

Bundle of documents for Oral hearings commencing from 13 May 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 28

Documents referred to in Impact and Infection Risk of QEUH and RHC site choice expert report by Allan Bennett

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NEW SOUTH GLASGOW HOSPITALS GLASGOW

Environmental Statement April 2007









NEW SOUTH GLASGOW HOSPITALS GLASGOW



For more information please visit www.nhsgg.org.uk

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NEW SOUTH GLASGOW HOSPITALS GLASGOW

Environmental Statement April 2007 Non Technical Summary







Greater Glasgow and Clyde







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Campus Development Plan Indicative Site Layout

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Aerial Photograph

Opportunity to Comment

Copies of the Environmental Statement

Further copies of this Environmental Statement are available at a cost of £150 for a paper copy or £15 for a CD-Rom version. Please contact:

James Miller, Technical Director Ironside Farrar 111 McDonald Road Edinburgh EH7 4NW public transport, walking and cycling rather than the private motor car, thereby promoting sustainable development.

Policies and Plans

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This section reviews the Development Plan framework and other relevant planning guidance and policy and seeks to assess compliance of the New South Glasgow Hospitals proposals with national, regional and local policies and plans. The proposals comply with national policies and guidance in relation to archaeology, economic development, flooding, natural heritage, waste management, transport, noise, open space, urban design and drainage.

The Development Plan comprises the Glasgow & Clyde Valley Joint Structure Plan (2002) and the Glasgow City Plan (2003). Key Structure Plan policies relating to the strategic management of travel demands and strategic environmental resources are supported by the proposals. The site is identified in the City Plan for civic, hospital and tertiary education. Key policies relating to transport infrastructure, vehicle-parking standards, pedestrians and cyclists, urban design, listed buildings and landscape design are all supported by the development proposals.

Disruption Due to Construction

Impacts during the construction phase will occur from a number of sources: noise, emissions and dust arising from vehicles, plant and machinery; visual impact of construction sites and plant and impacts of construction traffic on local roads. The main receptors of construction impacts are likely to be existing users of the hospital site: staff, patients and visitors, residents and occupants of the nearest properties, local communities, other users of the site. Some construction impacts will be unavoidable, and will require to be controlled and mitigated by the standard conditions, restrictions and responsibilities placed upon site development contractors. These measures should reduce most construction impacts to a minor level of significance, although adverse noise, dust and amenity impacts are likely to be of moderate significance for the nearest residents and local communities.

Cumulative Impacts

Cumulative impacts may arise from different impacts, such as noise and visual impacts at the same location or from the accumulation of different major projects in the same local area. A number of major infrastructure, transport and regeneration projects are currently ongoing or planned in the Govan area, including several as part of the Clyde Waterfront Initiative, Scotland's biggest ever regeneration project.

Where there is the potential for construction programmes to overlap, contractors of all schemes will require, where practicable, to identify and implement measures to reduce negative environmental impacts and disruption, e.g. traffic management measures. Close liaison between project

managers will be required through the detailed design stages of the NSGH and any concurrent projects.

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The assessment of likely cumulative impacts has identified a potential for impacts on air quality, noise and traffic and transportation, with receptors including the existing hospital users and local communities

Cumulative impacts cannot be quantified or assessed in detail or at this Outline Planning stage and no specific further mitigation is proposed. Appropriate mitigation measures may be identified as the detailed design progresses.

OPPORTUNITY TO COMMENT

The publication of the Environmental Statement will be followed by a 28-day period when the documents may be inspected at all reasonable hours in the register of planning applications at Glasgow City Council's Offices at Exchange House, 229 George Street, Glasgow G1 1QU.

Any person who wishes to make representations to Glasgow City Council about the Environmental Statement should make them in writing within this 28-day period to the Council at Exchange House, 229 George Street, Glasgow G1 1QU.

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Without the proposed redevelopment, local concentrations of NO2 will remain well within the relevant air quality objectives, whereas annual mean concentrations of dust (PM10) may exceed the 2010 objective.

During the construction period, the existing hospital and local housing will be highly sensitive to any adverse impacts on air quality and may experience minor adverse effects during periods of dry breezy weather and high levels of dust release from construction activity. The work will also give rise to emissions of PM10 and NO2 from diesel plant and construction related traffic. The net effect will be a small increase in local concentrations of PM10 and NOx/NO2, however current objectives are likely to be met.

Construction emissions should not exceed the 2010 PM10 annual mean objective. Off site PM10 concentrations should meet the current objective, but may be exceeded in the hospital's operational areas during prolonged dry weather if inadequate mitigation measures are employed.

Mitigation measures will be required to control emissions during construction. Even with good control measures, there will be a minor impact on air quality (PM10) and a moderate impact on dust nuisance within operational parts of the hospital, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The offsite impacts of construction will be much smaller

On completion, the increase in traffic flow will have a small adverse effect on local concentrations of PM10 and NO2, however, local air quality objectives should still be achieved.

A more detailed assessment is recommended of air quality impacts and dust emission mitigation measures during construction when the detailed construction programme is available. The proposed redevelopment will not result in significant effects on local or regional air quality.

Cultural Heritage

The Southern General Hospital site remained relatively undeveloped until the construction of the hospital in the mid 19th century. Eleven sites of cultural heritage interest are located within the proposed development area. These include the hospital itself, a World War II balloon barrage mooring, two Listed Buildings at 1345 Govan Road, the former asylum and a three-storey building constructed in the 1920s.

The proposed development will have a direct impact of minor-moderate significance and a negligible visual impact on the two Listed Buildings at 1345 Govan Road. The demolition in 2009-2010 of the former asylum building and the three-storey building will be an impact of moderate significance.

A programme of Historic Building Recording is recommended prior to any alterations to the Listed Buildings and prior to the demolition of the former asylum and three-storey building. In addition, an archaeological watching brief is recommended to monitor the groundbreaking works required to assess the condition of the foundations of the Listed Buildings at 1345 Govan Road and during the demolition of the former asylum and three-storey building.

Given the extent of recent development and disturbance which has occurred within the proposed development area, it is not thought that any archaeological remains of significance will survive intact below the modern ground surface; as a result no further mitigation is recommended.

Ecology and Nature Conservation

The New South Glasgow Hospital site lies within a built-up urban area and comprises a mixture of buildings of varying age, scale and construction, mowed grass, hard-standing and an area of greenspace which is partly wooded on the western boundary, on the site of the former small holding next to the ambulance station. More than 350 trees are identified in a Glasgow City Council Tree Preservation Order for the site. A small ditch runs for a short distance through the greenspace, into a culvert under the hospital grounds.

The site and its surroundings have no nature conservation designations. An ecological walkover survey identified no potentially significant impacts on habitats, birds, invertebrates or plants. A bat survey found no evidence of bats on site, but several buildings have potential for bat roosts. Precautionary measures are proposed to ensure no adverse impacts on bat species. Measures to avoid the spread of invasive plants are also proposed.

The proposed development is not expected to result in significant adverse ecological impacts.

Sustainability

This section provides a non-quantitative assessment of the project's impacts on sustainable development targets and indicators, both national and local. Adverse impacts include air quality issues relating to traffic generation and the demolition rather than re-use of existing buildings. These are offset by considerable beneficial impacts relating to the appropriate use of land, efficient energy use and protection and enhancement of existing green space. In addition, the site's central location and excellent transport links are designed to encourage the use of

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NON-TECHNICAL SUMMARY

Introduction

This document is a non-technical summary of an Environmental Statement prepared by Ironside Farrar on behalf of NHS Greater Glasgow & Clyde (the Board). It relates to the proposal to upgrade and redevelop the Southern General Hospital, Glasgow. The project is known as the New South Glasgow Hospitals (NSGH). The principal components of the project comprise a new adult acute hospital and a new hospital for sick children.

Environmental Statement

An Environmental Statement is a written report that draws together the findings of the environmental impact assessment (EIA) process. EIA identifies the likely consequences for all aspects of the environment and for man's health and welfare arising from the proposed development. The assessment and identification of environmental impacts of the Campus Development Plan and the Indicative Design provides information for the developer, local and central government, agencies and the public to enable the comparison of the development's benefits with any environmental loss.

Site Description

The site, dating from the late 19th century, extends to 28 hectares and consists of a teaching hospital in a campus style layout with associated open space and car parking facilities. The hospital site can be accessed from the nearby M8, junction 25, and locally from the A739 Clyde Tunnel access.

NEED FOR THE PROJECT

Glasgow's Hospitals - Acute Services Strategy In January 2002 the Board agreed that the future pattern of adult acute care would be delivered from five hospital sites within Glasgow. Two new Ambulatory Care and Diagnostic Hospitals (ACADs) are to be built at the Victoria Infirmary and Stobhill Hospital while in-patient services are to be provided at the Southern General, Gartnavel and Royal Infirmary sites.

Within this strategy the Southern General Hospital was confirmed as the single in-patient site within South Glasgow. In June 2002 the Board further decided that full accident and trauma care would be delivered from the Royal Infirmary and Southern General Hospital.

Royal Hospital for Sick Children

In early 2006 the Board decided to re-provide the existing children's hospital at Yorkhill on the Southern General site. The new Children's Hospital will deliver a world-class facility providing local, regional and national services.

It will be strategically placed to complement, and benefit from, the services of the New South Glasgow Hospital and the existing Neurosciences Institute and Maternity Hospital.

PROPOSED DEVELOPMENT

Consideration of Alternatives

As part of the Acute Services Review, options for the new adult acute hospital included the identification of a new greenfield site or to rebuild on the Southern General site, which assumed all facilities including Maternity/ Neurosciences etc. would be rebuilt on a vacant site away from existing SGH. A further option considered was whether to construct separate adult acute and children's hospitals, or a combined development with the two hospitals on adjacent sites.

The review concluded with the identification of the provision of the new adult acute and children's hospitals on adjacent sites on the existing Southern General Hospital site as the preferred option. This option has been endorsed by the Board and developed as the Public Sector Comparator.

Development Proposal

The proposal is to build a new circa 1109-bed adult acute hospital on site, providing outpatient, diagnostic and treatment facilities for local patients and a new circa 245-bed children's facility integrated with maternity facilities allowing specialised adult, maternity and children's facilities to be located together on the same site.

Indicative Design

The environmental assessment considers the indicative design prepared by the Board and its advisors to test and develop their brief for the site. This is only an indicative, exemplar scheme and does not reflect what will ultimately be built. It has been included to illustrate one possible solution and to provide a basis for initial assessment. However, many of the principles developed in the Campus Development Plan and the Exemplar Design will inform the approach adopted by the bidders in developing their own designs. In particular, principles of access, including pubic transport, private vehicle, ambulance, service vehicle, pedestrian and cycle routes, building location and massing, landscape, phasing and infrastructure will inform the work of the preferred bidder.

Landscape Strategy

A landscape strategy has been prepared which aims to create a cohesive campus and a quality hospital environment conducive to the care and healing of patients, integrating the hospital redevelopment with the existing landscape of the surrounding communities. The landscape spaces to be created across the campus range in form and scale from large passively monitored open space down to maintained and closely monitored courtyards Thirteen landscape zones have been identified, based on function, and landscape proposals are presented for each.



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ENVIRONMENTAL IMPACT ASSESSMENT

Land Use

The proposed development covers an area of some 28 hectares. Located in the south side of Glasgow, surrounding land uses consist of a mixture of residential to the south and east, industrial and business to the west, hi-tech industry to the north and the Shieldhall Waste Water Treatment Works to the north west. The site is currently used by the hospital and the land is therefore classified as Class 8 under the Use Classes Order 1997. There is also an area of greenspace in the west of the site

The site is currently serviced by all utilities: gas, electricity, water (supply and drainage) and telecoms. Land use and infrastructure impacts will be of minor to negligible significance, provided that mitigation is implemented to avoid inadvertent damage to service infrastructure, and that there is adequate capacity to service the proposed new development.

Ground Conditions

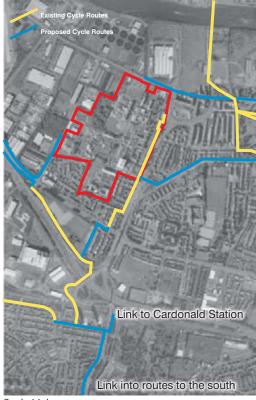
A study addressed the existing ground conditions within the development site in order to assess the potential impacts the ground conditions may have on the development. Potential environmental receptors include soils, geology and the development itself.

Impacts of the proposals on the site geology will be negligible. The presence of localised contamination will require to be confirmed by a programme of site investigations prior to construction, and suitable mitigation implemented. Residual impacts of site geology and soils on the proposed development will be low or negligible.

Community, Pedestrians and Cyclists

This assessment describes the impact of the proposed development on communities, cyclists and pedestrians. The proposed development is situated to south west of Glasgow city centre, south of the River Clyde, in an area of mixed residential, industrial and business uses. Both the hospital community of staff, patients and visitors and the surrounding communities of Linthouse, Shieldhall and Govan are considered. There is currently limited pedestrian and cyclist access through the hospital site and there is little interaction between the hospital site and the local community. No historical through routes are identified on historical maps.

The construction phase is likely to give rise to adverse impacts on community amenity, as a result of noise and dust nuisance and visual impacts. Construction traffic will result in minor severance impacts on the local road network. On completion of the construction phase, the community will benefit from improved access through the site and improved access to cycling and pedestrian links to the wider area and to green networks.



Cycle Links

Considerable improvements are proposed for public transport, which together with the implementation of a Travel Plan and a comprehensive parking strategy will effectively 'cap' development traffic to existing levels during the AM and PM peak periods. The development will result in no additional severance of local communities as a result of traffic increases. Community impacts range from minor adverse to moderate adverse during the construction period, but during the operation of the hospital, impacts on pedestrians, cyclists and community are beneficial.

Townscape and Visual

The landscape and visual assessment characterises the existing townscape, identifies potential visual receptors and identifies and evaluates beneficial and adverse landscape and visual impacts of the proposed development during construction and following completion.

Townscape impacts of the Campus Development Plan proposals are assessed against accepted urban design objectives which are to be integral to the design and implementation of the Campus Development Plan. Townscape impacts are assessed as moderate/substantial beneficial over most of the site.



Indicative Design - View from the west

A representative range of visual receptors is assessed, concentrating on areas of public access including main thoroughfares (such as M8, A814 Clydeside Expressway and Govan Road) and viewpoints (such as Dawsholm Park and Gleniffer Braes Country Park). A range of private residential properties is also assessed. Impacts are neutral for most of the public and private receptors.



Indicative Design - View from the east

Water and Drainage

There are no surface watercourses or waterbodies on or in close proximity of the site. There are three culverted burns under the site. Surface water from the site drains to a combined sewer and then to the River Clyde, some 400 metres north of the site boundary. The site is not located within a SEPA defined flood risk area.

Surface water drainage will comprise a Sustainable Urban Drainage System complying with SEPA and Scottish Water requirements. Groundwater is of low vulnerability. Provided appropriate measures are taken to address soil contamination, impacts on groundwater will be negligible.

Scottish Water is currently undertaking a Water and Drainage Impact Assessment on behalf of the Board. The results of this assessment, due in May 2007, will inform the water and drainage assessment at the detailed planning stage.

Mitigation measures to control impacts on water quality and drainage during construction will comprise compliance with current SEPA guidance and best practice procedures on site drainage, deliveries, storage and waste disposal and management issues.

No significant adverse impacts on water quality, quantity or drainage are envisaged.

Noise and Vibration

An assessment of potential noise and vibration impacts has been undertaken at a level commensurate with the outline planning status of the project. It has been determined, based on the Transport Assessment that the proposed development would have no impact on the trunk road network and that in terms of the local network the proposal will have a negligible impact on traffic levels.

Prior to commencement of work the Contactor should establish whether or not the Local Authority wishes to employ Best Practicable Means as an approach to control noise or whether a baseline noise survey is required. If the latter is deemed necessary the procedure to be adopted must be agreed with the Local Authority.

When detailed method statements for construction are available an assessment of hospital noise and vibration sensitivity should be undertaken and adequate controls put in place prior to the commencement of any construction/demolition work.

A detailed assessment of helicopter noise will be required for the temporary relocation site and the planned new roof-top site. It should be noted that at the Royal London Hospital secondary glazing was offered to all residents within a specified distance of the landing pad. A detailed assessment of likely qualifying properties will be required based upon a predetermined significance of impact criteria. The local authority should be included in agreeing the trigger level.

Air Quality

There are no major point sources of air pollution close to Southern General Hospital. Local air quality Glasgow/Central Belt conurbation. The adjacent Shieldhall Waste Water Treatment Works is currently a significant source of odour nuisance, although this is likely to reduce as a result of planned works within the next decade.



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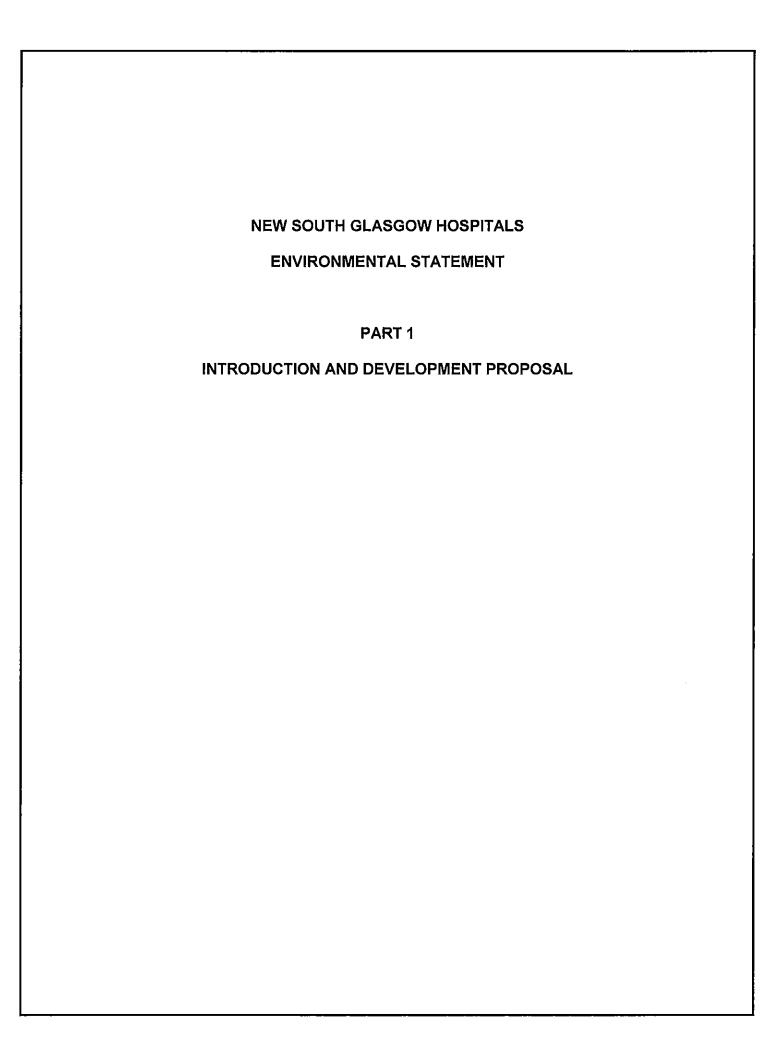
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1.0 INTRODUCTION

1.1 Project Background

This Environmental Statement has been prepared to support the planning application to Glasgow City Council by NHS Greater Glasgow and Clyde (the Board) for the upgrading and redevelopment of the Southern General Hospital near Shieldhall, Glasgow. A location plan, a plan of the site and aerial photograph of the site are provided in Figures 1.1, 1.2 and 1.3 respectively.

The Board are redeveloping the site as part of the ongoing Acute Services Review (ASR) strategy. Outline Planning Approval forms a significant milestone on the project's critical path. The Board are continuing with the preparation and submission of their Outline Business Case (OBC) to the Scottish Executive.

1.2 The NSGH Campus Development Plan

The Outline Planning Application and this Environmental Statement are based on the New South Glasgow Hospitals Campus Development Plan as prepared by the Board's advisory team. This proposes a complete overhaul and redevelopment of the existing hospital campus, with extensions to existing properties, some demolition and associated parking, pedestrian and vehicular circulation.

The Campus Development Plan is prepared in support of the proposed redevelopment of the Southern General Hospital site over the next 10-year period. A significant part of this development activity would involve the construction of new circa 1109-bed Adult Acute and circa 245-bed Children's Hospitals. The Healthcare services on the site are currently provided by the Board.

The Campus Development Plan provides the framework which will guide the long-term redevelopment of the Southern General Campus resulting in the significant rationalisation and modernisation of hospital services on the campus. The document sets out the Board's vision for the creation of a modern healthcare facility to serve the wider Glasgow area and outlines the opportunities and constraints which will impact on its future redevelopment. The Campus Development concludes by setting out a broad phasing strategy of construction and demolition activity over the next 5-10 years.

The Campus Development Plan has been prepared in consultation with officials of Glasgow City Council, including Development & Regeneration Services and Land Services. The document, and its future updates, will provide the City Council with a framework within which to assess individual applications at the site, placing both the requirements for supporting information and determination of the material issues in a wider context.

1.3 The Indicative Design and Outline Planning Application

The Outline Planning Application relates to the proposed hospital redevelopment and does not include those parts of the site where existing buildings are to be retained or those areas where other separate development will take place in the future. A broader Campus Development Plan was submitted in December 2006. The Campus Development Plan provides information on the whole of the site owned by the Board and sets out their plans for the future of the site as far as these are known at this stage. It therefore provides a context and a Development Control Plan or overall framework within which the proposals for the hospitals development can be assessed.

Environmental Statement Chapter 1: Introduction

This Environmental Statement includes the description of an indicative proposal in section 5.0. The indicative design has been prepared by the Board to test the project brief and provide a benchmark for OBC costing. It should be noted that the design is only an indicative, example scheme and does not reflect what will ultimately be built. It has been included here to illustrate one possible solution and has been included with the OPA to provide some further background.

The indicative design also provides future development partners with a design when preparing their own detailed proposals. Partners are at liberty to adopt aspects of the design or develop their own alternative proposals in dialogue with the Board. A partner will be selected on the basis of cost, design quality and service provision. The partner will then submit a full and detailed planning submission to Glasgow City Council.

A detailed planning application will be submitted in due course once a funding, design and construction partner has been selected. Responsibility for obtaining detailed planning approval will rest with the Board's future partner(s).

The Board and its advisors have considered various options for the redevelopment both through the exploration of alternative high level options and with reference to other example projects in the UK and around the world.

The New South Glasgow Hospitals presents an unusual challenge in that, although there are a number of synergies and shared services, they will remain as two separate hospitals. Added to this, the new hospitals must link to certain existing buildings on the site. The adult facility will when complete form one of the largest acute hospitals in Europe containing around 1700 beds in both new and existing buildings. The combination of these factors has required innovative thinking and hard debate where an existing model cannot be sourced. This debate still continues and will do so up until the brief is finalised.

1.4 Development Programme and Phasing

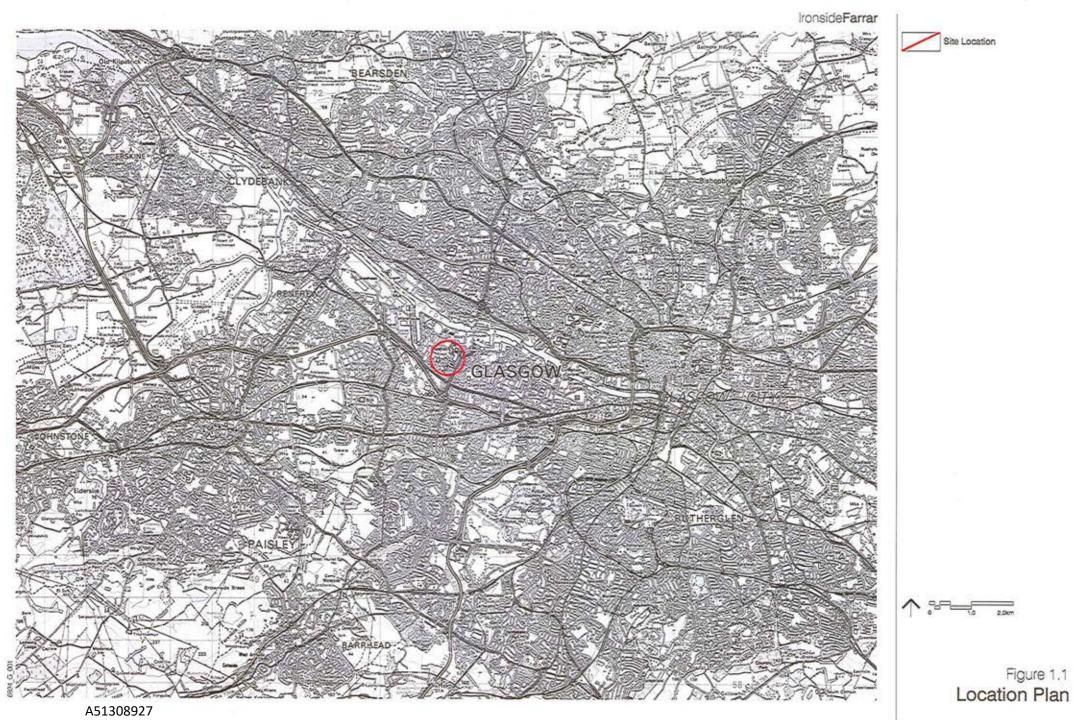
The development proposals have to accommodate the requirements of the existing hospital to allow its continued operation during the development stages. This is of paramount importance. Phasing of the work and the need to deliver the new hospitals in one continuous build will, however, place inevitable constraints on the redevelopment process and will require to be carefully managed to minimise environmental impacts. The Board has therefore, carried out extensive studies of both the clinical and service phasing requirements to achieve this. A process of decant, demolition and site service modifications is already underway. Phasing Plans ware included in the Campus Development Plan.

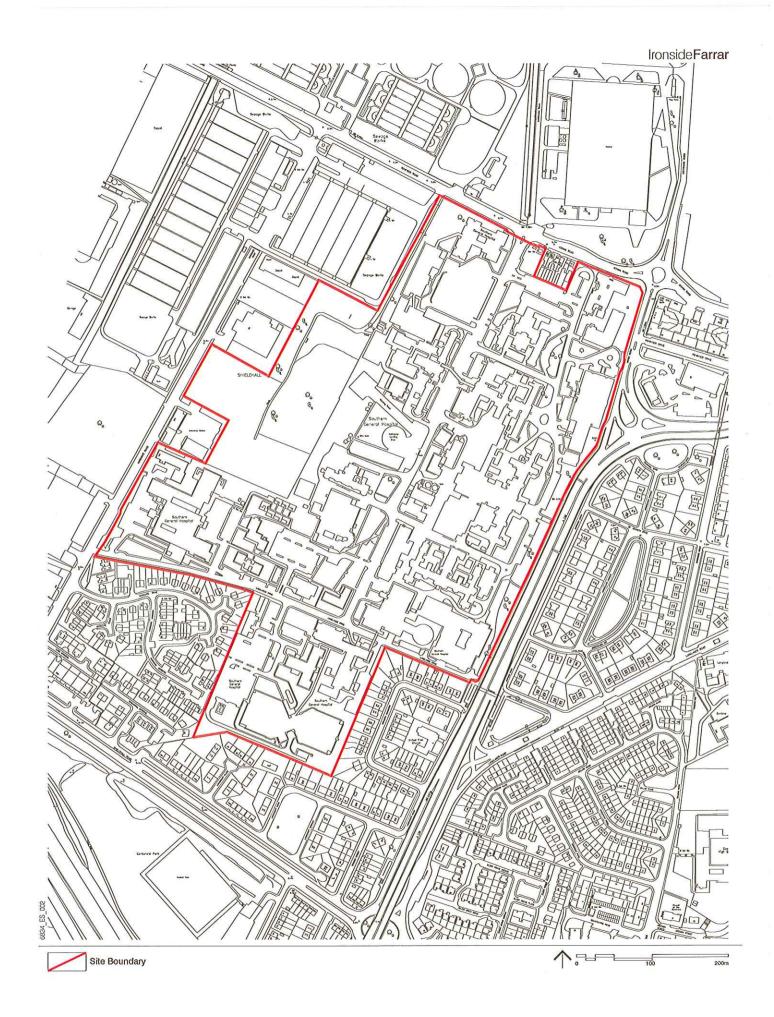
1.5 Requirement for an Environmental Statement

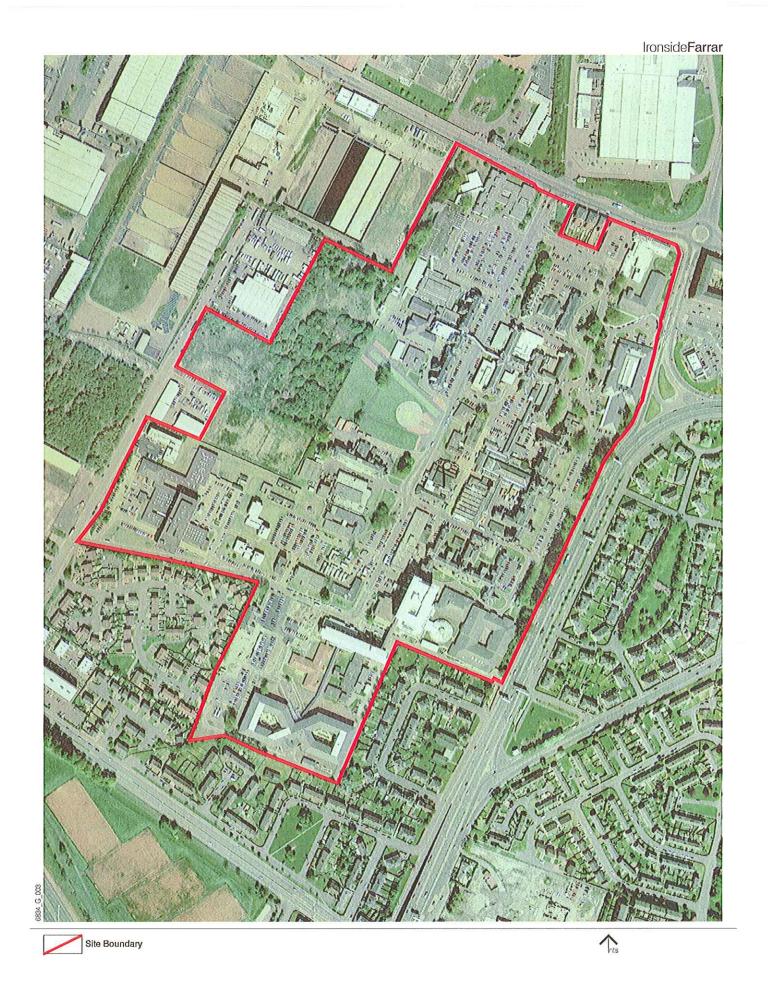
The City of Glasgow Council Planning Department has advised that a formal Environmental Impact Assessment is required for the proposed development. Within the terms of the Environmental Impact Assessment (Scotland) Regulations 1999, the proposals are considered to be a Schedule 2 type of development ('urban development').

1.6 Ironside Farrar Ltd

Ironside Farrar Ltd is one of Scotland's leading environmental consultancies offering multi-disciplinary professional service in Environmental Planning and Environmental Science with specialist experience in Environmental Impact Assessment and Environmental Design and Mitigation. The practice is fully registered with all the







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1.7 Further Copies of the Environmental Statement

Further copies of this Environmental Statement are available at a cost of £150.00 for a paper copy, and £15.00 for a CD-Rom version.

Please contact:

James Miller Technical Director Ironside Farrar 111 McDonald Road Edinburgh EH7 4NW

2.0 APPROACH AND METHODOLOGY

2.1 Structure of the Environmental Statement

This Environmental Statement is divided into six parts, summarised below:

Part One

Introduction and Development Proposal

Part Two

Need for the Project

Part Three

The Development Proposal

Part Four

Environmental Impact Assessment

Part Five

Schedule of Environmental Commitments

Part Six

Appendices

2.2 Legislative Context and Policy Guidance

This Environmental Impact Assessment (EIA) has been undertaken within the context of European and Scottish legislation and guidance concerning the content of Environmental Statements for development projects.

The European Directive

The statutory requirement for Environmental Impact Assessment is the 1985 European Council Directive (No. 85/337/EEC) 'on the assessment of the effects of certain public and private projects on the environment'. This was amended in 1997 by the European Council Directive 97/11/EC.

Environmental Impact Assessment (Scotland) Regulations 1999

The Environmental Impact Assessment (Scotland) Regulations (Scottish Statutory Instrument 1999 No. 1), as amended by the Environmental Impact Assessment (Scotland) Regulations 2002 (SSI 2002/324), transpose the EIA Directive into Scottish planning law. Circular 15/1999, as amended by Directive 97/11/EC, provides a statement of Scottish Executive Development Department's policy and gives guidance on the implementation of the regulations. In addition, Planning Advice Note (PAN) 58, Environmental Impact Assessment provides information and advice on the process of Environmental Impact Assessment and on good practice.

2.3 Screening

The first stage of the EIA process is screening to determine whether or not EIA is required. The 1999 Regulations set out the descriptions of development and applicable thresholds and criteria for the purposes of classifying development as Schedule 2 development, and therefore requiring screening.

The New South Glasgow Hospital proposal is classed as a Schedule 2 development as a result of its size. As a Schedule 2 project there is a requirement to screen the proposal to determine the requirement for an environmental impact assessment.

Glasgow City Council has adopted a Screening Opinion, dated 24 March 2006, that the proposal for a new hospital at the Southern General Site does constitute EIA development. An Environmental Statement is, therefore, required.

2.4 Scoping Study

An Environmental Scoping Study of the proposals was conducted by Ironside Farrar Ltd in July 2006. Scoping is an early stage of an EIA process and is designed to ensure that the environmental studies provide the relevant information on:

- The impacts of the project, in particular focussing on the most important impacts
- The alternatives t o the project
- Any other matters to be included.

The findings of the scoping exercise helped define the 'scope' of the environmental information to be included in the Environmental Statement, and provided the terms of reference for the environmental studies to be undertaken to compile that information.

The outcome of the scoping exercise indicated that the key issues to be addressed by the Environmental Impact Assessment of the proposed development at the New South Glasgow Hospital site are:

- Landscape and Visual
- Traffic and Transportation
- Community Effects
- Cultural Heritage

Scoping Opinion of Glasgow City Council

A formal Scoping Opinion was sought from Glasgow City Council, within terms of Regulation 10 of the Environmental Impact Assessment (Scotland) Regulations 1999, a copy of which can be found in Appendix 1. The GCC Scoping Opinion noted that Ironside Farrar's Scoping Report was acceptable for the purposes of the Regulations and identified the following key issues for assessment;

- Impact on surrounding Listed Buildings
- Visual context, including agreed viewpoints
- Traffic and transportation, including proposals impact on adjacent trunk road network
- Maximising contribution of site to landscape quality of green space
- Linkages between site and its surrounding hinterland
- Hydrological and hydrogeological conditions, including SUDS
- Potential bat presence and mitigation
- Significance of sunlight
- Air traffic control issues

The content of this Environmental Statement is guided by the findings of the Environmental Scoping Study and the consultation responses, and will provide an indepth assessment of the environmental topics listed above. Those issues identified as being unlikely to be significantly affected by the proposed development will not be afforded the same degree of importance, focus and analysis within the EIA process as those considered as key. This approach is intended to produce a concise and focussed Environmental Statement, improving interpretation and accessibility.

2.5 Aim of the Environmental Statement

Environmental Impact Assessment (EIA) is a process for identifying the likely consequences for the biological, physical and geomorphological environment and for human health and welfare arising from development (or range of development

options), and for considering the environmental issues as an integral part of the development planning and design process. Thus, a detailed assessment and identification of environmental impacts is required to provide information for the developer, local government and the public to help compare the benefits to be derived from the proposed development against any environmental loss. The Environmental Statement (ES) is the written report of the EIA findings.

The aims of environmental impact assessment are:

- To provide a detailed understanding of the environment of the proposed site and its surroundings
- To identify potential environmental impacts associated with the proposed future development of the site
- To provide a detailed assessment of those impacts likely to be significant
- To identify appropriate mitigation measures
- To provide information to assist the planning authority to make a determination on the planning application
- To assist consultation with the local community.

2.6 Environmental Impact Assessment Methodology

2.6.1 General Approach

In order to fulfil the requirements for information to be included in Environmental Statements, as listed in Schedule 4 of the Environmental Impact Assessment (Scotland) Regulations 1999, the impact assessment exercise will use the following methodology:

- Consultation with statutory and non-statutory consultees
- Review of published information and Environmental Scoping Report
- Consideration of potential impacts, including:
 - Current land use and infrastructure
 - Landscape and visual impacts
 - Ecology and nature conservation
 - Water quality and drainage
 - Geology and soils
 - Noise and vibration
 - Air quality
 - Community effects
 - Cultural heritage
- Consideration of mitigation proposals
- Identification of source pathway receptor linkages
- Assessment of impact significance in terms of magnitude, characteristics and receptor sensitivity
- Compliance where appropriate with impact assessment procedures described in the Design Manual for Roads and Bridges (DMRB) Volume 11
- Recognition of guidance provided in SNH Handbook on Environmental Impact Assessment, 2002

Specific methodologies for individual impact assessments, e.g. noise, visual impact, etc, will be described within the relevant chapter.

This ES has been conducted on the development proposals as described in the method statement and illustrated in the plans accompanying the planning application. An outline description of the proposals is provided in Chapter 5.

2.6.2 Evaluation of Impact Significance

The assessment of impact significance has used, where appropriate, the following methodology based on SNH's recently published guidance on EIA (A Handbook on Environmental Impact Assessment, Scottish Natural Heritage, 2002). In simple terms, the aim is to assign a level of significance based on impact magnitude and receptor sensitivity. Impact significance is assessed on the basis that the mitigation described within this report will be implemented.

Impact Magnitude

Impact magnitude is assigned on consideration of a combination of three parameters:

- Characteristics
- Quantification
- Probability

Impact Characteristics

The following parameters are used to indicate the character of the impact, as appropriate:

Predicable/ Unpredictable

Short/ Medium/ Long-term

Direct/ Indirect

One-off/ Intermittent/ Continuous

Positive/ Adverse

Certain/ Uncertain (identification of impact)

Temporary/ Permanent

Avoidable/ Unavoidable

Reversible/ Irreversible

Small/ Large

Localised/ Widespread

Individual/ Cumulative

Quantification

Where practicable, the extent of impact is expressed in absolute and relative terms, i.e. acres habitat lost, % of habitat in area.

Probability

An indication is provided of the likelihood of the impact occurring.

Receptor Sensitivity

The sensitivity of the receptor should be assessed as major, moderate or minor. The method for this will be specific to the environmental medium under construction. Sensitivity can be described as the resilience of a receptor to cope with changes resulting from an impact and the use and value which society has assigned to it.

Significance of Impact

Impact magnitude and receptor sensitivity are combined to indicate significance. Impact significance range is described in terms of major/ moderate/ minor/ negligible and combinations (e.g. minor-moderate), adverse and positive. The table below indicates a potential matrix.

Table 2.1 Significance Matrix

Magnitude		Significance	
Major	Moderate	Moderate/ Major	Major
Moderate	Minor/moderate	Moderate	Moderate/ Major
Minor	Negligible	Minor	Minor/ Moderate
	Minor	Moderate	Major
	Sensitivity		

2.7 Consultations

An important element in the environmental impact assessment is consultation with statutory and non-statutory agencies likely to have an interest in the development. During EIA process, the agencies and organisations listed in Table 2.2 were consulted.

Table 2.2 Consultations

Authorities and Agencies	Area/ Office
Health and Safety Executive (HSE)	Edinburgh
Historic Scotland	
Scottish Environment Protection Agency (SEPA)	
Scottish Executive Development Department (SEDD)	Edinburgh
Scottish Executive Environment and Rural Affairs Department (SEERAD)	Edinburgh
Scottish Natural Heritage (SNH)	
Scottish Water	
Scottish Rights of Way and Access Society (Scotways)	Edinburgh
Glasgow City Council, Environment Service, Archaeology Officer	Glasgow
Glasgow City Council, Countryside Service, Access Officer	Glasgow
Glasgow City Council, Development Control, Trees Officer	Glasgow
Glasgow City Council, Planning and Regulation	Glasgow
Glasgow City Council, Roads and Transport	Glasgow
Sustrans Scotland	Edinburgh

Appendix 2 includes copies of all consultee responses and a summary log sheet. Specific references to the consultation responses are included in the appropriate chapters of the ES.

2.8 The Assessment Team

The ES has been prepared by Ironside Farrar Ltd with specific specialist input as detailed below:

Table 2.3 Assessment Team

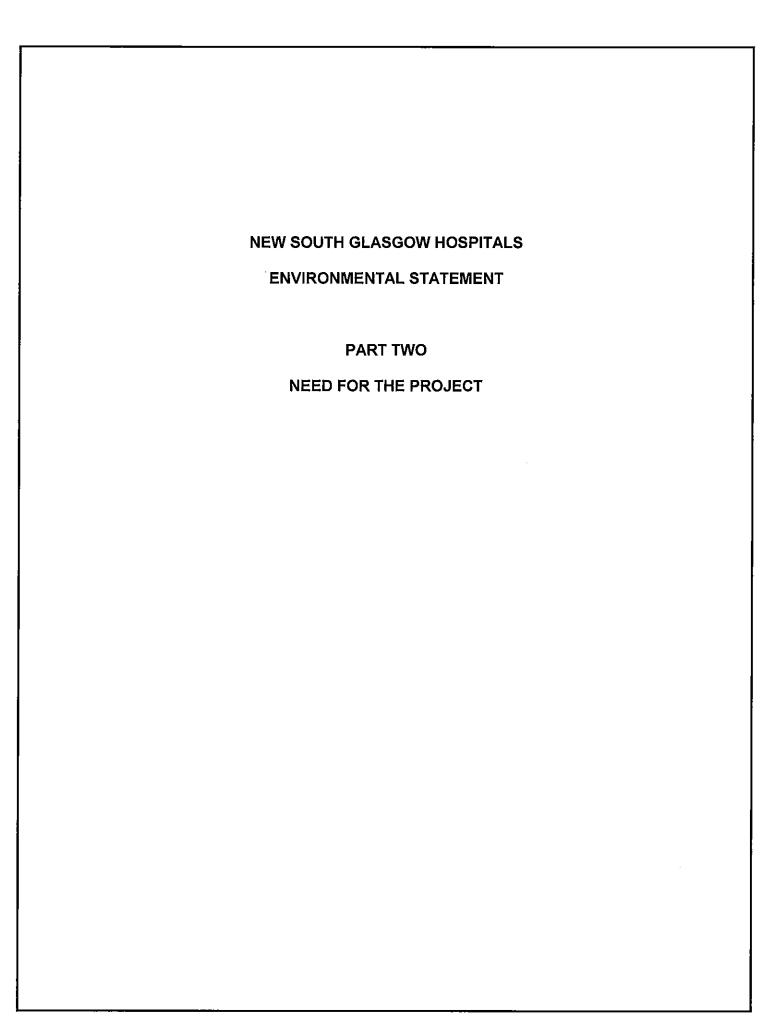
Environmental Specialism	Organisation	
Archaeology and Cultural Heritage	AOC Archaeology	·
Noise and Vibration	Hamilton & McGregor	
Air Quality	IOM	

2.9 Sources of Information

The ES takes account of information on the development proposals from the following sources:

- Campus Development Plan Keppie Design
- Landscape Strategy Keppie Design
- Design Statement Avanti Architects
- Transportation Assessment JMP Transportation Consultants
- Civil/Structural Engineering Review McLay Collier & Partners
- Sustainability Max Fordham
- Ecology SKM
- Flood Risk Assessment Curry & Brown
- Community Engagement NHS GG & C

A number of technical site surveys and desk studies relevant to the EIA process have been undertaken in recent months. These include both baseline information and consideration of potential impacts of the development proposals. These have been used to inform the EIA. A complete list of references is included in Appendix 3.



3.0 NEED FOR THE PROJECT

3.1 Acute Services Strategy

The Board, at its meeting held on 29th January 2002, agreed that the future pattern of adult acute care would be delivered from five hospital sites within Glasgow. Two new Ambulatory Care and Diagnostic Hospitals (ACADs) are to be built at the Victoria Infirmary and Stobhill Hospital while in-patient services are to be provided at the Southern General, Gartnavel and Royal Infirmary sites.

At Board meetings on 29th January and 19th March 2002, the Southern General Hospital was confirmed as the single in-patient site within South Glasgow with the Glasgow Royal Infirmary and Gartnavel General Hospital providing in-patient sites in North Glasgow. The Board's final decision on the provision of clinical services taken at a meeting held on 27th June 2002 determined that full accident and trauma care would be delivered from the Royal Infirmary and Southern General Hospital. In support of the two Accident and Trauma Units, Gartnavel General Hospital would not have full accident and emergency facilities but it would continue to receive referrals for emergency admission that have already been assessed by general practitioners.

3.2 Royal Hospital for Sick Children

In addition to the provision of the new adult acute care facility, the decision was taken in early 2006 to re-provide the existing children's hospital at Yorkhill on the Southern General site. The new Children's Hospital will deliver a world-class facility providing local, regional and national services. It will be strategically placed to complement, and benefit from, the services of the New South Glasgow Hospital and the existing Neurosciences Institute and Maternity Hospital. The range of services to be provided will be based on those currently in place at Yorkhill and the aspiration to develop and introduce new services will be fully maintained.

3.3 Implementation of Strategy

The implementation of the full strategy is expected to be delivered over a ten-year period. The Minister for Health and Community Care has endorsed the Board's Acute Services Strategy.

It is proposed that the development of the new South Glasgow Hospitals is achieved by the phased redevelopment of the existing Southern General Hospital. This would involve the demolition of several existing buildings and construction of new facilities within the boundary of the existing hospital site.

The final configuration of Hospital Services for South Glasgow under the Acute Services Review provides all acute services from the Southern General Hospital site and the proposed ACAD Hospital at the Victoria Infirmary.

3.4 The Acute Services Review

The Acute Services Review (ASR) addressed a number of challenges that Glasgow faces in modernising its acute services, these included:

- Outdated buildings, unsuitable and unfit for modern healthcare 21st century healthcare in 19th century buildings.
- Inpatient sites which are unable to provide the one stop / rapid diagnosis and treatment models for the large volumes of patients treated in Glasgow hospitals

- Fragmentation of care, as patients are required to move around sites and different buildings.
- Unsuitable diagnostic and imaging facilities
- Increasing sub-specialisation in medicine
- Glasgow's role in teaching and research and the links with the universities
- Too many inpatient sites requiring emergency on call rotas on each site
- Changes in doctors' training

The final configuration of acute services will be as follows:

- Three adult inpatient acute sites at Glasgow Royal Infirmary, new South Glasgow site and Gartnavel General Hospital
- Two A&E/ Trauma units at Glasgow Royal Infirmary and New South Glasgow Hospital
- An Acute Receiving Unit for GP referrals at Gartnavel General Hospital
- Five Minor Injuries Units at Glasgow Royal Infirmary. New South Glasgow Hospital, the New Stobhill and Victoria Hospitals
- Two new hospitals at the Stobhill and Victoria Infirmary sites providing ambulatory care
- Two maternity units at the Southern General site and Glasgow Royal Infirmary
- A new Children's Hospital co-located with a maternity unit on the Southern General site

The development is, therefore a critical component in delivering the necessary improvements to clinical facilities to deliver a new model of care for Glasgow as a whole. The co-location of children, adults and maternity on one site, the "Triple Gold Standard", presents a unique opportunity to deliver a fully integrated, inclusive environment which contributes positively to staff and patient wellbeing in clean and modern surroundings. The Board wish to deliver an iconic development that will contribute positively to the local context and be viewed with pride by the people of Glasgow, that meets the aspirations of patients and staff and provides an attractive, functional and quality environment to support the development of clinical excellence.

3.5 The Case for Change

The ASR recognises that current arrangements for delivery of Healthcare across the city are not sustainable in the longer term with much of our 21st Century medicine being delivered in outmoded 19th Century buildings. It is significant to note that many of the original buildings at the Southern General still in clinical use today were contemporary with Joseph Lister's appointment as head surgeon at the Royal Infirmary. Contrasted with this it is easy to see how medical and technological advances have leapt ahead of the hospital's built estate.

This problem is by no means unique to Glasgow and today we see an unprecedented UK wide programme of investment in Healthcare Buildings. Much of this is being driven by changes in 'patient focused care' with greater consideration now given to the physical and psychological needs of those requiring treatment and the environment in which this is delivered.

All too often in the past, buildings have determined how effectively and efficiently patients are treated and increasingly they are found to be lacking. As visitors to hospitals we are all too familiar with passing vulnerable strangers lying on a trolley as they are moved to and from potentially stressful procedures or pushed past waste containers stored in the same corridors. Over time we grow used to this and our expectations become accustomed to this being the norm.

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It need not be so. Although Scottish Hospitals provide some of the worlds leading clinical care (Yorkhill is recognised internationally as one of the worlds leading paediatric centres) the UK health sector's built environment has become one of the poorest in the developed world. Doing nothing is not an option.

The ASR and more specifically the New South Glasgow project will deal with the Heath estates clinical and environmental shortcomings. The adult acute facility will provide one of the City's two emergency acute facilities allowing expert staff to work and operate closely together. This ensures that in an emergency situation the right patients see the right staff at the right time on one site thereby leading to better health outcomes.

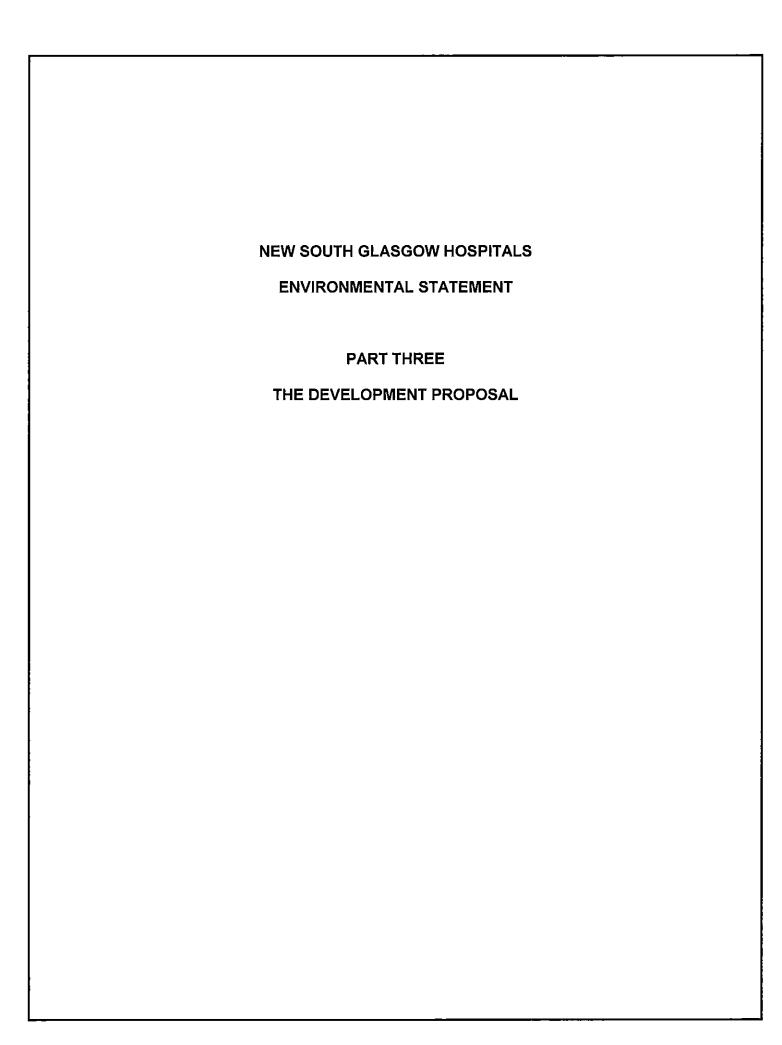
Medicine has become more specialised and whereas in the past a single surgeon may have performed a whole variety of operations, now more procedures are available and specialists increasingly deal with particular morbidities and parts of the body. Diagnosis can also be a multidisciplinary task often requiring patients to be seen by a number of expert staff before an accurate assessment of their condition is made. Having the expert staff together and closely integrated helps ensure valuable time is not lost before a treatment programme can start to make that person well.

Evidence also exists that patients who are kept in hospital longer than necessary become passive and quickly institutionalised. This in itself can extend recovery times. Advances in anaesthetics and surgical procedures now mean that more operations can be carried out as day cases, using local anaesthetic and minimally invasive techniques (i.e. keyhole surgery). Historically many beds were taken up in hospitals by patients recovering more from the effect of the anaesthetic that the operation itself. Delivery of rapid focused care ensures patients can get back on their feet and leave hospital before becoming institutionalised.

Imaging and radiology have provided unimaginable advances since the first crude x-rays were used at the end of the 19th Century and start of the 20th. A whole variety of imaging and scanning equipment is now available which allow clinicians to examine a patient and make rapid and accurate diagnosis. Increasingly this technology avoids painful and debilitating "exploratory" operations and consequent aftercare, providing instead a view inside without physical intervention. Advances in this technology now see imaging employed across many more fields of medicine with more departments requiring short and direct links to these facilities.

The ASR has provided an opportunity for a wholesale improvement of patient services for which the work at the New South Glasgow Hospitals is a cornerstone. The rationalisation of maternity services onto the Royal Infirmary and New South Glasgow sites will provide those mothers that require it with immediate links to adult critical care facilities, thereby reducing risk. The co-location of children, adults and maternity on one site achieves the "Triple Gold Standard" of care ensuring that any problems can be dealt with as quickly as possible to maximise patient safety.

Delivery of these clinical improvements in buildings which support excellent staff and patient welfare in clean and modern surroundings with good access to daylight and pleasant outdoor spaces is key to the redevelopment strategy. The Board wish to deliver a development that will be viewed with pride by the people of Glasgow, providing an attractive and welcoming environment to support the clinical staff excellence that already exists.



4.0 CONSIDERATIONS OF ALTERNATIVES

4.1 Acute Services Review

The background to the work on the southern site stems from the 2002 Acute Services Review (ASR). This covers the Pan-Glasgow restructuring, including redistribution of services and creation of Ambulatory Care and Diagnostic Hospitals (ACADs) etc. This review established the Southern General site as the location for acute expansion. Relocation of Yorkhill to the southern site has been subject to its own independent review by the Calder Group.

The Outline Business Case considers alternative options as follows:

Adult Hospital

As part of the Acute Services Review, options for the new adult acute hospital included the identification of a new greenfield site or to rebuild on the Southern site, which assumed all facilities inc. Maternity/ Neurosciences etc. would be rebuilt on a vacant site away from existing SGH. A further option considered was whether to construct separate adult acute and children's hospitals, or a combined development with the two hospitals on adjacent sites.

The review concluded with the identification of the provision of the new adult acute and children's hospitals on adjacent sites on the existing Southern General Hospital site as the preferred option. This option has been endorsed by the Board.

Children's Hospital

The independent review of the relocation of Yorkhill undertaken by the Calder Group considered a 'do nothing' option and an option to rebuild on the Southern General site. A further option considered the provision of a separate stand-alone development or combined hospital with the proposed acute hospital. The review concluded with the identification of the relocation and rebuild on the Southern General site as the preferred option. This solution has been developed as the preferred design option listed above.

- Separate or combined (examined if children's is built as standalone development from adult's hospital) – combined preferred
- Alternative Design options for combined rebuild on southern site— see Avanti's report dated 10 Nov 2006 preferred option selected.

4.2 Site Constraints and Opportunities

The land forming the existing site for the Southern General Hospital (SGH) extends to approximately 71 acres or 28 Hectares. The site is bordered and accessed from the north by Govan Road and on its west side off Hardgate Road.

The eastern boundary is formed by the Clyde Tunnel approach and Moss Road. The southern boundary is bordered by residential property. Road access is not currently available along either of these edges.

The north-western corner of the site between Govan Road and Hardgate Road is bordered by existing industrial land and Shieldhall Waste Treatment works. At present

Hardgate Road does not extend beyond the treatment works and therefore does not link with Govan Road.

The site is relatively flat dropping by approximately 2.5m from south to north across a distance of around 750m.

A spine road passes through the site linking north to the Govan Road entrance before turning east-west to meet the Hardgate Road entrance. The east-west section of the spine road forms what used to be Langlands Drive. Originally Langlands Drive joined with the old Moss Road until the junction was closed off when the dual carriageway approach into the Clyde Tunnel was built in the 1960's.

The existing hospital buildings are spread out over a large area of the site and in a number of cases require elevated bridge links across the spine road. Surface car parking is distributed sporadically adjacent to the numerous building entrances arising from the existing fragmented site layout.

A number of bus services pass close to or through the site. Emergency blue light traffic uses the same spine road network to access A&E, Maternity and Neuro/Spinal Injuries. In addition ambulances and other hospital transport circulates between the other entrances to support patient transfer and supply services. The Board are aware of the exciting opportunities brought by Phase 3 of GCC's draft Fastlink plans. If it progresses, it is proposed to bring the new service through the site. The Board are therefore planning for the future inclusion of this in the Campus Development Plan.

The existing site is underlain by a number of existing services. A large amount of work has already been done and will continue to be undertaken to develop a strategy which decentralises and reroutes services to provide an unencumbered development site. This includes the large culvert passing below the site which travels from south to north before it eventually discharges into the Clyde.

The phasing studies included within the future Campus Plan identify the site area which can be made available by early 2009. This extends to approximately 15.5 acres or 6.3 hectares of the overall site. This land will form the development area for both the new Royal Hospital for Sick Children (RHSC) and Adult Acute Hospital and allows these new facilities to be built in one continuous phase while the existing SGH services continue to operate. Included in this development land is 'Coila Park', an overgrown area to the northwest. This land enjoys a direct frontage onto Hardgate Road together with an existing unmade access route from Govan Road running behind the present Out-Patient and Therapy blocks.

A large number of mature trees are found on the site. These are included in a GCC Tree Preservation Order (TPO). A limited number of these trees will have to be removed in the central area to accommodate the new development but the majority can be retained and integrated into the future Campus Landscape.

Two of the original 19th Century Hospital Buildings on the east side of the site have a 'B' Listing by Historic Scotland. These buildings are to be retained in any future site strategy and it is envisaged that they will house administration and other support services required as part of the main redevelopment. A physical link to the new development is not required but attractive pedestrian routes between the two will be provided.

The Board has identified other buildings that must be retained in both the medium and long term. In particular, the new RHSC and Adult Acute Hospital will benefit from combined links to the existing Maternity and Neuroscience blocks. It is envisaged that

these links will be made at first floor level to join with the existing theatres/critical care suite in Neurosciences and the new Neo-Natal unit joined to maternity. The latter is currently being progressed as part of a separate Outline Business Case (OBC) but its implementation will be coordinated as part of the overall site redevelopment. The first floor link also provides a direct route for critical care staff to reach and transfer mothers requiring emergency acute services.

Studies show that the existing Neurosciences and Maternity buildings have different first floor level data. One of the challenges for the redevelopment is reconciling this difference and managing the implications of the vehicle height restrictions imposed by the new links.

The "Gold Standard" triple co-location of children, adults and maternity services on one site and the opportunity for a more seamless build is viewed as one of the key benefits arising from the combined redevelopment on the SGH site.

4.3 Design Brief

The briefs for the Adult Acute Hospital and RHSC have identified both the benefits arising from integration and the need to maintain distinct and separate identities for both institutions. The clinical planning assumes an effective separation of adult and children's patient streams whilst still enjoying the benefits of the triple co-location highlighted above.

Architecturally, the separate identities should be expressed with each hospital having their own public entrances and distinct public faces. Internally, the two hospitals will respond to the different requirements of children and adults arranged internally around their own public focal points.

The opportunities for integration are largely provided through the 'back of house' services although a number of combined clinical co-locations have also been identified (see below). Both hospitals can utilise shared hard and soft Facilities Management (FM) services and distribution systems providing greater efficiencies of scale. In addition, a combined link to the new Pan-Glasgow laboratory facility (currently being developed as part of a separate OBC) can be provided.

4.4 Clinical Design

Achieving good clinical adjacencies is a fundamental requirement for the new development. All hospitals set challenges in this respect and it is the task of the designers and their consultees to balance these overarching, often life and death, functional requirements with other sometimes conflicting design parameters. Good design is about balancing these compromises successfully. The Board has carried out an option appraisal exercise to explore alternative configurations before arriving at their preferred option. This work has previously been described in the Campus Development Plan and is set out in the 'Redevelopment Options Appraisal Report' submitted separately to Glasgow City Council Planning Dept.¹

The adult hospital is unusual in the extent to which ward space and inpatient clinical space significantly outweigh outpatient facilities, which in Glasgow will be largely provided in the new ACADS although the new facilities will retain most of the hospitals current out-patient activity. The presence of both an adult and children's

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¹ See Redevelopment Options Appraisal Report dated Nov 2006

hospitals and a requirement to link to the existing Neurosciences and Maternity buildings presents a set of adjacency problems specific to this site.

In any design, a key starting point will come from understanding the fixed relationship of these two existing buildings to the development as a whole. The new Children's Hospital requires an immediate physical adjacency to the Maternity Building linking via the new Neonatal unit. It is this neonatal linkage between Maternity and Children which will be lost when the Queen Mother's closes and the need to re-establish this relationship has been the principal driver for the relocation of Yorkhill to the South Glasgow site. Here is an example of where a relatively small, but key, department has a significant impact on the overall strategy.

The neonatal linkage will be at first floor level and will link through directly to the Paediatric Intensive Care Unit (PICU) and Children's theatres. This in turn determines the location of the Children's A&E department, which must also share close links to both theatres and PICU.

Significant discussion has taken place with clinicians to consider the relationship of the separate children's and adult's A&E departments and a variety of different options have been considered examining this one point alone. To date, an overarching concern has been legibility for users and the potential confusion that might arise from two public A&E entrances on one site. Concern was raised that emergency public entrances separated by any distance could lead to adults mis-presenting in an emergency at children's or visa versa with limited opportunity for simple redirection. The solution that has been agreed, places these entrances close to one another and although separated, the opportunity exists to pass patients quickly between their respective reception areas.

In turn, this relationship governs the position of the adult A&E and so also the adult theatre and critical care adjacencies. A link at first floor level across to Neurosciences must be provided. This will link the existing specialist Neuroscience theatres and critical care floor to both the new adult and children's hospitals.

Another key clinical consideration comes from a desire to separate 'hot' routes from 'cold' routes. Hot describes intensive clinical areas used essentially by staff for the treatment and movement of inpatients. Cold describes areas where members of the public will be self presenting such as A&E walk-in entrance and minors, Outpatients and visitor entrance areas. A development of this size will require careful management of access, security and infection control. The separation of these routes throughout the building will enable staff to move about safely and securely and will avoid vulnerable inpatients coming into casual contact with visitors moving through the building. This is a key consideration in the brief and the extent to which this can be achieved is described in section 5 below.

4.5 Combined Redevelopment Design Options Appraisal

The Board and their technical advisors have input into a shared design process to test alternative combined redevelopment configurations against the developing briefs. This process fell into 3 distinct stages:

<u>Stage 1</u> explored at a very high level four different site configurations testing alternative locations for the adults and children's hospitals. These examined, *inter alia*, the impact of placing the children's build to the east and the north of the maternity block and the impact either location would have on other key links (i.e. Mothers to adult acute facilities). The alternative options led to early phasing studies to test the feasibility of both single and multiphase solutions.

This work was supported by high-level briefing information for the adult hospital and broad assumptions regarding the possible RHSC relocation, which remained subject to the Calder Group's Report. This stage concluded in March 2006 once the Calder Group reported and briefing for the RHSC could commence. Four options were reviewed by a panel, put forward by the Board, and the outcome of the discussions recorded.

