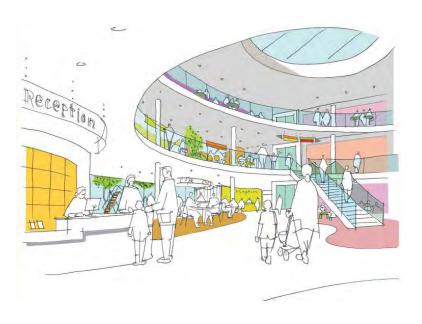
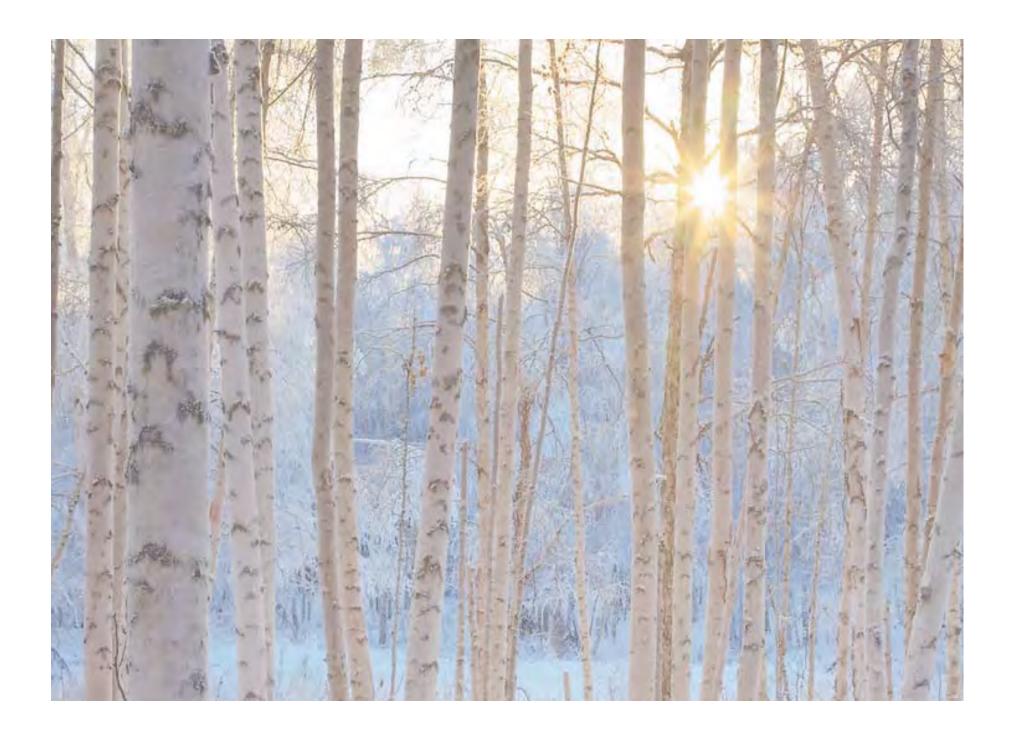
Scottish Futures Trust

Reference Primary Healthcare Design: Eastwood Health & Care Centre

STAGE C REPORT







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1. Introduction

1.1 Purpose of the Report

BDP are delighted to have been selected to develop a reference design for a Primary Healthcare Centre for the Scottish Government Health Directorate via the Scottish Futures Trust and NHS Greater Glasgow and Clyde. The project is being managed by Hub West Scotland.

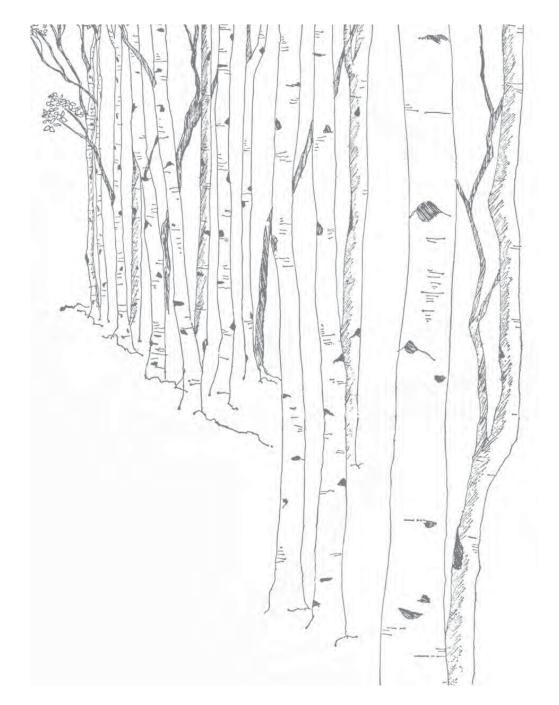
The intention is to develop a reference design which brings together a range of integrated primary health and care services under one roof for patient convenience, excellent healthcare delivery and gives value for money.

To be a successful reference design we must ensure that our solution delivers a design concept which is suitably flexible and robust to fit different scenarios of varying size, function, site and location in Scotland. In order to test design solutions East Renfrewshire Council were selected by the client to develop an actual brief and site for the first of the reference health and care centres. A site in Eastwood was identified as a suitable site and we were asked to develop a concept design for this project.

We have called this specific project... "The Birches", not just to personalise the project but also for reasons which will become apparent later within this report. This Stage C Report (RIBA Concept Design) is intended to provide, by means of a realistic worked study, an illustration of the opportunities which exist for good economical design in the creation of new primary health and care centres throughout Scotland.

This report records the relevant design development information included within the early consultation and engagement process including proposed designs, accommodation schedule, outline specification, engineering assessment and a cost plan. This Report provides a control document on which development of the design and process can be based as well as offering opportunities for design solutions for health and care centres elsewhere.

Colin Allan Architect Director, BDP



1.2 Ambitions of the Reference Primary Healthcare Design Study

Development of Proposals

The proposals contained within this report have been developed through a process of dialogue, engagement, continual refinement and assessment over a number of weeks involving stakeholders, the full project and design teams with input from a range of representatives including the Scottish Futures Trust, NHS Greater Glasgow and Clyde, East Renfrewshire Council, General Practitioners and Hub West Scotland.

Design Team

Architect BDP
Interior Designer BDP
Landscape Architect BDP
Civil & Structural Engineer BUP
Building Services Engineer BDP

Quantity Surveyor Turner Townsend

Aspirations for Reference Primary Healthcare Design

Traditionally, healthcare specialists, doctors' surgeries and the like were not particularly welcoming places. They were functional and practical, providing specific health and care facilities for the general public in a clinical and business like way. Besides the indifferent image they portrayed they were often remote from each other meaning someone who required access to more than one primary healthcare service had to travel some distance perhaps on the same day which could be inconvenient. Many of those who need to attend a health and care centre are elderly and have to depend on public transport. For many this could be a stressful, confusing and time consuming process.

This project has given us the opportunity to re-evaluate the basic requirements of health and care services and allow us to challenge many of the conventions. By incorporating the various skills and specialisms under one roof there is also a marvellous opportunity to share facilities and add value, enriching the project and benefiting the patient and deliverer alike.

Through consultation and engagement with the many enthusiastic stakeholders on a number of occasions it became apparent there was consensus for a facility which was welcoming, flexible, functional, sustainable and brought added value.

From the patient perspective there was a desire to have a facility which was easily accessible, welcoming, informal, had a café, comfortable waiting spaces and an outdoor space or garden. It is about placing the patient at the centre of the design.

From the deliverer of health and care perspective there was a desire to be a centre of excellence, well planned facilities and an efficient and effective place of work. It should be a place where health workers and carers can meet and exchange case notes, ideas and knowledge. A place where administrators are close by and feel part of the process.

It should also be a place which has genuine community benefit, access and engagement.

What we have sought to provide is a design which creates a place where everyone feels welcome and shares a sense of wellbeing and ownership.

For us the desire to create a social heart to the building is a key driver. The opportunity exists to create a central dynamic hub which is open galleried with an abundance of natural light and fresh air which has an exciting range of spaces and inter-action.

Beyond this social heart we envisage the more private, secure consulting, treatment and administrative activities will occur.

Not only the building but the outdoor spaces are very important to us as designers. Consequently we have explored public and private spaces and gardens which interact with the interiors as well as considering linkages beyond to the wider community.









Figure 2.01 - 2.03 Barrhead Health & Care Centre

2. Brief

2.1 Project Requirements

The objective for the Reference Primary Healthcare Design project was to develop and test creative responses to the integrated services agenda and to demonstrate that "Excellent design is achievable within good value affordability caps." The design was developed from November 2012 to January 2013.

The briefing process and documents highlighted the following key requirements:

- Provide an optimal Gross Internal Area (GIA) without loss of service delivery capacity. A GIA of 6190 m2, or better, was the target for the project.
- Deliver a prime cost, building element only, figure of £1400 per m2 based on 3rd quarter 2012 rates.
- Include parking provision for 250 spaces and potential expansion for a further 100 spaces should this be required following negotiations with the Local Authority Roads and Transport Department.
- Target a minimum EPC rating of B+ and a BREEAM (NHS 2011) rating of very good (aspiring for excellent) without the use of onsite renewable energy elements.
- Investigate different ways and opportunities to use space
- Provide a design with sufficient flexibility that can offer opportunities for components or elements to be adapted to varying site conditions, locations and scales of healthcare development and provide for expansion space;

A visit to the recently completed Barrhead Health & Care Centre was arranged by the client group which provided the opportunity for them to highlight the successful aspects of this project as well as communicating where the design could have been improved. This valuable feedback was used to inform our development of the reference design and test conceptual approaches with the stakeholder group.





