initiative would support UN Sustainable Development Goal (SDG) 11 (Sustainable Cities and Communities) through the promotion of green urban development practices**. [23]**

6.2 Recycled and Sustainable Materials

Construction projects that implement recycled concrete, reclaimed timber and low-carbon steel significantly reduces the effects of construction on the environment. The project reduces greenhouse gas emissions through the reuse of demolition waste and selection of materials that have reduced embodied carbon levels. Additionally, eco-friendly insulation options (e.g. sheep's wool or aerogel together with non-toxic paints) provide healthy indoor air quality benefits.

Regulatory Compliance:

- The strategy aligns with the EU Circular Economy Action Plan **[24]**, reducing waste and enhancing material reuse.
- The construction process complies with ISO 14001 standards for sustainable building practices**. [25]**
- The project supports SDG 12 (Responsible Consumption and Production) through its efforts to decrease waste generation and promote sustainable use of resources. **[26]**

6.3 Circular Economy Principles

Our design uses modular construction methods that allow building materials to be taken apart for reuse when the building reaches the end of its service life. Prefabricated components contribute to reduced construction waste and energy-efficient assembly operations. The use of deconstructable facades along with demountable interior partitions provides flexibility for future changes and helps in minimizing waste over time.
Regulatory Compliance:

- Supports BS 8001:2017 (Circular Economy in the Built Environment) **[27]**

- The methodology used decreases dependency on raw materials to comply with the EU Waste Framework Directive. **[28]**
- That the project contributes to SDG 9 (Industry, Innovation and Infrastructure) by encouraging resource-efficient construction methods**. [29]**

6.4 Energy Efficiency and Low-Carbon Design

Passive solar heating design and natural ventilation features allow the building to minimize the need for artificial climate control systems. The building achieves superior energy efficiency through high-performance insulation, low emissivity glazing and advanced smart HVAC systems. Moreover, on-site renewable energy sources generated by the implementation of solar photovoltaic (PV) panels and rainwater harvesting systems serves to decrease operational carbon emissions.

Regulatory Compliance:

- The building complies with UK Part L Building Regulations which establishes energy efficiency standards for new constructions. **[30]**
- The building achieves the BREEAM Excellent rating for its energy and water efficiency. **[20]**
- The initiative promotes SDG 7 (Affordable and Clean Energy) through reducing fossil fuel use and promoting renewable energy. **[31]**

6.5 Community Integration and Well-being

The design promotes social sustainability through the development of communal areas such as public plazas, co-working spaces and pedestrian-friendly walkways. These environments promote social connections between people, strengthening community participation and fostering a sense of belonging. By increasing accessibility and ease of walking, the design lessens the need for cars, leading to lower emission levels.

Regulatory Compliance:

- The design meets Inclusive Design Standards to provide access for all users. **[32]**
- Promotes UK Wellbeing in Design policies that encourage mental and social well-being throughout urban spaces. **[33]**
- Aligns with SDG 3 (Good Health and Well-being) and SDG 11 (Sustainable Cities and Communities) **[23], [34]**

7 Loading Scenarios

There aren't many live loads considered with the structure. First, the lecture halls and seminar rooms accommodate high occupant densities, which necessitate loading of approximately 3.0–4.0 kN/m^2. Next, the offices and computer labs generally have live loads of 2.0–3.0 kN/m^2; however, I would assess additional loading should partition changes or heavy equipment be anticipated in the future. The library has the possibility of high live loads as well, especially if there are book stacks. Libraries should account for loading of 6.0–7.2 kN/m^2 due to books and book shelving. The last live load, which is high yet unanticipated, is the corridors and staircases, which typically hold a loading of 4.0 kN/m^2 due to heavy foot traffic or potential overcrowding.

Regarding kitchens, we assume dead load based upon commercial appliances and probable shelving indicating live load no less than 4.0 kN/m^2. Mechanical rooms and storage require similar or more, depending upon the machinery. For lavatories and staff break rooms, live loads rest in the range of 2.0–3.0 kN/m^2, which is consistent with typical requirements for business occupancy classifications. Finally, any concentrated load requirements are spread based upon regional building code minimums for roll loads in hallways or dynamic loads in assembly rooms. Therefore, each space is evaluated and given live load thresholds for necessitation and safety purposes with an ease of flexibility

8 Costings

The design of Pool Street East will incorporate multiple different activities within a singular space, enhancing the links between academic and non-academic groups. The 10-floor building therefore includes various facilities to accommodate its functions:

- The building will have a footprint of 1918.44m^2 on its ground floor, with the outer walls forming a 43.8m by 43.8m perimeter. Most of the remaining surface area within the site is to be allocated to an exterior plaza.
- Floors above the ground floor will incorporate a 13.8m by 13.8m open inner courtyard (or atrium), bringing the total area for these floors to 1728m^2.
- The building must have 4 elevator shafts, each of dimensions 2.4m by 3.6m, and 2 staircases of dimensions 3.6m by 6m, on each floor. Each floor will also have two maintenance rooms of dimensions 3m by 3.6m.
- Ground and academic floors will have variable floor layouts, but have, at a minimum, basic amenities in the form of two unisex toilets of dimensions 5m by 7m.
- The ground floor will include a canteen (15m by 30m) and an additional youth centre of area xm^2.
- 4 Academic Floors will provide, divided between them all:
    1. 3 lecture halls of dimension 12m by 20m.
    2. 1 staff common room per floor (5m by 7m).
    3. 10 seminar room, 50m^2 each.
    4. 20 research offices, 30m^2 each (5m by 6m).
    5. 4 computer clusters, 150m^2 each (10m by 15m).
    6. 35 bookable studies of variable size:
        i. 20 Individual study pods (3m^2)
        ii. 10 Small group study (10m^2)
        iii. 5 Large group study (25m^2)
    7. 2 QCR rooms, 100m^2 each (10m by 10m)
    8. A library (36m by 12m + 25m by 6m)
- The upper five floors of the building will include large amount of student accommodation, with each floor following these design principles:
    1. Each floor must contain 54 en-suite, individual rooms, of dimensions 6m by 3m (totalling 18m^2). The bathrooms for each room should be of 1.2m by 2.5m configuration.
    2. Each floor will additionally contain six kitchens, four of which will be of dimensions 5.1m by 6m and two other being of dimension 7.8m by 6m.
- The south-facing facade shall be made into a green wall, which will allow for a local cooling effect and trap moisture.