<u>Stage 2</u> was supported by the developing clinical briefs for both adult and children's services. The two briefs outlined departmental floor areas for both hospitals and set out a number of key internal adjacencies that had to be met. The design work that emerged from this exercise tested three different configurations – A, B and C - which examined alternative adjacency options, land-take, stacking arrangements, massing solutions and varying heights of development. The options also set out alternative entrance solutions in light of the Board's latest assumptions regarding Fastlink. The route for this through the site was common to each configuration.

Similarly, the location for the new Pan-Glasgow Labs facility and FM areas associated with the new development was common to each configuration. These were placed on the northwest corner of the site bordering the adjacent industrial land. In this location both areas will benefit from upgrading the existing unmade access off Govan Road to provide a discrete vehicle route into and out of the site.

By Stage 2, the Board had identified their preferred phasing strategy that allows the new hospitals to be built in one continuous operation. All three options could broadly be delivered within this strategy.

This stage culminated in an Option Appraisal workshop on 10 October 2006 with a review panel put forward by the Board. The panel were presented with all three options and following a general discussion the panel were asked to score the three options against a list of criteria under the headings: Access, Departmental Adjacencies, Flexibility and Expansion, External Environment, Internal Environment and Deliverability. The outcome of this exercise identified Option C, the tallest of the three options, as the preferred configuration.

<u>Stage 3</u> followed the option appraisal and looked at alternative arrangements within the Option C configuration. This was in response to concerns expressed by users at the previous appraisal with regard to the positioning of entrances, and in particular the locations of the adult's and children's public emergency (walk-in) entrances. Four variants were shown to a smaller Board group which concluded that Option C4 should be developed as a preferred option.

For further background to Stages 1, 2 and 3 and other supporting information, refer to Avanti Architects' report, "Adult Acute and Royal Hospital for Sick Children combined redevelopment design options appraisal report".

4.6 Design Solution for the Single Integrated Build

The Board's Project Team and their technical advisors then went on to develop the preferred option in more detail to provide the preferred design solution. This work has continued to test the briefs for both hospitals and informed on-cost and risk for the design and construction phases.

The indicative design proposes a combined development sitting between the existing Neurosciences and Maternity Buildings. The new RHSC is positioned on the west

side immediately adjacent to Maternity. The Adult Acute Hospital is positioned on the east side. Access for both hospitals to Maternity and Neurosciences is achieved at first floor level via a shared and managed staff / inpatient 'hot' communication route effectively linking all four buildings internally.

The public entrances to both hospitals are placed on the north side with direct access from Fastlink stops. The entrances will also overlook a large new landscaped area that links the main Govan Road entrance with a new road entrance off Hardgate Road.

The main public entrances are placed at either end of this elevation with separate adult and children's drop-off and associated parking. Multi-storey parking solutions are assumed both to limit land take and reduce travel distances from individual parking bays to building entrances.

The adult and children's public (walk-in) emergency entrances sit together in the centre on this same elevation. Although these are closely co-located, they are designed to provide separation for adults and children. This issue has presented a key design challenge with the need to balance wayfinding clarity for members of the public arriving in an emergency, against the requirement to separate adult and children's emergency services and reinforce the two hospitals' separate identities.

The new blue light (ambulance) entrances are then placed together on the south face of the building close to the existing blue light entrance to Maternity. This allows the co-location of adult's and children's resuscitation areas identified in the brief. It also avoids blue light traffic coming into conflict with other vehicles close to building entrances.

Both hospital layouts strive to separate the 'hot' staff/inpatient routes from the 'cold' outpatient/public/visitor routes. This enhances the dignity of inpatients being moved within the hospital and allows a greater degree of control and security to be maintained in circulation areas.

A dedicated basement FM communication loop is provided with an underground link across to the new Pan-Glasgow Laboratories and shared FM areas. This loop distributes to the base of dedicated FM lifts which in turn rise up and serve upper floor areas. It is envisaged that such a design strategy could support a robotic delivery system.

The positioning of the emergency entrances determines the new Emergency Departments (ED) in the centre of the plan. Outpatient areas are located close to the respective main public entrances which also provide access to visitor lifts travelling to inpatient wards on the upper floors.

Radiology areas are located on ground, first and in the case of adults, second floor levels. This arrangement allows different radiology modalities to be co-located by the departments they serve to limit movements of seriously ill patients. The opportunity for links and sharing of specialist equipment between the Adult Acute and RHSC is also possible.

Theatres and critical care areas are located on the first and second floors with dedicated 'hot' cores linking to their respective EDs at ground level. The RHSC's Paediatric Intensive Care Unit (PICU) and theatres at first floor level connect with the Maternity building via the new Neonatal suite.

The remaining upper levels of both hospitals are taken up by the inpatient wards. A rooftop helipad is proposed with a hot link down and into the adult's and children's majors / resuscitation areas. This would also allow direct internal transfer to critical care areas, Neurosciences and the Spinal Injuries Unit.

Remaining areas of site to the east and west can then be redeveloped to provide additional accommodation and future hard expansion space for both hospitals. In the case of the RHSC this would include the existing Scottish Ambulance Service site adjoining Hardgate Road.

The Campus Development Plan allows the use of the existing listed buildings for admin purposes and shows how the surrounding plots can be developed in the future to provide education and training facilities to create a discrete clerical and education "quarter" within the main Campus. The remaining land to the north bordering Govan Road could support similar activities or another associated clinical use not directly linked to the main hospitals.

It should be noted that the Board anticipate further development of the preferred design following the OBC submission to respond to ongoing detailed briefing and to provide the Design Exemplar Solution.

Development Options are shown in Figure 4.1.

Option A Option B **Option C**

Figure 4.1 Development Options

5.0 PROPOSED DEVELOPMENT

Summary

The Board proposes to upgrade and redevelop the existing Southern General Hospital in Govan. The site, dating from the late 19th century, extends to 28 hectares and consists of a teaching hospital in a campus style layout with associated car parking facilities. The hospital site can be accessed from the nearby M8, junction 25, and locally from the A739 Clyde Tunnel access. The proposal from the Board is to build a new 1110-bed acute hospital on site, providing outpatient, diagnostic and treatment facilities for local patients a new 245-bed children's facility integrated with maternity facilities allowing specialised adult, maternity and children's facilities to be located together on the same site. The numbers of staff employed on the site will rise from the current 4,230 to approximately 10,100. The development will be phased in nine stages over a 10-year programme.

5.1 Description of Site

5.1.1 Site Location

The site of the proposed development extends to 28 hectares and is located within the existing hospital grounds at 1345 Govan Road, to the south- west of Glasgow city centre and adjacent to the residential area of Drumoyne and the industrial areas of Shieldhall and King George V Dock.

At present the teaching hospital has an acute operational bed compliment of approximately 900 beds, providing a comprehensive range of acute and related clinical services for both the south west of Glasgow and the City as a whole. The existing hospital complex is laid out in a campus style arrangement of buildings, associated landscaping, car parking plus vacant brownfield land, reflecting the hospitals piecemeal redevelopment since in construction in the late 19th Century.

The approximate Ordnance Survey grid reference of the centre of the study area is NS 536 656.

5.1.2 Site History

The hospital dates from 1872 when a new general hospital was built on the current site. In 1902–05 the hospital underwent an expansion and developed a further 700 beds. A new maternity unit was built in 1970 and the Institute of Neurological Service was completed 2 years later. The name of the Southern General was first adopted in 1923, and in 1992 it achieved trust status within the NHS, creating the Southern General Hospital NHS Trust, later to be replaced by the larger Southern Glasgow University Hospitals NHS Trust.

5.2 Current Site Ownership

The proposed development site is presently owned by the Scottish Ministers and managed by the Board on their behalf.

5.3 General Site Layout and Appearance

The New South Glasgow Hospitals site contains a mix of buildings of varying ages and architectural style and quality. The buildings are arranged in a Campus layout, with the oldest group of buildings concentrated to the northwest of the site. There has been a number of more modern additions to the campus over the last five years.

5.4 Site Access

The existing hospital lies close to the M8 Motorway with access / egress to the motorway at Junction 25 being available in the near vicinity. The motorway is not seen as the main access route to the hospital catchment from within the local area but functions as an important link from other areas further a field.

Consultations with local community and other groups has highlighted areas of concern relating to access and the potential for transportation impacts on the local area and local road network when linked to other major events at lbrox. Other issues, many of these potential surrogates for concern at the Board's rationalization plans, include concerns relating to the adjacent (Shieldhall) WWTW; impacts of temporary closure of the Clyde Tunnel, travel and social costs.

5.5 Outline Description of Project

The Board has determined the future shape of acute hospital services which include five acute hospitals in Greater Glasgow. Acute care will be delivered through three inpatient sites including the re-development of the South Glasgow Hospital Campus. The Board's proposals would see an investment package being put into the 28 hectare Govan site, providing new and improved facilities to work alongside the existing clinical units which operate from modern, fit-for-purpose accommodation. The new circa 1109-bed adult acute hospital will include facilities for:

- coronary care unit
- a surgical unit
- a medical receiving unit
- operating theatres
- Intensive Care Unit
- High Dependency Unit
- modern pharmacy facilities, and
- continuing refurbishment of medical facilities

The new-look South Glasgow Hospitals will also provide new outpatient, diagnostic and treatment facilities for patients, a new circa 245-bed children's facility integrated with maternity facilities allowing specialised adult, maternity and children's facilities to be located together on the same site.

The environmental assessment considers the preferred indicative design prepared by the Board and its advisors to test and develop their brief for the site. This is only an indicative scheme and does not reflect what will ultimately be built. It has been included to illustrate one possible solution and to provide a basis for initial assessment. However, many of the principles developed in the Campus Development Plan will inform the approach adopted by the bidders in developing their own designs. In particular, principles of access, including pubic transport, private vehicle, ambulance, service vehicle, pedestrian and cycle routes, building location and massing, landscape, phasing and infrastructure will inform the work of the successful bidder. The indicative design is shown in Figure 5.3.

5.6 Siting and Campus Development Plan Approach

The indicative design has been developed in response the phasing studies which identify the available site area in 2008/2009. The Board has been planning for some time to release the land between Maternity and Neurosciences to ensure that the new Hospitals can be located such that they link with these two existing buildings. The

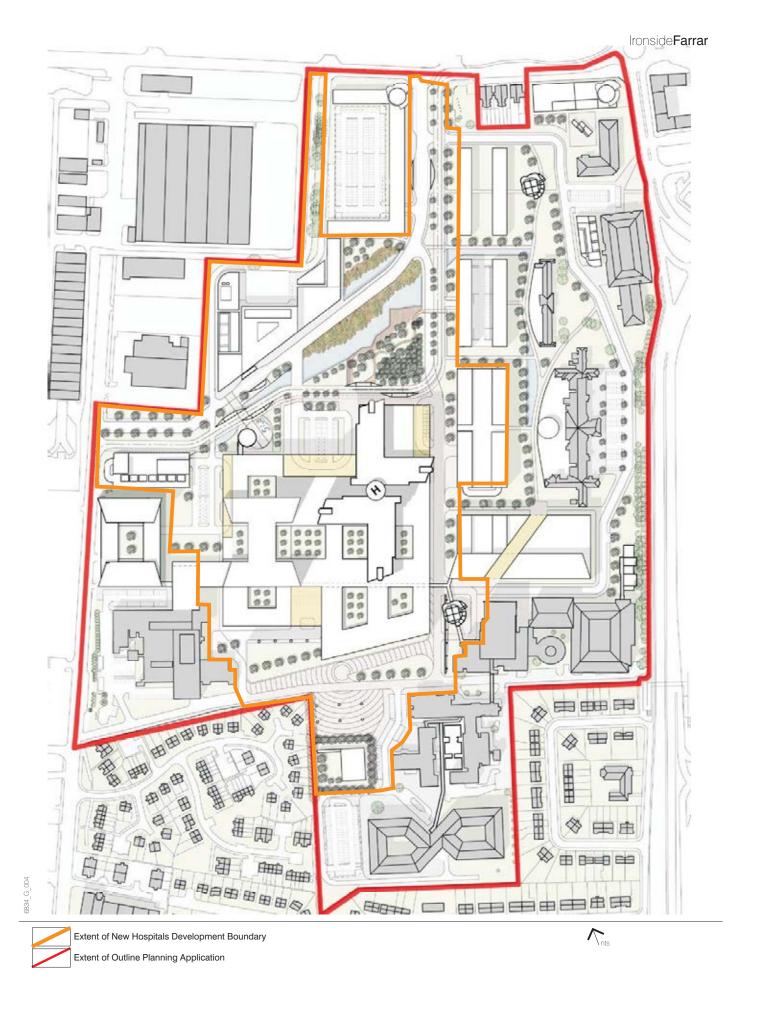


OBC Scheme Campus Model - view from west



OBC Scheme Campus Model - view from east

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positioning of the new buildings is therefore not just as a result of what land is available but in response to two fixed points on the existing site.

The Campus Development Plan lays out the site as a series of blocks with different activities zoned according to their function. Large and small open spaces are created between these blocks and particular emphasis is placed on the large green space in the centre, which faces the public entrances to both the children's and adult's hospital. This space is further broken down to create distinct entrances for the adults, children and emergency departments. The frontage to the children's hospital will look over a large play area and there are options in this space to include a dedicated cinema / media centre for which charitable funding may be available. The first impression upon arriving at the children's hospital will be a place of play incorporating colour and stimulating materials.

The entrance to the adult hospital will have easy access to the ponded areas which will include paths and sitting areas. Figure 5.1 shows images of the new adult and children's hospitals.

The Campus Development Plan supports a separate route for Fastlink through the centre of the site with stops immediately adjacent to the adult and children's entrances. The frequency of Fastlink is such that these vehicle movements will not compromise the quality of space immediately in front of the buildings.

A new through road has been formed on the opposite side of this space well away from the new public entrances. This road enters in via the existing entrance off Govan Road and leaves via a new entrance onto Hardgate Road. This effectively short circuits any through traffic and allows the board to "de-stress" remaining routes within the Campus to make them more attractive to cyclists and pedestrians.

The new Laboratories, Mortuary and Facilities areas are located in a separate zone to the north of this road. In this location the backs of these buildings face onto the adjacent water treatment works. The lab building is such that it will require a back through which deliveries and so forth come in but the offices and testing area can also provide a front to the new space. It is intended to locate the flues from the new Energy centre in the back corner such that this element sits closest to the water treatment works. The energy centre itself will be screened in turn by the labs and facilities block.

The service yard to the backs of these buildings can be accessed via a new road which will largely follow an existing unmade track opening off Govan Road. This will allow bulk supplies for the new buildings to be brought onto the site and off loaded without taking this traffic through the rest of the site. From here supplies will then be moved via a basement link under the road to the new hospitals.

Mortuary facilities will be located in the new Labs building. Deceased patients can be moved using the same discrete route to the mortuary where they will be collected. Screening of this activity from other patients and visitors is vitally important for moral and reasons of dignity and such an arrangement will ensure that undertaker's vehicles can also enter and leave the site discreetly.

The listed buildings will form one side of a new administration, training and research zone on the east side of the site. The Board proposes to retain the listed buildings for several reasons:

- Only the facades are protected by their listing and there are opportunities to remodel them internally
- The buildings currently accommodate clinical functions that cannot be relocated until the new hospital is constructed. This means that even if permission to

remove these buildings was granted, their sites could not easily be utilised for the main phase of development

- Reuse of the buildings for administrative support or teaching functions makes both economic and environmental sense as their building form lends itself to this type of conversion without resorting to demolition.
- These buildings have been listed as being of architectural and historic interest and as such ought to be found a new function and rehabilitated so that their future conservation is secured.

The plan is therefore to retain the listed buildings to form one edge of the teaching and administration zone n the eastern side of the site. In order to protect the setting of the listed buildings the Campus Plan requires that any new adjacent buildings proposed for the eastern side of the site will be of a scale and massing in keeping with that of the listed buildings.

The backs of the listed buildings can be improved to provide a face into a central linear garden. This space will be terminated at the north end by an 'object building' forming the new staff crèche relocated from the south of the site. This space will support pathways along and through to allow ease of movement from one side to the other. The buildings surrounding this space will be sympathetic in scale with the listed buildings.

The southern end of the site currently houses facilities for longer-term elderly care and rehabilitation. The Campus Development Plan recognises that this end of the site naturally wants to be slightly removed from the busy hospital activity and the main public entrances. The indicative design inflects the south face of the new buildings in to open up the view in off the southern Hardgate Road entrance. It proposes to terminate this view with a further "object building" supporting the link across to Neurosurgery. A paved surface will extend across what was Langlands Road to soften its effect as a division and help provide better visual linkages.

A small 1 to 2-storey development associated with Yorkhill is also proposed in this quieter part of the site. This provides mental health services for Children and requires access to dedicated and safe external play areas away from the public gaze.

5.7 Proposed Access, Traffic and Parking

Emergency ambulance access to the new hospitals will be located together on the south face of the new buildings away from public areas. This is close to Maternity's existing ambulance entrance. A further existing ambulance entrance is located on the north side of Neurosciences but use of this is far more infrequent.

Ambulances approaching the site from the south and west will continue to enter via the southern Hardgate Road entrance. Ambulances from the north and east will enter the site via the Govan Road entrance, pass along the new road and then in through the same Hardgate Road entrance. This strategy ensures that emergency vehicles moving in a hurry are not travelling long distances within the site itself.

To retain sufficient land for landscaping and future development, both contained surface and multi-storey parking solutions are envisaged. It is proposed to site these close to entrances to improve accessibility and allow them to be constructed in a phased manner in line with the growth of patient services on the site.

A hierarchy of vehicle routes will be established within and across the site defining access for service, blue light and private vehicles. The present site suffers from being used as a cut through which has in part been a consequence of Hardgate Road being closed at its northern end by the water treatment works. The Board recognise that by making the site more permeable through traffic cannot be avoided. The design must

therefore deal with this problem without dividing the site as it currently stands to avoid making pedestrian movement between buildings unattractive and potentially dangerous.

5.8 Building Organisation and Clinical Planning

The indicative design has been developed through extensive consultation between the Board, Clinicians and the Board's advisors. Discussion about some adjacencies is still ongoing but agreement on a number of relationships has been achieved.

It adopts an approach which places intensive clinical activities on the lower three floors with the emergency department on ground, theatres and critical care on first and second. Imaging is placed where it can be accessed by all departments.

Outpatient services are placed close to main entrances on the lower floors for ease of access. This establishes a diagram whereby 'hot' areas are zoned to the south and 'cold' areas to the north. This ensures that those attending for only a short period do not have to penetrate too deeply into the plan before finding the appropriate department or vertical stairs and lifts to upper floors. The separation of 'hot' and 'cold' routes throughout the plan and section effectively ensures that staff and inpatients can moved throughout the buildings without coming into contact with members of the public. This separation provides a much higher degree of security in clinical areas and allows patients to be moved with maximum dignity.

In line with the Board's brief, the indicative design places the Children's Hospital immediately beside the existing Maternity Building and provides the first floor link between Neonatal and PICU / Children's Theatres. This link also allows Adult Critical Staff based on the same level to travel across and down to the obstetric theatres in Maternity in the event of an emergency. The hot link at first floor level effectively joins all the acute activities in Neuroscience, Maternity, adult acute and children's hospitals. Direct links to this route are available from ambulance entrances, resus areas and the rooftop helicopter landing pad which optimises the speed seriously ill patients can be moved to key treatment areas.

Significant consideration has been given to travel times within the building and these were compared as different options emerged. If arranged on a single floor, the new floor area of the combined hospitals would be equivalent to building 1.4km long by 140m wide (including allowance for internal courtyards). Clearly it would be impractical to accommodate this on the site. To illustrate the problem, the Board's advisors prepared three diagrams which tested the effect on abstract journey times as the required floor plate was placed in different stacking arrangements. This demonstrated that travel time between two distant points in a single storey option, even if practically possible, would be very inefficient. Accepting that the hospital cannot operate on one floor lifts have to be introduced once the building is two storeys and above. Once lifts are required, lift waiting has a greater effect on travel time than lift travel distance. This is one consideration that has led the Board to favour a taller building on the site but it is true that travel times result from subtle relationships between plan and section and a future detailed scheme may achieve the same criteria in a different way. The Board has also adopted a lift strategy which provides resilience such that if a lift is out of action the remaining lifts will still provide an excellent service.

Consideration has also been given to the number of wards on a floor. Modern hospital wards now include therapy and other support areas to allow certain treatments and therapies to take place closer to patient beds. A single ward will not in itself generate sufficient activity, but a number of wards clustered together begin to allow these shared support areas to function more effectively. The Health Planners employed by the Board has established that four ward sharing support areas is an

optimal arrangement. Other requirements such as means of escape and horizontal evacuation also have an impact on ward footprint.

The indicative design therefore adopts in the adult hospital an arrangement whereby four adult wards are arranged floor by floor served bay a central support core, bed and facilities lifts. Visitors arrive at separate ward entrances on each floor via their own dedicated lifts and stairs. This effectively ensures separation of public and inpatients all the way to the ward itself.

5.9 Landscape Strategy

The landscape strategy (Keppie 2007) seeks to address all issues whilst underpinning the primary aim of creating a quality hospital environment conducive to the care and healing of patients, that inspires confidence in the public's perception of the hospital and the levels of hygiene and care provided.

The landscape of the new campus must integrate the hospital re-development with the existing landscape of the surrounding communities.

Sustainable transport links are to be a fundamental part of the new site. A variety of sustainable transport options will require to sit alongside continued private car use. The landscape design must successfully incorporate these elements and solve user conflict between them. The landscape design seeks to give adequate space to the quieter elements in order to make them as safe and attractive to potential users as possible.

The Campus Development Plan recognises national and city policies and includes an outline SUDS scheme. Boundary treatments are considered from the outset and designed into the campus strategy in order to minimise impact upon neighbouring residential properties and also to screen undesirable views out of the hospital.

There are almost inevitably, areas designed primarily for function that are not visually appealing. The landscape approach in these areas will be to soften and integrate these areas within the overall campus using trees, shrub and hedgerow planting

Based on the outline Campus Development Plan a series of spaces have been categorised based upon their primary function in order to break down the vast area of the campus into digestible zones. The zones are described below and are as follows.

1) Main Entrance

A poorly designed and maintained environment would present a poor impression and make patients and visitors question the standards of care and hygiene provided by this facility. As a result, the aim of this landscape area will be to present a modern frontage to the new hospital that has design continuity with the architecture and is reflective of the quality of open standards and care expected by the public.

2) General Open Space (inc. SUDS)

This will involve the implementation of a large open space along the length of the main building frontage in order to create a high quality landscape for the hospital and a campus contributing to a healing environment. Structural planting will be used to manipulate views and space along the length of this area, creating a mixture of scales.

The adaptation of a SUDS scheme provides the opportunity to create a large body of open water, with associated environmental benefits. Areas of structural planting trees, shrubs and grassland will also be incorporated.

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3) Children's Hospital Break - Out Area

This area will provide a safe and stimulating outdoor environment, easily accessible to recovering children, allowing them to retreat from the hospital wards. To provide this environment, bright saturated colours may be used which may not be in keeping with the rest of the campus. Landscape elements will include secure perimeter fencing of appropriate aesthetic standard. A 2.0m height weld mesh fencing with climbing plants incorporated along the base softening the overall appearance. Children's play equipment and artworks will also be an element of this landscape of this area.

4) Main Clinical Entrances

This will involve the creation of a highly functional, legible entrance area, clutter free and easily accessible. This area will primarily be hardscape with street furniture to control and aid the function of the area. Some peripheral 'Green Elements' will be incorporated to soften the spaces without compromising function. The detailed standard will be lower than that of higher quality areas but will still have a high design standard

5) Courtyards

Campus gardens within the courtyards will create a series of individual healing spaces split between public and patient access. Within these areas there exists the opportunity to implement very detailed intimate garden spaces. Each courtyard will have an individual identity to help add stimulus and avoid a bland blanket treatment to all. Flag paving, setts and decking will provide functional surfacing with evergreen shrub planting and mature trees as well as some water features providing softer qualities

6) Civic Space & Break - Out Area

The aim of this area will be to allow patients easy access to outdoor areas to provide a change of environment from the hospital wards to aid in their recovery. Artwork and sculptures will be provided to add stimulus to the space. The area will be a mixture of hard and soft landscapes. Specimen trees will be located to the outer edges of the area.

7) Access and Circulation Routes

In keeping with City policy there will be a focus on providing sustainable transport with landscape design focusing on making these routes safe and appealing. A new fast link service, local buses, private cars, cycle ways and pedestrian footways will serve the hospital development. There exists a potential for user conflict between these transport elements. Where possible a segregation of footway and cycle traffic from the road will be implemented Landscape Elements will include specimen tree planting, asphalt surfacing to footways and cycle ways where implemented and shrub plating implemented where possible.

8) Parking Areas

In line with City Policy areas of surface grade car parking will be interspersed with tree and shrub planting / hedges to soften visual experience. There will be elevation treatments to the multi-storey car parks to integrate these buildings with the rest of the hospital campus.

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9) Children's Psychiatric Unit

This area will provide the necessary landscape setting for this sensitive department and a quality space for the patients. Due to its sensitive nature the unit will require a robust buffer to the boundary. There is likely to be sustained periods of activity by children in the external space. Noise levels created by children at play needs to be dampened so as to minimise the impact upon neighbouring residential properties.

10) Facilities Management / Pathology

This area will create a functional landscape for this, almost, industrial element of the hospital. This area is purely functional with little or no public usage and to minimise maintenance burdens will be predominantly hardscape. The likelihood is that street furniture will come in for rough treatment over the lifespan of the space. Therefore functional, economic, easily replaced furniture should be specified. Easily maintained, replaceable bollards bins and signage will be utilised with some shrub planting to surplus areas around the periphery of the space to soften the overall appearance.

11) Boundary Treatments

This will involve the integration of the redeveloped hospital campus within the existing community and landscape without placing additional impacts upon neighbouring property. There will be 3 types of landscape treatments for Residential, Neutral and Negative Neighbours:

- Residential Neighbour: Maximise available space for buffer zone planting along boundary. Large tree and shrub planting. Living willow / acoustic treatment where appropriate. New garden fencing where necessary
- Neutral_Neighbour: A continuance of the boundary treatment along the (east)
 A739 road boundary in front of the large listed building on site. Open fencing
 given views into / out of the site with specimen tree planting and some shrub
 planting
- Negative Neighbour: Suitable buffer planting to screen negative neighbour from hospital. New EHS tree planting and large evergreen shrub planting to limit visual connectivity

12) Discrete Developments

The aim will be to ensure that the satellite building developments contribute through their landscape elements to a cohesive Campus Development Plan. Each building development separate from the main clinical building will be developed at a different stage / time. By advocating the use of similar species and sizing in the softworks as well as design attitude, hardscape materials and street furniture, these individual developments will appear to have been designed in conjunction with the core landscape areas producing a cohesive campus. Landscape elements will include specimen tree planting and shrubs with various hardscape (to suit building needs) and street furniture

13) Retained Hospital Landscape

This will involve the preservation and enhancement of the existing parkland quality around the retained buildings of the current hospital. A rationalisation of the space will be carried out, however this will respond to the existing mature trees on site. Following this, new planting will and landscape elements will be implement. In existing areas where the landscape is deemed sub-standard a Landscape Scheme will upgrade these areas in keeping with both the existing areas as well as the new design principles of the campus re-development, creating a balance and transition between the two.

5.10 Internal Environment

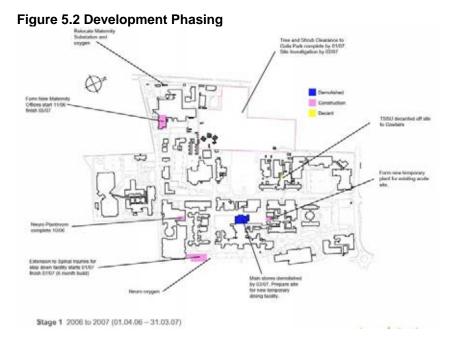
The indicative design places emphasis on the quality of the internal environment and opportunities for daylight. Emphasis is given to the main entrances such that they will be light, generous and airy. Many people associate hospitals with stale air smelling of disinfectant. This can lead to bad associations. It is therefore important that people entering are greeted in an environment that is reassuring and comforts all the senses. This places emphasis on clear wayfinding provided by a ground floor public spine leading to the outpatient entrances and visitor cores. Daylight, views into courtyards, casual waiting and pausing areas will be provided along these routes.

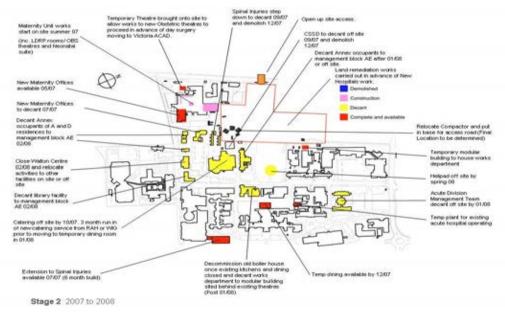
Modern wards must now incorporate a much larger number of single ensuite bedrooms than was the case in the past. This significantly improves patient choice and enhances the care that is provided. One consequence of this however is that a ward now requires a greater external perimeter to provide every patient room with a window. The indicative design proposes arranging the wards such that every inpatient room in a ward has a view out. Moreover, the views from wards are not into internal courtyards which, although providing daylight, cannot provide sufficient activity to stimulate the viewer. Instead all the ward rooms enjoy open views out across the city. The intention is to provide all inpatients with these quality views, to avoid the temporal and spatial dislocation often experienced in Hospital, by using the changing light and activity outside as stimulus throughout the day.

Enclosed courtyards are provided to the lower floors to bring daylight and opportunities for planting into what would otherwise be deep planned areas. Staff based in these areas all day benefit from the opportunity to see out and to have contact with the outside as they move around. The indicative design strives to make these courtyards as large as possible and ensures that no courtyards are surrounded on all four sides by building over 4 storeys. Access may be possible at the discretion of the hospital and in the case of the children's hospital they can provide secure outside play areas associated with internal waiting areas.

5.11 Development Phasing

A nine-stage programme over a 10-year period is envisaged as shown in Figure 5.2 below.





Name Children's unit wide.

New Children's unit wide.

New Children's unit wide.

New Children's unit wide.

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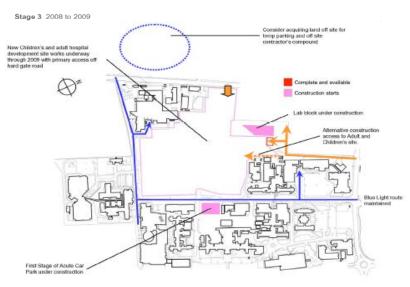
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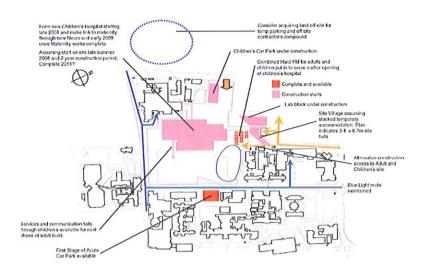
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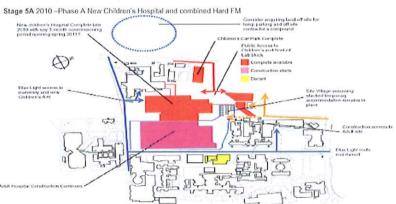
Note: in Summer 2008 you will have Maternity / Labs and Childrens and Adults Contracts overlapping



Stage 4 2009

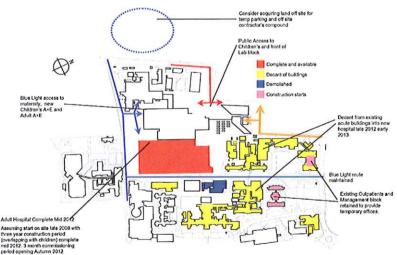


Note: Children and Adult Block shown is indicative only.



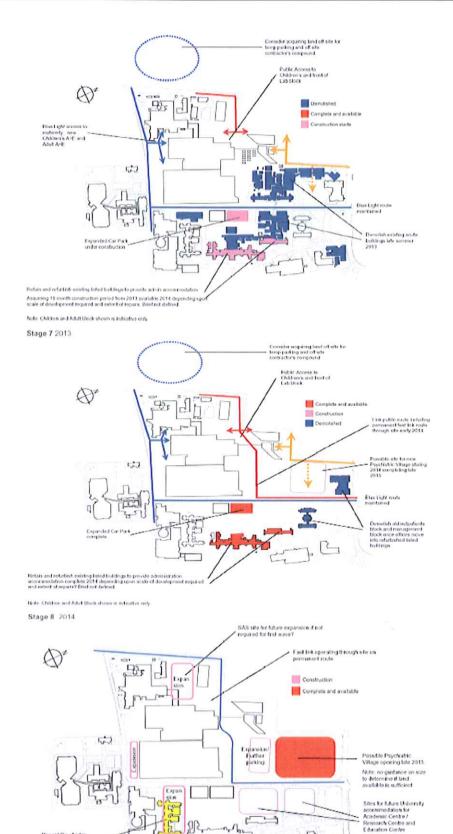
Note: Children and Adulf Block shown is indicative only

Stage 5B 2011 -Phase B opening of Children's, Adult Construction Cont



Note: Children and Adult Block shown is indicative only

Stage 6 2012 to 2013



15 and beyond

5.12 Sustainable Transport Proposals

The extended hospital will generate a wider pattern of movement with speciality facilities serving all of Scotland together with Glasgow wide responsibility for children and a significantly extended catchment throughout south Glasgow and to the immediate north of the Clyde. In the short to mid term staff travel distances are also likely to increase as a consequence of relocation.

A transportation access strategy has been developed to cater for these extended demands which maximises the benefits of the current accessibility to the strategic road network, particularly outwith peak periods, provides a public transport strategy which includes Fastlink plus significant increased public transport penetration of the site and completes walking and cycling links through investment in walking and cycling infrastructure.

The principal components of infrastructure improvement include a new single carriageway road connection between Govan Road and Hardgate Road, a segregated Fastlink corridor and a walk and cycle strategy which links with Glasgow's emerging core paths and cycle route strategy.

The overall transport access strategy achieves integration between land-use and transport by providing transport facilities by all modes which accommodate shift and 24 hour working operations, access by public transport which significantly exceed the Council's definition of High Accessibility, routes for essential and emergency vehicles and an excellent balance of provision for pedestrians and cyclists throughout the site on segregated facilities plus local access "shared" surface style roads. This strategy significantly improves the relationship between the site and associated transport infrastructure and provides patients, visitors and staff alike viable alternatives to the car. A car parking strategy which supports this sustainable transport package will ensure that car parking provision is appropriate in scale and not dominant

The Campus Development Plan (Keppie Planning) and Transport Assessment (JMP) have, together, identified a range of objectives and proposals which seek to achieve the transport integration of the NSGH. These include measures for the site itself and also for wider external links. The key measures are summarised below.

5.12.1 Internal Pedestrian and Cycle Links

Firstly, The Campus Development Plan notes that there is a need to create a more attractive pedestrian environment within the grounds of the campus. At present vehicular circulation dominates the site. The removal of the some surface car parking will offer the opportunity to create wider pathways and incorporate some soft landscape treatment. The existing high level of pedestrian accessibility is continued by providing a network of continuous footways through the development that will link to the surrounding residential areas.

The Campus Development Plan notes that clear signing throughout the hospital grounds needs to be provided to make it easier for visitors to locate the relevant department or ward that they are going to. The proposed development will recognise this and it is anticipated that consideration to signage of the hospital will help to promote walking as an alternative to travelling by public transport. This may also involve providing additional signs to the hospital from the surrounding local area

The design, construction and routing of all footways and cycleways through and in the vicinity of the site, with good lighting and safe crossing points at junctions should make the area a safer environment for local residents.

The landscape strategy for the site notes that the landscape design seeks to give an adequate space to the 'quieter' elements (pedestrian and cycle) in order to make

them as safe and attractive to potential users as possible. In keeping with Glasgow City policy there will be a focus on providing sustainable transport links with landscape design focusing on making these routes safe and appealing. Where possible, a segregation of footway and cycle traffic from the roads will be implemented.

5.12.2 Walking & Cycling Strategy

The JMP Transport Assessment includes a strategy for improving accessibility to the NSGH site by walking and cycling.

Glasgow City Council is at a preliminary stage in drawing up it's Core Path Network for the Govan areas requirement of the Land Reform (Scotland) Act 2003. The principles which are to be applied for the NSGH are for the site to be bisected by routes running north – south (linking Govan Road to Shieldhall Road) and east – west (linking Langcroft Road to Hardgate Road).

Although there are as yet no clear plans for the Core Path Network, the network of core pedestrian routes through the site and the external links have been designed to provide maximum accessibility and integration with the surrounding pedestrian network. In particular, the development proposals make use of the key crossing points at the Clyde Tunnel Approach Road which will clearly require to be part of the core path network.

The proposed development will seek to provide signed links to join up the existing cycle routes. Due to the location of the site and the barriers of the Clyde to the north and the M8 to the south, the majority of the links are focussed to the east and west as follows:

- To the north of the site, a signed link along Renfrew Road towards Govan, linking in to routes from /to the Clyde Tunnel and Elder Park.
- To the east of the site, a link from Elder Park along Langlands Road to link to the underpass that provides access to the south east corner of the site.
- To the south, it is proposed to provide a signed link from the existing cycle way that ends at the A8 at the eastern boundary of the site to join the existing route over the M8.
- An additional south link from Queensland Drive to Cardonald rail station, with a further link along Berryknowes Road.
- To the west of the site, a link is proposed from the hospital site down to Shieldhall Road then westwards to join into the existing link at King's Inch Road
- From the northern most point on the existing cycleway on King's Inch Road, a
 new link can be created along King's Inch Road to the Braehead shopping Centre
 then further westwards to the existing shared footway and cycleway at Xscape
 which continues towards Renfrew.

In addition to the external facilities highlighted above, a network of cycle routes will be provided through the redeveloped site. Connections are provided to the external network from accesses onto Hardgate Road, Govan Road, through to Langlands Road and onto the A739. On-site cycle parking facilities will be provided in accordance with GCC standards which will be located close to the main pedestrian access points to the hospital buildings and will be covered.

The following key recommendations are proposed to ensure that the walking and cycling strategy serving the site integrates both with the proposed land-use form and the overall transport strategy for all modes of travel:

 Ensure routes are provided that will link Govan Road to Shieldhall Road and Langcroft Road to Hardgate Road, thereby addressing the requirements of the GCC Core Paths Strategy;

- Provision of an extensive network of footways throughout the site that will provide a link to the existing and proposed pedestrian facilities for the surrounding area. These routes should be well lit to provide a safe environment for pedestrians;
- Upgrade of the existing underpasses at Skipness Drive and Burghead Drive. The
 existing standards are not fit for purpose and should be improved with a view of
 providing a safe environment for both pedestrians and cyclists;
- Provide signed cycle links connecting existing cycle routes including a link from the along from the Clyde Tunnel along Govan Road to the east, a link from Elder Park to the Skipness Drive underpass via Langlands Road and a link from the site to Cardonald Railway Station to the south;
- Provision of an internal cycle network that will link the site to external cycle facilities; and o Covered, secure cycle parking to GCC requirements should be provided close to the main pedestrian access points to hospital buildings.

5.12.3 Public Transport Strategy

Buses

The current bus services provide an effective baseline network, however, gaps in provision prevent the site from being fully accessible by bus. The Transport Assessment has identified a potential hospital catchment area, which includes 24 districts of Glasgow and proposed improved routes and frequencies which would, if adopted with a number of complimentary packages, meet the requirements for an effective public transport network for the hospital. Proposed bus service frequencies are shown in Table 5.1.

Rail Travel, Underground and Taxis

In addition to the bus service improvements noted above, there are also opportunities for rail, underground and taxis to help in serving the transport needs of the hospital. The Govan interchange provides the nearest link with Glasgow underground network, although the majority of the links provided by this network could also be provided by the Fastlink and direct enhanced link to Partick. The nearest rail station at Cardonald could also be linked to the hospital by a shuttle bus service. Taxis are recognised as an important mode of transport at the hospital and the Campus Development Plan includes drop off / pick up facilities to cater for a significant number of taxis.

Fastlink

In addition the redevelopment of the campus site offers the opportunity to bring the proposed Clyde Fastlink through the South Glasgow Hospital improving accessibility by public transport for visitors and staff. GCC are currently undertaking a feasibility study to extend the Fastlink service over the River Clyde via the Finnieston Bridge and link to the Braehead Shopping Centre. The route of this service has not yet been determined however it is likely to involve one of the following:

- Route through the proposed NSGH development site
- Along the former A8 to the south of the site
- From Govan Bus Station along Langlands Road passing through the Renfrew Road/Shieldhall Road roundabout.

Clearly Route 1 would best serve the needs of the proposed development and it is understood that GCC would prefer to see this option designed. Nevertheless, should either Routes 2 or 3 be designed, they would also improve accessibility to the site by public transport. The Campus Development Plan will include a segregated route for the Fastlink through the site. The route will run parallel with the road route through the site and will seek to provide stops adjacent to the main hospital and the children's hospital.

Table 5.1 Proposed Frequencies of Direct Bus Services into the NSGH (from Transport Assessment)

Location	Operating Sector	Proposed Interchange Point to Serve SG Campus (if applicable)	Potential Route from Interchange Point	Existing Direct Frequency to SG (bus/hr)	Proposed Frequency to SG Campus (bus/hr)	
Alexandra	NE	City Centre	Fastlink	0	10	
Park Bishopbriggs	NE	City Centre	Fastlink	0	10	
Easterhouse	NE	City Centre	Fastlink	0	10	
Springburn	NE	City Centre	Fastlink	2	10	
Anniesland	NW	Partick	Partick-Pollok	0	4	
Bearsden	NW	Partick	Partick-Pollok	0	4	
Clydebank	NW	Partick	Partick-Pollok	ő	4	
Drumchapel	NW	Partick	Partick-Pollok	o o	4	
Maryhill	NW	Partick	Partick-Pollok	ő	4	
Partick	NW	Direct	Partick-Pollok	2	4	
1170 min 200 1100 V			Castlemilk/Rutherglen-			
Battlefield	SE	Direct	Braehead	2	4	
Bridgeton	SE	City Centre	Fastlink	0	4	
Castlemilk	SE	Direct/(Shawlands/ Battlefield)	Braehead	0	2 + (2)	
Cathcart	SE	Shawlands/Battlefi eld	Braehead	0	4	
Clarkston	SE	Shawlands/Battlefi eld	Braehead	0	4	
East Kilbride	SE	Shawlands/Battlefi eld	Castlemilk/Rutherglen- Braehead	0	4	
Possilpark	NE	City Centre	Fastlink	0	10	
Rutherglen	SE	Direct + (Shawlands/Battlef ield)	Castlemilk/Rutherglen- Braehead	2	2 + (2)	
Shawlands	SE	Direct	Castlemilk/Rutherglen- Braehead	2	4	
Shettletson	SE	Shawlands/Battlefi eld	Braehead	0	4	
Braehead	sw	Direct	Fastlink + Castlemilk/Rutherglen- Braehead	0	10 + 4	
Govan	sw	Direct	Fastlink + Castlemilk/Rutherglen- Braehead + Partick-Pollok	5	10 + 4 + 4	
Paisley	sw	Direct	Paisley - Govan	1	4	
Pollok	SW	Direct	Partick - Pollok	2	4	
Renfrew	SW	Direct*	Fastlink	0	10	
* Fastlink to Renfrew						

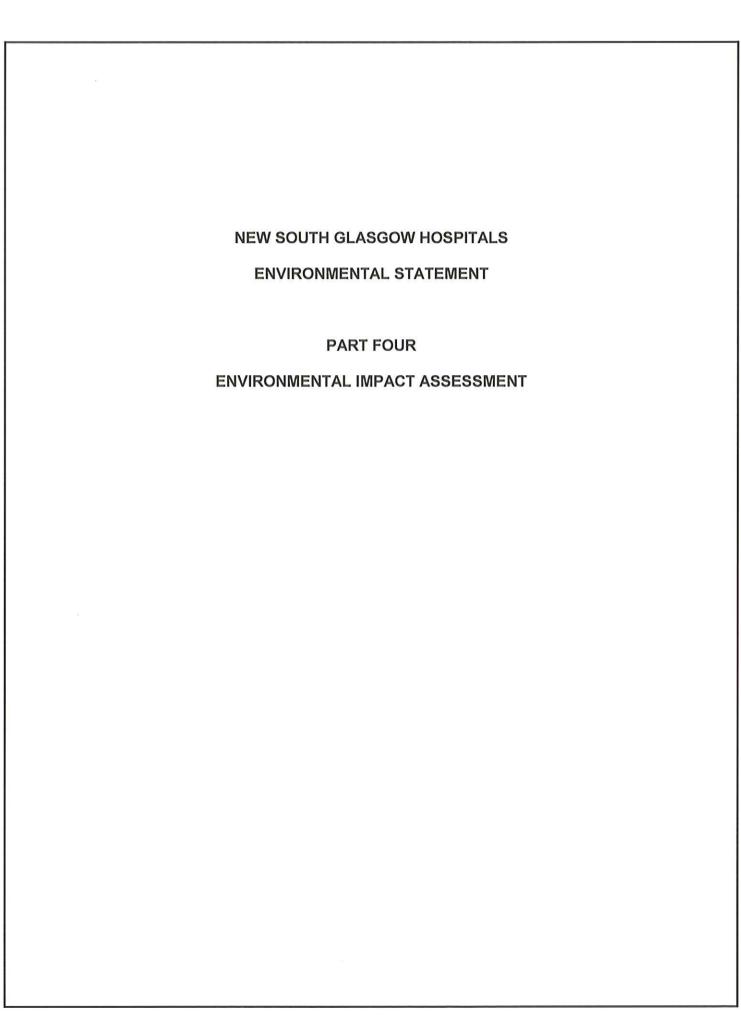
5.13 Community Engagement

The Board has undertaken a community engagement programme to assess the views of the wider public on the redevelopment of the hospital site. The project used three techniques to determine patient and carer views. These were:

- Focus groups
- Questionnaires
- Audit of complaints received in South Glasgow

The project identified a wide range of aspirational measures which are relevant to the hospital community. The following measures are reflected in the Campus Development Plan:

- The existence of appropriate, clear and accurate signage, externally and internally, was seen as important.
- Public transport should be able to penetrate the site from either end but be
 orientated to the main access point where appropriate support can be accessed
 immediately i.e. reception, escort, internal transport. If public transport is to
 penetrate the site then there is a need for designated stops with shelters and
 seating with regularly updated travel information
- The development of some form of internal transport system for people with mobility problems to help them move around the site.
- The issue of accessibility was viewed as important by over 97% of those surveyed. The two most prominent factors were related to reaching the site i.e. transport, car parking and physical access to the building and services.
- The need for a range of shopping facilities was identified, including a number of fixed and mobile retail units, and a good coverage of vending machines in public spaces. In addition, most people felt that that there should be a variety/mix of communal space spread throughout the hospital environment to enable patients/visitors/staff to socialize and meet, these should include designated café areas. In terms of fixed shopping units, the types of facilities envisaged included:
 - Café/ Coffee shop
 - Small general store/ supermarket/ cards/newspapers
 - Florist
 - Hairdresser
 - Fruit stall
 - Social area for patients/ staff



6.0 LAND USE & INFRASTRUCTURE

Summary

The proposed development covers an area of some 28 hectares. Located in the south side of Glasgow, surrounding land uses consist of a mixture of residential and commercial development, with hi-tech industry to the north and a sewage works to the north west. The site is currently used by the hospital and the land is therefore classified as Class 8 under the Use Classes Order 1997. There is also an area of public open space in the west of the site.

The site is currently serviced by all utilities: gas, electricity, water (supply and drainage) and telecoms. Land use and infrastructure impacts are assessed as being of minor to negligible significance, provided that mitigation is implemented to avoid inadvertent damage to service infrastructure, and that there is adequate capacity to service the proposed new development.

6.1 Introduction

The Campus Development Plan relates to the wider site, while the new hospitals development site is located in the centre of the campus.

The main purposes of this chapter are to:

- Provide an account of the land use change that will occur as a result of the proposals
- Address the wider implications for land use within the vicinity of the site
- Identify the location of existing site infrastructure and consider potential impacts and implications
- Identify appropriate mitigation measures
- Assess the significance of any residual impacts.

6.2 Methodology

Information on land uses on site and in the surrounding area was collated from a number of sources:

- Desk study/ literature review
- Development Plans
- Consultation with Glasgow City Council
- Site visits to confirm formal and informal land use

Information on land use proposals was obtained from the Campus Development Plan reports and drawings. The following companies were contacted for details of plant on site:

Scottish Power Transco
Thus Telewest
Scottish Water British Telecom

6.3 Limitations to Assessment

This assessment is based on the Campus Development Plan, December 2006, from Keppie Design, as described in Chapter 5. Information on gas, electric, water, drainage and telecom infrastructure was supplied by the service providers.

6.4 Baseline Conditions

6.4.1 Land Use History

All of the Historical maps referred to below can be found in Appendix 7 – Cultural Heritage.

Much of the site was undeveloped at the time of the first Ordnance Survey of the area in 1857. A building referred to as Merryflatts House was however present in the north-eastern corner of the site at this time while another building referred to as Shieldhall was present on the southern portion of the site. A further building referred to as Merryflatts was also present close to the southern boundary of the site. Most of the surrounding area like the hospital site was in agricultural use at this time.

The hospital dates from 1872 when a 240 bed general hospital and 180 patient lunatic asylum was built on the current site, part of the Govan Combination Poorhouse. In 1902-05 facilities accommodating a further 700 beds were built as the hospital continued to expand its services. Upgrading of the hospital's facilities, in the form of a multiplicity of medium–sized projects, began in the 1950s and was capped with the opening of a new Maternity Unit in 1970 and the completion of the Institute of Neurological Sciences in 1972.

Throughout it's history, land use change has been undertaken in a piecemeal fashion with buildings added in response to current and anticipated health care requirements.

The Ordnance Survey of 1895, indicated that the eastern half of the site had been developed and was now occupied by a hospital, a poorhouse and an asylum. These buildings were referred to as 'Govan Combination Parochial Buildings'. Several other buildings referred to as 'Shieldhall Combination Hospital' were located adjacent to the south-western boundary of the site.

Most of the remaining area surrounding the hospital site was still in agricultural use at this time.

By 1913, the number of the Govan Combination Parochial Buildings had increased resulting in a development of a large portion of the western portion of the site. The Shieldhall Combination Hospital on the southern portion of the site had also increased in size. The ponded area to the south-east of the site was still present and now had an access road leading into it from Moss Road to the west.

Areas immediately to the north, west and east of the property had also begun to be developed for residential and industrial use by this time. The Clyde Saw Mills was now present to the west of the site while the Shieldhall Goods and Mineral Station, and the Shieldhall Co-operative Works were present further to the west. To the immediate east of the site are several buildings of unknown use and one building labelled as the Linthouse Lumber Store.

By 1934, further buildings had been added to the central and northern portions of the hospital site. Buildings in this area were now referred to as The Southern General Hospital. The buildings on the southern portion of the site were referred to as Shieldhall Hospital at this time.

The area to the east of the site had been developed largely for residential use, except for the Linthouse Lumber store which was still present. The Clyde Saw Mills, Shieldhall Farm were still present to the west of the site however a recreation ground and bowling greens were now present immediately to the south of the farm. The area immediately to the south of the property was still undeveloped at this time although

Shieldhall Road was present a short distance to the south. The area to the north of the site of Renfrew Road was in industrial use at this time.

The hospital site had not changed substantially by the time of the next Ordnance Survey of the area in 1950. This shows an Electric Lamp Factory to the south-west of the site beyond a football ground, which was present immediately adjacent to the south-western boundary of the site, with a refuse heap to the west. Residential development had taken place to the south of the Shieldhall Hospital by 1950. This housing appeared to be on an area of reworked ground based on aerial photographs taken in 1947.

Aerial photographs from 1954 indicated an area of reworked ground with no vegetation directly to the south-west of the Shieldhall Hospital. This area is believed to have been used for recreational purposes at this time.

Historic maps for 1964/67 maps, indicated that the subject property had not changed significantly since 1960.

The 1970 map indicated that several reasonable large new buildings had been erected within the hospital grounds. To the west of the site a cement works was indicated.

Photographs of 1979 showed the site and surrounding area to be unchanged although the cement works appear to be disused.

The 1985 OS map, indicated that there was a new building to the north of the site and also a sewage works was now present to the north-west of the site close to the River Clyde, apparently replacing much of the shipbuilding warehouses. The same photographs showed there to be some new housing development on the former sportsfields to the south-west of the site. A new hospital building had also been erected on the southern portion of the property in the area formerly occupied by the Shieldhall Hospital.

The 1989 map indicated that there had been no significant change to the site or surrounding area.

By 1993 however, the western part of the property had seen further development activity and a helicopter landing pad was now present in the area. The buildings in the north-western corner of the site had also been extended by 1995 in addition several of the buildings in the southern part of the site had also been extended.

6.4.2 Present Land Use

The current Southern General campus site extends over approximately 28 hectares. The northern boundary is defined by Renfrew Road/Govan Road with the eastern boundary defined by Moss Road/A739 (Clyde Tunnel approach road). Langlands Drive and residential developments delineate the southern boundary and Hardgate Road runs north-westwards to form the western boundary of the hospital site. The site is located some 500 metres to the south of the River Clyde and lies on a former flood plain and is flat at an elevation of 7.5 AOD.

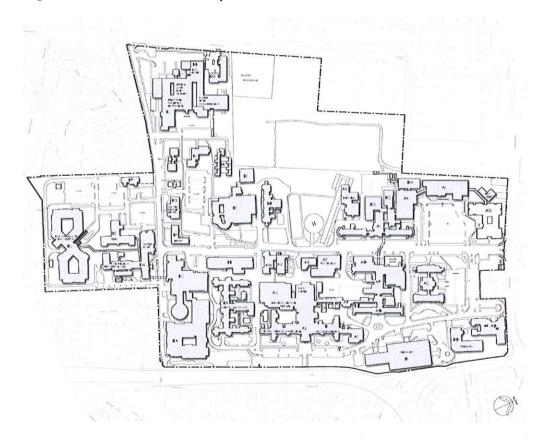
The current Southern General provides District General Hospital services for the southwest of Glasgow, with tertiary facilities providing services to the wider city area with regional Neurosciences and the Scottish National Spinal Injuries Unit also accommodated at this location. Services include:

- Accident & Emergency surgical intensive
- Surgical Intensive Therapy Unit
- Ear, Nose and Throat Clinic

- Oral and Maxillo Facial Unit
- General Medicine
- General Surgery
- Dermatology
- Gynaecology
- Neonatal Paediatrics
- Obstetrics
- Opthalmology
- Orthopaedic
- Urology
- Medicine for the Elderly
- Physically Disabled Rehabilitation and Continuing Care
- Therapy services
- Clinical services for prosthetics and orthotics
- Podiatry
- Neurology & Neurosurgery services for the West of Scotland
- Queen Elizabeth National Spinal Injuries Unit for Scotland
- Acute Psychiatry.

The locations of these facilities are shown on Figure 6.1

Figure 6.1 Facilities within Hospital Site



The hospital site contains a mix of buildings of varying ages and architectural style and quality. The oldest group of buildings on the site dates from 1872 and is concentrated to the northwest of the campus. There has been a number of more modern additions to the campus over the last 5 years including the Department of Medicine for the Elderly, the Westmarc building and the extensions to both the biochemistry and pathology buildings. In addition, the Maternity and Neurosciences

Units have been subject of major external and internal refurbishment to improve patient, clinical and support accommodation.

The architectural style and quality of the built form varies and many buildings would benefit from further redevelopment or refurbishment. There is a need to improve the quality of the built form if the vision for a modern hospital campus is to be realised. Building heights range from 1- 7 storeys with 4-5 storeys being the dominant building height. The site has the capacity to accommodate higher development to the north away from the surrounding residential uses.

The site currently has a parking provision of 1,400 spaces. These spaces are distributed throughout the site in the form of car parks and on street spaces. The largest of these car parks is provided at the Govan Road entrance adjacent to the Accident & Emergency and main outpatients building.

6.4.3 Land Ownership

All of the proposed development site is owned by the Scottish ministers, managed by the Board on their behalf, and incorporates an area of land earmarked for the development of a new hospital.

6.4.4 Land Use in the Surrounding Area

The surrounding area comprises predominantly residential and business and industrial use. Residential areas are mainly situated to the south and east of the site and generally comprise 2 storey semi-detached dwellings. Industrial and business uses are located mainly to the west and north of the site and include the Scottish Water Shieldhall Waste Water Treatment Works which operates at sites to the north and west of the hospital and a HGV hire business to the northwest of the site on Hardgate Road. Figure 6.2, an extract from the GCC City Plan, illustrates land use in the surrounding area.

6.4.5 Infrastructure/Services

Gas, electric, telecom, water and drainage services are present either on or adjacent to the site.

Utility services are shown on Figure 6.3. The plan is indicative of the services shown providing approximate locations of cables and pipes owned by Transco, Scottish Power, THUS, British Telecom and Scottish Water. Private connections, service pipes, valves, siphons, stub connections etc are not shown but may be located on the site. Initial negotiations have been undertaken with utilities providers to determine suitability of site infrastructure and supply issues.

Core utilities (representing Scottish Power) has indicted that substantial off site electrical infrastructure reinforcement is required to support the redevelopment and future expansion of the site.

Scottish Water is currently undertaking a review and is unable to comment on the suitability of site infrastructure until the review is complete (estimated in July 2007).

A gas requirement has been calculated based on the OBC scheme. Scottish Gas Networks has indicated that it will complete a site survey/investigation study once the application is logged.

BT has indicated that the BT lines coming in to the site could be increased in capacity to serve the new hospital.

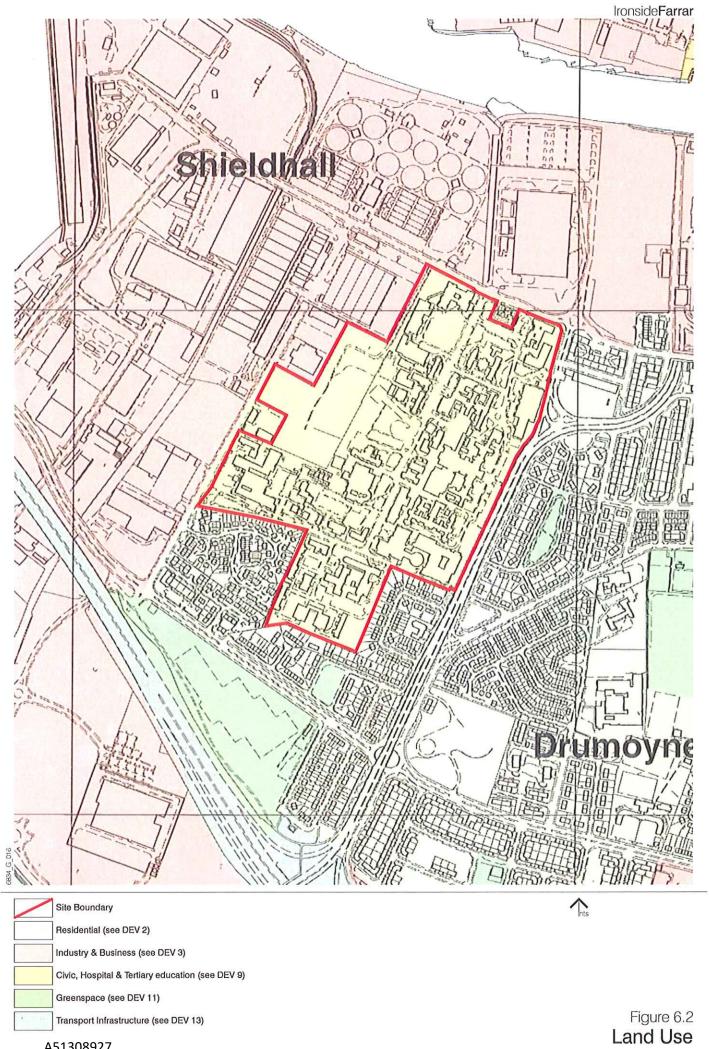
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Figure 6.3 Existing Services

6.4.6 Development Land

The potential for impacts on development land is considered by identifying and assessing impacts on any outstanding planning applications or planning consents for developments within or in the vicinity of the development site. Information on current planning applications will be obtained from Glasgow City Council Development and Regeneration Services. Any potential impacts can be assessed at the detailed planning stage.



6.5 Proposed Demolitions

The Campus Development Plan proposes the demolition of a number of complete buildings, all within the site, to be completed over a phased timescale, as the first stage of the programme for the redevelopment of the hospital. Buildings in the south/central part of the site will be demolished first to allow the new acute adult and childrens' hospitals to be built. At the later stages, (2013) the existing acute buildings, outpatients and management blocks in the northern part of the site will be demolished to provide sites for potential university accommodation and possible Psychiatric Village. In addition, some extensions to retained buildings will be demolished. This is in recognition that previous haphazard development has created a very poor existing context to build on and to allow all new development to proceed as in the Campus Development Plan.

6.6 Potential Issues

Potential land use issues resulting from the development of the site are:

- · Impacts on continuing site hospital use
- Impacts on neighbouring land use
- Cumulative impacts from other development in the area
- Risk of damage to underground services during construction
- Existing services capacity

Impacts on pedestrian access are addressed within Chapter 9.

6.7 Mitigation Measures

The need to avoid inadvertent damage to service infrastructure should be addressed within contractor requirements.

6.8 Impact Assessment

The new hospital complex, including clinical support facilities will occupy floor space in the region of 125-135,000 square metres. This includes some 55,000 square metres of the Retained Estate, made up as follows:

Acute Medical East	5,668	sq m
Podiatry	1,257	
Central Medical Wards	8,114	sq m
Maternity (BL)	10,184	sq m
Maternity (DB)	incl	1.5
Neurology (BW)	5,046	sq m
Neurosurgical (BC)	13,286	sq m
PDRU Building (DE)	857	sq m
Spinal Injury (DA)	4,452	sq m
Westmarc (DI)	6,460	sq m

The proposals represent a substantial increase in hospital accommodation and facilities on the site. Car parking provision will increase from 1400 to 3500/4000.

6.8.1 Land Use Impacts

Impacts on Land Use Within the Existing Hospital Site

Land use within the existing hospital site includes buildings, roads and footways, car parking areas, and open space (including green space and paved areas). The Campus Development Plan includes a similar range of land uses although the ratio of land uses may change. While the ratio of buildings and car parks to open space may be higher, the quality and accessibility of open space will be improved. During the construction phase, there will be a requirement for temporary land use change; car parking areas may be temporarily moved, sites may be required for temporary construction compounds and access routes may be diverted. Overall, the impacts on land use within the hospital site will be minor.

Impacts on Neighbouring Land Use

All of the proposed development will occur within the site boundaries. There will be no impacts on residential, industrial or community land in the surrounding area.

Cumulative Impacts

There is no evidence that the proposals will give rise to adverse impacts on commercial land use either during the construction phase or following completion of the development. The additional provision of improved open space represents a beneficial impact of minor significance.

Services

Scottish Water has advised that water supplies in the area are capable of serving the proposed development. It is assumed that there is also adequate capacity in existing site servicing to address gas, electric, telecom and drainage requirements of the proposed new development.

Provided standard requirements are imposed on contractors to avoid damage to existing infrastructure, adverse impacts during construction will be negligible. Adverse impacts during site operation are not envisaged.

6.9 Residual Impacts

Land use and infrastructure impacts are both beneficial and adverse, and are assessed as being of negligible to minor significance, provided that the assumptions made with regard to services can be confirmed.

The land use impacts of the development are summarised in Table 6.2 below:

Table 6.2 Land Use and Infrastructure Residual Impacts Summary

Impact	Significance	Comment	
Hospital land use	Neutral	Improved quality of open space	
Community land use	Negligible	No significant changes	
Commercial/ industrial land use	Negligible	No significant changes	
Residential land use	Negligible	No significant changes	
Cumulative land use impacts	Negligible	No significant changes	
Services infrastructure	Negligible	Assumes adequate capacity Assumes mitigation during constructi	

7.0 GROUND CONDITIONS

Summary

This chapter describes existing ground conditions within the development site and assesses the potential impacts the ground conditions may have on the development and vice versa. Potential environmental receptors include soils, geology and the development itself. There are no geological designated sites in the vicinity.

