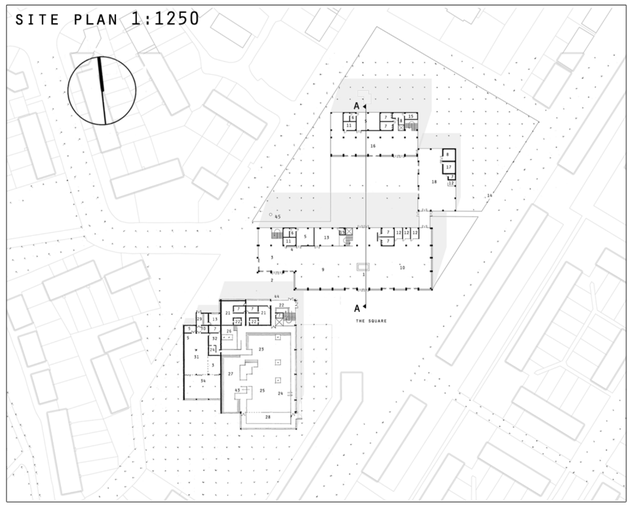
THE HEALTHY COMMUNITY: H.E. COLLEGE/PUBLIC LIBRARY/HEALTHY DINER

STRUCTURE, COMPOSITION AND DETEAIL



SUTAINABLITITY

DUE TO THE EVER INCREASING PRESSURES OF GLOBAL WARMING IT IS IMPORTANT THAT THIS IS TAKEN INTO CONSIDERATION WHEN DESIGNING A NEW BUILD OR RESTORATION, TO REDUCE THE CARBON FOOTPRINT OF THE BUILDING, AND POTENTIALLY BENEFIT THE ENVIRONMENT FROM WHICH IS PRESIDES.

THROUGHOUT THE DESIGN PROCESS THE ISSUE OF SUSTAINABILITY HAS BEEN CONSTANTLY ADDRESSED. THIS SCHEME LENDS ITSELF TO USING A BIOMASS BOILER FUELLED BY WOOD CHIP DUE TO THE CREATION OF A NEW WOODLAND THAT SURROUNDS IT. I HAVE FIGURED OUT THAT THE WHOLE SCHEME WILL NEED A 150KW BIOMASS BOILER TO POWER AND HEAT THE THREE BUILDINGS IN THE SCHEME. THIS MEANS THAT THE SCHEME WILL NEED 780 TONNES OF WOOD CHIP ANNUALLY. THE WOODLAND WILL HAVE 2 HECTARES OF LAND THAT WILL GROW WILLOW. THIS WILL PRODUCE UP TO 40 TONNES OF WOOD CHIP ONCE THE TREES ARE FULLY MATURE. THE OTHER TREES WILL PRODUCE COPPICE TOO, BUT NOT TO THE SAME EXTENT. THERE IS A LOCAL FIRM THAT GIVES AWAY WOOD CHIP THAT WILL BE MAKE UP THE REST OF THE FUEL CONSUMPTION. THE WHOLE SCHEME IS CONSTRUCTED FROM GLULAM BEAMS AND COLUMNS PRODUCED IN BRISTOL. TIMBER IS NOT ONLY CONSIDERED A ZERO CARBON MATERIAL, IT IS ALSO MADE WITHIN THIS COUNTRY, THEREFORE THE FOOTPRINT WILL BE KEPT TO A MINIMUM.

STRUCTURE

THE PRIMARY STRUCTURE IS GLULAM. THE APPROPRIATE COLUMN AND BEAM DIMENSIONS HAVE BEEN DESIGNED IN TO TAKE THE ACTIVE AND DEAD LOADS. TO CONNECT THE BEAMS TO THE COLUMNS STEEL SLEEVES WILL BE USED THAT HAVE SHEETS WELDED TO THEM. THE METAL SHEETS WILL BE SLOTTED INTO THE FEMALE COUNTERPARTS ON THE ENDS OF THE BEAMS, THEN THE SLEEVES AT EITHER END OF THE BEAM WILL BE SLOTTED OVER THE COLUMNS THEN BOLTED INTO PLACE.

THE CURTAIN WALL GLAZING IS PINNED BACK TO THE PRIMARY STRUCTURE VIA THE SLEEVES. A SECONDARY ROW OF COLUMNS WILL BE PLACES IN FRONT OF THE GLAZED FACADE TO HOLD THE MECHANICALLY CONTROLLED LOUVERS IN PLACE. THE SECONDARY SET OF COLUMNS ARE TIED BACK TO THE PRIMARY STRUCTURE VIA THE STEEL SLEEVES

DURABILITY

THE PRIMARY STRUCTURE IS MADE FROM GLULAM. THIS IS AN INCREDIBLY STRONG MATERIAL AS IT IS MADE FROM TIMBER WHICH IS INHERENTLY STRONG. THE FLOORS WILL BE FAIRLY DURABLE, HOWEVER, AS IT IS A COLLEGE BUILDING AND A PUBLIC BUILDING THERE WILL BE A BIG INFLUX OF PEOPLE USING THE PACE INSIDE, THEREFORE THE FLOOR WILL NEED MAINTENANCE CHECKS.

THERMAL PERFORMANCE

DUE TO THE CONCEPT OF THE BUILDING, GLAZING HAS PLAYED A KEY FEATURE, WHICH HAS THE POTENTIAL TO MAKE THE BUILDING OVER HEAT IN THE SUMMER AND BE COOL IN THE WINTER. HOWEVER, DUE TO THE LOUVERS ON THE SOUTH FACADE THIS EFFECT SHOULD HOPEFULLY BE REDUCED. PLUS THE FLOORS, AND THE ROOF OF THE BUILDING IS HEAVILY INSULATED WITH SHEEP WOOL, ONE OF THE BEST INSULATIVE PERFORMERS AND ONE OF THE MOST ENVIRONMENTALLY FRIENDLY TYPES OF INSULATION DUE TO IT BEING A NATURAL PRODUCE.

THE BUILDING HAS A UNIQUE HEATING SYSTEM WHERE THE BIOMASS BOILER WILL GENERATE HEAT. THE HEAT WILL THEN FLOW UP FROM THE FLOORS. A STACKING EFFECT WILL TAKE PLACE DUE TO THE ATRIUM THAT HAS BEEN DESIGNED INTO THE BUILDING. A HEAT EXTRACTOR IS PLACED IN THE ROOF VENTS TO ENABLE THE USERS TO REUSE THE HEAT IN ORDER TO REDUCE THE CO2 EMISSIONS. THE EXTRACTED HEAT WILL EITHER BE REUSED STRAIGHT AWAY, OR IT WILL BE PLACED INTO A THERMAL STORE TO USE AT A LATER DATE.

TO HELP VENTILATE AND COOL THE BUILDING IN THE SUMMER THE ROOF GLAZING CAN BE OPENED TO GENERATE A CONSTANT FLOW OF COOL FRESH AIR INTO THE BUILDING.

OTHER SYSTEMS

SUNLIGHT IS A VERY IMPORTANT PART OF THE SCHEME. THE LOUVERS WILL BE CONTROLLED BY A LIGHT DETECTORS WITHIN THE BUILDING TO INDICATE WHEN THERE IS OPTIMAL SUNLIGHT WITHIN THE WORKING SPACES SO IT WILL NOT BE TOO DIM OR TOO BRIGHT TO WORK IN. WHEN THERE IS NOT SUFFICIENT NATURAL LIGHT THE LIGHTING SYSTEM WILL BE ACTIVATED. THIS SMART SYSTEM WILL REDUCE THE AMOUNT OF ENERGY USED WITHIN THE BUILDING.

LEGISLATIVE FRAMEWORK

LEGISLATIVE FRAMEWORK IS A GUIDE/ LIST OF CRITERIA TO MEET, DEVISED TO HELP ARCHITECTS DESIGN SPACES THAT ARE SAFE FOR THE PUBLIC TO USE. EVERY NEW BUILD OR RESTORATION WITHIN THE UK HAS TO COMPLY WITH THE LATEST VERSION OF THE 'BUILDING REGULATIONS' IN ORDER FOR IT TO BE BUILT.

