



DEX RECYCLING AND LEISURE CENTRE

Feasibility report

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0.1 Strategic Brief

- **Site-** Dex Multistorey Carpark, New Bridge St W, Newcastle upon Tyne NE1 8AB.
- **Programme-** Waste to Energy Plant (Anaerobic Design Plant also know as AD Plant) + Leisure & social community Hub.
- **User Group-** Place for people of all generations, no set target audiences as the motive is to educate everyone who enters the building about food waste and how it is recycled and also make spaces for social interaction.
- **Client-** Newcastle City Council.

Questions for the client

- What will be the Venue opening times will it function at different times or along with the Energy plant?
- Separate entrance for the waste to arrive or it should be a revealing feature as the motive is to make people aware of their waste?
- How much exposure should be there to the plant should it be visually connected or have space where they can actually go around the plant through foot?
- How much flexibility do the food stalls need to have, as the motive is also to generate jobs for as many local food vendors in the city?
- How much change can be made to the existing building on the inside as well as on the outside?

SITE



STATEMENT OF NEED

Clients Needs-

- Food is not recycled in Newcastle. There is a lack of an effective strategy, which necessitates recycling food rather than treating it as general waste, and the client's need is to build a recycling facility to solve this problem while also interacting with the general public through a public venue.
- An attractive leisure hub where people want to come regularly and hence increase the profitability.

Clients Objectives-

- Converting Newcastle city centre's organic waste into Renewable Energy, and to educate and create awareness amongst the public
- To adaptive reuse the existing Dex car park and create waste to energy plant with a leisure social community hub that includes a Food hall and multifunctional performance space
- Supporting local economy and creating jobs

Impact of not meeting needs

- The possible impacts of not meeting needs are that the food waste of city centre will be sent to Byker recycling facility which will increase the cost of transportation of the waste.

Triggers for Change

- As Dex multistorey car park is an old construction on the edge of demolition, it is a ideal structure for repurposing and implementing the council's vision of sustainability in the city centre through an AD Plant and a space for social interaction.

Context of the Project

- The venues like food hall, multifunctional space for hiring will generate a good profitability.

What is expected

- Quality over time, where possible use of prefabrication is advisable to reduce time and on-site emissions. This project should be considered as a long-term investment rather than a profit generator because it will benefit the local community, create new venues for social interaction, improve Newcastle City Centre's organic waste plan, and help support the Newcastle food movement.

Any decisions required

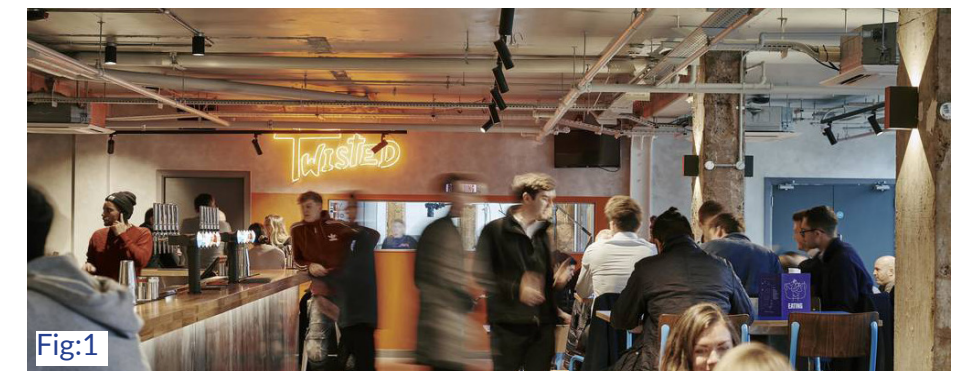
- Council will appoint a representative for day to day decisions

INITIAL PROJECT PRECEDENTS

Fig:1: Market Hall West End- Oxford ST- Exposing the old
Fig:2: Where?House- Cuts in slabs creating voids and double height spaces

Fig:3: North Transfer Station- view towards the recycle facility

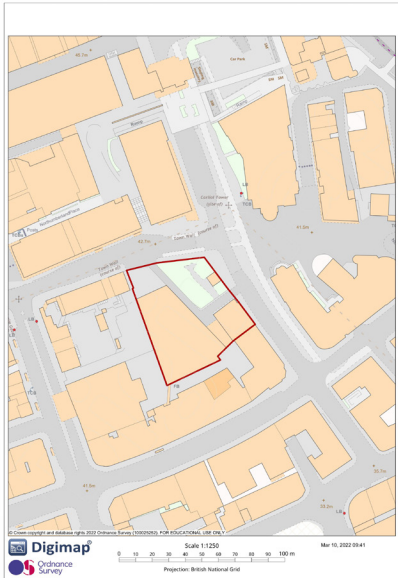
Fig:4: Östermalm's Temporary Market Hall - Transparency



0.2 Site information Review

- **Site**- Dex Multistorey Carpark, New Bridge St W, Newcastle upon Tyne NE1 8AB.
- **Site area**- 3521.5 m²
- **Materiality**- Reinforced concrete frame, slabs and walls are masonry infills

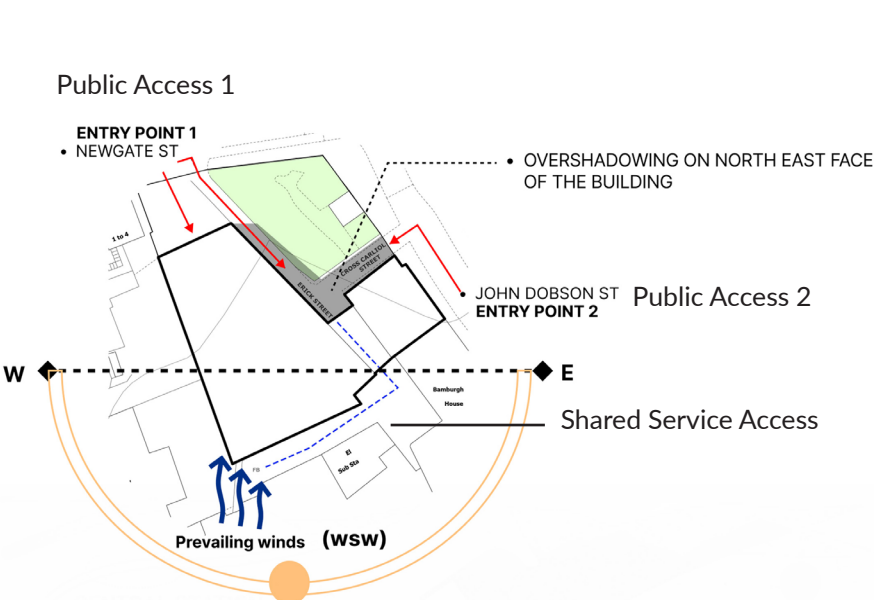
Site Boundary



Macro Analysis Access



Micro Analysis



OUTSTANDING INFORMATION

Structure strength

- Structural Engineers- The strength of the existing frame,walls and floors is unknown so the assessment of the existing is must before any further design decisions are made.

Existing services

- Services Engineers- Investigating existing services available like Gas, electricity, water, drainage

Site contamination survey

- As it is Brownfield site

Acoustic Survey

- Noise from New bridge street & John Dobson St. Because the location is close to other properties, it is the client's responsibility to inform all of the adjacent property owners before any work begins on the site.

Ground Survey-

- Before making any decision on extension to existing structure, the soil strength must be assessed

Energy Plant consultant-

- Assessment of the current site and determination of the best position for a biogas plant so that venues can be designed later without any constraints.

Site Photographic studies

Exterior conditions

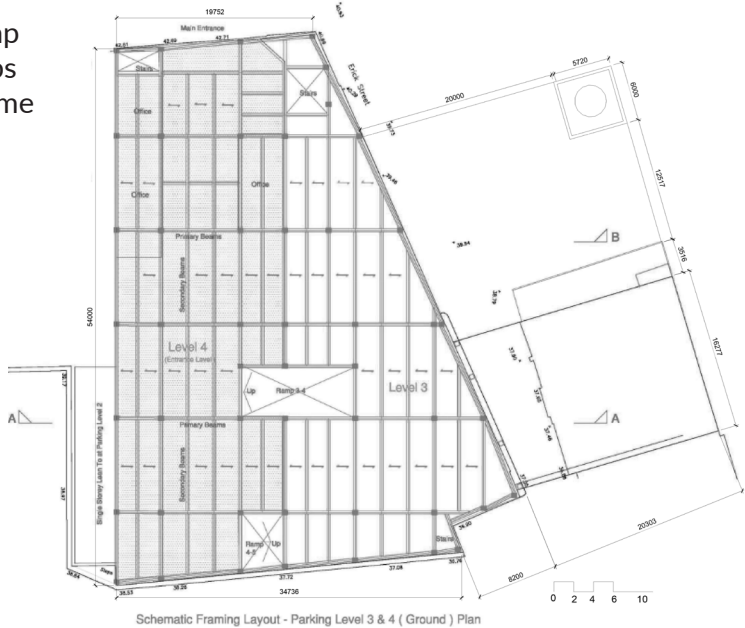
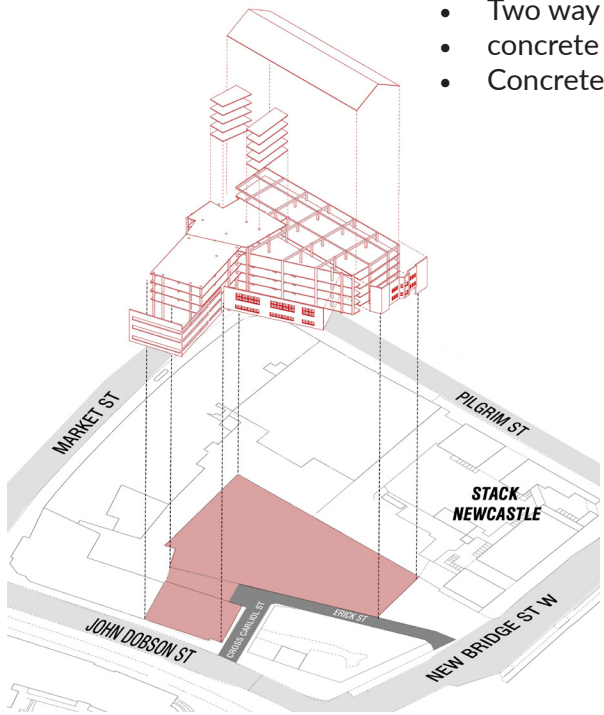


Interior conditions



Existing site Drawings

- Steel Roof
- Two way ramp
- concrete slabs
- Concrete frame



1.1 Roles and appointments of consultants

Site surveyor-

- To survey the terrain of the site, check how the soil conditions and also to determine the positions of the foundations and the type of the foundation present in the existing.