Impacts of the proposals on the site geology will be negligible. The presence of localised contamination will require to be confirmed by a programme of site investigations prior to construction, and suitable mitigation implemented. Residual impacts of site geology and soils on the proposed development will be or negligible to minor.

7.1 Introduction

This chapter reviews the existing information on geology and soils impacts of the scheme as obtained from desk studies.

Besides developments potentially impacting on geology and soils, the geology of the area may impact on the development, for example ground stability, or suitability for use as a fill material etc. Any contamination from previous historical development may also impact on new development proposals.

The site is situated on an alluvial floodplain approximately 500m south of the River Clyde. The results of nine ground investigations undertaken at the site were available. The SI has indicated that approximately a third of the site's area was covered to depths proving bedrock. The ground at the site consists of made ground that is underlain by alluvium, which in turn is underlain by glacial till and Carboniferous Coal Measures bedrock.

7.2 Baseline Conditions

7.2.1 Topography

The site for the new South Glasgow Hospitals is situated to the south of the River Clyde in the Shieldhall area of Glasgow. It covers approximately 28 hectares. The site is flat, lying on the raised beach / former flood plain of the River Clyde at an elevation of 7.5m AOD or thereby.

7.2.2 Designations

There are no geologically designated areas within or adjacent to the development site.

7.2.3 Solid Geology

The British Geological Survey Maps Sheets 30E (S) & (D) 1:1 10 000 (1996) provided information on solid geology for the site and local area.

Geological maps indicate that the site is likely to be underlain by the carboniferous age rocks of the Limestone Coal Formation which are likely to form a general sequence of mudstones with sandstones and seams of ironstone and coal. These rocks are likely to dip towards the east south-east in the vicinity of the site and have been disrupted by a number of faults on the site.

The Lower Garscadden Ironstone are expected to outcrop at rockhead on the southern portion of the site, whilst the Kilsyth Coking Coal is expected to outcrop immediately to the south-west of the southern portion. This latter seams also outcrops at rockhead a short distance to the west of the property boundary. The complicated pattern of faulting in the area means that the Kilsyth Coking Coal is also expected to outcrop at rockhead on the central portion of the site.

Although environmental geology maps indicate that the property is not located within an area of known mining, an abandoned mine shaft is located on the southern portion of the site. It is possible that this shaft has been used to gain access to the Garscadden Ironstone Seam, which although relatively thin (0.30m) has been worked further to the east of the site. Issues associated with mineral stability and the possible presence of a mine shaft on the site should be more fully established prior to any development of the site. The location of the abandoned shaft should be established and the Coal Authority should be contacted for any information they might have on shallow mine workings within the site boundary.

7.2.4 Drift Geology

British Geological Survey One Inch Series Glasgow Scotland Drift Edition shows the drift geology of the site.

Geological maps indicate that solid strata beneath the property are expected to be overlain by approximately 20m of drift deposits. These deposits are likely to comprise approximately 10m Flandrian age alluvial deposits which are likely to consist of sands and gravels. Alluvial deposits in turn expect to be underlain by approximately 10m glacial till (boulder clay deposits) which are likely to comprise stiff sandy clays with gravel and cobbles. Environmental geology maps indicate an area of infilled ground is located on the extreme south-eastern corner of the site.

7.2.5 Geology & Mining

The site lies on river terrace deposits associated with the River Clyde nearby, and it's estuary in past geological history. Ground conditions are alluvial overlying limestone coal group bedrock at a depth of 17m to 23m. This bedrock includes workable coals and limestones and while no recorded working is known, extraction clearly took place in the area as witnessed by the presence of shafts within the site.

A significant fault line runs east west through the north half of the site, noted as the Blythswood Fault, and possibly a continuation pf the Dechmont Fault. From this a further fault runs south, through the west section of the site and from this, in turn, a third fault runs eastward through the south area of the site. The Kilsyth Coking Coal outcrops between the first and third faults at the east of the site and an ironstone outcrop exists at the extreme southwest corner, hence there is the potential for shallow, unrecorded workings, predating the time when all operations underground had to be recorded by law.

The main east west fault line could exhibit minor seismic activity and should be assessed as part of any redevelopment strategy, including any possible affect on sensitive instrumentation.

Some ambiguity exists over the mineshafts recorded in the south area of the site and while previous investigations have concluded that the area can be considered as stable however, further investigations will be undertaken as part of the site investigation. The mineshaft recorded north of the new Medicine for the Elderly building was associated with blackband or clayband ironstone workings, the doubt being over which stratum was actually worked from this pit. How this shaft has been stabilised is not known at present. A borehole driven to the southeast of this shaft recorded disturbed strata within the rockhead, which was considered more likely to be

fault brecia than a mine waste, however there is no fault recorded at this locus, albeit the geology is complex. The shaft recorded north of the Works Department is understood to have been of an investigatory nature, driven to the blackband ironstone, thought to be at a depth of some 70m. Further investigative works require to be carried out to determine how this shaft was backfilled/stabilised.

The currently available information indicates that the remaining area of the existing site is stable and it would seem, subject to confirmatory investigation that the extension of the site to the west should also be stable.

7.2.6 Contamination and Ground Gas

Various depths of upfill have been recorded in previous investigations but testing has only been carried out more recently, revealing insignificant levels of contamination or ground gas. Any future investigations should include appropriate sampling and testing, when any infilled ground is encountered, or at any local pockets of organic materials which may exist naturally in the area.

One previous ground investigation identified ash till, which, when tested indicated variable and one unduly high level of combustibles within the material. Hence any such material identified in the future should be fully sampled and tested.

At this point in the Environmental Services report had not come to hand for the site but we have on file a Preliminary Environmental Liability Evaluation by Resource & Environmental Consultants Ltd. (REC)

7.2.7 Drainage

The drainage layout that exist within the hospital site appears to be, in the main, a combined system, discharging into the public sewerage network in the area; the exception being that the gullies at the east area roads and parking are connected to a separate surface water system there. A variety of plans exist indicating the early layout of the systems and the more recent configuration.

The sewers records received from the West of Scotland Water confirm the main public sewer running southwest to northeast, through the centre area of the site is public continuing to the nearby sewerage works. Parallel to this is the culverted Linthouse burn, which discharges to the River Clyde nearby to the north. We do not know the source and history of this burn, which strangely does not feature on the historic plan for the area, however it appears that ponding may have existed southeast of the site, which was probably the source of this burn.

A further culvert runs from the east through the northeast area of the site along with a lesser culvert through the centre area, from the west, these connecting to the Linthouse Burn culvert. All of the culverts are currently recorded as public. The west culvert is recorded as 600mm diameter, the east culvert as 1150 x 900 and the main culvert as varying from 1050mm to 2000mm, these main culverts being brick arch construction.

A further public sewer also exists running from the south, centre of the site, via Langlands Drive, to Moss Road. Both of the public sewers are recorded as 300mm diameter and appear to be exclusive to the hospital.

For the hospital envisaged a 300mm foul water outfall will be required, along with a 1200mm surface water outfall, providing an acceptable interface can be made with either the Linthouse Burn from the site or the other existing surface water systems in the area, these leading to the River Clyde to the north.

7.2.8 Structures & Foundations

All the reports concluded that the soft alluvium underlying the site has the potential to induce excessive settlements if structures were founded on spread foundations. A range of bearing capacities was presented ranging from 60kN/m2 to 100kN/m2 depending on drift geology. To reduce settlement some reports recommended the use of large sized spread foundations and raft foundations for low rise buildings, but it was added that settlements in excess of 25mm would still occur. All the reports concluded that structures with higher loadings, and settlement sensitive structures, should be either founded in the glacial till or socketed within bedrock by using piles.

The maximum bearing capacity of the bedrock was tentatively specified as 1.0MN in one report. The 1998 Arup report recommended a maximum safe working load of 480kN for 600mm piles founding in 6m of glacial till and a maximum safe working load of 500kN for 220mm mini-piles socketed 3m into bedrock.

The majority of the SI reports recommended the use of bored cast in-situ piles such as the CFA method of emplacement. One report concluded that down-drag of piles would need to be taken into account in the pile design.

Vibro replacement ground treatment of the weak alluvial deposits was discounted due to the presence of cohesive deposits.

For excavations it was concluded that groundwater would be an issue but that it could be feasibly controlled by sump pumping and temporary sheet piles. It is not known at this time whether the previous reports can be relied upon by the Client. If this is not the case then a major repeat of the previous investigations will be required to satisfy future liabilities and to mitigate against any project risks.

The made ground consists of a mixture of cinders, ash, sands and gravels, and brick, and ranges in thickness between 0.3m and 1.75m. The alluvium generally consist of soft to very soft clays and loose to medium dense silts and silty sands, of approximately 20m total thickness, but locally thinning to approximately 16m. The alluvium was generally found to be of high to medium compressibility.

In one site investigation report it was noted that differential settlements had adversely affected existing buildings at the site. The glacial till is described as stiff to very stiff and varies in thickness from less than a metre to approximately 15m, with an "average" thickness of approximately 6m.

The upper horizon is often weathered but strength increases with depth. Compressibility of the glacial till was found to be low to very low. Rockhead was found at various depths ranging between 15.5 mbgl to 25.5 mbgl.

Bedrock was found to consist of interbedded layers of sandstone, siltstone, and mudstone with occasional thin seams of coal. A thin layer of igneous rock was found at one location in association with evidence of a fault zone. The strength of bedrock ranged between very weak (coal), moderately weak (mudstones) to moderately strong and strong (siltstones and sandstones).

The new hospital buildings will range from single storey to low rise, multi-storey buildings hence a considerable range of structural formats will apply.

Likewise a considerable range of foundation types will arise, however, the ground conditions so far identified lead to the view that special foundation and ground floor construction will apply in many areas. With rockhead varying between 17m and 23m in depth, along with indifferent natural superficials, foundations will range from reinforced pad/strip/raft foundations to driven piles for buildings of any significance. Historic information indicates that the site is affected by the tides in the nearby River

Clyde with site ground water levels ranging from ground level to 4m depths at times – this will clearly impact on foundation construction and the like. The pre-developed nature of the site, with the presence of fill over some of the area and the indifferent natural strata may lead to the need to incorporate spanning ground floor slab construction, supported on additional foundation provision in line with the main foundations outlined above. All of these aspects outlined above will require to be investigated by an extensive ground study with mining details reviewed further after suitable desk study.

7.2.9 Contamination

Further site investigations will be required to enable a preliminary assessment of site contamination to be made, and to inform future, more detailed investigations, if appropriate.

7.3 Potential Impacts

Potential impacts arising on or from geology and soils are identified as:

Soils & Geology

- Loss or sterilisation of mineral reserves
- Loss of soils
- Loss or disturbance to important geological features
- Mine workings/ stability issues

Contaminated Land

- Toxic effects on construction workers
- Toxic effect on end users
- Chemical attack on structural and drainage elements
- Disturbance of contaminated materials via construction operations excavations.

In accordance with current guidance and best practice for impact assessment, the significance of all impacts will be considered after the mitigation measures have been implemented. For example, there may be a real risk to human health due to working in contaminated soils, however, these risks are greatly reduced via standard Health and Safety procedures and appropriate protective clothing. Hence the impact would be assessed as minor.

7.4 Mitigation Measures

7.4.1 Soil Quality

Any topsoil removed will be appropriately stored to avoid over-compaction and reused within the site landscaping scheme. Care should be taken to avoid compaction of areas to be landscaped.

7.4.2 Structures and Foundations

A summary of the SI reports¹ has concluded that the whole hospital site is underlain by potentially highly compressible material that would adversely affect structures if founded above or within these compressible deposits with loadings in excess of

Sinclair Knight Merz, Summary Report on previous Site Investigations, March 2007

50kN/m2. Therefore, it is recommended that structures with higher loadings be founded in stronger formation at depth, either in the very stiff glacial till (where it is of sufficient thickness), or socketed into the bedrock to an appropriate depth and rock quality.

The depths to bedrock and low shear strength cohesive deposits to significant depth above them is likely to require building loads to be supported on piled foundations taken down and socketed into the underlying solid deposits. This will require pile lengths in the order of 20m to 25m with adequate socket lengths to provide the required carrying capacity (typically about 5m but dependent upon the actual loading).

As the scheme design advances, the spacing and loads for required column loads will become known and therefore a piling specialist can be engaged to refine the pile design requirements. It is recommended that a supplementary site investigation is commissioned to cover the footprint of the proposed new structure, and that founding strata is tested by insitu methods (it is possible that High Pressure Dilatometer (HPD) testing could optimise foundation design).

With respect to the footprint of the proposed structure, the exact location of the offsite mine shaft as recorded in historical maps should be established. It is recommended that a piling contractor be contacted at an early stage to provide indicative costings and to consider alternative piling layouts. Following the additional ground investigation the piling proposals can be refined still further.

The site infrastructure will be highly dependant upon any change in topography during earthworks cut-and-fill operations. Should there be any soil retention requirements then the design of such retaining wall foundations will need great care to guard against sliding in such low strength founding materials, or else themselves also be piled.

Drainage runs may need to be laid to steeper than normal gradients to enable continued operation should the soft clays settle under the imposed weight of the site infrastructure. This effect will become more prominent if significant areas of the site are raised in level, even by a nominal amount (such as required to provide a piling mat, which in this situation is likely to be thick).

Excavations may be prone to groundwater ingress so consideration to the use of tightly interlocking driven sheet piles around excavations may be required for any deep excavations, with appropriate allowance for pumping from the base of such excavations.

Where basements are to be formed with service ducts the ground loading will be reduced, which may have a minimal heave consequence, but the main issue will be that of water tightness both permanently and during construction.

Contamination

The SI would be most economically undertaken if combined with any geotechnical investigations that are proposed for the development.

Appropriate mitigation measures should then be identified. These will include adopting appropriate health and safety measures to reduce exposure to potentially contaminated material. Other possible mitigation measures are:

 Advice to contractors/ construction workers regarding contamination issues with appropriate reference in the Construction, Design and Management (CDM) Regulations

- Use by construction workers of appropriate Personal Protective Equipment (PPE) such as gloves, boots, handwash facilities
- Consideration of protection of services, especially water pipes.
- Consideration of the importation of clean capping materials in areas not covered with hardstanding, e.g., landscaped areas
- Limited offsite removal of materials.

On the basis of soil testing data, there is no need to take special precautions to protect buried concrete against the deleterious effects of sulphate attack.

7.5 Impact Assessment

7.5.1 Geology and Soils

Mineral reserves

No workable mineral reserves were identified. Development will not result in any impacts on mineral reserves.

Soils

Areas of soil within the development area that are to be landscaped are sensitive to impacts during construction. Soil conditions are important to the establishment of vegetation. If soil structure is damaged, it may be difficult to establish vegetation in accordance with the landscape design proposals.

There is very little soil within the development site, owing to its urban nature. The proposals will not require large scale storage of or disruption to topsoil. Assuming appropriate storage of topsoils, adverse impacts on soils will be negligible and will be limited to the construction phase.

Impacts on soils are assessed as:

Sources

Earthworks, other construction activities

Pathways

Compaction during storage, damage from construction

vehicle movements

Receptor

Soil. Sensitivity minor-moderate

Magnitude

Negligible

Character

Adverse, low probability, short-term, local, small-scale,

avoidable

Impact Significance

Negligible

Designated Sites

None were identified. The development will not result in any impact on geological features.

Mine workings/ Stability Issues

Contractors will require to confirm site stability through further site investigations. It is assumed that appropriate construction engineering will mitigate for any potential constraint relating to subsidence.

Significant adverse impacts relating to mine workings or other stability issues are therefore not envisaged, based on information available at present, and are assessed as:

Sources

Subsidence hazards

Pathways

Development constraint

Receptor

Built development. Moderate sensitivity

Magnitude

Negligible

Character

Adverse, low probability, local, mitigated

Impact Significance

Negligible

7.5.2 Contaminated Land

Construction Phase

Exposure to potentially contaminated material will be significantly reduced by adopting appropriate health and safety measures. In addition, further site investigations within this zone will better define the nature and location of contaminants and enable specific mitigation measures to be identified and implemented.

Assuming appropriate mitigation measures are implemented, construction phase impacts from soil contamination are assessed as:

Sources

Soil contamination

Pathways

Human contact/ ingestion

Receptor

Construction workers. Sensitivity major

Magnitude

Negligible

Character

Adverse, low/ medium probability, local, mitigated

Impact Significance

Minor

Operational Phase

The risk from contaminated soil is minor. Following appropriate mitigation, operation phase residual impacts from contaminated soil are assessed as:

Sources

Soil contamination

Pathways

Human contact/ ingestion, plant uptake

Receptor

End users: sensitivity high/ landscaping works: sensitivity

medium

Magnitude

Negligible

Character

Adverse, low/ medium probability, local, mitigated

Impact Significance

Negligible

7.6 Residual Impacts

Table 7.1 summarises the impacts of the proposals on ground conditions.

Table 7.1 Ground Conditions – Impacts Summary

Impact	Significance	Comment
Mineral Reserves	No impacts	
Designated Sites	No impacts	
Soils	Negligible	
Geological features	No impacts	
Stability	Negligible	Contractors must confirm this for themselves
Contamination: Construction phase Operational phase	Minor Negligible	SI required to confirm

8.0 POLICIES AND PLANS

Summary

This chapter reviews the Development Plan framework and other relevant planning guidance and policy and seeks to assess compliance of the New South Glasgow Hospitals proposals with national, regional and local policies and plans. The proposals were found to be in compliance with National Policies and guidance in relation to economic development, archaeology, flooding, natural heritage, waste management, transport, noise, open space, urban design and drainage. The Development Plan for the site includes the Glasgow and Clyde Valley Joint Structure Plan (2002) and the Glasgow City Plan (2003). Key Structure Plan policies relating to the Strategic Management of Travel Demands and Strategic Environmental Resources are supported by the proposals. The site is identified in the City Plan for civic, hospital and tertiary education, and key policies related to transport infrastructure, vehicle parking standards, pedestrians and cyclists, urban design, listed buildings and landscape design are all supported by the development proposals.

8.1 Introduction

8.1.1 Planning Policy and Guidance Hierarchy

This chapter sets out the policy context and provides a comprehensive assessment of the design proposals for the redevelopment of this site as outlined in Chapter 2 of this ES. The proposals will be assessed against the relevant guidance contained within Scottish Planning Policy (SPP), National Planning Policy Guidance (NPPG), and related Planning Advice Notes (PAN): regional policy guidance in the Glasgow & Clyde Valley Joint Structure Plan 2000, and the local policy context contained within the Glasgow City Plan (2003).

8.1.2 Methodology

This chapter considers the compliance of the proposed development, as detailed in the Project Description in Chapter 4, with the relevant national, regional and local planning policies. The methodology includes:

- Identify relevant national policy and guidance;
- Identify relevant Structure Plan Policies;
- Identify all relevant adopted and emerging Local Plans and draw up a schedule of relevant policies;
- Assess the compliance of the proposals with the policies and guidance at all levels; and
- Consult with relevant planning authorities and record their responses.

8.2 National Planning Policy & Guidance

8.2.1 Introduction

National guidance in Scotland on planning is provided by the Scottish Executive in the form of the National Planning Framework, National Planning Policy Guidelines (NPPGs), their replacement Scottish Planning Policies (SPPs), Planning Advice Notes (PANs) and Planning Circulars. NPPGs and SPPs provide statements of Scottish Executive policy on nationally important land use and other planning matters, supported where appropriate by PANs provide advice on good planning practice.

Circulars provide statements and policy guidance on implementation through legislative or procedural change.

NPPGs, SPPs, PANs and Circulars relevant to the New South Glasgow Hospitals are listed in Table 8.1.

Table 8.1 Schedule of National Planning Policy & Guidance

Date	Title
SPP 1/2002	The Planning System
SPP 2/2002	Economic Development
SPP 7/2004	Planning and Flooding
NPPG 5/1994	Archaeology and Planning
NPPG 10/1996	Planning and Waste Management
NPPG 14/1998	Natural Heritage
SPP 17/2005	Transport and Planning
NPPG 18/1999	Planning and the Historic Environment
PAN 42/1994	Archaeology
PAN 56/1999	Planning and Noise
PAN 58/1999	Environmental Impact Assessment
PAN 60/ 2000	Planning for Natural Heritage
PAN 61/2001	Planning and Sustainable Urban Drainage Systems
PAN 65/2003	Planning and Open Space
PAN 68/2003	Design Statements
PAN 75/1999	Transport and Planning
PAN 77/2006	Designing Safer Places
PAN 78/2006	Inclusive Design
PAN 79/2006	Water and Drainage
Circular 15/1999	The Environmental Impact Assessment (Scotland) Regulations 1999

It should be noted that it is implicit that the Outline Planning Application accords with the guidance contained within PAN58 and the requirements of Circular 15/1999.

8.2.2 Scottish Planning Policy and National Planning Policy Guidance

SPP1: The Planning System outlines the purpose of the planning system and seeks to ensure that future development is sited in appropriate and sustainable locations. It promotes the integration of sustainable development into planning policy and guidance at all levels. In particular it is considered that sustainable development should be encouraged by:

- Promoting regeneration and the full and appropriate use of land, buildings and infrastructure;
- Promoting the use of previously developed land and minimising Greenfield development;
- Conserving important and historic and cultural assets;
- Protecting and enhancing areas for recreation and natural heritage;
- Supporting better access by foot, cycle and public transport, as well as by car;
- Encouraging energy efficiency through the layout and design of development;
- Considering the lifecycle of development from the outset;
- Encouraging prudent use of natural resources.

Comment: The proposals for the NSGH promote the regeneration of an existing hospital site whilst conserving the existing listed buildings. The landscape strategy for the site encourages the creation of open spaces which can be used by staff, patients and visitors of the hospital whilst contributing to local biodiversity. As outlined in the Transport Assessment, consideration has been given to improving accessibility to the site to encourage, staff in particular, to use alternative modes of transport. Whilst the proposals are in outline consideration has been given to whole lifecycle costs and energy efficiency with the indicative design assessed in this context to set the benchmark targets for any proposals submitted by the preferred bidders.

SPP2 Economic Development focuses on four areas where planning can contribute to economic development:

- Providing a range of development opportunities to ensure that there is a range and choice of sites for new employment opportunity.
- Securing new development in sustainable locations to improve integration between transport and locations for development and to encourage more sustainable forms of development.
- Safeguarding and enhancing the environment to make sure that new development contributes to a high standard of design and that the natural built environment is protected
- Providing a dialogue between councils and business to encourage a positive culture of engagement and better understanding of the priorities of the business community and the role the planning system in enhancing economic competitiveness.

Comment: The Board is one of the city's key employers and an important service provider. The redevelopment of the SGH site is part of a wider clinical strategy which aims to improve services. The construction of the NSGH will improve the environment and working conditions for its staff. In addition, the proposed development will be one of the largest public sector developments in Scotland and will bring new employment opportunities to the area throughout the construction period. The proposals involve the redevelopment an existing site and the Green Travel Plan seeks to improve accessibility and encourage the use of more sustainable modes of transport (refer Transport Assessment)

NPPG 5 Archaeology and Planning provides policies concerning the protection of archaeological sites of regional importance. Its aim is to accommodate development without eroding environmental assets.

Comment: The archaeological impacts of the proposals will be fully considered at all stages in compliance with guidelines contained in *NPPG5*. Given the historical use on the site it is considered unlikely that any archaeological finds of importance would be uncovered. In the event that something is discovered the appropriate protocol will be followed to ensure they are recorded.

SPP 7 Planning and Flooding aims to ensure that flood risk is properly taken into account due to the damage which floods may cause.

Comment: A Level 3 Flood Assessment was undertaken by Halcrow in 2005 and concluded that the SGH site was not at risk from flooding (refer Chapter 11 of this ES).

NPPG 10 Planning and Waste Management sets out the Government's planning policies for development involving the management of waste, including guidance on applying the aims of sustainable development. The five principles on which any waste

management framework should be founded are identified as: the proximity principle, regional self-sufficiency, the precautionary principle, the polluter pays and best practicable environmental option (BPEO).

Comment: The NSGH is in compliance with the policy objectives contained *in NPPG10 Planning and Waste Management*. By making use of an existing hospital site, the scheme will minimise the effects on the land use and surrounding environment, as well as being the Best Practicable Environmental Option (BPEO) for the new facility. The BPEO is the option that provides the most benefit with the least damage to the environment as a whole, at an acceptable cost in the short and long term.

NPPG 14 Natural Heritage ensures that the natural heritage is conserved and enhanced for the benefit of present and future generations. It considers that new development can play an important role in securing environmental improvements and seeks to ensure that the conservation and enjoyment of the natural heritage brings benefits to local communities and provides opportunities for social and economic progress.

Paragraph 52 states that NPPG 14 stressed that scale, siting and design of new development should take full account of the character of the landscape and the potential impact on the local environment.

Comment: The landscape strategy for the site aims to create a quality hospital environment conducive to the care and healing of patients. The enhancement of existing open spaces and the creation of new spaces will help achieve this aim creating a high quality environment and landscape setting for the hospital which will also contribute to local biodiversity through habitat creation. Chapter 15 of this ES deals with ecology and nature conservation in more detail and concludes that the impacts of the proposed development are negligible.

Chapter 10 of this ES assesses the proposals for the redevelopment of the site in the context of visual impact and impact on the existing character and townscape of the area.

SPP17 Planning & Transport seeks to achieve better integration between development and different modes of transport. The policy also establishes the requirements for Councils to establish maximum parking standards for new development. Paragraph 55 notes that where an area is well served by other modes of transport, a more restrictive maximum parking standard can be applied with the objective of reducing car use.

Comment: The Transport Assessment lodged in support of this application will consider the uses raised by SSP17 in detail; however, a few general issues can be established at this point:

- The site is easily accessible by a number of bus services and accessible by rail and underground services.
- The site is an established part of the city and existing road, footpath and cycle networks provide access for pedestrians and cyclists.

The Transport Assessment encourages improvements to existing pedestrian and cycle routes to provide safe and accessible connections into and through the site. It also seeks to improve access to the site by public transport to reduce private car uses. It also outlines recommendations for a parking strategy to contribute to reduction in the number of users travelling to the site by private car. Chapters 8 & 9 cover impacts on Transport and Pedestrian & Cyclists in more detail.

NPPG 18 Planning and the Historic Environment sets out government policy in relation to the historic environment which seeks to secure the protection, conservation and enhancement of our built heritage whilst remaining responsive to present needs. The policy seeks to protect listed buildings and their setting but recognises that they may not be readily adapted to new uses.

Comment: There are two listed buildings on the SGH site and it is the Boards intention to retain and reuse these buildings for administrative functions on completion of the new hospital. When developing the indicative design for the hospital consideration has been given the impact of any proposed development on the setting of these listed buildings.

8.2.3 Planning Advice Notes

PAN42 Archaeology supports the policies contained within NPPG5 concerning the protection of archaeological sites of regional importance.

Comment: As previously discussed the archaeological impacts of the proposals will be fully considered at all stages in compliance with guidelines contained in *NPPG5*.

PAN 56 Planning & Noise sets out a range of noise issues which should be considered when developing proposals to ensure that the proposed development will not adversely impact the amenity and quality of life of surrounding residents.

Comment: Chapter 12 of this ES considers the existing noise environment of the site and the likely effects o the proposed development both during construction and on completion of the development. It concludes that impacts during constriction will be no more than of medium significance if recommended mitigation measures are implements and that there will be a noise increase of low significance on completion mainly due to increased traffic movement.

PAN 60 Planning for Natural Heritage aims to safeguarding our natural heritage through:

- Maintenance and enhancement of landscape character.
- Providing diversity for wildlife habitats.
- Fostering opportunities for learning about the environment.

Paragraph 44 addresses the issue of greenspace in and around our towns and cities, with paragraph 48 addressing the need for green networks. This provides a range of valuable wildlife habitats and recreational opportunities, creates attractive environments for living and working, and offers scope for local communities to play an active part in caring for the environment.

PAN65 Planning and Open Space also gives advice on the role of the planning system in protecting and enhancing existing open spaces and the provision of new high quality open spaces in urban areas. Paragraph 4 notes that the planning system performs 2 key functions in relation to open space:

- Protecting areas that are valuable and valued;
- Ensuring provision of appropriate quality in, or within easy reach of, new development.

Comment: The SGH is an established site within the city and as such connections to the surrounding communities. As previously outlined the landscape strategy for the site aims to create a quality hospital environment conducive to the care and healing of patients. The enhancement of existing landscape character through the creation of new areas of open space will help achieve this aim creating a high quality environment and landscape setting for the hospital which will also contribute to local biodiversity through habitat creation.

PAN 61 Planning and Sustainable Urban Drainage Systems provides best practice advice on integration of SUD Schemes as part of new developments. SUDs aim to deal with issues of water quantity, quality and amenity in an integrated way to return excess surface water to the natural water cycle with minimal adverse impact on people and the environment.

Comment: This is an important issue given the sites proximity to the River Clyde and has been considered in Chapter 11 of this ES. The outline proposals for the site include provision for a SUDs scheme which has a dual function by also providing the main focal space within the campus in front of the main public entrance to the hospital.

PAN63 Waste Management Planning complements the policy guidance contained within NPPG10 and provides advice on a sustainable approach to waste management.

Comment: As outlined in paragraph 8.4.2, the NSGH will ensure that due consideration is given to the management of waste associated with the site. Consideration will be given to the design and layout of space for waste management on the site to ensure that it is discreet and is accessible and well lit to ensure the safety of the staff operating it.

PAN68 Design Statements outlines what a design statement is, why it is a useful tool, when it is required and how it should be presented. A design statement enables the applicant to explain why the selected design solution is the most suitable for that site.

Comment: Parts 2 & 3 of this ES outline the need for development, development description, development context and design context. A design statement has also been submitted in support of this application demonstrating through the indicative design, one way in which the site could be developed to accommodate the new hospitals.

PAN75 Planning for Transport accompanies SPP17. It aims to create greater awareness how linkages between planning and transport can be managed.

Comment: As outline in section 8.4.2, a Transport Assessment accompanies this application and has been prepared in accordance with SPP17 and PAN75 Transport issues are specifically dealt with in Chapter 8 of this ES.

PAN77 Design Safer Places supersedes PAN46 Planning for Crime Prevention and should be read in conjunction with PAN67, PAN68 and PAN76. This document highlights the positive role good planning and design can plan in helping to create attractive, well-managed environments which help to discourage criminal behaviour.

Comment: As previously discussed, a Campus Development Plan has been submitted in support of this application. This Campus Development Plan provides the framework for the future development of the site and a key objective is the creation of a high quality, accessible Campus environment which is well managed and developed in accordance with Secured by Design guidance and other relevant Development Plan polices.

PAN78 Inclusive Design has been produced in response to the requirements of the Disability Discrimination Act 2006 (DDA). The Scottish Executive are promoting more equality in the areas where we live and work to ensure they are accessible to a wider user group. Inclusive design relates not only to the design of the buildings themselves but also the spaces between the buildings and the way they interact with these spaces.

Comment: The principles of inclusive design and the DDA have been given due consideration in the development of proposals for the New South Glasgow Hospitals and are discussed in more detail in the Campus Development Plan and the Design Statement submitted in support of the Outline Planning Application.

PAN79 Water & Drainage provides goof advice in relation to the provision of water & drainage in the contact of new developments. It highlights the need for partnership working between the planning authorities, Scottish Water, SEPA and developers.

Comment: In accordance with the guidance set out in this PAN, the Board have engaged with Scottish Water and SEPA throughout the process, it should be noted that the Board have instructed Scottish Water to undertake a Drainage Impact Assessment. Chapter 11 investigates Water Quality and Drainage issues in more detail and concludes that the impact of the proposed development will be negligible.

8.2.4 Compliance with National Policy and Guidance

For the reasons outlined above it is considered that the outline proposals for the New South Glasgow Hospitals are compliant with the relevant national planning policy and guidance.

The Campus Development Plan and the indicative design proposal accord with sustainable development measures inherent in all the relevant national planning policy and guidance, including development of brownfield land, sustainable urban drainage systems, and consideration of environmental, archaeological and transportation issues. Comprehensive mitigation measures are included in the proposals to minimise any adverse impacts. It is therefore considered that there are no significant areas of non-compliance with national policies and plans.

8.3 Statutory Development Plan

8.3.1 The Glasgow & Clyde Valley Joint Structure Plan

The Structure Plan was approved in May 2002. Its overall aim is to promote balanced and sustainable development by encouraging economic, social and environmental regeneration and maintaining whilst enhancing the quality of natural heritage and built environment.

The plan aims to sustain and enhance the natural and built environment and promotes regeneration through the reuse of vacant, derelict and underused land.

In the context of the proposed development, the most relevant policies to be assessed are:

• Strategic Policy 3 – Strategic Management of Travel Demands

• Strategic Policy 7 - Strategic Environmental Resources

• Strategic Policy 9 – Assessment of Development Proposals

Strategic Policy 3 promotes a sustainable approach to transport with walking, cycling and public transport taking preference over the private car.

Comment: The development site is located close to a number of major bus corridors and is directly served by a number of services. It is accessible and in accordance with Schedule 3(a)(iii), the proposals promote people based movements with links to the existing cycle and pedestrian networks and recommendations for the enhancement of these existing networks.

Strategic Policy 7 seeks to safeguard and manage strategic environmental resources within the plan area including, listed buildings.

Comment: As previously outlined, the site contains two listed buildings which will be retained and reused as part of the long-term redevelopment of the SGH site.

Strategic Policy 9 sets out the criteria against which all new development proposals o a significant scale must be assessed.

Comment: Part Two of this ES outlines the need for this project and it is considered that it can be justified in the context of the relevant criteria contained within part 9(A) of this policy. In the context of the criteria set out in 9(B):

- i. the redevelopment of the SGH site will not result in the diversion or displacement of investment from the development locations identified in Strategic Policies 1, 5, 6 or 8. It is considered that the redevelopment of this site may potentially encourage investment to the Govan area.
- *ii.* (a) it is the redevelopment of a site currently use for healthcare purposes.
- iii Not Applicable
- *iv* The development of the wider campus will see the retention and re-use of existing listed buildings in accordance with the principles of Strategic Policy 7.
- v Not Applicable
- vi (a) the site is accessible by a range of transport modes.
 - (b) it is considered a sustainable location for development for the reasons outlined in this ES.
- vii Not Applicable
- **viii** As previously discussed the site is not at risk of flooding and surface water drainage will be dealt with through the implementation of SUDs to ensure that the site does not contribute to flood risks in the area.
- ix The development of new hospitals at this location will not impact on health and safety.

The appropriate provision has also been made to ensure that the development is compliant with criteria outlined in part 9© of this policy.

8.3.2 Glasgow City Plan

This section reviews the key policies within the Glasgow City Plan applicable to this development. The City Plan was adopted in August 2003 and sets out the strategic and local policy framework for development within the city.

The relevant Local Plan policies are detailed in Table 8.2.

Table 8.2: Local Plan Policy Compliance

Policy	Compliance	Comment
DEV 9: Civic, Hospital & Tertiary Education Policy DEV9 outlines that the area designated Civic, Hospital and Tertiary education will remain primarily in use for services and infrastructure of City-wide or regional significance. Proposals that seek to improve or extend the range of services or facilities within these categories will be encouraged. The Council will seek to maintain and improve the quality of the environment of these areas by supporting developments that will enhance the amenity and urban design quality of the area.	✓	As outlined in Parts 2 & 3 of this ES, the proposals for the development of a new adult acute and children's hospital on the Southern General site to improve healthcare facilities and services within the city. The Campus Development Plan sets out the long-term strategy for the development of the wider site promoting the development of future development sites for hospital and tertiary education facilities.
DEV 13: Transport Infrastructure The Council will encourage proposals which support a sustainable transport network, assist the regeneration of the city and improve the quality of the environment of the transport corridors and associate facilities.	✓	As outlined in the Transport Assessment, the proposed development of the NSGH will seek to improve public transport provision and facilities within the site to encourage a reduction in private car use. The proposals also make provision for the Fastlink to serve the site to assist with the implementation of this important transport infrastructure.
TRANS 4: Vehicle Parking Standards As part of the Government aim of achieving sustainable patterns of development and (particularly maximising the use of public transport, cycling and walking), Scottish Planning Policy (SPP17: Transport and Planning) and other advice, encourages local authorities to set maximum parking standards and promote the use of public transport, walking and cycling in preference to the use of private transport. The policy notes that the appropriate Maximum Provision for hospitals is calculated as 1 space per 6 beds and 1 space per 8 staff. The policy also requires a Green Travel Plan and transport assessment is required for major developments.		A Travel Plan and Transport Assessment have been prepared in support of the outline application to reduce private car use and encourage the use of sustainable modes of transport whilst ensuring an appropriate level of car parking is provided for on site.

Table 8.2 continued

Policy	Compliance	Comment
TRANS 5: City Cycle Network and Providing for Pedestrians and Cyclists in New Development The Council is keen to ensure that the needs of pedestrians and cyclists are catered for on the existing road network in new developments. Development proposals located beside or on proposed cycle routes will be expected to facilitate and promote walking and cycling and link into existing (and proposed) cycle and footpath networks.	✓	As outlined in the Transport Assessment consideration has been given to improving pedestrian and cycle facilities and ensuring that the hospital campus is well integrated with the local pedestrian and cycle networks.
TRANS 6: Cycle Parking Standards The following cycle standards are intended to deliver a minimum level of cycle parking in new development and redevelopment. The policy sets out levels of cycle parking for hospitals at 1 space per 25 beds, and 1+1 space per 20 staff.	√	As outlined in the Transport Assessment consideration has been given to improving cycle facilities within the site including the provision of the appropriate level of cycle parking.
DES 1: Reinforcing Local Character and Identity The Council seeks to reinforce and enhance the City's positive attributes by securing the highest possible quality of built environment that will promote a positive City image and create a strong 'sense of place'. New development proposals and improvement measures (including alterations and extensions) should respect and reinforce local character and identity, or seek to create one where none exists. The design of new development should consider the following; townscape characteristics, listed buildings, focal points, nodes, landmarks, green network and natural characteristics.	•	The Campus Development Plan sets out the framework for the long-term redevelopment of the site to ensure new development respects and enhances the existing character of the area to create a new high quality 'Health Quarter' for the city. The Campus Development Plan and indicative design set the benchmark for detailed design proposals.
DES 2: Urban Design All new development proposals should seek to create successful, meaningful and memorable buildings and spaces. High standards of urban design in new developments will be expected to; respond to site context, enhance urban character, contribute to a safe environment, ensure adequate parking provisions.	√	As previously discussed, the Campus Development Plan sets out the land use strategy for the redevelopment of the wider site and promotes the creation of Campus Environment with a clear hierarchy of vehicular, pedestrian and cycle routes and public space with exemplar public buildings and the appropriate level of parking. The Campus Development Plan and indicative design set the benchmark for detailed design proposals.

Table 8.2 continued

Policy	Compliance	Comment	
DES 4: Design Statement The Council outline that developers of large scale developments in sensitive locations (including hospitals) will submit a detailed justification of their proposals, along with their planning application, detailing that the Council criteria (detailed in DES 1- 3) has been met.	√	A Design Statement has been submitted in support of this Outline Application and includes the indicative design which illustrates one way in which the new hospitals could be developed and demonstrates the sites capacity to accommodate a development of this scale.	
DES 9: Barrier Free Access		As previously discussed, this	
The Council outlines its commitment through its Equality Policy and Key Objectives, to promoting equality for all citizens and to provide accessible and accountable services, and outlines a series of guidelines that should be observed in all new developments where members of the public have access. These guidelines cover, parking, surfacing, paths, ramps, steps, entrances, exits and street furniture.	¥	application is in Outline and whilst the Campus Development Plan and indicative design promote the creation of a healthcare campus which is accessible to all, the detailed design of these elements will form part of any future full/reserved matters applications	
HER 2: Listed Buildings (Buildings of Architectural and Historic Importance) Outlines that there is a presumption in favour of retaining listed buildings, but the Council take the view that these buildings must be allowed to adapt to new uses in order to remain part of the living fabric of the City.	✓	The listed buildings within the SGH site will be retained for healthcare related uses and the impacts of any future development on their setting assessed.	
ENV 11: Tree Preservation Orders (TPO) Policy ENV 11 outlines that the Council will take into account the effect of any loss of amenity when assessing any development likely to have an adverse effect on trees, groups of trees specified in a Tree Preservation Order (TPO).	✓	It should again be noted that the subject of this ES is an outline application and that whilst details of the indicative design are submitted in support of the application these are for illustrative purposes only. A tree survey and arboricultural report will be submitted in support of any detailed/reserved matters applications for the site in accordance with the requirements of this policy.	
ENV 12: Landscape Standards in New Developments Policy ENV 12 outlines the importance of the City's Green Network and the close relationship between environmental quality and regeneration. It outlines that landscape treatment should be designed to provide an attractive setting for buildings taking cognisance of the surrounding land uses.	√	A landscape strategy for the site has been included within the Campus Development Plan and Chapter 10 of this ES. This strategy seeks to create a quality hospital environment which integrates with the existing community.	

8.4 Compliance of Statutory Development Plan

For the reasons outlined above it is considered that the outline proposals for the New South Glasgow Hospitals are compliant with the relevant policies contained within the Statutory Development Plan.

8.5 Other Planning Related Documents

A number of additional strategies and plans are also relevant to the study area:

- Glasgow and Clyde Valley 2025, Consultative Draft Structure Plan 2005
- City Plan 2, Consultative Draft 2006
- Local Transport Strategy (2000)
- Economic Development Strategy 2003-2006
- Action Plan for Central Govan
- Local Development Strategy for Central Govan

These are noted where relevant to the EIA.

9.0 COMMUNITY, PEDESTRIANS AND CYCLISTS

Summary

Chapter 9 describes the impact of the proposed development on communities, cyclists and pedestrians. The proposed development is situated to south west of Glasgow city centre, south of the River Clyde, in an area of mixed residential, industrial and business land uses. Both the hospital community of staff, patients and visitors and the surrounding communities of Linthouse, Shieldhall and Govan are considered. There is currently limited pedestrian and cyclist access through the hospital site and there is little interaction between the hospital site and the local community. No historical through routes are identified on historical maps.

The construction phase of the development is likely to give rise to adverse impacts on community amenity, as a result of noise and dust nuisance and visual impacts. Construction traffic will result in minor severance impacts on the local road network. On completion of the construction phase, the community will benefit from improved access through the site and improved access to cycling and pedestrian links to the wider area and to green networks.

Considerable improvements are proposed for public transport, which together with the implementation of a Travel Plan and a comprehensive parking strategy will effectively 'cap' development traffic to existing levels during the AM and PM peak periods. The development will result in no additional severance of local communities as a result of traffic increases. Community impacts range from minor adverse to moderate adverse during the construction period, but during the operation of the hospital, impacts on pedestrians, cyclists and community are beneficial.

9.1 Introduction

The chapter is concerned with the assessment of the New South Glasgow Hospitals' (NSGH) impact on the people living in close proximity to the site, and the journeys they make within the locality. It considers journeys made by people as pedestrians and cyclists and assesses the wider affects of the proposal on local amenity and on the local community.

Amenity is composed of many factors, but can be defined in general as the relative pleasantness of a journey, whether made by a pedestrian, cyclist or vehicle user. Reduced amenity can result, for example from an increase in the degree and duration of people's exposure to traffic, dirt, poor air quality and noise pollution. Safety and perceived risk associated with a particular journey are also important factors, Accessibility relates to the ease of joining a route and the ease with which it may be followed.

Community effects relate to severance which is primarily concerned with the separation of residents from facilities and services used in the community, from friends and relatives, places of work, schools, churches and leisure centres, as a result of changes in road patterns and traffic levels. Access issues encompass rights of way and other footpaths.

All of the development will take place within the boundaries of the existing hospital site, thus limiting the community impacts. However, during the construction phase there will be potential for community impacts, including severance as a result of increased traffic.

The community impacts of the NSGH will be twofold:

- Impacts on the hospital community: staff, patients and visitors. The hospital currently has around 900 beds with around 4,200 full and part-time staff. The new facility on completion will contain around 2000 adult and children's beds with some 10,000 staff. In addition, the hospital is used daily for a wide range of specialist services.
- Impacts on the surrounding communities to the north, south, east and west of the hospital site.

9.2 Environmental Scoping

The Environmental Scoping exercise, as reported in Chapter 2 of this ES Report was undertaken to:

- Focus the EIA on the environmental issues and potential impacts which need the most thorough attention
- Identify those which are likely to need detailed study
- Identify those which are unlikely to need detailed study
- Provide an early indication of where mitigation measures are necessary.

The Scoping Exercise considered the nature of the project, the site and the environment in the context of each of the environmental factors and also drew on the knowledge of the planning authorities and consultees to allow key issues to be identified. Community Effects is identified as a key issue which will determine the overall acceptability of the project.

9.3 Methodology

The consideration of community effects has used the following methodology:

- Consultation with Glasgow City Council and NHS Greater Glasgow
- Site visits
- Review of published information
- Identification of baseline information
- Consideration of potential impacts, taking account of appropriate mitigation
- Identification of key community, pedestrians, cyclists and equestrian issues and their likely significance for the development of the site.

In common with assessment for other environmental factors, impact magnitude and receptor sensitivity are combined to indicate significance. Impact significance range is described in terms of major/ moderate/ minor/ negligible and combinations (e.g. minor-moderate), adverse and beneficial.

9.4 Limitations to Assessment

This assessment of impacts on local communities is based on the information for the proposed New South Glasgow Hospitals as made available to Ironside Farrar at the time of assessment. No survey information is available on the extent of use or distribution of different types of users of community facilities. This assessment focuses mainly on the use of footpaths/ cyclepaths, as these are more likely to be affected by the proposals. Impacts on community facilities are noted where relevant.

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9.5 Baseline Conditions

9.5.1 Local Communities

The New South Glasgow Hospitals Site, the current Southern General Hospital site, lies to the south of the River Clyde, south west of Glasgow City Centre. The surrounding communities are: Linthouse, to the north east; West Drumoyne, to the east; part of Shieldhall, to the south; Cardonald, to the south; and North Cardonald, to the west. Studies of archive maps before the construction of the Clyde Tunnel approach show the hospital integrating well along the western edge of Govan. The original hospital frontage faced what was the southern part of Moss Road with the main entrance positioned symmetrically in the centre directly opposite the clock tower. The site also enjoyed a link to the main tram route which passed along the Govan Road on the northern site boundary through to Govan and on to the City Centre. The construction of the dual carriageway to the Clyde Tunnel on the eastern side of the hospital severed the site from the Govan community while the loss of the tram contributed to it's isolation from the local communities.

There are very high levels of social deprivation and social exclusion within the Govan area as defined by the Scottish Index of Multiple Deprivation (SIMD). The eastern part of the area is at particular risk from social exclusion, as reflected in the area's Social Inclusion Partnership (SIP) status. There is a mix of land uses in the area with some residential areas hemmed in by industrial land uses, with densely populated tenements and large areas of lower density social housing. This combination has led to a very low quality environment in some areas.

There are already well-established links to the existing hospital site by foot, bicycle, public transport and car.

9.5.2 Community Facilities

Within the existing hospital site there are convenience (volunteer) shops, restaurant, café and an automatic bank teller. Within the vicinity of the hospital, i.e. within 100 metres of the site boundary there is a very limited range of facilities. Further afield, the local communities have a range of community facilities, including schools (nursery, primary and secondary), churches, community halls, post office, shops, cafes/ restaurants/ public houses, and various recreational facilities including parks and play areas. Community facilities in the local area are listed below and those in close proximity to the site are noted in Figure 9.1.

Retail

- LIDL, Peninver Drive
- Limited range of shops/convenience stores, Govan Road, Linthouse
- Gazelle Public House, Govan Road
- Petrol Filling Station, Govan Road

Other Community Facilities

- Linthouse St Kenneth's Church and Community Hall, Linthouse Drive
- Bethesda Hall, Holmfauldhead Place
- United Free Church, Langcroft Road
- Riverside Community Hall, Clydebrae Street, Govan
- West Drumoyne Tenants Hall, Kincraig Street
- Linthouse Urban Village, public internet access point

Libraries

Elder Park Library and Learning Centre, Langlands Road

Recreational Facilities/ Greenspace

- There are a number of small areas of planting and grassland within the grounds of the Southern General Hospital
- Elder Park, 500 metres to the east, is an important resource for the community as a whole
- Cardonald Park, to the south of the M8, has four football pitches
- Cardonald Crematorium to south of M8
- The Southern General Hospital site is within the Carts Greenspace Area working with the Glasgow and Clyde Valley Greenspace Trust.

9.5.3 Schools and Educational Establishments

There are no schools within 100 metres of the site boundary. Schools which serve the local communities are as follows:

- St Anthony's Primary
- St Jerome's Primary
- Elder Park Primary School
- Drumoyne Primary School
- Hill's Trust Primary School
- Cartvale School (Secondary Special Educational Needs School, Govan)
- Govan High School
- Lourdes Secondary School
- Copeland Primary School, 3 Burndyke Court
- St Saviour's Primary RC School

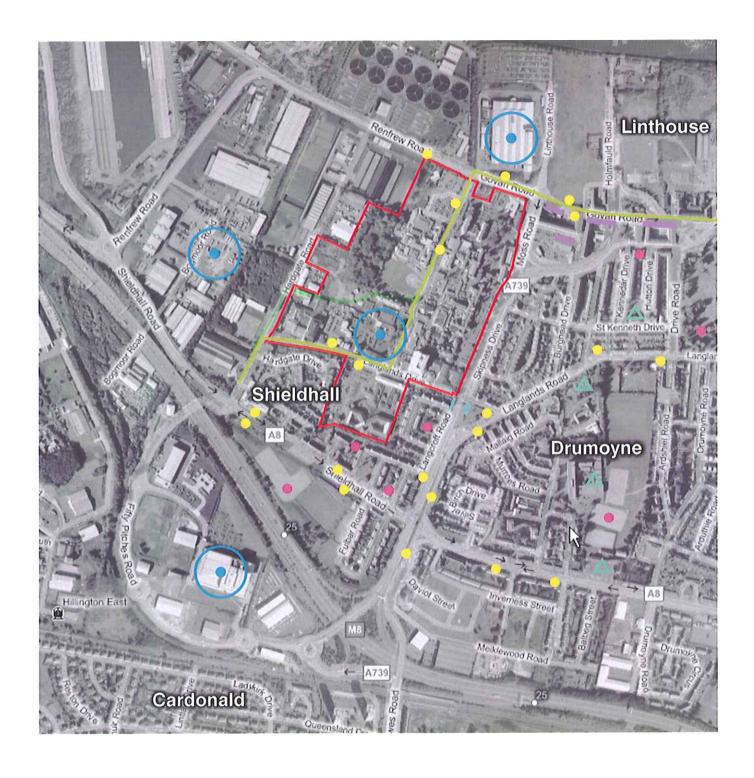
Walk to School

Glasgow City Council is currently implementing the initiative 'Walk to School', the objective of which is to encourage more children to take regular exercise and improve traffic safety by promoting the use of footpaths that avoid busy roads or by improving pedestrian and cyclist provision on these roads. Pupils living in the local communities currently require to 'cross' roads in the local network, either walking to school or to reach bus stops. There are signalised crossings on all the local roads. In addition, there are pedestrian subways under the A739 at two locations: east end of Langlands Drive; north end of Burghead Drive.

9.5.4 Access and Existing Road Connections

As the road network has developed around the site the hospital has enjoyed excellent connections to the strategic and local road networks. For all but around 20 hours per week when congestion occurs, the proximity to the strategic road network significantly improves accessibility. However, the proximity to the M8 and particularly the Moss Road approach to the Clyde Tunnel results in severance from local communities. While public transport can overcome these barriers, the relationship between the site and the significant number of buses in the area is truncated and few services directly access the site. The strategic road network is also a barrier to pedestrian and cycle activity to and from the site. Existing facilities seek to overcome this severance particularly cycle facilities from Cardonald which negotiate the M8 and a pedestrian underpass under Moss Road. These facilities are not of a standard or design which would encourage use, with the Moss Road Underpass particularly threatening in appearance with the perception of risk discouraging use.

This slightly uneasy relationship between the site and its surrounding transport infrastructure has managed to accommodate the current travel demand requirements of the relatively local catchment which has resulted in an over reliance on the private car.





There are currently two points of vehicular access to the SGH located on Govan Road (northern access) and Hardgate Road (southern access) with the Govan Road access forming the main access to the hospital. Govan Road is the main traffic distributor road through Govan, providing a link from Renfrew Road to the west to Paisley Road West to the east. Hardgate Road provides access to the existing industrial units from Shieldhall Road and is stopped up at its northern end.

Langlands Drive forms the main route through the hospital for both pedestrians and vehicles with further links 'branching' off to the remaining sections of the hospital and the numerous car parks provided throughout the hospital grounds.

9.5.5 Local Road Network

The local road network includes the following routes:

- Govan Road/Renfrew Road, on northern boundary
- Moss Road, at north east corner of site
- A 739 Clyde Tunnel southern access, on eastern boundary
- Skipness Drive, to east of and parallel to A739
- Shieldhall Road, to south of site
- Hardgate Road, on western boundary of site

9.5.6 Pedestrian Routes

Historical Routes

The Ordnance Survey 1inch map of Glasgow Sheet 72, 1925, identifies the Poorhouse Hospital on the north east part of the site. No pedestrian routes are noted on or in the vicinity of the site.

Internal Pedestrian Facilities

The existing SGH site already has a well-maintained internal network of footways that provide links to all of the buildings within the hospital grounds for staff, patients and visitors and also to public transport facilities and the local residential areas of Shieldhall, Linthouse and Drumoyne. There are three pedestrian zebra crossings on Langlands Drive within the hospital.

There are six pedestrian accesses to the SGH at the following locations:

- Govan Road (main access)
- Govan Road (opposite eastbound bus stop)
- Hardgate Road (southern access)
- Langcroft Road (adjacent to Spinal Injury Unit)
- A737 (Opposite Wards 30–32)
- A737 (Rear of Zone 2 access).

Figure 9.2 illustrates the existing footway network, access locations and pedestrian crossing points within the hospital grounds and in the local road network.

Pedestrian Access from the Surrounding Communities

A number of footways provide links to the above entrances of the SGH from the adjacent residential and employment areas and the surrounding public transport facilities.

Based on the Institution of Highways and Transportation (IHT) Guidelines 'Providing for Journeys on Foot' and the recommended walking distances of 500m, 1000m and 2000m which equate to approximately 7, 14 and 28 minutes. Walking isochrones, as shown in Figure 9.3, illustrate that the existing pedestrian facilities make the site accessible by foot from Shieldhall, Drumoyne, Linthouse and Cardonald, representing some 9000 people who are all within the preferred maximum walking distance 2km.

To further improve pedestrian movements to the site, signalised pedestrian crossings are provided at all major roads en route to the site including the following locations:

- Govan Road east of the north access
- Moss Road south of the Govan Road/Moss Road roundabout
- Shieldhall Road/Hardgate Road signalised junction
- Shieldhall Road west of Drumoyne Roundabout
- Shieldhall road east of Drumoyne Roundabout
- Langlands Road north of Drumoyne Roundabout
- The A739 north of Drumoyne Roundabout

In addition to the above crossing points, an underpass under the A739 is located on at Langlands Drive and provides a link from Skipness Drive to the access adjacent to the spinal unit on Langcroft Road.

9.5.7 Cycling Routes and Facilities

Approximately 30 cycle stands/spaces are currently provided within the hospital grounds. There are no dedicated cycle lanes within the hospital grounds.

The existing cycle facilities throughout the campus and the cycle lanes within close proximity of the site, provide scope to promote cycling for both staff and visitors to the site. Existing cycle routes are illustrated in Figure 9.4. Cycling isochrones for 10, 20 and 30 minutes, as illustrated in Figure 9.5, indicate that the site is readily accessible by cycle from a large part of the City of Glasgow, including destinations as far afield as Bearsden, Rutherglen, Paisley and Erskine. There are a number of cycle routes in close proximity to the SGH namely sections of the Glasgow and Clyde Routes (GCR) and the Clyde Tunnel Link. The GCR is located to the east of the SGH adjacent to the A739 and provides a link from the southern edge of the site along the eastern boundary to as far as the podiatry unit.

Glasgow and Clyde Routes

A section of the GCR is also provided through the Fifty Pitches football grounds to the south of Shieldhall Road providing a link from the Shieldhall Road/Hardgate Road signalised junction to the north of Cardonald. It is acknowledged that to reach this link from the hospital, a short on-road journey of around 100m will be required. Notwithstanding this, the signals on Shieldhall Road may make this a relatively safe journey for cycles. From the Cardonald section of the link it will be possible, by means of a short on-road cycle journey (approximately 150m) to access another section of the GCR. This section of the GCR provides a link from Cardonald to the west via Hillington and Penilee.

Clyde Tunnel Link

This link is located some 350m to the east of the SGH north access and provides a segregated route through the Clyde Tunnel from Govan to National Cycle Route (NCR) 7 from where it is possible to cycle to a number of locations including Yoker and Clydebank to the west and the City Centre to the east via the residential developments along this route.

9.5.8 Public Transport Provision

Buses

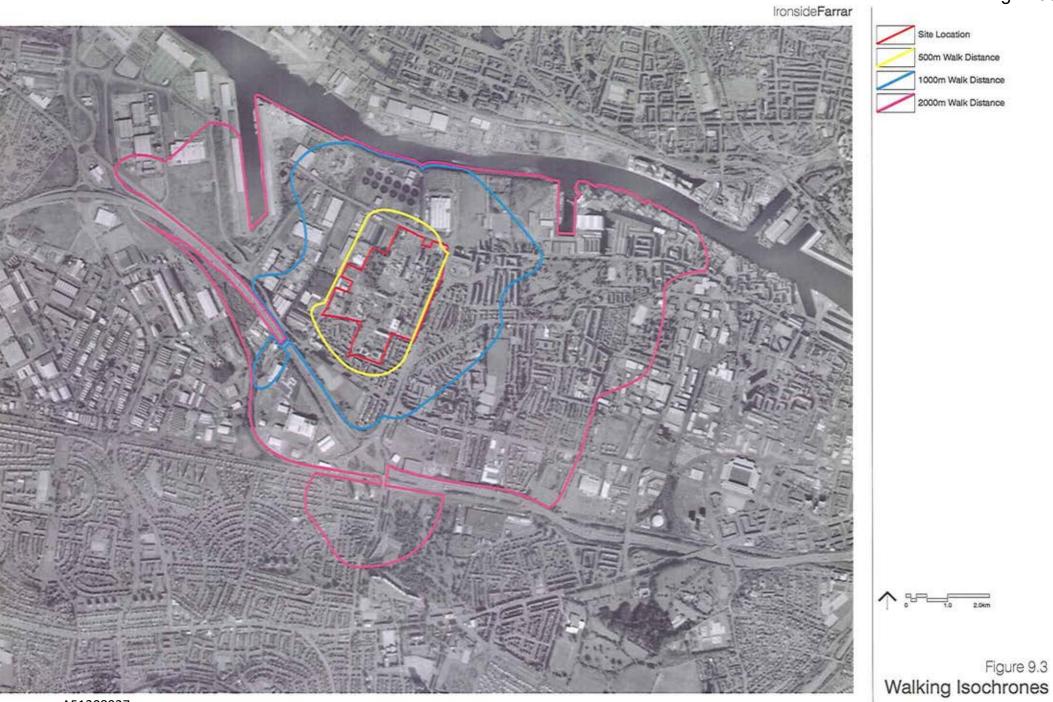
A large number of bus services operate in and around the grounds of the SGH providing frequent links to the majority of Glasgow and the surrounding settlements of Renfrew, Paisley and beyond. Services are operated by eight competing operators offering over 50 buses an hour at peak times on a variety of routes within 800 metres of the centre of the site. Existing bus stops within the hospital grounds serve the 89, 90, 25, 117 and the 279 bus services. Figure 9.1 indicates the locations of bus stops in the vicinity of the site.



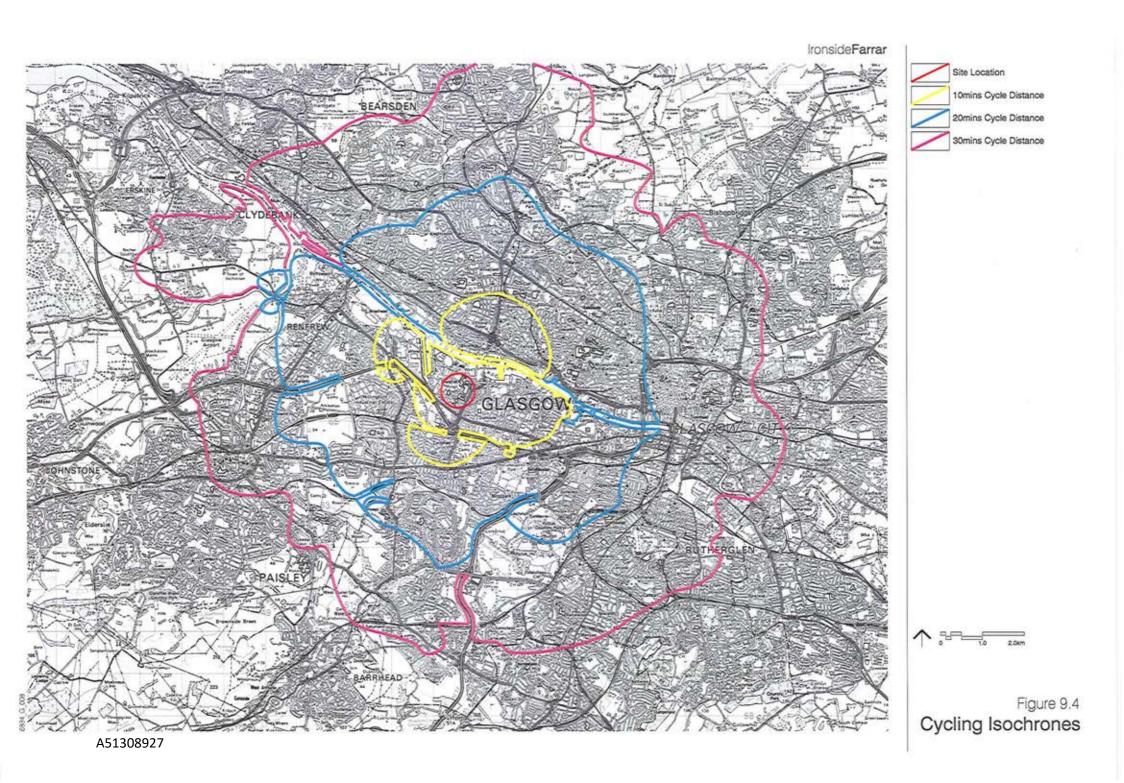








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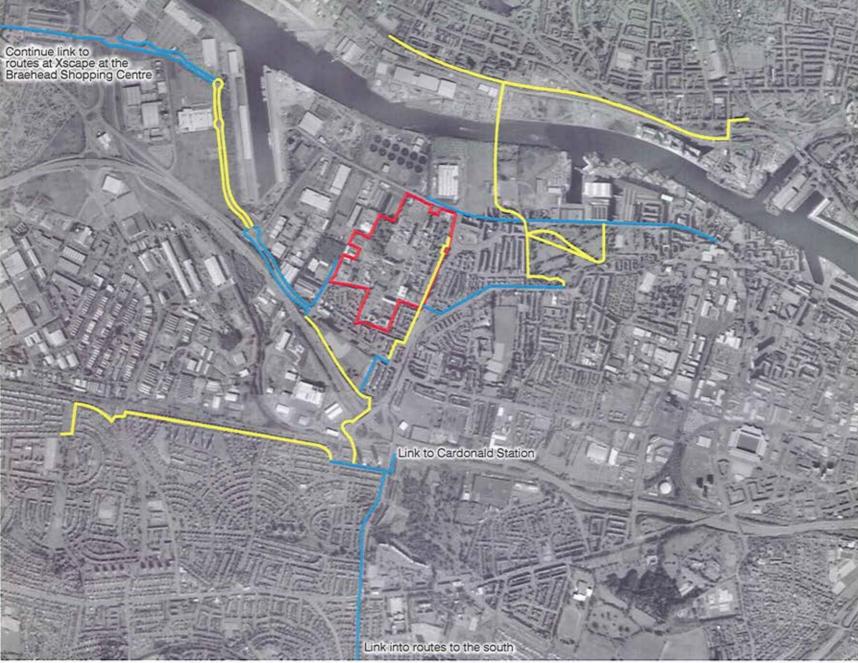


Figure 9.5 Existing & Proposed Cycle Links

For the surrounding bus service facilities, bus shelters are provided at all the stops on the main bus routes of Govan road, Shieldhall Road and Langlands Road. In addition to the bus services that route through the hospital grounds, there are a further 17 services that also operate within close proximity of the hospital including Govan Road, Shieldhall Road and Langlands Road with bus stops and shelters located approximately 400m, 800m and 550m walking distance from the hospital respectively. Details of the existing services are noted in Table 9.1.