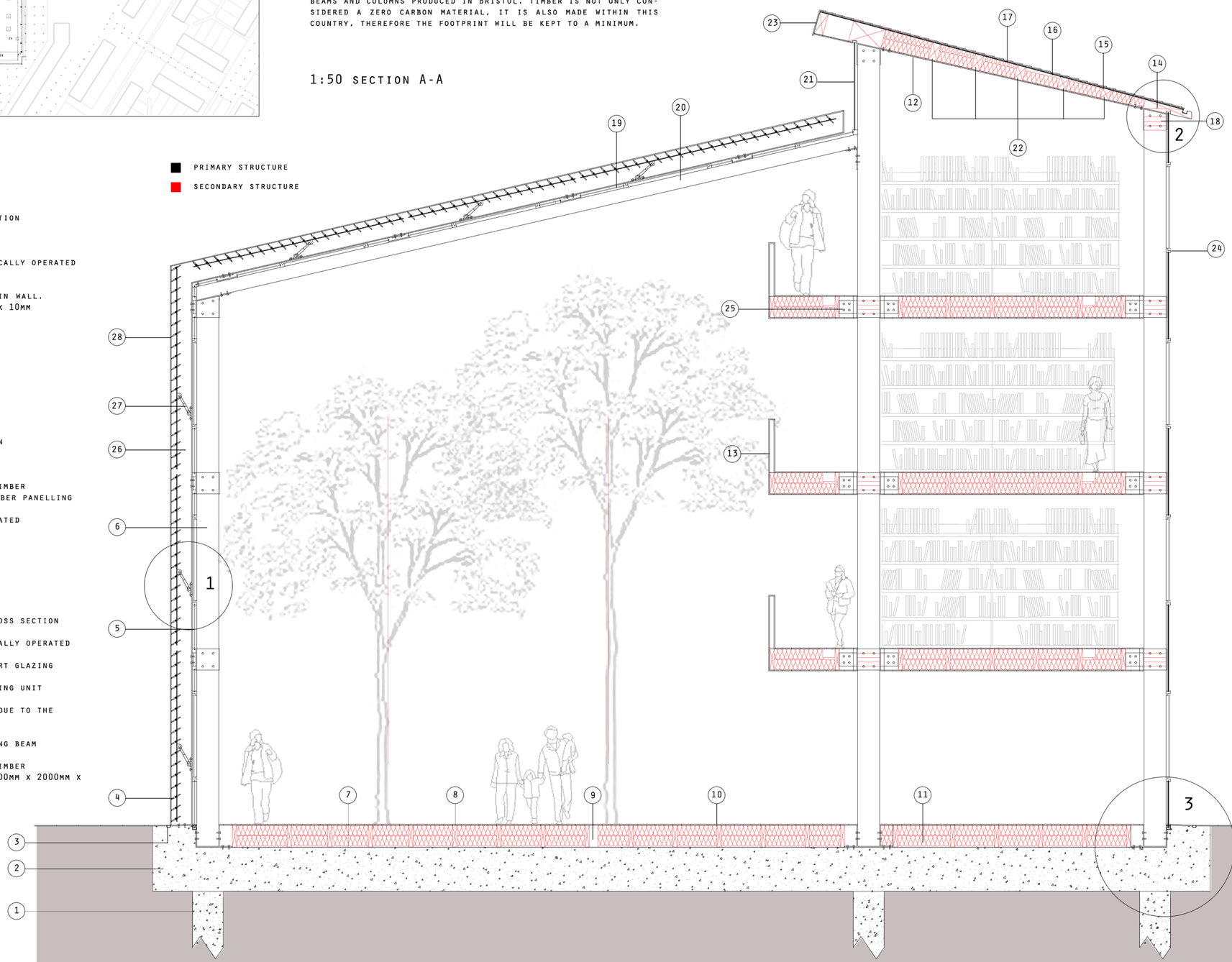
PART A - THE BUILDING HAS BEEN DESIGN TO BE ABLE TO TAKE THE DEAD AND ACTIVE LOADS OF THE BOOK CASES WITHIN THE LIBRARY SPACE.

PART B - GLULAM IS BRILLIANT WITHIN A FIRE SITUATION AS TIMBER CHARS AT A SLOW RATE: 40MM /HR, AND IT RETAINS ITS STRUCTURAL INTEGRITY. GLULAM UNITS ALSO ACT AS A WHOLE UNIT THROUGHOUT A FIRE DUE TO THE HIGHLY FIRE RESISTANT LAMINATING ADHESIVES USED ON IT. THE FIRE EXISTS ARE WITHIN THE BUILDING REGULATION STANDARDS.

PART E - THE CLASS ROOMS AND WORKING SPACES IN THE LIBRARY NEED TO BE QUIET, AND NOT ECHO TO CREATE THE OPTIMUM WORKING ENVIRONMENT. TIMBER IS A VERY GOOD NOISE REDUCER AS IT IS A SOFT MATERIAL AND ABSORBS NOISE. THE CLASSROOMS HAVE SOLID, INSULATED WALLS BETWEEN THEM WHICH WILL PREVENT THE CLASSES FROM HEARING ONE ANOTHER.

PART M - DUE TO THE USE OF THIS BUILDING IT HAS BEEN AN IMPORTANT SECTION IN THE DESIGN PROCESS WHEN CONSIDERING HOW PEOPLE WILL MOVE THROUGH AND INTO THIS BUILDING. SECTION 1 AND 2 WERE VERY NECESSARY TO FIGURE OUT HOW THE STAIRS SHOULD BE CONFIGURED.

1:50 SECTION A-A



KEY

- PRIMARY STRUCTURE
- SECONDARY STRUCTURE

1. 500MM DIAMETER PILE FOUNDATION
2. 300MM DEEP HARDCORE CONCRETE FOUNDATION
3. DRAINAGE
4. 250MM X 15MM CROSS SECTION, MECHANICALLY OPERATED TIMBER LOUVERS
5. FASSADEN DOUBLE GLAZED TIMBER CURTAIN WALL. GLASS MEASUREMENTS 1000MM X 2000MM X 10MM
6. 500MM X 500MM GLULAM BEAM
7. DAMP PROOF MEMBRANE
8. 200MM X 500MM TIMBER BEAM
9. 400MM X 200MM HOT AIR DUCT
10. 200MM X 10MM TIMBER FLOOR PLANKS
11. BLACK MOUNTAIN SHEEP WOOL INSULATION
12. 200MM X 10MM TIMBER CEILING PLANKS
13. BALUSTRADE 1200MM X 2000MM X 10MM TIMBER PANELLING AND 200MM X 2000MM X 10MM TIMBER PANELLING
14. TAPERING 200MM X 1000MM WEATHER TREATED TIMBER BEAM
15. RED CEDAR SHINGLES
16. DAMP PROOF MEMBRANE
17. TIMBER PANELLING
18. GLULAM BEAM WITH AN ASYMMETRICAL CROSS SECTION
19. TIMBER FRAME ROOF GLAZING, MECHANICALLY OPERATED
20. 300MM X 500MM GLULAM BEAMS TO SUPPORT GLAZING
21. HEAT EXTRACTOR/VENTILATION AND GLAZING UNIT
22. TIMBER BEAMS OF VARYING DIMENSIONS DUE TO THE TAPERING ROOF
23. CEDAR PANELLING COVERING THE TAPERING BEAM
24. FASSADEN INSULATIVE DOUBLE GLAZED TIMBER CURTAIN WALL. GLASS MEASUREMENTS 1000MM X 2000MM X 10MM
26. STEEL U-BEAM
27. HYDROLIC LOUVRE SYSTEM
28. WEATHER TREATED TIMBER PANELLING

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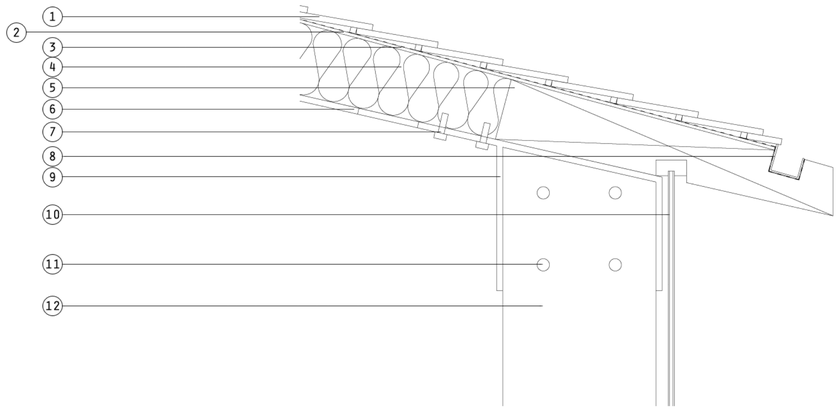
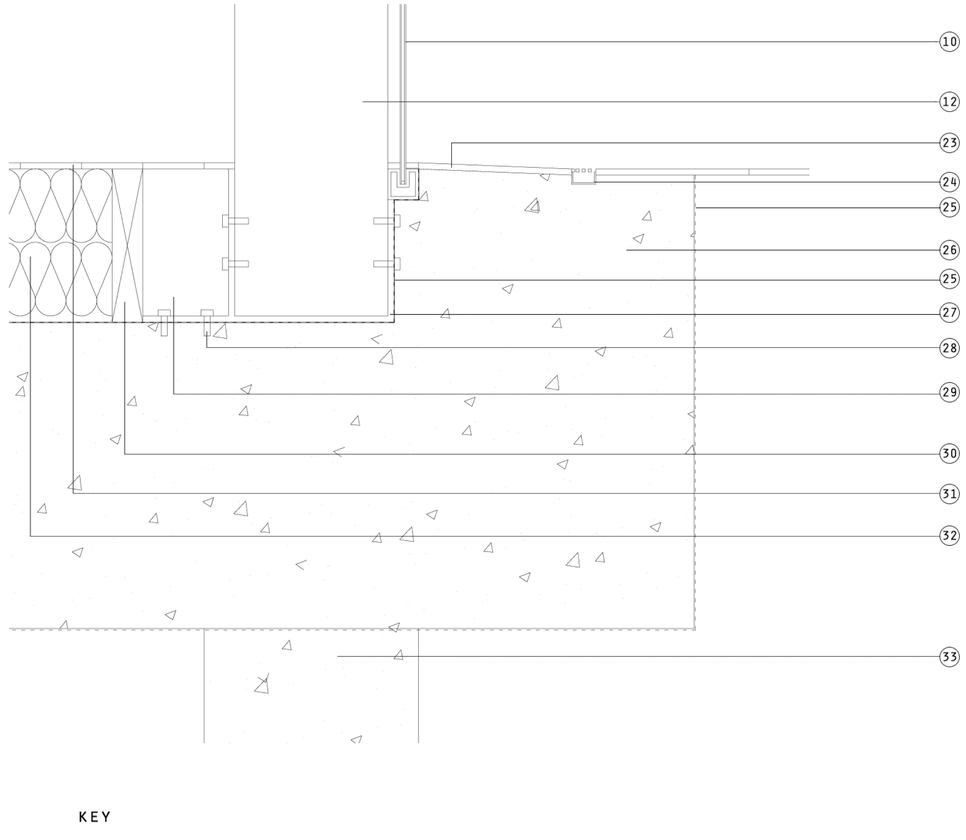
STRUCTURE, COMPOSITION AND DETEAIL