Structural Engineer-

- To carry out the structural inspection of the existing Dex car park
- Advice on extents of demolition
- Advice on strength of the existing sub and super structure and what needs to be done in order to increase the strength and weather it is suitable for adaptive reuse

Acoustic Engineers

- They will advice on how to stop the travel of sound through rooms coming from biogas plant operations.
- Advice on how to create a comfortable environment inside the food hall and multifunctional hall

Party Wall surveyor

- To determine if the wall on the east side comes under any party wall considerations and if yes then what are preventions that must be taken during the construction
- To give notice to the surrounding properties before the work can commence
- A party wall surveyor plays an important role in resolving disputes between neighbours under the Act. Rather than the persons who appoint them, party wall surveyors have a responsibility to the Act, and they resolve disputes in a fair and practical manner.

Environmental consultant

- Environmental specialists can offer valuable insight into a project. Environmental consultants can play an essential part in the decision-making process, as they are often employed early in a project to help plan, organise, and police a development to minimise its negative consequences and help achieve client's goal of sustainability with respect to standards like BREEAM

M&E Consultants

- Advice on best strategies for lighting, heating and cooling in terms of cost and carbon emissions.
- They also assist on how comfortable temperatures can be achieved inside the building
- In this scheme will have to work closely with the energy plant consultants for reducing the energy use in the plant.

Quantity Surveyor

- Will assist the client and the architect in tendering process and developed design
- To ensure if the project is feasible

Energy plant consultants

- To advice on what is the best position for the plant to be placed on site
- What are the needs for the operation of the plant
- Advice on safety considerations
- Noise and vibration control
- How will the energy be supplied to the venue and many other engineering expertise

Health and safety consultant

- As the demolition of the existing involves risks it is good to have a health and safety consultant as they will advice and check if the risks associated in construction are prevented and are meeting the safety standards.

Contractors & Sub contractors

- Main contractor appointed during the tendering process for works of demolition and repairs and overall construction including the extension that is the urban terrace
- Sub contractors will also have to appointed because of the prefabricated of the facade that includes polycarbonate facade units and glazing units.

1.2 Planning Processes

There are three types of planning consent

- Full Planning Consent,
- Listed Building Consent and
- Change of Use Class

Because the existing Dex car park is being turned into an energy plant as well as a leisure and community hub with a food hall and multifunctional hall, **a change of use consent** is necessary for this project.

A full planning consent is also required due to the major demolition work on the interior floor plates and exterior façades, as well as for the construction of the new steel structure platform extension that is attached onto the existing building on the east face.

Pre application

In some cases if the client is unsure about a design approach, it is a good idea to have an informal discussion with representatives of the local planning authority. This will benefit the client by determining whether any other consents are required, preventing reapplications and extra cost, and subsequently improving the overall scheme.

In this project the pre application advice will likely be needed as the client itself is the local authority that is Newcastle city council.
(Planningportal.co.uk, 2015)

National Validation Requirements for applying for planning permission

- Completed application form
 - Site location plan- 1:1000/1250
 - Site plan 1:200 or 1:100
 - Design and access statement- Explain the design principles and concepts through justifications and development works
 - Ownership Certificate- Dex car park
- (Newcastle City Council, 2019)

Application fees

The fees is paid by the client on successful submission of documents by the architect online. The total cost of full planning application consent comes should be calculated via planning application calculator

Planning decision

- There are four responses to an application, approval, approval with some conditions to meet, no decision in 8 weeks, or denial.
- If the application is approved, then the work should commence without 3years
- If the application is approved but with some conditions, then the work can only commence if the following conditions are met.
- If there is no response to the application in 8weeks, the client or the applicant has the right to appeal to the security of state.
- If the application is denied the applicant can resubmit another application within 12 months at no extra cost.

(Legislation.gov.uk, 2015)

COMMUNITY RIGHTS IN ENGLAND-

"If your building project benefits the local community, and the community supports it, you may not have to go through the normal planning permission process. Neighbourhood planning and Community Right to Build lets your community grant planning permission directly under certain circumstances." (GOV.UK, n.d.)

Change of use

Current use- Dex Car park (Sui Generis)

Proposed use- Leisure social community hub (Class E & F)
Energy plant (Sui Generis)

(Planning Portal, 2019)

National Planning Policy Framework

An economic objective – to help build a strong, responsive and competitive economy

A social objective – to support strong, vibrant and healthy communities

An environmental objective – to protect and enhance our natural, built and historic environment

(Ministry of Housing, Communities & Local Government, 2021)

In order for the application to be approved its good that it complies with the Local NPPF.

Policy UC12 Urban Design

To deliver higher quality locally distinctive places in terms of architecture and public realm, development will:

1. Be designed to respect and enhance the positive characteristics and context,
2. Provide a co-ordinated approach that reinforces and creates linkages to its surroundings,
3. Provide strong urban frontages and an appropriate urban grain reinforcing continuity and enclosure at a walkable urban block scale,
4. Ensure active frontages along Primary and Secondary Pedestrian Routes, and
5. Incorporate high quality, durable and sustainable materials appropriate to the character of the area and the use envisaged for the site. (Newcastle city council, 2015)

Policy UC13 Respecting and Managing Views Within, From and Into the Urban Core

To respect important public views there will be a presumption against development proposals that would cause significant harm. Views that will be respected include those:

1. From or across or into the Tyne Gorge,
2. From defined major movement corridors/routeways, and
3. Of designated heritage assets, other distinctive landmark buildings and structures

(Newcastle city council, 2015)

1.3 Business case

This is a elemental cost plan and should be reviewed by the Quantity surveyor

| Components | Cost per m2 | Area m2 | Cost Per Unit (£) | Unit/s | Total (£) |
|--|-------------|----------|-------------------|--------|-------------|
| | | | | | |
| Demolition | Cost m2 | Area m2 | | | |
| Internal Slabs (reinforced concrete) | £114.64 | 2633.013 | | | £301,848.61 |
| Three External Facade (External Walls) | £95.49 | 555.694 | | | £53,063.22 |
| | | | | | |
| Substructure Urban terrace extension | | | | | |
| Isolated Foundation | £122.12 | 77.76 | | | £9,496.05 |
| Square hollow Columns | | | £3,190.41 | 36 | £114,854.76 |
| Square hollow Beams | | | £2,570.76 | 6 | £15,424.56 |
| Square hollow Braces | | | £2,570.76 | 36 | £92,547.36 |
| Marble-cement composite planks | £18.61 | 347.219 | | | £6,461.75 |
| | | | | | |
| Upper Floor | | | | | |
| 50mm reinforced concrete screed | £18.51 | 3134 | | | £58,010.34 |
| Epoxy resin coating finish | £35.70 | 3134 | | | £111,883.80 |
| Thermal insulation | £30.70 | 704 | | | £21,612.80 |
| | | | | | |
| Roof | | | | | |
| Fully adhered single ply roof membrane | £37.77 | 1893 | | | £71,498.61 |
| Thermal Insulation | £36.27 | 1893 | | | £68,659.11 |
| | | | | | |
| Stairs, Ramps and Lifts | | | | | |
| Polycarbonate façade system (external) | £43.01 | 360.125 | | | £15,488.98 |
| Wall Internal- Partitions | £30.00 | 88.054 | | | £2,641.62 |
| Internal glazed partitions | £370.37 | 395.843 | | | £146,608.37 |
| | | | | | |
| External Doors | | | | | |
| Curtain panel doors (Entrance) | | | £2,546.16 | 4 | £10,184.64 |
| Sliding door wooden frame | | | £5,092.32 | 20 | £101,846.40 |

| Components | Cost per m2 | Area m2 | Cost Per Unit (£) | Unit/s | Total (£) |
|---------------------------------------|-------------|----------|-------------------|--------|---------------|
| | | | | | |
| Internal Doors | | | | | |
| Internal Doors | | | £204.71 | 32 | £6,550.72 |
| Loading door | | | £950.00 | 1 | £950.00 |
| | | | | | |
| Internal Finishes | | | | | |
| PlasterBoard | £664.00 | 8.2 | | | £5,444.80 |
| Paint (Yellow & White) | £664.00 | 2.35 | | | £1,560.40 |
| Accoustic Baffels | | | £126.85 | 240 | £30,444.00 |
| | | | | | |
| Special Fittings | | | | | |
| Waste Processing machinery | N/A | N/A | N/A | | |
| Office Furniture, Food hall Furniture | | | £2,062.50 | 35 | £72,187.50 |
| Bleachers | | | £22,032.00 | 3 | £66,096.00 |
| Kitchen fittings, equipments | | | £822.33 | 15 | £12,334.95 |
| Temporary stalls (food hall) | | | £1,122.33 | 5 | £5,611.65 |
| | | | | | |
| Services | | | | | |
| Air Conditioning & Heating | £104.86 | 3188.707 | | | £334,367.82 |
| Electrical Installations | £75.00 | 4088.707 | | | £306,653.03 |
| Toilets | | | £1,058.33 | 15 | £15,874.95 |
| Security systems | £18.00 | 4088.707 | | | £73,596.73 |
| | | | | | |
| External Works | | | | | |
| Soft landscaping | | | £898.20 | 8 | £7,185.60 |
| Total Build Cost | | | | | £2,140,989.11 |
| | | | VAT(20%) | | £428,197.82 |
| | | | Contigency(12%) | | £256,918.69 |
| | | | | | |
| Architect Fees (4.5%) | | | | | £96,344.51 |
| Structural Engineer(2.5%) | | | | | £53,524.73 |
| Acoustic Engineer(0.50%) | | | | | £10,704.95 |
| M & E Consultants(2%) | | | | | £42,819.78 |
| Quantity Surveyor(2.2%) | | | | | £47,101.76 |
| Health and Safety consultant(0.50%) | | | | | £10,704.95 |
| Contractor and Subcontractors(12%) | | | | | £25,691.87 |
| | | | | | |
| Professional Fees | | | | | £286,892.54 |
| | | | | | |
| Total | | | | | £3,112,998.17 |

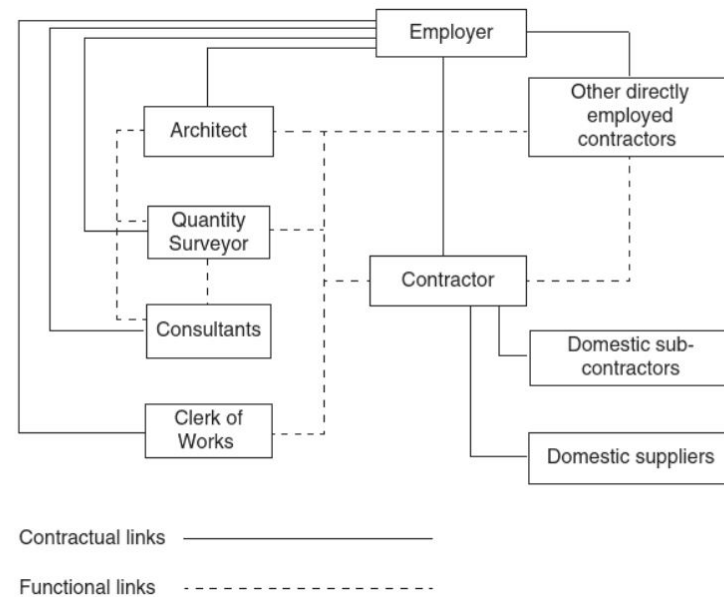
2.1: Procurement Route

Procurement can be defined as the process of purchasing goods and services (Young, n.d.).