Category	Phase	Subcategory	Dimensions	Qty	Est. Cost (£)	% of Total
Preliminary Works	**1**				**£3M**	**2.0%**
		Soil Analysis and Site Prep	-	1	£3M	2.0%
Foundations	**1**				**£15M**	**10.2%**
		Foundations & Piling	-	1	£15M	10.2%
Ground Floor	**2**				**£3M**	**2.0%**
		Canteen	15m x 30m	1	£1.8M	1.2%
		Youth Centre	600m^2	1	£1.2M	0.8%
Academic Floors	**3**				**£26.8M**	**18.2%**
		Lecture Theatre	12m x 20m	3	£7.2M	4.9%
		Seminar Rooms	50m^2	10	£2M	1.4%
		Research Offices	5m x 6m	20	£2.4M	1.6%
		Computer Clusters	10m x 15m	4	£4.8M	3.3%
		Staff Rooms	5m x 7m	4	£0.4M	0.3%
		Study Pods	Variable	35	£1.3M	0.9%
		QCR Rooms	10m x 10m	2	£1.2M	0.8%
		Library	(36m x 12m + 25m x 6m)	1	£7.5M	5.1%
Residential Floors	**4**				**£36M**	**24.4%**
		Accommodation	6m x 3m	270	£30M	20.4%
		Large Kitchen	7.8m x 6m	10	£3.6M	2.4%
		Small Kitchen	5.1m x 6m	20	£2.4M	1.6%
Structural Work	**2 - 4**				**£25M**	**17.0%**
		Concrete Columns, Steel Beams, Floor Slabs	-	-	£25M	17.0%
Finishes	**5**				**£12M**	**8.1%**
		Claddings, Windows	-	-	£12M	8.1%
Amenities	**5**				**£2.2M**	**1.5%**
		Toilets	5m x 7m	10	£1M	0.7%
		Maintenance rooms	3m x 3.6m	20	£1.2M	0.8%
Landscaping	**6**				**£4.3M**	**2.9%**
		Plaza	650m^2	1	£2.3M	1.6%
		Green Wall	-	1	£2M	1.4%
Contingency	**All**					**13.6%**
		Changes, Allowances	-	-	£20M	13.6%
Total Cost					**£147.3M**	**100%**

Table 1: A costings table for UCL Pool Street East

9 Appendices

Appendix 1: Contribution Table for the report and presentation

Name	Contribution Factor	Contribution Score /10
Siam Chowdhury	writing for introduction, site analysis, and stakeholder needs and formatting	10
Yilifeina Paerhati	hand drawings + sustainability principles	10
Rasil Ali	letter + load diagrams	10
Issa Rabah	design features section, dimensions for building, justifications	10
Eyobied Kibrom	CAD drawings, dimensions for buildings	10
Alexandre Fedala	costings and PowerPoint design	10

Table 2: Group Contribution Table

Appendix 2: Risk Assessment Table

HAZARD IDENTIFICATION AND RISK ASSESMENT										
	Pre-Control Measure						Control Measure	Post-Control Measure		
Ref	Hazard	Person at risk	Risk Description	Likelihood of arising	Severity of impact	Risk		Residual Likelihood	Residual Severity	Residual Risk
1	Fire Hazards	Occupants, Visitors	Electrical faults, flammable materials causing fire.	3	5	15	Install fire detection systems, fire-resistant materials, and conduct regular fire drills.	1	5	5
2	Evacuation Challenges	Occupants, Disabled individuals	Difficulties in exiting due to poor design or congestion	3	4	12	Provide clear evacuation routes, signage, and accessible exits for all users.	1	4	4
3	Wind & Weather Resistance	Building structure, Pedestrians	Strong winds impacting structural integrity and public safety.	2	5	10	Conduct wind tunnel testing, use reinforced materials, and install wind barriers.	1	3	3
4	Water Management & Flooding	Occupants, Building Systems	Inefficient drainage leading to water damage or flooding.	3	4	12	Implement permeable surfaces, green roofs, and rainwater harvesting systems.	1	4	4

5	Electrical contact	Occupants, Building systems	Electric shocks, burns from exposed wiring or faulty tools.	2	4	8	Use insulated tools, implement lockout/tagout (LOTO) (Pirbright Institute, n.d.) procedures, conduct regular electrical safety checks and provide appropriate PPE.	1	4	4
6	Security	General public	Security risks in open spaces such as crimes	3	3	9	install CCTV and provide well-lit paths.	1	3	3
7	Structural Integrity Issues	Occupants, Maintenance Staff	Long-term degradation of materials impacting safety.	2	5	10	Use durable, low-maintenance materials and conduct regular inspections.	1	5	5

Table 3: Risk Assessment Table

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