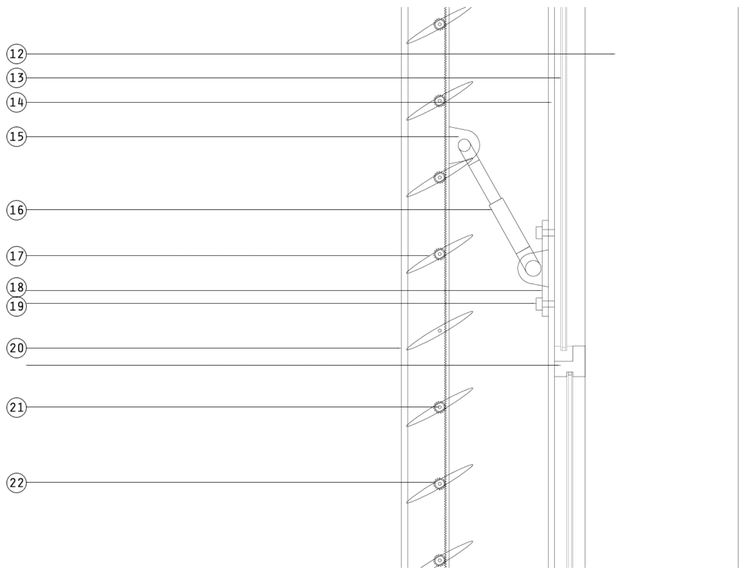
1:10 ROOF DETAIL



1:10 FOUNDATION AND FLOOR DETAIL



1:10 LOUVRE AND GLAZED WALL DETAIL



KEY

1. RED CEDAR SHINGLES
2. DAMP PROOF MEMBRANE
3. MEDIUM DENSITY FIBREBOARD
4. BLACK MOUNTAIN SHEEP WOOL INSULATION
5. WEATHER TREATED ASYMMETRICAL CROSS SECTION TIMBER BEAM
6. 200MM X 10MM TIMBER CEILING PANELLING
7. 10MM DIAMETER BOLT
8. ASYMMETRICAL CROSS SECTION GUTTERING
9. ASYMMETRICAL CROSS SECTION STEEL CONECTING CAP
10. FASSADEN INSULATIVE DOUBLE GLAZED TIMBER CURTAIN WALL. GLASS MEASUREMENTS 1000MM X 2000MM X 10MM
11. 10MM DIAMETER X 100MM STEEL BOLTS
12. 500MM X 500MM GLULAM COLUMN
13. FASSADEN DOUBLE GLAZED TIMBER CURTAIN WALL GLASS MEASUREMENTS 1000MM X 2000MM X 10MM
14. STEEL U-BEAM
15. ROTATING STEEL JOINT WELDED TO TOOTHED BAR
16. SENSORY CONTROLLED HYDROLIC ARM
17. 250MM X 480MM TAPERED TIMBER LOUVRES
18. 300MM X 300 MM X 10MM ROTATING STEEL PLATE FIXTURE BOLTED AND WELDED TO U-BEAM
19. 10MM X 20MM BOLT
20. WEATHER TREATED RED CEDAR PANNELS
21. 10MM DIAMETER STEEL ROD
22. 30MM DIAMETER STEEL COG
23. STONE FLOORING
24. DRAINAGE
25. DAMP PROOF COURSE
26. 1000MM DEEP HARDCORE CONCRETE FOUNDATION
27. 500MM X 500MM STEEL COLUMB FIXTURE
28. 10MM DIAMETER X 50MM BOLTS
29. 500MM X 250MM DUCT FOR WIRES AND PIPES
30. 500MM X 100MM TIMBER FLOOR STRUTS
31. 200MM X 10MM TIMBER FLOOR BEAMS
32. 500MM BLACK MOUNTAIN SHEEP WOOL INSULATION
33. 700MM DIAMETER PILE FOUNDATIONS

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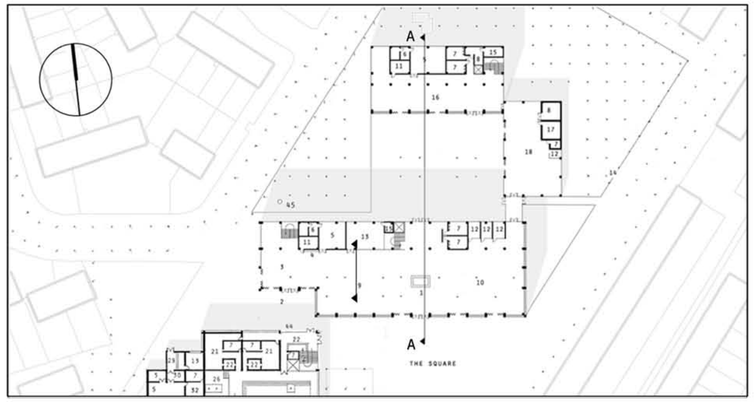
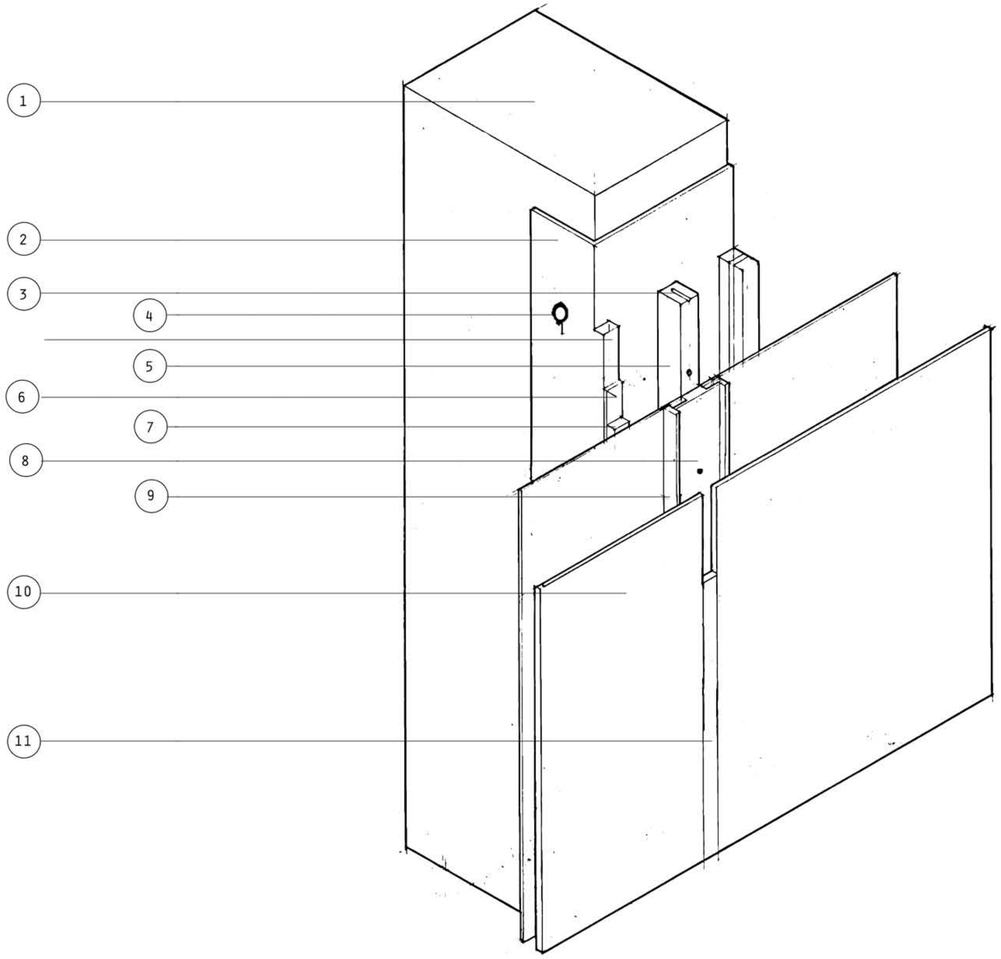
STRUCTURE, COMPOSITION AND DETEAIL