Chosen procurement route: Traditional Route (Conventional)

- Because the AD plant must be carefully developed beside the public venue and must also fit into the environment of the Newcastle city centre, traditional procurement is utilised. This will allow for higher project quality since the design is finalised by the client and the architects before the tendering process begins, giving the client more flexibility and say over the design.

All three images are taken from the book Architect in Practise (Chappell and Dunn, 2016)



Traditional Route

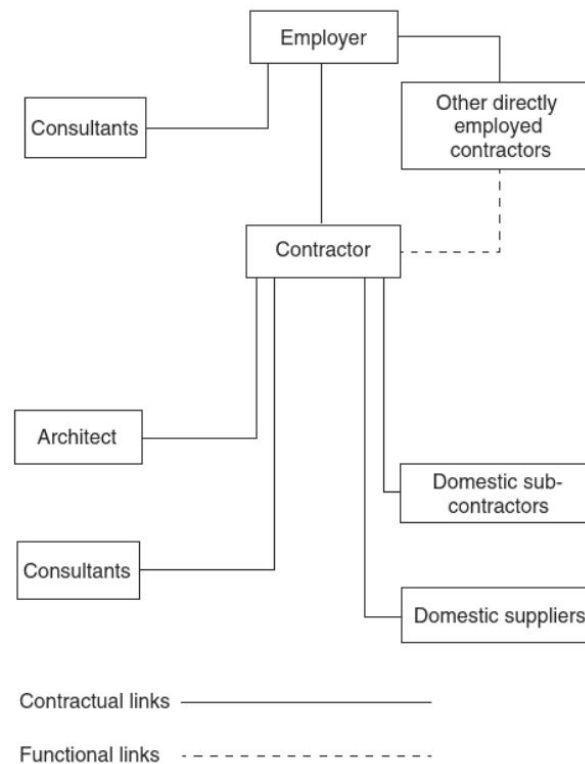
It is the most commonly used procurement route and accounts to 70 percent of projects (NBS, 2015), and in this route the client appoints the architect and the consultants to carry out the full design, that also includes the preparation of price documents that can be made available for the tender. The architect and consultants are solely in charge of the design phase, not the building phase, the liability of the construction is on the contractor

Advantages:

- Because the design is finalised before the contractors are hired, this procurement maximises quality. This means that there is a better understanding of how much the project is likely to cost.
- Each party's liability is clear (Lupton and Manos Stellakis, 2019)
- Flexibility in design

Disadvantages

- At the time of tender, an incomplete design can incur cost and time uncertainty.
- The process takes longer since the contractor is hired only after the design is completed, and also because there is no involvement of contractor at the early stages.



Design & Build

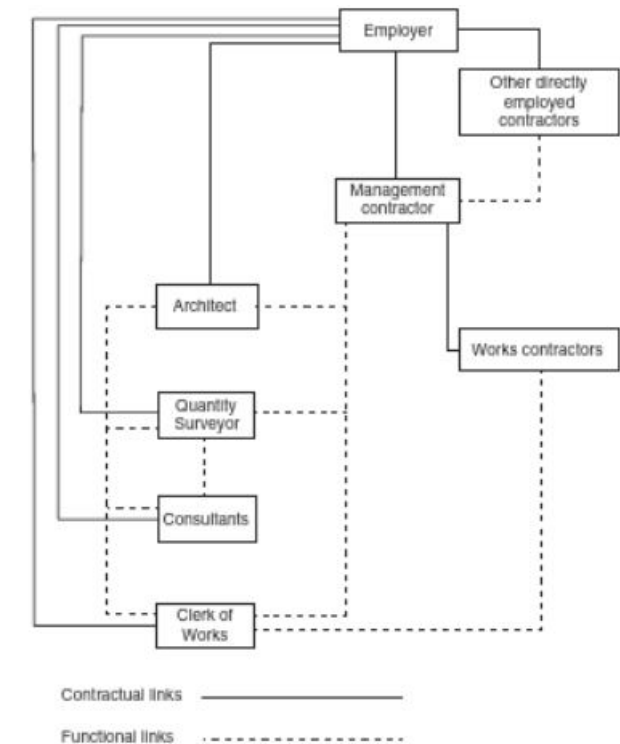
Design and built accounts for 25percent of the projects (NBS, 2015), this route is preferred if the client wants the work to commence early on site. The contractor is appointed very early and contribute to the design process and in this case the client does not have full control over the design development as in the traditional method (Chappell and Dunn, 2016).

Advantages

- The construction time is reduced as the tendering begins even before the design is completed.
- Single point of responsibility for design and construction
- The design can benefit from the contractor's expertise.

Disadvantages

- Quality may be reduced in this approach because the contractor may seek for cheaper alternatives in order to maximise profitability and convenience of scheme implementation.
- It might be difficult and costly to make changes to the initial brief



Management

This is the least used procurement method. The client appoints the management contractor, and because it is a management position, they are not accountable for the construction or design process, but rather for dividing the scheme work into different packages for the greatest quality. This technique is suitable for large, complicated projects where the benefits of construction management, such as upfront buildability information, programme advice, and specialist input from trade contractors, may be utilised. The client has a lot more involvement in the project and how the design is changed, which increases their risk (Chappell and Dunn, 2016)

Advantages

- By combining design and construction, the overall project period can be reduced
- Roles, risks and relationships for all parties are clear
- Changes in design can be accommodated without paying a premium

Disadvantages

- Big risk on client
- Client has a lot of consultants and contractors to deal with
- Changes to later packages may adversely affect cost (expensive)

2.2: Tendering and Cost Control

Types of Tendering

- Open tendering
 - Selective tendering
 - Negotiated tendering
 - Serial tendering (hybrid)
 - Framework tendering
 - Single-stage and two-stage tendering
 - Public procurement
- Competitive

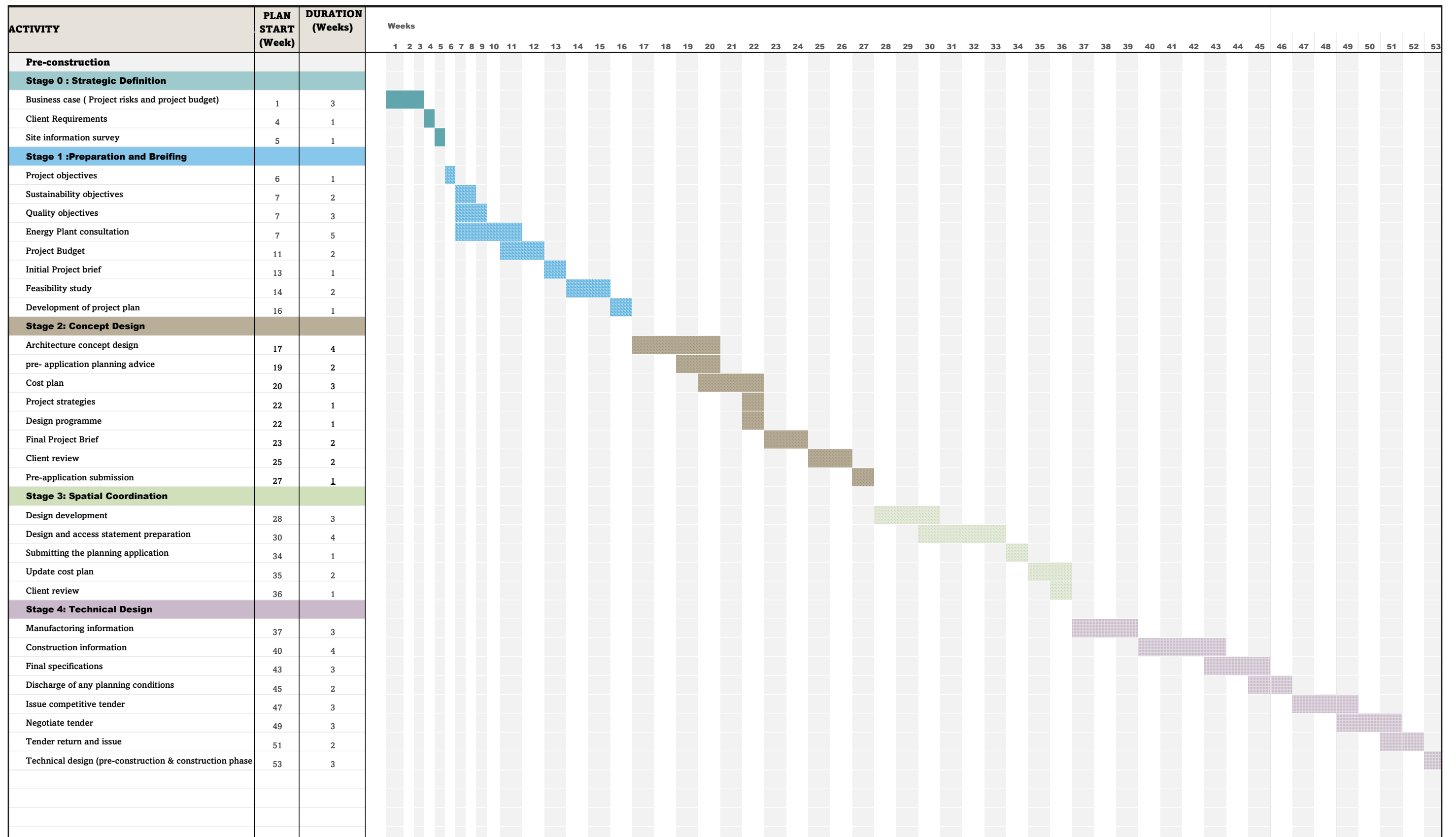
Tendering

- Because the project is publicly funded, a competitive tender process with negotiation is employed, being publicly funded it is influenced by OJEU Procurement regulations. This is also owing to the project’s intricacy and the desire to reach a higher price for quality. Two stage selective tender can also be considered for greater flexibility and quality in project if the contractor appointed does not meet the expectations and can be replaced in stage two of the the tender.
(Designingbuildings.co.uk, 2013) (Designingbuildings.co.uk, 2011a)