2.2 Eastwood Site Location

A site options appraisal was carried out by East Renfrewshire Council in June 2012 which resulted in the selection of a preferred site on Drumby Crescent, Clarkston which is currently occupied by the former Isobel Mair School and disused Williamwood High School sports field.

The site is currently owned by East Renfrewshire Council and is within a one mile radius of the Clarkston Medical Centre and just over a mile from the other GP practices that are to be located in the new centre.

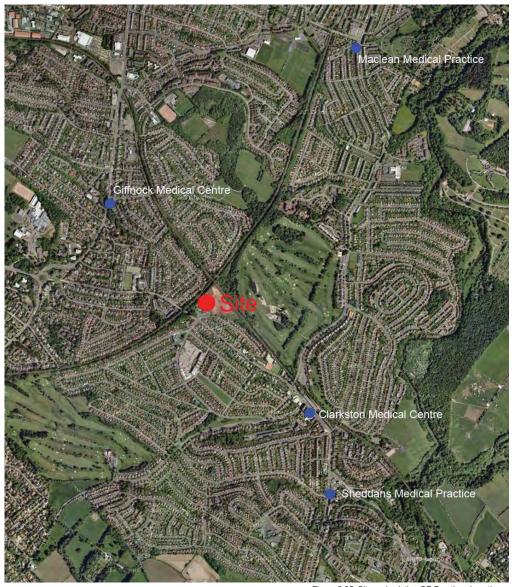


Figure 2.05 Site and existing GP Practices Locations



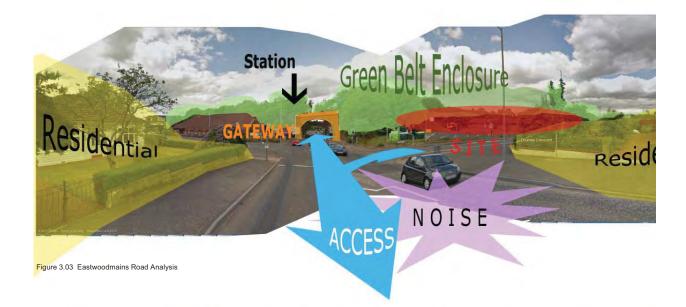
3. Site Analysis

3.1 Site Analysis

The overall site area is approximately 3.6 Ha and is bounded to the north-west and north-east by the Neilston and East Kilbride railway lines. The western boundary rises steeply to the railway viaduct over the adjacent Eastwoodmains Road with the southern boundary onto the residential street of Drumby Crescent.

Our site analysis established the following key issues:

- The existing mature tree belts adjacent to the railway lines are a key character of the site and should be positively integrated into the development strategy. The wooded incline to the railway viaduct could also be utilised as 'green' outlook from the building.
- Topography a significant change in level of approximately 4-5m divides the site between the existing school and the playing field.
- Potential noise and air quality issues from the busy Eastwoodmains Road and the adjacent train lines will need to be considered.
- Accessibility the site has good public transport connections with the nearby Williamwood Train Station and a bus service is available on the adjacent main road. Potential for improved pedestrian link to the station.
- Vehicle access is only available from Drumby Crescent and the location of the access point will be influenced by the distance to the signalised junction onto Eastwoodmains Road.
- The park & ride facility (32 spaces) currently located in the south-west corner of the site must be maintained or re-provided as part of the development.
- East Renfrewshire Council has highlighted their wish to maximise the opportunities for residential development on the remainder of the site





4.0 Consultation

Consultation

4.1 Stakeholder Engagement

Our approach to developing the reference design was one of partnership. By having meaningful consultation throughout the design development, this provided a shared vision and allowed users to make informed decisions on the developing proposals.

Over a six week period BDP held 3 workshops with users represented from the following groups:

GP Practices NHS Greater Glasgow & Clyde East Renfrewshire CHCP East Renfrewshire Council Public Patient Forum **Hub West** Scottish Futures Trust A&DS

The stakeholder discussions, ideas and aspirations from the workshops were recorded and issued in a report for each stage. These can be made available on • Cafe, request to SFT.

Pre-Workshop Explorer Pack - Prior to the first workshop we issued an Explorer Pack to each of the attendees from the consultative groups. This consisted of a short series of questions targeted at specific aspects of the forthcoming project – vision, likes, dislikes, wishes, aspirations and fears. This information was brought along to the first workshop by the attendees.

Workshop 1 - This workshop was structured and tailored to allow the group participants to discuss and consider the questions and responses from the Explorer Pack Questionnaire. BDP selected the most appropriate activities from the BDP Toolkit such as the 'Explorer Board' and 'A Day in the Life' to allow topics and ideas to be explored in an interactive way. This encouraged engagement and debate and served as an "icebreaker" for the group. At the end of the workshop the consensus of those participating acknowledged the need for a new centre which is functional, flexible and accessible, whilst also being considerate to the local neighbours in terms of privacy and views.

Workshop 2 – During this session BDP worked with the stakeholder group to develop the functional (clinical) brief and schedule of accommodation through the exploration of existing precedents and current best practice. A key difference for this stage was the splitting of some user groups to allow them to focus on specific areas relevant to their discipline.

BDP prepared a series of images for the Stage 2 Workshops to prompt discussion with the aim of exploring:

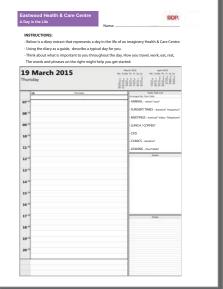
- · Arrival, Reception and Waiting,
- · Clinical Rooms,
- GP Consulting Room,
- Treatment Room.
- · Podiatry Treatment Room,
- Physiotherapy Room, Treatment Room & Gym,
- Range of Meeting & Interview Spaces.
- · Staff Room.
- Records / Storage Areas.
- · Range of Workplace.

The consensus of those participating was that some accommodation within the brief could be combined to allow an area saving to be gained, or to allow space for additional features within the building.

Workshop 3 – At this workshop BDP presented 3 different conceptual approaches to the site zoning and building layout. These ideas were presented graphically using plans, sections and 3D visuals as well as a physical sketch model which assisted everyone's understanding and avoided ambiguity. The designs were rigorously challenged and tested by all attendees and concluded with a scoring of the different concepts to enable the selection of a preferred option.

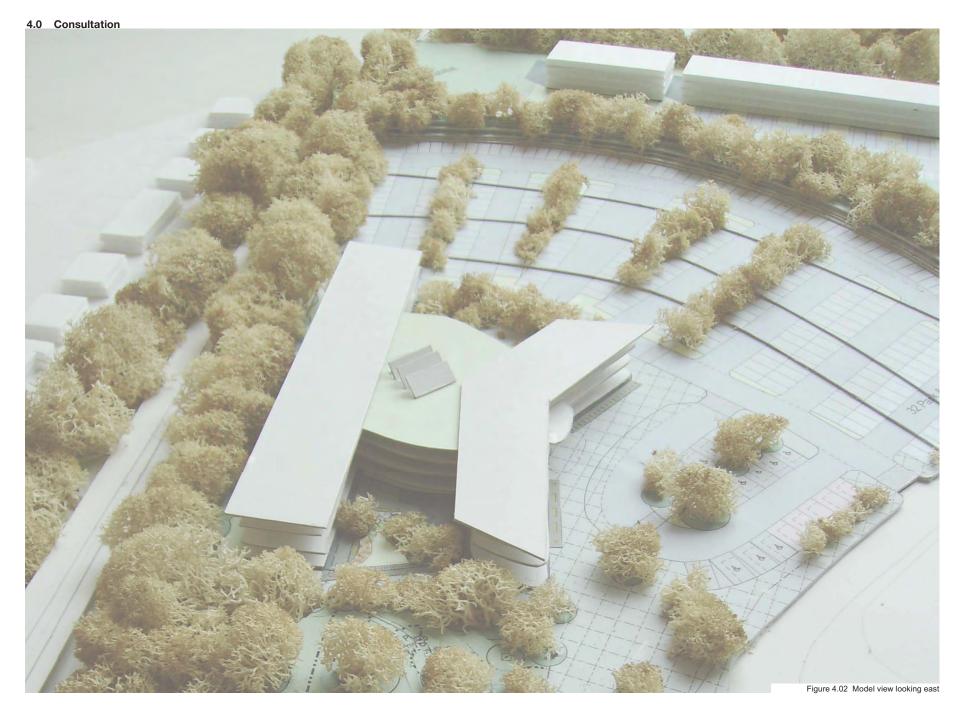
Final Presentation - The consultation process was concluded with a presentation of the final Stage C proposals which updated the users on developments of the preferred design following feedback from Workshop 3 and also focused on responses to the briefing criteria set out in the Stakeholder's Design Statement.











4.2 Planning and Roads

BDP attended a meeting with East Renfrewshire Council's Planning and Roads Department on 5th December 2012 to discuss possible approaches to vehicular access onto the site, building mass and positioning on the site.