SITE PLANS 1:1250



1:2 Isometric Detail

Structural Silicone Glazing Fitting - Hybrid Toggle system



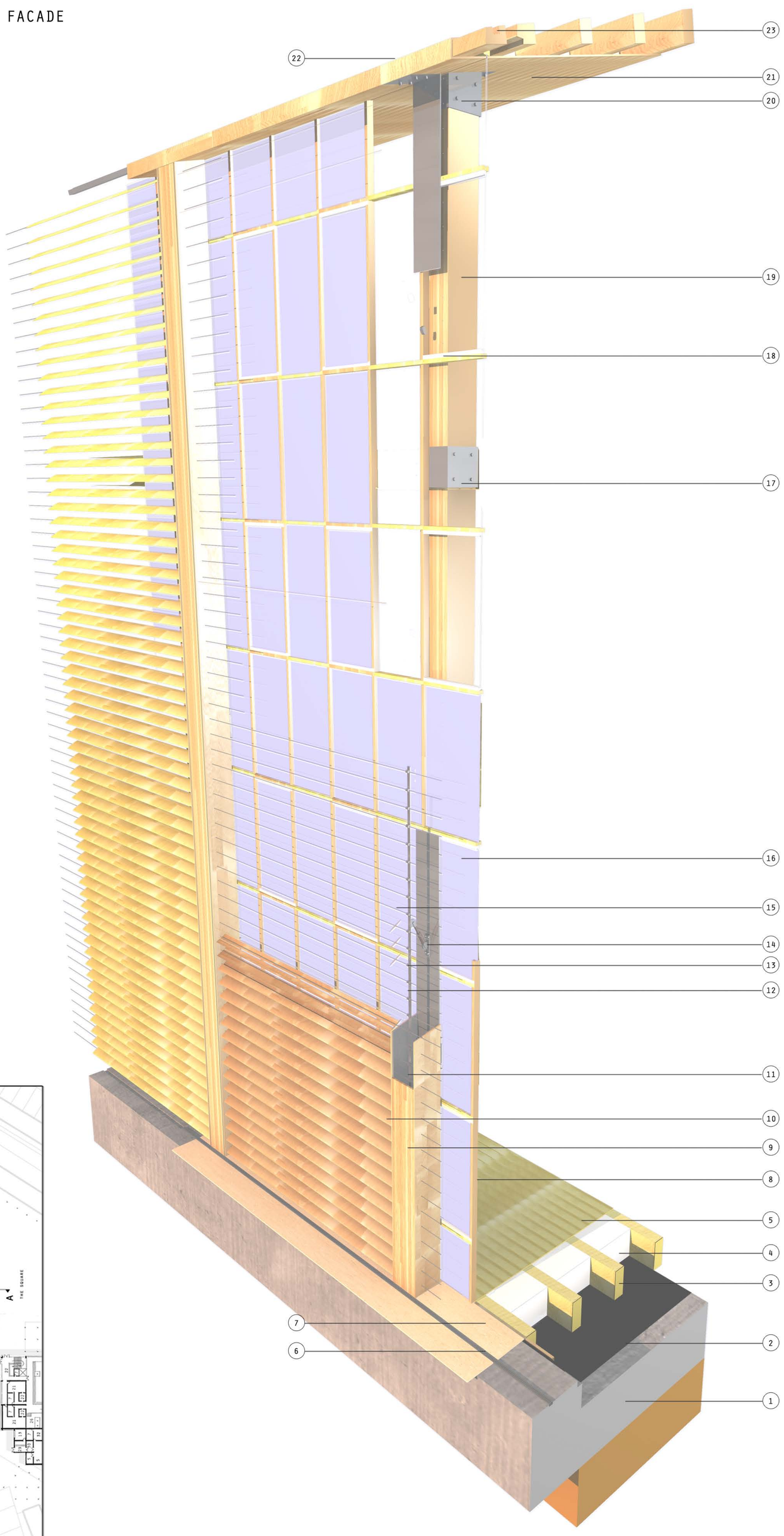
Key

1. 100mm x 150mm timber mullion
2. Steel Bracket
3. Self tap screw
4. Bolt fixing braket to mullion
5. 74mm Box mullion
6. Gasket
7. Silicone
8. Glazing spacer
9. Glazing packer
10. 6mm thick glazing
11. Structural silicone sealant

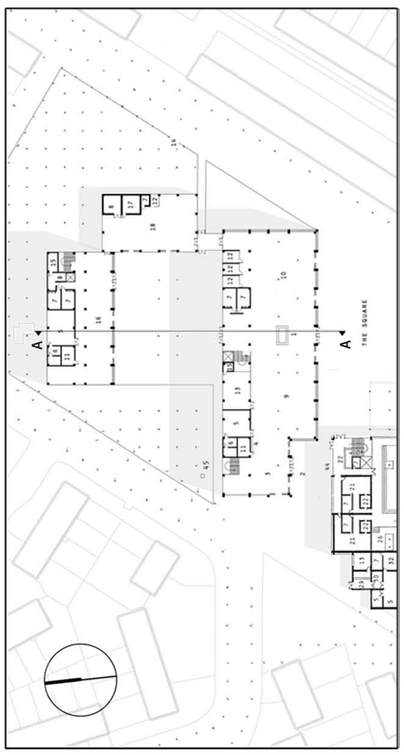
1:20 3D MODEL SHOWING THE FACADE

KEY

1. 500mm diameter pile foundation, 300mm deep hardcore concrete foundation
2. Damp Proof Membrane
3. 200mm x 500mm timber beams
4. sheeps wool insluation
5. 200mm x 10mm timber floor planks
6. drain
7. sandstone slabs
8. FASSADEN double glazed timber curtain wall.
9. 500mm x 20mm timber panelling
10. 250mm x 15mm cross section, mechanically operated timber louvers taped
11. 460mm x 480mm steel U beam
12. steel bar with teeth on it
13. steel cog
14. Sensory controlled hydrolic arm
15. steel rods
16. glass measurements 1000mm x 2000mm x 10mm
17. 10mm thick steel sleeve
18. 10mm x 300mm steel plate
19. 500mm x 500mm GLULAM beam
20. 10mm thick steel sleave, 540mm x 540mm steel plate welded to top of sleeve and bolted to the roof beams
21. 200mm x 10mm timber ceiling planks
22. 500mm x 500mm GLULAM beams, 10mm thick timber panelling, Damp Proof Membrane, timber struts, red cedar shingles
23. guttering



SITE PLANS 1:1250



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3D DETAIL STUDY

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ENVIRONMENT & ENERGY

DIRECT DAYLIGHT | INDIRECT DAYLIGHT | DARKNESS

HEATING, COOLING AND VENTILATION

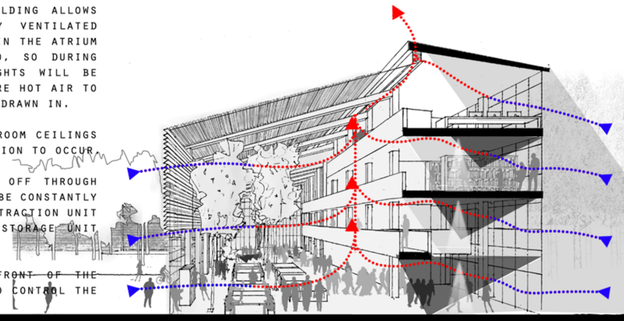
SUMMER DAY

During the day, the building allows itself to be naturally ventilated constantly. The glazing in the atrium is mechanically operated, so during the summer the roof lights will be able to open to allow more hot air to be expelled and cold air drawn in.

There are vents in classroom ceilings to allow natural ventilation to occur.

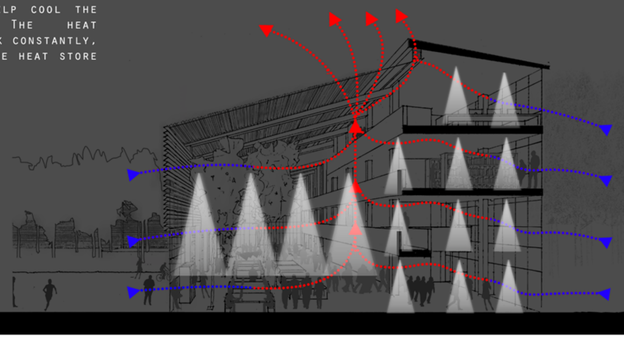
The heating will remain off through the summer but heat will be constantly extracted via the heat extraction unit and stored in the heat storage unit until required.

The louvers placed in front of the glass facade will help to control the heat of the building too.



SUMMER NIGHT

In the nighttime the glazing on the south facade, and the glazed atrium, can be left open to help cool the building naturally. The heat extraction unit will work constantly, and store the heat in the heat store until it is required.



DAYLIGHT AND MECHANICAL LIHTING

The summer sun can be very intense during the day. On the south facade there are louvers that are mechanically controlled by a light sensor in the library/work space. This is so there will always be an optimum amount of natural light within the space.

The lighting system should hopefully not need to be on for most of the day due to the amount of indirect sunlight the building will receive.

The north facade back onto the woodland so no louvers have been placed down that side. The tree canopies will reduce the amount of sunlight.

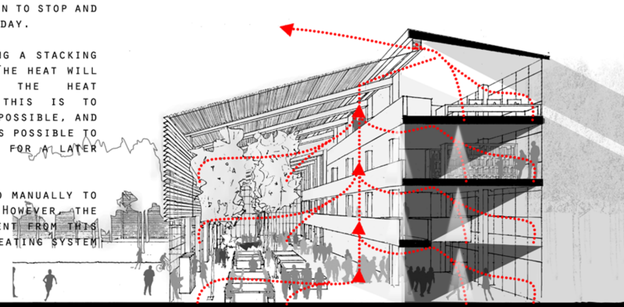
During the evening the mechanical lighting will be required. It will work on a sensor to space on energy.

WINTER DAY

throughout the winter the heating system will be working. There will be heat sensors within the building to let the biomass boiler when to stop and start working during the day.

The ventilate the building a stacking effect will take place. The heat will be expelled through the heat extraction unit only, this is to conserve as much heat as possible, and to extract as much heat as possible to either reuse or to store for a later date.

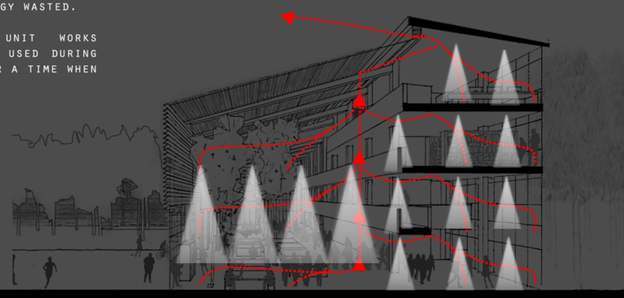
The windows can be opened manually to cool the building down. However, the heat sensors should prevent from this happening, and turn the heating system off to save energy.