Table 9.1 - Existing Bus Services (from TA)

Operator Bus No.	Route	Frequency		
		(Mon - Sat)	(Sun)	
First Glasgow	89	Govan Bus Station, Shawlands, Rutherglen, Parkhead, Springburn, Maryhill, Partick, Southern General Hospital, Govan Bus Station.	20 Mins	30 Mins
First Glasgow	90	Govan Bus Station, Southern General Hospital, Partick, Maryhill, Springburn, Parkhead, Rutherglen, Shawlands, Govan Bus Station.	20 Mins	30 Mins
Skyline	25	Nitshill, Priesthill, Pollok Centre, North Pollok, Crookston, Cardonald, Southern General Hospital, Govan Bus Station.	30 Mins (Mon – Fri)	No Service
First Stop Travel	117	Paisley, Penilee, Cardonald, Southern General Hospital, Govan Bus Station.	60 Mins	60 Minutes
First Stop Travel	279	Southern General Hospital - Linthouse - Govan - Ibrox	20 mins (Mon-Fri)	No Service
First Stop Travel	217	Paisley, Penilee, Cardonald, Govan Bus Station.	20 Mins	No Service
Arriva	17	Glasgow, Partick, Shieldhall, Cardonald, Paisley, Johnstone Centre, Spateston or Beith or Lochwinnoch, Kilbirnie, Largs.	30 Mins	60 Mins
First Glasgow	17	Paisley, Penilee, Cardonald, Shieldhall, Govan, Mosspark.	60 Mins	No Service
Gibson Direct	21/A	Paisley, Newmains, Renfrew, Braehead, Govan Circular.	10 Mins	10 Mins
Arriva	23	Erskine, Renfrew, Braehead, Govan, Glasgow.	10 Mins	20 Mins
First Glasgow	23	Govan Bus Station, Langlands Rd Cardonald, Pollok, Shawlands, Glasgow (Renfrew St.)	10 Mins	30 Mins
Arriva	24	Glasgow City Centre, Govan Bus Station, Renfrew, Paisley (Town Centre) or Nethercraigs.	30 Mins	60 Min
Arriva	25	Glasgow, Drumoyne, Shieldhall, Braehead, Renfrew, Paisley, Nethercraigs.	30 Mins	30 Min
First Glasgow	34	Govan Bus Station, Langlands Road, Cardonald, Mosspark, Dumbreck, Shawlands, Battlefield, King's Park, Castlemilk.	10 Mins	30 Min
First Glasgow	121	Pollok Centre - Crookston Castle - Cardonald - Shieldhall (for Southern General Hospital) - Govan - Ibrox - Pollokshields - Govanhill - Crosshill - Queen's Park (East) - Victoria Infirmary - Battlefield - Mount Florida (for Hampden Park)	30 mins	1 Hour
First Glasgow	709	Drumchapel - Blairdardie (Great Western Road) - Knightswood - Scotstounhill - Garscadden - Scotstoun - Whiteinch - Linthouse (for Southern General Hospital) - Shieldhall - Hillington Industrial Estate (works service	AM Peak (mon-fri)	No Service
First Glasgow	765	Easterhouse - Springboig (for Queenslie) - Carntyne - Dennistoun (Duke St) - Bellgrove - Bridgeton - Gorbals - Govan - Linthouse (for Southern General Hospital) - Shieldhall West - Hillington Industrial Estate (works service)	AM Peak (Mon-Fri)	No Service
First Stop Travel	134	Castlemilk - Croftfoot - King's Park - Battlefield - Victoria Infirmary - Langside (for Queen's Park) - Shawlands - Crossmyloof - Mosspark (for Bellahouston Park) - Cardonald - Shieldhall (for Southern General Hospital) - Drumoyne - Govan	20 mins	No Service
Gullivers Travel	4	Neilston - Barrhead - Potterhill - Paisley - Dean Park - Newmains - Renfrew - Braehead Centre - Linthouse (for Southern General Hospital) - Govan	20 mins (Mon- Fri)	No Service
Gullivers Travel	21	Neilston - Barrhead - Potterhill - Paisley - Dean Park - Newmains - Renfrew - Braehead Centre - Linthouse (for Southern General Hospital) - Govan	20 mins (Mon-Ffri)	No Service
Puma Coaches	23	Govan - Drumoyne – Langlands Road (for Southern General Hospital) - North Cardonald - Cardonald - Crookston - Leverndale - Pollok Centre - [Cowglen]	10 mins	No Service
Skyline	121	Govan - Drumoyne - Shieldhall (for Southern General Hospital) - Cardonald - Crookston Castle - Pollok Centre	30 mins	No Service

It is acknowledged that some of these services will require a walk greater than the GCC recommended maximum walking distance of 300m. However, it is understood that this distance is based on as the 'crow flies' and not by road. On-site observations have indicated that people are willing to make this journey to make use of the frequent bus services available. It should also be noted that the services on Govan Road are in accordance with the maximum walking distance of 400m as stated by PAN 75.

The strengths of the existing bus services are:

- High frequency of weekday services within 400m of site
- Links to key areas from a number of services within the site
- Services operate witin the site
- Proximity of key attractor of Braehead Shopping Centre provides additional demand for service
- Proximity of Govan Bus Station provides link to addditional network of bus services and the underground.

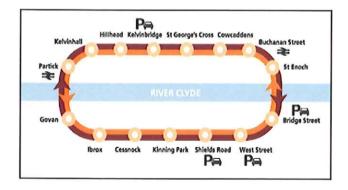
The weaknesses of the existing bus services are:

- Limited number of direct services from the site, especially to the city centre
- Reduced evening and Sunday frequency
- Low percentage of services direct to site
- Variable stopping places
- Large numbers of operators with variable standards
- Long journey times to the site
- Limited waiting facilities
- · Poor access to site from stopping places
- Disjointed from key hospital activity.

SPT Subway

Govan Underground Station is located approximately 2km to the east of the SGH. The Underground provides a frequent train service to 15 stations within the wider city centre area, and the City Centre. Figure 9.6 indicates the locations served by the SPT subway. Govan bus station and underground together form transport interchange offering services throughout the city.

Figure 9.6- SPT Subway Map



SPT Train Services

There are two railway stations in the vicinity of the proposed development, namely Cardonald and Hillington East. The nearest of the two railway stations, in terms of walking distance, is Cardonald which is located approximately 1.2km from the proposed development site.

The Cardonald railway station is on the main Glasgow to Gourock line that has a 30-minute train frequency Monday to Saturday and a 60-minute train frequency on a Sunday. This service provides a link from Glasgow Central, Hillington East, Hillington West, Paisley Gilmour Street and the remaining halts to Gourock.

The Cardonald railway station is outwith the recommended maximum walking distance of 800m as stated by both GCC guidelines and PAN 75. Nevertheless, previous surveys undertaken at the SGH have demonstrated that a minority are willing to make this journey, thereby indicating that there may be scope to promote this form of transport. There are also a number of existing bus services available that provide around 34 buses per hour from the railway station to the existing bus stops adjacent to the hospital.

9.5.9 Car Parking

There are currently around 1400 formal parking spaces provided within the grounds of the SGH. On-site observations have indicated that this is not sufficient to serve the current parking demand of the hospital as significant parking occurs on restricted areas of the hospital: namely yellow boxes, double yellow lines and grass verges. Previous surveys have indicated that the majority of this illegal parking is caused by hospital staff.

9.5.10 Community Initiatives

A number of local community initiatives in the local area are ongoing or recently completed. These are summarised below.

Govan Graving Docks

Timescale:

2002-12

Budget:

£150million

Partners:

Various

Lead:

City Canal Limited

Target:

To regenerate site for residential/leisure and workspaces with associated uses.

Status:

Masterplan presented to the City Council in 2002. Revised Masterplan 2005

This regeneration project, to be known as City Dock, is based to the west of Pacific Quay. It was home to the Govan Graving Docks and former Harland and Wolf shipyard and the site and structures are A-listed. It will see the construction of a mix of residential, business

Activity:

units, leisure and retail within the framework of an integrated Masterplan. As well as providing services like restaurants and coffee shops for workers at Pacific Quay, it is also envisaged that it will bring social and economic development benefits to the wider

community, particularly in Govan.

Linthouse Urban Village

Timescale:

2003-06

Budget:

£575,000

Partners:

The Greater Govan Key Fund; Community Scotland; Glasgow City Council; Scotlish

Enterprise National and individual owners.

Lead:

Linthouse Housing Association

Target:

To improve existing shopfronts which will improve aspiration, and community self-esteem

Status:

Completed

Linthouse Urban Village Project was led by Linthouse Housing Association. The first phase of the project started in September 2003 with money from the Greater Govan Key Fund to employ five artists to work within the local community and with local shopkeepers to develop innovative and cutting edge designs for the exterior of the small business

Activity:

to develop innovative and cutting edge designs for the exterior of the small business premises within Linthouse. 14 shopfronts in the Linthouse area of Greater Govan rejuvenated in 2005. Phase 1 of this project, the LUV gallery continues to thrive.

Central Govan Action Plan

Timescale:

2005-10

Budget:

£80 million

Partners:

Glasgow City Council, Scottish Enterprise Glasgow, Govan & Craigton Community

Planning Partnership, Govan Initiative

Lead:

Glasgow City Council

Target:

To implement the development proposals recommended in the approved Central Govan

Action Plan

Status:

Central Govan Action Plan approved by Development and Regeneration Services

Committee in December 2005.

The key aim of the Action Plan is to attract more people to live in Central Govan. The objectives of the plan to achieve this are:

 Provision of new mixed tenure residential development on key sites to improve housing quality and choice.

Improvement of existing townscape and public realm to create a distinctive town

Activity:

Attraction of private investment that creates employment space.

- Linking these interventions to on going training and employment initiatives.
- Reuse of vacant/derelict land and listed/underused buildings
- · Strengthening of links within Govan, to the waterfront and to other areas
- Development of heritage and tourism potential

Clyde Waterfront Green Network Strategy

The Clyde Waterfront Green Network Strategy has been prepared by a partnership brought together by the Glasgow and Clyde Valley Structure Plan Team as one of two launch projects for the Glasgow and Clyde Valley Green Network Partnership.

The purpose of the study has been to explore and assess the nature, scope and scale of Green Network opportunities that exist across the Waterfront project area and to develop a strategy for maximising the contribution of this area to the Green Network, whilst at the same time creating linkages with the wider Structure Plan area.

In addition to considering the Waterfront area as a whole, the study has reviewed opportunities relevant to each of 11 constituent 'action areas'. The NSGH site lies within the Govan Action Area (Action Area 5) of the Strategy.

The NSGH site is identified in the Clyde Waterfront Green Network Strategy as a Key New Space within the Green Network. The specific objective for the site is as follows:

'The redevelopment of the Southern General site should, if possible include provision of an additional space or spaces for use by patients, visitors and staff. Greenspace has been shown to have therapeutic properties and the increase in users of this site suggests that it will form a significant part of the community in its own right that would benefit from its own supply of usable spaces. This could partly compensate for potential loss of semi natural space as a result of the development'.

9.6 Potential Issues

The NSGH is a major 10-year development project. All of the proposed development will be within the existing site boundaries. The Campus Development Plan includes potential proposals to enhance greenspace provision and to improve the pedestrian permeability of the site. Adverse community impacts are likely to be limited to residential areas in close proximity to the development site and to users of the site

itself. Potential adverse impacts arising from the proposals which could affect the hospital community and local communities include:

Construction Phase

- Noise and dust nuisance from works and works traffic, see also Chapters 12 and 13 respectively
- Visual impacts, see also Chapter 10
- Safety issues heavy plant, construction traffic, see also Transport Assessment and Chapter 17
- Access road works and footpath diversions/disruptions, see also Transport Assessment and Chapter 9.

Operational Phase

- Noise nuisance from increased traffic, Chapter 12;
- Visual impacts of completed development, addressed in Chapter 10
- Local air quality impact from road traffic: addressed in Chapter 13;
- Safety issues increased road traffic, addressed in Transport Assessment;
- Access altered/improved path & road network and improved public transport, see also Chapter 9

9.7 Mitigation Measures

9.7.1 Construction Phase Mitigation

During the construction of the NSGH, there will be an increase in heavy plant and construction traffic on the local road network. This will have an impact on the safety of pedestrians in the communities located adjacent to the existing road network including the existing communities of Linthouse, West Drumoyne, Shieldhall, North Cardonald and also any new residential areas which are created as part of regeneration proposals for the wider area.

The potential for interruption to day-to-day services and facilities within the site during construction has been carefully analysed and will be managed by a series of enabling works to decentralise the main hospital services and utilities and by isolating the construction site from the remainder of the hospital with materials and construction traffic accessing the site from a discrete entrance off Hardgate road and a link to Govan Road that presently exists within the site.

The mitigation measures for construction impacts are discussed in more detail in Chapter 17. There are standard conditions, restrictions and responsibilities generally imposed on site development contractors to mitigate potential construction impacts. Contractors will be obliged to comply with an agreed strategy of mitigating measures covering noise, dust, safety etc. to include measures such as:

- Specifying methods of working
- Restricting hours of working
- Site safety and security control
- Careful siting of plant and vehicle routes
- Screening
- Use of silencers on construction vehicles

Contractors will be required to notify local residents and other occupants of local properties of all short-term potentially significant impacts, including alternative access arrangements. The contractor will also be required to ensure that any other agreed mitigation requirements are not adversely affected or compromised.

To minimise the impact of this traffic on the local road networks, construction traffic access routes will be identified as part of a 'safety plan' and imposed through the construction contracts. Consideration will also be given to introduction of appropriate traffic calming measures on the local roads to restrict traffic speeds though local communities to appropriate safe levels.

In addition to safety impacts from construction traffic, the proximity of construction works represents a potential safety hazard should members of the public, especially small children, inadvertently enter areas under construction. The risk of this will be reduced to negligible by contractor requirements for adequate signing, barriers and other safety and security measures.

9.7.2 Operational Phase Mitigation

The Campus Development Plan seeks to ensure that the local communities, pedestrians and cyclists will benefit from improved sustainable transport measures and better quality footpath and cycle access to and through the hospital site. Mitigation measures to minimise impacts on local communities will include:

Parking

A total of some 3500 parking spaces is proposed, of which some 2,400 will be allocated to staff, which equates to 45% of on-site staff receiving a parking space. The introduction of charging is likely to result in car parking being displaced to the streets in the neighbouring residential areas as drivers seek to avoid paying for parking on the site. Streets potentially affected would be in Drumoyne, to the west of the site and Shieldhall to the south. In these circumstances it would be necessary to introduce parking controls on the streets surrounding the NSGH to ensure that existing residents are not adversely affected. As part of the parking strategy for the proposed site, consideration will be given to the impact that parking constraints within the site may have on the adjacent public roads. Potentially affected streets are as shown in Figure 9.7 below

Figure 9.7 Residential Areas affected by Parking Displacement



Travel Plan

A key measure which will ensure continued and promotion and success of sustainable transport for the NSGH and minimise impacts for the local communities is the implementation of a Travel Plan which provides a long term commitment to the sustainable transport measures. These are all detailed in the JMP Transport Assessment Chapter 9.

9.8 Impact Assessment

9.8.1 Local communities

Community severance is defined as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows. Changes to journey times and amenity for pedestrians and others may affect, adversely and beneficially, the degree to which a locality is subject to 'community severance'.

During the construction phase the local communities will experience some temporary adverse impacts including noise, visual impact and potential safety concerns. These are discussed in more detail in the relevant chapters of this report, as noted above. During the operational phase, some minor adverse impacts will occur. However, the local communities will also experience minor benefits as noted below.

9.8.2 Community Facilities

Retail

The new NSGH Campus will include improved retail facilities, including café/s restaurant/s. These will offer significant benefits to users of the hospital; staff, patients and visitors. Retail facilities in the surrounding area will not experience significant adverse impacts and may benefit from the greater numbers of people within the local area and improved accessibility of the surrounding area for pedestrians and cyclists. Overall, there will be **negligible** impact on retail facilities.

Other Community Facilities/Libraries

The construction of the NSGH and the associated improved footways and cycle routes will improve vehicular, pedestrian and cyclist access to community facilities in the local area. Impacts on community facilities following completion of the construction phase will be **negligible**.

Greenspace

It is recognised that there is limited scope to create green and open space within the site itself due to a range of physical constraints. It is not therefore realistic to suggest that major opportunities exist to provide amenity greenspace for local community use. The prime focus will need to be on creating attractive, quiet and safe greenspace where staff, patients and visitors can take time out to relax, reflect and recharge their batteries.

In view of the pressure that exists on space within the site, consideration could also be given to creating and linking into greenspace on adjacent sites in order to expand and enhance the range of greenspace opportunities for staff and visitors. This could also result in enhanced opportunities for local community access.

Whilst it is not envisaged by the Green Network Partnership that the greenspace created and enhanced within the NSGH will have public access some important opportunities may nevertheless exist, for example through the linking up of walking and cycling routes to improve access between key points within Govan.

Greenspace will also have significant biodiversity benefits and will benefit the hospital community of staff, patients and visitors. The site will also form an important link in

the Green Network of the wider Clyde Waterfront area. Overall the impacts on greenspace will be minor beneficial.

9.8.3 Schools and Educational Establishments

During the construction phase there will be increased plant and HGVs on the local road network. However, routes to school, whether walking or by public transport will not be adversely affected. Existing crossings and crossing patrols will be maintained and there will be no reduction in road safety. During the operational phase there will be a net increase in development traffic, but with a negligible impact on the local road network. As for the construction period, safety will not be affected. The overall impact on schools and educational establishments is negligible.

9.8.4 Access and Existing Road Connections

The public transport system will seek to ensure high levels of accessibility to areas of the hospital with high turnovers of patients and visitors. The target of the NSGH will be to provide a development that is designated as "High Accessibility" as in the GCC City Plan. The main vehicular access will still be taken from the existing Govan Road access with a new secondary access provided on Hardgate Road. The existing access on Hardgate Road will be used primarily for emergency vehicles and access to the A & E, but will also serve the buildings in the southern quarter of the site. Proposed site access and through transport routes are shown on Figure 9.8. Impacts on access and existing road connections will be **neutral**.

9.8.5 Local Road Network

The local road network will be subject to some traffic disruption during the construction period. Traffic management measures will be required to minimise disruption. After the development is complete, improved public transport services will reduce the net increase in additional traffic on the local road network and the overall impact will be **negligible**.

9.8.6 Pedestrian Routes

Changes to journey times and amenity for pedestrians and others may affect, adversely and beneficially, the degree to which a locality is subject to 'community severance'.

In the case of the NSGH all of the development will take place within the boundaries of the existing hospital site, thus limiting the community impacts. However, during the construction phase there will be potential for community impacts, including severance as a result of increased traffic:

There is currently a well maintained network of footways and pedestrian facilities throughout the hospital grounds that provide convenient access to the surrounding residential catchment areas via the numerous pedestrian access points as discussed above.

During the construction phase the works will have the potential to create severance impacts for residents is assumed that access will be maintained through the main pedestrian routes through the site.

During the operational phase of the hospital the local communities will benefit from improved pedestrian linkages to and through the site, particularly from the east and west. The overall impact on pedestrians will be **minor beneficial**.

9.8.7 Cycling Routes and Facilities

Although there are a number of cycle routes in the vicinity of the site, these are fragmented and do not provide a user-friendly network. Figure 9.4 illustrates additional proposed cycle links likely to be included in the emerging Glasgow City Council's Core Paths Network proposals which will join up the existing routes and create a more cohesive network in the vicinity of the site and with improved access to the wider cycle path network.

While short on-road journeys will be required to travel to the NSGH via the cycle routes within the local area, it is clear that there is scope to promote cycling to the hospital for a significant number of people, including staff and visitors. Notwithstanding this, given the enclosed space of the Clyde Tunnel Route, it is acknowledged that there may be a certain level of perceived safety risk for cyclists.

In addition to the external facilities highlighted above, a network of cycle routes will be provided through the redeveloped site as illustrated in Figure 9.8. Connections are provided to the external network from accesses onto Hardgate Road, Govan Road, through to Langlands Road and onto the A739. On-site covered cycle parking facilities will be provided in accordance with GCC standards, which will be located close to the main pedestrian access points to the hospital buildings.

The existing cycle routes will not be adversely affected by the on-site developments. The commitments included in the Campus Development Plan to enhance cycle route links and encourage access by sustainable transport modes and proposals in the TA for additional links into the wider cycle network will result in **minor beneficial** impacts on cyclists.

9.8.8 Public Transport Provision

During the construction period there are likely to be diversions to the routes through the hospital site. However, these are unlikely to result in significant increases in journey distances and times. The impact on public transport during construction will be minor.

The major development of the NSGH over a 10-year period will result in a significant increase in the number of people – patients, visitors and staff accessing the site from the local area and from the wider south Glasgow area and beyond.

The TA has identified a wide range of proposals which can be implemented in partnership with operators and local authorities. These proposals will be able to deliver the necessary additional links and infrastructure to ensure that the NSGH Campus can be effectively served by public transport. Additionally, the proposed Fastlink bus would be routed through the hospital site, providing public transport benefits for patients, staff and visitors.

Travel Plan

In accordance with the Scottish Executive's guidelines 'Transport Assessment Implementation: A Guide' (2005), a Travel Plan will be prepared in support of the proposed development. The Travel Plan will seek to encourage a shift in transport from the private car to the more sustainable modes of transport that are, and will be available to the site.

With the implementation of more reliable and frequent services, improved accessibility and quality of buses and bus stops the resulting impacts on public transport will be moderate beneficial.

9.8.9 Parking

During the construction period there will be changes to the parking arrangements within the hospital site. However, it is anticipated that the level of parking available will not be significantly reduced and the overall impact will be minor. During the operational period, parking provision will be limited to 3,500 spaces including 2,400 spaces allocated to staff. The introduction of charging is likely to result in car parking being displaced to the streets in the neighbouring residential areas as drivers seek to avoid paying for parking on the site. Parking controls may need to be introduced to ensure that existing residents are not adversely affected. The resultant impact would be minor adverse for the local communities.

9.8.10 Community Initiatives

Clyde Waterfront Green Network Strategy

The Clyde Waterfront Green Network Strategy notes that: 'The redevelopment of the Southern General site should, if possible include provision of an additional space or spaces for use by patients, visitors and staff....... This could partly compensate for potential loss of semi natural space as a result of the development'.

The Campus Development Plan includes proposals for areas of greenspace, as part of the SUDS proposals and landscape proposals for the site. These landscape proposals will result in a development with provision and quality of greenspace which is an improvement on the existing and will provide significant benefits for users of the site and contribute to the Green Network Strategy and also to the Glasgow LBAP. Other community initiatives will not be directly impacted by the proposals. Overall impact on community initiatives will be **minor beneficial**.

9.8.11 Wider Community and Socio-Economic Benefits

The Board recognise that the New South Glasgow Hospitals provide the opportunity to create a new health "quarter" to the west of Govan. The Board is aware of various bodies who are interested in acquiring space both on and around the site and to that end the they have prepared a Campus Development Plan that identifies future sites that can be used for education, training and research purposes as well as other clinical activities.

To support this work, the board has jointly commissioned with Communities Scotland, Linthouse Housing Association, Scottish Enterprise Glasgow, Govan Initiative, Community Planning, Glasgow City Council, South West Community Health and Care Partnership and the Glasgow Centre for Population Health work to explore the potential economic and social benefits associated with this development and how partners can work together to realise these. This includes the potential to work with local housing associations and other providers to explore provision of affordable housing for key workers in the local area and the potential to develop joint working around childcare provision.

The board also recognises that this development has the potential to contribute substantially to the local economy not only in terms of attracting investment but also through direct and indirect training and employment opportunities. Subsequently, the board is pro-actively engaged with partners to ensure the development maximises employment and training opportunities and also taking account of city-wide initiatives to improve alternative means of access to the site and will endeavour to respond to these as they develop to ensure the appropriate linkages are provided to and across the site.

Securing an outline planning approval for the new adult and children's hospitals will provide the necessary comfort for partners to explore the potential opportunities offered by this development.

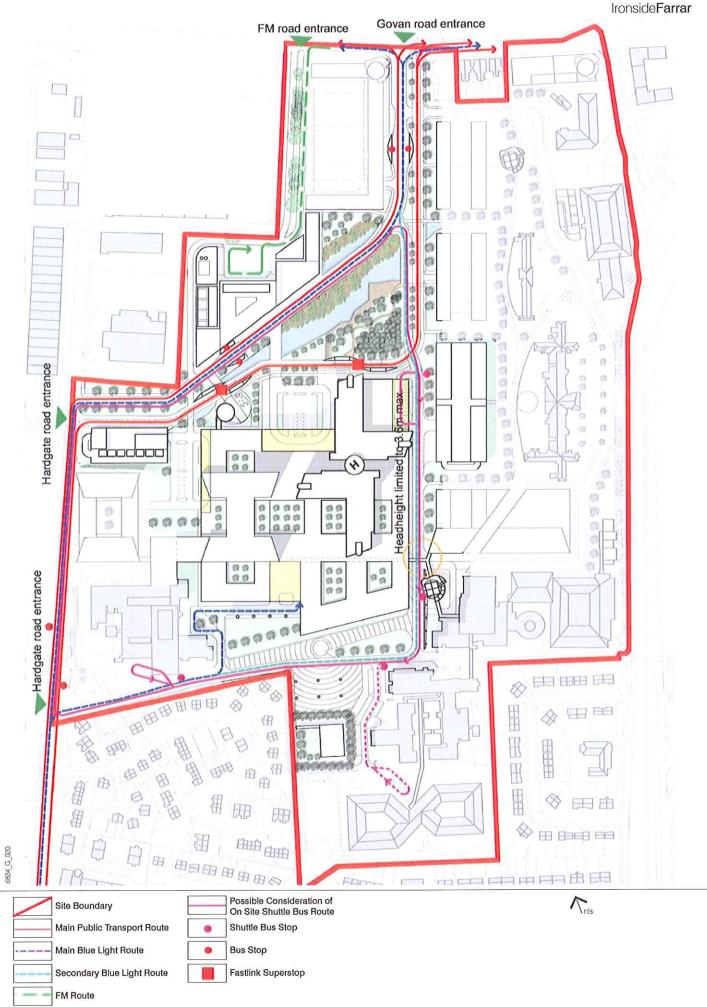


Figure 9.8 Proposed Access & Through Routes



In addition to the substantial economic benefits to Shieldhall, South West Glasgow and the City, the opportunity also exists to create a new urban centre with its own distinct identity that not only fits within the local context and contributes positively to the immediate physical environment but also takes its place in the sequence of regenerated areas coming west along the river (i.e. Govan Town centre, Pacific Quay, Science Centre etc.) and contributes positively to the emerging townscape along the waterfront. The socio-economic impacts are therefore assessed as moderate beneficial.

9.9 Residual Impacts

The key issues for pedestrians, cyclists and community are concerned with the need to ensure that the construction and operation of the NSGH does not result in reduced access and/or severance of local communities from the facilities and services which they use. The above assessment has shown that the proposals will result in both adverse and beneficial impacts for the community. Adverse impacts include short-term access disruption and noise and dust nuisance during construction, and traffic increases following completion of the development. Beneficial impacts include improved pedestrian and cyclist access. Table 9.2 summarises the residual community impacts

Table 9.2 Summary of Residual Community Impacts

Impact Description		Impact Significance	Comment	
Communities	Construction	Minor	Safety plan and safety and security measures	
	Operation	Negligible	Negligible increase in traffic	
Community	Construction	Negligible	No significant impacts	
Facilities	Operation	Minor beneficial	Improved facilities within site. No impacts on surrounding community facilities. Contribution to Green Network	
Access and	Construction	Minor	Temporary traffic disruption	
road network	Operation	Neutral	Negligible increase in traffic in local and trunk road networks	
Pedestrians	Construction	Minor	Temporary traffic disruption	
	Operation	Minor beneficial	Benefits for pedestrians - improved access and through routes	
Cyclists	Construction	Minor	Temporary traffic disruption	
	Operation	Minor beneficial	Benefits for cyclists – improved access and through routes	
Public	Construction	Minor	Temporary traffic disruption	
Transport	Operation	Moderate beneficial	Benefits for hospital users and local community	
Parking	Construction	Moderate	On-site parking will be displaced	
		Minor	Potential impacts on surrounding residential areas	
Community	Construction	Negligible	No significant impacts	
Initiatives	Operation	Minor beneficial	Contribution to Green Network Strategy	
Socio- economics	Construction	Minor beneficial		
	Operation	Moderate beneficial	Opportunity for social and economic regeneration in wider area	

10.0 TOWNSCAPE AND VISUAL

Summary

The landscape and visual assessment characterises the existing landscape (or 'townscape' in the urban context), identifies potential visual receptors and identifies and evaluates beneficial and adverse landscape and visual impacts of the proposed development during construction and following completion.

The Campus Development Plan site is located in the Shieldhall/ Govan area of Glasgow, in the south side of the city.

Townscape impacts of the Campus Development Plan proposals are assessed against accepted urban design objectives which are to be integral to the design and implementation of the Campus Development Plan. Townscape impacts are assessed as moderate/ substantial beneficial over most of the site.

A representative range of visual receptors is assessed, concentrating on areas of public access including main thoroughfares (such as M8, A814 Clydeside Expressway and Govan Road) and viewpoints (such as Dawsholm Park and Gleniffer Braes Country Park). A range of private residential properties is also assessed. Impacts are insignificant and neutral for most of the public and private receptors, although some nearby residential receptors may experience significant adverse impacts due to the dominant size of the Adult and Children Hospital buildings.

10.1 Introduction

The proposed regeneration of the New South Glasgow Hospitals Campus Development Plan area will lead to significant changes in the character and fabric of the local urban landscape. This will in turn lead to changes to views of the site, affecting the local residential and working population and people passing through the area. The purpose of this assessment is to determine the nature and significance of the potential landscape and visual impacts. As the assessment is carried out predominantly within an urban, built up area the term 'Townscape' has been substituted for 'Landscape' as it is more appropriate to the location.

The assessment has been carried out in accordance with published guidance (Guidelines for Landscape and Visual Impact Assessment, Second Edition, 2002). The townscape context of the site is described, then the site's townscape structure and character evaluated. The visibility of the site is determined and the potential visual receptors identified. The sensitivity to change of the townscape and of visual receptors is determined. The nature and extent of the changes is described and evaluated. From this information an assessment is made of the potential significance of townscape and visual impacts.

The assessment takes into account the potential for mitigation of impacts, which will be integral to the design of the development.

10.2 Baseline Conditions

10.2.1 Landscape/ Townscape Context and History

The Campus Development Plan area is located in the south side of the city, in the Shieldhall/ Govan area, approximately 500 metres to the south of the River Clyde.

The Govan area appears to be one of the earliest Christian settlements in mainland Scotland, dating back to before the 9th century where it may have been the site of a Monastery.

By the 16th century, when extensive coal mines were worked at Craigton and Drumoyne, the Govan area grew and new trades and crafts such as weaving, pottery and agriculture were established.

Town Plans for the area dated 1865 show the Hospital site to be open space and agricultural fields, and utilised by Shieldhall and Merryflatts Farms. Further north, towards the River Clyde are located the buildings and grounds of Shieldhall House, Merryflatts House, Greenhead House and Linthouse. East of the Hospital site is further open space and agricultural land utilised by Greenhead, Drumoyne, Langlands and Fairfield Farms, and the land of Fairfield House.

Around this period, Govan was beginning to lose its rural appearance and assume the character of a town as other industries, including Reid's Dye Works and Pollok's Silk Mill were established. Shipbuilding accelerated this change most prominently, and the Govan area developed as the centre of the world-renowned Clydeside shipbuilding industry. Govan shipyard was founded in the 1860s to the northeast of the Hospital site as Randolph, Elder and Company, renamed later as John Elder and Company and reorganised in 1885 as the Fairfield Shipbuilding and Engineering Co. Ltd.

The First Edition Ordnance Survey Town Plan of Glasgow (published 1895) shows the eastern section of the Hospital site to be used by the Govan Combination Parochial Buildings (Merryflatts). These buildings include the current Acute and Central Medical Blocks which are utilised at this date as a Hospital and a Poorhouse respectively. An Asylum building is also located immediately south of the Poorhouse.

A range of residential buildings, industrial buildings and open space are located immediately to the north of the site towards the River Clyde. These include the Linthouse Shipbuilding and Industrial Works and associated buildings and land, and the Shieldhall Lairage and Slaughter House.

Open land is located immediately east of the Hospital site, with Elder Park (formerly Fairfield Farm), and the Fairfield Shipbuilding and Engineering Works located north of this area.

During the 19th century as a result of the industrial activity in the area, the population of Govan increased from 9,000 in 1864 to 95,000 by 1907 making the town the seventh largest in Scotland. In 1912 Govan was annexed to Glasgow.

The Hospital site underwent redevelopment from the mid to late 19th century and into the early 20th century, and adopted the name 'Southern General Hospital' in 1923 since which time it has been the responsibility of different authorities including Glasgow Parish Council and Glasgow Corporation.

During the 1930s housing estates were developed in the Govan area to relieve the overcrowded slum district of The Gorbals, Glasgow. The Shieldhall Riverside Quay and King George V Dock complex was also developed during this period, north of the Hospital site at the River Clyde.

Prior to the construction of the Clyde Tunnel in 1957 the hospital site was well integrated along the western edge of the Govan conurbation. The original hospital frontage addressed what was Moss Road with the main entrance positioned symmetrically in the

centre directly opposite the clock tower. The site also enjoyed a link to the main tram route which passed along the Govan Road edge before travelling east through Govan and onto the centre of the city. The city block pattern extended along this route with coherent tenement frontages addressing the public domain, made up of roads and green spaces, a good example of which exists to the east at Elder Park.

Significant expansion of the Hospital site occurred in the later 20th century with the completion of the Maternity unit in 1970 and the Institute of Neurological Sciences in 1972. This process of piecemeal development has led to the fragmentation of clinical facilities across the site which results today in a number of poor clinical adjacencies and departmental relationships.

The existing hospital, Neurological and Maternity buildings are not physically joined and instead sit on opposite sides of the site. Many of the original buildings have been extended to accommodate changes over time and a number of link corridors have been formed. The ad-hoc built forms of the existing buildings creates a poor visual impact and space between buildings is not attractively utilized.

10.2.2 Landscape/ Townscape Designations

There are a few designations applicable to the landscape and individual buildings of the Campus Development Plan area and surroundings.

A Tree Preservation Order (TPO) covers the majority of the campus site. The smaller clusters within the campus site offer the opportunity to create a small network of open spaces which would provide attractive areas for patients and visitors to spend time.

The largest clusters are located along the development site boundaries and it is recommended that new tree planting be introduced to reinforce this boundary. This would have a number of benefits for the site such as providing a defensible boundary for the hospital site, providing some screening for the surrounding residential uses and providing a barrier to the noise emanating from the Clyde Tunnel approach road.

A 'Site of Special Landscape Importance' (SSLI) is located approximately 500m east of the Campus Development Plan site which encompasses the grounds of Elder Park.

There are two listed buildings which are in reasonable condition within the Campus Development Plan site. These are outlined below:

 1345 Govan Road, Southern General Hospital, Central Medical Block: HB Number: 33306; Category: B; Date of Listing: 12 October 1989

Statutory Description:

Later 19th century, but probably not all one built. Large symmetrical hospital block, long symmetrical E front with iron-crested French roofs to pavilions, at centrepiece and at advance wings near ends, distinctive clock tower central with louvered bipartites to square stage, inset and curved above with clocks to elevations, louvered and slated pyramidal top. Parapetted wide deep and low entrance range, with Doric portico, probably not original. All snecked and squared ashlar, polished dressings, unmargined windows mostly original, small-paned sashes; blocked main cornice at centre and at ends; corniced stacks; slate roofs. Long W elevation also with variety of wall-panes, wings and pavilions. Modern wing at N not included in listing.

 1345 Govan Road, Southern General Hospital, Acute Medical Block: HB Number: 33307; Category B; Date of Listing: 12 October 1989 Statutory Description:

Mid/ later 19th century, perhaps incorporating John Honeyman's 1858 hospital as centrepiece. 2-storey hospital block with long symmetrical E front with iron-crested French-roofed pavilions and small square tower over shallow advanced 7-bay centrepiece. Snecked, stugged and squared ashlar with polished dressings, unmargined windows, horizontal bands between floors, small-paned sashes; centrepiece has alternate ground floor windows bipartite, segmental-arched at 1st floor, round-headed lights in pavilions; pilastered tripartite doorway, central, painted, now with modern doors; corniced stacks, slate roofs (finialed and leaded axial platform at S end of main roof). Rear elevation similarly treated, large rear wing also with iron-crested French roofs.

There is one listed building located approximately 100m southwest of the Hospital site:

 470, 480, 490, 500 and 510 Shieldhall Road, Hardgate Road, Luma Tower: HB Number: 33308; Category B; Date of Listing: 04 July 1988

Statutory Description:

Cornelius Armour, SCWS staff architect, 1936-38. 1930's modern electric light factory. Flat-roofed large rectangular-plan block with glazed huge 2-stage lamptesting tower placed above main eaves, off-centre over curved staircase bay with iron-railed deck walk. Converted to housing, 1995/96, with an office suite located within the tower. Brickwork rendered; multi-paned large Crittall steel windows, 3 3-storey bays to left of stair included offices, recessed range to right with similar eaves level but originally expressed as 2 storeys, high manufacturing hall at 1st floor lit at upper level by close-spaced windows. Iron railing to roadside.

A further three listed buildings are located within 500m to the east of the Hospital site.

- 87, 91 Holmfaud Street, Linthouse Buildings:
 HB Number: 33309; Category B; Date of Listing: 12 October 1989;
- 200 Shieldhall Road, Drumoyne Primary School, Janitors Lodge Gatepiers and Boundary Walls:

HB Number: 33312; Category B; Date of Listing: 12 October 1989; and

 9 Skipness Drive, Linthouse, St Kenneth's Church, including original Church Hall and Church Officer's House:

HB Number: 33313; Category B; Date of Listing: 12 October 1989.

10.2.3 Regional Landscape Character

Descriptions of the landscape context and urban form of the site and surroundings are given in the following sections.

10.2.4 Local Landscape Character

The local landscape character is urban, principally comprising a mix of residential, commercial and institutional use, and open space. The principal surrounding land uses/townscape characters are illustrated in Fig. 10.1 and include:

Residential – Predominantly includes residential areas of differing ages and character including 2 storey semi-detached dwellings between the Campus Development Plan site and Pirie Park to the east, and between the site and Cardonald Park to the south, such as the Luma building. A range of tenement buildings are also located between the site and Elder Park to the east.

Commercial/ Industrial – Scottish Water Treatment works operates at sites to the north and west of the hospital site. The Shieldhall Riverside Quay and King George V Dock complex is located north of the side at the River Clyde. An HGV hire business operates to the northwest of the site.

Institutional – Langlands Primary School, Drumoyne Primary School and Govan High School are located east of the Campus Development Plan site, adjacent to Pirie Park.

Open Space – Blaes and artificial turf football pitches are located to the south of the site at Cardonald Park. Further open space is located east of the site at Pirie Park and Elder Park, and north of the site adjacent to the River Clyde.

A more detailed description of the landscape character of the site and its surroundings is given below.

10.2.5 Description of Site and Surroundings

The Site

The hospital site (Fig. 10.2 and Fig. 10.3) contains a mix of buildings of varying ages and architectural styles and quality. The oldest group of buildings on the site date from 1872 and are concentrated to the northwest of the campus. There have been modern additions to the campus over the last 5 years including, the Department of Medicine for the Elderly, the Westmarc building and the extensions to both the biochemistry and pathology buildings. In addition the Maternity and Neurosciences Units has been subject of major external and internal refurbishment.

The architectural style and quality of the built form varies and many buildings would benefit from further redevelopment or refurbishment. Building heights range from 1-7 storeys with 4-5 storeys being the dominant building height. The site has the capacity to accommodate higher development to the north away from the surrounding residential uses.

Surrounding Area

The surrounding townscape/ landscape include King George V Dock, Shieldhall Riverside Quay, Elder Park, Pirie Park, Cardonald Park and the River Clyde, all key elements in Glasgow's historical and landscape heritage.

The Shieldhall Riverside Quay and King George V Dock complex was built in the 1930's and is primarily used at present as a terminal for the loading and unloading of cement, bulk goods, scrap, and animal feeds.

Elder Park is named after John Elder (1824-1869) who was an important figure in the history of shipbuilding in Glasgow. Originally Fairfield Farm, the park was designed by John Honeyman and opened in 1885, and has been an important asset to the local community.

Pirie Park is an informal community park which consists of playing fields, bowling greens and trees.

Cardonald Park is also and informal community park consisting primarily of blaes and artificial turf football pitches.

The northern boundary of the Campus Development Plan site is defined by Renfrew Road/ Govan Road, with the River Clyde located further north beyond this area.

The eastern boundary is defined by Moss Road/ A739 (Clyde Tunnel Approach road), while Langlands Drive and residential developments delineate the southern boundary and Hardgate Road runs north-westwards to identify the western boundary of the hospital site.

10.2.6 Townscape Sensitivity

The assessment guidelines require that the affected site's sensitivity to change should be assessed. The evaluation is based on the physical features, qualities and character of the site and its perceived value as a landscape or townscape, evaluated against the type of change that is proposed. This evaluation is carried out in the assessment section, 10.5.3 following the methodology in section 10.5.2 and has considered a number of factors as summarised in Table 10.2, which considers the entire Campus Development Plan area.

10.3 Potential Issues

The proposed redevelopment of the Campus Development Plan site is described in detail in Chapter 5 of this report. The principal changes will include demolition of existing buildings, construction of new buildings, hard and soft landscape and car parking in place of former open service areas and buildings. The townscape, usage and character of built up areas will change. Twelve buildings will be demolished in the short term, with a further eighteen demolished in the medium term. A further fourteen existing buildings and some of the existing trees will remain. Development of the new hospitals proposals are anticipated to take place gradually over a 5 to 10 year period, starting with demolition of existing buildings and construction of new buildings in the east of the site.

The proposed changes will lead to a number of potentially significant landscape and visual changes during construction and subsequent long-term usage of the site:

- Unsightly works, activity and machinery during demolition and construction works
- Loss of familiar/ valued/ unsightly features including buildings, trees etc during demolition and construction works
- New layouts and densities of buildings and open spaces
- Type, scale and appearance of new buildings, particularly tall buildings
- New hard landscape (paving, walls, fences etc)
- New landscape planting and lawns
- Increased site activity/ vehicle access
- Decreased open car parking areas
- New lighting, signage and street furniture

The changes could lead to positive, negative or neutral impacts depending on their nature and context.

10.4 Mitigation and Design

The mitigation of potential landscape and visual impacts will be integral to the Campus redevelopment. As a predominantly urban site the design should take account of all or many of the following factors, considered by the Scottish Executive's Policy Statement 'Designing Places' (2001) and Planning Advice Note (PAN) 68 'Design Statements' (2003) to be the key objectives of creating a successful urban place:

Distinctive – Does the development enhance the sense of identity?

Opportunities for creating a sense of identity:

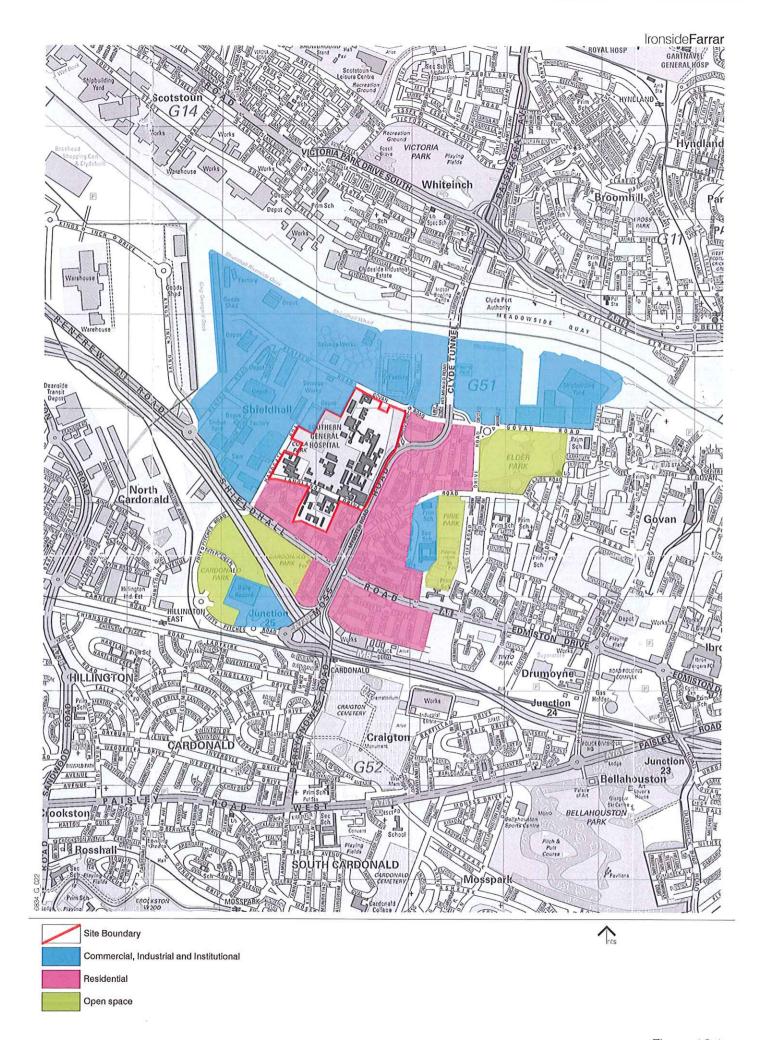


Figure 10.1 **Townscape / Land Use Types**



1. View from Maternity building looking west to Shieldhall. The Luma building is on the left of the frame.



2. View from Maternity building looking north to River Clyde.



\$3. View from Maternity building looking east to A739 Moss Road. The Neurosciences building is in the centre of the frame.

Figure 10.2 Views of Site



4. View from Maternity building looking south to A8 Shieldhall Road and M8. The Luma building is in the centre of the frame.



5. View from southern boundary of site. The Maternity building is on the left of the frame, and the Neurosciences building is visible on the right.



\$6. View from northern boundary of site to main access corridor.

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Distinctive landscapes, natural features, buildings, streets, street patterns, spaces, skylines, building forms, practices and materials that should inspire patterns of new building.

 Safe and pleasant – Is the space safe for the community, attractive useable and at the right scale?

Opportunities for creating safe and pleasant spaces:

Places where a street would be livelier and feel safer if a building had windows, doors or active uses on to the street, rather than presenting a blank façade; places where footpaths and open spaces would feel safer if buildings overlooked them; places with potential for living over shops to provide inhabited rooms overlooking streets and to encourage evening activity; places where the distinction between public or private space can be made clearer; places where a gap in an otherwise continuous line of building frontages along a street detracts from the street's quality, and could be either filled or made into a usable, attractive space for pedestrians; and opportunities to create a sense of enclosure by enclosing streets, squares, parks and other spaces by buildings and or trees of a scale that feels right.

• Easy to get to and move around – Have direct routes been created? Does it provide access for disabled people?

Opportunities for creating easier movement:

Opportunities to ensure that the density of development is highest where access to public transport is best; opportunities to site bus stops more conveniently and to make them safer and better lit; opportunities to make railway stations accessible by foot from all directions; roads or footpaths that need to be better connected into well used routes, so that the presence of more people makes them feel safer; public spaces that need to be better linked into a route that is well used by people on foot; opportunities to encourage cycling; and places that pedestrians go to and from which need to be connected by more direct routes.

 Welcoming – Have any new landmarks or gateways been created which will help people to find their way around?

Opportunities for creating a sense of welcome:

Places where new landmarks could create or improve views and help people find their way around; places where views need to be opened up; opportunities to mark places that act as gateways to particular areas; places where better lighting is needed to improve safety, help people find their way around, highlight landmarks, show off attractive buildings or disguise eyesores; opportunities for creating distinctive works or art and craft; and places where better signs are needed.

 Adaptable – Does the development or improvements support a mix of compatible uses? Will there be opportunities to make buildings and areas adaptable to a variety of future uses?

Opportunities for making a place adaptable:

Opportunities to ensure that new development or other improvements support a mix of compatible uses and tenures, helping to make the place one where people live, work and play, rather than having a single use and being dead after hours; and opportunities to make buildings and areas adaptable to a variety of future uses, by ensuring that they are not tightly designed to a particular use.

 Resource efficient – Has the opportunity been used to create a new and exciting building in how it has been constructed? Does it minimise the use of energy through the way it faces the sun? How sheltered is it from the wind? Opportunities for making good use of resources:

Opportunities for new and existing buildings to minimise their use of energy through the way they face the sun, how they are sheltered from the wind by the slope of the land, trees and other buildings, and how they are constructed; buildings, sites or areas that are underused; building materials that are available from local and or sustainable sources; natural features that are important to conserve and emphasise; places where a park or green space needs to be created or improved; and opportunities to improve habitats and support wildlife, attracting and protecting living things.

Other considerations will include the need to mitigate potential impacts on neighbouring buildings and spaces, including public and private properties. This will include the avoidance of excessive shading and visual intrusion due to building height, scale and proximity. These factors will be considered in the context of a dense urban site and the overall townscape objectives of the Campus Development Plan and will also form the basis for assessing the townscape impacts of the proposed Campus Development Plan (see 10.5.4: Landscape/ Townscape Impacts).

The design and mitigation objectives will be achieved through the implementation of a coordinated and comprehensive Campus Development Plan, which includes guidelines on the development mix and layout of the site, the design of buildings and the quality and type of materials. The extent and nature of townscape and visual impacts will be determined by the successful implementation of the Campus Development Plan objectives and layouts. The commitment to architectural quality and full Campus Development Plan details are described in detail in a separate written design statement. The principal measures are described in 10.4.1 to 10.4.6 below.

10.4.1 Building Location and Design

Building Location

The proposed positioning of the New South Glasgow Hospital and Children's Hospital on the site of the existing Southern General Hospital has been determined by a number of factors. First, two major buildings on the site containing two major clinical departments, Maternity and Neurosciences, have to be retained because the life expectancy of these buildings, and the fact that significant investment has recently been made in upgrading them, means that they represent a significant asset to the Board

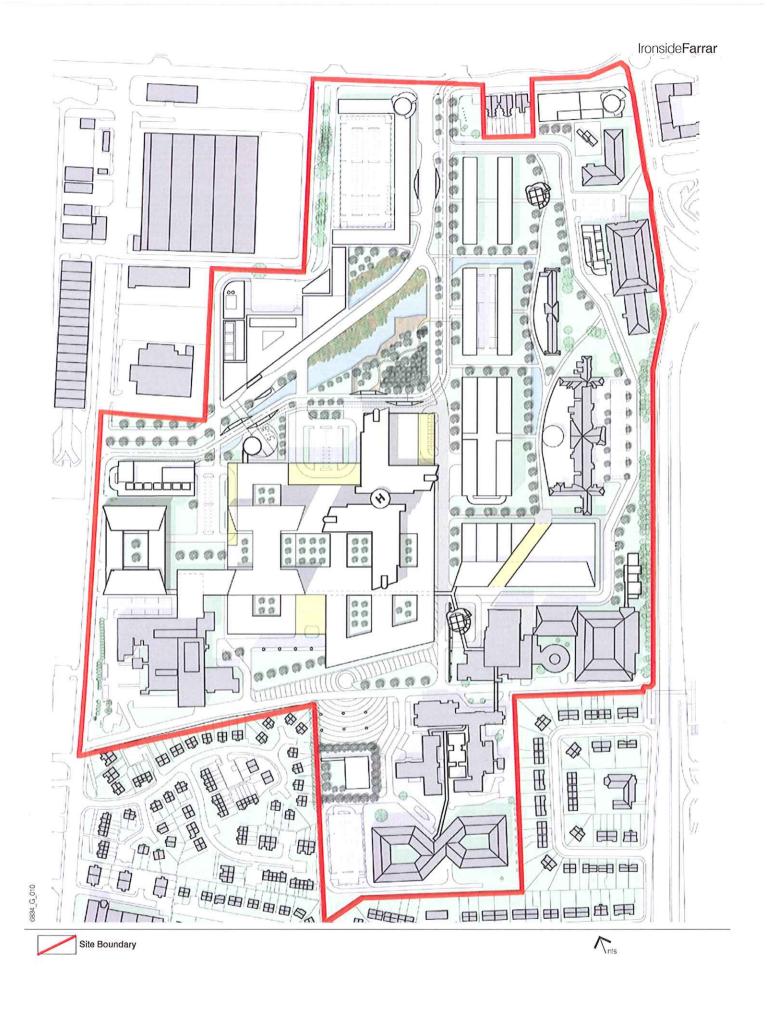
There is also a large area of undeveloped land on the western boundary of the Southern General site which sits immediately next to the land being cleared between the Maternity and Neurosciences buildings. Together, these areas provide an area that is large enough to accommodate the construction of both of the new hospitals.

The Campus Development Plan (Fig 10.4) lays out the site as a series of blocks with different areas zoned for different activities according to their location. Large and small open spaces are created between these blocks and particular emphasis is placed on the large green space in the centre of the site which faces the public entrances to both the Children's and Adult's hospital.

Urban Design

The New South Glasgow Hospitals provide the opportunity to create a new health "quarter" to the west of Govan.

The opportunity also exists to create a new urban quarter with its own distinct identity that takes its place in the sequence of regenerated areas coming west along the river (i.e. Govan Town centre, Finnieston Quay, Science Centre etc.).





Proposals: Scheme Sketch View from Govan Road Entrance



Figure 10.6
Proposals: Scheme
Sketch View
from Hardgate Road
Entrance

Measured against the six criteria set out in 'Designing Places' of Distinctive; Safe and pleasant; Ease to get to and move around; Welcoming; Adaptable and Resource efficient, it is hard to score the existing context too highly.

The design vision (Figs. 10.5-10.8) is therefore to reshape the context in such a way that it builds on successful patterns from the past and provides the site and its surroundings with a new identity and coherence for the future. In so doing the initial phase of development on the site will provide a strong central "armature" around which future development can take place. This will support a recognisable hierarchy of built forms and external spaces appropriate to their function and sympathetic to neighbouring buildings. Such an approach recognises that there is no longer only "one face" on "one edge" of the hospital but rather it has to present many different faces. Not least of these is the desire to both integrate aspects of the Children's and Adult Hospitals but also to ensure their separate identities are maintained through distinct approach and entrance areas.

The present site is much larger than a single city block and naturally falls into a number of smaller individual blocks. The original East face of the site formed by the two listed buildings was once the principal edge that addressed the city. This was created at a time when the hospital represented the western edge of the City and access was only possible from that frontage. This strategy is no longer appropriate as the city continues growing to surround the site whilst the original Moss Road entrance has been destroyed by subsequent road development outside the site, mostly notably the Clyde Tunnel approach road. Moreover, the new hospital will have a very diverse and wide catchment with users now approaching from the south, west, east and even north of the city. The design will therefore respond to all approaches to provide a wider landmark visible from further afield.

Breaking the site down into distinct blocks also offers an opportunity to integrate open green spaces, green corridors, and choices for pedestrian and cycle paths through the site. Creation of a welcoming public space in the centre of the site will provide a new focus for the health "quarter" in the way that a town square comes to identify an area of city made up from a variety of different buildings. Views into and from the centre will be possible from a variety of different directions. Some will be broad views on the main approach. Others will take the form of framed micro vistas on smaller pedestrian approaches.

The public frontages of the buildings will seek to surround and define a welcoming public heart which becomes a focal point for this new urban "quarter" with blocks radiating out and merging with the wider city to create a permeable edge. Once this strategy is adopted the site will offer at its heart a focus for the diverse routes and activities which in turn lead off into other complimentary spaces. This network of spaces can be designed to define different public and private hierarchies depending on the nature of the surrounding activity. Building corners and other key features can be designed to provide focal points and nodes, shaping routes and acting as visual aids to legibility and wayfinding. By wrapping the public face in and through the site, greater overlooking and natural surveillance of public space is possible to improve safety and security. Opportunities to bring public transport into the centre of the site allow provision of drop-offs equidistant to existing and proposed entrances. This will encourage greater take up of these services than would be the case if drop-off is limited to the site edge.

The retention of the listed buildings is proposed for several reasons; first, only their outer facades have architectural or historical significance and therefore opportunities exist to remodel them internally. Second, the buildings currently accommodate clinical functions that cannot be relocated until such time as the new Hospital is constructed. Thirdly, reuse of the buildings for administrative support or teaching functions makes both economic and environmental sense as their building form lends itself to this type of conversion without resorting to demolition. In addition, these are buildings that have been listed as being of architectural and historic interest and as such ought to be found a new function and rehabilitated so that their future conservation is secured.

The plan is therefore to retain the listed buildings to form one edge of the teaching and administration zone on the eastern side of the site. In order to protect the setting of the listed buildings the Campus Plan requires that any new adjacent buildings proposed for the eastern side of the site will be of a scale and massing that is in keeping with that of the listed buildings.

10.4.2 Streetscape and Landscape Treatment

Landscape Design

The open space will take the form of small parks, squares and boulevards defined by buildings and routes (i.e. as nearby Elder Park) rather than an open landscape with buildings set in a free space. Spaces between buildings will be designed appropriate to the activity surrounding them. Spaces that form a central public focus for entrances and drop off will be treated differently to those predominantly providing an outlook such as an internal courtyard. The hierarchy of buildings on the site will mean that different scales of building will be required and the space adjoining different buildings will be designed accordingly.

Geometry will be bold and simple and used to provide structure for planting and surfaces appropriate to the activity. There will be a requirement to remove some of the protected trees on the site to ensure effective clinical planning. However, wherever possible existing trees will be retained and new trees will be planted. Opportunities to incorporate public art both inside and outside the building will be explored. Distinctive pieces of sculpture can act as markers on a route assisting wayfinding and orientation.

The landscape design proposes the incorporation of a Sustainable Urban Drainage Scheme (SUDS). A network of connecting balancing ponds, rills and swales will provide opportunities for attenuation as well as attractive landscape features. Planting, ponds and other water features will support biodiversity allowing safe access to green space and contact with nature.

Public Green Space

The large green space which is proposed for the centre of the site will play an essential role in creating a new identity for the hospitals by creating a significant urban space with which they will be associated and onto which they face. It is intended that this space will be a public space belonging to the public realm of the city, not an on-site semi-public space within the hospital grounds. To this end it is proposed that the space will be directly connected into the surrounding street pattern and that both public transport and private cars will be able to pass through the space on a public highway. This will have the effect of creating a new public frontage for the hospital to replace its existing rather weakly defined presence on Govan Road.

This new public green space is subdivided to create distinct entrances for the adults, children and emergency departments. The frontage to the Adult Acute hospital is opposite the widest section of the space in order to provide an appropriate setting for the taller ward block by which it is overlooked. The entrance to the adult hospital will have easy access to the parkland and lake which will include paths and sitting areas. The frontage to the children's hospital will look over a large play area. The first impression upon arriving at the children's hospital will be a place of play incorporating colour and stimulating materials.

Hierarchy of Landscape Space

Based on the outline Landscape Campus Plan a series of spaces have been categorised based upon their primary function in order to break down the vast area of the campus into smaller zones. The zones are as follows and are described in more detail in Table 10.1 'Landscape Strategy':

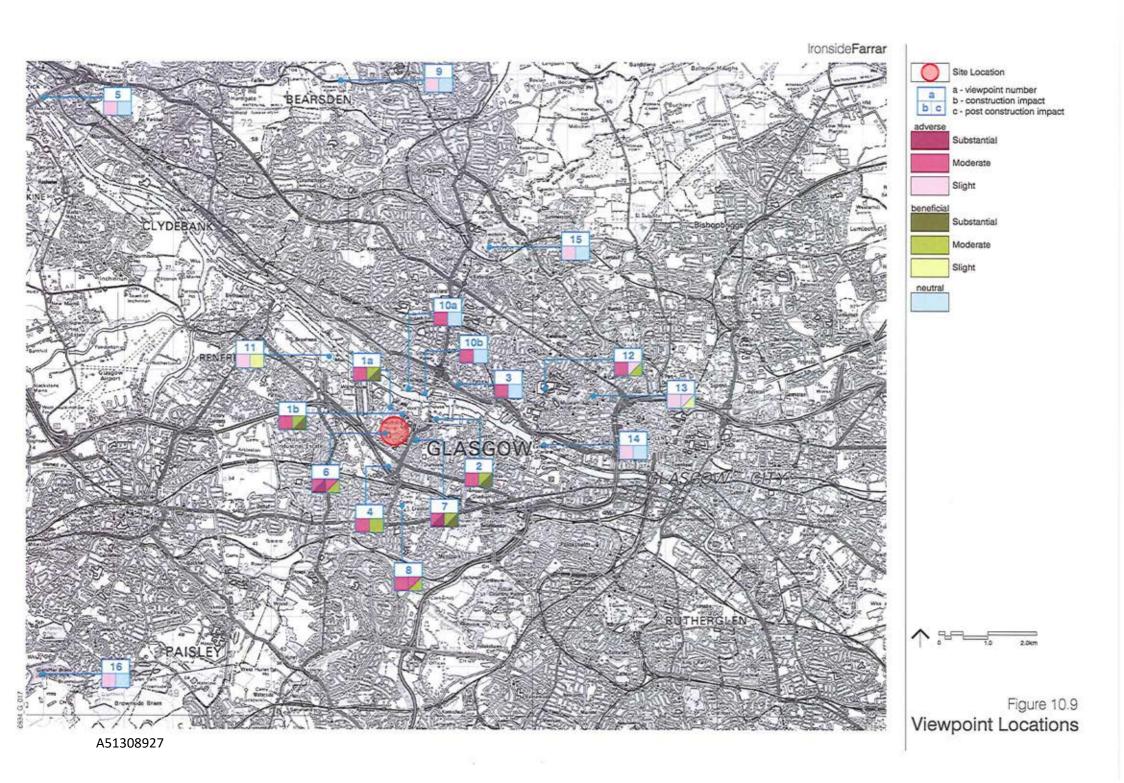


Figure 10.7
Proposals: Scheme
Campus Model
View from East



Proposals: Scheme Campus Model View from West

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Viewpoint 1a. View south from Renfrew Road near northern site access point. New Childrens and Adult Hospitals will be visible in centre of frame.



Viewpoint 1b. View south from Renfrew Road. New Childrens and Adult Hospitals will be visible in centre of frame.



Viewpoint 2. View southwest from Govan Road / Moss Road. Central Medical Block tower visible on left of frame. New Childrens and Adult Hospitals will be visible above roofline of residences.

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Figure 10.10 Viewpoint Photographs



Viewpoint 3. View southwest from A814 Clydeside Expressway. New Childrens and Adult Hospitals will be visible in centre of frame.