Planning

During the discussion with the Planner a number of key points that should be considered as the project moves forward were noted, these included:

- Building height of three to three and half stories was felt to be appropriate for this site,
- Ideally the building should be positioned closer to the mature trees of the railway than to Drumby Crescent to minimise the visual impact on the residents.

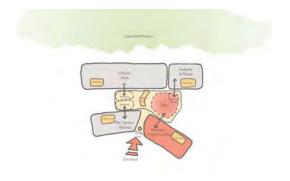
Roads & Transportation

The discussion with the Roads Department focused on the issue of vehicular access onto the site and the impact on the surrounding roads network. The key points noted included:

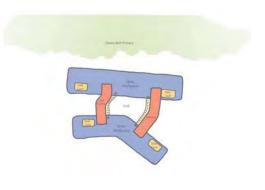
- Vehicle access directly from the signalised junction would not be accepted,
- The park and ride must be retained on site and should accommodate 32 car spaces,
- Traffic calming measures may be introduced to Drumby Crescent to deter centre users from using the Crescent as a short cut.
- A pedestrian route from the park & ride facility up onto the discussed railway viaduct and onto Williamwood Station is a future possibility.
- Re-using the existing junctions as an "in" and "out" arrangement would be acceptable.

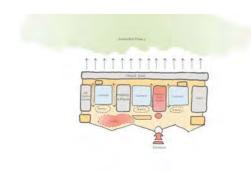


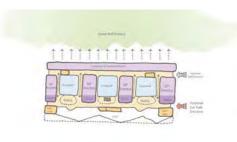
Figure 4.01 Model view looking west



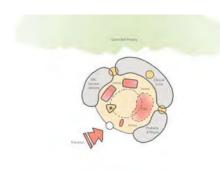


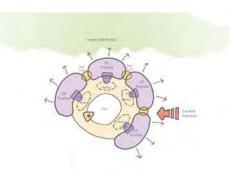














5.1 Concept Design Approaches

The three conceptual strategies for the building and site were presented to the Stakeholder Group at Workshop 3. During the workshop the Stakeholders split into 3 smaller groups to allow them to discuss and score each of the concepts.

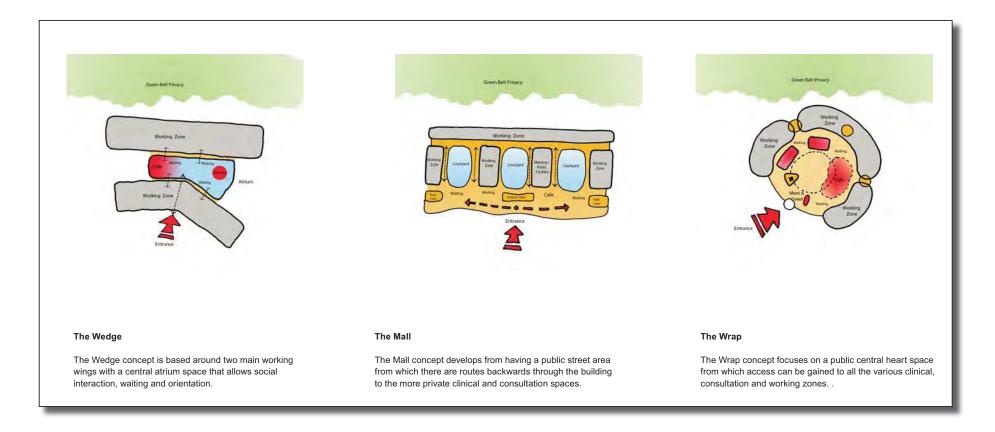


Figure 5.01 Building Concept





Figure 5.04 The Wedge Sketch Floor plan - Level 01



Figure 5.05 The Wedge Sketch Floor plan - Level 02

The Wedge

The Stakeholders comments on "The Wedge" concept were as follows:-

Figure 5.03 The Wedge Sketch Floor plan - Level 00

- More parking to the front of the building would be preferable,
- 1st floor entrance from car park may have a negative impact on how well cafe is used and in addition all footfall through GP entrance would be an issue,
- The park and ride was viewed as a barrier to the building's approach and should therefore be more integrated,

- Adjacency of interview rooms to main entrance was good but more interview rooms required adjacent to clinical rooms,
- · Staff facilities may benefit from being on 2nd Floor,
- Good daylighting and natural ventilation to all clincal rooms was positive,
- Generally all thought this concept worked well especially for way finding and travel distance,
- Grouping treatment rooms in the locations between adjoining practices would allow these rooms to be shared,

- · 1 shared meeting room required on GP floor,
- · 2 lifts back to back required for resilience,
- Level 02 central meeting rooms and staff area worked well but more meeting/interview rooms required,
- Question was asked if there was a possibility of a staff balcony or roof terrace,



Figure 5.06 The Wedge Sketch Section









Figure 5.08 The Mall Sketch Floor plan - Level 00

Figure 5.09 The Mall Sketch Floor plan - Level 01

Figure 5.10 The Mall Sketch Floor plan - Level 02

Level 02

The Mall

The Stakeholders comments on "The Mall" concept were as follows:-

- · Car parking to front of building is good,
- The pedestrian walkway should be direct from Eastwoodmains Road,
- Hybrid solution between The Wedge building and The Mall car park was suggested as a workable solution,
- Physiotherapy & Podiatry should be closer to entrance and adjacent to clinic,

- Group rooms should be located near the entrance,
- Plant and staff areas better located on the 3rd floor,
- Clinic waiting area does require a discreet location, adjacent to cafe may not be best location,
- The length of walks within the building appears long,
- The public area to the front was felt to give a flexible space to the building,

- Staff lift is good idea but entrances at both GP level and workplace would need reviewed,
- GP rooms in a row gives impression of a very long, corridor however the flexibility and future adaptability was a benefit,
- Courtyards are a good idea although some felt the courtyards should be larger,
- · Level 03 adjacencies to be reviewed,
- Open plan areas must encourage team working,

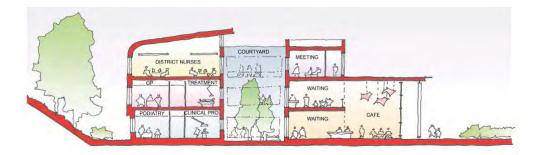


Figure 5.11 The Mall Sketch Section



Reference Primary Healthcare Design : Eastwood Health & Care Centre



The Wrap

The Stakeholders comments on "The Wrap" concept were as follows:-

- Didn't like the building at the back of site. Compact footprint noted
- Main pedestrian approach compromised by drop-off area,
- · Main entrance/central space works well,
- Staff entrance problematic as passes through public area,



Figure 5.14 The Wrap Sketch Floor plan - Level 01

- · Meeting rooms off central space would be useful,
- · Wayfinding good,
- · Shared Meeting Room for GPs would be beneficial,
- · Waiting areas good,
- · Some concerns over no interview rooms,
- Concerns over internal Treatment Rooms having limited daylight and need for mechanical ventilation,

5.0 Initial Building Options



Figure 5.15 The Wrap Sketch Floor plan - Level 02

- · Public / Private separation good,
- No objection to different GP Practices sharing private corridor route.
- · Secure staff only 2nd floor welcomed,
- · Liked open staff area to atrium,
- Liked the suite of meeting rooms / staff area being centrally accessible

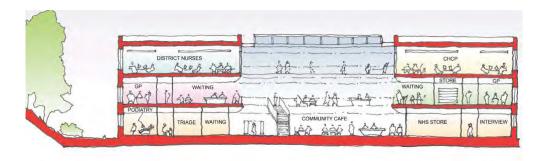


Figure 5.16 The Wrap Sketch Section

5.2 Design Principles

Following the conclusion of the Stakeholder Engagement process BDP met with the Project Core Group. During this session NHS Greater Glasgow and Clyde issued a list of key points arising from discussions with stakeholders that should be evident in designs:

- GP practices acceptable above ground floor level.
- Records storage more economic to backscan (£70k for 4 practices) versus 25 year cost of accommodation (circa £325k).
- Centralised staff room beneficial if satellite tea-preps are provided in departments.
- Shared GP waiting areas acceptable. Shared receptions resisted, but adjacent locations make long-term flexibility and sharing of resources viable.
- Zone of rooms for sessional use most beneficial if served by a reception and mix of clinical and interview rooms provided.

- 6. Some benefits of distribution of some sessional space into front-end of GP practices to offer GP flexibility without need for over supply of accommodation to practices. Careful planning and agreement on reception arrangements needed with practices.
- Potential for GP Treatment Room areas to be banked between practices to allow flexibility for temporary extended use for flu-clinics etc.
- Group rooms best located near entrance since these are most likely to be of benefit to out-ofhours community use.
- Physiotherapy gym best located near entrance to offer flexibility of out-of hours use.

- Dedicated Physiotherapy space can be reduced if co-located with suitably equipped bookable consulting rooms, rather than all plinths in single area.
- Minimise provision of dedicated "departments" and maximise opportunity for flexible sessional use of all service delivery rooms.
- Hot-desking/drop-ins best provided as zones within public cafe and staff room areas rather than dedicated space.





5.3 Building Blocks

As part of the Stakeholder engagement BDP explored the 'building blocks' of the brief with a view to maximising efficiencies and standardising components wherever possible.