WINTER NIGHT

The heating system will be on a control, so when the building is not in use there will be no energy wasted.

The heat extraction unit works constantly, so the heat used during the day can be stored for a time when it is needed.



During the winter the suns rays are short lived and weaker than the summer sun. This means that there will inevitably be use of the mechanical lighting. The lights are sensored, so only the spaces in use will be lit, this will help cut down on carbon emissions and save energy. As mentioned above, the louvers are controlled by a light detector, so the building will be able to utilise as much natural light as possible to prevent the need for mechanical lighting.

Again, as mentioned previously, the lighting will be needed, but will work on sensors to prevent energy wastage.

SUSTAINABLE CONSIDERATIONS

Throughout the design process the sustainable characteristics of the building have been accessed. The primary structure will be made from GLULAM produced in Bristol. Each cubic meter of GLULAM reduces CO2 emissions into the atmosphere by 2 tonnes. However, the timber used is outsourced from other European countries so the carbon footprint will be raised.

The building is designed so the longest facade is facing south, this will allow the users to utilise as much natural sunlight as possible. Sunlight is a brilliant product, as it helps the bod create vitamin D and release serotonin. Both of which help people to stay more alert, concentrate more, and feel better about themselves. This will ensure the education facility gets the most out of its users.

The glazing will not only allow lots of sun light in, but it will also let the user view the woodland. Being able to see greenery has been proven to reduce stress, increases productivity by up to 12%, increase concentration levels and reduce sick building syndrome by 60% to help generate healthy atmosphere. Potted plants will mix throughout the building to again help emphasise this effect.

ACOUSTICS

The library, class room and work space needs to be quite in order for people to work in. This issues has been considered heavily as I designed the scheme. A reason why I chose timber as the main building material is because is is very good for acoustics. It will dampen noises, and echoing will not occur. The floors are also heavily insulated with sheep wool which will further reduce the noise, creating a perfect atmosphere for studying.

LEGISLATIVE FRAMEWORK

Part E - Ressistance to the passage of sound

Due to the functionality of my building is it important that the building is insulated well enough to reduce noise. This dccument allowed me to understand what I needed to achieve for these spaces to be functional.

Part F - Ventilation

This document outlines various types of ventilation methods and requirments for them.
As my building will be naturally ventilated the air change will satisfy the demands of the 'office' air change rate, 10L/s per person

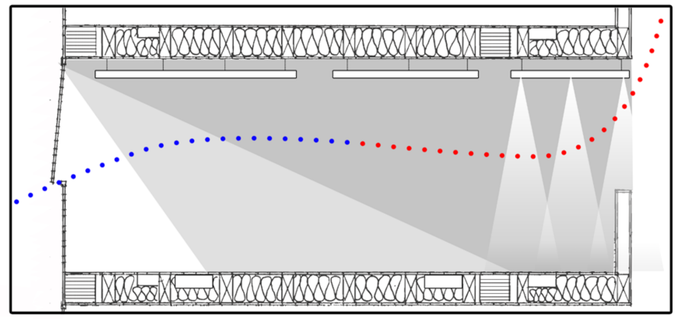
Part L2A - conservation of fuel and power (new buildings other than dwellings)

This document lists and outlines ways in how to reduce energy consumption. This section helped me to understand how I should taylor the building design and the energy systems inside for this building to energy efficient.

MICRO SCALE SUMMER DAY

During the day the library /workspace needs optimum lighting conditions. I have designed mechanical louvers into the scheme so the natural light can be controlled, allowing for optimum conditions. The mechanical lighting shouldn't be necessary throughout the summer days due to the amount of indirect sunlight and how long the sun is risen for in the day.

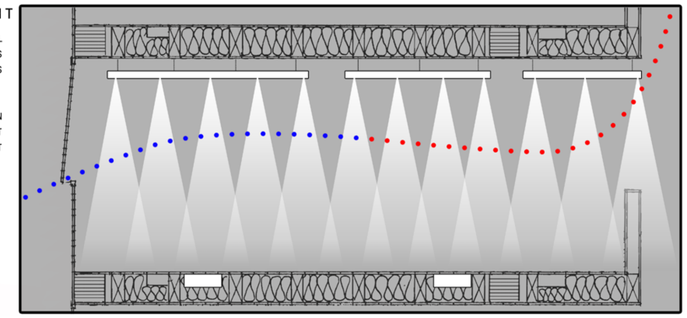
The space will be naturally ventilated allowing for cool fresh air into the building. The heating should not be required, if it is the heat store will be used.



MICRO SCALE SUMMER NIGHT

In the evening the mechanical lighting will be used. The lights work on sensors so only the spaces in use are lit.

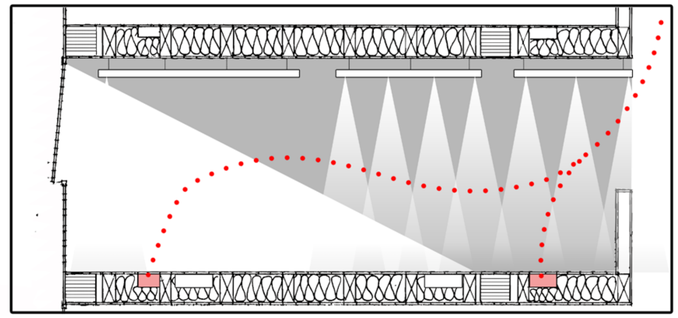
Natural ventilation will happen through out the building use at night. If heating is required it will be taken from the heat store.



MICRO SCALE WINTER DAY

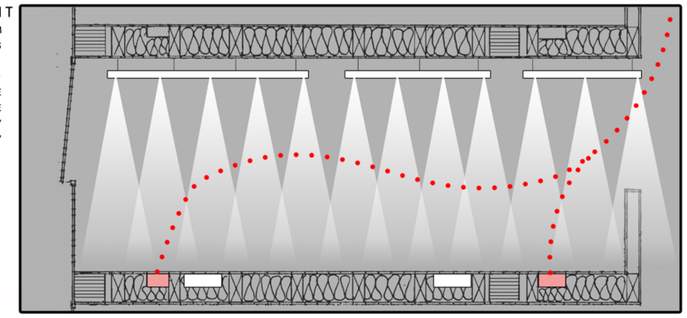
During the day the building will be heated through hot air ducts that run through the floor with vents in them to allow the whole volume to warm up. The hot air will be sucked out through the atrium space dragging fresh warm air up. The windows are manually operated so the users can adapt their environment if necessary. However, the heat sensors should be able to realise when it is to warm and stop the hot air from being pumped through the ducts.

As the winter sun is we a king than the summer sun, and is in the sky for less time the mechanical lighting will need to work.



MICRO SCALE WINTER NIGHT

In the evening the heating system will turn off when the building is not in use so energy isn't wasted. The lighting system will be working, and as said previously, the sensors will detect where people are using the building and only light up those areas, so energy isn't wasted.



ENERGY SOURCE AND DISTRIBUTION

WILLOW COPPICE

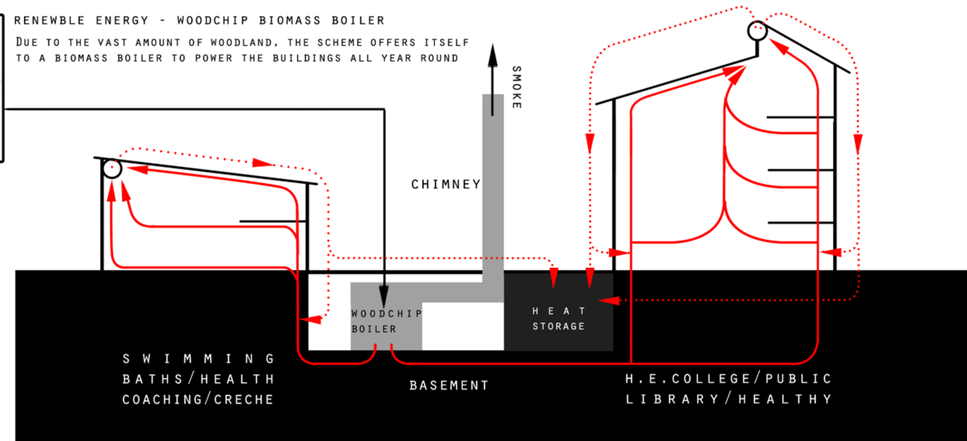
150kW biomass boiler will generate enough to heat and power the full scheme

The park will contain 3 hectares of willow and polar trees which will generate around 40-60 tonnes of coppice annually.

The excess heat that is expelled from the building will be extracted from the air n the vents and will be either reused or stored for later date.