| | Benefits | Disadvantages |
|-------------|--|---|
| Negotiated | <ul style="list-style-type: none">• Increased trust in current working ties• Decreased tendering duration and expenses• Early contractor participation, early price, beneficial for specialist projects like in this case for energy plant strategies• Client can choice the contractor | <ul style="list-style-type: none">• Result in high contract offer because lack of competition• Is not suitable for large public projects which are publicly-funded• Anti-competitive and exclusive |
| Competitive | <ul style="list-style-type: none">• Because every contractor is competing with each other, they will submit their most competitive bids, which will add value to the client• Creates an opportunity to experiment with various design choices• Drives down the cost | <ul style="list-style-type: none">• Due to contractors having to select cheapest price for the work can compromise on quality• Due to contractors having to select cheapest price for the work can compromise on quality• Competitive tendering might be viewed as a “race to the bottom,” which can lead to disagreements later in the project as suppliers look for ways to raise their prices. |

(Designingbuildings.co.uk, 2013a)

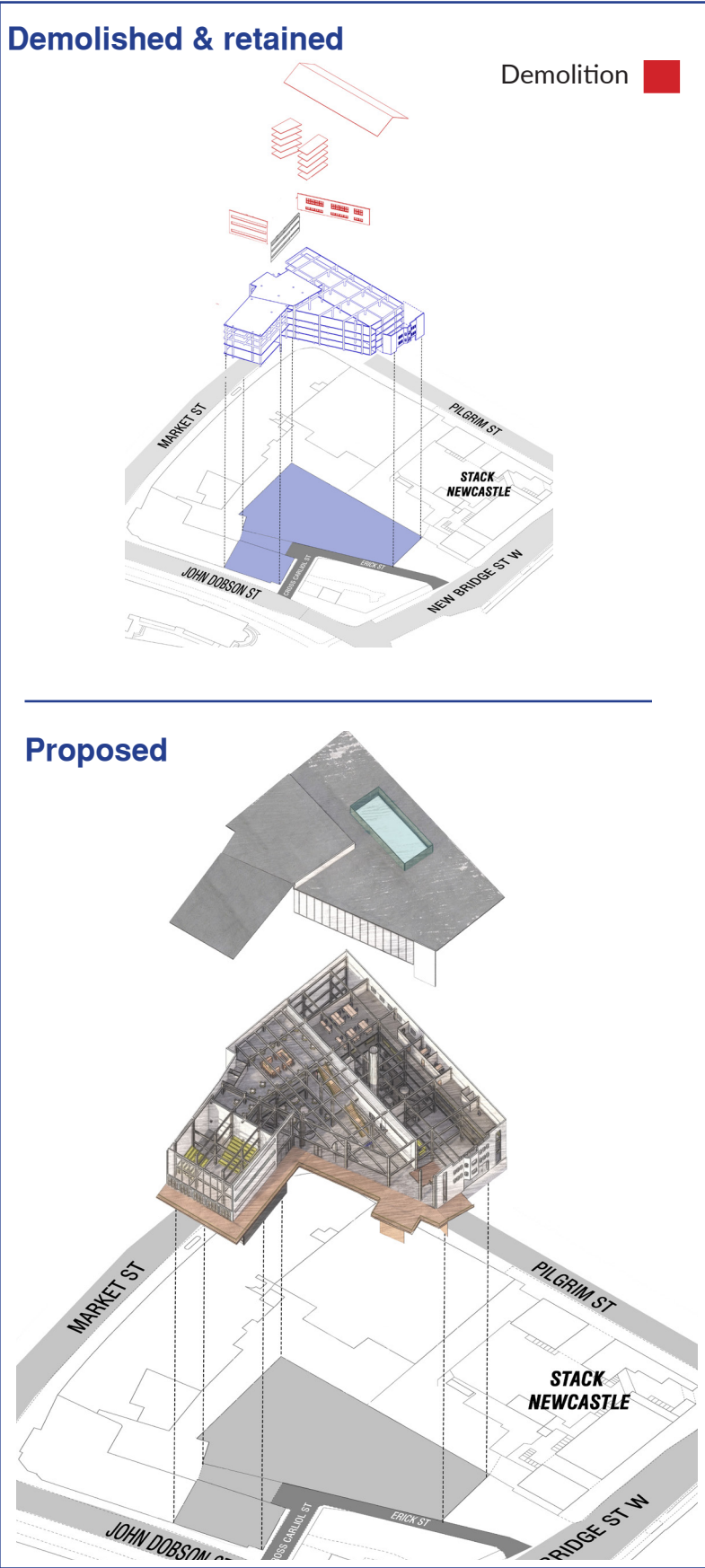
2.3: Programme



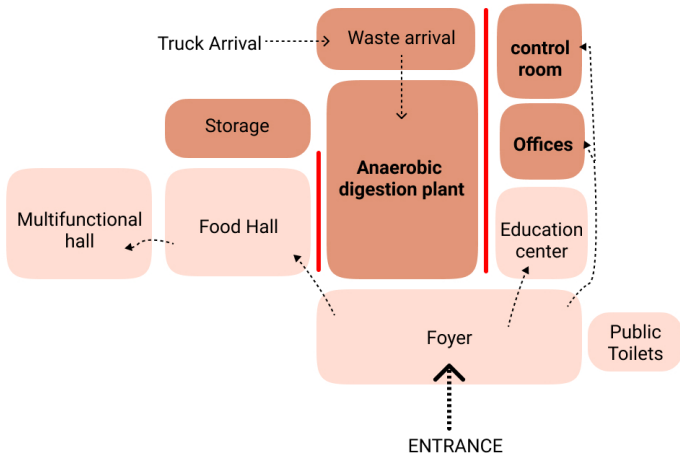
All the durations are assumed in accordance with RIBA Plan of Work 2020

3.1: Design And Access Statement: Design Principles

The strategy will be to maintain the current floor slabs and make the necessary cutbacks, as well as repair and resurface the concrete structure and slabs. Keeping the services, and the existing frames exposed will create a combination of old and new materials and create more interest.



Adjacency

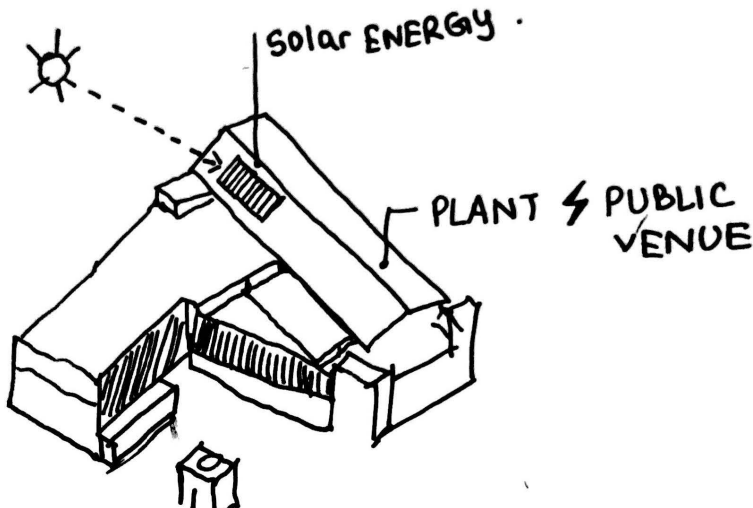


PROGRAMME GOALS

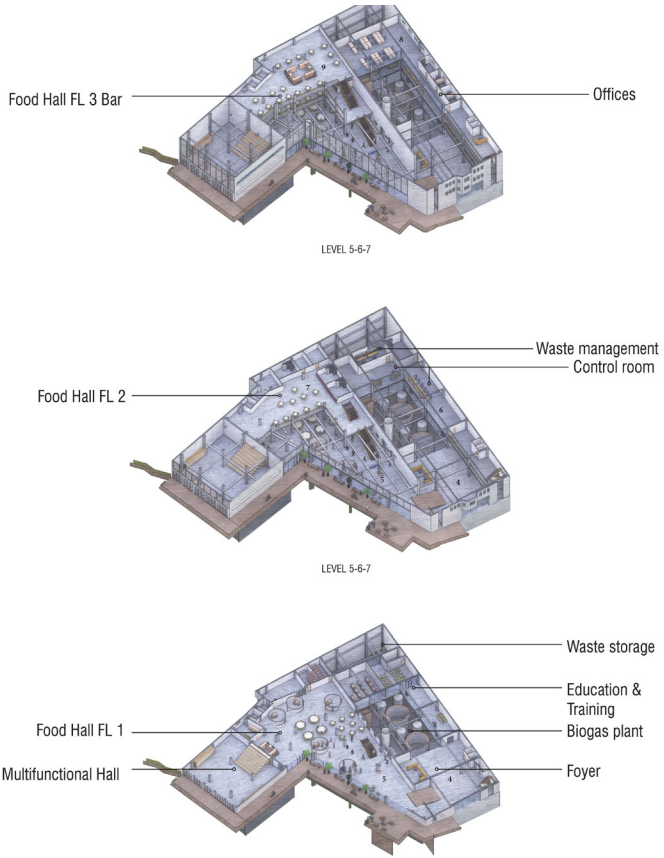
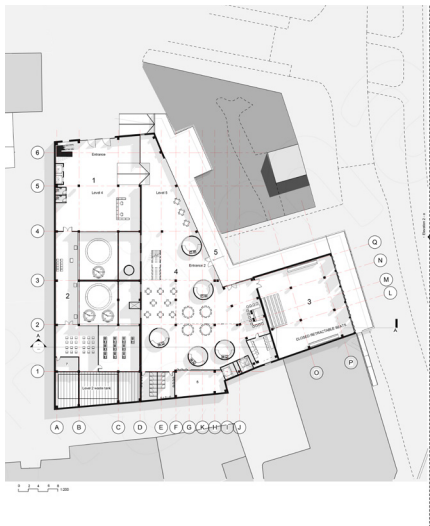
- Supporting local economy and creating jobs
- Educating and training on REUSE of food waste
- Redistribution of food to end food waste problem
- New Leisure space for public of Newcastle

Sustainability

The energy from the biogas plant will be used to supply electricity to the public venue, as well as to power the radiators and lighting appliances, making the building very sustainable in terms of lighting heating and making it a self-sustaining system. And also the biogas plant uses the energy that is generated in its own operations.