Viewpoint 4. View north M8 at Cardonald Park. Luma is on the left of the frame. New Childrens and Adult Hospitals will be visible in centre of frame, through trees and above roofline of residences.



§ Viewpoint 5. View southeast from Erskine Bridge.

Figure 10.11 Viewpoint Photographs



Viewpoint 6. View north from Hardgate Drive. Maternity building visible in left of frame. New Childrens and Adult Hospitals will be visible in centre of frame, above roofline of residences.



Viewpoint 7. View west from A739 Moss Road / Skipness Drive looking west to Central Medical Block listed building. New Childrens and Adult Hospitals will be visible in left of frame, above existing rooflines.



Viewpoint 8. View north from Moss Heights Avenue, Craigton - Lourdes Primary School is in foreground. Neurosciences building visible in centre of frame.

New Childrens and Adult Hospitals will be visible in centre of frame.



Viewpoint 9. View south from A810 Duntocher Road, Bearsden.



Viewpoint 10a. View south from Clydeside Industrial Estate. New Childrens and Adult Hospitals will be visible in centre of frame.

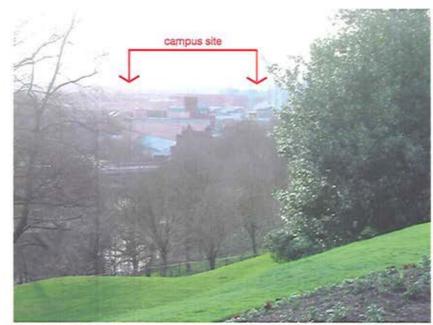


Viewpoint 10b. View south from Clydeside Industrial Estate. New Childrens and Adult Hospitals will be visible towards left of frame. A51308927

Figure 10.13 Viewpoint Photographs



Viewpoint 11. View southeast from Braehead Shopping Centre.



Viewpoint 12. View southwest from The University of Glasgow at Kelvingrove.



Viewpoint 13. View southwest from Park Terrace / Park Circus.

Figure 10.14 Viewpoint Photographs



Viewpoint 14. View east from River Clyde at Glasgow Science Centre



Viewpoint 15. View south from Dawsholm Park, Kelvindale.



Viewpoint 16. View northeast from Robertson Park at Gleniffer Braes Country Park, near Paisley. Stanley Reservoir is on the left of frame.

Figure 10.15 Viewpoint Photographs

- 1. Main Entrance
- General Open Space (including SUDS)
 Children's Hospital Break-Out Area
- 4. Main Clinical Entrances
- 5. Courtyards
- 6. Civic Space & Break-Out Area
- 7. Access & Circulation Routes
- 8. Parking Areas
- 9. Children's Psychiatric Unit
- 10. Facilities Management / Pathology
- 11. Boundary Treatments12. Discrete Developments
- 13. Retained Hospital Landscapes

Table 10.1: Landscape Strategy

No.	Landscape Area	Aim	Additional Description	Landscape Elements
1	Main Entrance	To present a modern frontage to the new hospital that has design continuity with the architecture and is reflective of the quality of standards and care expected by the public.	A poorly designed and maintained environment would present a poor impression and make patients and visitors question the standards of care and hygiene provided by the facility. The landscape setting and entrance to the hospital should inspire confidence in patients and visitors that they are in a modern, clean, healthcare environment.	The highest quality hardscape materials used in the hospital grounds will be used around this entrance. Flag paving and stainless steel street furniture (bollards, bins and benches and lighting units). EHS (or larger) tree planting for immediate presence, with high quality shrub planting. High maintenance throughout area to achieve highest standards.
2	General Open Space (including SUDS)	The implementation of a large open space along the length of the main building frontage to create a high quality landscape setting for the hospital and a campus contributing to a healing environment.	Structural planting will be used to manipulate views and space along the length of this area, creating a mixture of scales. This can be used to aid wayfinding by focusing the attention of spaces at critical wayfinding junctions. The campus environment and setting of the new hospital will be defined by the quality of this space.	The adaptation of a SUDS scheme provides the opportunity to create a large body of open water, with associated environmental elements. Areas of structural planting, trees, shrubs and grassland planting. Specimen trees, shrub planting, deck areas and furniture all contribute to create quality feature areas.
3	Children's Hospital Break-Out Area	To provide a safe and stimulating outdoor environment, easily accessible to recovering children, allowing them to escape the confines of the hospital wards.	To provide a stimulating environment, bright saturated colours may be used which may not be in keeping with the rest of the campus.	Secure perimeter fencing of appropriate aesthetic standard. A 2.0m height weld mesh fencing with climbing plants incorporated along the base softening the overall appearance. Children's play equipment and artworks within the area. Large tree planting to provide dappled shade for the benefit of the children.

Table 10.1: Landscape Strategy (continued)

No.	Landscape Area	Aim	Additional Description	Landscape Elements
4	Main Clinical Entrances	Creation of a highly functional, legible entrance area, clutter-free and easily accessible	Street furniture of the same design as main entrance only galvanised powder coated finish instead of stainless steel. Some peripheral 'Green Elements' where appropriate to soften the spaces without compromising function.	Primarily hardscape areas with street furniture to control and aid the function of the area. Robust lighting, bollards, bins and signage. Lower detail standard than the High Quality areas but still have of a high design standard.
5	Courtyards	Campus gardens within the courtyards will create a series of individual healing spaces split between public and patient access.	Within these areas there exists the opportunity to implement very detailed intimate garden spaces. Each courtyard will have an individual identity to help add stimulus and avoid a bland blanket treatment to all.	Flag paving, setts and decking will provide the functional surfacing. Evergreen shrub planting and mature trees as well as some water features will provide softer qualities to the areas.
6	Civic Space & Break-Out Area	To provide excellent opportunities for patients to step out of the hospital environment into a quality environment.	Allow patients easy access to outdoor areas to provide a change in environment from the hospital wards and to aid in their recovery. Artwork and sculptures to be provided in this area to add stimulus to the space.	Mixture of hard and soft 'scapes. Provision of high quality street furniture. Stainless steel bollards, bins, and benches. Control of traffic through this zone. Specimen trees with shrubs to the outer edges of the area.
7	Access & Circulation Routes	In keeping with City policy there will be a focus on providing sustainable transport links with landscape design focusing on making these routes safe and appealing.	The hospital development will be served by a new fast link service, local buses, private cars, cycle ways and pedestrian footways. There exists a potential for user conflict between these transport elements. Where possible a segregation of footway and cycle traffic from the roads will be implemented.	Specimen tree planting. Asphalt surfacing to footways and cycle ways where implemented. Shrub planting shall be implemented where possible. The design of which will ensure it will not present a safety risk at any point in the future.

Table 10.1: Landscape Strategy (continued)

No.	Landscape Area	Aim	Additional Description	Landscape Elements
8	Parking Areas	To soften the visual intrusion and stark appearance of all parking areas.	In line with City policy areas of surface grade car parking will be interspersed with tree and shrub planting/ hedges to soften visual appearance. There will be (poss.) elevation treatments to the multi-storey car parks to integrate these buildings with the rest of the hospital campus.	Weld mesh fencing at 1.0m height used as structure within hedgerows will be implemented between parking bays throughout surface grade car parks. Multi-storey car parks will have EHS trees planted around their elevations where space permits with some surface elevation treatments to soften their appearance.
9	Children's Psychiatric Unit	To provide the necessary landscape setting for this sensitive department and a quality space for the patients.	Due to the sensitive nature of this unit, it requires a robust buffer to the boundary. There is likely to be sustained periods of activity by children in the external space. Noise levels created by children at play needs to be dampened so as to minimise the impact upon neighbouring residential properties.	Large open playing field. Dense boundary shrub planting. Evergreen tree planting around perimeter.
10	Facilities Management / Pathology	To create a functional landscape for this, almost, industrial element of the hospital	There will be little or no public usage of this area of the campus. It will be a purely functional space and to minimise maintenance burdens will be predominantly hardscape. The likelihood is that street furniture will come in for rough treatment over the lifespan of the space. Therefore functional, economic, easily replaced furniture should be specified.	Functional, robust and economical street furniture will be the predominant landscape feature. Easily maintained, replaceable, bollards, bins and signage. Some shrub planting to surplus areas around the periphery of the space to soften the overall appearance and maintenance burdens.
11	Boundary Treatments	To integrate the redeveloped hospital campus within the existing community and landscape without placing additional impacts upon neighbouring property.	A primary concern of City policy is how new/ re-development integrates with the existing surroundings, and the treatments to the hospital boundaries will be critical in achieving an acceptable level of integration.	In broad terms, there will be 3 types of landscape treatments for Residential, Neutral and Negative neighbours. Residential Neighbour: Maximise available space for buffer zone planting along boundary. Large tree and shrub planting. Living willow/ acoustic treatments where appropriate. New garden fencing where necessary.

Table 10.1: Landscape Strategy (continued)

No.	Landscape Area	Aim	Additional Description	Landscape Elements
11	Boundary Treatments (continued)			Neutral Neighbour: A continuance of the boundary treatment currently along the (east) A739 road boundary in front of the large listed building on site. Open fencing giving views into/out of the site with specimen tree planting and some shrub planting. Negative Neighbour: Suitable buffer planting to screen negative neighbour from hospital. New EHS tree planting and large evergreen shrub planting to limit visual connectivity.
12	Discrete Developments	To ensure that the satellite building developments contribute through their landscape elements to a cohesive campus Development Plan.	Each building development separate from the main clinical building will be developed at a different stage/ time. By advocating the use of similar species and sizing in the softworks as well as design attitude, hardscape materials and street furniture, these individual developments will appear to have been designed in conjunction with the core landscape areas producing a cohesive campus.	Specimen tree planting and shrubs. Various hardscapes (to suit building needs) and street furniture.

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Table 10.1: Landscape Strategy (continued)

No.	Landscape Area	Aim	Additional Description	Landscape Elements
13	Retained Hospital Landscapes	To preserve, and where possible, enhance the existing parkland landscape quality around the retained buildings of the current hospital.	The redevelopment of the hospital offers the opportunity to manage and plan the ongoing success of the existing landscape of the hospital. A rationalisation of the space will be carried out, however this will respond to the existing mature trees on site. Following this rationalisation, new planting and landscape elements will be implemented. In existing areas where the landscape is deemed substandard and not of the quality found on the eastern side of the campus, a Landscape Scheme will upgrade these areas in keeping with both the existing areas as well as the new design principles of the campus redevelopment, creating a balance and transition between the two.	Existing mature trees retained and managed. New (long term replacement) specimen trees in areas where existing trees are very mature. New shrub and feature areas where there is a rationalisation of space/roads.

10.4.3 Car Parking and Vehicular Access

A hierarchy of vehicle routes will be established within and across the site defining access for service, blue light and private vehicles. The present site suffers from being used as a cut-through which has in part been a consequence of Hardgate Road being closed at its northern end by the water treatment works. Concentration of through traffic may be avoided by making the site more permeable.

To retain sufficient land for landscaping and future development both contained surface and multi-storey parking solutions are envisaged. It is proposed to site these close to entrances to improve accessibility and allow them to be constructed in a phased manner in line with the growth of patient services on the site.

It has been established that 3,500 parking spaces will be required. This number of spaces would cover the entire area of land available for development if it were to be placed on grade. The public parking will therefore include a mixture of surface and multi-storey located as close as possible to the main public entrances. The larger of the multi storey car parks will have 6 stories above ground and one below ground and is located next to the Adult Acute Hospital entrance. The other multi storey car park will have 5 stories above ground and one below ground and will be located next to the Sick Children's Hospital entrance. Both car parks will be designed to complement the adjoining buildings in terms of scale, materials and elevational treatment.

10.4.4 Accessibility

The Campus Development Plan supports a separate route for Fastlink through the centre of the site with stops immediately adjacent to the Adult Acute and Children's hospital entrances. The new through road has been located on the opposite side of public green space well away from the new public entrances to the hospitals. This road enters via the existing entrance off Govan Road and leaves via a new entrance onto Hardgate Road. This allows remaining routes within the Campus to be utilised by cyclists and pedestrians. Bus routes will pass through the site on the through route road with bus stops located opposite the entrances to the Adult Acute and the Children's hospital entrances. It is proposed that those buildings which are located off the new through route road, such as the Institute of Neurosciences, Maternity and the longer term Elderly Care and Rehab building at the rear of the site will be served by an on site shuttle bus service.

10.4.5 Environmental Design

Analysis which considers the effects of the proposals on the availability of skylight for the existing residential properties to the southwest of the site at Hardgate Drive has been undertaken using EcoTech to calculate the Vertical Sky Component (VSC) and Orientation.

The analysis concluded that the diffuse lighting of the existing residential properties analysed will not be adversely affected by the proposals as the VSC does not fall below 28% at the centre of a main window, and is not less than 0.8 times its current value.

Analysis also concluded that sunlighting of the existing residential properties analysed with a main window facing within 90 degrees of due south, will not be adversely affected by the proposals as the new development does not subtend to more than 25 degrees to the horizontal.

10.5 Impact Assessment

10.5.1 Zone of Visual Influence

A zone of visual influence has been determined by study of maps and site visits. Due to the complexity of screening elements such as buildings and trees in an urban area the principal method of determining visibility is by visiting locations around the site. This has also led to the identification of the principal visual receptors (see 10.5.5 below and Fig. 10.9). In the case of high buildings visible from the site it has been assumed that there will be views available from these receptors, but due to access difficulties this has not been confirmed by viewing from individual properties.

The site is predominantly visible from its immediate surroundings, with visibility reducing with distance due to the height and density of city development.

Within the immediate context the site is visible from all directions. The principal locations in close proximity from which the site is visible include Renfrew Road/ Govan Road to the north, and Hardgate Road to the west.

From beyond the immediate surroundings parts of the site are mainly visible from taller buildings, and higher areas of open ground. More distant views are mainly from the south and north including an open view from higher flats at Moss Heights Avenue, Craigton and views from higher land such as at Dawsholm Park, Kelvindale/ Maryhill.

10.5.2 Impact Criteria and Evaluation Method

Evaluation of Landscape/ Townscape Impacts

Landscape impact assessment concerns the effects of the proposed development on the integrity and character of the landscape as a whole. In this entirely urban context the term 'Townscape' is applied. The significance of impact relates to a combination of two factors:

- The magnitude of physical and character change to the townscape of the site and surroundings, including the duration and permanence of the changes.
- The sensitivity of the site and surroundings over the lifetime of the development (i.e. the character and perceived value of the townscape and its ability to absorb the type of change proposed).

Both factors are rated as **High, Medium** or **Low** according to the extent, degree and duration of the change to the townscape and the type of townscape affected. The ratings should be considered as stages on a continuum and intermediate ratings are sometimes applicable.

The sensitivity to change of townscape relates to a number of interacting factors that contribute to the character of an area, its perceived value and its ability to absorb change. The factors considered in this assessment are:

- Existing land uses and landscape/ townscape elements
- Pattern, density and scale of existing buildings/ spaces/ townscape
- Condition of urban fabric/ townscape
- Susceptibility of the area to the types of change proposed (i.e. ability to absorb change)
- · Scope for mitigation of proposed changes
- Value placed on townscape through official designations and by users

The combination of these factors leads to an assessment of townscape sensitivity in terms of High, Medium or Low as explained above.

Townscape impacts result from the combination of magnitude and sensitivity and are classified in accordance with a graded hierarchy. For this assessment we have used: **Substantial, Moderate, Minor** or **No Change** (or intermediate between these defined criteria). All changes offer the potential to be adverse, beneficial or neutral (or sometimes a combination) depending on the nature of the change and the nature of the receptor. The following definitions are illustrative, and should be considered as stages on a continuum of potential impacts:

Substantial High magnitude/ fundamental change in a highly valued and/ or sensitive

townscape introducing fundamental changes which are likely to

completely change the fabric and character of the townscape.

Moderate Noticeable change in a moderately valued and/ or sensitive townscape

with some effect on townscape character but which by reason of limited duration or scale has only a limited effect on the fabric or character of the

townscape.

Slight Minor changes in any townscape type

No Change Townscape will not be affected or a combination of insignificant adverse

and beneficial changes will be balanced

Evaluation of Visual Impacts

Visual impact assessment concerns the effects of the proposed development on the surrounding visual receptors (i.e. locations with views of the site frequented or inhabited by people). The significance of impact relates to a combination of:

- The **magnitude** of change in the view(s) seen by the visual receptor, including the duration and permanence of the change
- The sensitivity of the receptor to changes in view

Both factors are rated as **High, Medium** and **Low** according to the extent, degree and duration of change in the view and the type of receptor affected. The ratings should be considered as stages on a continuum and intermediate ratings are sometimes applicable.

The sensitivity of any receptor reflects a range of factors such as level of use, user perception, quality of place, nature of activity and expectations of users. Typically, sensitive receptors include residential properties, informal recreation areas and viewpoints where the setting and character is important or where there is a high level of amenity use. Moderately sensitive receptors include most roads and public buildings or general public open space. Receptors with low sensitivity include most work places and industrial sites.

The locations of potential visual receptors are identified during the visibility survey. Impacts are classified as **Substantial**, **Moderate**, **Slight** or **No Change** (or intermediates between these defined criteria) and can be adverse, beneficial or neutral (or sometimes a combination) depending on the nature of the change. The following definitions are illustrative and should be considered as stages on a continuum of potential impacts:

Substantial High magnitude/ fundamental change in view towards the site as seen from a highly sensitive receptor.

Moderate Noticeable change in view towards site as seen from a highly or

moderately sensitive receptor.

Slight Barely noticeable and non intrusive changes in view as seen by any

receptor type.

No Change View from receptor will not be affected or insignificant adverse and

beneficial changes will be balanced.

Evaluation of Significance

As described above the assessment of impacts includes both townscape and the effect on receptors experiencing the townscape. In such a key public context and considering the complexity of the proposals the distinction between the two assessments is more blurred than it might be for a lower key more rural development. For this reason the selection of visual receptors is weighted towards public viewpoints and the public experience of townscape. Nevertheless a number of nearby residential locations have been included in the assessment.

The assessment of visual impacts in particular is based on the basic assumption that the aesthetic qualities of the proposed redevelopment, by comparison with many of the existing buildings and spaces, will be viewed in a positive light by visual receptors. Should future development proposals not be carried out to a high standard of design, detailing and materials this may lead to negative townscape and visual impacts not anticipated by this assessment.

Where applicable, factors such as blocking of views or loss of valued familiar features are factored into the assessment as potentially negative impacts.

The assessment considers both the construction and post completion phases of the proposals in order to assess the shorter-term potentially adverse impacts and the longer term but potentially more beneficial impacts.

The redevelopment of the site is likely to take place over 5 to 10 years. As parts of the site are already in use and others will be brought into use during the construction period, it is difficult to separate the two phases of development (i.e. construction and operation). In this case the assessment of construction impacts has been taken to be the first 5 to 10 years, when the projects are most likely to be implemented. Post completion impacts are taken to be in the period following completion of all construction works.

For the purposes of this assessment, only impacts of moderate and above are regarded as significant.

Evaluation of Impacts on Listed Buildings and Structures

As shown in section 10.2.2, and Chapter 14 Cultural Heritage and Archaeology, there are 2 listed buildings within the Campus Development Plan area and 4 in nearby areas that are potentially indirectly affected.

The evaluation of impacts on the settings of listed buildings and structures and ancient monuments is largely covered by the assessment of impacts on townscape and views within and around the Campus Development Plan site. A separate summary statement is given in 10.5.6 with respect to the likely impacts.

10.5.3 Townscape Sensitivity

Landscape assessment guidelines require that the affected site's sensitivity to change should be assessed (see 10.5.2 above). The evaluation is based on the physical features, qualities and character of the site and its perceived value as a landscape, evaluated against the type of change that is proposed. This evaluation has considered a number of factors as summarised below in Table 10.1, which considers the Campus Development Plan area.

The Hospital site is considered to be of medium sensitivity. This is principally due to limited integrity of urban character and average condition of buildings.

Table 10.2: Evaluation of Existing Townscape Sensitivity

CRITERIA	CAMPUS DEVELOPMENT PLAN SITE
Existing Land uses/ Landscape Elements	Mixed buildings of varying ages and style. Institutional/ educational use. Access roads/ lanes. Car parking. Open spaces, predominately hard, including servicing yards, informal parking and courtyards. Trees and shrub planting. Grass and lawn areas.
Pattern and Scale	Small to Medium and Large (in urban terms) with a basic north-south and east-west street pattern. Buildings varied in size, shape, age and appearance Piecemeal development. Pattern of townscape and open areas fragmented/ degraded in places. Little consistency in pattern/ character.
Condition of Urban Fabric/ Landscape	Average to Good. Condition/ maintenance of streetscape and open space vary.
Susceptibility to Change	Fabric and character of site is slightly susceptible to changes proposed, due to the scale/ height of existing buildings. Older buildings are potentially susceptible to change due to their detailing and materials. Larger and modern buildings are less susceptible to change due to their scale and materials. Existing open space not very susceptible to change due to lack of significant/ valued features.
Scope for Mitigation	Significant potential exists for strengthening of townscape, landscape framework, improvements in quality of image/ site identity, building quality and overall maintenance.
Value Placed on Landscape/ Townscape	Medium value: Designations relate to specific buildings and trees, rather than quality of townscape. Open space is of variable quality.
TOWNSCAPE SENSITIVITY	The townscape and landscape of the site has limited integrity of character and is in average condition in several locations. It is slightly susceptible to change and there is scope for mitigation of impacts. It is not highly valued as a townscape and landscape.
	Overall rating: Low/ Medium sensitivity

10.5.4 Assessment of Landscape/ Townscape Impacts

For the purposes of this assessment the long term changes in townscape are considered in terms of the urban design objectives listed in 10.4 'Mitigation and Design'. These objectives are considered to encompass the key aesthetic and functional aspects of townscape. A consideration of each objective in relation to the extent of change and whether the change is beneficial or adverse leads to an overall assessment of impact. This assessment is carried out for the whole Campus Development Plan area.

An assessment of impacts is also made for the construction phase, but in less detail and without consideration of the urban design objectives. This is because the changes are temporary and not an intended outcome.

Construction Phase

Construction impacts are based on an estimated programme of works that will last approximately 10 years overall, but will be staggered such that impacts in smaller specific locations will last perhaps 1 or 2 years before buildings are completed and development moves on to another area. The construction phase of the new hospitals will be approximately 3.5 to 4 years.

Phasing in the Campus Development Plan site will mean that decant and demolition occurs quickly in the south/ central area, followed by construction in this location. Decant of buildings in the northeast area of the site will follow the completion of these stages followed by demolition and construction in this location.

In the Campus Development Plan site, impacts will be medium to high magnitude by comparison with the composition, scale and character of the existing site. The impacts of demolition and construction will be largely adverse in this context, involving vehicle and machinery activity; creation of waste; stockpiling of materials and potential loss of trees and other vegetation. The impacts will however be of a short to medium term duration as most buildings will take one to two years to complete. As the site is of medium sensitivity to change, construction impacts on the townscape are considered to be moderate adverse and therefore significant.

Post Completion – Long Term Impacts

At completion of redevelopment the townscape changes will include a range of new buildings, refurbished buildings, new and realigned accesses, public and private open spaces, car parking and hard and soft landscaping. This will replace demolished buildings and open spaces. The appearance of the site will be more densely built up and more structured, co-ordinated and better maintained than is currently the case. The landscape structure including planting and hard landscape, will be more co-ordinated and of a significantly higher quality and legibility.

The townscape impacts on the Campus Development Plan site is assessed in more detail in Table 10.3 overleaf, by assessing the achievement of the objectives described in 10.4. The impacts on townscape over most of the Campus Development Plan site are assessed as medium/ high beneficial in most of the factors, leading to an overall moderate/ substantial beneficial impact.

This is particularly because of improvements related to definition and legibility of spaces, increased ease of pedestrian movement through the site and the quality of the public realm and private spaces.

Table 10.3: Townscape Impacts

Townscape Objective	Campus Davidonment Plan Site
Townscape Objective	Campus Development Plan Site
Distinctive	Improved streets, buildings, landscapes and spaces will better define the area and create a locally distinctive area and health 'quarter'. Hierarchy of built forms and external spaces, appropriate to function and sympathetic to neighbouring buildings. Eastern edge of site forms a distinct teaching/ admin zone. Provides site with new identity and coherence.
Safe and pleasant	Elimination of poorly defined under-used areas. Safety and security improved through the wrapping of public face in and through the site, resulting in greater overlooking and natural surveillance of public spaces. Urban blocks radiate out to merge with wider city and create an urban edge.
Easy to get to and move around	Opportunity to link site to proposed Clyde Fastlink public transport route. Distinct approach and entrance areas. Increased pedestrian access from Hardgate Road to west and Govan Road to north. Better defined circulation of people and vehicles. A hierarchy of vehicle routes established within and across site defining access. Open spaces linked to pedestrian routes. Building corners and other key features designed to provide focal points and nodes, shaping routes and acting as visual aides to legibility and wayfinding.
Welcoming	Improved views and mobility of visitors through introduction of landmark buildings, landscape and open space. Creation of a welcoming public space in the centre of the site, creating a new focus for the health 'quarter'.
Adaptable	Continued use of site for institutional purposes, but future adaptation of buildings and areas may be possible. Multi-storey parking proposed to retain land for landscaping and future development.
Resource efficient	Improved resource efficiency through development of buildings and areas which are underused, creation of park and green space, and improved habitats. Protected setting of Listed Buildings.
Assessment of Magnitude/ Nature of Change	Medium/ High Beneficial
Sensitivity (From Table 10.1)	Low/ Medium
Overall Impact on Townscape	Moderate/ Substantial Beneficial

10.5.5 Assessment of Visual Impacts

A number of viewpoints within and outside the site have been selected as representative of the range of views available from receptors. They include a range of receptors that are representative of the key public thoroughfares and viewpoints and a range of views that would be available to local residents. As stated in 10.5.2, the assessment of visual impacts is based on the assumption that the Campus Development Plan will be executed to a high standard of design with a positive public reaction, but does take account of potentially adverse impacts, such as shading or blocking of existing views. Construction impacts are generally adverse but short to medium term.

The visual receptors are number coded (Viewpoints 1, 2 etc.) and locations shown in Fig. 10.9, with photographs from selected viewpoints in Figures 10.10 to 10.15. A detailed description of current and proposed views with assessed impacts is given in Table 10.4.

Visual Impacts on Roads and Public Access Routes

The improvements in Townscape are perhaps best experienced by receptors using the roads and other linked open spaces that pass through or adjacent to parts of the Campus Development Plan site. Users of Renfrew Road (Viewpoints 1a and 1b – Figure 10.10) will experience beneficial change due to improvements in townscape in this industrial area. This will be particularly apparent at the northern boundary of the development site where improvements in streetscape and landscape quality will be most visible. Impacts will generally be moderate beneficial.

Users of Govan Road (Viewpoint 2 – Figure 10.10) to the west of A739 Moss Road will experience similar beneficial change due to improvements in townscape, streetscape and landscape. Views towards the site from Govan Road to the east of A739 Moss Road are restricted by the density of tenement urban development in this area.

Views from elevated sections of the Clydeside Expressway (Viewpoint 3 – Figure 10.11) will not significantly change in character. The upper levels of the new Adult and Children Hospital buildings will be visible above the existing mid-distance roofline. Impacts will generally be neutral due to limited, indirect views of the site from a distance.

For users of the M8 Motorway corridor (Viewpoint 4 – Figure 10.11) travelling east or west at Cardonald Park the new Adult and Children Hospital buildings will be clearly visible above the existing roofline to users. Impacts will be moderate beneficial.

Views from Erskine Bridge (Viewpoint 5 – Figure 10.11) will not significantly alter due to distance (approx. 10km) and the extensive townscape view in the foreground from this point.

Visual Impacts on Residential Areas

The Campus Development Plans will have a significant adverse impact on views from properties at Hardgate Drive in the Shieldhall/ Govan area (Viewpoint 6 – Figure 10.12) due to the proximity and dominance of the new Adult and Children Hospital buildings. There will however be improvements in immediate outlook from this area towards the proposed civic space.

The effects of the Campus Development Plan on residential properties at Skipness Drive/A739 Moss Road in the Shieldhall/ Govan area (Viewpoint 7 – Figure 10.12) will be beneficial due to improvements in townscape, streetscape, landscape, human scale and activity. The upper levels of the new Adult and Children Hospital buildings will be visible above the roofline of the Central Medical Block building. Generally there will be an improvement in outlook due to the more interesting townscape and improved quality and diversity of individual buildings and spaces.

Views from Moss Heights, Craigton area (Viewpoint 8 – Figure 10.12) will alter significantly as the new Adult and Child Hospital buildings will appear prominent in the mid-distance view. Moderate adverse impacts such as restriction of view will be balanced moderate beneficial impacts such as improvements in townscape quality.

Views from the Bearsden area at A810 Duntocher Road (Viewpoint 9 – Figure 10.13) will not be altered significantly as a result of the proposals. The new Adult and Children Hospital buildings may be visible in the long-distance view. Impacts will generally be neutral due to the distance (approx. 8km) and broad townscape view.

Visual Impacts on Commercial, Industrial and Institutional Properties

Views from Clydeside Industrial Estate/ River Clyde (Viewpoint 10a and 10b – Figure 10.13) will be neutral due to limited views of development and lack of direct connection with townscape improvements.

Views from Braehead Shopping Centre (Viewpoint 11 – Figure 10.14) will be relatively unaltered as a result of the Campus Development Plans. Filtered views through existing landscape and townscape of the upper levels of the new Adult and Children Hospital buildings may be possible. Impacts will be neutral.

The University of Glasgow at Kelvingrove (Viewpoint 12 – Figure 10.14) will have filtered views of the upper levels of the new Adult and Children Hospital buildings. Slight adverse impacts will be balanced by slight beneficial impacts.

Views from Park Terrace/ Park Circus (Viewpoint 13 – Figure 10.14) will include the upper levels of the new Adult and Children Hospital buildings. Slight adverse impacts will be balanced by slight beneficial impacts.

Visual Impacts on Viewpoints and Public Open Space

Views from the River Clyde at Glasgow Science Centre (Viewpoint 14 – Figure 10.15) will be relatively unaltered with potential views of the upper levels of the new Adult and Children's Hospital buildings. Impacts will be neutral due to distance (approx. 2.5km) and broad townscape view.

Views towards the Campus Development Plan site from Dawsholm Park (Viewpoint 15 – Figure 10.15) will be altered with possible views of the new Adult and Children Hospital buildings. The character of the view will be generally be unaffected by the proposed development and impacts will be neutral due to distance (approx. 4.5km) and broad townscape view.

Views from Robertson Park at Gleniffer Braes Country Park (Viewpoint 16 – Figure 10.15) will not change significantly in character. The new Adult and Children Hospital building may be visible amongst the extensive townscape view from this point. Impacts will be neutral due to distance (approx. 9km) and the extensive view.

10.5.6 Assessment of Impacts on Listed Buildings

There are two Listed Buildings located within the Campus Development Plan site at 1345 Govan Road. These are expected to incur low impact due to the proposed development. The buildings are to be retained and re-used, and work may be carried out which affects the structures. The setting of the buildings will be beneficially affected by changes, including the creation of landscape and improved urban structure.

There are a further four Grade B Listed Buildings within the vicinity of the site. The setting of the listed building located immediately to the south of the Campus Development Plan area at Shieldhall Road may be affected to some degree.

Table 10.4: Visual Impacts Schedule

Roads and Public Access Routes

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion)	Duration/ Nature of Impact	Magnitude	Significance of Impact
1	Renfrew Road (Shieldhall/ Govan district) / (25m-300m)	High stone walls, gates and fences in foreground. Mature trees beyond this point. Filtered views of existing Hospital buildings through fences and trees. Upper levels of existing Hospital and industrial buildings visible above stone walls.	Medium	Construction: Direct views of construction cranes and activity. Night time lighting. Completion: New buildings and landscape lining road. Views of new Adult and Children Hospital buildings. Views of main northern access route and associated buildings and landscape. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Medium/ High Medium/ High	Moderate Adverse Moderate to Substantial Beneficial
2	Govan Road/ Moss Road (Shieldhall/ Govan district) / (25m-300m)	Roundabout in foreground. Tenement buildings to left. Industrial land and recent tree planting to right. Small-medium scale residential units and mature trees in mid-distance view. Clock tower of existing Central Medical Block, and Hospital chimney visible above roofline beyond this point.	Medium	Construction: Direct views of construction cranes and activity. Night time lighting. Completion: Views of new Adult and Children Hospital buildings. Views of main northern access route and associated buildings and landscape. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Medium/ High Medium/ High	Moderate Adverse Moderate to Substantial Beneficial
3	A814 Clydeside Expressway / (1km-2km)	Steep grass banking in foreground. Castlebank Street and recent tree planting visible beyond this point. Industrial and brownfield land including Meadowside Quay visible beyond this point. River Clyde and active Govan Shipbuilding Yard visible in mid-distance view. Central Medical Block clock tower and Hospital chimney visible in distance above tree line.	Medium	Construction: Filtered views of construction cranes and activity. Night time lighting. Completion: Filtered and indirect views of upper levels of new Adult and Children Hospital buildings. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Low	Moderate Adverse Neutral

Table 10.4: Visual Impacts Schedule (continued)

Roads and Public Access Routes (continued)

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion)	Duration/ Nature of Impact	Magnitude	Significance of Impact
4	M8 Motorway corridor (at Cardonald Park) / (300m-1.5km)	Blaes football pitch and gently sloping grass bank in foreground. Row of mature trees beyond this point. Luma building, residential properties and A8 Shieldhall Road visible through trees. South Glasgow Hospital Neuroscience building visible beyond properties.	Medium	Construction: Filtered direct views of construction cranes and activity. Night time lighting. Completion: Relatively prominent views of new Adult and Children Hospital buildings above roofline of residential properties. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Medium Medium	Moderate Adverse Moderate Beneficial
5	Erskine Bridge / (10km)	Extensive view east towards city of Glasgow. River Clyde, settlement of Old Kilpatrick/ Mountblow including Mountblow industrial units visible in foreground. The University of Glasgow at Kelvingrove, Kelvingrove Museum and Art Gallery, SECC and Glasgow Tower visible in distance.	Medium	Construction: Possible views of night time lighting among extensive townscape, though not prominent. Completion: Possible views of night time lighting among extensive townscape, though not prominent.	Medium Term/ Adverse Long Term/ Beneficial	Low	Slight Adverse Neutral

Table 10.4: Visual Impacts Schedule (continued)

Residential Areas

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion)	Duration/ Nature of Impact	Magnitude	Significance of Impact
6	Hardgate Drive (Shieldhall/ Govan district) / (50m)	Car parking, small trees and high fences visible in foreground. Medium scale residential units visible in mid- distance view. Maternity building and Neurosciences building visible above roofline of residential units.	High	Construction: Direct views of scaffolding, cranes and general construction activity. Night time lighting. Completion: Direct views of new Adult and Children Hospital buildings. Direct views of new Civic Space and Breakout Area. Night time lighting	Medium Term/ Adverse Long Term/ Adverse- Beneficial	Medium/ High Medium/ High	Moderate to Substantial Adverse Moderate to Substantial Adverse and Moderate Beneficial
7	Skipness Drive/ A739 Moss Road (Shieldhall/ Govan district) / (50m)	Landscape, trees, road barriers and A739 Moss Road in foreground. Central Medical Block and mature trees visible beyond this point. Neuroscience building, hospital chimney and Acute Medical Block visible beyond this point.	High	Construction: Direct views of scaffolding, cranes and general construction activity. Night time lighting. Completion: Relatively prominent views of new Adult and Children Hospital buildings above roofline of Central Medical Block building. Extension to spinal injuries building and redevelopment of Central Medical Block building. Night time Lighting. Trees and landscaping.	Medium Term/ Adverse Long Term/ Beneficial	Medium/ High Medium/ High	Moderate to Substantial Adverse Moderate Beneficial

Table 10.4: Visual Impacts Schedule (continued)

Residential Areas (continued)

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion	Duration/ Nature of Impact	Magnitude	Significance of Impact
8	Moss Heights Avenue (Craigton/ South Cardonald district) / (1.5km)	Broad view north towards central Glasgow. Lourdes Primary School, A739 Berryknowes Road residences and Craigton Cemetery visible in foreground. Two Cardonald tower blocks and Daily Record building at Cardonald Park visible beyond this point. South Glasgow Hospital Neurosciences building and Central Medical Block building visible in centre of view. Numerous city tower blocks clearly visible.	Medium	Construction: Limited views of construction cranes and activity. Night time lighting. Completion: Prominent views of new Adult and Children Hospital buildings above roofline of residential properties. Night time lighting.	Medium Term/ Adverse Long Term/ Adverse- Beneficial	Medium Medium	Moderate Adverse Moderate Adverse and Moderate Beneficial
9	A810 Duntocher Road (Bearsden district) / (8km)	Broad view south towards city of Glasgow. Semi-rural land in foreground steeply slopes towards peripheral city urban development. Residential properties of Bearden and Drumchapel districts visible beyond this point. Numerous city tower blocks clearly visible.	Low/ Medium	Construction: Potential views of night time lighting among broad townscape, though not prominent. Completion: Potential views of new Adult and Children Hospital buildings among broad townscape, though not prominent. Night time lighting, though not prominent.	Medium Term/ Adverse Long Term/ Beneficial	Low/ Medium Low/ Medium	Slight Adverse Neutral

Table 10.4: Visual Impacts Schedule (continued)

Commercial, Industrial and Institutional Areas

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion	Duration/ Nature of Impact	Magnitude	Significance of Impact
10	Clydeside Industrial Estate (Scotstoun/ Whiteinch district) / (500m)	Industrial units, containers, skips and crates visible in foreground. Scattered trees and low quality vegetation beyond this point. Large scale industrial structures visible in distance. Central Medical Block clock tower, Neurosciences building and Hospital chimney visible beyond this point.	Low	Construction: Filtered views of construction cranes and activity. Night time lighting. Completion: Filtered views of upper levels of new Adult and Children Hospital buildings.	Medium Term/ Adverse Long Term/ Beneficial	Medium Medium/ High	Moderate Adverse Neutral
11	Braehead Shopping Centre (Braehead district) / (1km)	Views obscured by car parking, traffic, street lighting, tree and industrial buildings. South Glasgow Hospital chimney visible in distance.	Low	Construction: Filtered and limited views of construction cranes and activity within landscape and townscape, and not prominent. Potential views of night time lighting. Completion: Filtered and limited views of new Adult and Children Hospital buildings within landscape and townscape, though not prominent. Potential views of night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Low	Slight Adverse Neutral

Table 10.4: Visual Impacts Schedule (continued)

Commercial, Industrial and Institutional Properties (continued)

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion)	Duration/ Nature of Impact	Magnitude	Significance of Impact
12	The University of Glasgow (Kelvingrove district) / (3km)	Foreground view obscured by large number of mature trees at Kelvingrove Park. Several large structures and industrial cranes visible beyond this point. South Glasgow Hospital Neurosciences building visible in distance.	Medium/ High	Construction: Limited views of construction cranes and activity. Night time lighting. Completion: Filtered views of new Adult and Children Hospital buildings within landscape and townscape. Night time lighting.	Medium Term/ Adverse Long Term/ Adverse- Beneficial	Low/ Medium	Moderate Adverse Slight Adverse and Slight Beneficial
13	Park Terrace/ Park Circus (Kelvingrove Park/ Kelvingrove district) / (3.5km)	Foreground view obscured by vegetation and large number of mature trees at Kelvingrove Park. Kelvingrove Museum and Art Gallery visible beyond this point. South Glasgow Hospital chimney visible in distance.	Medium/ High	Construction: Potential views of construction cranes and activity. Night time lighting. Completion: Potential views of upper levels of new Adult and Children Hospital buildings above Kelvingrove Museum roofscape. Night time lighting.	Medium Term/ Adverse Long Term/ Adverse- Beneficial	Low/ Medium Medium	Slight Adverse Slight Adverse and Slight Beneficial

Table 10.4: Visual Impacts Schedule (continued)

Viewpoints and Public Open Space

Ref No.	Receptor Location/ Distance to Site	Current View Towards Site	Sensitivity of Receptor	Visual Impacts (During Construction and upon Completion)	Duration/ Nature of Impact	Magnitude	Significance of Impact
14	River Clyde (at Glasgow Science Centre) / (2.5km)	Glasgow Science Centre and Glasgow Tower visible to left. Quayside pathway, small to medium scale trees, clock tower and tall ship visible to right. River Clyde in centre of view. Recent large-scale tower development visible north of river. Govan Shipbuilding Yard and cranes visible south of river. Govan tenement structures visible beyond Glasgow Tower.	Medium/ High	Construction: Views of construction cranes and activity. Night time lighting. Completion: Possible views of upper levels of new Adult and Children Hospital buildings above existing townscape roofline.	Medium Term/ Adverse Long Term/ Beneficial	Low/ Medium	Slight Adverse Neutral
15	Dawsholm Park (Kelvindale/ Maryhill district) (4.5km)	Broad view south towards central Glasgow. Foreground of rough grassland and mature tress gently slopes away towards residential properties of Temple district and Gas Works structures. South Glasgow Hospital chimney visible in distance.	Medium/ High	Construction: Potential views of construction cranes and activity among broad townscape, though not prominent. Night time lighting. Completion: Potential views of new Adult and Children Hospital buildings among broad townscape, though not prominent. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Low Low/ Medium	Slight Adverse Neutral
16	Robertson Park (at Gleniffer Braes Country Park, near Paisley) / (9km)	Extensive view northeast towards Paisley and the city of Glasgow. Foreground of rough grassland and mature trees steeply slopes towards Paisley and Stanley Reservoir. Majority of city of Glasgow visible beyond this point. SECC visible in distance at right of view. South Glasgow Hospital Neuroscienes building visible in distance.	Medium	Construction: Potential views of construction cranes and activity among extensive townscape, though not prominent. Night time lighting. Completion: Potential views of new Adult and Children Hospital buildings among extensive townscape. Night time lighting.	Medium Term/ Adverse Long Term/ Beneficial	Low	Slight Adverse Neutral

10.6 Conclusions

The regeneration of the New South Glasgow Campus Development Plan area will result in long term moderate to substantial beneficial impacts to the townscape due to significant improvements accessibility, legibility and urban structure.

Most visual receptors into the site from immediate surroundings will be beneficially affected. This is particularly the case for roads and public access such as Renfrew Road and the M8 corridor. The beneficial impacts are due to improvements in townscape resulting from a Campus Development Plan with a focus on high quality urban and landscape design. Some residential receptors will experience a mix of beneficial and adverse impacts due to the improvements in townscape balanced by the proximity of large scale development.

Construction impacts on townscape and visual receptors will be adverse but temporary. Due to the phasing of construction works they will be short to medium term and will not affect the whole site at any one time.

The landscape and visual impacts of the development are summarised in Table 10.5 below:

Table 10.5: Summary of Landscape and Visual Impacts

Impact	Significance	Comment			
Townscape Impact Construction Phase	Moderate Adverse	Impacts are mainly short to medium term and affect specific parts of the site at any one time.			
Townscape Impact Post Completion	Moderate/ Substantial Beneficial	Beneficial impacts dependent on Campus Development Plan implementation and quality of design and materials.			
Visual Impact Views from roads and public accesses	Moderate Beneficial	Beneficial impacts dependent on Campus Development Plan implementation and quality of design and materials.			
Visual Impact Views from residences	Moderate Adverse and Moderate Beneficial	Adverse impacts relate to proximity to large scale development but may be balanced to an extent by improved character of townscape, landscape and public realm.			
Visual Impact Views from commercial, industrial and institutional properties	Neutral	Beneficial impacts relate to views from industrial locations. Adverse impacts relate to views from institutional locations.			
Visual Impact Views from public open spaces	Neutral	Changes merge into surrounding townscape when viewed from more distant viewpoints.			

11.0 WATER QUALITY AND DRAINAGE

Summary

There are no surface watercourses or waterbodies on or in close proximity of the site. Three known burns are culverted under the site. Surface water from the site presently drains to a combined sewer and then to the River Clyde, some 400 metres north of the site boundary. The site is not in a flood risk area.

Surface water drainage will comprise a Sustainable Urban Drainage System complying with SEPA and Scottish Water requirements. Groundwater is of low vulnerability. Provided appropriate measures are taken to address soil contamination, A Water and Drainage Impact impacts on groundwater will be negligible. Assessment is currently being undertaken by Scottish Water on behalf of the Board. The results of this assessment are expected to be available in May 2007 and will inform the final Water and Drainage Assessment at the detailed planning stage.

Measures to mitigate potential impacts on water quality and drainage during construction will comprise compliance with current SEPA guidance and best practice procedures considering issues such as site drainage, deliveries, storage and waste disposal and management.

No significant adverse impacts on water quality, quantity or drainage are envisaged.

11.1 Introduction

This chapter considers the impacts of the proposed development on water quality, water quantity and drainage issues. Information on baseline water resources was obtained from existing data on the site. An assessment has been made of the significance of impacts and appropriate mitigation measures identified. A key aspect of the proposals for water and drainage is the introduction of a Sustainable Urban Drainage System (SUDS). Site development will include measures to address contamination which could affect groundwater.

Water is a valuable resource, which has multiple uses, e.g. potable water supply, waste water disposal, water for agriculture and industry, ecology and conservation, recreation, sport and transport. To help meet these needs, the Government has set standards for river quality. The Scottish Environment Protection Agency (SEPA) is responsible for monitoring, maintaining and enforcing these standards.

SEPA is responsible for both the protection of 'controlled waters' from pollution and for the prevention of pollution of the environment, harm to human health and detriment to local amenity by waste management activities under the Environmental Protection Act 1990. 'Controlled Waters' include all watercourses, lakes, locks, coastal waters and water contained in underground strata (or 'groundwater') and it is an offence to pollute such waters, either deliberately or accidentally.

In Scotland, all groundwater is protected against pollution caused by certain dangerous substances under the EC Groundwater Directive (80/68/EEC). SEPA have prepared a Groundwater Protection Policy for Scotland (1997), which provides a framework for the management and protection of groundwater in Scotland.

The Water Framework Directive

The Water Environment and Water Services (Scotland) Act 2003 transposes the EC Water Framework Directive into Scots Law. The aim of the legislation is to maintain and improve the quality of aquatic ecosystems and requires that deterioration from one status class to another be prevented.

Over the coming years, a range of secondary legislation will be developed to provide and confirm the detailed arrangements and mechanisms for the Act's implementation. This includes the Water Environment (Controlled Activities) Regulations 2005, or 'CAR Regulations'. These came into force on 1 April 2006, replacing existing environmental regulatory regimes.

The Regulations provide for three levels of control ('authorisations'):

1. General Binding Rules

statutory controls over low risk activities

2. Registrations

low risk activities that cumulatively pose a risk to the

water environment

3. Water Use Licences

provide for site-specific controls and constraints

CAR Regulations will control numerous activities, including:

- Engineering activities in rivers, lochs and wetlands;
- Engineering activities in the vicinity or rivers, lochs and wetlands which are likely to have a significant adverse impact upon the water environment;
- · Activities liable to cause pollution; and
- Any other activities, which directly or indirectly are liable to cause a significant adverse impact upon the water environment.

Low risk activities controlled by General Binding Rules, include:

- Construction of minor bridges,
- Operating plant or machinery in the vicinity of water, and
- Discharge of surface water runoff, which does not cause pollution of the water environment.

The proposed hospital development includes various works, which will fall within the remit of the WFD and CAR. Discussion with SEPA at detailed design stage will be required to address this issue and ensure the appropriate authorisations are obtained. SEPA advises it is minded to authorise the entire railway project under a single CAR licence.

11.1.2 Detailed Assessment Method

The detailed assessment of water quality and drainage has been carried out in accordance with the methods set out in the Design Manual for Roads and Bridges Volume 11 Section 3 Part 10. Further guidance on the assessment of scheme impacts on the water environment has been obtained from the Scottish Transport Appraisal Guidance (STAG) and WebTAG (Web-based multimodal transport analysis guidance).

Baseline conditions were determined through the following:

- Site walkover;
- Liaison and consultation with statutory authorities including:
 - The Scottish Environment Protection Agency (SEPA)
 - Scottish Natural Heritage (SNH)
 - Glasgow City Council (GCC)
 - Scottish Water (SW)

- Review and assessment of topographical survey data, drainage plans and geotechnical information
- Review of relevant documentation and guidelines.

11.2 Methodology

The methodology for the assessment of effects on water quality and drainage included:

- Consultations with SEPA and Glasgow City Council
- Review of Scottish Water, water and drainage plant within the area
- Review of SEPA Flood Map
- Review of Groundwater Vulnerability Map of Scotland
- Site Investigations survey results and available borehole data
- Review of existing data and reports

11.2.1 Consultation Responses

SEPA

SEPA's response to Glasgow City Council's Scoping Consultation noted the following:

Surface Water and Foul Drainage: The EIA should address all issues relating to surface water and foul water drainage of the site. Surface water not going to the sewer should be treated in accordance with the principles of the CIRIA guidance.

Flooding: The FRA states that the hospital is at little or no risk of flooding as outlined by SPP 7 of a 1 in 1000-year flood. Details of the FRA should be included in the ES.

Culverts: SEPA promotes the restoration of culverted to open watercourses. There is a potential opportunity to de-culvert some of the culverts present on the site.

Land Contamination: Further investigations required

Pollution Prevention: SEPA's Pollution Prevention Guidelines, PPG1 General Guide to the prevention of water pollution' and PPG055 'Works in, near or liable to affect watercourses' should be followed at all times.

Japanese Knotweed: SEPA welcomes the proposal to treat Japanese Knotweed.

BAA

BAA expressed some concerns in relation to Aerodrome Safeguarding issues. Their principle concern related to potential risk of bird strikes. BAA would require further information on SUDS proposals.

11.3 Limitations to the Assessment

This assessment of water and drainage impacts is based on the proposed development as described in the Hospital Campus Development Plan. Details required on any survey data, SI data available for site. It is understood that Drainage Impact Assessment is currently being undertaken to establish the capacity of Scottish Water infrastructure, current and future outfalls, attenuation and SUDS requirements.

A Water and Drainage Impact Assessment is also currently being undertaken by Scottish Water on behalf of the Board. The result of this assessment are expected to be available in May 2007 and will inform the final Water and Drainage assessment.

11.4 Baseline Conditions

11.4.1 Surface Water

There are three known burns which flow beneath the hospital complex. The main burn is known as the Linthouse Burn which flows in a SSW-NNE direction under the hospital. It flows in an open channel downstream of Renfrew Road, and then culverted to an outfall into the River Clyde. There are two further branch watercourses that join into this main one. Jenny's Burn' flows underground in an easterly direction and a smaller burn flows into the complex from the east (location unknown)¹. There are no other waterbodies on the site.

11.4.2 Groundwater

Groundwater and perched groundwater exists at the site at depths ranging between approximately 1.0mbgl to 4.0mbgl. However, where the drift deposits are relatively impervious, groundwater was not encountered until near-bedrock depths. Water strikes at these depths generally produced sub-artesian groundwater rises of between 6m and 10m.

SEPA are in the presence of producing new Groundwater maps but these are not available at the moment

The factors used to define vulnerability are the presence and nature of the nearsurface soils, the presence and nature of the drift deposits, the nature of the solid strata and their associated hydrological characteristics, and the depth of the unsaturated zone.

Geological maps show the geology of the proposed development site to be weakly permeable. Weakly permeable formations do not generally contain groundwater in exploitable quantities, although some formations can locally yield water supplies in sufficient quantities for private use. All igneous rocks, such as those comprising the solid geology of the site, are weakly permeable.

11.4.3 Flooding

The River Clyde lies some 500m to the north of the existing hospital, the other river in the near vicinity being the River Cart, located some 5km to the southwest. As noted earlier, the culverted Linthouse burn runs through the site in a southwest to northeast direction, discharging to the River Clyde to the north.

Major incidences of flooding have occurred in and around the city area over the last quarter century, associated with rainstorms centred remote from the city centre, however none of these appear to have lead to any difficulty at the locus in question. Despite the level of damage caused by these incidents, some of them were not unduly onerous in statistical terms, arising from rainfall of around 1/20 year intensity.

¹ Currie and Brown, Halcrow Group, Glasgow Southern General Hospital, Flood Risk Assessment, 2005

Following from these incidents Strathclyde Regional Council promoted in-depth studies of the flood potential at various areas, from which an assessment has been made of the likely extent of a 1 in 100-year occurrence. The City Council has inherited the responsibility for flood protection, and a study is currently underway to assess the likely effects of a 1 in 200 year incident - this is the level of protection is now accepted as the minimum for urban areas albeit the level of protection required for specific developments must be assessed on its merits. In addition the effects of surge tides are being assessed on the tidal reaches of the River Clyde, which would further relate to the Southern General Site.

Historic information indicates that the site is affected by the tides in the nearby River Clyde with site ground water levels ranging from ground level to 4m depths at times – this will clearly impact on the flood potential for the area if a combination of adverse circumstances arise at the same time.

The results of the current study are unavailable at present, however, the findings of the study should be taken into consideration when assessing the site, in conjunction with information relating to climatic changes.

A Level 3 flood risk assessment (as set out in CIRIA C624) was carried out for the site by Halcrow in 2005. The assessment identified four potential sources of flooding at the site:

- a) Tidal / Fluvial flood risk from the River Clyde
- b) Storm (pluvial) flood risk from:
 - 1) Sewers
 - 2) Local Watercourses
 - 3) Surface Water

The flood risk assessment details that with the existing topography the proposed development within the hospital is at little or no risk, as outlined by SPP 7, of flooding for the extreme 1 in 1000 year event plus climate change (by 2050) from the River Clyde. At present there is a 0.74 metre freeboard between minimum ground levels and extreme river levels.

The burns flowing beneath the hospital complex are significantly lower than the ground level and therefore pose a negligible risk to flooding. However, should the culvert fail or become surcharged, analysis has shown that escaping water will flow away from the hospital. The flood risk assessment also detailed that the present site topography will allow for surface water flows to be directed away from the site.

Therefore, provided that the topography of the site is not altered, and the finished floor levels of the development are at least equal to those at present, it is concluded that the site is not at high risk from flooding from fluvial / tidal or pluvial causes and will not have any impact on surrounding areas.

Glasgow City Council (and SEPA) will require the detail of the Flood Risk Assessment (Halcrow, 2005) to be submitted with the EIA. Any additional studies or development amendments that may alter / amend the Flood Risk Assessment will be undertaken at the appropriate time and incorporated into the EIA.

SEPA's Indicative River and Coastal Flood Map has been developed to provide a strategic national overview of flood risk in Scotland. The flood map has been developed to show areas that may be affected by flooding from either rivers or the sea. The flood map shows an *estimate* of the areas of Scotland with a 0.5% or greater probability of being flooded in any given year, or put another way the areas

estimated to have a 1 in 200 or greater chance of being flooded in any given year. The flood map has been developed to give an indication of whether a general area, not individual properties or specific location, may be affected by flooding.

The SEPA Flood Map identifies the River Clyde and it's banks, including the George V Dock, as an area at risk of flooding from both rivers and the sea. The NSGH site is not identified as being at risk of flooding.

11.4.4 Drainage

The drainage layout that exists within the hospital site appears to be, in the main, a combined system, discharging into the public sewerage network in the area, the exception being that the gullies at the east area roads and parking are connected to a separate surface water system there. A variety of plans exist indicating the early layout of the system and the more recent configuration.

The sewers records received from Scottish Water confirm that the main public sewer running southwest to northeast, through the centre area of the site is public, continuing to the nearby sewage works. Parallel to this is the culverted Linthouse burn, which discharges to the River Clyde nearby to the north. The source and history of this burn is unknown and it does not feature on the historic plans for the area, however it appears that ponding may have existed southeast of the site, which was most probably the source of this burn. A further culvert runs from the east through the northeast area of the site along with a lesser culvert through the centre area, from the west, these connecting to the Linthouse Burn culvert. All of the culverts are currently recorded as public. The west culvert is recorded as 600mm diameter, the east culvert as 1150 x 900 and the main culvert as varying from 1050mm to 2000mm; these main culverts being brick arch construction. A further public sewer also exists running from the south, centre area of the site, via Langlands Drive, to Moss Road. Both of the public sewers are recorded as 300mm diameter and appear to be exclusive to the hospital.

For the hospital envisaged a 300mm foul water outfall would be required, along with a 1200mm surface water outfall, providing an acceptable interface can be made with either the Linthouse Burn from the site or the other existing surface water systems in the area, these leading to the River Clyde to the north. While the surface water outfall may be minimised by the application of "Sustainable Urban Drainage" (SUDS) techniques, it will also be restricted by the GCC flood control requirements that apply to the River Clyde catchment, such that the maximum discharge permitted, from any new development, must not exceed that currently discharged by the existing hospital. The question of longer term storm protection and drainage will also require to be reviewed, all most probably leading to the requirement to provide storm flow attenuation within the site area. These aspects will lead to the need to carry out a detailed hydrological study relative to the existing/adjacent features and watercourses.

An established private drainage system exists throughout the site area and appears to function reasonably adequately with no record of flooding, other than localised ponding, in recent history. Numerous CCTV surveys exist for much of the existing drainage system, which with the hospitals maintenance records would form the basis of any alterations, upgrading or assessment of the existing systems. With the indifferent ground conditions that exist and the enormous increase in traffic since many parts of the hospital were first built, it is likely that many areas of drainage are reaching the end of their useful life.

Historic information indicates that the site is affected by the tides in the nearby River Clyde with site ground water levels ranging from ground level to 4m depths at times – this will clearly impact on any drainage or underground works.

Another feature of the existing hospital infrastructure is the network of service ducts throughout the area. Some of these are walking ducts, some are at ground level and others are less significant, all forming part of an important network to be maintained, rebuilt or expanded to suit the development proposals.

Gas, electric, telecom, water and drainage services are present either on or adjacent to the site.

Scottish Water advises that water supplies in this area are capable of serving the proposed development.

A Development Impact Assessment (DIA) will be required to be progressed with Scottish Water in accordance with Scottish Water development guidelines.

Utility services are shown on Figure 6.2. The plan is indicative of the services shown providing approximate locations of cables and pipes owned by Transco, Scottish Power, THUS, British Telecom and Scottish Water. Private connections, service pipes, valves, siphons, stub connections etc are not shown but may be located on the site.

11.4.5 Soil Contamination

Details of ground contamination impacts are provided in Chapter 7 Ground Conditions. Survey work is required to determine presence of soil contamination.

11.5 Potential Issues

Surface water impacts may include:

- Increased impermeable surface
- Installation of surface water drainage system
- Damage to surface drains from silt during construction phase

Groundwater impacts may include:

- New build foundations may disrupt movement of groundwater within site
- New surface water drainage system may affect volume of recharge to groundwater
- Contaminants in soil may be mobilised during works and may percolate to groundwater
- Grouting/ capping works to historical wells
- Foundation design consideration

11.6 Proposed Site Drainage System

Discussions have taken place with SEPA, and the requirements of a Sustainable Urban Drainage System will be included in the scheme. Surface water from the site will drain to the public combined sewer and then onto the River Clyde.

The Campus Development Plan includes three proposed areas of open water located to north of the hospital building. Site drainage details and the design criteria for storage and slow release facilities would require to be agreed with Scottish Water.

11.7 Mitigation Measures

11.7.1 Construction Phase Mitigation

Measures to mitigate potential impacts on water quality and drainage during construction will comprise compliance with current SEPA guidance and best practice procedures including Pollution Prevention Guideline 6 (PPG6): Working at Construction and Demolition Sites. PPG6 addresses the avoidance of pollution for specific construction issues such as site drainage, deliveries, storage and waste disposal and management.

Care will be required during works to avoid inadvertent damage to existing drainage infrastructure.

Implementation of best practices will be followed when undertaking construction and grouting works to minimise the risk of contamination of groundwater.

11.7.2 Operational Phase Mitigation

Sustainable Urban Drainage Systems

The drainage design for the scheme will incorporate SUDS measures as described in Chapter 7. It is recommended that guidance within the following reports is followed:

- CIRIA Report C523, SUDS Best Practice Manual, 2001
- Planning Advice Note (PAN 61), Planning and Sustainable Urban Drainage Systems, Scottish Executive, July 2001

The landscape strategy for the site (Keppie, March 2007) includes, as Landscape Area 4, a large open space along the length of the main building, providing an opportunity to create a large body of water, as part of the SUDS scheme for the site.

Water Economy

At the detailed design stage, developers may consider the inclusion of water economy measures such as low-flush volume WCs, timed operation taps, water meters and monitoring. Economy measures will be included in the development brief.

11.8 Impact Assessment

11.8.1 Surface Water Quality

There are no surface watercourses within the site. Three watercourses have been identified, all of which have been culverted. SEPA has indicated in consultation that opportunities should be sought to de-culvert some of the existing culverted watercourses. This would result in a positive water quality impact. Details of proposed de-culverting will require to be agreed in consultation with SEPA.

11.8.2 Groundwater

Geological maps indicated that the site is likely to be underlain by the Carboniferous age rocks of the Limestone Coal formation, which are likely to form a general

sequence of mudstones with sandstones and seams of ironstone and coal. Most of the site is either built on or hard-surfaced. Presence of aquifers to be confirmed.

The foundations for the new buildings could potentially form barriers or pathways to groundwater flow. In addition, the development may alter the rate of infiltration to groundwater by altering the area of impermeable surface cover. Relation the actual development

During construction works, there is the potential for contamination present within the soil to be mobilised and affect groundwater. Site investigation data suggests that the general level of contamination is low, and further investigation and appropriate mitigation will further reduce the risk of soil contamination-related impacts on groundwater. Impacts on groundwater are assessed as:

Sources Construction earthworks, stabilisation works and built

development

Pathways Contamination, flow disruption, infiltration from surface

Receptor Groundwater. Sensitivity low

Magnitude Negligible

Character Adverse, local, small scale

Impact Significance Negligible

11.8.3 Drainage

Construction

During construction, particularly during earthworks and landscaping stages, there is a risk of surface water run-off becoming contaminated with high levels of silty material which could potentially obstruct flow in the combined sewer.

However, the risk of silty run-off from the site during construction works will be minimised by compliance with good practice, including SEPA pollution prevention guidelines. Construction impacts on drainage are therefore envisaged as negligible.

Operation

The final design of the new build elements is likely to incorporate various forms of water efficiency measures. Besides reducing water use, these will also reduce the quantity of foul drainage from the completed development. Assuming that the receiving sewer has adequate capacity to deal with foul drainage from the site, adverse impacts are not envisaged.

Surface water drainage will comprise a Sustainable Urban Drainage System complying with SEPA and Scottish Water requirements, and adverse impacts on site surface water drainage are not envisaged.

11.8.4 Flooding

Flood Risk Assessment has been assessed as minor. 2...

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² Currie and Brown, Halcrow Group, Glasgow Southern General Hospital, Flood Risk Assessment, 2005

11.9 Residual Impacts

Significant adverse impacts on water quality or drainage are not expected to arise as a result of the proposed development, provided that developers will comply in full with SEPA guidelines and incorporate SUDS. Groundwater impacts will be negligible.

The water and drainage impacts are summarised in Table 11.1 below:

Table 11.1 Water & Drainage Residual Impacts Summary

Impact	Significance	Comment		
Groundwater quality, quantity and flow	Negligible	Assumes further SI and appropriate mitigation for soil contamination		
Silting up of sewer during construction	Negligible	Assumes standard pollution prevention measures implemented		
Surface water drainage	Negligible	Assumes appropriate SUDS implementation		
Flooding	Minor	Assumes appropriate SUDS and foul drainage implementation		

12.0 NOISE

Summary

An assessment of potential noise and vibration impacts has been undertaken at a level commensurate with the outline planning status of the project. It has been determined, based on the Transport Assessment that the proposed development would have no impact on the trunk road network (Section 10.19 of the JMP report) and that in terms of the local network the proposal will have a negligible impact on traffic levels.

Prior to commencement of work the Contactor should establish whether or not the Local Authority wishes to employ Best Practicable Means as an approach to control noise or whether a baseline noise survey is required. If the latter is deemed necessary the procedure to be adopted must be agreed with the Local Authority.