Consulting / Clinical Rooms

- The concept of standardising the size of clinical rooms to aid future flexibility was well received and thought to be a benefit,
- Participants noted that storage within consulting rooms is important to the success of the room,
- Clinical zone consulting rooms must be close to interview rooms.
- The consulting room size used in the final proposals was 15m², based on the recent work carried out by NHS Lanarkshire.

Meeting & Interview Rooms

- GP's don't require a separate interview room for each practice, they simply need access to a bookable interview room.
- Meeting rooms with moveable partitions that allow flexibility of use were thought to be a good use of space rather than having underutilised large meeting rooms,
- Most frequent meeting size is approx 8-12 people, although on occasions training events require 40 people to be accommodated,
- Group rooms that are used for a variety of uses are essential and must be easily accessible by staff and public.

Workplace

- Staff noted that there is a natural linkage between departments and open plan arrangements could assist in grouping people together,
- Team managers use 1 to 1 rooms for a large proportion of the day,
- How 'agile' staff are accommodated has to be well defined.

Reception and Waiting

- Waiting space can be combined although some form of demarcation would be required to encourage visitors to wait near the service they are visiting,
- A single Meet & Greet reception at the main entrance was viewed as beneficial,
- GP's and Practice Managers noted that it was essential that they all had their own reception points,
- Clinical staff suggested that a single clinical reception would work best for them rather than having individual receptions for mental health etc.

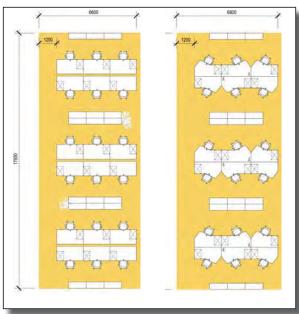


Figure 5.17 Workplace Alternatives



Figure 5.18 GP Consulting Room



Figure 5.19 Treatment Room

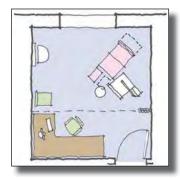


Figure 5.20 Podiatry Room

6.1 Site Context

The preferred option located the building to the rear of the site reducing the impact of the development to Drumby Crescent.

The approach to the main entrance from Eastwoodmains Road is via a safe, pedestrianised south facing plaza. A single vehicle access point from Drumby Crescent provides access to a dedicated drop off and accessible parking zone adjacent to the main entrance as well as leading to a simple radial parking arrangement that culminates with a service area to the rear of the building. The parking to the rear of the site is for priority staff and is close to the dedicated staff entrance. The additional 100 parking spaces potentially required by the brief continue the radial arrangement and could be implemented without adversely affecting any residential development on the adjacent site.





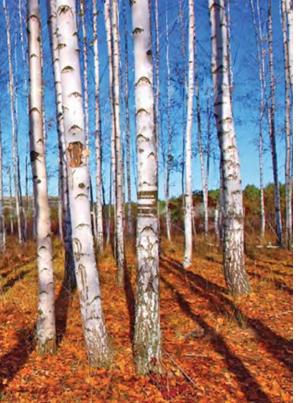
Figure 6.01 Site Plan for 250 Spaces



Figure 6.02 Alternative Site Plan for 350 Spaces

The Birches...



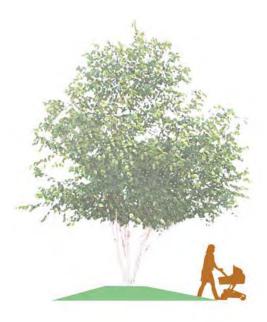




6.2 Landscape Proposals

The site's landscape history revealed that this area was first referred to as Birkenshaw in the 16th century, when the lands were gifted to the Earls of Eglinton by King James V. The name Birkenshaw translates as Birch Grove and the intention is to set the building within a grove of Birch trees. The Birch is a native tree that symbolises fertility and new birth. It is also known as the Pioneer species within any newly regenerating woodland - as reference to the aspiration that this will be a pioneering building too.

The use of the Birch tree throughout the landscape design will create a setting for the building that has a unique and identifiable character. Birch woodland will be planted to define and screen the car parking and connect with the building. The Birch tree also has medicinal associations and its bark/leaves and sap can be used in herbal remedies. This association of plants and health has then been brought into the garden spaces.



"Birkenshaw" translates as...."Birch Grove"



Origins:

The lands known as "Birkenshaw" were gifted by James V in 1530 to the 13^{th} Earl of Eglinton.

6.0 Preferred Option Obs. Room Service Delivery 2 Contact Room 1 Contact Room 2 Service Delivery 3 Clinical Reception 15m2 12m2 15m2 15m2 14m2 cafe terrace family contact 8m2 spill out secure edge with gates birch trees informal children's play spaces Service Delivery 1 Meetin herb banking creates swathes of colour and scent Inter-Inter-Meeting Room view view view 8m2 8m2 8m2 20m2

6.2 Landscape Proposals

The building form creates two courtyard gardens to the north and south which will each have a distinct character built on the creation of remedy gardens. They are directly accessible and connected to the internal functions of the building as well as being secure and screened from the car parking.

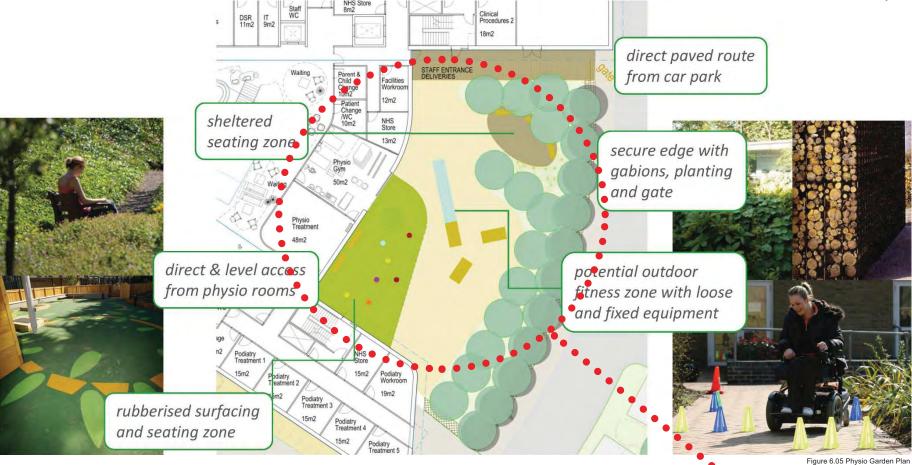
The south facing, herbal remedy garden has colourful banks of scented perennial herbs to provide an attractive area that contains a series of external spaces for the Cafe, Family Contact rooms and childrens play space to spill out from the building.

The main entrance plaza contains island groups of Birch trees with seating for waiting by the drop off area and cycle parking for staff and visitors.

The cycle parking will be provided at the main entrance to the building in dedicated shelters and also along the building facade, using the overhang of the building canopy to create shelter. In this location the parking will be highly visible and also accessible for those who may want to use the train station. In accordance with the BREEAM Healthcare guidance 54 spaces will be provided in total.

Figure 6.03 Garden sketch towards building

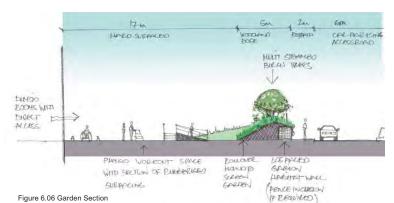




6.2 Landscape Proposals

The northern woodland garden provides a spill out from the Physio suites with level and direct access for the use of fixed or loose equipment.

There is also a quiet outdoor seating area for staff. The planting will be concentrated on green, calming colours with lush woodland remedy plants. Both gardens are secured by a gabion edge detail that allows the landscape to rise up to the edge of the garden and provide a green outlook.