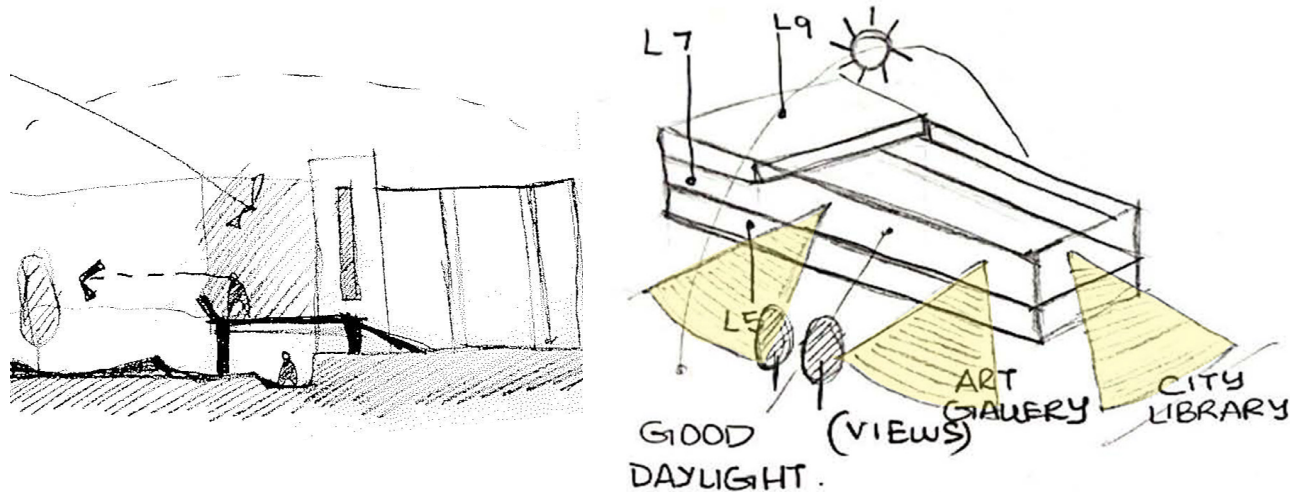
Connected views to plant from Foyer, food hall and education centre



- The layout is designed to visually connect the public spaces with the recycling facilities

3.1.2: Design And Access Statement: Contextual Response

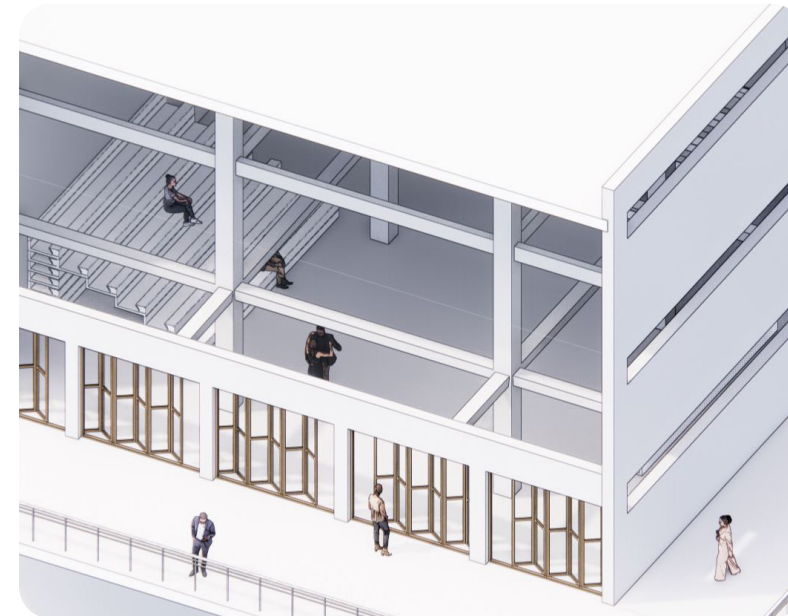
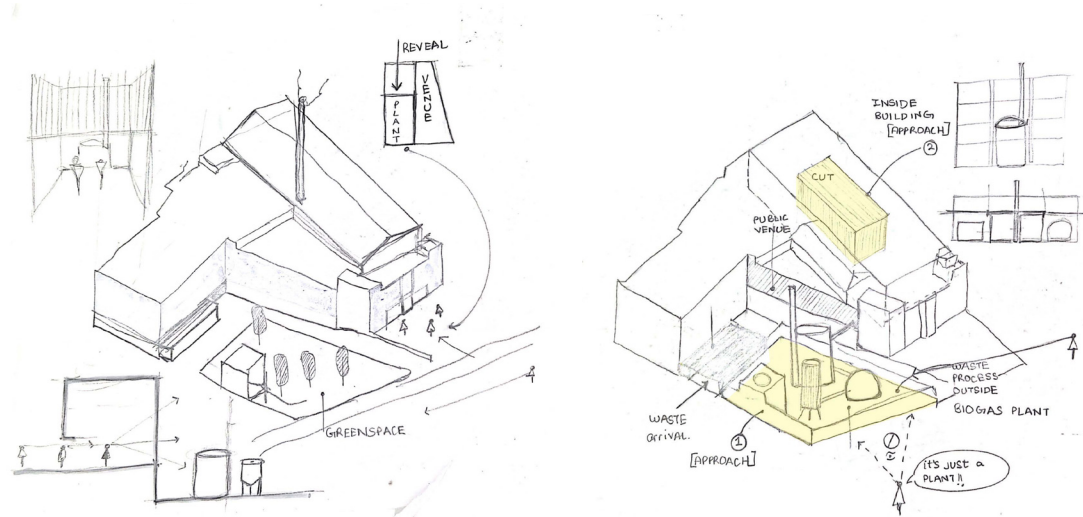
- Position of Food Hall & Urban Terrace
- Placing the Food Hall on the East Face of the building, as well as constructing an external urban terrace expansion, will draw more attention from the streets, while those inside can enjoy views of the Laing Art Gallery and City Library.



- Encouraging engagement of people through urban terrace and hence bring them inside the facility and making them reveal the plant once inside



- Position of the Plant
- Placing the plant inside and in the middle will make it more contained in nature, and placing the biogas plant inside rather than outside allows for unobstructed views towards Laing Art gallery, Newcastle city Library and the adjacent road.



- Materials used for the east external facade are used to attract people from the streets and create a industrial feel to and also to create an interesting beam of light feature at night.
- The Front facade is repainted to retain it;s historic look.
- The landscape on the front of the site will be replanted with lesser trees for visibility from the streets and also allow people passing by with a stop and sit park.

3.1.3: Design And Access Statement: Access statement

- 1- Foyer
- 2- Education and training centre
- 3- Multifunctional Auditorium
- 4- Food Hall with flexible food stalls
- 5- External steel structure Platform linked to Food Hall and Auditorium space
- 6- Storage for temporary stalls and auditorium equipments
- 7- Storage for education and training space
- 8- Green room
- 9- Biogas Plant

Strategic placement of spaces

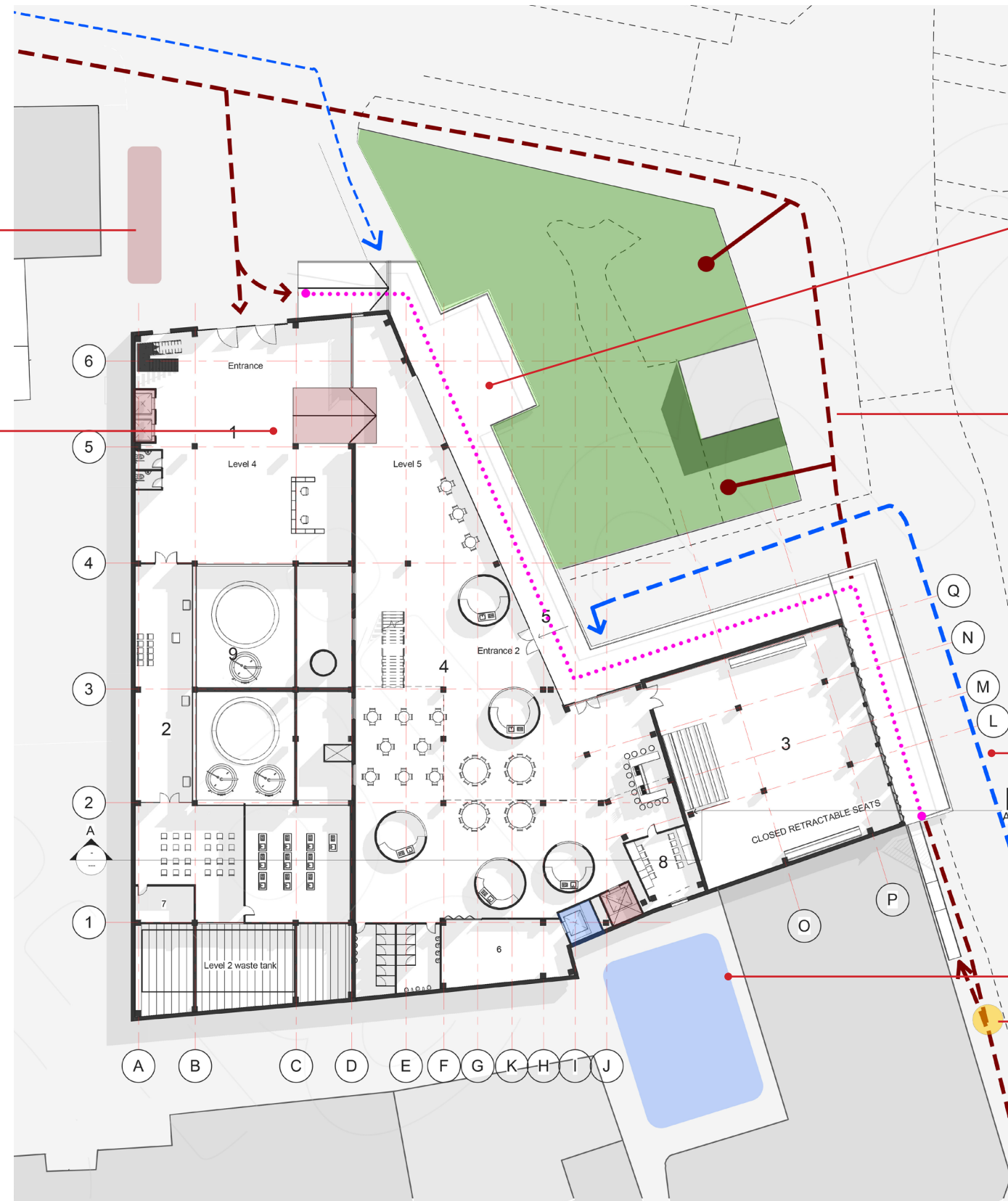
- Food hall easily accessible through streets
- Multifunctional hall accessible through urban terrace and act as a spill out space

Bike parks are provided and no car park is available on site as the motive is get people into the site through cycling and walking from city center. And also as newgate st will be pedestrianized in future is it will create more footfall.