When detailed method statements for construction are available an assessment of hospital noise and vibration sensitivity should be undertaken and adequate controls put in place prior to the commencement of any construction/demolition work.

Finally, in relation to helicopter noise a detailed assessment will be required for the temporary relocation site and the planned new site. It should be noted that at the Royal London Hospital secondary glazing was offered to all residents within a specified distance of the landing pad. A detailed assessment of likely qualifying properties will be required based upon a predetermined significance of impact criteria. The local authority should be included in agreeing the trigger level.

12.1 Introduction

This chapter details the possible noise impacts that have been identified at the outline planning stage in respect of the NHS Greater Glasgow and Clyde proposal to upgrade and redevelop the existing Southern General Hospital in Govan. The noise issues of relevance at this stage are traffic noise on the wider and local community, helicopter noise impact on the local community and future hospital occupants and construction noise impacts on both the local community and the existing hospital occupants.

12.2 Noise Units and Indices

To assist in the understanding of noise it may be helpful to the reader to appreciate that The World Health Organisation (WHO, 1999) defines noise as unwanted sound, and sound is measured in terms of decibels (dB). Whilst the audible range of hearing extends from 20 Hertz (Hz) to 20,000Hz, human hearing is not equally sensitive to all frequencies. Consequently, the A-weighting is used to simulate the response of the human ear and environmental noise is generally measured in terms of dB(A).

Generally, noise fluctuates over time and to compare different types of time-varying sound it is therefore necessary to obtain representative levels. For environmental noise this is commonly the equivalent continuous sound pressure level, the $L_{eq(\Gamma)}$. It is also possible to represent time-varying noise by means of statistical parameters such as analysis of the distribution of sound levels. For example, L_{90} , is the level exceeded for 90% of the measurement time and L_{10} is the level exceeded for 10% of the measurement time period. The L_{A90} is commonly accepted as a descriptor for background noise and the index adopted by the Government to assess traffic noise is the $L_{A10(18hr)}$, which is the arithmetic mean of the noise levels exceeded for 10% of the time in each of the one hour periods between 06:00h and midnight.

For the purposes of assessment, noise impacts are considered as increases or decreases in road traffic or construction noise relative to the pre-existing noise levels within the area affected. When considering noise levels, it may be of assistance to note that doubling or halving of the otherwise similar traffic flow is equivalent to a change of approximately 3 dB(A), and a subjective impression of a doubling of loudness generally corresponds to a 10 dB(A) sound level increase. As noise is assessed as a logarithmic ratio of pressure levels (i.e. decibels), it is sometimes helpful to consider the relationship between the subjective evaluation of noise and the actual objective levels, and examples are therefore provided in Table 12.1 below.

Table 12.1 – Typical Noise Levels and Subjective Evaluation

Noise Level dB(A)	Description					
120	Threshold of pain					
95	Pneumatic drill (unsilenced); 7m distance					
83	Heavy diesel lorry (40 km/h at 7m distance)					
81	Modern twin-engined jet (at take-off at 152m distance)					
70	Passenger car (60 km/h at 7m distance)	-				
60	Office environment					
50	Ordinary conversation					
40	Library					
35	Quiet bedroom					
0	Threshold of hearing					

12.3 Road Traffic Noise

12.3.1 Trunk and Local Road Network

At the stage of outline planning it is reasonable to consider the potential noise impact based on the data contained within the Transport Assessment. A Transport Assessment has been prepared by JMP Consulting. This Transport Assessment reported that the proposed development will have no impact on the trunk road network (Section 10.19 of the JMP report) and that in terms of the local network the proposal will have a negligible impact (less than 1dB change). It was acknowledged (section 10.14 of the JMP report) that there would be a 5% impact on the Shieldhall/Hardgate Road signalised junction, but it also advised that this junction will be improved by the introduction of a left turn filter from Hardgate Road.

In terms of traffic flows a 25% increase in the traffic flow corresponds to a 1dB(A) increase in noise and a 20% decrease in the traffic flow corresponds to a 1dB(A) decrease in the resulting noise level (all other traffic variables such as speed and percentage of heavy vehicles, road gradient and road surface assumed to be constant).

It is therefore clear that with a 5% increase in the local network there will be negligible change in the noise climate and therefore no impact.

Emergency ambulance access to the new hospitals will be located together on the south face of the new buildings away from public areas. This is close to the Maternity Unit's existing ambulance entrance. A further existing ambulance entrance is located on the north side of Neurosciences, but use of this is far more infrequent.

Ambulances approaching the site from the south and west will continue to enter via the southern Hardgate Road entrance. Ambulances from the north and east will enter the site via the Govan Road entrance, pass along the new road and then in through the same Hardgate Road entrance. This strategy ensures that emergency vehicles moving at speed are not travelling long distances within the site itself. No additional noise impact will result from this activity.

12.4 Construction Noise and Vibration

12.4.1 Noise and Vibration Impacts

It is inevitable that, as with any major development, there will be some disturbance caused to those living nearby and to hospital residents (patients) and workers during the construction phase. Disruption due to construction will be temporary in nature and will not be constant through the ten-year construction phase. The locations likely to be sensitive to construction noise are residential properties around the perimeter of the site (Langlands Drive) and workers and residents (patients) in the existing hospital blocks closest to the construction works. The effects of noise on the neighbourhood are varied and complicated. They include loudness sensation, interference with speech communication, disturbance of work or leisure, disturbance of sleep, annoyance and possible effects on mental and physical health. A complicating factor is that in any neighbourhood some individuals will be more sensitive to noise than others.

People who are ill or recovering from operations find noise more troublesome than healthy people and can even take longer to recover if their sleep or emotional well-being is disturbed by it and, as in any workplace, intrusive and inappropriate noise disturbs the concentration of staff and can lead to mistakes, fatigue and low morale

At this stage in the project it is not possible to undertake any predictive work to assess potential impacts, as there is no detailed method statement for construction works. However, some guidance can be provided for the possible control of construction noise to minimise impacts on the aforementioned noise sensitive locations and advice provided such that the appointed Contractor can incorporate such measures into the proposal and also commission a suitable noise assessment tailored specifically to deal with the very varied needs of the hospital patients and workers that will occur over the entire existing hospital site. It is recommended that noise assessments prepared by the Contractor identify needs of both patients and workers at each of the existing hospital buildings for different times of the day to enable the impact of construction to be assessed for the varying needs.

Should the scheme proceed, the appointed contractor will be, as a minimum required to adhere to the guidance contained within British Standard BS 5228: Part 1: 1997 and Part 4: 1992: "Noise and Vibration Control on Construction and Open Sites" and the Control of Pollution Act 1974, both of which are considered in more detail below.

Vibrations, even of very low magnitude, may be perceptible to people and can interfere with the satisfactory conduct of certain activities, e.g. delicate procedures in hospital operating theatres, use of very sensitive laboratory weighing equipment. Vibration nuisance is frequently associated with the assumption that, if vibrations can be felt, then damage is inevitable; however, considerably greater levels of vibration are required to cause damage to buildings and structures (see, for example, BS 7385: Part 2) or to cause computers and similar electronic equipment to malfunction. Vibrations transmitted from site activities to the neighbourhood may, therefore, cause anxiety as well as annoyance, and can disturb sleep, work or leisure activities. As with noise, in any neighbourhood some individuals will be more sensitive to vibration than others.

Once detailed method statements for construction are available an assessment of hospital noise and vibration sensitivity should be undertaken and adequate controls put in place prior to the commencement of any construction/demolition work.

12.4.2 Control of Pollution Act 1974

The general public is protected from noise from construction sites by the provisions of sections 60 and 61 of the Control of Pollution Act 1974. Section 60 enables a local authority to serve a notice specifying its noise control requirements covering:

- plant or machinery that is or is not to be used;
- hours of working;
- · levels of noise that can be emitted.

Section 61 relates to prior consent, and is for situations where a contractor or developer takes the initiative and approaches the local authority before work starts in order to obtain approval for the methods to be used, and to establish any noise and vibration control techniques that may be required. However, the local authorities are unlikely to encourage this form of prior consent and will usually request that the contractor adopt and demonstrate best practicable means. The term 'Best Practicable Means' is defined in Section 72 of the Control of Pollution Act where 'practicable means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications'. Also, the local authorities are unlikely to apply fixed levels as part of any requirement or planning condition in relation to noise. However, levels can be used as guidance. The following guidance on noise levels from construction works (see Table 12.2) is a useful guide in assessing impacts on residential noise sensitive locations.

Table 12.2 Guidance on Construction Noise Limits

Pre Contract	Time Periods Weekday working Monday to Friday excluding Public Holldays						
Ambient Noise Levels L _{Asq,2h} (08.00-10.00 19.00-21.00 or as appropriate) (Façade)							
	Day (07.00- 19.00) *L _{Aeq,12hr}	L _{Amax} (Fast)	Evening (19.00- 22.00) *L _{Aeq,3hr}	L _{Amax} (Fast)	Night Hours (22.00- 07.00)	Saturday	Sunday Public Holldays
35	65	86	55	65	Given on	As week- day	Given on request
40	65	86	55	65	request		
45	65	86	60	70]		
50	70	92	60	70] .		1
55	75	96	65	75			
60	75	96	65	75			
65	75	96	65	75			
70	80	101	80	90			
75	80	101	80	90			

^{*}Façade Level

In terms of impact on patients within the existing buildings and hospital staff

12.4.3 BS 5228: Noise and Vibration Control on Construction and Open Sites

Guidance on the approach to control of construction noise is contained within British Standard BS 5228: Part 1: 1997 and Part 4: 1992: "Noise and Vibration Control on Construction and Open Sites". BS 5228 states that "Good relations with people living and working in the vicinity of site operations are of paramount importance". It suggests that the early establishment and maintenance of these relations throughout the contract will go someway to allying people's fears. It also suggests that the formation of liaison committees with members of the public can be considered for longer term projects where relatively large numbers of people are involved. It is recommended that a liaison group is established and that local communities are informed in advance of particularly noisy periods of daytime and night-time construction works. The determination of 'particularly noisy' may be reached through agreement with the local authority.

The standard also advises that it is not possible to provide detailed guidance for determining whether or not noise from a site will constitute a problem in a particular situation as a number of factors will affect the acceptability of the site noise and vibration. These factors are:

- site location;
- existing ambient noise and vibration levels;
- duration of site operations;
- hours of work;
- · attitude to site operator;
- noise and vibration characteristics;
- effect on buildings.

The level of noise experienced by inhabitants of a property will vary according to the following factors:

- sound power outputs of processes and plant;
- · periods of operation of processes and plant;
- distances from source to receiver:
- presence of screening by barriers;
- · reflection of sound associated with topographical features;
- phasing/programming of demolition works:
- · soft ground attenuation; and
- meteorological factors.

Once a method statement for construction is available, detailed predictions of construction noise can be undertaken for each phase of the works with a view to achieving agreement with the local authority as to what levels and time periods will be acceptable to minimise impact.

Should complaints be received from local residents, the local authority would determine whether best practicable means is being applied. Should this not be the case, action under the Control of Pollution Act 1974 may be taken. Therefore, best practicable means will be employed to ensure that noise levels are minimised. As a general guide it is anticipated that the following mitigation measures will be employed to ensure that noise levels are attenuated as far as is reasonably practicable:

- low noise emission machinery will be used where feasible;
- plant will be orientated away from the noise sensitive receptor;
- machines which are used intermittently will be shut down between periods of activity;

- all machinery will be well-maintained (abnormal increases of noise are often associated with wear and tear/indicative of mechanical failure); and
- all construction work will be undertaken in accordance with codes of practice for construction work and piling as outlined in BS 5228.

Prior to commencement of work the Contactor should establish whether or not the local authority wish to employ *Best Practicable Means* as an approach to control noise or whether a baseline noise survey is required. If the latter is deemed necessary the procedure to be adopted must be agreed with the local authority.

12.5 Helicopter Noise

There will be a helicopter landing area on site for receiving emergency admissions. At the Southern General Hospital campus, there is currently a helicopter landing site located at the centre of the campus. The planned redevelopment of this site requires the temporary relocation of the helicopter landing area to a site, which will continue to serve the Southern General Hospital, throughout the redevelopment.

Currently, there are only two other sites in the United Kingdom where roof top helicopter landing sites have been used: Royal London and Leeds General Infirmary. The need for a rooftop helicopter landing site arises from on-site restrictions to helicopter flight paths and approaches, a plan, which is supported by the Civil Aviation Authority

The proposed rooftop siting of a Helicopter Landing Area must take into consideration the noise and vibrations which may result from helicopter landings and take offs. If, as expected, Option 'C' from the South Glasgow Hospital Campus Development Plan is chosen, the helicopter landing site will be above the 14th floor of the hospital, where there would be patient wards. This may potentially lead to disturbance to patient care. In terms of local residents and the effect that helicopter flights may have, the closest residential properties are c.200m, if the flight path was from the south. If the helicopters were to arrive form the north the closest residential properties would be c.600m.

Helicopter noise can be particularly troublesome because of the pulsating noise with a high low-frequency content. Basic measures can be adopted such as ensuring that quieter helicopters are used rather than those from existing older stock.

In summary, a more detailed assessment will be required for the temporary relocated helicopter landing area and the planned new rooftop site. It should be noted that at the Royal London Hospital secondary glazing was offered to all residents within a specified distance of the landing pad. A detailed assessment of likely qualifying properties will be required based upon a predetermined significance of impact criteria. The local authority should be included in agreeing the trigger level.

13.0 AIR QUALITY

Summary

There are no major point sources of air pollution close to Southern General Hospital. Local air quality is dominated by the effects of traffic emissions in the immediate area and more widely within the Glasgow/Central Belt conurbation. The adjacent Shieldhall Waste Water Treatment Works is currently a significant source of odour nuisance, although this is likely to reduce as a result of planned works within the next decade. Without the proposed redevelopment, local concentrations of NO_2 will remain well within the relevant air quality objectives, whereas annual mean concentrations of dust (PM_{10}) may exceed the 2010 objective.

During the construction period, the existing hospital and local housing will be highly sensitive to any adverse impacts on air quality and may experience minor adverse effects during periods of dry breezy weather and high levels of dust release from construction activity. The work will also give rise to emissions of PM_{10} and NO_2 from diesel plant and construction related traffic. The net effect will be a small increase in local concentrations of PM_{10} and NO_x/NO_2 however current objectives are likely to be met.

Construction emissions should not exceed the 2010 PM_{10} annual mean objective. Off site PM_{10} concentrations should meet the current objective, but may be exceeded in the hospital's operational areas during prolonged dry weather if inadequate mitigation measures are employed. On completion, the increase in traffic flow will have a small adverse effect on local concentrations of PM_{10} and NO_2 , however, local air quality objectives should still be achieved.

Mitigation measures will be required to control emissions during construction. Even with good control measures, there will be a minor impact on air quality (PM_{10}) and a moderate impact on dust nuisance within operational parts of the hospital, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The offsite impacts of construction will be much smaller.

A more detailed assessment is recommended of air quality impacts and dust emission mitigation measures during construction when the detailed construction programme is available. The proposed redevelopment will not result in significant effects on local or regional air quality.

13.1 Introduction

This report describes the existing air quality in the vicinity of the New South Glasgow Hospital (NSGH) development site and assesses the potential air quality impacts of the redevelopment of the hospital complex. It includes a review of the relevant legislation, a description of the assessment methodology, identification of receptors and a prediction of impacts.

The aims of the air quality assessment were to:

- Establish the baseline pollutant concentrations at representative locations in the vicinity of the site.
- Assess the impacts associated with the proposed redevelopment of the hospital site.
- Consider the local and regional air quality impacts of traffic emissions arising from predicted changes in traffic flow.

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13.2 Air Quality Objectives

13.2.1 Air Quality (Scotland) Regulations 2000

European Union directives on air quality were enacted in UK law through Part IV of the Environment Act 1995, which established the process known as Local Air Quality Management (LAQM). Guidelines for local air quality were published in the 1997 National Air Quality Strategy (NAQS) and associated guidance and technical guidance, revised in 2000 and 2001. The latest air quality objectives are set out in the Air Quality (Scotland) (Amendment) Regulations 2002 and the Air Quality (Scotland) Regulations 2000. These objectives are based on the medical evidence of the effects of each pollutant on human health, taking account of the costs, benefits and technical feasibility of achieving the objectives. Of the target pollutants, only sulphur dioxide is not considered to have a predominant road traffic source. Most of the air quality objectives that have been set in Scotland have been based on the standards proposed by the Department for the Environment, Food and Rural Affairs and Devolved Administrations' Expert Panel for Air Quality Standards (EPAQS). These standards have been recommended for the protection of human health.

Table 13.1: Summary of objectives outlined in the Air Quality (Scotland)
Regulations 2000 as amended in 2002

Pollutant	Objective	Averaging time	Date to be achieved by
Benzene	16.25 ugm ⁻³ 3.25 ugm ⁻³	running annual mean	31/12/03 31/12/10
1,3-Butadiene	2.25 ugm ⁻³	running annual mean	31/12/03
Carbon monoxide (CO)	10 mgm ⁻³	running 8 hour mean	31/12/03
Lead (Pb)	0.5 ugm ⁻³ 0.25 ugm ⁻³	annual mean annual mean	31/12/04 31/12/08
Nitrogen dioxide (NO₂)	200 ugm ⁻³ (105ppb) not to be exceeded more than 18 times a year 40 ugm ⁻³ (21ppb)	1 hour mean	31/12/05 31/12/05
Particles (PM ₁₀)*	50 ugm ⁻³ not to be exceeded more than 35 times a year 40 ugm ⁻³ 50 ugm ⁻³ not to be exceeded more than 7 times a year 18 ugm ⁻³	24 hour mean annual mean 24 hour mean annual mean	31/12/04 31/12/04 31/12/10 31/12/10
Sulphur dioxide (SO₂)	hur dioxide (SO ₂) 350 ugm ⁻³ not to be exceeded more than 24 times a year 125 ugm ⁻³ not to be exceeded more than 3 times a year 266 ugm ⁻³ not to be exceeded more than 35 times a year		31/12/04 31/12/04 31/12/05

Notes on Table 13.1

^{*}PM₁₀ is approximately equivalent to the ISO thoracic fraction (ie those particles small enough to penetrate to the lung) and represents a log normal sampling efficiency (with respect to particle size) with a median cut off of 10 um aerodynamic diameter.

13.2.2 Nuisance

There are no formal standards with respect to dust nuisance. Generally, the deposition of visible dust on surfaces would be deemed to be unacceptable. This level of deposition might equate to a dust deposition rate of 200 mgm⁻²day⁻¹ (as a monthly mean; PAN50, Annex B). Visible dust nuisance might occur at lower levels of dust deposition where there is a marked difference in colour between the dust and the affected surface.

13.3 Assessment Methodology

13.3.1 Baseline Air Quality

A visit was made to the site to identify any existing local sources of air pollution and the main potential receptors with respect to potential impacts of the development project. A search was also made of the National Emissions Inventory (www.naei.org.uk) to identify any major industrial sources of air pollution within the immediate area of the development site.

Information about current concentrations of air pollutants at the site was derived from the NETCEN maps published on the National Air Quality Archive website (www.airquality.co.uk). The NETCEN maps provide information about background concentrations of air quality strategy pollutants in 2001 and their predicted concentrations for target years for the various air quality objectives. Further information was obtained from Glasgow City Council's (2005) air quality assessment.

13.3.2 Impact Assessment

The impact assessment for air quality strategy pollutants was based on the Technical Guidance for Local Air Quality Management TG(03) published by DEFRA *et al* (2003). The assessment also took account of the Scottish Transport Appraisal Guidance (STAG) published by the Scottish Executive¹). Concentrations of nitrogen dioxide and PM₁₀ are of particular concern, both with respect to compliance with the objectives of the Air Quality Strategy and also their potential effects on human health

An appraisal was made of the planned development to identify the potential sources of air pollution associated with the development. The impact of the identified sources was then assessed on the basis of the Technical Guidance in TG(03), experience from other sites and consideration of factors such as wind direction and local topography (including that of the built environment) in governing the dispersion of emissions associated with the site. The effects of traffic emissions were estimated using the DMRB spreadsheet as recommended in TG(03) and available on the Highways Agency website². Traffic flow predictions were provided by JMP for 2012 with and without the development.

The impact assessment for dust nuisance was based on previous experience and the limited published information about impacts from construction projects and earth moving operations (Department of the Environment, 1990, PAN50 Annex B, DEFRA and the Devolved Administration's Air Quality Expert Group (AQEG), 2004).

The criteria used to assess the magnitude of predicted air quality impacts are tabulated overleaf (Table 13.2). Impacts that would have no measurable effect on the parameter of interest were deemed to be negligible. The Air Quality Standards are

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¹ www.scot-tag.org.uk/stag/06.htm

² http://www.highways.gov.uk/business/238.aspx

those set by EPAQS and the Objectives are those set by the Government with respect to the maximum number of occasions these Standards should be exceeded.

Table 13.2: Criteria used to assess impacts

Impact	Magnitude						
	Neutral	Minor	Moderate	Large			
Air pollutants regulated under the NAQS	Emission of pollutant(s) leading to no measurable change in predicted concentrations	Predicted concentrations are less than relevant EPQAS Standards*	Predicted concentrations would occasionally exceed relevant EPAQS Standards*	The predicted numbe of excedences of a relevant air quality standard is greater than the Government's objective			
Dust Deposition No discernible dust deposition		No discernible dust deposition	Rates of dust deposition sometimes sufficient to give rise to visible dust layer	Rates of dust deposition sufficient to give rise to visible dust soiling			

^{*}or where these standards are already exceeded, the development would not make an important difference (minor) or only a small difference (moderate) to the number of days on which exceedences occur.

13.4 Receptors

The hospital will continue to be used through the redevelopment process and represents a highly sensitive receptor. Individuals with pre-existing respiratory or cardiovascular illness are believed to be particularly sensitive to the adverse effects of air pollution, particularly fine particulate such as emitted in diesel exhaust. Dust deposition on surfaces is also likely to present particular difficulties in the hospital environment where high standards of cleanliness are required.

There are hundreds of residential properties within 300 metres of the site boundary (Table 13.3). All of these homes are within 300 m of major roads and/or the M8.

There are several schools at distances of about 250 to 500 m east of the site: Drumoyne Primary School, Govan High School, Langlands School and Elder Park School.

Table 13.3: Residential properties within 300m of site boundary

Name / Location	Approx no. of Houses	Approx. Distance from Site (Metres)	Direction from Site
Hardgate Drive	85	100	south
Hardgate Gardens 48		200	south
Hardgate Road	15	200	south-west
Shieldhall Gardens	32	300	south, west
Langcroft Place 23		200	south
Cowden Street	10	150-200	south
Langcroft Road	39	100	south
Langcroft Terrace 18		100-200	south-east
Shieldhall Road 34		200-300	south

Receptors continued

Carleith Quad	100	100	east /south
Skipness Drive 48		150	east
Greenloan Avenue 65		200	east
Greengairs Avenue	61	250	east
Langlands Avenue	40	150	east
Govan Road	12	100	north-east
Peninver Drive/Burghead Place	Tenements >100	200-300	east

13.5 Baseline Conditions

There are no major point sources of air pollution within 1 km of the proposed development (Table 13.4). The M8 however passes to the south and west of the site at a distance of about 250 m at its nearest point. The eastern boundary of the site is delineated by the A809, a dual carriageway feeding into the Clyde Tunnel is a heavily trafficked road. Air quality in this area is likely to be dominated by the effects of traffic emissions in the immediate area and more widely within the Glasgow/Central Belt conurbation.

Table 13.4: Emissions (tonnes per annum per km²) within 1 km of G514TF in 2003

Pollutant	7		Sectors as	define	d in th	e Nation	al Emissio	ns Invent	ory					
1 Onutant	2	3	4	5	6	7	8	9	10	11	Total			
1,3-butadiene	-	03	04	05	06	07	08	09	10	11	0.19			
Benzo[a]pyrene	1-1	-		(.	-	0.18	0.010		-	-	0.061			
Benzene	0.030	-	0.00043	-	-	0.049	0.00028	0.0019	-	0.0097	0.36			
Carbon Monoxide	1.6	0.00021	-	0.013	-	0.27	0.049	0.0016	-	:-	131			
Carbon Dioxide as C	1954	0.019	-	i.e.	-	121	5.7	1.8	0.0085	0.40	5405			
Lead		6.2	-	-	-	3229	10	206	0.061	-	0.60			
Nitrogen Oxides as NO2	8.1	-	.	ı.Ē	-	0.20	0.0022	0.40	(8		64			
PM10 (Particulate Matter < 10um)	0.12	0.091	-	(-	E.	54	0.37	1.6	0.00024	0.013	2.1			
Sulphur Dioxide	-	0.0013	0.051	-	0.24	1.3	0.034	0.29	X=	0.064	1.3			
Non Methane VOC	0.33	ē	= 1			0.30	0.024	0.99	7/2	-	27			

2: Combustion in commercial, institutions, residential and agricultural sectors; 3: Combustion in industry 4: Production processes; 5: Extraction and distribution of fossil fuels; 6: Solvent use; 7: Road transport; 8: Other transport and machinery; 9: Waste treatment and disposal; 10: Agriculture; 11 Nature, land use change and other

The Scottish Pollutant Release Inventory lists several installations within a distance of 1 mile of the hospital site (www.sepa.org.uk/spri/index.htm). These include the Shieldhall Wastewater Treatment Works (WWTW) which is immediately to the north-west of the site, at a distance of less than 200 m at the closest point. The WWTW is listed by the Scottish Executive as being amongst the 35 WWTWs with the greatest record of public complaint about odour. There was a discernable sewage odour within 300 m of the WWTW on a blustery March day when the site visit was undertaken. Odour nuisance on warmer, stiller days would be expected to be considerably greater. Work to upgrade

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the WWTW in order to reduce odour emissions is scheduled to be undertaken between 2010 and 2014³.

Other installations within 1 mile include Princes Soft Drinks in Bogmoor Road where canned drinks manufacture is undertaken. Thales Optronics Ltd in Linthouse Road, about 300 m north-east of the site, is a chemical works producing a wide range of inorganic chemicals. Cohen Alloys Ltd in Barfillan Drive which undertakes smelting, including the alloyage, of non-ferrous metals, including recovered products, (refining, foundry casting etc.). There is also a steel fabrication works in Hardgate Road about 300 south- west of the site, although it is unclear whether this is an active production site. Further west, but within 800 m of the site there is a Timber Yard, Civic amenity site/recycling centre and small business including two undertakers and suppliers of catering equipment, marble fireplaces/tiles and plastics. The civic amenity site is a potential source of odour and dust nuisance with odour clearly discernible when the site visit was undertaken. None of the other industrial sites is a major emissions source.

Modelled background concentrations of pollutants in the area around the site are well within the Air Quality Objectives for NO_2 and the current Objective for PM_{10} (Table 13.5). The predicted 2010 concentration for PM_{10} listed in the air quality archive slightly exceeds the 2010 objective, although Glasgow City Council currently predicts that the 2010 PM_{10} objective is likely to be met at the development site and in its immediate vicinity (Glasgow City Council, 2005). Some exceedences of the 24 hour 50 y0 y1 standard for y1 may occur during either cold still weather or hot dry weather, but the 2010 objective of no more than 7 exceedences in a year should be met. On the basis of the guidance for Local Authorities undertaking local air quality assessments (TG(03)), the 1 hour 200 y1 objective for y2 is likely to be met as the annual mean concentration is well below the objective.

Table 13.5: Predicted background (annual mean) concentrations of pollutants at the development site (national grid reference: (25356655) - information from the National Air Quality Archive (www.airquality.co.uk).

Pollutant and year	Concentration ugm ⁻³
NO _x 2005	42.8
NO _x 2010	34
NO ₂ 2005	26.7
NO ₂ 2010	23.1
PM ₁₀ 2005 (gravimetric)	20.5
PM ₁₀ 2010 (gravimetric)	19.2
PM ₁₀ secondary 2004 (gravimetric)	3.44

Concentrations of pollutants at the development site would be expected to be slightly lower than measured values at the nearest monitoring sites in central Glasgow because of the lower levels of traffic congestion and better dispersion (Table 13.6). Measurements of NO₂ made by Glasgow City Council using diffusion tubes at Mallaig place, about 300 m south-east of the site are well within the 40 ugm⁻³ objective. The nearest air quality management area (AQMA) to the development site is about 3 km to the east and encompasses central Glasgow. It has been declared in order to address concentrations of NO₂ that exceed 40 ugm⁻³ as an annual mean. Glasgow City Council (2005) has established that exceedences of NO₂ objective are also likely at Royston Road (about 7 km east of the site), North Street/Glasgow 1 (St Patricks

www.scotland.gov.uk/Topics/Environment/Pollution/Noise-Nuisance/Odour/Odour

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School, about 4 km east of the site). Byres Road, (about 3 km, north-east of the site), Dumbarton Road (about 2 km, east-north-east) and Parkhead Cross. These are expected to form the basis of further AQMAs. The NO_2 objective is also likely to be exceeded at Napiershall Street (about 3 km east) but further assessment is required before an AQMA is declared. None of these proposed AQMAs are close to the development site. Background concentrations of PM_{10} and NO_2 are expected to fall over the next 15 years.

Table 13.6: Automatic monitoring data for central Glasgow (Netcen, 2005)

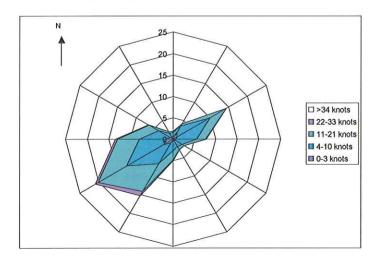
Pollutant	Index	Glasgow Centre	Glasgow City Chambers	Glasgow Kerbside
СО	CO annual mean mgm ⁻³		0.4	0.4
	maximum running 8 hour mean mgm ⁻³	5.6	2.4	2.3
NO2	annual mean ugm ⁻³	36	49	68
	exceedences of 1 hour AQS	0	0	14
NOx	annual mean ugm ⁻³	70	101	263
PM10	annual mean ugm ⁻³	-	-	27
	exceedences of 24 hour AQS	-00	Ī	31
SO2	annual mean ugm ⁻³	2	-	-
	Exceedences of AQS	0	-	-
Ozone	annual mean ugm ⁻³	37	\(\frac{2}{2}\)	200
	Exceedences of AQS	13	9	i e

13.6 Impacts of Development

13.6.1 Dispersion of emissions

Winds in central Scotland are dominantly from the west and south-west (Fig. 13.1). There is minor secondary node from the east-north-east and winds are rarely from the south east or northwest. Winds from these directions are usually very light. The wind is almost never directly from the north. The wind rose for Bishopton presented by Glasgow City Council is almost identical to that for the airport.

Figure 13.1: Wind rose for Glasgow airport showing percentage of time between 1970-1994 that winds of different strengths blow from each direction category. The distance along each axis relates to the proportion of time that winds are from that direction.



13.6.2 Construction

Emissions

The demolition of existing buildings on site that are due to be replaced and associated earth movements will give rise to emissions of airborne mineral particles (dust) from earth moving and materials handling operations. In addition, dust will be emitted as a result of windblow across stockpiles or uncovered truckloads of granular materials such as soil or aggregate and from vehicle movement across muddy surfaces. This includes dust raised by traffic travelling on mud contaminated roads in the local area. Emissions from all these sources are likely to be greatest during dry, breezy weather. The timing of work involving earth moving, materials handling or transport will have a substantial effect on dust emissions. In most years, soils and similar materials dry out to become potential dust sources most readily during late spring and summer. During this period, rates of moisture evaporation from soils normally outstrip rainfall. Dust emissions would normally be much lower during the autumn and winter, when soils and other granular materials are slow to dry out and moisture binds mineral particles to each other and to other surfaces, preventing particles from becoming airborne.

The construction of the proposed scheme will also give rise to emissions of PM_{10} and NO_2 from diesel plant. One excavator with a power rating of 120 kW that meets the EU Stage II emissions limits (Directive 97/68/EEC) would emit up to 10 mg of particles per second during use. If used for an average of 40 hours a week would give rise to annual emissions of 72 kg. Annual emissions of NO_x from the same excavator would be 2.2 tonnes of which only a proportion would be NO_2 .

The construction site will also generate traffic including trucks supplying materials/removing waste and workers vehicles, and will also cause some delays and diversions leading to longer journeys for other local vehicles. The net effect of these impacts on traffic flow will be a small increase in local concentrations or PM_{10} and NO_x/NO_2 , although the additional traffic emissions during construction would be expected to be much less than the total impact of additional vehicle emissions once the housing development is completed and occupied.

Dust nuisance

Dust nuisance is likely to be greatest during prolonged periods of dry weather during the late spring, summer or early autumn, particularly if combined with a light to moderate breeze and/or active work on site. In addition, during warm weather the opening of windows may lead to dust soiling of interior surfaces in addition to nuisance caused by the soiling of drying laundry and exterior paintwork including vehicle surfaces. Dust soiling can also cause lose of amenity arising from the discoloration of hedgerows, trees and other vegetation. Dust nuisance is generally caused by the larger particles emitted from site works and most of these particles are deposited within a few tens of metres of source with concentrations giving rise to an exponential decrease in dust levels with increased distance from the site. Dust emitted from construction sites can be a cause of dust nuisance at properties up to several hundred metres from source, but the effects are greatest within 100 m of active works with maximum impacts at distances of less than 25 m.

The prevailing south-westerly winds are often associated with wet weather which would limit dust pick up and transport. Although winds from the east occur less commonly than westerly winds, easterly winds are more commonly associated with prolonged dry weather when dust pick up and transport may be enhanced. Emissions arising from earth-moving are likely to be confined to a few weeks at specific points

during the construction programme, but there may be ongoing impacts if the road becomes covered in mud that can dry to generate airborne dust.

The potential for offsite dust nuisance during the redevelopment process is relatively small. The closest houses to the site in Hardgate Drive and in Carleith Quad Road are relatively unlikely to experience significant dust nuisance because winds from the north-east or north are extremely unusual in central Scotland and would not be expected to coincide with a prolonged dry spell. Houses in Skipness Drive are at slightly greater distance from the site and given that winds from the west are often associated with damp weather, the potential for dust nuisance is small. The potential for onsite dust nuisance affecting operational parts of the hospital is considerably greater because of the proximity of the hospital buildings to redevelopment works. The potential consequences of dust nuisance are also likely to be more severe within the hospital than for local residents with potential adverse effects on hospital hygiene and equipment function.

Airborne particles

There have been relatively few studies of the impacts of construction sites on local concentrations of PM₁₀. A major construction project undertaken adjacent to the automatic air quality monitoring site in Cardiff during 1994 gave rise to an annual mean concentration of PM₁₀ that was 12 ugm⁻³ higher than the average annual mean during the subsequent three years of monitoring. The rise in PM₁₀ associated with the Cardiff site, however, occurred within a confined built-up city centre area where dispersion is likely to have been much poorer than would be expected for a more open site. More recently, construction work close to the air monitoring site in Marylebone Road in London was associated with elevated concentrations of PM₁₀ during working hours (AQEG, 2004). Short term peaks in concentrations of 800 ugm were measured. The highest daily mean concentration measured was 139 ugm⁻³ but daily mean concentrations only exceeded 50 ugm⁻³ on 27 days during the 8 month period during which construction work was undertaken. A US study found an increment in concentrations of 80 ugm⁻³ within 20 m of a construction site, falling to 40 ugm⁻³ at a distance of 80m from the site (EQAG, 2004). Overall, it seems likely that the redevelopment of the hospital complex would lead to a slightly increased risk of exceedences of the 24 hour mean 50 ugm⁻³ standard for PM₁₀ in the local area, particularly within 100m of active works. The number of exceedences will depend on the mitigation measures employed, the weather and the total duration of site works. The offsite impacts of the redevelopment process on local air quality will be relatively small, with houses within 100m of the site (Hardgate Drive, Langcroft Road, Langcroft terrace, Carleith Quad, Govan Road) likely to experience the greatest (but still marginal) increase in airborne particulate concentrations. The impacts may be greatest in Govan Road where properties are immediately downwind of the site with respect to the prevailing wind. The onsite increase in airborne particles is likely to be much greater with mean concentrations of PM_{10} in operational parts of the hospital being potentially raised by several ugm⁻³ over a period of months, coupled with an increased frequency of days on which the 50 ugm⁻³ standard is exceeded. The potential consequences of raised concentrations of PM_{10} are also likely to be more severe within the hospital than for local residents as it is believed that people with pre-existing illness, particularly cardiovascular or respiratory illness, are most at risk of experiencing adverse effects as a result of exposure to air pollution. It is possible that the current objective of no more than 35 exceedences of the 50 ugm⁻³ standard per year would not be met on site and likely that the 2010 objective of no more than 7 exceedences would not be met. It is likely that the offsite impacts will be less severe and that the number of exceedences of the 50 ugm⁻³ will be within the current and 2010 objectives.

The annual mean objective for NO₂, and the one hour objective for NO₂ are also likely to be met both on and offsite during the reconstruction process.

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Mitigation

Given the planned continued use of the hospital during its redevelopment and the potential sensitivity of many patients to the adverse health effects of air pollution, it will be extremely important to ensure that dust and exhaust emissions are adequately controlled. A number of measures can be used to control emissions of mineral dust from construction sites. Where a particular access route is to be used over a period of weeks, a wheel wash should be used to prevent mud being carried onto local roads. In the absence of a wheel wash, road cleaning should be undertaken, Dust emissions from internal haul roads should be minimised by restricting vehicle speeds and by damping down dust with water, if required. Site runoff of water or mud should be prevented. Granular loads should be covered during transport to and from the site. Dust pick up from stored granular materials can be reduced by keeping materials wet or covered or by the use of screening to reduce wind speeds across stockpiled materials. Screening can also be used to reduce dust emissions from active building and demolition works. The minimisation of drop heights will minimise dust emissions while tipping material from trucks. A solid barrier at the site boundary can be used to minimise impacts on adjacent properties. No bonfires should be permitted. The timing of operations will have a crucial effect on the dust impact as dust emissions are likely to be lowest during wet weather. Where possible dust generating activities should be kept to a minimum on dry windy days.

It is proposed to fit additional filters to air intakes of air handling plant on buildings close to construction or demolition sites that may create dust, for example theatres/ITU/Cancer-Bone Marrow treatment.

Evaluation of impacts

The continued operation of the hospital during its redevelopment means that it is highly unlikely that minor adverse effects on air quality and associated slight dust nuisance could be entirely avoided in parts of the hospital where patient treatment is undertaken. The proximity of existing residential properties to the hospital site will make it difficult to completely avoid nuisance arising from dust emissions from construction activities during dry weather, particularly at within parts of the hospital and properties within 100m downwind of active works. The timing of construction activities will have a critical effect on the likelihood of substantial dust nuisance arising and on the likelihood of not meeting the air quality objective for 24 hour mean concentrations of PM₁₀. Impacts would be greatest if these operations are performed during dry warm weather and least if performed during cold wet weather.

Within the grounds of the hospital, the development process is likely to have a minor impact on air quality (PM_{10}) and a moderate impact on dust nuisance, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The exact location of works relative to operational areas of the hospital will determine the extent and scope of nuisance. Dust emissions during wet weather are likely to be negligible and would not give rise to any nuisance on the hospital site or at nearby properties. Given the comparative rarity of prolonged periods of dry weather in Central Scotland, it is likely that dust nuisance will be at worst of moderate significance and would last, for at most, only a few days during the redevelopment work.

13.6.3 Impacts once development is complete

Effects on local air quality

The main effect of the proposed redevelopment of the hospital on air quality would be an increase in concentrations of NO_x, NO₂ and PM₁₀ resulting from increased traffic

flow. The predicted effects on PM_{10} and NO_2 are small and would not be reliably detected by a measurement campaign (Table 13.7). The increased traffic flow will contribute to the predicted exceedence of the 2010 objective for annual mean concentrations of PM_{10} but the predicted increments in concentration are of insufficient magnitude to make an important difference to the achievement of the objective. Daily mean concentrations of PM_{10} will occasionally exceed the 50 ugm⁻³ standard, but are likely to remain within the objective of no more than 7 exceedences. The predicted annual mean concentrations of NO_2 are well within the annual mean objective and therefore the 200 ugm⁻³, one hour mean, objective is also likely to be met (DEFRA et al, 2003). Increases in other pollutants for which air quality objectives have been set are predicted to be extremely small and the objectives for these pollutants should be readily met within the hospital and the surrounding area.

Table 13.7: Predicted impact of increased traffic flow arising from the proposed redevelopment of the hospital site on local concentrations of NO_x, NO₂ and PM₁₀.

	2012 Baseline without development			2012 wi	2012 with development			Increment due to development Annual mean			
	Annual mean Days		Annual	Annual mean Days							
	NO _x ugm ⁻³	NO ₂ ugm ⁻³	PM ₁₀ ugm ⁻³	PM ₁₀ > 50 ugm ⁻³	NO _x ugm ⁻³	NO₂ ugm ⁻³	PM ₁₀ ugm ⁻³	PM ₁₀ > 50 ugm ⁻³	NO _x ugm ⁻³	NO ₂ ugm ⁻³	PM ₁₀ ugm ⁻³
Housing											
Hardgate Road	42.0	25.3	20.13	4	45.1	26.1	20.53	4	3.9	1.1	0.47
Shieldhall Road W	44.8	26.0	20.20	4	46.0	26.3	20.32	4	3.8	1.1	0.35
Shieldhall Road E	58.7	29.3	21.50	5	60.4	29.7	21.66	6	4.8	1.3	0.45
Govan Road	58.0	29.2	21.34	5	60.1	29.6	21.54	6	3.8	1.1	0.34
Hospital											
Maternity Hospital	38.6	24.4	19.78	3	42.5	25.4	20.29	4	4.9	1.4	0.64
New Childrens Hospital	34.8	23.2	19.30	3	35.4	23.5	19.37	3	0.8	0.2	0.10
New Adults Hospital	34.6	23.3	19.26	3	34.8	23.3	19.29	3	0.3	0.1	0.03
Spinal Injuries Unit	42.9	25.5	20.03	3	43.1	25.6	20.05	3	0.6	0.2	0.06

Overall, the output from the DMRB screening model indicates that increase in local traffic flow following the redevelopment of the hospital site would not be expected to make an important contribution to the possible exceedence of the 2010 objective for annual mean concentrations of PM_{10} and would not give rise to any exceedence of the NO_2 objectives. The frequency of occasional exceedences of the 50 ugm⁻³ standard for PM_{10} may be slightly increased as a result of the increased traffic flow.

The potentially elevated background levels of PM_{10} at the hospital location and also the existing odour nuisance associated with the WWTW are of potential concern given the likely greater susceptibility of hospital patients to adverse effects in comparison to healthier members of the population.

Effects on regional air quality

Table 13.8 summarises the pollutant emissions from the predicted increased traffic flow that may arise as a result of the redevelopment of the hospital site. The

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increased traffic flow that would arise from the development has a minimal effect on regional emission levels.

Table 13.8: Comparison of predicted emissions from the increased traffic flow arising as a result of redevelopment of the hospital site with those from baseline traffic flows alone the same routes

Pollutant	Total traffic emissions without development	Total traffic emission with development	Increment due to development	Units
со	133,277	150,997	17,720	kg/year
THC	19,055	21,408	2,353	kg/year
NO _x	94,123	104,527	10,404	kg/year
PM ₁₀	2,487	2,783	296	kg/year
CO ₂	29,715	33,377	3,662	tonnes/year

13.7 Residual Impacts

Table 13.9 summarises this preliminary assessment of overall impact of redevelopment of the hospital site on air quality. Both dust nuisance and air quality impacts in operational parts of the hospital during the redevelopment process could be of moderate significance. Careful planning will be required to minimise dust and exhaust emissions arising from the redevelopment work. The predicted increase in traffic flows following the redevelopment of the hospital would be expected to have a minor adverse effect on local air quality.

Table 13.9: Summary of residual air quality impacts of hospital development

	Construction	Following redevelopment
Dust nuisance	Moderate (on site) Minor (off site)	None
Local air quality	Moderate (on site) Minor (off site)	Minor
Regional air quality	Minor	Minor

13.8 References

AQEG (2004) Particulate Matter in the United Kingdom. DEFRA and the Devolved Administrations' Air Quality Expert Group (available from www.defra.gov.uk)

Department of the Environment (1990) Environmental effects of surface mineral workings. HMSO

DEFRA and the Devolved Administrations (2003) Part IV of the Environment Act 1995: Local Air Quality Management. Technical Guidance LAQM. TG(03) (www.defra.gov.uk), also Local Air Quality Management Tools — from www.airquality.co.uk (including DMRB spreadsheet and link to DMRB manual)

DEFRA and the Devolved Administrations⁴ (2001) The air quality strategy for England, Scotland, Wales and Northern Ireland. A consultation document on proposals for air quality objectives for particles, benzene, carbon monoxide and polycyclic aromatic hydrocarbons.

Department of the Environment, Transport and the Regions in partnership with the Scottish Executive, the Welsh Assembly and the Department for the Environment for Northern Ireland (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

Glasgow City Council (2005) Local air quality management: Detailed assessment report www.glasgow.gov.uk/NR/rdonlyres/3CFAF22D-AEB1-452B-AB91-81CF27325EC6/0/LocalAirQualityManagementDetailedAssessmentV2.pdf

Netcen (2005) Air pollution in the UK: 2004: a report prepared for DEFRA and the Devolved Administrations

PAN 50 Annex B: The control of dust at surface mineral workings. The Scottish Office Development Department (1998)

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⁴ Department of the Environment, Food and Rural Affairs in partnership with the Scottish Executive, the Welsh Assembly and the Department for the Environment for Northern Ireland

14.0 CULTURAL HERITAGE

Summary

AOC Archaeology Group was commissioned by Ironside Farrar Ltd on behalf of the Board to undertake a cultural heritage chapter for an Environmental Impact Assessment prior to the redevelopment of South General Hospital, Govan, Glasgow.

Cartographic and bibliographic sources indicate that the proposed development area remained relatively undeveloped until the construction of the hospital in the mid 19th century. The only known evidence of occupation prior to this is the site of the now demolished farmhouse of Shieldhall and its associated structures (Sites 3, 8 & 13), dating from c. 1720, and Merryflatts (Sites 9 & 10). Eleven sites of cultural heritage interest have been located within the proposed development area. In addition to Sheildhall (Sites 3, 8 & 13) and Merryflatts (Sites 9 & 10) mentioned above, these include the hospital itself (Site 5), a World War II balloon barrage mooring (Site 4) and two Listed Buildings at 1345 Govan Road (Sites 1 & 2). Site 11 was identified as the former asylum building dating to the 19th century, and therefore part of the early hospital infrastructure. Site 12, a three-storey building constructed in the 1920s appears to have a relatively unaltered exterior and is representative of the early twentieth century development of the hospital. An additional two sites have been identified within the wider 100 m study area. One of these is the Govan Burgh Survey (Site 6) and comprises a survey of the historical, architectural and archaeological merits of the entire burgh. The final site is the former Linthouse Engine Works and Shipyard (Site 7) located northeast of the proposed development area. While outside the 100m study area the Luma Factory (Site 14) may be visually impacted upon by proposed 14 storey hospital buildings; as such these impacts are assessed here.

The proposed development will have a possible direct impact of minor-moderate significance on the two Listed Buildings at 1345 Govan Road (Sites 1 & 2) and a negligible visual impact on these same buildings. Sites 11 & 12, also dating to the early development of the hospital will be demolished between 2009-2010 this will constitute a moderate significance of impact.

In compliance with national and local planning policies, it is recommended that that a programme of Historic Building Recording be undertaken prior to any alterations which may be required to facilitate the reuse of the Listed Buildings (Sites 1 &2) and prior to the demolition of Sites 11 & 12. In addition, an archaeological watching brief is recommended, to monitor the groundbreaking works required to assess the condition of the foundations of the Listed Buildings at 1345 Govan Road (Site 1 & 2). A watching brief is also recommended during ground breaking works associated with the demolition of Sites 11 & 12. Given the extent of recent development and disturbance which has occurred within the proposed development area, it is not thought that any archaeological remains of significance will survive intact below the modern ground surface; as a result no further mitigation is recommended.

14.1 Introduction

14.1.1 Development site

Location and extent

The proposed development site is located at Govan, Glasgow (National Grid Reference centred on NS 536 656). The site is bounded by the A739 and Moss Road to the east, Govan Road to the north, a Sewage Works and Hardgate Road to the west and residential buildings to the south. The site is approximately 28 hectares and comprises the current Southern General Hospital buildings, car parking and associated infrastructure.

Geology and topography

Glasgow lies on part of the downfaulted rift, which forms the Midland Valley of Scotland. This has left the solid geology of Carboniferous Limestone Coal formation. The drift geology overlying the Limestone consists mostly of Devonian glacial till (Hall et al 1998). The site is urban in nature and the River Clyde is located to the north.

14.1.2 Development proposal

AOC Archaeology Group was commissioned by Ironside Farrar on behalf of the Board to undertake a cultural heritage chapter for an Environmental Impact Assessment prior to the redevelopment of Glasgow Southern General Hospital including the creation of a new Adult Acute Hospital complex and a Children's Hospital.

14.1.3 Government and local planning procedures

National Planning Policy Guidelines

The statutory framework for heritage in Scotland is outlined in the Town and Country Planning (Scotland) Act 1997, as amended in the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.

The implications of the Ancient Monuments and Archaeological Areas Act 1979 with regard to local government planning policy are described within the National Planning Policy Guidelines (NPPG) and Planning Advice Notes (PAN) for Scotland. NPPG5 'Archaeology and Planning' (1994), NPPG18 'Planning and the Historic Environment' (1999) and PAN42 'Archaeology-the Planning Process and Scheduled Ancient Monument Procedures' (1994) deal specifically with planning policy in relation to heritage. The planning guidance expresses a general presumption in favour of preserving heritage remains in situ. Their 'preservation by record' (i.e. excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative.

Structure Plan

Structure Plans are strategic land-use policy documents designed to cover a period of several years, and which set down policies with regard to various land-use types across a broad region. Policies set out in the Glasgow and Clyde Valley Structure Plan emulate national policies and seek to preserve cultural heritage.

The Glasgow and Clyde Valley Joint Structure Plan (2000) covers the council areas of North Lanarkshire, South Lanarkshire, Renfrewshire, Inverclyde, East Dunbartonshire, West Dunbartonshire and the City of Glasgow. The cultural heritage policies in the Structure Plan closely reflect those in national planning policies.

"The protection and enhancement of natural and built resources is prerequisite of the Development Strategy. The Guiding principles of the plan therefore explicitly recognise the importance of Environmental Resources, particularly in terms of a general presumption in safeguarding the quality and extent of identified environmental resources (Section 2.4).

Local Plan

The policies in the Glasgow City Council Local Plan (2003) reiterate the national policies with regard to heritage:

'There will be a presumption in favour of retaining, protecting, preserving and enhancing the ancient monuments and their setting.' (Policy HER 4, City Plan 2003)

The policies included in the City Plan (2003), HER 2 Listed Buildings (Buildings of Architectural and Historic Importance), that address the 'built heritage' conservation are concerned with identifying areas of special architectural or historic interest, the character of which it is desirable to preserve and enhance.

Where buildings have been listed as being of special architectural or historic interest:

- there will be a presumption in favour of the retention of listed buildings;
- there will be a requirement for owners to maintain listed buildings in a good state of repair;
- repairs, alterations and extensions will be carried out in accordance with the design standards in policy HER 3;
- proposals for demolition will be subject to rigorous scrutiny in respect of importance, condition and alternative uses; and
- the best viable use will be sought where re-use and disposal is being considered.

The following policy guidance is stipulated by Glasgow City Council:

Assessment of Development Proposals Affecting the Character and Setting of Listed Buildings

Given the importance of listed buildings to the historic and architectural heritage and image of the City, it is essential that a rigorous set of procedures are followed that provide adequate safeguards and that place a strong emphasis on the re-use of listed buildings.

Development proposals affecting the character and setting of listed buildings will be assessed against the following criteria and other relevant policies of the Plan:

(i) facade retention may be considered but will not be regarded as an automatic option (see also policy RES 6: Retention of Traditional Sandstone Dwellings);

Planning considerations pertaining to the site

The local planning authority is advised on all archaeological matters by West of Scotland Archaeological Service (WoSAS).

Any works that affect the fabric or setting of a listed building can only be undertaken once listed building consent has been granted by the Local Authority. Note that the visual setting of listed buildings is also a competent planning matter. Demolition or alteration of the appearance of the existing buildings on the development site, or the construction of new buildings, could have visual impacts upon the surrounding protected buildings and monuments. The policy that the setting of Listed Buildings should be an issue in development control is outlined in National Planning Policy Guidelines:

'Issues generally relevant to the consideration of all applications for listed building consent and applications for planning permission affecting listed buildings include: the building's setting and contribution to the townscape or landscape, having particular regard to the impact of development upon the views to and from the listed building' (NPPG 18 April 1999, Section 43).

14.1.4 Restrictions on reporting

This assessment has been based upon data obtained from publicly accessible archives as described in the *Data Sources* in Section 4.2.

14.2 Aims and Objectives

- 14.2.1 The aim of this study is to identify sites of cultural heritage value that may be impacted upon by the proposed development at Glasgow Southern General Hospital. The evidence presented and the conclusions offered will provide a comprehensive basis for further discussion and decisions regarding the future of this site and for the formulation of a mitigation strategy, should this be required.
- 14.2.2 The objectives to be undertaken in pursuing this study will be focused on assessing the cultural significance of the area to be affected by the developments at Glasgow Southern General Hospital, by examining a variety of evidence for upstanding and buried remains within 100 m of the proposed development area. Based upon the cultural heritage value thus identified, and the nature and scale of the proposed development, a mitigation strategy will be proposed.

14.3 Methodology

14.3.1 Standards

The scope of each Environmental Impact Assessment meets the requirements of current planning regulations set out in NPPG5 and PAN42.

AOC Archaeology Group conforms to the standards of professional conduct outlined in the Institute of Field Archaeologists' Code of Conduct, the IFA Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, the IFA Standards and Guidance for Environmental Impact Assessments, Field Evaluations etc., and the British Archaeologists and Developers Liaison Group Code of Practice.

AOC Archaeology Group is a Registered Archaeological Organisation (RAO) of the Institute of Field Archaeologists. This status ensures that there is regular monitoring and approval by external peers of our internal systems, standards and skills development.

14.3.2 Data sources

The following sources have been consulted in the preparation of this assessment:

- National Monuments Record for Scotland (RCAHMS, Bernard Terrace, Edinburgh): For NMRS data, archaeological and architectural photographs, NMRS maps and unpublished archaeological reports;
- National Map Library (National Library of Scotland, Causewayside, Edinburgh): For old Ordnance Survey maps (1st & 2nd Edition, small- and large-scale) and pre-Ordnance Survey historical maps;
- Historic Scotland (Longmore House, Salisbury Place, Edinburgh): For Scheduled Ancient Monument data and Listed Buildings data;
- Sites and Monuments Record (West of Scotland Archaeology Service): For SMR data, sites of local importance, and unpublished archaeological reports;

14.3.3 Chapter structure

Each archaeological or historical site, monument or building referred to in the text is listed in the Gazetteer in Appendix 1. Each has been assigned a 'Site No.' unique to this assessment, and the Gazetteer includes information regarding the type, period, grid reference, NMRS number, statutory protective designation, and other descriptive information, as derived from the consulted sources, for each Site No.

Each archaeological or historical site, monument or building referred to in the text is plotted on Figure 14.1 below, using the assigned Site No.'s. The area proposed for development is shown outlined.

Features of potential archaeological or historical significance within 100 m of the area proposed for development have also been assessed. The aim of this is to predict whether any similar types of archaeological remains survive on the development site and to assess any possible visual impacts upon protected sites.

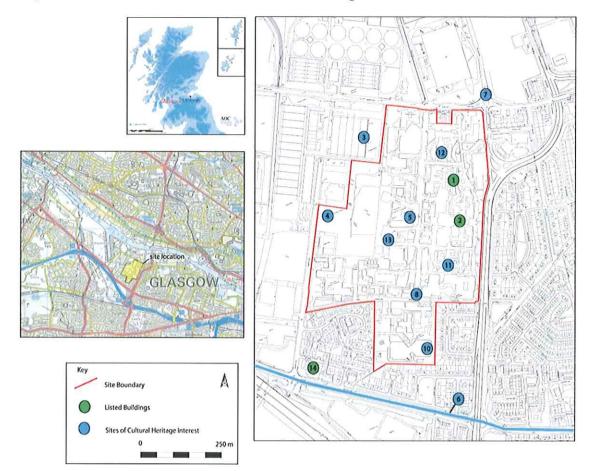


Figure 14.1 Site location and sites of Cultural Heritage interest

The rating of archaeological sensitivity of the assessment area will be guided by criteria used by Historic Scotland for Scheduling ancient monuments and classifying Listed Buildings. Monuments are generally considered for Scheduling based upon factors such as age, rarity, condition and archaeological context, while Listed Buildings are designated and categorised based upon similar criteria as well as technical innovation/virtuosity, architectural design and associations with well-known architects, historical persons or events. In some cases a site or building which does not have a protective designation assigned to it could, nonetheless, still be rated as having the same significance as another one which is protected. This is because the selection of items for listing and scheduling is an ongoing national activity. Generally, the criteria for judging archaeological significance are gradually evolving, with an increasing trend towards including more recent types of structures. In some cases, important buildings or monuments may have been overlooked during listing, or could now be judged worthy of listing, whereas they were not previously.

14.3.4 Impact Assessment Criteria and Methodology

The criteria used to rate archaeological and cultural heritage significance in the proposed development area are presented in Table 14.1 below.

Table 14.1 Criteria for Rating Cultural Significance

Cultural	Criteria
Significance	
International	World Heritage Sites
and	or
National	Iconic Sites and Monuments;
	or
	Scheduled Ancient Monuments (Actual and Potential;
	or
	Grade A Listed Buildings;
	or
	Remains of national or international importance, or fine,
	little-altered examples of some particular period, style or type
Regional	Grade B Listed Buildings;
	or
	Remains of regional or more than local importance, or major examples of some
	period, style or type, which may have been altered.
	Remains of national importance that have been partially
	Damaged.
Local	Grade C and C(S) Listed Buildings
	or
	Remains of local importance, lesser examples of any period, style or type, as
	originally constructed or altered, and simple, traditional sites, which group well with
	other significant remains, or are part of a planned group such as an estate or an
	industrial complex;
	Cropmarks of indeterminate origin.
	Remains of regional importance that have been partially damaged or remains of
	national importance that have been largely damaged.
Negligible	Relatively numerous types of remains, of some local importance; findspots of
	artefacts that have no definite archaeological remains known in their context.
	Remains of local importance that have been largely damaged;
	Isolated findpots;
	Undesignated structures
	Undesignated structures

The magnitude of the physical impact upon monuments caused by the development has been rated using the classifications and criteria outlined in Table 14.2 below.

Table 14.2 Criteria for Classifying Magnitude of Physical Impact

Physical impact	Criteria
High	Major loss of information content resulting from total or large-scale removal of deposits from a site whether or not the site is associated with a monument. Major alteration of a monument's baseline condition. Any physical alteration to a Scheduled Ancient Monument. Any alteration to a Grade A Listed Buildings, massive alterations to a Grade B or Grade C Building.
Medium	Moderate loss of information content resulting from material alteration of the baseline conditions by removal of part of a site whether or not the site is associated with a monument. Slight alteration of a monument's baseline condition
Low	Minor detectable impacts leading to the loss of information content. Minor alterations to the baseline condition of a monument.
Negligible	Very slight or barely measurable loss of information content; Loss of a small percentage of the area of a site's peripheral deposits. Very slight and reversible alterations to a monument.
None	No physical impact anticipated.

The predicted significance of impact upon each monument was determined by considering its archaeological significance in conjunction with the magnitude of impact predicted on it. The method of deriving the significance of impact classifications is shown in Table 14.3 below.

Table 14.3 Method of Rating Significance of Impact on Archaeology/Cultural Heritage Sites by the Proposed Development

	Archaeological Significance				
	Negligible	Local	Regional	National	International
Magnitude impact					
High	Minor- Moderate	Moderate	Moderate- Major	Major	Extreme
Moderate	Minor	Minor- Moderate	Moderate	Moderate- Major	Major
Low	Negligible	Minor	Minor- Moderate	Moderate	Moderate- Major
Marginal	Negligible	Negligible	Minor	Minor- Moderate	Moderate
None	None	None	None	None	None

The criteria for classifying magnitude of visual impact is outlined in Table 14.4 below.

Table 14.4 Criteria For Classifying Magnitude Of Visual Impact

Physical impact	Criteria
High	Direct and substantial visual impact on a significant sightline to or from a ritual monument or prominent fort; Major alteration to the prenumbral or close settings of a Scheduled Ancient Monument; Major visual imposition within a Cultural Landscape; Major visual imposition within or affecting and Iconic Site or Monument
Medium	Oblique visual impact on an axis adjacent to a significant sightline to or from a ritual monument but where the significant sightline of the monument is not obscured. Glacis of a prominent fort (based on the proportion of the glacis that would be obscured). Significant alteration to the setting of a SAM outwith its penumbral setting or significant alteration to the setting of a Grade A, B or C Listed Building beyond its curtilage. Significant but not major visual imposition within a Cultural Landscape.
Low	Peripheral visual impact on a significant sightline to or from a ritual monument. Insignificant alteration to the setting of a SAM outwith its penumbral setting or significant alteration to the setting of a Grade A or B Listed Building beyond its curtilage. Minor visual imposition with a Cultural Landscape
Negligible	All other visual impacts
None	No intervisibility.

The predicted significance of visual impact upon each monument was determined by considering its archaeological significance in conjunction with the magnitude of visual impact predicted on it. The method of deriving the significance of impact classifications is shown in Table 14.5 below.

Table 14.5 Significance of the Effects of Visual Impacts on the Cultural Value of Monuments

Impact magnitude	Negligible	Local	Regional	International or National
High	Minor	Minor	Moderate	Major
Medium	Negligible	Minor	Minor	Moderate
Low	None/Negligible	Negligible	Minor	Minor
Negligible	None	None	Negligible	Minor

The impacts recorded in highlighted cells are 'significant' in terms of the Environmental Impact Assessment (Scotland) Regulations 1999

The assessment of the significance of impact by the development is based upon plans supplied by the client to AOC Archaeology Group. The rating of significance of impact on each monument is presented in Section 7 below.

All sources consulted during the desk-based assessment, including publications, archived records, photographic and cartographic evidence, are listed in the *References* in Section 14.9.

14.3.5 Copyright and confidentiality

AOC Archaeology will retain full copyright of any commissioned reports, tender documents or other project documents under the Copyright, Designs and Patents Act 1988 with all rights reserved, but provides an exclusive licence to the Client in all matters directly relating to the project.

AOC Archaeology will assign copyright to the client upon written request but retains the right to be identified as the author of all project documentation and reports as defined in the Copyright, Designs and Patents Act 1988. AOC Archaeology will advise the Client of any materials supplied in the course of projects, which are not AOC Archaeology's copyright.

AOC Archaeology undertakes to respect all requirements for confidentiality about the Client's proposals provided that these are clearly stated. In addition, and where commercial factors require it, AOC Archaeology further undertakes to keep confidential for the time being any conclusions about the likely implications of such proposals for the historic environment. It is expected that Clients respect AOC Archaeology's and the Institute of Field Archaeologists' ethical obligations not to suppress significant archaeological data for an unreasonable period.