Woodland remedy garden



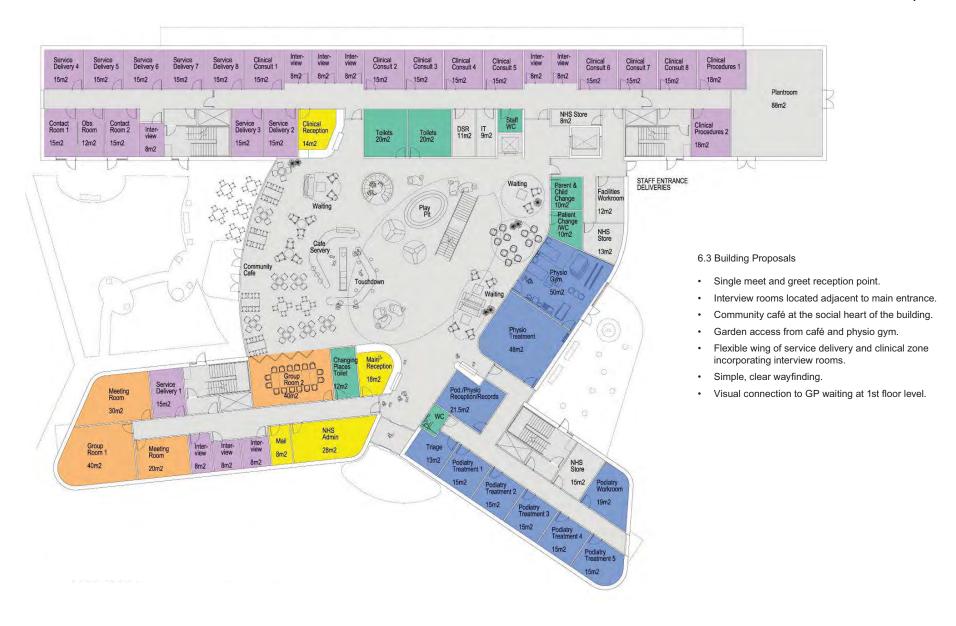


Figure 6.08 Level 00 Floor Plan

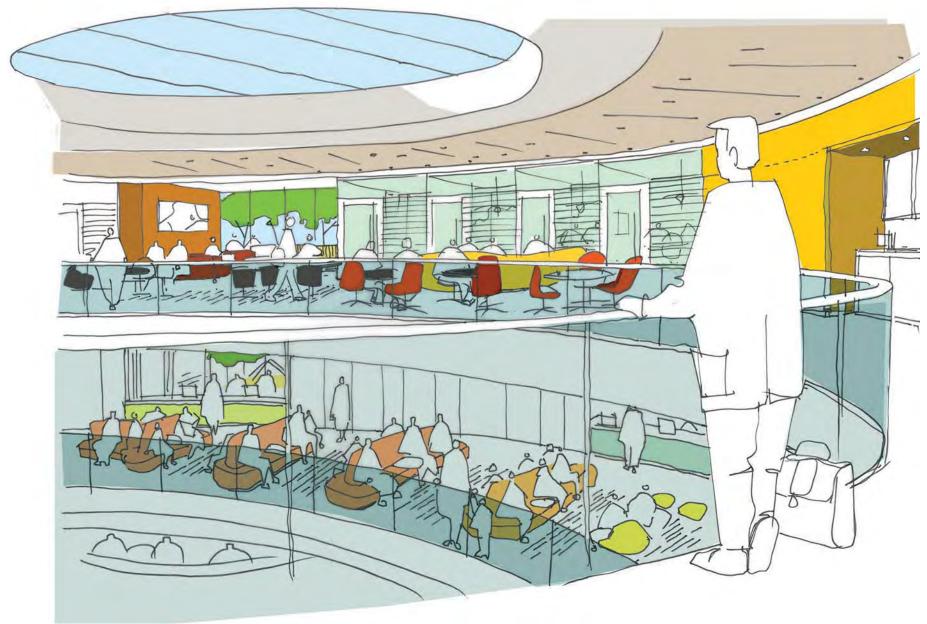


Figure 6.09 Internal atrium sketch from Level 02



Figure 6.10 Level 01 Floor Plan



Figure 6.11 Workspace sketch on level 02



Figure 6.12 Level 02 Floor Plan



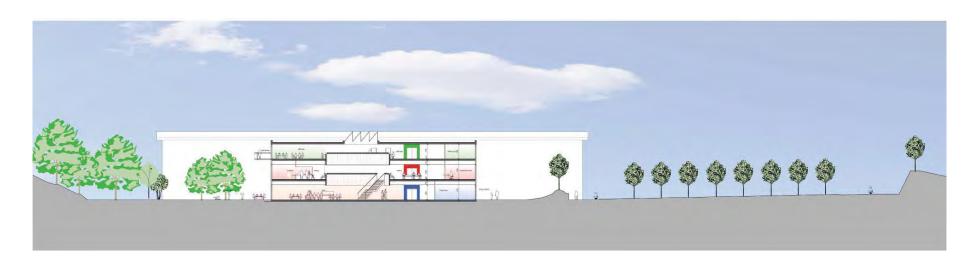


Figure 6.13 Cross Sections







6.5 Maintenance

The ground floor plant room has good external access and is directly adjacent to the service area. The large vertical service risers are incorporated into each of the stair cores providing an even distribution to each of the wings. Horizontal distribution of services is via the corridor ceiling voids which have robust, easily accessible metal ceiling tiles.



Figure 6.17 Service Routes

6.6 Expansion, Flexibility and Adaptability

The building has been designed to meet the requirements of the current brief however due to the 'winged' concept and the distribution of stair cores, the potential for future expansion is as follows:

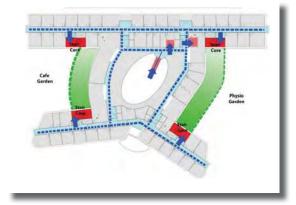


Figure 6.18 Option 1 Radial Expansion Additional GIFA: 942 m²

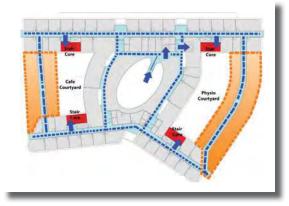


Figure 6.19 Option 2 Courtyard Expansion Additional GIFA = 1764 m² = +29%

7. Future Scalability

7.1 Future Scalability

The design, as illustrated in figure 7.01, has been developed to respond to the brief for a 6200m², 4 GP practice, Health and Care Centre and its form and orientation respond to the specific context of the Eastwood site. However, the concept model has three main components – the wings, the atrium and the garden enclosures that can be scaled up or down to respond to varying briefs and site conditions.

The length of the wings can be extended or reduced to suit the number of consulting rooms briefed however we would highlight the wings at the Eastwood site are reaching the maximum for escape and travel distance to clinical rooms.

The size and shape of the central atrium can be adapted in response to requirements for waiting areas and the size of community café or Third Sector areas briefed.

The garden enclosures at Eastwood created secure areas with different character; however the concept can be re-orientated depending on the aspect and views from a specific site.

The adjacent diagrams illustrate examples of how the key components could be reconfigured to create buildings that have common parts but most importantly they still need to be bespoke to a place – its community, climate and culture.

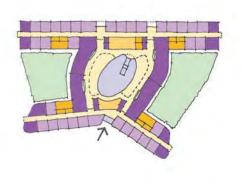


Figure 7.01

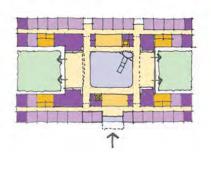
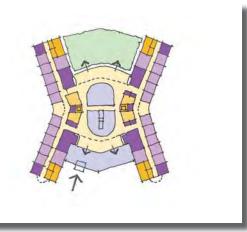


Figure 7.02

Figure 7.03



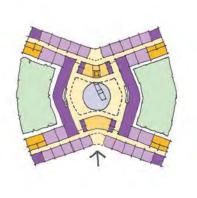


Figure 7.04

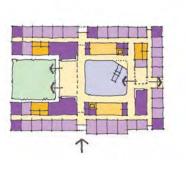


Figure 7.05

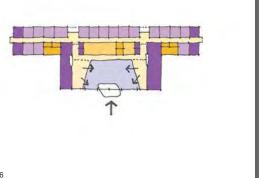


Figure 7.06

8. Technical Reports

8.1 Services & Sustainablility

Heating

Our proposal would be to generate energy for building heating and hot water using a ground sourced heat pump, with borehole pipework located under the car park. This heat pump would be supplemented with a high efficient boiler arrangement to provide top up heat, with all heat generated feeding into a Low Temperature Hot water distribution System LTHW. This main plant is proposed to be located in a dedicated plant room on the ground floor.

Heating to the floors would generally be provided with radiant heating panels mounted at ceiling level and to more transient large open spaces, underfloor heating.

Zonal control valves will be provided at strategic locations to aid heating system control where elevations are experiencing benefit from solar gain and thus can have the heating circulation interrupted to reduce energy use. This will also benefit any occasions where the building is used out of normal hours and some floors or areas are unoccupied thus again interrupting heating flow.

Due to the need to ventilate some clinical spaces and internally occupied rooms provision of an air handling unit will be made and heating coils within this unit will be fed from the LTHW system.

Domestic hot water provision will also be generated by heat input from the LTHW system.

Cooling

The use of the heat pump arrangement allows cooling to be generated in an efficient manner using ground source energy to cool any clinical spaces that require cooling according to HTM guidance i.e... treatment rooms, in addition to any large occupancy rooms where overheating may occur. This cooling system will be a chilled water system serving in room fan coil units or cooler batteries within ductwork.

It is also proposed to provide separate DX refrigeration systems to cool the IT hub rooms thus keeping wet chilled water outside a sensitive IT space.

Ventilation

Due to the need to ventilate some clinical spaces to meet HTM requirements, internally occupied rooms and dirty rooms i.e. toilets, an air handling unit (AHU) will be provided together with dedicated extract systems for the dirty spaces.

This air handling unit will be an externally located unit positioned on the roof of the development with safe and adequate man access afforded to support maintenance requirements.

The AHU will be complete with integral heat recovery device in order to recover used heat and reuse it to preheat incoming supply air, ensuring reduced energy use.

Hot water

New hot water generation plant will be provided in the form of a packaged plate heat exchanger and semi storage buffer vessel fed from the LTHW heating system. Hot water will be distributed via a flow and return system to all hot water using appliances within the building. A self balancing return valve with pasteurising facility is proposed to be used on all the return legs to promote attainment of the required flow temperatures to counter legionella proliferation along all branches.

Cold Water

Cold water is to be distributed to all cold water using appliances utilising a potable boosted system with break tank and booster set located in an appropriate plant room and fed from the incoming mains water system.

Drainage

A suitable above ground drainage system will be provided to serve all sanitary and water using appliances, that is suitably ventilated and conveys waste water to the below ground drainage system.