Accessibility for all: The layout is designed in such a way that everyone with disabilities can also access the building without any restrictions



Macro Analysis



Urban attraction from the streets



Public has access to the green space from the walkway, no fencing is provided

Access for waste trucks to get into the site

The trucks can be parked behind the property where there is share corridor

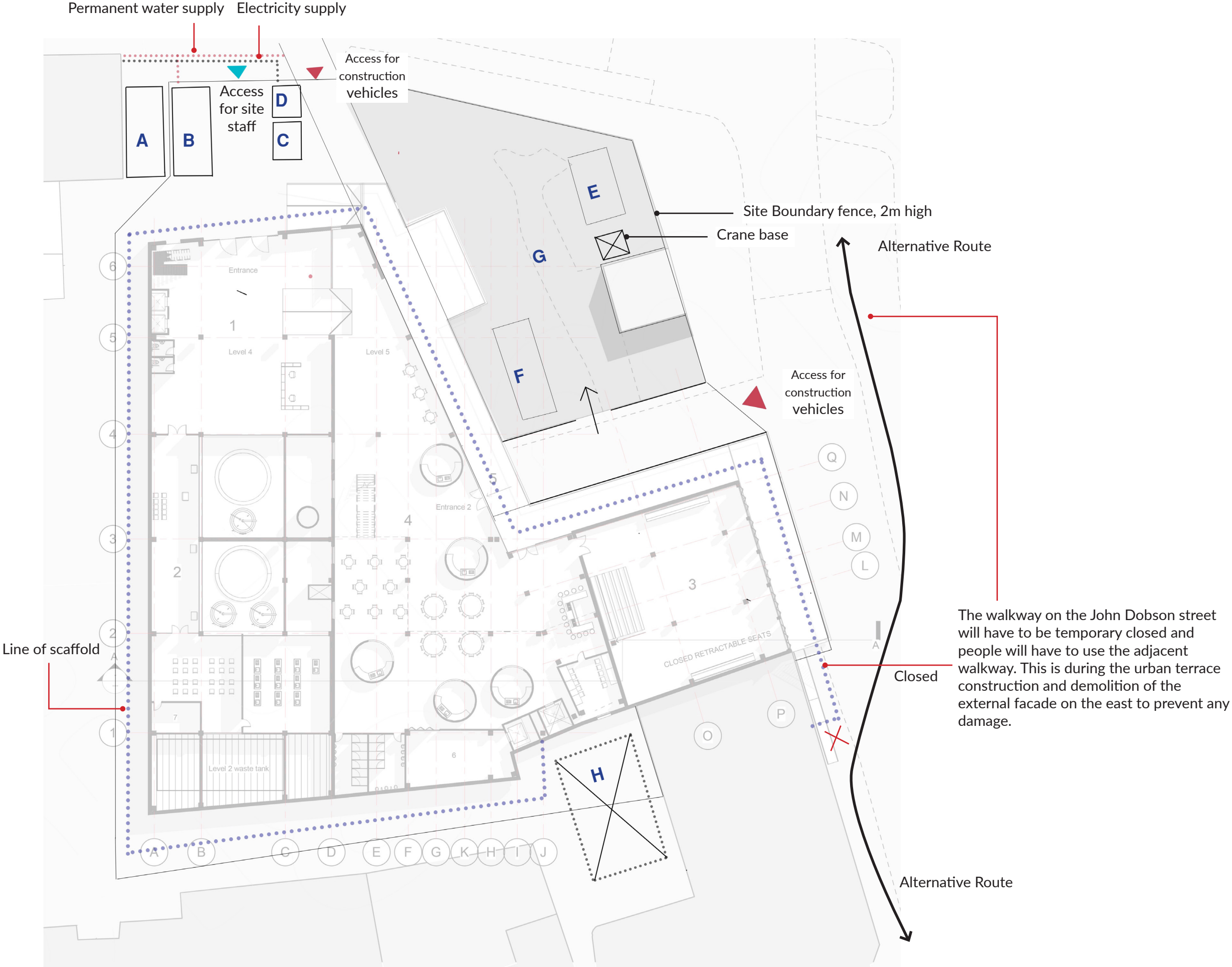
BUS STOP

The site has good transport links with bus stop just next to it which gives the opportunity to create new public realm with must visibility

4.1.2 Pre-construction Health and Safety plan

Health and Safety Executive (2006). Health and safety in construction.

- A** Car park for site staff, site visitors
- B** Resting facilities, mess and drying facilities
- C** Portable Toilets with temporary drain connection
- D** Timekeeper, site office
- E** Cement store and area for mixing
- F&H** Scaffold storage
- G** Area where trucks can load the demolition waste to keep the site clear

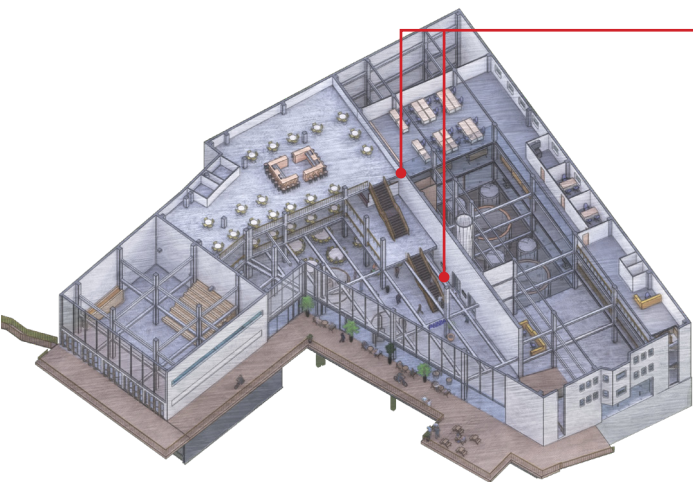


4.1.2: Construction Phase Health and Safety

Demolition phase

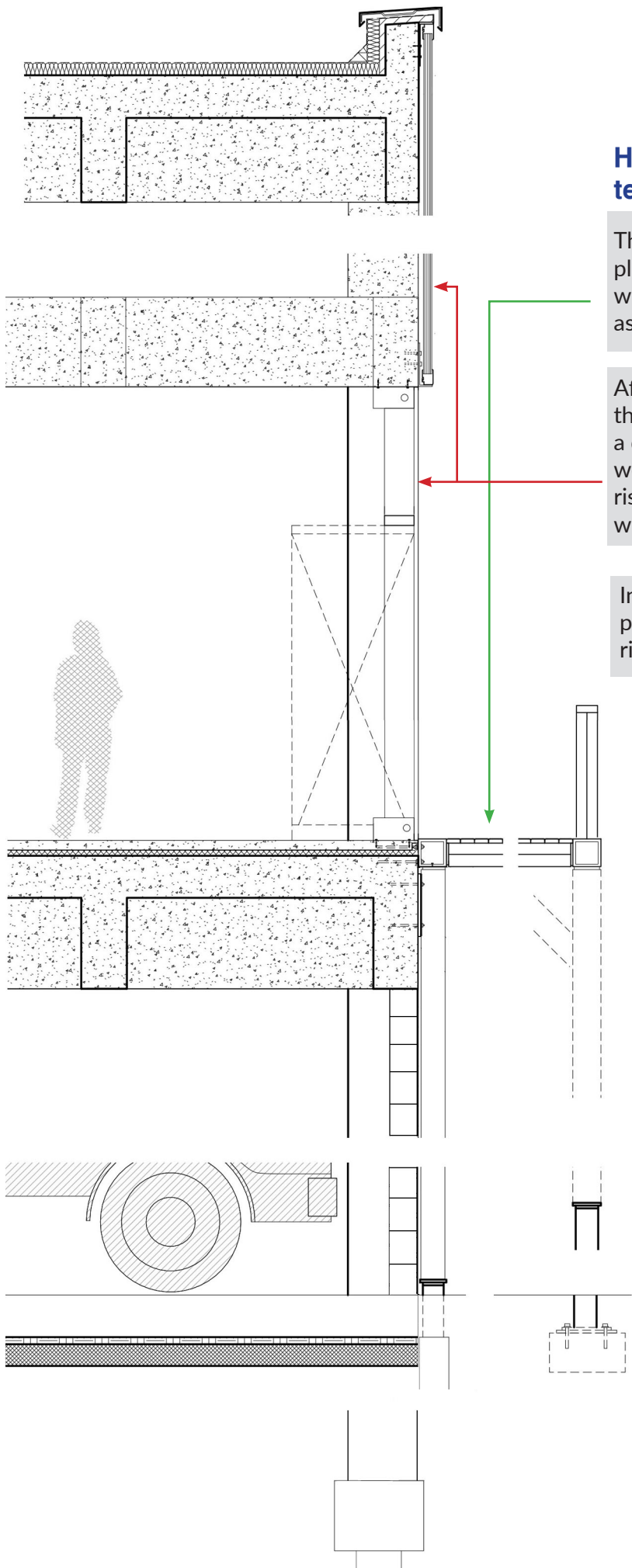
CDM Regulation 20 Demolition or dismantling

- (1) The demolition or dismantling of a structure must be planned and carried out in such a manner as to prevent danger or, where it is not practicable to prevent it, to reduce danger to as low a level as is reasonably practicable.
- (2) The arrangements for carrying out such demolition or dismantling must be recorded in writing before the demolition or dismantling work begins (Health and Safety Executive (2015b)).



After the demolition is completed the precast concrete stairs should be installed which will provide early means of escape in case of a fire.