RENEWBLE ENERGY - WOODCHIP BIOMASS BOILER

Due to the vast amount of woodland, the scheme offers itself to a biomass boiler to power the buildings all year round



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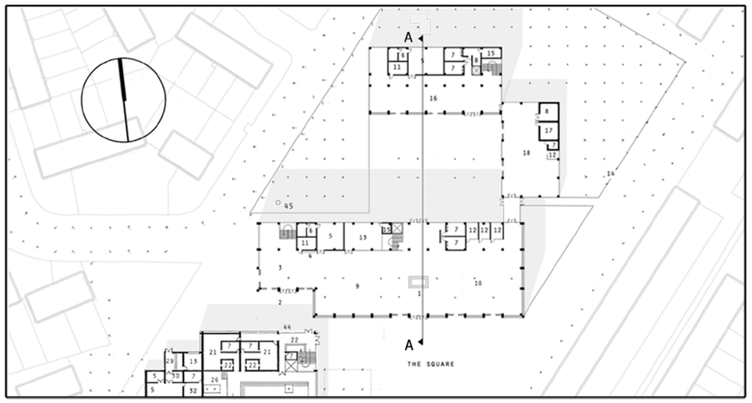
EXTERNAL FORCES Vs INTERNAL DESIRES

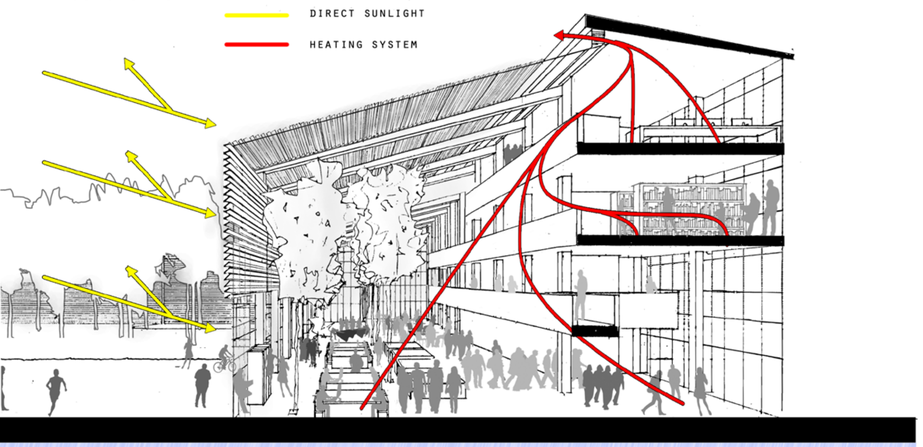
SITE PLANS 1:1250

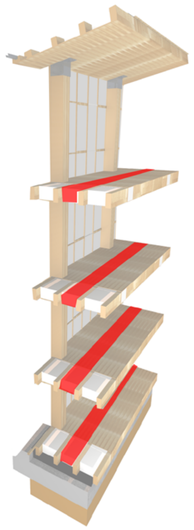


Heating

Hot air from the ducts that run through the floor will be controlled by temperature sensors that will be placed throughout the building. The external issues to consider is the sun rays. Some rays will penetrate through the glazing on the south whcih will warm the building up, however, the louvers will help reduce this effect, by preventing th rays from passing through the glazing. Th floors are insulated, to keep the heat in the working environments to help reduce the amount of energy needed to power the heating system.

1:200 section

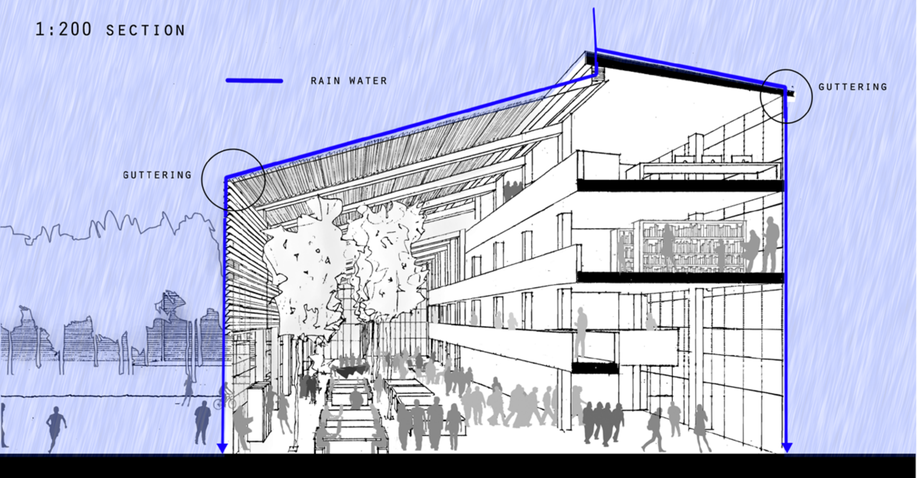




MOISTURE

The building's facade will be ealed to prevent moisture from getting into the building, preventing issues such as mould from arising. The glass rof is cantalevered on the north facade, inside the courtyrad to create shelter for people who wish to stnd outside in wet conditions. There is guttering on the south eave, whcih will drain water to the grey water tank used for watering the indoor trees. There is also drains that runn parallel to the building's north and south facade which will also drain water to the grey water tank.

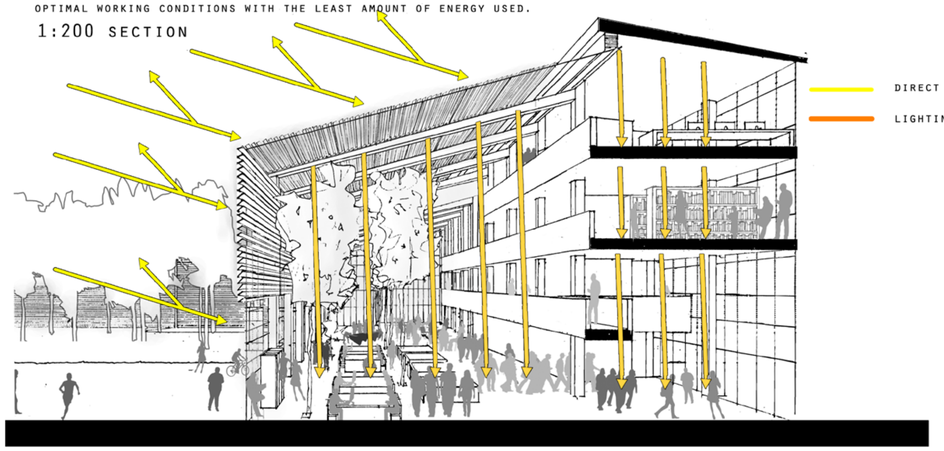
1:200 section

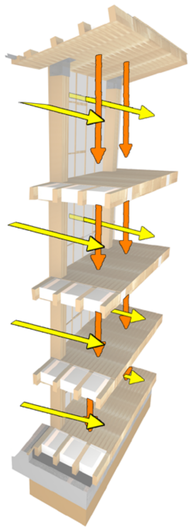


LIGHTING

The south facade is heavily glazed. This is to allow as much natural sunlight into the working space as it aids people to work harder. There are louvers covering the whole of the south facade also. t hese are opperated by hydrolic arms which in turn are controled by light sensors placed throughout the buildng. The hydrolic arms will move, changing the angle onf the louvers to either increase of reduce the intensity of the sunlight to create an optimal work environment. The trees in in the glass atrium will reduce the direct sunlight entering the work environment, reducing glare. There will be internal lighting that will work on a timer/sonsors as to help create the optimal working conditions with the least amount of energy used.

1:200 section

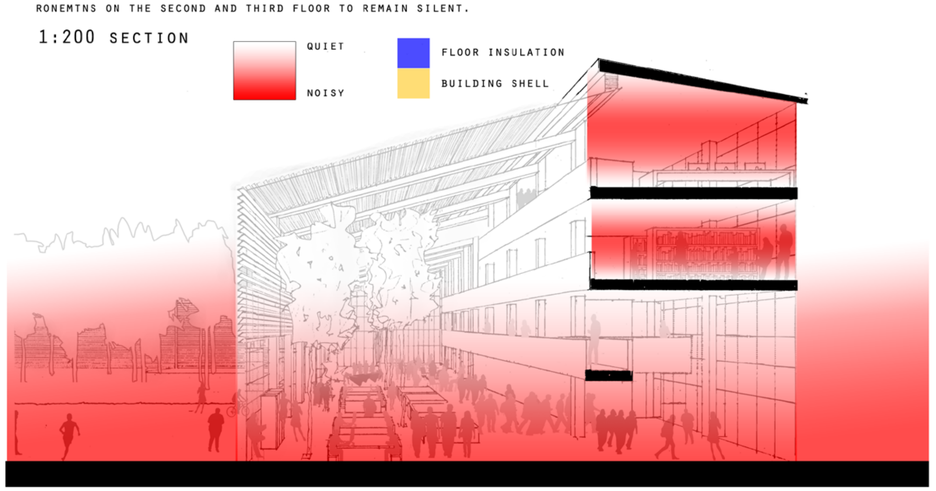


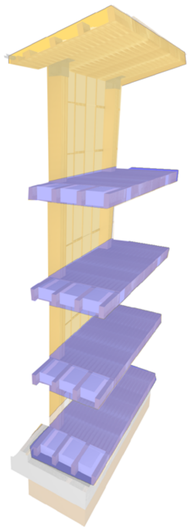


NOISE LEVELS

As this is a working environment it is essential that noise is reduced to a minimum. This has been achieved through several measures. The louvers on the south and east facade face the community square and holderness road. they are cvered in louvers, these will buffer the noise, and the double glazing will reduce the effects even more so. The floors re well insulated, again buffering the noise from each floor. The ground level will be a busy, interactive place. The tree canopies will diffuse the noise, allwoing the work environments, especially the quiet work environemtns on the second and third floor to remain silent.