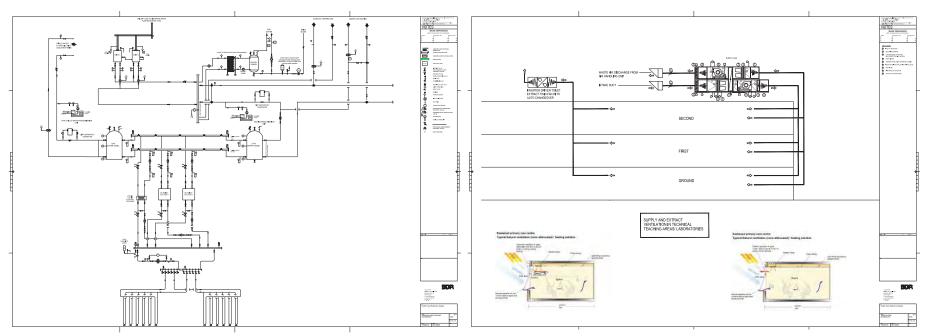


Figure 8.01 Schematic Figure 8.02 Schematic

8.0 Technical Reports

Medical Gases

Any medical gases requirement for the treatment rooms is deemed to be met by local mobile bottle provision and no central medical gases provision of distribution network is proposed.

Natural Gas

Natural gas will be provided to serve the new boilers as required.

Utility Connections

Applications to stats will be made for utility connections of gas, water, drainage, electricity, comms.

Electrical Power systems and distribution

Electrical power supplies shall be provided and distributed as required to ensure the correct level of redundancy, resilience and reliability is made available to meet the needs of clinical services offered by the practice. These shall be in accordance with HTM 06-01 (if required) and BS 7671.

Lighting

Daylight is generally thought to provide the best colour rendering, but of necessity a significant proportion of practice work is carried out under artificial light due both to requests for privacy, the design of the rooms and the availability of daylight.

Low energy artificial lighting shall be provided where required to ensure good colour rendering is achieved with energy efficient lighting control systems providing manual and automatic controlled luminaires.

Control strategies may include absence detection to ensure occupied areas are not lit unnecessarily and daylight linked luminaires allowing them to be switched off in areas where daylight ingress is sufficient.

In examination and minor operation areas special low voltage enclosed lamps provides shadow free illumination and negligible heat output. Medical lighting will be either fixed purpose or designed suspension units or mobile units to allow maximum flexibility.

Security

An access and security strategy shall be developed by the design team, including liaison with Police crime prevention officer. Systems may include CCTV, Access Control, Intruder Alarms, Staff Attack systems.

Communications and Audio/Visual

ICT infrastructure shall be provided in accordance with the clients current ICT strategies and needs.

Patient call systems shall be provided as required.

Induction loop systems shall be provided for patients who use hearing aids.



NHS BREEAM 2011 - Achieving BREEAM Very Good and Excellent

We have an excellent track record in undertaking BREEAM assessments both for Healthcare projects and across all of the BREEAM schemes and our leading-edge sustainable consultants would bring best value to the project by maximising commercially feasible low environmental impact design solutions throughout the project.

Unfortunately we would not be able to achieve a BREEAM Excellent rating for the project if no onsite renewable energy systems are to be provided; as the provision of a LZC technology is a mandatory requirement of all BREEAM Excellent ratings. And although we could achieve a minimum of a B+ EPC rating through lean and mean measures we believe it would also be extremely challenging to achieve the mandatory 6 credits required for Excellent under the 'Reduction of CO2 emissions' issue without the integration of a green technology.

Nonetheless whether the final project requirement is for a BREEAM Very Good or Excellent rating our Sustainability team would deliver the BREEAM assessment by guiding and supporting the design team through what maybe an unfamiliar process. We will promote commercially feasible low environmental impact design solutions and will work closely with the project cost consultant to guide to team along the lowest capital and whole life cost route to achieving these goals.

Based upon the optimum route for achieving the project aims, we will provide clear and simple guidance to project team members on the BREEAM credit requirements and use our in-house BREEAM management spreadsheets to clearly communicate the timeline, responsibilities and deadlines for the delivery of BREEAM evidence.

Typical areas where we would gain BREEAM credits for the M&E services would be as follows:

- · Use of low flushing sanitary appliances.
- · Use of PIR control to water closets.
- Investigate the practicalities of incorporating rain water harvesting to recycle surface water run off.
- Use of daylight and presence detection control to artificial lighting systems.
- Use our Lean, Mean, Green energy philosophy to reduce energy use on the site.
- Adopt a natural ventilation philosophy where applicable.
- Provide local zonal heating control for occupants of each area.
- Use low flow taps where there is no clinical need.

We will also develop comprehensive contractor's requirements documents at the tender stage so that the responsibilities for delivering BREEAM are clearly communicated and priced in to the contract and a significant proportion of the evidence collection is achieved through this process. This will greatly facilitate the delivery of the Client's BREEAM objectives for optimum value.

Finally we will use our vast experience to efficiently co-ordinate the collation of BREEAM evidence at both the design and post construction stages and compile high quality reports which will facilitate certification.



8.0 Technical Reports



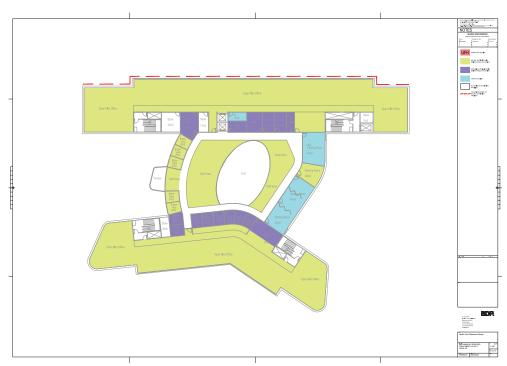


Figure 8.03 Level 00 Floor Plan

Achieving EPC performance of B+

BDP are very accustomed to designing low energy buildings and on many of our designs we adopt a standard approach that uses the Lean Mean Green philosophy as follows:

- Lean reduce a buildings need for energy using passive measures.
- Mean use energy efficient equipment to produce the energy requirements.
- Green design in green low carbon technologies where appropriate.

In order to achieve an EPC rating of B+ the following will be incorporated into the design of the Eastwood Health & Care Centre by following the above philosophy.

Lean

The U values of the building fabric will be improved from building regulation minimums by 20% thus reducing heating energy input

The air leakage criteria for the building fabric will be improved from the building regulation minimum by 50%, preventing space warm air being diluted and again reducing heating energy input.

Natural ventilation will be used throughout the building to ventilate the spaces subject to clinical need and internal configuration, thus reducing any fan energy requirement.

Use of solar control glass or shading on solar elevations to reduce any cooling load.

Mean

The main air handling unit will be provided with a heat recovery facility in order to reduce the need for heating input from the boilers to warm the ventilation air.

Use of underfloor heating at reduced flow and return temperatures complimenting condensing boiler or ground source heat pump technology.

Incorporation of increased design temperature delta T on heating system flow and return distribution for higher temperature circuits promoting reduced flow rates and reduced pumping requirements.

Use intelligent control system network (BMS) to turn off main plant or circuits when there is no demand.

Use 2 port control valves and inverter drive technology on heating / chilled water pumps that will reduce the flow rate when there is no demand, promoting reduced electrical energy use.

Use power factor correction equipment where there is a high inductive loads.

Use daylight linking and presence detection control to artificial lighting circuits to reduce electrical energy use.

Reduce ventilation ductwork velocities to reduce resistance within ductwork reducing fan energy use and improving specific fan powers.

Green

We recognise the statement in the brief that no onsite renewable energy elements are to be provided, however in our experience in order to achieve the minimum 6 ENE1 credits needed to achieve a BREEAM excellent building some form of low carbon technology is usually required.

While all the items listed under Lean and Mean above will normally be adequate to help achieve a BREEAM Very Good rating in terms of the energy use and a good EPC rating. In light of our experience with regards to achieving BREEAM excellent, which is typically what a new health care facility is required to achieve under NHS briefing directives, we propose to incorporate a ground source heat pump to help generate a form of low carbon energy on the site and help achieve the minimum of 6 ENE 1 BREEAM credits.



8.0 Technical Reports

8.2 Structural Strategy

The choice of materials and design solutions for the superstructure frame and floor construction requires detailed consideration of a number of issues. Primarily the design solution must ensure the aspirations of the client and the architect are achieved, whilst also providing a co-ordinated approach with the architectural and environmental design packages. Well considered solutions will also provide an inherently sustainable approach to the building by enabling a reduction in carbon creation through reducing energy in use and minimising embodied energy in manufacture and construction.

The layout of the proposed building creates a compact and efficient construction. For the general accommodation we propose a regular grid at 7.8m centres along the length of the building, with a central line of columns creating approximate grid dimensions of 4.8m and 5.8m across the width of the building. This grid layout is a structurally efficient layout and could feasibly be applied to a number of different frame construction types. The considered primary options will be discussed here.

Steel frame with composite deck flooring

A steel frame is likely to be the most cost effective structural frame solution although it does have disadvantages in relation to co-ordination with M&E services in comparison to a flat slab concrete frame. However, there are a number of layout and construction benefits that are achieved by the use of a steel frame construction. These include the following.