14.4 Baseline Conditions

14.4.1 Archaeological and Historical Evidence

All of the sites identified during this assessment date to the post-medieval and modern periods. Cartographic sources indicate the proposed development area was almost entirely undeveloped until John Honeyman constructed the first hospital on site in 1858. Shieldhall House (Site 3) and Merryflatts House (Site 9) were present on site from at least the late 18th century as they are shown on Richardson' map of 1795 (See Appendix 7, Figure A7.1). Shieldhall (Site 3) was also included in a survey of gentry houses of Glasgow in the late 19th Century. Simon, Mitchell and Buchanan noted that the older portions of the house probably dated to c. 1720 (1878). The house occupied land north-west of the proposed development site up until at least 1948, when it is depicted on Ordnance Survey maps of this date (not shown). While West of Scotland Archaeological Service Sites and Monuments Record places Shieldhall House (Site 3) within the proposed development area boundary, map regression indicates that it was located to the west; just outside of the proposed development boundary as shown on Figure A7.2. However, it is probable that the policies of Sheildhall House extended into the proposed development area as indicated by extensive garden and pathways marked on 1st edition maps within the proposed development area. These maps also show a road leading from Sheildhall House to two structures in the centre of the proposed development area (Site 13) Another building, also called Shieldhall (Site 8), was identified on 1st edition Ordnance Survey maps (Figure A7.2) to the southeast of Shieldhall House and possibly functioned as a subsidiary farm house or residence to the main house. An additional building called Merryflatts (Site 10) was also identified on the 1st and 2nd edition Ordnance Survey Maps (Figures A7.2 & A7.3), to the south of Meryflatts House. A structure labelled 'ruin' corresponding to Site 10 was also observed on the 1950 Ordnance Survey Plan (Figure A7.6).

The Listed Buildings at 1345 Govan Road (Sites 1 & 2) include an original hospital and an administration block, though they are now in use for various hospital functions. The hospital block (Site 1) probably incorporates portions of John

Honeyman's 1858 hospital in the centrepiece though the rest of it dates later. The administration block (Site 2) was built by John Thomson, governor of the poorhouse, which was part of Govan Combination Parochial Buildings, in the late 19th century; though it does not appear to be all one build. An Asylum (Site 11) was constructed south of the poorhouse in the late 19th century.

The Linthouse Engine Works And Shipyard (Site 7) to the northeast of the proposed development area was founded in 1869 by Alexander Stephenson; the cast iron framed engine works was added three years later. The works grew significantly in the first decade of the 20th century and the red brick office block was added in 1914 (Hume 1974, 1976). The engine works building was moved to Scottish Maritime Museum at Irvine sometime before 1995.

Cartographic evidence indicates that the proposed development area has essentially undergone constant development since the first hospital was constructed on the site in the mid 19th century. The 2nd edition Ordnance Survey map, of 1895 (Figure A7.3) indicates that both of the Govan Combination Parochial Buildings, which included a poorhouse, infectious disease hospital and asylum, and Sheildhall Hospital to the south had been constructed on site.

By the publication of the 1913 edition of the Ordnance Survey (Figure A7.4), both Shieldhall Hospital and the Parochial Buildings site had significantly expanded to include three additional structures to the west. The 1934 Ordnance Survey map (Figure A7.5) indicates that many additions had been made to the site, including a laundry, mortuary and a large building to the north (Site 12) and also shows a recreation ground complete with tennis courts and a bowling green west of the Southern General Hospital and south of the Shieldhall House (Site 3).

The Balloon Barrage mooring site (Site 4) was identified on aerial photographs dating to 1941. The site was used during World War II and was located to the east of Hardgate Road, south of the sewage works. Work for the Govan Burgh Survey (Site 6), the southern extent of which is shown to the south of the proposed development are on Figure 14.1, was undertaken recently; a rough draft of the text being completed in 2004. The survey of architectural, historical and archaeological features in Govan was undertaken by Dalglish and Driscoll as part of the Council for British Archaeology's Scottish Burgh Series and is due to be published soon.

The 1950 Ordnance Survey map (Figure A7.6) reveals little change to have occurred within the hospital grounds with the exception of a glasshouse in the west of the site. The 1964/67 Ordnance Survey Map (Figure A7.7) indicates that Shieldhall Hospital was no longer in use as an infectious disease hospital but as a 'geriatric' hospital. A survey of large-scale 1:1250 Ordnance Survey Plans dating as late as 1995 indicates that new buildings and additions to existing buildings continued throughout the late twentieth century.

14.5 Site Visit

14.5.1 A site was undertaken on the 22 March 2007 in dry overcast conditions. The purpose of this visit was to confirm baseline conditions. Both Listed Buildings (Sites 1-2) were identified and are in good external condition. Both are constructed of sandstone blocks and appear to be generally symmetrical and E -shaped in plan at their front elevations and have French roofs to pavilions as described by Historic Scotland. Site 1 (Plate 1), has a small square ventilation tower as a centrepiece. It has various extensions at its rear (northwest) linking it to other hospital buildings.

- 14.5.2 Site 2 comprises the administration buildings with clock tower (Plate 2). The clock tower is central with louvered bipartites to square stage, inset and curved above with clocks to elevations, louvered and slated pyramidal top. The main elevation, to the east, appears relatively intact. The rear of the building however is difficult to interpret. Several contemporary and modern buildings appear to be linked together. Immediately west of Site 2 exists a rectangular building of sandstone (Plate 3) which appears to be in a slightly dilapidated condition with a sagging roof and several missing window panes—this appears to be linked to Site 2 via an enclosed walkway which is shown on the 1895 Ordnance Survey map (Figure A7.3); it is not clear from Historic Scotland's data, whether this is included in the listing.
- 14.5.3 Several other buildings contained within the hospital grounds appear to be contemporary with the Listed Buildings. These include the mother and baby and psychiatric wards (Site 11) (Plate 4) in a building to the south of Site 2 which also has French roofs to pavilions and is marked as the 'asylum' on the 1895 Ordnance Survey Map (Figure A7.3). This building has however had external staircases covered by corrugated iron added to it as fire escapes and has had a modern extension, to the back as well as what appears to have been a contemporary extension a portion of which may have been removed (Plate 5). A three story white building (Site 12) (Plate 6), located to the north of Site 1 dates to the early 20th century, appearing on the 1934 Ordnance Survey map (Figure A7.5); its exterior appears relatively unaltered. The rest of the buildings on site are generally modern and the site as a whole contains buildings of varying dates and architectural styles.

14.6 Development Impact And Mitigation

14.6.1 Direct impacts

Potential impacts on known or unknown buried archaeological remains and upstanding buildings, including Listed Buildings, relate to the possibility of disturbing, removing or destroying *in situ* remains and artefacts during groundbreaking works (including excavation, construction and other works associated with the development) and building alteration within the proposed development area.

Eleven sites have been identified within the proposed development area. One of these (Site 5) is a general reference to the existence of the modern hospital on the site. Both the World War II balloon barrage mooring (Site 4) and Shieldhall (Sites 3, 8, & 13) and Merryflatts (Sites 9 & 10) have already been demolished. The Listed Buildings at 1345 Govan Road (Sites 1 & 2) as well as the asylum and early 20th century building (Sites 11-12) of 19th century date could be impacted upon. The scoping study for the Environmental Impact Assessment (September 2006) indicates that the development proposal provides for the retained use of the Listed Buildings. However, it also notes that exploratory work to assess the condition of the original foundations of the buildings may be required. Additional impacts may be incurred during any alteration work required to adapt the use of the buildings. The former asylum and early 20th century building (Sites 11-12) will be demolished between 2009-2010 as a result of the development.

Table 14.6 below outlines the predicted significance of impact by the development upon the remains found within the development area.

Table 14.6 Predicted Significance of Impact by the Development upon Remains

Site Number	Site Name	Archaeologic al Significance	Magnitude of direct impact from proposed development	Significanc e of impact
1	1345 Govan Road, Southern General Hospital	Regional	Low	Minor- Moderate
2	1345 Govan Road, Southern General Hospital, Administration Block	Regional	Low	Minor- Moderate
3	Shield Hall House	Negligible	None	None
4	Shieldhall, Hardgate Road Barrage Balloon Site	Negligible	None	None
5	Southern General Hospital	Local	Marginal	Negligible
8	Shieldhall	Negligible	None	None
9	Merryflatts House	Negligible	None	None
10	Merryflatts	Negligible	None	None
11	1345 Govan Road, Mother & Baby and psychiatric unit: former asylum	Local	High	Moderate
12	1345 Govan Road; early 20 th century building	Local	High	Moderate
13	Shieldhall	Negligible	None	None

The significance of impacts upon the sites located within the proposed development area has been rated in Table 14.6 above. It is predicted that there will be no impact upon the Shieldhall and Merryflatts sites (Sites 3, 8-10 13) or upon the Barrage Balloon mooring (Site 4) as these sites are no longer extant and any surviving below ground remains are likely to have been destroyed by the subsequent construction of the later hospital buildings. The development is expected to have a marginal impact of negligible significance on Southern General Hospital as a whole. This is because the hospital has undergone continuous development since it was first constructed in the mid 19th century; the majority of the buildings date to the 20th century and are of little cultural heritage value. The Listed Buildings at 1345 Govan Road (Sites 1-2) are expected to incur a low impact due to the proposed developments. This impact is predicted based upon the indication in the scoping study that the buildings will be retained and reused; but may require alteration, addition or repair to facilitate this reuse and thus their current state will be impacted upon. A low impact upon these Listed Buildings will be of minor-moderate significance. The former asylum and early 20th century building (Sites 11 & 12) will be demolished resulting in a high impact of moderate significance.

Given the extent of the development which has occurred on site since the mid 19th century it is unlikely that any hitherto unknown archaeological remains of significance survive *in situ* below the modern ground surface. Additionally, no sites identified in the wider study area indicate the possibility of encountering hitherto unknown remains.

14.7 Indirect impacts

Indirect impacts include potential visual effects on the settings of protected buildings and monuments. There are 2 Listed Buildings within the proposed development area. While outside the boundary of the proposed development area, and indeed the 100 m study area the Luma Light Factory (Site 14) may incur visual impacts from proposed 14 storey hospital buildings; as such impacts on it are assessed below. Table 14.7 below outlines the predicted significance of visual impacts upon protected sites, i.e. Listed Buildings, which may be affected by the proposed development.

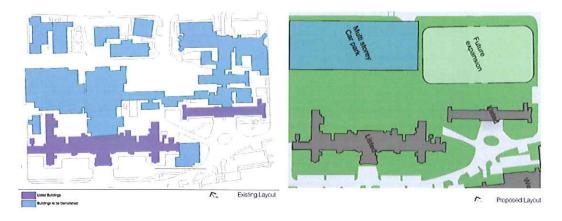
Table 14.7 Summary of Visual Impacts by the Proposed Development

Site Number	Site Name	Archaeological Significance	Magnitude of direct impact from proposed development	Significance of impact
1	1345 Govan Road, Southern General Hospital	Regional	Negligible	Negligible
2	1345 Govan Road, Southern General Hospital, Administration Block	Regional	Negligible	Negligible
14	Luma Factory	Regional	Negligible	Negligible

There will be a negligible visual impact upon the Listed Buildings at 1345 Govan Road (Sites 1 & 2) and upon the Luma Factory (Site No. 13). All of these buildings have already undergone some alteration and/or addition. The Luma Factory was originally industrial in nature and as such its visual setting may not have been a consideration in its construction. The Listed Buildings at 1345 Govan Road were built to be set in a medical environment. Continual development at Southern General Hospital Glasgow, and indeed in the wider Sheildhall area, has created a setting which includes several buildings of different ages and styles. As a result the impact of further development in the immediate curtilage of all three of these Listed Buildings will be of negligible significance. Only visual effects upon the settings of Listed Buildings are highlighted in this assessment, since their curtilage and amenity (in addition to their physical remains) are protected by legislation.

In the latter stages of the development, the removal of existing large extensions dating from various different periods which are currently attached to the Listed Buildings, will enhance their setting. The buildings/extensions to be demolished are shown in Figure 14.2 below.

Figure 14.2 Effects of Demolitions on Setting of Listed Buildings



14.8 Mitigation of significant impacts

- 14.8.1 National planning policies and planning guidance (NPPG5 & PAN42), as well as the local planning policies (Local Plan 2003, Structure Plan 2000), outlined in Section 14.1.3 of this chapter, require a mitigation response that is designed to investigate the potential for archaeological sites within the development area and thence allow the preservation or recording of any significant remains. Planning policies (NPPG18) also advocate the investigation and the recording or preservation of historic building remains.
- 14.8.2 Of the eleven sites identified during this assessment only the two Listed Buildings at 1345 Govan Road (Sites 1 & 2) and the asylum and early 20th century building (Sites 11 & 12) will require mitigation as a result of direct impacts; the other sites identified having already been destroyed, or as in the case of the Govan Burgh Survey (Site 6) comprise an archaeological event rather than actual remains, and will require no mitigation. It is recommended, in accordance with national and local planning policy on cultural heritage, that a programme of Historic Building Recording be undertaken prior to any alterations, either internal or external, that may be required to facilitate a change of use of the Listed Buildings. The level of Historic Building Recording required for the Listed Buildings will depend upon the extent of alterations proposed. The former asylum and the early 20th century building (Sites 11 & 12) do not necessarily warrant preservation in situ; however they should undergo programme of Historic Building Recording to facilitate preservation by record prior to demolition. It is recommended that a Level 1 programme of Historic Building Recording, including a full photographic and descriptive record, be undertaken on Sites 11 & 12 before they are demolished. The buildings (Sites 1-2 & 11-12) date from the initial phases of hospital construction, as such their footprints are likely to have remained relatively undisturbed since the mid 19th and early 20th centuries. Therefore in the event that ground breaking works are required to assess the condition of the original foundations associated with the Listed Buildings (Sites 1 & 2) and during the demolition of the former asylum and the early 20th century building (Sites 11 & 12); an archaeological watching brief should be employed, in accordance with national and local planning policies on cultural heritage. The aim of this watching brief would be to identify and record any archaeological features of significance including any remains associated with the construction of the buildings.
- 14.8.3 Potential visual impacts on the setting the Listed Buildings at 1345 Govan Road (Sites 1 & 2) and the Luma Factory (Site 14), by the proposed development, were identified in this assessment and are considered to be of negligible significance.

14.9 References

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14.9.2 Cartographic references

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- 1895 Ordnance Survey Lanarkshire: Glasgow and its Environs Sheet V.12; Renfrewshire Sheets VIII.16 & XII.4 (parts of), 1:2500
- 1913 Ordnance Survey Lanarkshire Sheet V.12; Renfrewshire Sheets VIII.16 & VIII.16 & XII.4, 1:2500
- 1934 Ordnance Survey Lanarkshire Sheet V.12 & 15, 1:2500
- 1948 Ordnance Survey Plan 26/5365NE, 1:1250
- 1948 Ordnance Survey Plan NS5365NW, 1:1250
- 1948 Ordnance Survey Plan NS5365SE, 1:1250
- 1949 Ordnance Survey Plan 26/5366SE, 1:1250
- 1950 Ordnance Survey Plan 26/5365, 1:2500
- 1951 Ordnance Survey Plan NS5366SE, 1:1250
- 1961 Ordnance Survey Plan NS5365NW, 1:1250
- 1961 Ordnance Survey Plan NS5366SE, 1:1250
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- 1964 Ordnance Survey Plan NS5265-5366, 1:2500
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1970	Ordnance Survey Plan NS5365NE, 1:1250
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1971	Ordnance Survey Plan NS5265-5365, 1:2500
1985	Ordnance Survey Plan NS5365NE, 1:1250
1985	Ordnance Survey Plan NS5365SW, 1:1250
1985	Ordnance Survey Plan NS5366SE, 1:1250
1985	Ordnance Survey Plan NS5366SW, 1:1250
1987	Ordnance Survey Plan NS5366SW, 1:1250
1988	Ordnance Survey Plan NS5365NW, 1:1250
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1993a	Ordnance Survey Plan NS5365NE, 1:1250
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1995	Ordnance Survey Plan NS5365NE, 1:1250
1995	Ordnance Survey Plan NS5365NW, 1:1250
1995	Ordnance Survey Plan NS5365SE, 1:1250
1995	Ordnance Survey Plan NS5365SW, 1:1250

15.0 ECOLOGY, NATURE CONSERVATION AND BIODIVERSITY

Summary

The New South Glasgow Hospital site lies within a built-up urban area and comprises a mixture of buildings of varying age, scale and construction, mowed grass, hardstanding and an area of greenspace which is partly wooded on the western boundary, on the site of the former small holding next to the ambulance station. More than 350 trees are identified in a Glasgow City Council Tree Preservation Order for the site. A small ditch runs for a short distance through the greenspace, into a culvert under the hospital grounds.

The site and its surroundings have no nature conservation designations. An ecological walkover survey identified no potentially significant impacts on habitats, birds, invertebrates or plants. A bat survey found no evidence of bats on site, but several buildings have potential for bat roosts. Precautionary measures are proposed to ensure no adverse impacts on bat species. Measures to avoid the spread of invasive plants, particularly Japanese Knotweed, are also proposed. Ecological impacts resulting from the proposed development are assessed as negligible, provided all appropriate mitigation is implemented.

15.1 Introduction

This chapter considers the impacts of the proposed development on the ecology of the site and surrounding area.

The hospital site comprises a mixture of standing buildings, mowed grass, hardstanding and an extensive area of wild ground on the site of the former small holding next to the ambulance station. A small ditch runs for a short distance through the wild area, into a culvert under the hospital grounds. Existing ecological resources are likely to be limited.

SKM was commissioned in February 2006 by Greater Glasgow Health Board to carry out a preliminary ecological appraisal of the proposed development site. The purpose of the appraisal was to collect information on ecological issues to be addressed in an Environmental Impact Assessment (EIA). The scope of the appraisal was to identify any ecological issues, including the likelihood of protected species (e.g. bats, water voles etc) and the presence of Japanese Knotweed (*Polygonum cuspidatum*) on the site. The walkover survey was carried out by Karen Blake, Principal Ecologist, on Tuesday 7th February 2006, in dry clear conditions. This chapter includes the results of the appraisal and discusses the likelihood of Protected Species being affected by the development works proposed at the Southern General Hospital.

15.2 Methodology

The methodology for the assessment of effects on ecology and nature conservation included:

- Desk-based study, including consultations with SNH and Glasgow City Council, Glasgow Museums Resource Centre, Natural History
- Review of Glasgow Biodiversity Action Plan
- Site Walkover survey, February 2006 (noted above)

The walkover survey visit comprised a consultation with a member of staff from the estates department, and a walkover of the site, with visual inspection of all areas surrounding the existing buildings (including gardens between the buildings) and car

parks. Photographs were taken of the undeveloped scrub area to the north of the site, which forms part of the proposed development.

The relative value of ecological features is based on the following classifications (with examples) as provided in Table 15.1.

Table 15.1 Value of Ecological Resources

Level of Value	Examples
International	Internationally designated or proposed sites such as Ramsar Sites, Special Protected Areas, Biosphere Reserves and Special Areas of Conservation, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species.
National	Nationally designated sites such as SSSIs, or non-designated sites meeting SSSI selection criteria, NNRs, Marine Nature Reserves, NCR Grade 1 sites. Those containing viable areas of any key habitat identified in the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book species (excluding scarce species), or supplying critical elements of their habitat requirements.
Regional	Sites containing viable areas of threatened habitats listed in a Regional BAP (or some Natural Areas), comfortably exceeding SINC criteria, but not meeting SSSI selection criteria. Sites supporting viable breeding populations of Nationally Scarce species or those included in the Regional BAP (or some Natural Areas) on account of their rarity, or supplying critical elements of their habitat requirements.
Local	This is sometimes sub-divided into 'High-', 'Moderate-' and 'Low-Local': High: Sites meeting the criteria for a county or metropolitan area designation (such as SINC or SMI), which may include amenity and educational criteria in urban areas. Ancient semi-natural woodland. Designated Local Nature Reserves. Sites containing viable areas of any key habitat identified in the County BAP (or some Natural Areas). Sites supporting viable breeding populations of species known to be county/metropolitan rarities (e.g. featuring in a county 'red data book' or included in the county/metropolitan BAP or some Natural Areas), or supplying critical elements of their habitat requirements. Moderate: Undesignated sites, or features considered to appreciably enrich the habitat resource within the context of the Borough or District, or included in the Borough or District BAP or some Natural Areas. Amenity and educational functions will be recognised in urban areas. Sites supporting viable breeding populations of species listed in the Borough or District BAP or some Natural Areas, or supplying critical elements of their habitat requirements. Low: Undesignated sites, or features considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood (e.g. a species-rich hedgerow).
Negligible	Low grade and widespread habitats.

Note: Where species or habitats occur in more than one category, the highest value is applicable

15.3 Limitations to Assessment

The site survey provided only a snapshot in time. Owing to the dynamic nature of ecosystems. It is feasible that the ecological status of the site will alter between the time of the survey, the granting of planning approval and the beginning of construction. Therefore, an ecological impact assessment carried out in the future may require additional survey work to confirm the preliminary findings reported here.

No internal inspection of the buildings or loft spaces was undertaken during the bat survey, and no internal search of the buildings or roof spaces was performed. The survey was limited to an assessment of the suitability of the buildings from the outside. In addition, the survey was undertaken from ground level, which limited the extent of assessment of some of the taller buildings.

15.4 Designations and Guidance

15.4.1 International and National designations

There are no sites with international designations within the Glasgow City Council area. Some 5 km to the north west, within Renfrewshire, is the Inner Clyde Estuary SPA/Ramsaar while the Black Cart SPA lies some 5 km to the west, on the north side of Glasgow Airport.

There are no SSSIs on or in the vicinity of the site.

15.4.2 Local Plan Designations

Sites of Interest for Nature Conservation (SINCs)

There are no statutory designated sites for nature conservation within the study area. Glasgow has 36 city wide SINCs. There are no SINCs in the vicinity of the hospital site. The nearest SINC is at Pollock Country Park and Pollock Estate, some 3 km to the south, at 481 hectares, the largest Site of Importance for Nature Conservation within the city.

Tree Preservation Orders

Glasgow City Council Tree Preservation Order Number GDC 052 (1995) Southern General Hospital (Ward 39) identifies the following TPOs on the site:

- 57 trees specified individually
- 29 groups of trees (3-46 trees)

Some 358 trees in total are identified in the TPO. Species identified include:

Lime, Cherry, Sycamore, Birch, Ash, Oak, Maple, Willow, Scots Pine, Bird cherry, Holly, Pear, Prunus, Elm, Larch, Apple, Sorbus, Horse Chestnut, Rowan, Elder, Swedish Whitebeam, Acer, Laburnus, Lombardy Poplar, Goat Willow.

The TPO prohibits any felling, topping, lopping, uprooting, damage or destruction of all identified trees without the consent of the planning authority.

Some species have special protection under the Species and Habitats Directive (European Protected Species) or the Wildlife and Countryside Act, including all species of bats, badgers, otters, water voles and great crested newts, among others. The site was examined to determine the likelihood of any protected species occupying the area, which would be subject to special mitigation measures.

15.4.3 Relevant Regulations and Guidance

There is a range of European, National and local guidance on ecology and nature conservation issues – species and habitats. Those which are relevant to the NSGH site are noted below.

The Conservation (Natural Habitats Etc) Regulations 1994

These regulations transpose EC nature conservation directives into UK law.

Scottish Office Circular 6/1995 (and update June 2000)

This circular provides guidance on assessing the significance of any project on a Natura 2000 Site i.e. a Spa or SAC.

Nature Conservation (Scotland) Act 2004

Passed by the Scottish Parliament on 5 May 2004 and effective from November 2004, it introduces a wide range of protection and enforcement measures to safeguard and enhance wildlife. In addition to new measures to protect wildlife and habitats under this Act, biodiversity is identified as a responsibility of public bodies and they have a duty to conserve biodiversity whilst exercising their functions.

United Kingdom Biodiversity Action Plan (UKBAP)

This Plan implements the Government's commitment to the Earth Summit in Rio de Janeiro in 1992. It identifies priority habitats and species for the UK.

Glasgow Local Biodiversity Action Plan, 2001

Glasgow's LBAP was launched in September 2001 and comprised an introductory booklet along with 9 Species Action Plans (SAPs) and 11 Habitat Action Plans (HAPs). A further 10 Action Plans were produced in September 2002, with more being planned for future publication. Each individual Species or Habitat Action Plan has a number of objectives, and details actions to be carried out in order to conserve and enhance populations of particular animal and plant species, or to protect and enhance valuable habitats.

Fundamental to understanding and conserving Glasgow's wildlife is a knowledge of what species occur, or are known to have formerly occurred, within Glasgow. An Audit document was produced in 2001 listing the 3,545 species of animals, plants and fungi recorded within Glasgow (pre and post-1950). The LBAP is a process which should take advantage of opportunities for partnership working, new projects and funding as these become available. The monitoring of actions is essential to ensure that the action targets and objectives of each plan are being achieved.

Natural Heritage Futures-West Central Belt

This recent publication by SNH provides a vision of sustainable land use and development. It seeks to reverse trends in decreasing diversity, loss of habitat and loss of local character. The key priorities are an integrated approach to all land-uses and the need for dialogue to ensure this co-ordinated approach.

Population Status of Birds in the UK: Birds of Conservation Concern 2002-2007 This document is newly published by the RSPB and identifies UK bird species in terms of conservation concern, with Red List species being of highest concern.

Protected Sites

In the absence of European and UK designated sites, regional protection is provided by the non-statutory Wildlife Sites and Sites of Importance for Nature Conservation.

Protected Species

There is a legal obligation to ensure that species-specific surveys are undertaken to ensure that no wildlife laws are broken by the rail link proposals. Known protected species include Bats, Otter, Water Vole and Badger. The relevant legislation for known species is:

United Kingdom

- Badger: Appendix III of Bern Convention of the Conservation of European Wildlife and Natural Habitats; Protection of Badgers Act 1992; Wildlife & Countryside Act 1981, Schedule 5; and
- Water Vole: Wildlife & Countryside Act 1981 Section 9 (4a, 4b).

European

 Otter: Appendix III of Bern Convention of the Conservation of European Wildlife and Natural Habitats; Annexes 2 & 4 of EC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora; Wildlife & Countryside Act 1981, Schedules 5 & 6; CITES 1; Bats: Appendix II of Bern Convention of the Conservation of European Wildlife and Natural Habitats; Appendix II of Bonn Convention on the Conservation of Migratory Species of Wild Animals; Annexe 4 of EC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora; Wildlife & Countryside Act 1981, Schedules 5&6.

In general this legislation protects both species and their shelters.

Other Guidance

- 1 EIA Handbook, SNH 2002.
- 2 Scottish Biodiversity List. www.biodiversityscotland.gov.uk.

15.4.4 Consultation Responses

Responses received from statutory and non-statutory consultees, as part of the Scoping and EIA processes, included the following comments on ecology and nature conservation:

Glasgow and Clyde Valley Green Network (November 2006)

The Green Network Partnership wishes to encourage and support redevelopment of the Southern General hospital so as to maximise the contribution of the site to the Glasgow and Clyde Valley Green Network.

Specific objectives are to maximise the value of the site in terms of:

- Landscape quality of greenspace;
- Use value by local communities, hospital related staff, patients and visitors; and
- Biodiversity value.

In addition to promoting a high quality greenspace environment within the site itself, the Partnership is seeking to encourage the development of linkages between the site and its surrounding area recognising, for example:

- The impact that a major site of high environmental quality can make in helping to promote Govan as a competitive place for investment;
- The contribution that the development can make in promoting more sustainable travel - walking, cycling, and use of public transport - if attractive and safe access routes can be created between key points; and
- The potential of the site to contribute to the development of effective habitat networks across the Glasgow and Clyde Valley area.

Biodiversity

The biodiversity value of the site may be enhanced through careful attention to greenspace design, planting and management. Design proposals should be set in context of local biodiversity objectives and be structured to provide effective linkage with other local greenspace sites.

Temporary Greenspace

The construction period extends across a number of years and this will be a difficult time for staff and patients given that the hospital is intended to remain fully functioning over the period. Opportunities may exist to incorporate temporary greenspace into the site at various stages during the development programme in order to enhance the working environment.

Glasgow City Council (Comments on Campus Development Plan)

There are currently no nature conservation designations within the site; however the development of the site provides an opportunity to contribute to local biodiversity. The development of Sustainable Urban Drainage Schemes within the site should provide an opportunity for innovate use of biodiversity and provide for a duality of use.

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The drainage scheme should therefore incorporate biodiversity and be useable as open space that meets the needs of the new community that is being created.

The proposal will be expected to demonstrate compatibility with the aims and objectives of the Local Biodiversity Action Plan. The Developer should identify appropriate measures to protect, enhance and promote existing habitats and/or create new habitats, and provide effective management of these habitats.

Development that would have an adverse effect on habitats or species protected under British or European Law, or identified as a priority in UK or Local Biodiversity Action plans, or other valuable habitats, would normally be refused. Therefore the developer requires to demonstrate that:

- a) Public benefits at a local level clearly outweigh the value of the habitat for biodiversity conservation;
- The development will be sited and designated to minimise adverse impacts on the biodiversity of the site; including its environmental quality, ecological status and viability; and
- c) There will be no further fragmentation or isolation of habitats as a result of the development.

Where there is evidence to suggest that a habitat or species of importance exists on the site, the developer may be required at his own expense to undertake a survey of the site's natural environment. Where planning permission is granted, planning conditions will be imposed, or agreements negotiated to minimise disturbance or put alternative conservation measures in place.

Where possible developers should incorporate existing habitats and identify suitable opportunities for creating and restoring habitats, wildlife corridors and enhancement schemes.

The balance between amenity space and habitats, the incorporation of SUDS, the planting and species, the relationships between spaces and buildings are each issues which will need to be addressed to satisfy these policy requirements. The open space provided should link to the biodiversity and SUDS provision and be an integral part of the access provision for cycling and walking. Opportunity should be taken to link through to the river.

Renfrewshire Council

In it's response to GCC's Scoping Consultation Renfrewshire Council noted that 'reassurances would be required on the management of work on site to minimise and control surface water runoff or other discharges, especially those which could adversely affect the Clyde foreshore in Renfrewshire, where a Ramsaar site is designated and recognised by Policy ENV 1of the Renfrewshire Local Plan. The Inner Clyde Estuary Special Protection Area refers. Further details of the site management and method statements to consider these matters would be required'.

15.5 Baseline Conditions

15.5.1 Site Description

The development area comprises a mixture of standing buildings, manicured grass, hardstanding and an extensive area of wild ground on the site of the former smallholding next to the new ambulance station. A small ditch runs for a short distance through the wild area, into a culvert under the hospital.

The wild area is generally good for wildlife, comprising a mixture of grassland, ruderal vegetation (e.g. rosebay willowherb etc), and mature trees. Areas of mature trees will

provide bird breeding sites and the potential for bat species. Some trees were noted as being partially rotten with hollows suitable for animal and bird occupation. Japanese knotweed stands are present throughout the wild area, and are encroaching into some of the managed area as well.

There is a green corridor (a linear arrangement of green features such as trees, verges etc) linking the site with the M8 motorway and the River Clyde. A fox was seen on the wild area, which may be living underneath the portakabins on site and making use of the green corridor.

Around the perimeter of the wild area, there is extensive evidence of tipping of a variety of materials, including tarmac, rubble, wood and wood chippings, litter and builder's waste

15.5.2 Biological Records

Biological Records for the area around the Southern General Hospital in Glasgow, were provided by the Glasgow Museums Resource Centre. These include: a simple species list, a list of species on the various conservation lists, and species on the Scottish Biodiversity List. These records are included as Appendix 6.

Most of the botanical records were made by the local BSBI recorder, as part of the Changing Flora of Glasgow Project, a project aimed at recording all plant species found in Glasgow which ran between the early 1980s and late 1990s. The moth records (and a few other records) are casual records made by the County moth recorder for Renfrewshire. The other records are individual casual records which have been passed to the record centre.

15.5.3 Habitats & Species

Japanese Knotweed

Japanese Knotweed Fallopia japonica is an alien invasive, introduced species scheduled under Section 14, Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). The Act states that:

"If any person plants or causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence."

The species has widely colonised a variety of areas in the UK. Although it dies back in winter, Japanese Knotweed stands generally persist and mature stands are readily identifiable, even in winter. It should be noted, however, that young plants may be concealed by other vegetation at this time of year, and no guarantee is given that knotweed is not present in other areas, that were not identified in this survey.

There were several stands of Japanese knotweed within the wild area, as well as some plants in the managed areas. In particular, plants were noted:

- Encroaching over the boundary between the currently developed area and the wild area – at the end of the car park past building that houses the management annex.
- Behind the container at the eastern end of the wild area, around the back of the contractor's compound.

Japanese Knotweed spreads by vegetative means, i.e. all new plants are created by fragments of existing plants and a new plant can grow from a fragment of root as small as 0.8 grams. It has an extensive underground rhizome (root) system that can extend several metres around and deep, depending on ground conditions. Under the Wildlife and Countryside Act 1981 it is an offence 'to plant or otherwise encourage' the growth of Japanese Knotweed. This could include cutting the plant or roots or disturbing surrounding soil, if not correctly managed. Spread can occur through

Modernising Glasgow's Acute Hospital Services

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THE FUTURE OF GLASGOW'S HOSPITAL SERVICES: FIRST PHASE OF CONSULTATION

CONTENTS

See also Erratum - 6th November 2000

Click on Chapter title below to view full document.

1. Introduction

Sets out the Board's aims as it embarked upon a period of 5 months consultation on Modernising the Acute Hospital Services in Glasgow.

2. The Nature of the Debate

Explains that debate has been vigorous with sectional campaigning, but with others recognising the complexity of the issues and the knock-on effect one decision has on other parts of the strategy.

3. The Theme of Consolidating In-Patient Services

Proposals sought the creation of larger Specialist teams to achieve real benefits for patient care and for staff – this could be achieved by creating 3 in-patient sites. Support for Gartnavel General and a single in-patient site for the southside was overwhelming: Trusts and medical advisory committees suggest creating a single in-patient centre for North and East Glasgow at the GRI.

4. Ambulatory Care

Explains the rationale behind Ambulatory Care Hospitals for Stobhill and the Victoria in easing local access to hospital services. Opposition to Ambulatory Care Hospitals has centred upon them being untried, no in-patient back-up should complications arise and will lead to split-site working – each issue is explored further.

5. Accident and Emergency and Related Services

Detailed section on the role Trauma Centres and Minor Injuries Units can play and the impact they can have on patients' attendances, ambulances' response times and major disaster planning. Raises the issue of the capacity of the A&E Unit at GRI.

6. Access, Public Transport and Traffic Impact

Public transport, road congestion and car parking at hospitals – all major concerns – now and in the future. This chapter includes detailed analysis of the Southside Hospital Travel Time Study – commissioned by the South-East Health Forum.

7. Population Change, Cross-Boundary Flows and Wider Planning Choices

Gives recognition to the falling population in GGNHSB's areas (which may be addressed by the creation of new neighbourhoods, better housing and the arrival of asylum seekers), neighbouring Health Boards' plans for the future and the potential role of hospitals nearby.

8. Bed Numbers

Picks up on the issue of the error in the original calculation of the bed numbers and the need to further discuss with clinicians an agreed bed model.

9. The Financial Position and Affordability

Explores the affordability issue of the proposals, bearing in mind that Health Boards have received additional NHS funds in the recent past. The paper suggests that this level of funding may be difficult to sustain in the longer term and examines the implications. This chapter maps out a framework for the known choices with other Ministerial announcements still to be made.

10. Decision-Making and Risk

Emphasises the responsibilities of Health Boards in taking account of affordability, best value for taxpayers money, synergy of public policies and managing the risks – recognising that decisions in one area affects another part of the strategy.

11. South Glasgow Services

The issue which has attracted by far the most comment: consensus for single in-patient hospital for South Glasgow – the issue of debate is where should it be located.

12. The GRI/Stobhill Partnership

Addresses the detail of the proposals for change that have developed during the consultation debate. Shows this debate on a specialty by specialty basis.

13. Services in West Glasgow

The chapter deals with Orthopaedic services in the West, the wish to see the acceleration of the transfer of the Beatson Oncology Centre to Gartnavel and the plans for Cardiothoracic services.

14. Other Specialties

Specific proposals for Dermatology, Nephrology, Urology and the linkages with aspects of Mental Health services.

15. Maternal and Child Health

Addresses further the suggestion made about the possibility of re-locating Yorkhill's hospital services into brand new facilities.

16. Future of Glasgow Dental Hospital and School

Separate consideration now to be given to the future of Glasgow's Dental Hospital and School following a structural survey of the existing building. Options are explored.

17. Summary of Proposed Decisions and Further Work After December 2000

Sets out the issues and propositions from the consultation which will require decisions at the end of the consultation process in December 2000.

ANNEXES

Please note: Only some of the Annexes are available on-line. Should you require a copy of those not on-line, please contact us.

- Annex 1. <u>List of Consultation Leaflets</u>
- Annex 2. The Process of Consultation:
 - i) Feedback from Public Meetings
- **Annex 3.** Analysis of the Responses to the Consultation:
 - i) Response by Subject Matter by Organisation
 - ii) Individual Responses
 - iii) Standard Responses
 - iv) Graphic Illustrations
- Annex 4. Report on a Visit to the Jethro Arscott Day Surgery Unit, Bexhill
- Annex 5. Scottish Ambulance Service Daily Shift in Greater Glasgow
- Annex 6. A&E Services: A Model for Gauging Future Flows
- Annex 7. "Southside Hospitals Travel Time Study", Mr A W Drewette, Consulting Traffic and Transportation

Engineer

Annex 8. Proposal for a Unified Dermatology Service for Glasgow

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Annex 9. Maternal and Child Health: 10 Key Principles

Annex 10. <u>Acute Hospital Services – How it Looks to us Now</u>

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ERRATUM of Report on the First Phase of Public Consultation on the Future of Acute Hospital Services

On page 63, in the Southside decision matrix, against criterion 18 there is an inconsistency in the amounts identified as capital expenditure on new buildings at the Southern General Hospital. One column refers to £41 million spent and one to £33 million.

The figure in each of the two columns should be the same - i.e. £33 million, made up of:

£m

Oral/maxillo facial and ENT units 11

Spinal injuries unit 9

Westmarc (artificial limbs & wheelchair service) 5

A&E and Out-Patient Department 4

Podiatry Department (foot care) 2

Physically Disabled Rehabilitation Unit 2

<u>33</u>

It is also the case that £12 million is currently being spent to build a unit for care of the elderly (through Private Finance Initiative). This was originally included in the first column (and with an uncorrected typing error the overall total was shown as £41 million rather than £45 million). However the nature of the PFI agreement is that it cannot be relinquished even if the Southern General closed and would have to continue in use. It was therefore removed from the overall total, resulting in a total of £33 million being a true "sunk cost" penalty of walking away from recent significant capital investment, This correction was made in the right hand column, should have been made also in the left hand column but was overlooked in the final rush to get the Board agenda paper finalised.

Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

1. INTRODUCTION

- 1. In April, 2000 Greater Glasgow NHS Board (GGNHSB) embarked on a formal consultation about how best to reshape Glasgow's hospital services. We had five aims:
 - a. modern facilities for a better patient experience.
 - b. creating larger specialist teams of doctors in order to assure more continuous availability of specialists and to tackle new requirements governing the working hours of senior and junior (trainee) doctors.
 - c. maintaining local access for as much as possible.
 - d. creating a pattern of hospital services that made sense across Glasgow as a whole.
 - e. levering in major capital investment in a way that was affordable.
- 2. A comprehensive range of 22 leaflets was published setting out the proposals, background information and detail. Annex 1 lists them. Cross-references to them are made in the text of this paper. A large number of public and staff meetings were held. Similarly there were discussions with the City Council, other local authorities whose populations use Glasgow hospitals, the Local Health Council, Glasgow University, neighbouring Health Boards, MSPs, the Scottish Ambulance Service, Strathclyde Passenger Transport Executive and other interested parties. Press coverage was extensive. Annex 2 to this paper itemises the consultation activity in detail.
- 3. This report describes the nature of responses we have received, reflects on their implications and suggests what response the Health Board might now make.
- 4. This response to consultation should itself be the subject of further consultation throughout October and November with the Health Board finally reviewing the position at its meeting on 19th December, 2000.



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2. THE NATURE OF THE DEBATE

- 1. Although a small minority of those who responded regarded the issues as simple ("just replace the existing hospitals in situ"), the great majority recognised that the issues are complicated and that decisions affecting one part of the Glasgow hospital system have disconcerting repercussions elsewhere in the system (uncannily like a Rubik's Cube). In particular trying to reconcile:
 - clinician advice about concentrating teams/facilities versus public preferences about access.
 - o operational linkages between different specialties.
 - hospital planning considerations with wider traffic and transport issues.
 - the need to invest more money in acute hospital services versus the imperative of building up primary care, community health services, children's services, addiction services, mental health services and other services aimed to tackle fundamental inequalities in health.
 - timing\phasing and financial flows.

continues to be a difficult challenge.

- 2. As might be expected the debate has been vigorous. Some of it has explicitly taken the form of sectional campaigning rather debating the inter-relationship of issues and the difficult trade-offs involved in making choices. On the other hand some of the responses we have received demonstrate a considerable investment of time and effort to understand the issues and to develop a coherent analysis. We are especially grateful to those individuals and organisations because they have contributed greatly to the testing of ideas and propositions.
- 3. It is striking just how uneven the pattern of response has been; confirming that those living in circumstances of deprivation are often those least likely to take part in a debate of this type. Yet their needs must always be in the forefront of our minds. In particular, issues of access and cost of public transport fares are highly significant for them. Later in this paper we reflect on how the consultation process has helped us to focus our minds on these needs. Sections 5 and 6 explore the issues.
- 4. One intrinsic difficulty in a debate at this stage of strategic planning is that many commentators feel frustrated at the lack of convincing operational detail underpinning some of the proposals. But such detail can only come with the costly and time-consuming work that is part of the next stage of the planning process the development of Outline Business Cases. There is a Catch-22 here. Some people will only be convinced if they see the detail but the detail cannot be provided until the fundamental strategic direction has been agreed. Ironically, many of the comments we received ignored factual detail that we had provided in the consultation leaflets (for example on the numbers and different types of patients currently flowing into Accident and Emergency Departments and how they could be managed in future). It was also clear that many people were expressing concerns about things we were not proposing anyway (for example, many people attending out-patient clinics at the Victoria were concerned about having to go to the Southern General but that was not what we

- were proposing at all). Similarly some campaigners described the Southern General option as a proposal for "refurbishing it" whereas the option essentially results in demolition of all the old buildings and their replacement by brand new buildings.
- 5. Much of the debate has focused on issues common across Glasgow as a whole (such as public transport; traffic impact; the role of stand-alone Ambulatory Care Centres; bed numbers etc). The debate about the Southside proposals has been intense. There has been less about the pattern in North Glasgow, probably because the documents published in April posed questions rather than made definitive suggestions (in North-East Glasgow at least).
- 6. Annexe 3 describes the range, subject matter, source and weight of responses that we received.
- 7. Public decision-making can never be based on popularity\unpopularity alone. The Scottish Parliament, taxpayers, professional regulatory bodies and the like expect other criteria to be taken into account, such as:
 - a. value for money.
 - b. management of risk.
 - c. opportunity cost and wider implications for other areas of public policy.
 - d. affordability.
 - e. meeting basic quality standards for service organisation and delivery.
 - f. how these factors inter-relate with each other.

In analysing the responses to consultation we have sought to cross reference them to this framework for decision-making.

8. In the time since the end of the first phase of the consultation period we have not been able to absorb all the details but believe this paper does capture the key issues. If there are other substantive issues relevant to the strategic decisions that need to be taken in December we hope they will be identified over the next few weeks.



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3. THE THEME OF CONSOLIDATING IN-PATIENT SERVICES

- 1. In our proposals we argued that **creating larger specialist teams** would greatly increase our ability to ensure that patients most needing treatment and care by specialist teams would get it regardless of the impact of annual leave, study leave, sick leave, and rostered time off. Although published evidence that specialist teams secure the best outcomes for patients is not extensive, where it does exist it is compelling, and intuitively most of us would prefer to be seen by someone specialising in our particular condition, especially if we are seriously ill. Leaflets 3 and 4 explained the issues.
- 2. In addition larger clinical teams make it easier to fulfil the new limitations on senior and junior doctors' working hour commitments. Indeed without such consolidation it will be virtually impossible in most specialties to meet the now very stringent limitations, bearing in mind the national shortage in the supply of doctors, the need not to dilute the skills of doctors and the punitive costs incurred if junior doctors' hours are not significantly reduced. Leaflet 10 explained the issues in detail but has now been overtaken by a national agreement on junior doctors' hours and pay which makes much of the present pattern of rotas in Glasgow unacceptable, unsustainable and unaffordable.

Currently North Glasgow Trust has 626 junior doctors with a cost of £23.6 million.

If rotas remain unchanged, by 2002 the new pay agreement means the cost will be £31.8 million.

- 3. Achievement of the shorter working hours for junior doctors requires a significant **reduction in the number of emergency cover rosters** in the city. A relatively small specialty such as gynaecology, for example, cannot sustain five emergency rotas for a mere 126 beds in the city (its present bed complement). ENT cannot sustain three rotas for its 59 beds. Other specialties face similar challenges.
- 4. These realities led us to suggest that:
 - a. the single site New Western Infirmary at Gartnavel, formally approved by the then Secretary of State in 1996, should be confirmed. (Leaflet 18)
 - b. a single in-patient centre for the Southside should be created. (Leaflet 16)
 - c. the long term continuation of in-patient beds at Stobhill was unlikely to be sustainable. (Leaflet 19)
- 5. In a later section in this paper we discuss the practical implications of achieving the single-site hospital at **Gartnavel** previously approved in 1996. Support for this move remains almost universal among the responses we have received.
- 6. The proposition that there should be a **single Southside in-patient centre** was strongly endorsed by the Area Medical Committee (representing GPs and hospital doctors), the Local Health Council, most local MSPs, and most members of the public who responded (2,876 out of 3,416 = 84%). The issues of controversy are where such a hospital should be located and whether it should be complemented by a stand alone Ambulatory Care Centre at the Victoria Infirmary site.

7. As far as **North-East Glasgow** is concerned, in our original consultation We 84ggested (in leaflet 19) that the future of orthopsedics, gynaecology, ophthalmology, urology, and EMT as in-patient specialties at Stobhill was unsustainable given their already small bed numbers and the pressure on doctors' emergency rotas. We suggested that the question of whether there should be a single general surgical service for the 340,000 people of North and East Glasgow should be debated – we implied that there should be such a service. Finally we asked whether general medicine could be sustained alone on the Stobhill site if general surgery had no in-patient presence there. We report in more detail later in this paper what response we got to these suggestions. Although there has not been a large volume of response to these questions, the North Glasgow trust itself and the medical advisory machinery are advising us that we should aim to create a single in-patient centre for North and East Glasgow at the GRI – the question of when and how this can be completed in practice is explored later in this paper.



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4. AMBULATORY CARE

- 1. In our proposals we observed that 85% to 90% or more of the patient encounters with the acute hospital services was now on a "walk-in, walk-out, same day" basis. These include out-patient clinics; diagnostic tests such as x-ray or ECG; out-patient physiotherapy, speech therapy and the like; day surgery and minor injury attendance at Accident and Emergency Departments. The jargon term for this type of work is "Ambulatory Care". Leaflets 6 and 7 explained the background.
- 2. We confirmed that the GRI, Gartnavel and the Southside in-patient centre would provide ambulatory care services on site to complement their in-patient work. This has been welcomed by all of those commenting on this aspect of our proposals.
- 3. We also suggested that in order to meet the public's wish to preserve as much local access to hospital services as possible, we should build new purpose-designed Ambulatory Care Centres at both Stobhill and the Victoria Infirmary. We demonstrated how such units would provide around 90% of the hospital services currently used by local people at those sites. (See leaflets 16 and 19)
- 4. The suggestion that there should be "stand-alone" Ambulatory Care Centres at Stobhill and the Victoria Infirmary has attracted opposition on several grounds:
 - a. the concept of Ambulatory Care Centres is said by some to be "untried".
 - b. more particularly some clinicians have expressed concern that patient safety might be compromised if day surgery or interventional radiology are undertaken on a site with no in-patient beds or intensive care back up if complications arise. Some MSPs, the Local Health Council, Area Medical Committee and members of the public have picked up on this issue and are adding their voices to the issue.
 - c. some clinicians argue that doing some of their ambulatory care work on one site and their in-patient working on another constitutes "split-site working" which they regard as inefficient and undesirable.
 - d. some clinicians fear that the stand-alone Ambulatory Care Centres might result in inefficient duplication or triplication of expensive radiological, endoscopic and laboratory equipment.

5. Are Ambulatory Care Centres "untried"?

No. Ambulatory Care is what we already do now. Around 90% of hospital work is ambulatory care. An Ambulatory Care Centre is simply a purpose-designed setting that allows ambulatory care to be undertaken more efficiently, in a pleasant environment, providing greater scope for a "one-stop" experience of diagnosis and treatment for more patients. Our present hospitals have developed so haphazardly that they defeat the aim of organising the patient's experience efficiently and as pleasantly as possible. For us not to seek to provide facilities that are organised around the needs of the patient, exploiting new equipment and technologies and giving staff teams a more satisfying holistic relationship with patients is unthinkable. Nor do the design challenges take us into uncharted territory.

Our present "tried and tested" models of organisation are frankly too often a mess. They include services and equipment that fail to insulate the interests of elective patients against the dominating needs of emergency patients. They result in delays. They entail multiple visits when one or two would suffice. They entail long treks around confusing corridors and between different buildings.

Purpose-built Ambulatory Care Centres solve these problems. They enable investment to be made in facilities and services that will transform the patients' experience for the better.

6. Are day surgery and interventional radiology unsafe without back-up of inpatient services?

The scarcity of stand-alone Ambulatory Care Centres in the UK, the lack of published data on complication rates, and to-day's more exposed medicolegal position of doctors have caused some doctors to express this anxiety.

There is a stand-alone Ambulatory Care day surgery service at Bexhill in Sussex which has operational links to the Conquest Hospital in Hastings (around 7 miles away). It has undertaken 14,000 day cases, of which only 71 (0.5%) have required transfer to Hastings. Admissions are usually for the side effects of anaesthesia or pain medication and are usually confined to nausea and vomiting. Annex 4 provides a report compiled following a visit to the Unit.

Data provided by Stobhill shows that in 1998\99 out of 12,045 day cases 105 (0.87%) were subsequently admitted to an in-patient bed. The reasons included:

20 "social reasons"

24 experienced post-operative nausea and vomiting (usually due to analgesia).

7 were classified as "under recovered".

2 were kept in for "observation".

14 were described as "unfit".

7 were experiencing pain.

2 had vision problems.

1 needed to be intubated.

8 were described as having a medical, heart or blood pressure problems.

6 were bleeding.

1 had their operation abandoned.

13 needed further investigation or surgery.

What is not clear is whether any of these could have been avoided through improved routines for screening for suitability for selection for day surgery in the first place. Nor is it clear how many of them required intervention by doctors as opposed to routine post-operative observation and care by nurses on an extended day basis. (The Stobhill Day Surgery Unit closes at 7.00 p.m.)

Similarly it is not clear how many of them were so unwell or serious that transport by ambulance to another hospital would have been considered if there had been no on-site beds (i.e. the Bexhill\Hastings arrangement).

However, given the number of admissions at Stobhill for social reasons or because a bit more time was needed to recover from analgesia it is likely that a stand-alone Ambulatory Surgery service at Stobhill with recovery beds open

later into the evening (or overnight, as in the proposal for the Victoria Infirmary Ambulatory Care Centre) would entail only a similar transfer rate to in-patient beds as is experienced at Bexhill (0.5% of 12,045 cases would be 60 transfers – just over one case a week and a rate of transfer 58 times less than experienced by West Glasgow patients in their current use of West Glasgow hospitals' split-site working).

Clinical audit data from the Victoria Infirmary indicates that in the last six years no day surgery patients have needed to be transferred into Intensive Care. In the UK many surgeons, who also work in the NHS, undertake significant in-patient surgery in private hospitals with no on-site intensive care facilities.

In the USA there are around 1,300 free-standing Ambulatory Care Centres which are neither based on hospital sites nor merely what the Americans call "officebased" (i.e. undertaking very minor procedures in a doctor's consulting rooms). The great majority of these undertake endoscopies and day surgery in ENT, gastroenterology, ophthalmology, urology, orthopaedics and general surgery. Many are twenty to thirty minutes away from the link in-patient hospital (source: **Ambulatory Systems Development Consulting – Website** http://www.asdconsulting.com). It is clear that such centres are seen as a rapidly growing part of the American healthcare scene (ibid). The Federated Ambulatory Surgery Association (FASA) in the USA reports a high level of patient satisfaction. A survey undertaken by the US Department of Health of 837 patients who had cataract extraction with intraocular lens implant, upper gastrointestinal endoscopy, colonoscopy or bunion-removal showed that patients preferred out-patient surgery to in-patient stays, 98% expressed satisfaction with the service and post-operative care was not a problem for most patients (see www.fasa.org/aschistory.html). FASA also report that only 9.6% of surgery centres offered 23 hour post-surgical recovery care.

GGNHSB understands why clinicians feel cautious in to-day's climate but we do not think the concept of day surgery in stand-alone Ambulatory Care Centres should be discarded, particularly since it is so widespread in the USA, a country with the highest level of medical litigation and extensive accreditation regimes. We have now made a contact in the USA and will arrange for clinicians and other interested parties to visit some hospitals to examine issues of risk management at first hand.

7. "Split-site Working"

"Split-site working" is understandably an emotive term. In Glasgow it has gained particular resonance from the wholly unsatisfactory patterns of care and working arrangements experienced in West Glasgow where many patients have to be transferred between the Western and Gartnavel in mid-episode of care and where staff also find themselves shuttling backwards and forwards between the two sites.

The creation of the New Western Infirmary at Gartnavel, with its own on-site Ambulatory Care Service will mean that physicians and surgeons based there will not experience "split-site working" (although some specialists based at Gartnavel may very well do clinics or provide expert advice\support at other hospitals elsewhere in Glasgow or further afield as part of a Managed Clinical Network).

However, the contention that stand-alone Ambulatory Care Centres at Stobhill and the Victoria Infirmary would cause "split-site working" needs closer

- a. For patients attending the Victoria or Stobhill Ambulatory Care Centre only a tiny proportion might find themselves transferred to the Southside in-patient centre or GRI respectively (e.g. those experiencing problems after day surgery see above or those who attend an out-patient clinic but are then assessed as needing immediate in-patient admission relatively few in number). A level of transfers such as this is nothing like the volume and seriousness experienced currently by West Glasgow hospitals' patients. (The Ambulance Service carries 3,500 patients per year between the West Glasgow Hospitals).
- b. Patient Records will need to transfer between hospital sites if a patient is, say, attending the Ambulatory Care Centre but later has to be admitted as an in-patient to, say, the Southside in-patient centre either electively or as an emergency. By the time the new pattern of service is implemented the NHS in Scotland will surely be well down the path of electronic records and any remaining logistics involving paper records ought to be amenable to good organisation.
- c. Staff movement between sites is inefficient and disruptive if it has to take place erratically or several times during a working day. However, the creation of larger clinical teams will mean that for most staff their work can be more adequately planned on a weekly or monthly basis and the designation of teammembers to concentrate on emergency cover on a programmed basis will free other team members from the clashes between emergency and elective work which is currently such a blight. Thus if a consultant is programmed to spend a day at, say, the Stobhill Ambulatory Care Centre we would not expect him or her to be called back to the GRI to deal with an emergency.

Having a programme of work which takes staff to different hospitals on different days can rightly be regarded as "multi-site working" but that does not entail the disruptions caused by the "split-site working" as typified by the current Western\Gartnavel arrangement.

d. <u>Duplication of equipment</u> is theoretically a possibility in any situation but one that can only be addressed at a later stage of planning. The essence of an improved service for patients requires smartly scheduled access to equipment. The Ambulatory Care Centre model will be dealing with the vast majority of patients and each Centre will have equipment to meet its needs. It is the concentration of in-patient work onto fewer sites which will reduce the risks of duplication of equipment for what they need. We have already made the point that because Ambulatory Care Centres insulate their patients from the pressures of urgency associated with in-patients, they experience fewer delays, cancellations and costs (to the NHS and to its patients) which such inefficiency causes.

The NHS has experienced at least two decades of seriously inadequate investment in new equipment. There are encouraging signs that the problem is now being addressed, driven by a governmental determination that the experience of patients must be transformed for the better.

Our commitment to them reflects our desire that patients should have as much local access to as many services as possible. The concept of stand-alone Ambulatory Care Centres would, in particular, protect this aspect of service quality for the current users of service at Stobhill and the Victoria Infirmary – areas where issues of local access are particularly important to local people, judging from the comments received during the consultation.

We do not think the concept of day surgery at these Centres should be discarded. GGNHSB would not wish to put in place arrangements which cannot be managed safely. We will organise further work and enquiry to look at risk management arrangements in the USA which is a highly litigious society and takes risk management very seriously.

We do not think the "day surgery tail" should wag the "Ambulatory Care dog". For the two hospitals the <u>total</u> amount of day surgery amounts to only around 5% or less of the expected Ambulatory Care Centre workload. We certainly do not think the provision of Ambulatory Care Centres for the two sites should be lost even if, as a result of more tightly defined selection of suitable patients, slightly less day surgery were done than we previously estimated.

We think the convenience of local access for patients for most services is more important than eliminating a pattern of multi-site working for staff, especially since that multi-site working should be well programmed. Both the proposed stand-alone Ambulatory Care Centres would be located in, or close to, populations with high levels of socio-economic deprivation, for whom ease of access is very important.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

6. ACCESS, PUBLIC TRANSPORT AND TRAFFIC IMPACT

- 1. These issues were the foundation of more comment in the consultation than anything else.
- 2. GGNHSB's proposal to have stand-alone **Ambulatory Care Centres and associated Minor Injuries Units** at the Victoria Infirmary and at Stobhill was intended precisely to address the issue of local accessibility. In all the debate, virtually nobody has acknowledged this feature and its significance. It is, therefore worth repeating:

	(a)	(b)	(c)	
	Present total patient encounters\ episodes per year	Future	Number affected by change of service location	%
Victoria Infirmary	393,000	316,500	76,500	19.5
Stobhill	324,747	287,537	37,210	11.5

These figures were derived from the 1998\99 Blue Book. Column (a) shows all inpatients, day surgery cases, out-patients (consultant clinics, physio and other therapies, hearing aids, out-patient, diagnostic services), A & E attendances and day patients. Column (b) assumes day surgery cases, out-patients, day patients and estimated adult attendances at the local Minor Injuries Unit at the rate of 60% - see Scenarios 5 and 6 in Annex 6. Of the other 40% of A & E attendances who go to main A & E Departments at GRI or Southern General / Cowglen, many of those will 'walk-in, walk-out' on the same day.

Of the numbers in column (c), approximately 40% at the Victoria (around 30,500) are in-patients. At Stobhill the figure is around 75% (28,000 in-patients). Many of these will be emergency admissions, taken to hospital by ambulance. For them, ease of access for themselves is not an issue.

Our proposals therefore offer state-of-the art modern facilities at the Victoria Infirmary and Stobhill with no change in accessibility for a massive number of over 700,000 attendances. The number of patients from these two hospitals affected by change adds up to around 114,000 by contrast. This is not to dismiss the issue of access but it does need to be put in context.

- 3. The impact of our proposals in West Glasgow has attracted relatively little comment other than in relation to Accident and Emergency services (see Section 5) and orthopaedics. In fact, with the exception of the population clustered immediately around the Western Infirmary the transfer of services to Gartnavel (or to the Southern General if that becomes the chosen option for South Glasgow) makes access to hospital services easier for most of the West Glasgow catchment population.
- 4. What has come out loud and clear from the consultation is that public transport access, road congestion and car parking are seen as problems here and now. Even if

we were not proposing change in hospital configuration these are issues that would need to be addressed. The concerns that have been identified are as follows:

	Action needed	
a) Car parking at GRI	Implement multi-story car park as required by planning consent for the Maternity\Plastic Surgery\Emergency Receiving Scheme currently under construction.	
b) Traffic congestion at Townhead (affecting GRI)	Mostly outside the influence of the NHS, but re-orientation of more of GRI's services along Alexandra Parade will mean that the problems of Castle Street are not added to. Completion of the M74 in the strategic planning period would take pressure off the M8.	
c) On-site access for A & E at GRI	Detailed planning issue that the Trust must resolve. There is scope to do so.	
d) Bus routes to GRI from East Glasgow	These are seen as poor at some times of the day. The Trust need to explore this issue with the bus companies. GGNHSB also needs to explore whether the creation of a more locally accessible healthcare facility in the East End offering a range of diagnostic and therapy services and a Minor Injuries Unit is feasible. This would improve access to services for this population and reduce some of the traffic pressure local to the GRI.	
e) Car parking at Gartnavel	The Trust acknowledges this needs to be addressed in the next stages of site development planning. This issue emphasises the importance of not overloading the Gartnavel site with services transferred from elsewhere.	
f) Access from Hyndland Station to Gartnavel	Strathclyde Passenger Transport Executive intend to make the station easier to use for people with restricted mobility. The Trust need to review access from the station to the hospital for such people and improve where necessary.	
g) Making Gartnavel site more attractive for bus routes to come on site	Trust to consider at the next stage of planning. Strathclyde PTE can offer advice as to what is needed.	
h) Traffic densities at Gartnavel.	Identified as an issue to be addressed in finalising the whole site development plan (including mental health services). The Trust need to work with the City Council and local residents in addressing	

	this. Access onto the Great Western Road will be a central focus of this work.	
i) Car parking at Southern General	An issue often quoted by opponents of the Southern General Hospital option. Yet the hospital, like Stobhill, currently has the best parking provision of any hospital in Glasgow and there are as many anecdotes about absolute ease of parking as there are difficulties. It is possible that the issue is one of needing improved sign-posting on site and advance information for patients and visitors – people may currently be experiencing localised difficulty on site and not realising that there is plenty of space elsewhere. For the future, if the hospital is the site of the new Southside Hospital, it would have plenty of space for car parking.	
j) Congestion through the Clyde Tunnel affecting road access to the Southern General	Liaison between tunnel management and the ambulance services ensures that this is not a problem for emergency ambulance access. At most times traffic flows smoothly, with the tunnel being no more prone to blockage or congestion than surface roads in the conurbation. When traffic is congested driver\passenger perceptions of delay often feel much greater than the actuality measured in minutes of delay.	
k) Bus access onto the Southern General site	Some buses already go onto the Southern General site. The Trust need to explore with Strathclyde PTE and the bus companies the scope for an increase in routing through the site, especially where it can result in people not having to use the unpopular pedestrian underpass at Drumoyne.	
I) Bus routes to the Southern General	This issue is considered more fully below.	
m) Car parking at the Victoria Infirmary	There is virtually none available at present. Redevelopment of the site owned by the Trust to build an Ambulatory Care Centre will include car parking – a significant improvement on the present position.	

a. Some responses to the consultation have complained that our proposals have not been underpinned by detailed Traffic Impact Analysis. This will certainly need to be done at the next stage of detailed planning and discussed with City Council planners.

However, such analyses are costly to undertake and we did not feel that expense could be justified until there was clarity about strategic service direction.