During the demolition work that is the removal existing floor plates to create voids and external facade on the east and removal of interior partitions a high amount of dust is produced. To prevent this the site should be screened off so as to prevent the spread of dust. All precautions should be taken by the works and a RPE mask is compulsory as the demolition process gives out dust that is not good for the workers and can cause severe disease like lung cancer. The provision for natural ventilation should be made available through openable windows and where possible use water suppression or on-tool extraction. The demolition sequence should be determined early to avoid any undetermined collapse of the structure. The demolition works involves noise from heavy machinery so the adjacent properties should be given notice by the party wall surveyor before the work commences. Also the workers should be wearing a hearing protector.(cite the yellow book)



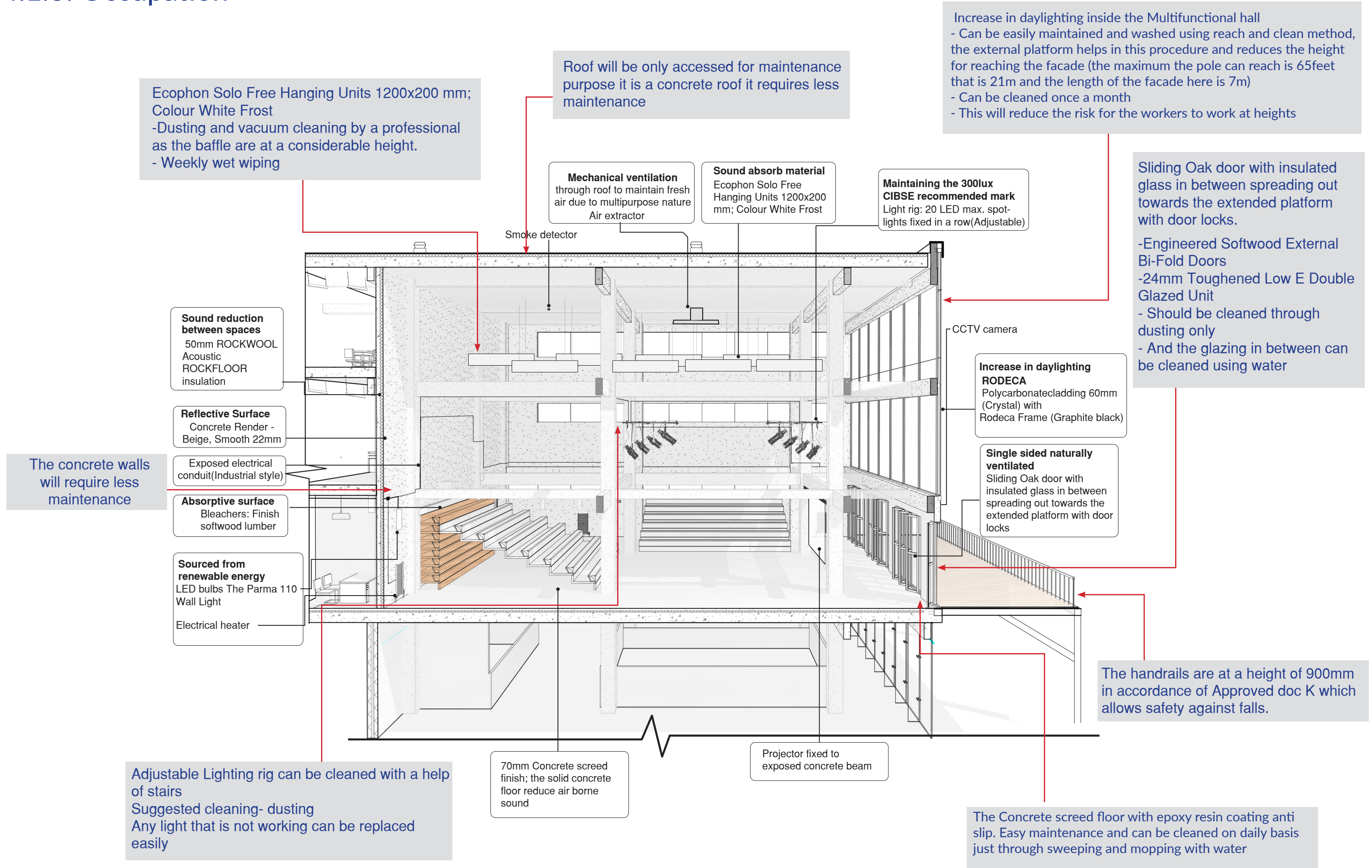
Handling and construction of urban terrace

The urban terrace should be constructed before the placing of glazing and polycarbonate facade units this will also help the workers while craning the glazing units as it will act has a base of support.

After the internal repairs are done, the glazing units and the polycarbonate facade frame should be craned and a double cup suction lifter should be utilised to reduce weight and ease the construction and also reduce the risk shattering. The urban terrace will help the workers while working

Independent Scaffolds must be used while installing the polycarbonate sheets onto the frame which will prevent risk of falling.

4.1.3: Occupation



4.2: Building regulations: Part B (Fire Safety)

Information taken from Approved document B: Buildings other than Dwellings



Layout is done in such a way that there no rushing while escaping the building

B1 Warning and escape

1:5 : Automatic fire detection and alarm systems should be provided in non residential occupancies where a fire could break out in an unoccupied part of premises (e.g storage area)

Table 2:1- Offices, shops, and commercial buildings have a maximum travel distance of 18m if travel is only allowed in one direction and 45m where travel is available in more than one way.

Table 2:2 Minimum number of escape routes and exits from a room

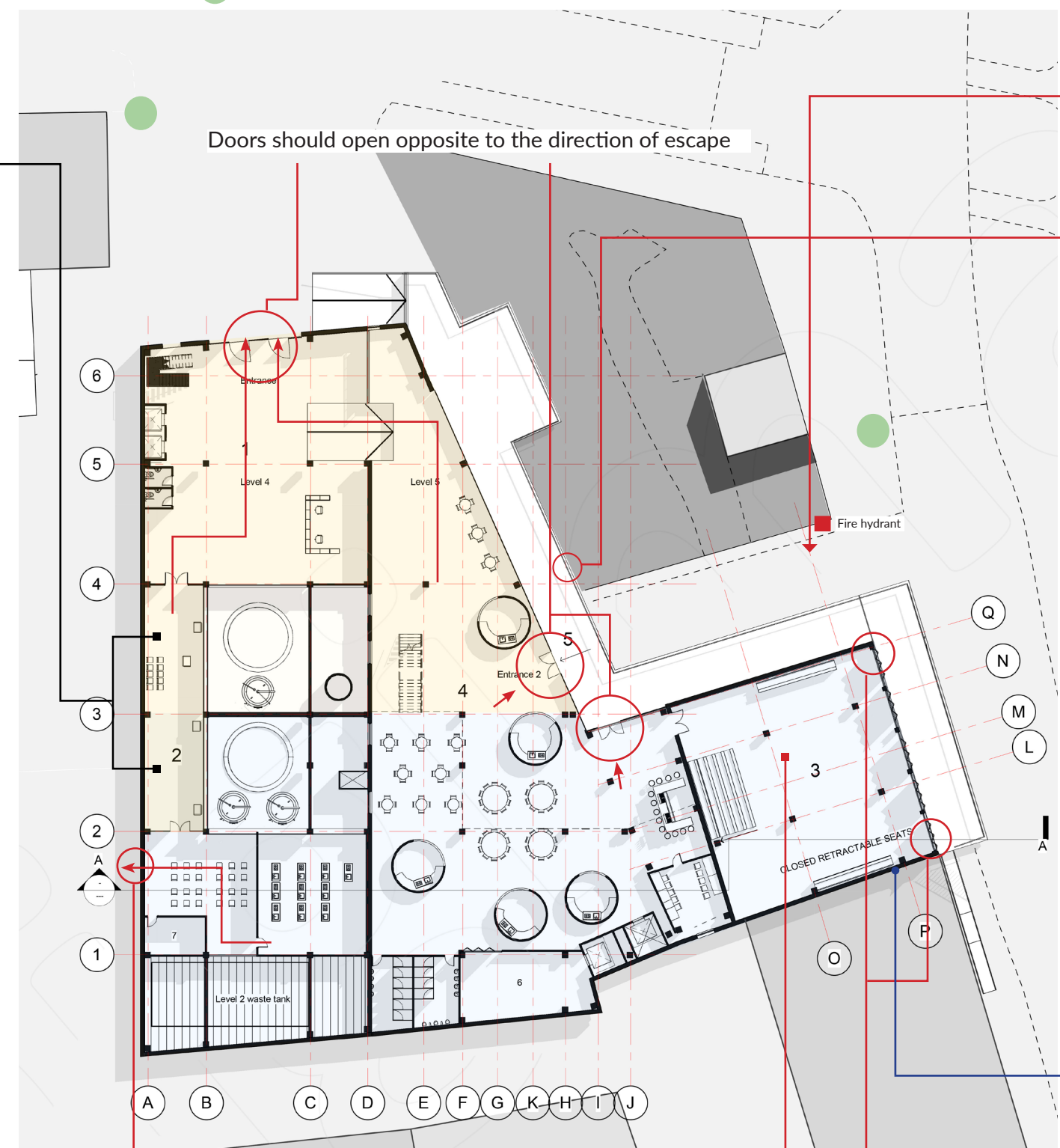
The building will have several exits because of the different venues with different levels of occupancy ranging from anywhere 60-400 people, so the minimum escapes routes of 3 will be followed but can be more. In this project there are 6 exits in total

The escape stairs in the food hall have a width of 1500mm more than the minimum requirement and the possible people served here would be anywhere around 200-220

| Table 3.1 Minimum widths of escape stairs | | |
|---|--|--------------------------|
| Situation of stair | Maximum number of people served ⁽¹⁾ | Minimum stair width (mm) |
| 1a. In a 'residential (institutional)' building (unless the stair will only be used by staff) | 150 | 1000 ⁽²⁾ |
| 1b. In an 'assembly and recreation' building and serving an area used for assembly purposes (unless the area is less than 100m ²) | 220 | 1100 |
| 1c. In any other building and serving an area with an occupancy of more than 50 | Over 220 | See note 3 |
| 2. Any stair not described above | 50 | 800 ⁽⁴⁾ |

| Table 2.3 Widths of escape routes and exits | |
|---|---|
| Maximum number of people | Minimum width (mm) ⁽¹⁾⁽²⁾⁽³⁾ |
| 60 | 750 ⁽⁴⁾ |
| 110 | 850 |
| 220 | 1050 |
| More than 220 | 5 per person ⁽⁵⁾ |

Assembly Points -



A alternative escape should also be considered here because as the chances of fire in the Kitchen workshop is more and the travel distance from kitchen to possible escape is very far this will also reduce rushing in event of fire

The bi-folding doors can also be used for escape

Alternative fire escape door to be considered for quick escape

B5: Access and facilities for fire service

- There is a lot of space for the fire fighters, also enough space to turn around
- The use of fire hydrant
- A staircase of 1500 or more should also be considered for quick escape as the food hall is very vulnerable to fire and also most of the people will be accomodated in that space

B2&B3: Internal Fire spread (Linings & Structure)

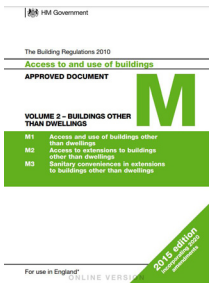
- As the interior walls are made of pre-cast concrete panels they resist fire for safe evacuation, it reduces the spread of fire from one room to another.
- Precast walls were used on to inside because of it's impact resistance and also because of noise of plant
- Also the internal Pilkington fire-resistant glass partitions are also non combustible reducing the spread.
- The floors and intermediate walls are made of concrete will also help stop the spread of fire from one to another.