 A steel frame solution provides a lightweight structure and therefore reduces the size of foundations required to support the frame, hence reducing costs and minimising material use. A steel frame solution has site construction benefits due to its faster build time compared to alternative forms of construction.

All structural steelwork that will be used as part of the frame will be from recycled sources, therefore minimising the embodied carbon created in the steelwork manufacturing process. In comparison to a concrete framed solution, the steelwork manufacturing process creates less carbon in comparison to cement production. Combined with the efficiency benefits listed above, steelwork provides a more sustainable solution than an alternative concrete solution.

This option considers the use of a relatively thin composite deck floor construction which is made up of a profiled metal sheet connected to the top of the steel beam via welded shear studs and an insitu concrete topping. The thin profile steel decking acts as permanent formwork to the concrete.

The steel beams that run perpendicular to the span of the deck will be designed to act compositely with the concrete slab above. The composite connection between the concrete slab and the steel beam is achieved through the shear studs that are located on the top of the beam and this action between the floor slab and the steel beam allows the depth of the beams to be reduced in comparison to a standard steel beam design.

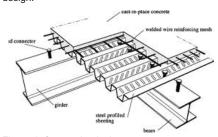


Figure 1: Composite deck

With the floor to floor height set at 3750mm, there are a number of key interfaces that have been considered to ensure the structural frame co-ordinates with the architectural and services strategy

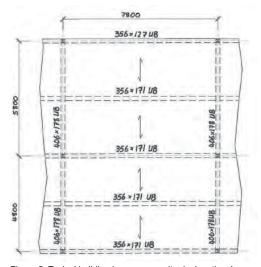


Figure 2: Typical building bay – composite deck option 1

For the majority of spaces, the servicing strategy is to adopt natural ventilation where possible, using opening windows or attenuated louvres along elevations with acoustic issues. Where a cross flow strategy is proposed, louvres will also be required at high level in the corridor partition wall. With a proposed ceiling height of 2.7m, any internal or external louvres would be located above this level, therefore interaction of the louvres with the steel floor beams will need to be considered. In rooms that require mechanical ventilation, consideration will need to be given to the location of the required ductwork and how this interacts with the steel floor beams.

We have developed two options for the layout of steelwork framing the floors. With a ceiling level of 2.7m, this provides a structure and services zone of 1.05m. From our initial assessment and co-ordination with M&E services, both options are adequate to be contained within this zone. Moving forward, we would assess each option in more detail to understand their detailed interaction with the servicing strategy and interaction with architectural detailing to allow us to determine the favoured option.

The stability of the frame will be provided by vertical steel x-bracing that will be co-ordinated with the architectural layout. Bracing elements will be located within solid external and internal walls to avoid clashes with glazing. The concrete floors will be designed to act as diaphragms to transfer the horizontal loading into the vertical bracing elements and down to the foundations.

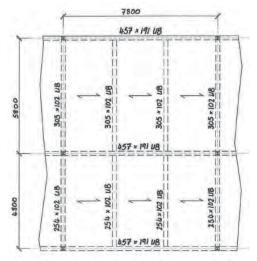


Figure 3: Typical building bay – composite deck option 2

Insitu concrete frame

An alternative option to consider is an insitu concrete frame with two way spanning flat slab between the columns. Although this option will undoubtedly be the heaviest option, and hence require the largest foundations, the flat slab soffit allows the ultimate flexibility in relation to service distribution and accommodation of louvres. This frame is also the most flexible in that partition walls can be relocated without clashing with downstand structural elements. The layout of the floor construction is shown below.

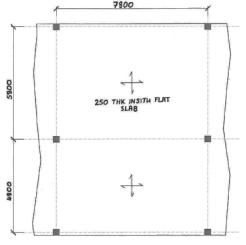


Figure 4: Typical building bay – concrete flat slab option

As this option provides no downstand structure, there may be an opportunity to reduce the floor to floor height of the building. If a clear servicing zone of 600mm is provided, combined with a 250mm slab thickness, this reduces the structure and services zone to 850mm, therefore achieving a reduced floor to floor height of 200mm for each floor level. This reduction will enable a reduction in costs to the elevational elements of the project.

Other benefits of the concrete frame are the inherent fire resistance, good acoustic properties and simple accommodation of late changes by forming new openings relatively easily. Although the structure is heavier, there is an option to reduce the weight with the use of a post-tensioned concrete flat slab that could potentially reduce the slab thickness by around 20%.

9. Materials

External

- Sandstone
- Render
- Timber Screens
- Weathered Zinc
- Sedum roof



Building materials have been selected for their suitability in terms of aesthetics, efficiency, low maintenance and sustainability. The external materials include a sandstone cladding at ground floor level which gives a warmth and human scale when approaching the building. On the upper levels the primary element is a white finished render which is contrasted with weathered zinc panels that are introduced at the highest level and help to reduce the scale of the development. These walls will be punctured by a range of polyester powder coated aluminiumthermally controlled windows that include birch timber screens providing continuity of colour and material with the landscape strategy. Glazed curtain walling is introduced around the entrance, café and second floor office areas for greater transparency between the inside and outside. A projecting canopy of glass and aluminium protects the route to the main entrance. A low maintenance gently pitched aluminium standing seam roof is used for each of the wings while the sedum roof to the central area will be used to assist in the attenuation of rainwater. North facing rooflights will be used to provide ample daylight to the central atrium while eliminating solar gain.

Internal

- Linoleum
- Carpet
- Wallboard + Art
- · Acoustic Ceiling
- · Birch Panelling













The selection of materials internally has also been specified for their durability and sustainability credentials. The predominant floor covering will be linoleum which is made primarily from natural and renewable raw materials, as well as being a product manufactured in Scotland. It also has inherent properties which contribute to the control of infection. Internal partitions will be heavy duty impact resistant plasterboard on lightweight metal studs which can be easily removed should there be a requirement for internal reconfiguration of rooms. Birch panelling will be used for reception desks and internal wall cladding which picks up on the historical references to the site. Colour and super graphics will be used on feature walls, particularly around the atrium in areas such as the café, GP waiting areas and the staff zone on level 02. Acoustic ceiling panels will be used in the atrium space to combat excessive noise but without eliminating the 'buzz' that is desirable in the social heart of the building.

10.0 Area Schedule

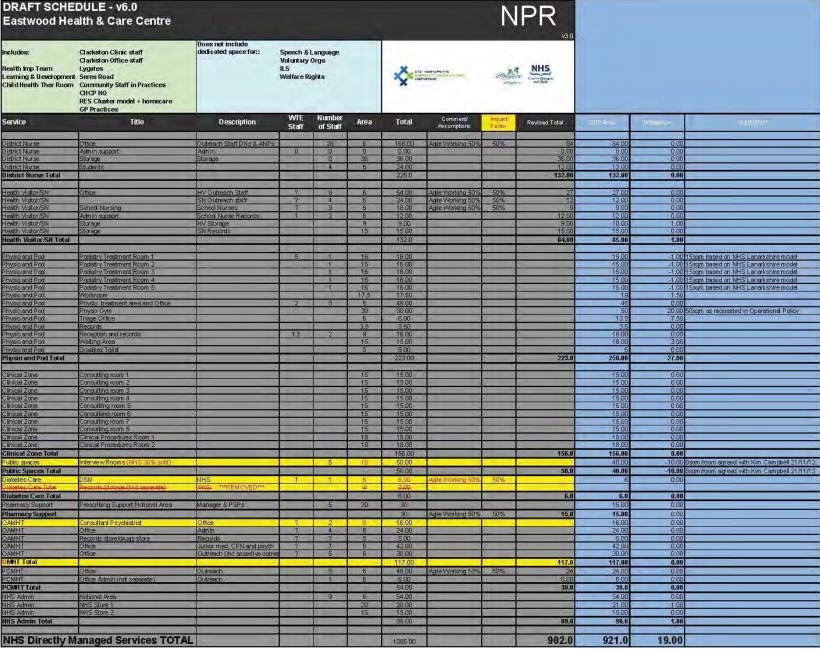


Figure 10.01 Area Schedule

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tervention 3	Service Delivery room				15	15.00			15.00	15.00	0.00	
tervention 4	Service Delivery room				15	15.00			15.00	15.00	0.00	
tervention 5	Service Delivery room	*** Additional Room***			15	15,00			15.00	15.00	0.00	
tervention 6	Service Delivery room	*** Additional Room***			15	15.00			15.00	15.00	0.00	
tervention 7	Service Delivery room	*** Additional Room***			15	15.00			15.00	15.00	0.00	
tervention 8	Service Delivery room	*** Additional Room***			15	15,00			15.00	15.00	0.00	
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ublic spaces	Front reception				18	18.00				18.00	0.00	
iblic spaces	Breast feeding room				15.5	15,50				15.50	0.00	
blic spaces	Patient Change/Toilet				10	10.00	-)—————————————————————————————————————	10.00	0.00	
blic spaces	Parent and Child changing				10	10.00			1	10.00	0.00	
blic spaces	Toilets				48	48.00	4			40.00	-8.00	
iblic spaces	Changing Places Public Toilet				12	12.00				12.00	0.00	
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inical Zone	Reception	Reduced from 20m² to 14m²			14	14.00				14.00	0.00	
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inical Zone					80	80.00				135.00		Includes GP staff area
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linical Zone laff spaces laff spaces laff spaces	Shower room Grup room Meeting Room 1 Meeting Room 2 Meeting Room 3 Meeting Room 4 Meeting Room 4 Meeting Room 5 OSR Room x 4 Mail Room Morkroom				40 40 30 30 20 20 44 8	40.00 40.00 30.00 30.00 20.00 20 44.00 8.00 12.00				40.00 30.00 30.00 20.00 20.00 33.00 8.00 12.00	0.00 0.00 0.00 0.00 0.00 -11.00 0.00	