1:200 section

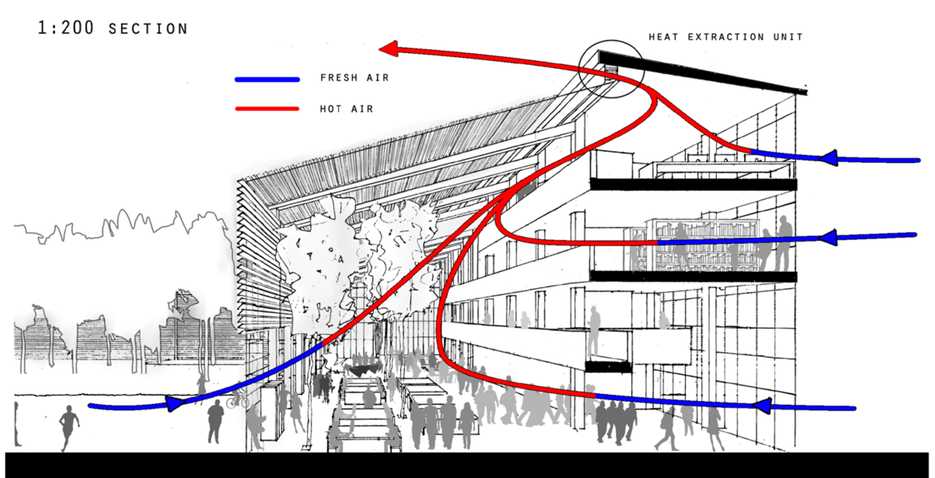


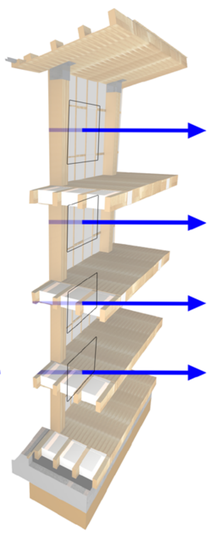


VENTILATION

This building will be using a cross ventilation stratergy o ventilate the work spaces. There is a gap between the glass and louvers allowing windows to be opened for fresh air to be brough in. There is a heat extraction unit placed in the juncture here the used hot air will escape through so the heat can be extraced from the used air, stored and reused at a later date. As the hot air escapes, cold air will be ddragged through the building, cooling the internal spaces.

1:200 section

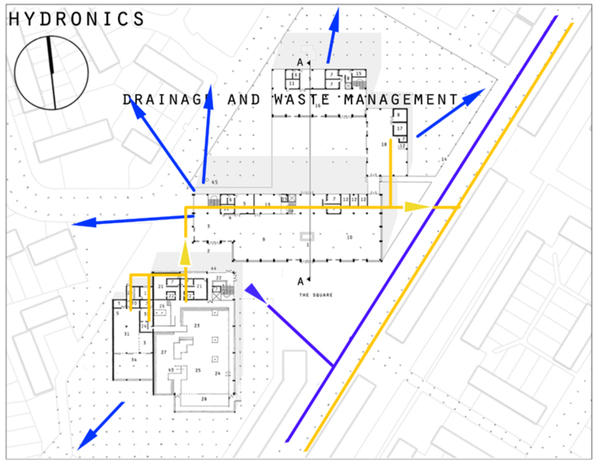




THE HEALTHY COMMUNITY: H.E. COLLEGE/PUBLIC LIBRARY/HEALTHY DINER

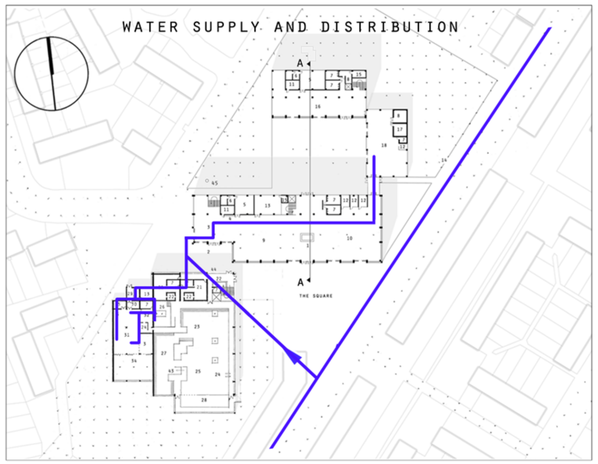
SERVICES & INTEGRATION

SITE PLAN 1:1250



WASTE PIPES

RUNOFF WATER



FRESH WATER DISTRIBUTION

DRAINAGE AND WASTE MANAGEMENT

Most of The runoff water from the square and the buildings will be absorbed by the surrounding woodland area. There will also be drainage pipes taht will join the main drainage system in longhill.

The soil/waste pipes will be travel through one route from al the building on the site and join the sewer system that runs down holdreness road.

The drainage pipes, waste pipes, fresh water pipes will all run alongside one another using the shortest distance possible to reach the main fresh water, sweage and drainage pipes in longhill.

WATER SUPPLY AND DISTRIBUTION

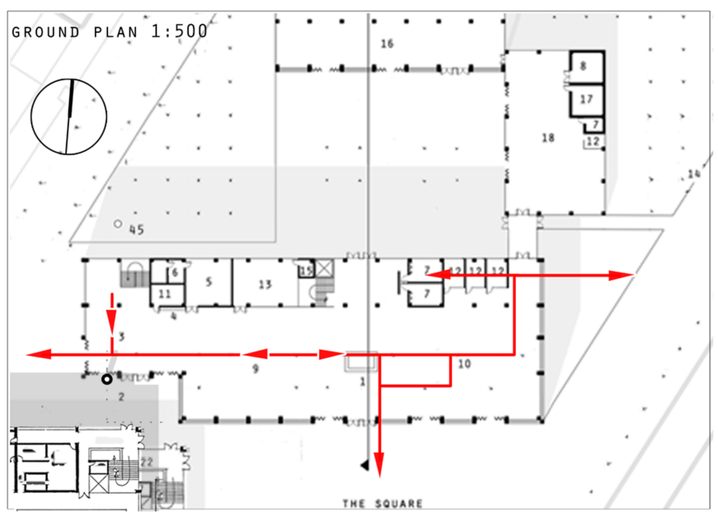
The water supl will be plumbed to the plant room first which sits between the education building and the swimming pool. The water will then be distributed to the areas that require hot and/or cold water.

LEGISLATIVE FRAMEWORK

Part G - This document outlines how to supply wholesome water eficiently to the users, how sanitation should be managed. My building will coply to the standards set by this document. G6 was an important section in designing the kitchen space.

Part H - This document covers the issues that can be raised by drainage and waste pipe disposal. The building waste disposal and drainage systems will comply to the standards.

FIRE STRATERGY



FIRST FLOOR PLAN 1:500

FIRE EXIT ROUTES

MEANS OF ESCAPE

This building will be very easy to evacuate in case of a fire. on ground floor you are never more than 15m from a fire exit, and on the 3 floors above you are never more than 35m away from a stairwell that exits at a fire point on ground level.

COMPARTMENTALISATION

The kitchen will have compartmental walls surrounding it and the stair to the west of the building will have a compartmental wall as glazing makes up the other two walls.

FIRE EQUIPMENT

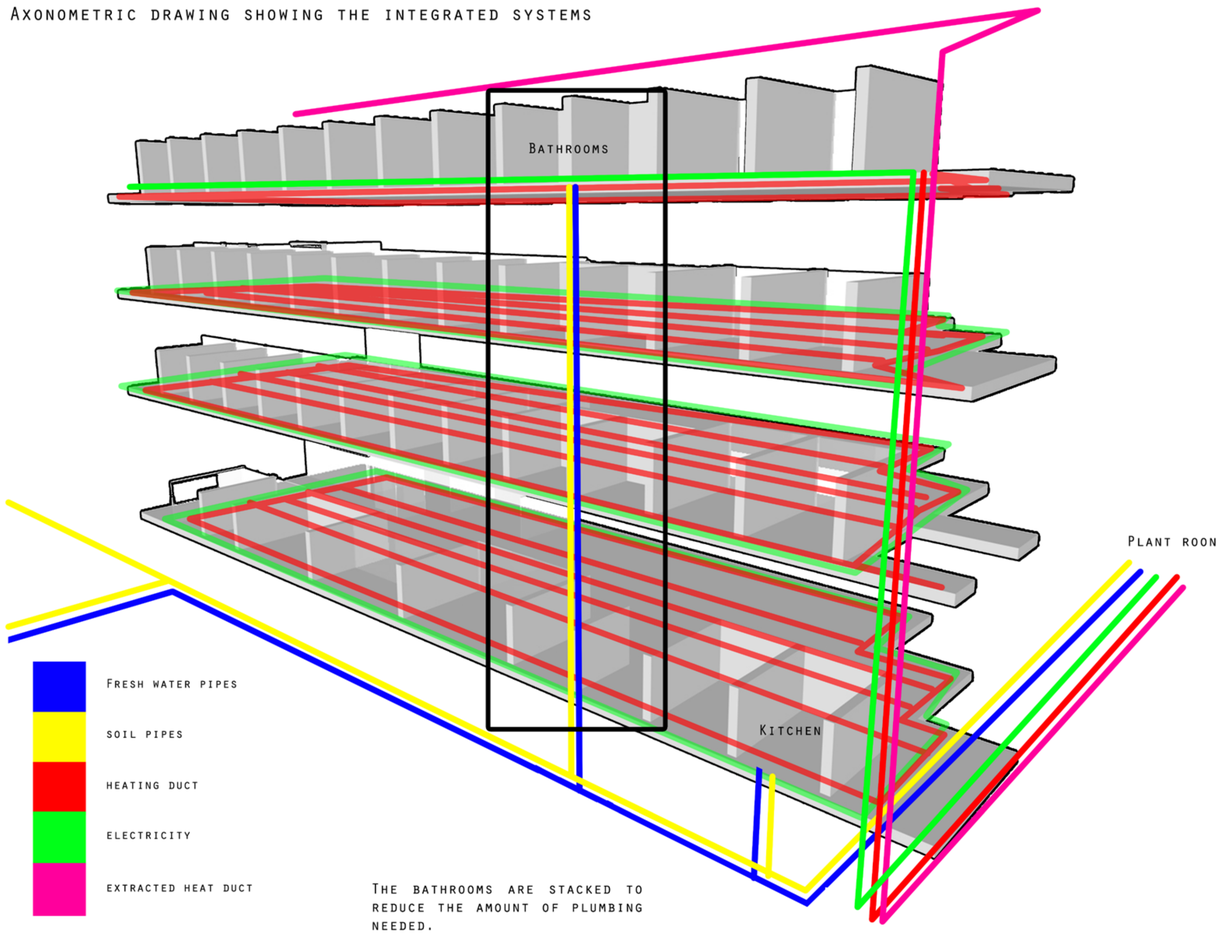
To control a fire if it ever was to occur, a sprinkler system will be in place. There will also be CO2 exstinguishers placed throughout the building. There will be a smoke/heat detector that will sound if there is a fire, and breakable glass units with handles inside to pull down if someone spots a fire inside will be placed throughout the building. Outside the building there will be fire hydrants that lie flush with the ground for the fire fighters to use in case of emergency