B4: External Fire spread

- The external walls are cladded with Pilkington Pyroclear (E glazing), and RODECA Polycarbonate cladding 60mm (Crystal) with Rodeca Frame (Graphite black) B-s1,d0 which can resist fire.
- The existing structure is reinforced concrete frame which is non combustible and withstand the fire for a long time before collapsing.

This is a reinforced concrete wall to stop the spread of fire from harming the adjacent property

4.3: Building regulations: Part M (Accessibility)



Information taken from Approved document M Vol. 2: Buildings other than Dwellings

Rise- 1010mm
Run- 6600mm
Gradient- 0.1530 or 1/6.534
Angle- 8.69 degrees
According to the limit for ramp gradients the maximum gradient 1/12 corresponds to an angle of 4.74 degrees. So the gradient with an angle of 8.69 degrees will require assisted support for wheel-chair access

| Table 1 Limits for ramp gradients | | |
|-----------------------------------|------------------|--------------|
| Going of a flight | Maximum gradient | Maximum rise |
| 10m | 1:20 | 500mm |
| 5m | 1:15 | 333mm |
| 2m | 1:12 | 166mm |

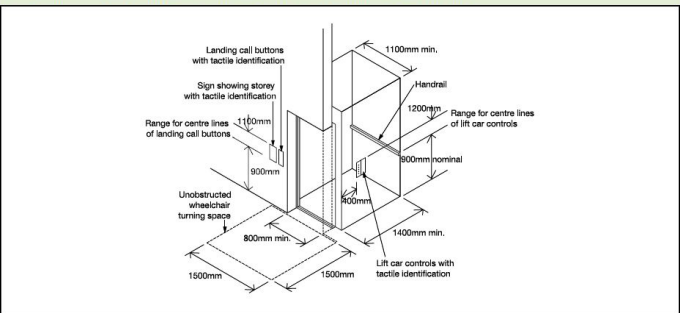
Note:
For goings between 2m and 10m, it is acceptable to interpolate between the maximum gradients, i.e. 1:14 for a 4m going or 1:19 for a 9m going (see Diagram 3).

Reception desk
-To be located to be easily accessible
-Two work surface heights for standing/sitting visitors
-Clear manoeuvring space in front desk-1400 deep x2200 wide
As the entrance hall is the first point of contact with a building's activities and resources the reception area in particular should not only be easily accessible but also convenient to use.

3.34 D,G, H: Passenger lift design

- Lift dimension 1300x1400mm complying with the minimum requirement of 1100x1400mm
- Unobstructed manoeuvring space of 1500x1500 for wheelchair turning space
- Because the lift is not large enough for the wheelchair user to turn around in the lift car, a mirror is essential so that the person in the wheelchair can see behind them when reversing.
- Landing call buttons to at a height of 900mm from floor to be accessible to all including disabilities.

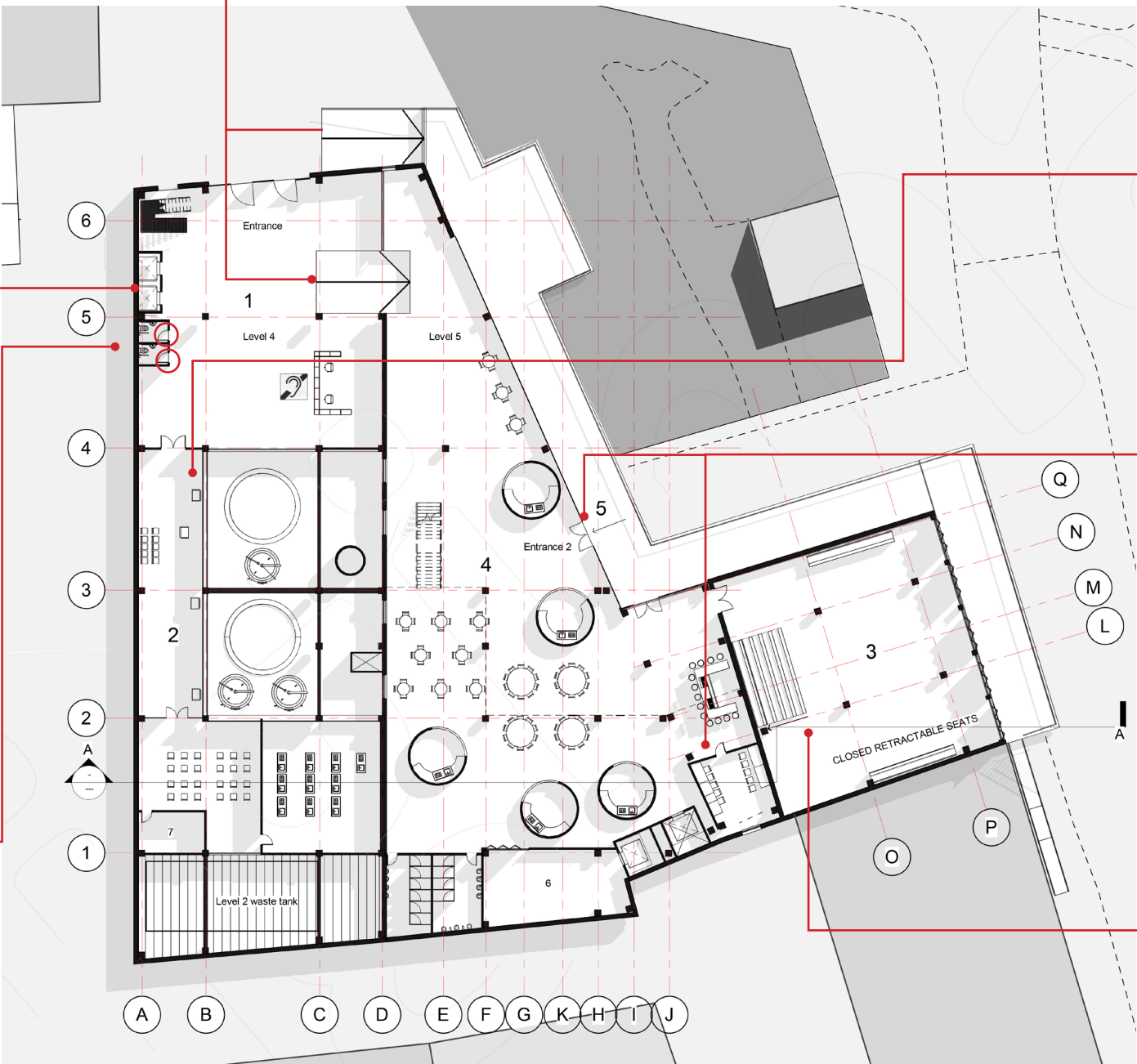
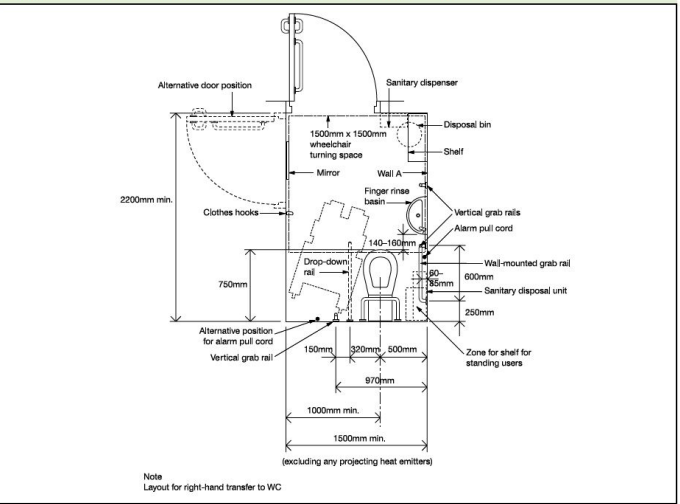
Diagram 11 Key dimensions associated with passenger lifts



Disabled Toilet Access

- Unisex accessible toilets in the foyer
- Complying the minimum size 1500x2200mm
- Doors have to open outwards
- Grab rail provisions in these toilets

Diagram 18 Unisex wheelchair-accessible toilet with corner WC



Layout

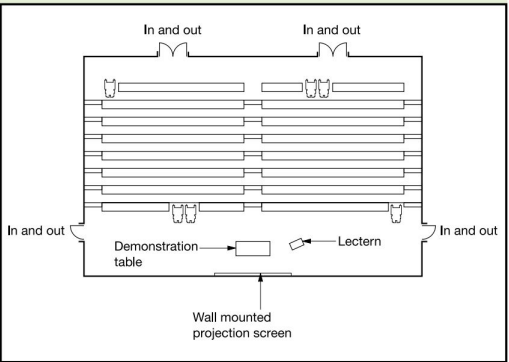
The design layout is created from the beginning with the goal of making it accessible to all. As a result, internal ramps connecting to the food hall, as well as slip resistant ramps on the exterior are considered for maximum accessibility to all spaces including the urban terrace. Furthermore, all internal public spaces are located on the ground and first floors, which are accessible via a non-slip ramp clad with marble composite planks.

3.10 C Door Accessibility

Doorways should have a minimum clear width of 800mm
All single doors in this scheme have a clear with of 800mm
Double doors have a clear width of 1800mm

Wheelchair accessibility must be considered in the multifunctional hall

Diagram 13 An example of wheelchair spaces in a lecture theatre



Floor and wall finish

In this design, the exposed frames are bright yellow, the walls are white, and the floor is greyish, which is ideal for visually impaired people because it creates a clear separation between the floor, frames, and walls.

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