3Ps		1			1	-					
			16								
larkston Medical Centr	re x 2 practices sharing										
	Consulting Rooms x 9	GP 15m ² p/room		9	15	135.00			135.00	0.00	
	Consulting Rooms x 4	Practice Nurse 15m2 p/room		4	15	60.00			72.00	12.00	
	Consulting Room	Treatment Room		1	15	15.00			18.00	3.00	
	Consulting Room	Audit Nurse/Phlebatomist		-	15	15.00			18.00	3.00	
	Office	Practice Manager		1	15	15.00			15.00	0.00	
	Office	Admin		5	6	30.00			30.00	0.00	
	Reception Area	P-GHIIII		10	6	60.00			60.00	0.00	
	Records Area **REM OVED**	Patients Records		10	-	0.00			00.00	0.00	
	Waiting Area	Patients			36	36.00			40.00	4.00	
	Meeting Room	Shared with other practices			7.5	7.50			10.00	2.50	Included in 1 no. Shared meeting room
	Locker/Shower Room/Toilets	Shared with other practices	1		20	20.00			2.00		Showers/lockers on level 02
	Copier and Comms Room				8	8.00			4.00		Copy space only
	Public Tailets x 2	Male & Female @ 4m²		2	4	8.00			8.00	0.00	
	Store	Small		-	2.5	2.50			2.50	0.00	
	Store	Small			2.5	2.50			0.00	-2.50	
	Store	Large			10	10.00			10.00	0.00	
	Store	Large			10	10.00			10.00	0.00	
	Stff room and library				20	20.00			4.00		Tea Station allowance, staff area on level 02
	Interview Room				10	10.00			0.00		GP's agreed to use int rms on other levels
Clarkston Medical Centr	re x 2 practices sharing					464.50		464.5	438.50	-26.00	0100
COLUMN TENANTI COM	S in a presentation and ining					404.00		404.0	-130,38	-20.00	
Maclean Practice Branch	ы										
Macieali Flacuce Dialici		AR 48 7 1			100						
	Consulting Rooms x 6	GP 15m ² p/room		6	15	90.00			93.00	3.00	
	Consulting Rooms x1	Practice Nurse 15m ² p/room		1	15	15,00			18.00	3,00	_
	Office **REMOVED ***	Practice Manager		1	45	0.00			0.00	0.00	
	Comms and Copier		1		8	8.00			4.00	-4.00	Copy space only
	Office	Senior Receptionist			9	9.00			9.00		Included in admin area
	Office	Admin (4 Staff)		4	- 6	24.00			24,00	0.00	
	Storage				15	15.00			16.00	1.00	
	Storage	Practice Nurse			10	10,00			10.00	0.00	
	Meeting Room	Shared with other practices			7.5	7.50			10,00		Included in 1 no. Shared meeting room
	Reception Area	Datases		4	6 26	26.00			24.00	0.00	
	Waiting Area	Patients			26	25.00			26.00 0.00	0.00	
	Records Avea **REMU VEU**	Patients Records			4						
	Public Toilets x 2	Male & Female @ 4m ²		2	4	8.00			8.00	0.00	
	Staff Room/Library				20	20.00			4.00	-16.00	Tea Station allowance, staff area on level 02
	Locker/Shower Room/Toilets	Shared with other practices			20	20.00			2.00		Showerslockers on level 02
	InterviewRoom				10	10.00			0.00		GP's agreed to use Int rms on other levels
Maclean Practice Branci	h		4			286.50	1	286.50	248.00	-38,50	
Sheddens										- 7	
	Consulting Rooms x 2	GP 15m ² p/room		2	15	30,00			30.00	0.00	
	Consulting Rooms x 1	Practice Nurse 15m2 p/room		1	15	15.00			18.00	3.00	
	Bookable Consulting Room 1	*** Additional Room***		1	15	15.00			15.00	0.00	
	Bookable Consulting Room 2	*** Additional Room***		1	15	15.00			15.00	0.00	
	Bookable Consulting Room 3	*** Additional Room***		1	15	15.00			18.00	3.00	
	Bookable Consulting Room 4	*** Additional Room***		1	15	15,00			15.00	0.00	
	Consulting Rooms × 1 **REMOVED**	Treatment Room		4	48	0.00			0.00	0.00	
	Office	Practice Manager		1	15	15.00			15.00	0.00	
	Office **REMOVED**	Typist & Reception Staff		3.	8	0.00			0.00	0.00	
	Reception Area			3	6	18,00			26.00	8.00	
	Records Storage **REMOVED**	Patient Records			58	0.00			0.00	0.00	
	Waiting Area	Patients			20	20.00			24.00	4.00	
					20	20.00			14.00	-6.00	Includes tea st/copy, Staff area at level 02
	Staff Room				5.3	5.30			10.00		Included in 1 no. Shared meeting room
	Staff Room Meeting Room	Shared with other practices									
		Shared with other practices			13	13.00			2.00	-11.00	Showers/lockers on level 02
	Meeting Room			2					2.00	-11.00 0.00	Shovers/lockers on level 02
	Meeting Room Locker/Shower Room/Toilets Public Toilets x 2	Male & Female @ 4m ²		2	13 4	13.00 8.00			8.00	-11.00 0.00	Showers/lockers on level 02
	Meeting Room Locker/Shower Room/Toilets			2	13	13.00				-11.00	Showers/lockers on level 02

	Consulting Rooms x 3	GP 15m ² p/room	3	15	45.00			45.00	0.00	
	Consulting Rooms x1	Practice Nurse 15m2 p/room	1	15	15.00			18,00	3.00	
	Office	Practice Manager	1	15	15.00			17.00	2.00	P. Communication of the Commun
	Comms & Copier			8	8.00			4.00	-4.00	Copy space only
	Office **REMOVED**	Senior Receptionist	1		0.00			0.00	0.00	
	Office	Admin ×5	5	6	30,00			30.00	0:00	
	Storage			15	15.00			15.00	0.00	
	Storage	Practice Nurse		10	10.00	7		13.00	3.00	
	Meeting Room	Shared with other Practices		7.5	7.50			10.00	2.50	Included in 1 no. Shared meeting room
	Reception Area		2	.6	12.00			12.00	0.00	
	Waiting Area	Patients		22	22.00			28.00	6.00	
	Records Area **REMOVED**	Ratients Records		27	0.00			0.00	0:00	
	Public Toilets x 2	Male & Female @ 4m²	2	4	8.00			8.00	0.00	And the second second
	Staff Room / Library			20	20.00			4.00	-16.00	Tea Station allowance, staff area on level 02
	Locker/Shower Room/Toilets	Shared with other Practices		20	20.00			2.00	-18.00	Showers/lockers on level 02
	Interview Room			10	10.00			0.00		GP's agreed to use Intirms on other levels
fnock					237,50		237.5	206.00	-31.50	
					1210.80					
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D Total Co	200				1210.00		4240.0	4420 5	00.20	Ta .
P Total Sp	ace	1			1210300		1210.8	1120.5	-90.30	
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S C CP ARED	ace				1210.00		902.0 1149.2 215.0	921.0 1125.0 215.0	19.00 -24.20 0.00	
S C CP ARED	ace				1210.00		902.0 1149.2 215.0 892.5	921.0 1125.0 215.0 916.5	19.00 -24.20 0.00 24.00	
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S C C C P ARED Dtal					1.0.00		902 0 1149.2 215.0 892.5 1210.8	921.0 1125.0 215.0 916.5 1120.5 4298.0	19.00 -24.20 0.00 24.00 -90.30	
S C C CP ARED OTAI	MUNICATION & ENGINEERING				121000		902 0 1149.2 215.0 892.5 1210.8	921.0 1125.0 215.0 916.5 1120.5	19.00 -24.20 0.00 24.00 -90.30	

11. Initial Design Risks

A summary of the initial design risks for the Eastwood design study are as follows:

- Topography A survey was not available as part of the briefing documents therefore assumptions were made for the design on the levels across the site and for the location of trees. Action to be taken – full survey required.
- Ground Conditions A SI was not available therefore for costing purposes it has been assumed there are no abnormal ground conditions, presence of ground gases, or high water table. Action to be taken – full survey required.
- Acoustics It has been assumed the noise from the adjacent railway lines and roads will not adversely affect the natural ventilation strategy for the building. Action to be taken – specialist survey required.
- Ecology The ER Planning Brief stated the site does not contain any known areas of ecological significance however this will require to be confirmed with an Environmental Impact Analysis. Action to be taken – specialist survey required.
- Planning Objections BDP's initial meeting with ER Planning and Roads Department was positive however the impact of the development, particularly traffic and parking issues, on the adjoining residential areas will need to be managed. Action to be taken – consultation events with local community.











Figure 11.01 Site Aerial