LEGISLATIVE FRAMEWORK

Part B - This document outlines the measured that need to be carried out in order for a building to be safe for the occupants incase of a fire. My building will satisfy the regulations. One important factor was the idth of stair wells due to it being a public building and a college,

INTEGRATED SERVICES

Axonometric drawing showing the integrated systems



Fresh water pipes

soil pipes

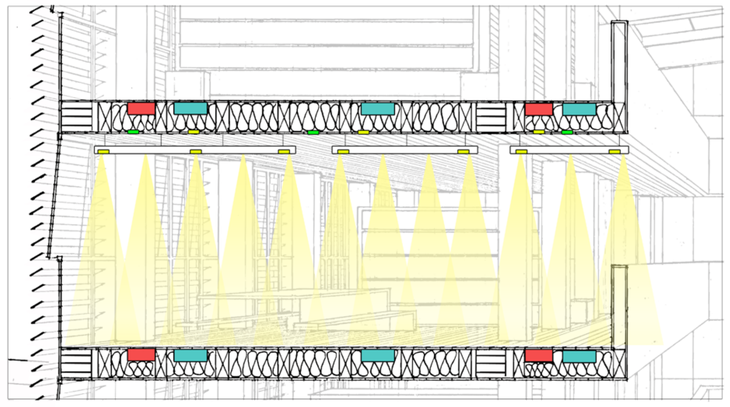
heating duct

electricity

extracted heat duct

The bathrooms are stacked to reduce the amount of plumbing needed.

1:50 section of the library/work space



electrical ducts

heating ducts

sensors

sprinkler system

The heating ducts will run below the flooring and vents will let the hot air produced by the biomass boiler out into all the floor spaces used.

The sensors in the ceiling will detect how warm it is, the information will be relayed to the heating system, and the appropriate actions will be taken depending if it it too cold, too warm, or optimal. There will also be a sprinkler system that will be recessed in the ceiling and fire detectors recessed in the ceiling throughout the building.

The lights will have heat sensors to know when people are in the space they occupy to determine whether they should be on or off.

The sensors will help reduce the energy used by the building.

LEGISLATIVE FRAMEWORK

Part F - This document covers ventilation, ways in how to ventilate a building appropriately what standards need to be achieved. My building will comply with the standards set as my building will be naturally ventilated, allowing fresh air to be drawn through the building constantly.

Part P - This document is focused on electrical installations within buildings. My building will comply with the standards set within this section as the electrical duct will be insulated to prevent moisture from affecting it. The electrical appliances will need to be heavily insulated within the kitchen to keep the users safe from water and electrical contact.

THE HEALTHY COMMUNITY: H.E. COLLEGE/PUBLIC LIBRARY/HEALTHY DINER

PRACTICE, MANAGEMENT AND LAW

DEVELOPMENT APPRAISAL

my site is placed along holderness road which is the main road that runs out of hull. currently the types of development based along this strech of road is retail. a retail unit would be the next best thing to be placed on this site, so i will use this as a precedent to figure out how much the site would be valued at.

BUILDING AREA = 1120m2

GDV (gross development value) = 1120 x £100psm = £112,000 per annum
yeild 12% = 100/12 = 8.5 years
112,000 x 8.5years = *£952,000 GDV*

CONSTRUCTION COSTS = 1120m2 x £800pms = *£896,000*

PROFESSIONAL FEES = 10% of £896,000 = £89,600

FINANCE COSTS = 2% of 1/2 the construction fee
(£896,000/2).02 = *£8960*

DISPOSAL COST = sales fee 2% of sale
£896,000 x 0.02 = *£17,920*

DEVELOPER'S PROFIT = 10% of £896,000 = *£89,600*

CONTINGENCY = 5% of £896,000 = *£4,4800*

THEREFORE

THE RESIDUAL AMOUNT = GDV - (construction cost + professional fees + finance costs + disposal costs + developer's profit + contingncy)

= 952,000 - (896,000 + 89,600 + 8960 + 17,920 + 89,600 + 44,800)

= 952,000 - 1,146,880

= *-£194,880*

COST PLANNING

This is how much this building would cost to be built

Unit Build Area	(m2) Build	Cost £m2	Sub Total
Class rooms	1260	£1,077	£1,357,020
Admin	120	£1,130	£135,600
Store rooms	290	£861	£249,690
Toilets	200	£1,023	£204,600
Plant room	400	£861	£344,400
Seating space diner	70	£861	£60,270
community library	2740	£1,077	£2,950,980
Kitchen	35	£861	£30,135
Stand in fridge / freezer	15	£861	£12,915
Circulation	293	£430	£125,990

TOTAL BUILDNG COST = £5,471,600

ROUND IT UP TO £5,500,000

SITE WORKS AND PROFESSIONAL FEES

Preliminaries (10% remediation, highway and landscaping costs)	£550,000
Contractors OHP (3.5% of remediation, highways and landscaping costs)	£19,250
Utilities (5%)	£275,000
Contingency costs (5%)	£275,000
Professional Fees (10%)	£550,000

OVERALL TOTAL = £7,200,000

If this builing was made by an external company and rented to the government the company would make annually:

rent - (£100psm) 400m2 usable to rent = 400 x 100 = £400,000 per annum

if sold the developer would make:

Developers Profit (10%) £720,000

REVENUE

Due to tis scheme being purely for education the primary source of income would relate to the F.E. College and library which, while municipal, would be funded from separate revenue streams. and as such, assessing the revenue is hard to get to grips with. In practice, it would likely be known by the Local Authority prior to commission the study.

The diner could potentially be leased to a business in order to attract a rental income. A commercial agent / development surveyor would be consulted during the development process in order to ascertain likely rental income.

Fundamentally, however, this scheme will not be funded by the development value it produces as would a traditional commercial development e.g. offices. The revenue produced by this scheme is incidental to its purpose and not the primary driver of development. As such, a conventional residual appraisal is not appropriate.

PROCUREMENT

The type of procurement that best suits this development at this moment in time with the unstable economic climate briain is in a PFI contract would best suit thisdevelopment as the coucil will only have to rent the building as opposed to fund for the whole development to be built.

RIBA WORK STAGES

PREPARATION

A Appraisal Identification of client's needs and objectives, business case and possible constraint on development. Preparation of feasibility studies and assessment of options to enable the client to decide whether to proceed.

B Design Brief Development of initial statement of requirement into the Design Brief by or on behalf of the client confirming key requirements and constraints. Identification of procurement method, procedures, organisational structure and range of consultants and others to be engaged for the project.

DESIGN

C Concept Implementation of Design Brief and preparation of additional data. Preparation of Concept design including outline proposals for structural and building service systems, outline specifications and preliminary cost plan. Review of procurement route.

D Design Development Development of concept design to include structural and building services systems, updated outline specifications and cost plan. Completion of Project Brief. Application for detailed planning permission.

E Technical Design Preparation of technical design(s) and specifications, sufficient to co-ordinate components and elements of the projects and information for statutory standards and construction safety.

PRE-CONSTRUCTION

F Production Information Preparation of detailed information for construction. Application for statutory approvals. Preparation of further information for construction required under the building contract. Review of information provided by specialists.

G Tender Documentation Preparation and / or collation of tender documentation in sufficient detail to enable a tender or tenders to be obtained for the project.

H Tender Action Identification and evaluation of potential contractors and/ or specialists for the project. Obtaining and appraising tenders; submission for recommendations to the client.

CONSTRUCTION

J Mobilisation Letting the building contract, appointing the contractor. Issuing of information to the contractor. Arranging site hand over to the contractor.

K Construction to Practical Completion Administration of the building contract to Practical Completion. Provision to the contractor of further information as and when reasonably required. Review of information provided by contractors and specialists.

USE

L Post Practical Completion Administration of the building contract after Practical Completion and making final inspections. Assisting building user during initial occupation period. Review of project performance in use.

ARCHTECTS FEE PROPOSALS

Architects' generally get around 4% of the total building cost as a fee

4% £5,500,000 = £220,000 (Architects fees)

The archtects' practice will take the fee and aply the 1/3's rule to it where: 1/3 will go on Salery, 1/3 will go on overheads and 1/3 will be what the company makes as pure profit.

Generally speaking a practice will spend £100/hr on a director, £60/hr on a project architect and £40/hr on an assistant architect. These amounts include wage, profit and overheads

RIBA work stage	Hours per member: Associate Director	Project Architect	Architectural Assistants
A	46	50	100
B	50	55	70
C	40	100	190
D	70	200	300
E	70	275	280
F	55	190	280
G	85	90	60
H	95	95	0
J	95	95	0
K	130	190	60
L	80	90	0
Total hours	806	1430	1340
Total money used	£80,600	£85,800	£53,600
Days spent on the scheme (8 hour days)	101	179	168