- b. However, there are some observations that can be made on this issue at this stage:
 - a. predictions of future traffic levels and their relationship to road capacity are fraught with uncertainties depending on:
 - what improvements are made in public transport (now an explicit UK government priority).
 - increases in car ownership.
 - economic, retail, leisure and housing developments (such as Braehead, Pacific Quay, Drumchapel New Neighbourhood, Clyde Port Authority granaries).
 - investment in new roads (e.g. M74 extension; Glasgow Southern Orbital).
 - f. by proposing Ambulatory Care Centres at Stobhill and the Victoria Infirmary we are creating less change in current traffic patterns than would be the case if we adopted the three hospitals option preferred by the Area Medical Committee for example (GRI, Gartnavel and Southside).
 - g. moving the Southern General's in-patient and A & E services to the Victoria Infirmary would have a significantly adverse traffic impact in an area where there is little spare capacity on the existing road network and little opportunity to substantially improve it.
 - h. the prospect of increased traffic impact at Gartnavel is unavoidable unless we continue its present split-site working with the Western (clinically unacceptable) or closed it altogether, redistributing its services onto other sites altogether. We say more about this in Section 7.
 - i. much has been made of traffic impact in concentrating more in-patient services at the Southern General but it has more local manoeuvrability in choice of road access than most other hospitals:

Gartnavel	Great Western Road only. (Access off Crow Road is not supported by City Planners or local residents).
GRI	Castle Street from the east and south Wishart Street from the south Alexandra Parade from the east and north.
Victoria	The Langside Road, Battlefield Road, Grange Road tight triangle at the junction of busy east / west, north\south through routes.
Stobhill	Stobhill Road (narrow residential street), Belmont Road from Balgrayhill Road, back entrance of Balornock Road
Southern General	Served by a "box of roads" giving flexible local choices (Govan Road, Renfrew Road, Shieldhall Road, Hardgate Road, Moss Road).
927	Beyond that there are other choices of approach involving Edmiston Road into Shieldhall Road, M8 into Moss Road,

Berryknowes Road from Paisley Road to Moss Road. These choices offer opportunities for spreading traffic impact.

- 7. One of the most valuable contributions to debate in the consultation period was a "Southside Hospital Travel Time Study" commissioned from Mr. A.W. Drewette, a Consulting Traffic and Transportation Engineer by the Health Forum (South East). This is attached at Annex 7. Mr. Drewette's study contains much useful information. Unfortunately the brief he was given limits the full value of his study because several relevant factors were omitted:
 - a. the significance of patient access southwards for some residents in the west of Glasgow north of the river (e.g. for A & E, maternity, gynaecology, orthopaedic services).
 - b. the options of access to GRI or Hairmyres for people in Rutherglen and Cambuslang.
 - c. non-GGNHSB residents in Renfrewshire who use the Southern General.
- 8. Nevertheless Mr. Drewette's report is helpful because it demonstrates the application of accepted strategic transport models. Mr. Drewette is also scrupulous to point out that his modelling would be affected by future changes in public transport, car usage and road capacity.
- 9. In the debate about access to Cowglen versus Southern General, Mr. Drewette's report (his Table 1) is very helpful in providing insights at the individual patient\visitor level.
 - It demonstrates how accessible the Victoria Infirmary site is to such a large proportion of the Southside population by both car and public transport. However, as we explain later in Section 11, we do not regard the creation of a new Southside Hospital on the Victoria Infirmary campus as a viable option.
- 10. We therefore need to examine Mr. Drewette's Table 1 to see what light it casts on the significance of access to the choice between Southern General and Cowglen.
- 11. Taking public transport we need to consider first the needs of in-patients. Many of them will have been taken to hospital by ambulance.

For example, over 10,000 of the Victoria Infirmary's 29,000 in-patient admissions were in general medicine and the majority of them will have been taken by ambulance. This is corroborated by the one week survey of A & E attendances in 1998 which suggest that on an annual basis around 8,320 GP referrals are conveyed to the Victoria Infirmary by A & E\urgent ambulance. The total number of A & E\urgent ambulance journeys to the hospital in 1999\2000 was just over 16,000 (Ambulance Service data). Not all of these would have been admitted as in-patients but a large proportion would have. If, say, of the hospital's 29,000 inpatients just under half were conveyed by ambulance, the other 15,000 to 17,000 would have come in by other means. With family, friends and neighbours rallying round in a time of need, and with a not insignificant proportion of the population able to afford taxis, it is difficult to see how in-patients using public transport to go to the Victoria Infirmary would be more than about 20 to 25 people a day (7,300 to 9,000 people a year).

12. The larger need arises from patients' visitors. Mr. Drewette's report suggests that each patient might have 5 sets of visitors per day (3 sets travelling by car or taxi, 2 sets travelling by public transport). We have no separate survey data to confirm or vary this assumption. Arguably as an average it might be on the high side but is certainly helpful for modelling purposes. Mr. Drewette's analysis of the travel implications of this pattern is flawed slightly since he assumes 100% bed occupancy whereas 80% to 85% is probably a more realistic average figure. A51308927

Mr. Drewette converts his calculations into assessments of additional traffic vehicle kilometres travelled and total person hours spent on public transport per day. Without seeing the detail underneath the calculations it is not possible to gain a picture of what his global figures mean in terms of individual people's experience. However, taking his own assumptions about visiting rates, public transport users, bed numbers (but corrected to an 85% occupancy) and add a further assumption of 2 visitors per set of visitors, we can estimate that if the beds at the Victoria were re-located (to the Southern General or to Cowglen) the number of visitors using public transport would be:

	2 sets of visitors using public transport	
X	2 visitors per set	
X	2	2 journeys per visit (i.e. there and back)
X	485 (85% occupancy of 570 beds)	
visitor journeys per day by public transport, principally from people living in the current Victoria Infirmary catchment area.		principally from people living in the current

(If one felt that Mr. Drewette's estimate were too high and that <u>each</u> patient might get only one visitation per day using public transport, with an average of one and a half visitors per visitation, the figure would be:

	1	visitation per day
X	1.5	visitors per day
X	2	2 journeys each (there and back)
X	485	beds occupied
	1,455	visitor journeys by public transport per day.

This demonstrates that the global totals are very susceptible to only very slight changes in assumptions about number of visitations, numbers of visitors and mode of transport.

It is also the case that Mr. Drewette's analysis does not take into account the easing of patients' visitors' travel times resulting from our proposal to provide 120 rehabilitation beds at the Victoria Infirmary site. This would benefit precisely those people who have been expressing the most personal concern about this issue.

13. So, what are the implications of the choice between Cowglen and Southern General in terms of public transport access? Mr. Drewette's Table A shows the following profile of respective advantage in public transport times at off-peak (when most patient visitors will be travelling):

<u>Cowglen advantageous compared with Southern General by:</u> (minutes)

Mansewood	34.9
Thornliebank	29.0
Shawlands	28.8
Rouken Glen	21.9
Priesthill	21.8

Crookfur	21.8
Croftfoot	20.0
Govanhill	19.2
Pollokshields	13.3
Pollok	13.2
Cambuslang	12.3
Eaglesham	9.8
Burnside	9.4
Giffnock	8.6
Crookston	8.2
Mosspark	6.8
Castlemilk	6.7
Carmunnock	6.7 *
Oatlands	5.8
Rutherglen	5.6 *
Busby	4.5
Craigton	Equal *
Cathcart	2.1 SGH advantage over Cowglen
Hillington	2.9
Clarkston	3.6
Gorbals	5.5
Netherlee	7.1
Toryglen	8.3
Kirkhill (Newton Mearns)	8.3
Cardonald	8.4
Ibrox	14.7
Kingston	15.8
Drumoyne	23.6
Govan	26.9

* For these places SGH is advantageous during peak hour travel by public transport.

This analysis shows us that for 19 of the 34 places the difference in public transport time is 10 minutes per journey or less. Moreover in commissioning Mr. Drewette's report the Health Forum (South-East) omitted to ask him to include Renfrew and Dean Park in his analysis nor any flows from north of the river or further afield (where access via the Underground and shuttle bus link from Govan station to the Southern General would be relevant).

14. It is worth taking a sideways look at the travel times by car columns in Mr. Drewette's Table 1. They suggest, for example, that the slow public transport access from places like Mansewood, parts of Pollok, Pollokshields, Shawlands and Thornliebank is not caused intrinsically by distance or road travel time but by bus frequencies and\or routing. Most if not all of these problems should be amenable to negotiation with the bus companies or by the development of dedicated shuttle bus routes to which we have already committed ourselves.

At an individual public transport user level therefore we do not consider that the public transport issue is a differentiator between the Southern General and Cowglen.

- For 19 of the 34 places the difference is 10 minutes per journey or less.
- In both cases public transport would need to be improved.
- In both cases most of the more onerous differences can be resolved by the development of express shuttle buses.
- In both cases, the 120 rehabilitation beds and the Ambulatory Care Centre at the Victoria Infirmary means that public transport access for the vast majority of people, especially the elderly, is no different from what it is now.
- 15. We must turn now to the question of road access and travel times by car (or taxi). Again Mr. Drewette's Table 1 is a helpful source of information. It shows, for example, that the Victoria Infirmary has the shortest travel times by car for 17 of the 34 places, while Cowglen has the shortest travel time for 10 places and Southern General 6. Crookston is equidistant in travel time to both Cowglen and the Southern General.

In understanding travel time as a differentiator between options for the future we need to look at the pattern of advantage between the Southern General and Cowglen. At off-peak times (which is when most patient visitors will be travelling) the profile is as follows:

<u>Cowglen advantageous compared with Southern General by</u>: (minutes)

Thornliebank	10.3
Mansewood	9.8
Giffnock	9.8
Netherlee	9.7
Cathcart	9.6

Croftfoot	9.5
Burnside	9.5
Rutherglen	8.5
Rouken Glen	8.4
Eaglesham	8.4
Clarkston	8.4
Carmunnock	8.4
Busby	8.4
Castlemilk	8.3
Kirkhill (Newton Mearns)	8.3
Crookfur	8.1
Priesthill	7.5
Toryglen	6.5
Shawlands	6.3
Cambuslang	5.7
Pollok	5.3
Govanhill	4.5
Oatlands	3.7
Mosspark	3.1
Pollokshields	2.4
Gorbals	1.8
Kingston	1.5
Crookston	Equal
Craigton	0.8 SGH advantage over Cowglen
Cardonald	1.9
Ibrox	2.3
Hillington	3.1
Govan	3.7
Drumoyne	4.0

Cowglen clearly has the balance of advantage. At what point might such differences become truly decisive at an individual driver\passenger level? At less than five minutes? At eight minutes? The maximum travel time given by Mr. Drewette in his Table A is 30 minutes from Burnside and from Cambuslang to the Southern General. (From each of these two places the alternative travel time to Cowglen is 20.6 minutes and 23.9 minutes respectively).

Thus the debate about the impact of access time for car\taxi users is contained within an envelope of 30 minutes of maximum actual travel time where the difference between the two options is six minutes or less for 15 of the 34 places. for

another 12 of the 34 places, the difference is less than 9 minutes.

16. The question of what significance to place on individuals' feelings about differences in travel times, whether by public transport or by car\taxi is fraught with subjectivity. For some people an extra ten minutes is onerous; others regard it as inconsequential. Mr. Drewette's Report quite correctly seeks to address this issue by converting it into an economic analysis (see Section 7 of his report).

As we have pointed out Mr. Drewette's analysis has some important drawbacks. It is based on 100% occupancy rather than 80-85%; it is highly susceptible to variations in the number of visitations to patients and the number of visitors per visitation; it will be influenced by the pattern of origin of journeys, which will not be of equal density or mode of transport from all 34 places, it ignores patient (and visitor flows) from Renfrew and from north of the river and it ignores the significance of maintaining 120 rehabilitation beds at the Victoria Infirmary site.

16. However, the analysis is still helpful in giving some sense of how wider economic considerations might look alongside the differences in cost to the NHS. Mr. Drewette suggests that the comparison of the two options would be (as discounted costs over 30 years):

	<u>£M</u>	£M
	SGH option	Cowglen Option
Additional travel time costs	72.0	32.1
Additional vehicle operating costs	5.9	1.2
Additional accident costs	<u>7.6</u>	<u>1.6</u>
	<u>85.5</u>	34.9

This needs to be seen against the difference in costs to the NHS. Compared with the present cost of hospital services in the Southside we estimated (see leaflet 16) that the Southern General option would cost us £11 million a year more whereas the Cowglen option would cost around £18 million a year more.

If that difference is discounted over 30 years at 6% in exactly the same way as Mr. Drewette's calculation the additional service cost of the Southern General over 30 years would be £151.4 million whilst that of Cowglen would be £247.7 million. Putting Mr. Drewette's transport-related 30 year cost alongside the equivalent 30 year calculation for NHS cost results in the following:

		Net Present Value at 6% over 30 years		
		Southern General Cowglen		
		<u>£m</u>	<u>£m</u>	
	Transport	85.5	34.9	
	Change in hospital running costs	151.4	247.7	
A51	TOTAL 808927	236.9	<u>282.6</u>	

The Southern General Hospital has a net economic advantage (when measured on transport and hospital running costs) of £45.7 million. This advantage would be even greater when the flaws in Mr. Drewette's analysis are taken into account (see earlier in this paragraph).

17. There is one final issue concerning access which has emerged from the consultation period. It concerns access to services for six areas each of which has not only significant problems of deprivation, social exclusion and poor health status but also difficulties with access to hospital services already – the East End, Rutherglen, Cambuslang, Castlemilk, Drumchapel and Clydebank and Kirkintilloch.

In each case there are already problems of access to services, including limitations in public transport (frequencies, routing and the cost of journeys involving more than one bus or bus\train combinations). Although GGNHSB cannot resolve all the problems of public transport in the Glasgow conurbation we can alleviate the access problem in three ways:

- a. firstly by subsidising or stimulating some hospital shuttle buses from key points.
- b. secondly by exploring scope to increase Community Transport Schemes. We understand that in London the Camden Community Transport Scheme has one hundred vehicles and one hundred and fifty staff, providing non-emergency patient transport to Barts, the Royal Free, Chase Farm Hospital and Enfield Community Trust. There are already community transport schemes in Greater Glasgow but they are usually localised, sometimes specialising on particular specialist purposes. There may be scope in Greater Glasgow to strengthen the capacity of community transport.
- c. secondly by strengthening local health services. This is most likely through working with Local Health Care Co-operatives and the Primary Care Trust to extend the range and quality of local primary care. Although these would not result in services on the scale proposed for the Ambulatory Care Centres at Stobhill and the Victoria Infirmary they would make a significant contribution to achieving easier local access to a wider range of healthcare and reduce pressure on waiting times elsewhere in the Glasgow NHS. GGNHSB commits itself to exploring these potentials with LHCCs, NHS Trusts, Social Inclusion Partnerships and local authorities.

We think it is highly likely that this work will also be relevant to other Social Inclusion Partnership areas such as Gorbals, Glasgow North and Pollok and we intend to explore the issues with them in the light of what we learn from discussion with the other SIPs.



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THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

7. POPULATION CHANGE, CROSS-BOUNDARY FLOWS AND WIDER PLANNING CHOICES

- 1. Some commentators have said that they regard future population changes as an important issue which we had not adequately addressed.
- 2. There are several features to consider:
 - a. overall change in population numbers and age structures.
 - b. changes in flows of patients across Health Board boundaries.
- 3. The GGNHSB population profile for the future is expected to decline although the rate of decline is susceptible to two relatively new factors:
 - a. a concerted effort by the Glasgow Alliance to reduce decline through the creation of New Neighbourhoods (at Drumchapel and Ruchill) and a continuing improvement in housing and infrastructure.
 - b. the expectation that Glasgow will be home for several thousand asylum seekers.

The Government population prediction used by the Arbuthnott Report in its calculations of funding used a 1994-based population projection which showed Greater Glasgow having a population of 893,000 in the year 2000, declining to 852,000 by 2010, a decline of 41,000 (or 4.6%). One might expect that due to the new factors referred to earlier the rate of decline might be rather slower.

- 4. Age structure has a particular impact on planning services for children, adolescents and the elderly, although in Greater Glasgow as much attention has to be given to its locally distinctive health status and patterns of illness. The impact of deprivation and social inclusion worsens many adults' health much earlier in their lives than elsewhere.
- 5. The impact of the scale of expected population change is marginal at the level of our strategic planning. It does not affect:
 - how many hospitals there should be.
 - how many Accident and Emergency Departments there should be.
 - the concept of Ambulatory Care Centres.

It <u>will</u> affect the number of beds provided, and that will need to be picked up by Trusts at the next stage of Outline Business Case planning. Even so, population change is only one factor in determining bed numbers – as we see in the next section of this paper.

6. As far as changes in flows of patients are concerned, we are already aware that Lanarkshire Health Board wish to see some changes affecting their residents. Discussions with Lanarkshire Health Board and the acute hospital Trusts concerned are still underway but it is anticipated that over a three year period from 2001\2 there will be fewer patients coming to Glasgow hospitals from the Cumbernauld, Wishaw, East Kilbride, Hamilton and Monklands areas. These changes have been translated into estimated numbers of cases.

7. In advance of definitive agreement being reached we cannot be precise about impact, but it might help to illustrate the impact by reference to a range of specialties affected. The numbers that follow are illustrative only:

In year one 2,200 fewer cases to North Glasgow, 1,100 fewer to South.

In year two 3,400 fewer cases to North Glasgow.

In year three 2,400 fewer cases to North Glasgow.

- 8. The impact on bed requirements depends on the mix between in-patient cases and day cases (which is not yet clear). If this followed the normal current ratio of cases to in-patient (1:3), then 1,100 fewer patients in South Glasgow might equate to 275 day cases, 825 in-patients. If those in-patients had average lengths of stay of as much as 5 days (which is relatively high), that equates to 4,125 bed days or around 13 beds at 85% occupancy. Clearly the potential impact is higher in North Glasgow, where a similar illustrative calculation results in an impact of some 96 beds (at a 5 day average length of stay). Clearly if the ratio of day cases to in-patient care is different or length of stay were less than 5 days which is likely then the impact on bed numbers is likely to be less than this.
- 9. What is more problematic is the loss of income from Lanarkshire. Because the bed numbers impact will be scattered in small numbers between different specialties and different hospitals it will be difficult for the Trusts to reduce their costs. This means prices to GGNHSB (mostly) and other Health Boards are likely to rise. The withdrawal of income is estimated at:

2001\2 £2.2 million

2002\3 £2.9 million

2003\4 £3.9 million

and the impact has to be factored into GGNHSB's financial planning.

10. Argyll and Clyde Health Board rightly draw attention to a more complex set of inter-relationships between their hospital services and those in Glasgow. For example, they point to the fact that a "modern healthcare facility (Royal Alexandra Hospital, Paisley) already exists a short distance from the Southern General and this could present significant opportunity for improved working and modernisation across boundaries".

The Chief Executive of GGNHSB has used several opportunities provided by Argyll and Clyde in the last two years to share thinking from within Greater Glasgow with a range of stakeholders in Argyll and Clyde. The Health Board response reflects the questions that have been raised on those occasions and provides a useful agenda for some further discussion both within the next two months and in the more detailed planning processes that lie beyond.

11. The dilemma of how to regard the potential roles of nearby hospitals such as the Royal Alexandra, Paisley; the Vale of Leven and Hairmyres has hovered uneasily through the process of reflection during the last two years. At one extreme one could say that South Glasgow does not need any new hospitals at all and that patients could argue either travel north of the river or outwards to the Royal Alexandra or Hairmyres. Both hospitals are modern and could be expanded if necessary. Yet this is not a strategy which Greater Glasgow NHS Board felt it could promote with any prospect of success even if it were minded to (which it was not).

12. We think the more fruitful line of approach is through encouraging collaboration between clinical teams, using the Managed Clinical Network approach as a model. It is highly likely that problems such as single-handed specialists, or gaps in specialist services, or conforming to to-day's requirements on doctors' working hours, would look very different when viewed from the perspective of having larger clinical teams, telemedicine links, electronic records and joint clinical policies. We think this is the way forward; not hospital closures nor the loss of particular clinical specialties from their local access.



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THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

8. BED NUMBERS

- 1. In our original consultation material we went to some lengths to explain why "bed numbers" has been such a source of hot debate for so many years and why trying to predict requirements for the future is difficult. We referred to trends that might continue to reduce beds (decline in population, new clinical techniques etc) and trends that might increase them (more elderly people in the population, for example).
- 2. We wished to be cautious in our approach using the phased approach to the implementing the strategy during the decade to take stock of bed requirements half way through the programme of change.
- 3. We published two different projections for bed requirements. One showed the position if demand in general medicine continued to grow (at a rate of 5% by 2005) while requirement for beds in other specialties remained unchanged in that period due to continuing reduction in length of stay and increases in day surgery. The other assumed 2% growth in all specialties by 2005.
- 4. Regrettably the calculations we had done for us made an error in the way they calculated the average length of stay of remaining in-patients after applying the assumption that all current zero, one and two day stay in-patients would in future be treated on a day case basis.
- 5. Some of the assumptions in the model were also queried:
 - a. our model assumed 85% occupancy; clinicians feel 80% makes it easier to manage peaks in demand.
 - b. the assumption that all zero, one and two day stay in-patients would in future be day cases was felt by clinicians to be over-ambitious.
 - c. the variant that assumed no increase in demand impacting on bed requirements in surgery was queried, although no statistically argued alternative hypothesis was put forward.
- 6. Clearly we would wish to correct the statistical error but a meaningful agreed bed model cannot be finalised until there has been further discussion with clinicians about:
 - a. legitimate scope for increased rates of day surgery (we are below national casemix adjusted benchmarks in a number of specialties).
 - b. an analytical approach to verifying different bed occupancy rates against their capacity to absorb peaks in demand in large or small pools of beds.
 - c. bed requirements to deal with medical emergency admissions (for the immediate future we shall be increasing medical bed numbers this winter 2000\1).
- 1. As an example of the range within which this work now needs to be done, the Table below shows:
 - a. the current number of beds in the North Glasgow Trust.
 - b. the (arithmetically flawed) number suggested by ISD.
 - c. figures suggested in recent discussions with North Glasgow clinicians.

A5130	Specialty	Current beds	ISD	Trust Clinical
	ENT 8927	32	8	24

General Surgery 373 263 350 Ophthalmology 22 6 16 Urology 82 41 79 ITU 17 17 17 Cardiology 103 66 95 Clinical Haematology 26 24 27 Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30	1	-!	!	
Urology 82 41 79 ITU 17 17 17 Cardiology 103 66 95 Clinical Haematology 26 24 27 Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194 <td>General Surgery</td> <td>373</td> <td>263</td> <td>350</td>	General Surgery	373	263	350
ITU 17 17 17 Cardiology 103 66 95 Clinical Haematology 26 24 27 Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Ophthalmology	22	6	16
Cardiology 103 66 95 Clinical Haematology 26 24 27 Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Urology	82	41	79
Clinical Haematology 26 24 27 Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	ITU	17	17	17
Communicable Disease 32 24 20 Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Cardiology	103	66	95
Dermatology 20 6 18 Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Clinical Haematology	26	24	27
Gastroenterology 8 3 General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Communicable Disease	32	24	20
General Medicine (inc. Resp\Haem) 417 504 513 Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Dermatology	20	6	18
Homoeopathy 15 15 15 Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Gastroenterology		8	3
Nephrology 61 62 73 Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	General Medicine (inc. Resp\Haem)	417	504	513
Respiratory Medicine 90 69 89 Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Homoeopathy	15	15	15
Rheumatology 39 38 33 A & E 22 0 0 Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Nephrology	61	62	73
A & E	Respiratory Medicine	90	69	89
Orthopaedics 172 122 158 Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Rheumatology	39	38	33
Plastics 76 42 70 Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	A & E	22	0	0
Burns 22 15 15 Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Orthopaedics	172	122	158
Oncology 141 130 130 Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Plastics	76	42	70
Gynaecology 75 32 30 Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Burns	22	15	15
Cardiothoracic 94 94 94 Geriatric Assessment 194 194 194	Oncology	141	130	130
Geriatric Assessment 194 194 194	Gynaecology	75	32	30
	Cardiothoracic	94	94	94
TOTAL 2125 1792 2051	Geriatric Assessment	194	194	194
	TOTAL	2125	1792	2051

8. In part the relevance of this work becomes clear at the Outline Business Case stage of planning. At our present stage of strategic planning, the significance impacts on overall affordability. Other factors impact on affordability too, such as the capital charges of new buildings or the speed with which we procure new buildings. Work is in hand to refine these affordability profiles during the next few weeks.



Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

9. THE FINANCIAL POSITION AND AFFORDABILITY

- 1. In our original consultation we made the point that GGNHSB was willing to invest significantly more revenue into acute services in order to pay the higher capital changes for modern buildings replacing heavily depreciated old buildings. For the Southside alone we were willing to invest an extra £11 million per year for new buildings that would offer a greatly improved patient experience. We also envisaged increased revenue costs in North Glasgow but not on the same scale (see leaflet 15).
- 2. In considering options for the Southside we estimated that the Cowglen option would cost an extra £18.4 million in revenue per year (see leaflet 16). The difference between this and the option of replacing the old Southern General Hospital buildings is around £7.3 million. We expressed the opinion that this opportunity cost of £7.3 million was too high a price to pay for having bricks and mortar in place A rather than place B. We pointed out that £7.3 million would pay for better primary care, shorter waiting times, better rehabilitation services, more effective treatment for addictions, better services for children, more district nurses. £7.3 million would pay for around 350 front-line health care staff (nurses, physios etc). We felt using money these ways would be significantly more in the interest of people's health and quality of service.
- 3. It was disappointing that the responses to the consultation have almost universally ignored this fundamental issue of choice which has a real impact on what care can be provided for vulnerable people.
 - The majority of responses have had the tone of demanding that the extra cost of the Cowglen option be met and if necessary GGNHSB should demand that the Scottish Executive simply provide the extra money. This displays a lack of recognition that Health Board revenue funding is essentially formula-driven.
- 4. One major development since the consultation began has been the UK Chancellor's March budget and his announcement of significant additional funding for the NHS. We have reviewed the financial prospects for this decade in the light of that announcement. We have also taken stock of known financial pressures and the implications of the government's challenge to the NHS that extra funding must secure a transformation in the NHS's responsiveness and quality drastically shorter waiting times, for example.
- 5. The money allocated to Health Boards is shared between them on a formula basis. The Arbuthnott Report published in 1999 has been subject to consultation and has recently published revised proposals. These are currently being considered by the Minister. The Arbuthnott revised proposals include an illustrative projection of what GGNHSB's allocations might be over the period up to and including 2003\4. In developing a financial framework we have used that illustration but must await Ministerial announcements before we can confirm the framework.

- 6. Our financial framework allows some sense to be made of what money is likely to be available for particular types of service development. The model has several features:
 - a. its baseline is the current position for 2000\1. It does not yet include any of the "Tobacco Tax" money (£26 million nationally) that the Minister has earmarked for a "Public Health Fund". Some of it is being used for national projects but around £13 million is flowing through to Health Boards. GGNHSB's share varies year from year but is around £2.5 million per year to be used on local public health initiatives, over half of which will have been specified nationally by the Minister. Nor does this baseline include any additional money that might possibly be allocated to GGNHSB later in 2000\1 as a first step in moving us towards our new Arbuthnott target.
 - b. its baseline includes GMS cash limited funds, ACT Research funding, GP out of hours, HIV\AIDS, and distinction awards funding which were not included in the baseline given in the most recent Arbuthnott Report "illustration".
 - c. the model incorporates a comparison of current spending with the service programme component originally developed by Arbuthnott in building up the new national formula in his review group's first report. Since we do not yet know what revisions have been made to the Arbuthnott formula following the national exercise of consultation and further work this comparison is subject to revision. However, what it shows is this:

Programme area	Current spending 2000\1 £m	Current GGNHSB Spending (%)	Target population in Arbuthnott Formula (%)	Comment
Acute services	347.6	56.77%	53.43%	GGNHSB currently spending more on acute services than the Arbuthnott share suggests.
Mental Health	81.1	13.57%	17.38%	GGNHSB spending below what Arbuthnott share suggests.
Community Health Services	80.2	13.10%	9.96%	GGNHSB spending above what Arbuthnott share suggests, but this element of the Arbuthnott formula was the one subject to the most adverse criticism (i.e. in underestimating the Community Health Service needs and costs elements within the formula).
Maternity Services	27.6	4.51%	4.67%	No increase\decrease indicated, but present spending in Glasgow on maternity services is unbalanced between hospital delivery services and pre and post-natal care, with the balance threatening to worsen unless we reduce from three delivery units to two in line with falling birth numbers.
Learning Disabilities	38.7	6.32%	6.38%	No increase\decrease indicated on a formula basis. Existing JCCP agreements see fundamental re-shaping of services (including resource transfer to local authorities) as part of the plans to close Lennox Castle, RSNH and similar hospitals in Lanarkshire.
Geriatric Long Stay	35.0	5.72%	8.18%	Issues of definition arise here. The Arbuthnott category "geriatric long stay" cannot be seen in isolation from the pattern of complementary services for the elderly in acute hospitals and community health services. Glasgow currently has a relatively high level of hospital continuing care provision for the elderly.

It should be noted that the Arbuthnott formula does not have a separate programme element for children. In terms of using these comparisons to guide future investment choices in service delivery it makes sense to form three aggregations:

	2000\1 spend £m	Current GGNHSB proportion	Arbuthnott	Difference £m
Acute services	347.6	56.77%	53.43 %	-20.5
Mental health	83.1	13.57%	17.38 %	+23.3
Other programmes	181.5	<u>29.66%</u>	29.19%	- 2.8
_	612.2	100.00%	100.00%	0

Such an aggregation will allow flexibility in the 'Other Programmes' category in developing primary care community health responses to children, elderly people, people with physical or learning disabilities, problems of addiction and building capacity for healthy living in deprived communities. These areas of need would mainly be met from the 'Other Services' category. The cost of children's hospital services is currently reflected in the Acute Services category and would therefore access some development money through it. Similarly some (but not all) elements of addiction services are reflected in the cost of Mental Health Services.

- d. the model provides for the funding of pay and price inflation at a level above the GDP deflator, which reflects the experience of recent years. Thus in 2001\2 the GGNHSB allocation is expected to increase by £49.4 million, of which £18 million will be earmarked to cover the costs of inflation in hospital and community services and £12.2 million for inflation in the 'unified budget' which includes GP prescribing. In 2002\3 the model also provides for the increase in NHS employers' superannuation contributions which falls due that year (at a recurrent cost of £5.8 million).
- e. although the Comprehensive Spending Review announced by the Chancellor runs only to 2003\4 we have assumed that 2004\5 would have a similar profile.

The model ignores some year on year movements in the Joint Community Care Plan (JCCP) financial envelope. Principally in 2002\3 the JCCP shows a recurrent "surplus" of £1.7 million which restores transitional funding invested by GGNHSB in earlier years of the JCCP.

TABLE A

	2000\1 £m	2001\2 £m	2002\3 £m	2003\4 £m	2004\5 £m
INCOME					
4 00WA51308927	770.0	007.0	077.0	000.4	070 5

1. GGNHSB income base	776.8	827.8	8/1.2	929.4	9/8.5
2. Increase over previous year	51.0	49.4	52.2	49.1	48.9
3. Total Income	<u>827.8</u>	<u>877.2</u>	929.4	<u>978.5</u>	<u>1027.4</u>
4. Expenditure base	784.9	827.	877.2	929.4	978.5
5. Unified budget inflation (GP prescribing etc)	11.2	12.2	13.4	14.7	16.0
6. Provision for inflation in Trusts	17.4	18.0	24.4	19.7	20.4
7. Available for service development ①	14.3	<u>19.2</u> ³	14.4	14.7	12.5
8. Total Application of funds	827.8	<u>877.2</u>	929.4	<u>978.5</u>	1027.4

- The model assumes that line 7 investments are recurrently committed each year and become part of the following year's expenditure base in line 4.
- Includes £5.8 million for increase in NHS employers' superannuation contributions.
- Approximately £3 million of this £19.2 million is required for the balance to full year effect of developments started part way through 2000\1.
- Of the £827.8 million spending in 2000\1 approximately £200 million is spent on GP Prescribing and General Medical Services cash-limited services (GP services). The remaining £627 million is spent on acute hospital, mental health services and the other programmes defined in paragraph 9.6 (c) above.
 - 7. Line 7 in this model is the money available to meet the great array of competing service priorities already identified in previous Health Improvement Programmes or still to be developed in response to the National Plan for the NHS in Scotland which is expected to be published later this autumn.
 - 8. The question is how best to deploy the resources available in line 7 to meet the number of requirements:
 - a. whatever requirements emerge from the National Plan for the NHS in Scotland. Reduction in waiting times and improved cancer services are likely to be main features and will almost certainly entail a significant increase in the number of doctors, nurses, radiographers, physiotherapists and other professions supplementary to medicine. To give a sense of orders of magnitude, 25 to 30 extra consultants would cost around £1.5 million to £2.0 million in salary costs alone. Each incremental increase of 50 more nurses, physiotherapists, radiographers etc., would cost around £1.25 million to £1.5 million. Extra linear accelerators for treating cancer will be expensive to maintain.
 - b. implementation of the GGNHSB's existing plans for the Mental Health Framework, including services for Mentally Disordered Offenders.
 - c. improving services for the management of chronic disease such as epilepsy, diabetes, multiple sclerosis, chronic fatigue syndrome, the effects of head injury, and so on.
 - d. strengthening the range and quality of primary care.
 - e. investing in public health measures, service improvements and community development aimed at tackling inequalities in health and the problems associated with socio-economic deprivation, especially among children, people with addictions and those experiencing homelessness and social exclusion.
 - f. providing a wider range of locally accessible health care in communities such as the East End, Rutherglen, Cambuslang, Castlemilk, Drumchapel and Clydebank.
 - g. the extra cost arising from replacing old hospital buildings with new buildings.

9. Experience demonstrates that if money for some of these services is not ring-fenced, cost pressures within acute hospital services tends to consume any available cash. Table B shows two different approaches to ring-fencing money for development during the planning period to 2004\5. One approach assumes that line 7 in Table A is distributed on the basis of current share of spending; the second shows a distribution based on the Arbuthnott formula proportions.

TABLE B - USING MONEY FOR SERVICE DEVELOPMENT

Option 1 – based on current spending share.

	2001\2 £m	2002\3 £m	2003\4 £m	2004\5 £m
a) Acute 56.77%	10.9	8.2	8.3	7.1
b) Mental health 13.57%	2.6	2.0	2.0	1.7
c) Other programme 29.66%	<u>5.7</u>	4.2	4.4	3.7
	<u>19.2</u>	<u>14.4</u>	<u>14.7</u>	<u>12.5</u>

Option 2 – based on Arbuthnott formula proportions

	2001\2	2002\3	2003\4	2004\5
	£m	£m	£m	£m
a) Acute 53.43%	10.3	7.7	7.9	6.7
b) Mental health 17.38%	3.3	2.5	2.5	2.2
c) Other programme 29.19%	<u>5.6</u>	4.2	4.3	3.6
	<u>19.2</u>	<u>14.4</u>	<u>14.7</u>	<u>12.5</u>

- 10. When this framework is put alongside the service requirements identified in paragraph 9.8 above it looks adequate in addressing issues for mental health and other programmes as measured by the aspirations set out in 2000\1 Health Improvement Programme but taking into account also the Board's commitment to see significant improvements in primary care and child health above levels signalled in the Health Improvement Programme.
- 11. The framework is under pressure in relation to acute services especially in 2001\2 where there are major extra costs associated with junior doctors' hours, the Working Times Directive and loss of Trust income (£2million gross) to reflect reductions in the inflow of patients to Glasgow hospitals from Lanarkshire Health Board. In addition North Glasgow Trust still has an unresolved deficit of around £10 million that needs to be addressed, possibly involving extra income from GGNHSB.

Beyond 2001\2 however the money available for acute services would allow only some relatively modest service developments. In both 2002\3 and 2003\4 further significant income reductions are expected in respect of continuing reductions in Lanarkshire cross-boundary flow (£2.9 million and 3.9 million respectively).

12. As far as choices about meeting the cost of new hospital buildings is concerned we were expecting the major revenue costs of a new Southside hospital to fall due at the beginning of the 2006\7 (if Cowglen) or in 2005\6 (if new build at the Southern General). The profile we gave in leaflet 15 was:

TABLE C

	Net increase in cost £ million				
	(a)	(b)	(c)	(d)	(e)
	2001\2	2002\3	2003\4	2004\5	2005\6
GRI maternity, plastic surgery and	1.7				
emergency receiving					
Gartnavel : new linear accelerators	1.2				
Stobhill Ambulatory Care Centre		1.1			
● GRI – new orthopaedics unit			0.3		
West Glasgow – new buildings				3.0	(5.0)
● Victoria Ambulatory Care				3.0	
Southern General new build				6.0 *	
	2.9	1.1	0.3	12.0	<u>(5.0)</u>

^{*} Money reserved in 2004\5 to be available in 2005\6.

The balance of the Southern General option revenue cost would fall to be met in the period between 2006\7 and 2010.

- 13. The consultation period has highlighted the importance of moving faster in centralising the Beatson Oncology Centre at Gartnavel and so we would expect the requirement in column (d) to be higher.
- 14. If the Cowglen option were pursued, the increased revenue cost of £18.4 million would fall due to be met sometime towards the end of the decade, if town planning problems could be overcome that is.
- 15. The projection given in Table B, when put alongside the revenue requirements for new buildings illustrated in Table C shows how the cost of new buildings would in 2004\5 or 2005\6 (depending on when the money needed to be deployed) consume virtually the whole of the year's development monies for acute services altogether. The Cowglen option revenue cost would, by itself, require more than the total of development monies available for acute services development. It would consume money otherwise earmarked for mental health and the other programmes (primary care, child health, community health etc).

- 16. Furthermore we need to bear in mind that the levels of real term growth in NHS spending for the four year period 2000\1 to 2003\4 are at an all-time historic high, far surpassing anything we have seen sustained at that level since 1948. There can be no guarantee that this unusually high level will be continued in 2004\5 and beyond. If growth fell back to its more historically usual levels the total amount of money available for all types of service improvements (after provision for inflation), would more typically be around £10 million per year.
- 17. There is, therefore, a very real risk that the Cowglen option would be unaffordable within the GGNHSB formula allocation from the Scottish Executive. Indeed even the Southern General option will require careful financial stewardship if its additional revenue costs are to be met.



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10. DECISION-MAKING AND RISK

- Earlier in this review we described the complexity of the overall decision process in reconfiguring hospital services for Glasgow. Decisions or judgements affecting one factor or one part of the Glasgow hospital system have repercussions elsewhere. We likened it to a Rubik's Cube.
- 2. We emphasised too that a coherent and realistic set of decisions of this type cannot be based merely on the weight of sentiment or popularity alone. There are other tests to be passed, applied variously by the Scottish Parliament, the Scottish Executive, the statutory Auditors and professional regulatory bodies. They include:
 - a. ensuring that what is proposed meets good **quality standards** for service organisation and delivery.
 - b. ensuring that the decision offers the best possible synergy with other aspects of public policy and avoids conflict with those other policies. The most relevant policies are:
 - protecting the environment.
 - minimising traffic impact.
 - · promoting employment opportunity.
 - promoting ease of access to services for people who lack mobility for physical or economic reasons.
 - promoting opportunities for health gain.
 - c. achieving **best value** for the taxpayers' money.
 - d. **managing risk** so that major overspends, delays or fruitless payments are avoided.
 - e. demonstrating that the decision does not create unacceptable **opportunity costs** adversely damaging the achievement of other needs and priorities.
 - f. ensuring that the decision is **affordable** within the resources allocated by the Scottish Executive.
 - g. seeking the **best possible fit** with all of these factors.
- 3. Our proposals have been designed to give the best possible fit across all of these factors. For example, if we had proposed just a three hospital site option with no Ambulatory Care facilities at Stobhill and the Victoria we might have satisfied criterion (a) but the sheer scale of the new investment required would have enhanced risk under criteria (d), (e) and (f) and compromised the traffic impact and accessibility elements under criterion (b) to a significant degree.

Similarly a proposal to quit the GRI and build a brand new hospital at Stobhill would have raised extremely searching questions about criteria (c) and (d) [in terms of waste of the new capital investment currently under construction at the GRI].

- 4. In particular our proposals aim to achieve a transformation of service quality and environment for patients. They maximise the amount of modern (25 years old or less) facilities in use for hospital services in Glasgow, at the same time preserving local accessibility for most services while adopting a model of service organisation and delivery which meets modern quality standards. We seek to achieve this in a way which represents value for money, is affordable and leaves scope to greatly increase the numbers of doctors, nurses and other health care staff providing treatment and care for patients. While we have a responsibility to minimise the risk of cost overruns and fruitless payments, our priority is to minimise the risk of lengthy further delay.
- 5. Elsewhere in this paper we apply this framework to the various contentious elements of the decision-set we need to make. It is important that our partners in this important debate for the future of Glasgow's hospital services recognise the obligation we have to scan across all of these criteria. It would be wonderful simply to be able to make the popular decisions and be greeted with public acclaim but sadly they do not automatically meet the testing expectations of the Parliament and other judges of the quality of our decision-making and stewardship.



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11. SOUTH GLASGOW SERVICES

- 1. This element of the proposals has attracted significantly more comment than any other. There have been hundreds of letters from members of the public, responses from Community Councils, comments from local authorities, professional advisory committees and the Local Health Council. Local MSPs have maintained a close interest throughout the period of consultation.
- 2. If decision-making were a matter of weighing the sheer volume of comment it would point unequivocally to overwhelming support for the concept of a single in-patient hospital on the Southside. But beyond that there is mixed opinion as to whether it should be at the Victoria/Queen's Park Recreation site or Cowglen.

Up until 31st August there was a desire for it to be built at Cowglen (103 responses): however, in the last few days of the consultation period the volume shifted for it to be located at the Victoria or Queen's Park Recreation site (171 responses).

In addition the lack of response from people from the south-west of Glasgow does not mean that the option of the Southern General would have no support.

- 3. The concept of a single in-patient hospital for the Southside appears to have attracted support for a number of reasons:
 - a. frustration at the appalling quality of most of the buildings in the Southside hospitals, particularly at the Victoria Infirmary where there has been a lack of investment in upgrading or replacing existing facilities over the last 10 to 15 years. The Southern General has been better served by its management in that period. However, it too is burdened by a legacy of Victorian buildings which cannot add up to a hospital designed efficiently around the needs of patients, no matter how well individual ward upgradings and link corridor schemes have been undertaken.
 - b. recognition of the importance of creating larger specialist teams.
 - c. a concern that the current fragmented pattern will continue to cast the Southside in a less favourable position compared with the bigger groupings and more recent investment that can be seen - albeit incompletely and unbalanced - in North Glasgow. This can undermine staff recruitment attractiveness and has also retarded specialist service development in South Glasgow.
- 4. GGNHSB believes that failure to deliver on this consensus would be highly damaging to the quality of hospital services in South Glasgow.
- 5. The issues of controversy concern the question of **location**.
- 6. As is said in paragraph 11.2 some respondents have argued that a new Southside hospital should be located at or alongside the existing Victoria Infirmary site, (171 respondents). It is timely to remind ourselves why this has not been seen by A513089 HSB to be a viable option:

- a. In a "two A & E for Greater Glasgow" configuration, with one of those two being at the GRI, the Victoria Infirmary is not an acceptable site because the whole of West Glasgow, north and south of the river, would have to look to the East for access. A North\East and South\West axis for A & E services provides the most balanced position, particularly if the two units are close to the strategic road corridors (M8, M77, Clyde Expressway, Clyde Tunnel).
- b. **the site is too small**. The acreage already owned by the Trust is only some 11 acres (including the Grange Road School site).
- c. the suggestion made by some respondents that a larger site could be made available by the Trust acquiring the whole of the **Queens Park Recreation** site does not seem to us to be viable:
 - i) it would still only offer 34.2 acres (compared with 67 acres at the Southern General and 73.6 acres at Cowglen)
 - ii) it would not be large enough to accommodate **acute mental illness** beds for South Glasgow nor a relocated **Royal Hospital for Sick Children** if that were transferred.
 - iii) advice from town planners confirms that the acquisition of Queens Park Recreation site would require a change of use of land currently designated as Open Space. We are advised that areas designated as Open Space are "key elements in the green-space network of the city and there will be a strong presumption against loss of designated open space, whether in public or private ownership" and that the Open Space Land Use Policy requires that such areas "should remain primarily as open space and that development will only be permitted which relates to open space\recreation purposes" (letter from City Council Development Control dated 22nd August, 2000). It would require specific public consultation, the formal overturning of its own Land Use Policy by the City Council as town planning authority, and the agreement of Sport Scotland.

It is likely that a formal public enquiry would be held. The complex town planning process would take between one to two years. It would also be necessary for the Trust to meet the cost of providing replacement playing fields in the vicinity. Given the size of site involved it is far from clear whether such alternative space is available (it would already have been identified by Scottish Enterprise – Glasgow if it were since they are very anxious to find large sites for industrial development in South Glasgow and are finding it difficult to identify any).

The existing Queens Park Recreation site is used as overflow car parking for matches at Hampden Park – its loss for that purpose would also pose problems in finding acceptable alternatives.

This option would almost certainly add two years to the process of securing a new hospital for the Southside, thus prolonging the present problem of improvement blight experienced by the Southside's hospital service.

Acquisition and re-provision would clearly add to the cost and delay of any hospital development. It is more likely however, that the option would fail to overcome the planning barriers.

d. The Victoria is located in a "highly developed area where there is little spare capacity on the existing road network and little opportunity to substantially improve it". (Source: Travel Time Study commissioned by the Glasgow

Health Forum (South-East)). It hardly seems likely that the **traffic impact** of bringing the Southern General's in-patient work into the area would be viewed favourably, nor would they be physically easy to resolve. This issue adds to the town planning complexity already described earlier.

- e. A new Southside Hospital at the Victoria Infirmary campus would have to be phased since a quarter of the total 34.2 acres (if Queens Park Recreation were available) is already occupied by the existing hospital which would have to remain in use while new facilities were built on the adjacent site. A two phase development would therefore be unavoidable. Added to the town planning delays, this means that the Victoria Infirmary option would be much slower to deliver than the Southern General option.
- 7. These reasons continue to be compelling.
- 8. In leaflet 16 we set out the **differences between the other two alternatives** (Cowglen and the Southern General). We said that the differences centred on:
 - a. accessibility.
 - b. speed of completion.
 - c. risks.
 - d. cost.

During the consultation period three other factors have been raised:

- a. wider implications for other areas of public policy.
- b. traffic impact.
- c. the environmental impact of the Shieldhall Sewage works.
- 9. It is important to revisit each of these in turn in the light of consultation. However, before doing so it is necessary to **revisit the position on Ambulatory Care**.
- 10. An Ambulatory Care Centre at the Victoria Infirmary campus would provide local access for at least 85% to 90% of all patient contacts that currently use the Victoria Infirmary. (Details given in leaflet 16). Many of the letters of concern we have received have been from people who currently go to ambulatory care services at the Victoria and who have gained the impression that in future they would have to go to the Southern General. There is no basis for such anxiety.

Such patients would continue to go to the Victoria Infirmary as they do now:

- around 275,000 out-patients No change ¹
- around 5,000 day patients No change
- around 9,000 day surgery cases No change ²
- (1 "out-patients" also includes visits to x-rays, physio, speech therapy, hearing aids etc.)
- (2 assumes the issues around complication rates are satisfactorily resolved)

Of around 75,000 A & E attendances, between a minimum of around 14,900 would go to the Minor Injuries Unit at the Victoria, more likely a figure of 27,000 would go there. (Annex 6 explains this range) Around 14,000 children attend the Victoria A & E Department each year; an expert Paediatric A & E Review Group has recommended that all such children should go to the Yorkhill A & E or else attend local primary care services.

In addition the proposal to provide 120 rehabilitation beds in a new building next to the Ambulatory Care Centre would help local people needing to visit a patient

who needs more extensive time in hospital to recover.

Thus for over 310,000 patients concerns about access to a new Southside Hospital at Cowglen or to the Southern General do not arise.

As Section 4 of this paper sets out GGNHSB sees no reason to depart from its original view that stand-alone Ambulatory Care Centres have a major part to play in the future pattern of service.

11. Section 6 of this paper explores the issues of **accessibility** which attracted a large amount of comment in the consultation.

We suspect that much of the concern was from people who did not appreciate the significance of providing an Ambulatory Care Centre and 120 rehabilitation beds at the Victoria Infirmary (see above). Certainly many of the letters specifically referred to difficulties in attending out-patient clinics – which we are not proposing to move from the Victoria Infirmary campus. Others quoted the concerns of elderly people visiting their partners or friends during lengthy spells in hospital – the 120 rehabilitation beds are aimed to meet precisely the needs of such people.

For **in-patients** we suggest, in section 6, that the number relying on public transport to get from the present Victoria Infirmary catchment area to either Cowglen or Southern General (i.e. those not taken to hospital by ambulance, by taxi or by car driven by family, friends or neighbours) is unlikely to exceed 20 to 25 people a day. This would involve a public transport journey averaging 57.1 minutes (if Cowglen) or 62.4 minutes (if Southern General) if off-peak or 60.3 minutes and 64.7 minutes respectively if at peak hour – an average difference of between 4 and 6 minutes.

In the case of **patients' visitors** we have drawn on a useful analysis commissioned by the Health Forum (South-East) – see Annex 7. We analyse the position in some detail in section 6. We concluded that:

- a. at an individual public transport user level, **public transport** is **not** a **differentiator** between the Southern General and Cowglen because:
 - for 19 of the 34 places examined in Annex 7, the difference is 10 minutes per journey or less.
 - in both cases public transport would need to be improved.
 - in both cases most of the more onerous differences can be resolved by the development of express shuttle buses.
- b. for **car users** the difference is contained within a **10 minute margin either** way and on a personal level the significance of this will be subjective.
- c. the economic advantage of Cowglen over the Southern General option in terms of travel times and costs was more than outweighed by the economic advantage to the NHS and taxpayers of the Southern General option over Cowglen.
- d. the significance of the 120 rehabilitation beds at the Victoria Infirmary site had been overlooked by many respondents but would significantly remove differences in public transport access for many patients' visitors, especially the elderly.

A further issue that was raised during the consultation concerned the **speed** with which a new hospital for the Southside could be achieved. Many of those who commented on this issue preferred the **Cowglen** option because it assumed a **single phase construction** completed in approximately 7 years time (i.e. 2007). By contrast the Southern General option would involve a first phase of new

building (not upgrading) complete by the same time scale and with a second phase of new building following demolition of old buildings elsewhere on the site freed up by the availability of the new hospital blocks.

The two phase approach was principally determined by the need to create potential site space for the relocation of the Royal Hospital for Sick Children (if that was decided). The Trust has reviewed the way in which site space could be released for new building and there might be scope for a single phase provision of a Southside hospital at the Southern General site. This needs further consideration both in terms of practicality and the profile of revenue funding requirements which the Trust would be able to examine reliably at Outline Business Case stage.

12. A major differentiator in the choice between the two principle options has been **cost**. In our original consultation material we highlighted that the Cowglen option would cost an extra £18.4 million per year more than the present cost of hospital services in South Glasgow compared with an extra £11.1 million per year for the Southern **General option**. We felt that the difference of £7.3 million was too high both in terms of absolute affordability and as an opportunity cost (i.e. taking into account that the £7.3 million could otherwise be spent on doctors, nurses and other healthcare staff providing extra healthcare for patients).

The responses to consultation were not impressed by this argument. However, the significance of this issue is now greater because the revision of bed numbers (see Section 8) means that the running costs of a new Southside Hospital (whether at Southern General or Cowglen) will be higher than we estimated in our original consultation period.

In Section 8 of this paper we revisit the issues of financial affordability in the light of the consultation responses the revision in bed numbers and new developments in NHS funding. Section 8 includes a new financial model for the period up to 2004\5 but also looks at the prospects for 2005\6 and beyond.

Its conclusion is that there is a very real risk that in 2006\7 the Cowglen option revenue requirement would be unaffordable within the GGNHSB formula allocation from the Scottish Executive. Indeed even the Southern General option with its higher number of beds will require careful financial stewardship over the next few years if its additional revenue costs are to be met.

13. Cowglen - site issues.

At the start of the consultation we said two potential sites had been identified in the Cowglen area.

- a. a 44.7 acre site incorporating the present Cowglen Hospital and the National Savings Bank. Adjacent land owned by Retail Property Holdings Ltd would have created just enough additional space to build a hospital.
- b. a 73.6 acre site incorporating the Pollok Playing Fields and owned by the Pollok Estate.

Early in the consultation period the South Glasgow NHS Trust met representatives of the National Savings Bank (NSB) and, at the latter's request, recognised that the NSB site was not for sale. Siemens, who run the operation on behalf of NSB, have recently won another contract which will further increase employment on this site. Building a hospital on the site would not create new jobs in South Glasgow (since NHS jobs would simply be transferring from the Southern General and Victoria to Cowglen) but would involve displacement of the NSB and all the hundreds of jobs it provides.

This leaves the Pollok Playing Fields site as the only potential location large enough in the Cowglen area.

14. Cowglen: New Hospital on the Green Belt for Pollok?

The Greater Pollok Social Inclusion Partnership has written to point out that this site has been identified as an alternative site for the reprovision of playing fields at South Pollok which were lost when the M77 was built. The Greater Pollok Partnership wrote that they "would not support construction of a new hospital which encroached onto Broompark Farm without the full support of the local community. The provision of these playing fields is a requirement under the National Planning Guidance following the loss of the former facilities at South Pollok".

It is also the case that this site, which is designated as Green Belt Open Ground and as a Conservation Area is subject to a Conservation Agreement between Nether Pollok Ltd (now Pollok and Corrour Ltd) and the National Trust for Scotland. Use of the site would therefore require the agreement of the National Trust, the Trustees of Pollok Park and the City Council as local planning authority. The City Council's Pollok Park Local Plan aims to "promote and maintain it as a high quality countryside area within which leisure and cultural pursuits can be undertaken without detriment to the countryside environment. In these circumstances serious doubts as to the viability of any proposal to develop a new hospital on this site" (City Council Development Control letter dated 22nd August, 2000).

Any planning application to build on designated Green Belt needs to demonstrate very special circumstances which include demonstrating that:

- there is nowhere else that the proposed development could go.
- the development could not be reasonably undertaken on another site.
- the development would not materially diminish the openness of the Green Belt
- o there are substantial benefits for the community.

Even if, contrary to its own Local Plan and policies, the City Council approved a planning submission that approval would still need to be referred to the Scottish Executive who might decide to 'call it in' and then to hold a public enquiry. It seems inconceivable that there would be no "green\conservation" interest groups that would not be opposing loss of Green Belt in the sensitive Pollok Estate. The odds on a public enquiry must be very high and the certainty of a successful outcome very low. The process would take a minimum of one to two years. It would also be unfortunate, to say the least, for a Health Board committed to promoting physical exercise as a major contributor to good health maintenance to be dismissive of recreational space close to an area of significant health and social deprivation. Likewise for a Health Board to seek to convert a Green Belt Conservation Area into a high density concentration of buildings, car parking and yet more traffic is also out of tune with what is expected in responsible corporate decision-making.

15. Are there any **other sites in a central location** in the Southside? In their response the Local Health Council urge GGNHSB "to pursue a longer term strategy which is more radical and will lead to the development of a much needed new hospital on a more centrally located site in South Glasgow". We understand this ambition, and who could not be tempted by its challenge? However, in starting its work on the proposals last year the South Glasgow Trust and its property advisers were unable to locate any such sites of adequate size other than those at Cowglen, Darnley and the Southern General.

At a meeting of the Glasgow Alliance Management Board on 25th August Scottish Enterprise – Glasgow gave a presentation on its programme to secure an adequate supply of good quality, well located, serviced sites in order to attract employment opportunities into Glasgow.

Among their criteria for success are:

- approximately 50 acres or more.
- high quality environment.
- motorway connections.
- o access to facilities.
- scope to achieve unified public ownership.

They reported that the city is running out of the first class sites now needed to attract major inward location of new industrial\business opportunities. Such sites usually take two or three years to assemble and make ready for business occupation. They were aware of our initial interest in the Cowglen NSB site and were intending to work in partnership with the owners to help bring the Savings Bank building into full business use thereby increasing employment opportunity in the area. The only other site identifiable in the city south of the river was Darnley Mains. Scottish Enterprise – Glasgow were concerned that use of prime vacant sites for a new Southside Hospital would possibly deny the city a major new net extra employment opportunity in one of the very parts of the city where such opportunities are both needed (adjacent to Pollok) and most difficult to create. It was also pointed out that although an NHS development in such a site large enough for a new hospital would in due course release the Southern General site for industrial development that opportunity would not be ready for use until the end of the decade whereas the need to attract net additional employment existed here and now.

The sense of the Glasgow Alliance Management Board meeting was that the creation of net extra employment opportunity for the Southside should not be overlooked when decisions are to be made about Southside Hospital configuration (which offers no net increase in employment). Three issues therefore arise in addressing the Health Council's challenge:

- a. what alternative sites are there?
- b. if there were alternative sites how should we weigh employment opportunity against those considerations of public feeling about the Southern General site explored elsewhere in this paper?
- c. how long are we prepared to wait in order to identify a site and resolve tortuous planning issues (or find that we cannot resolve them) when we already own a site (Southern General) which is certainly large enough and has fewer town planning problems associated with it?
- 16. Some responses to consultation rightly draw attention to the **traffic impact** of options for the Southside. In section 6 we analyse this issue in overall terms. There will certainly need to be a traffic impact analysis as part of the next stages of planning, involving liaison with the City Council in its planning, roads and traffic management roles. The salient points emerging from our considerations of comments made so far are as follows:
 - a. <u>any</u> reconfiguration of hospital services in Glasgow will change traffic patterns one way or another.
 - b. our creation of a stand-alone **Ambulatory Care Centre** at the **Victoria Infirmary keeps overall traffic change to a minimum**. It will however reduce traffic around the congested area of Battlefield Road\Langside Avenue\Prospecthill.

- c. conversely our judgement not to locate a single hospital for the whole of the Southside at the Victoria Infirmary site avoids what would almost certainly be a quite unacceptable increase in local traffic and reduction in local environmental amenity.
- d. the **Cowglen** option would clearly be better than the Southern General in involving a more manageable **traffic impact** but, as we identified in 11.13 and 11.14 above there are serious other problems involved with the acquisition and use of sites at Cowglen.
- e. the whole issue of **traffic impact at the Southern General** would need to be examined alongside issues of existing road capacity, scope for improved public transport to reduce extra traffic, neighbouring developments at Braehead, Pacific Quay, Meadowside Granary and Yorkhill and any road or bridge developments associated with them.
- 17. A large number of consultation responses cited the smell from **Shieldhall Sewage Works**, adjacent to the Southern General as a significant reason why a single-site
 Southside hospital should not be located there. GGNHSB has raised the issue with
 West of Scotland Water who replied that they were very conscious of the potential
 impact that the Shieldhall facility can have on neighbouring properties. They went on:

"Consequently, three years ago this Authority developed an outline plan to reduce odours from this site. This plan is based on reliable measurement of odour nuisance to locate the principal sources of complaint and , therefore, to find innovative and cost effective solutions.

Measurement of odour levels has been undertaken at Shieldhall continuously since 1997. The information collected is utilised by site personnel on a daily basis to monitor and improve operational performance. A site specific odour dispersion model has been developed by a specialist consultant and is used to help identify the problem locations and determine priority investment.

The Authority has invested in excess of £1 million at Shieldhall during the past 18 months addressing odour issues.

In addition, the underlisted investment is planned:

Financial year 2000\1

- Physical covering of high risk channels and pump wells.
- Consultant investigation to optimise the operation of the site to mitigate odour generation.
- Review of odour model to incorporate new measurement techniques identified in the latest European CEN Standard.

Financial year 2001\2

- Discontinue the use of the Interim Sludge Treatment Centre.
- Reduce the quantities of sludge delivered to Shieldhall for processing.
- Improve\upgrade odour abatement plant on site.

When this programme of work is completed, all of the presently identified significant sources of odour will be largely abated. Thereafter, there will be a further programme of measurement to ensure that there will be no outstanding odour generators.

The operation of this site does generate odours. However, West of Scotland Water is endeavouring to ensure that at the boundary with our neighbours, there is no cause for complaint as a result of site operations. In this regard, we have established day-to-day

liaison with representatives of the local community, Barr and Stroud and your hospital to assist in identifying sources of complaint and speedy advice of difficulties."

Clearly it is not possible for us to predict the precise success of these measures but we are confident that West of Scotland Water recognise the importance of the issue and are demonstrating a significant commitment to tackling it. Because they are monitoring complaints and linking them to specific site operations and weather conditions it will be possible to assess with some precision the effect of their current investment when it is completed by Spring, 2002.

Some consultation responses raised concern about the risk of airborne infection from the Sewage Works. Public health monitoring shows no pattern of disease in the area which could be attributed to the Sewage Works nor is there any experience elsewhere of disease being transmitted from a sewage works to neighbouring communities by an airborne route.

The issue of the Shieldhall Sewage Works is not, in our view, a factor that should influence the decision about future strategic configuration of hospitals, particularly since by the time change occurs West of Scotland Water's investment programme will have been undertaken and its effectiveness monitored. If an odour nuisance remains it will be necessary to press for further measures by West of Scotland Water.

- 18. In leaflet 16 we identified a number of **risks** associated with the two main options on the Southside. They concerned:
 - a. site availability.
 - b. site acquisition cost.
 - c. degree of flexibility in relating ultimate bed numbers to clinical experience and need over time.
 - d. relationship of building contract size to degree of risk of cost-overruns.
 - e. traffic impact issues.
 - f. the risk, with two or three phase developments, of hiatus between phases.
 - g. on-site disruption during building works.
- 19. In terms of differentiating between the Southside option, the risk profile is as follows:

	Southern General	Cowglen	Victoria (incl. Queen's ParkRecreation)
a) Site availability	Nil risk. Already fully owned by Trust	High risk. Competing public policy considerations and long town planning process delays. Successful outcome cannot be guaranteed.	High risk. Competing public policy considerations. Long town planning process delays. Successful outcome cannot be guaranteed.
b) Site acquisition cost	Nil risk. Already fully owned by Trust.	Medium risk. Costs of reprovision\relocation of playing field space (but where?) likely to arise.	Medium to high risk. Cost of providing alternative playing field space arises, so amount of land to be paid for is almost twice the area needed for the hospital itself.
c) Flexibility on future bed numbers	Good flexibility unless we seek to achieve a single phase exercise.	Low flexibility because single phase project.	Good flexibility because it would have to be a two phase project.
d) Risk of cost overrun	High, especially if a single phase approach is	Medium if PPP used.	High because of site complications

scale of building contract	sought and if PPP not used.		and phasing.
e) Traffic impact	Medium, depending on other nearby retail and leisure developments.	Low, although any expansion of other retail\ commercial activity around junction 2 of the M77 may raise this risk.	High, due to existing lack of local road capacity.
f) Phasing hiatus	High, unless single phase approach is feasible.	Nil risk.	High.
g) Building work disruption on site	Medium. Site layout makes demolition and new building on a zoned basis possible without excessive disruption of other zones.	Nil risk.	Low risk. Disruption would be to the local neighbourhood rather than to the Victoria Infirmary itself.

Of these (a) is critical – no site, no hospital. Risk (b) is also a first order risk, since it will magnify cost differences between options to a significant degree. Risk (c) is not a significant differentiator. In our view the risks at (a) and (b) outweigh the risks at (e), (f), and (g). If risk (d) becomes high for the Southern General option because a single phase approach is adopted, then risk (f) becomes a nil risk for the Southern General.

20. Taking Stock

Taking into account all the perspectives raised and explored during the consultation process how does GGNHSB view the position now?

- a. Firstly we wish to re-affirm our ambition that the Southside should have a pattern of hospital services that stand comparison with those available north of the river. This means:
- a coherent range of general acute services offering state-of-the-art ambulatory and in-patient care, with specialties and sub-specialties viably staffed and assuring the local population reliable access to specialist teams at all times.
- the presence of regional services which add richness to the clinical life of a hospital.
- co-location of acute mental illness services with general acute services so as to reduce the stigma of mental illness and to provide clinical links where they are needed (e.g. in relation to overdose patients and emergency patients with physical and mental illness).
- thoroughly modern facilities helping to make the patient experience as good as it can be.
- b. Secondly, we do believe a stand-alone Ambulatory Care Centre, including a Minor Injuries Service and 120 rehabilitation beds, located at the Victoria Infirmary will provide the best possible local access to as many services for as many people as possible.
- c. Thirdly, we continue to subscribe to a pattern of two Accident and Emergency Services for Greater Glasgow (supported by a network of more

local Minor Injuries Units) which is best positioned on a north\east and south\west axis.

d. Fourthly, we are anxious that the strategic planning blight which has afflicted South Glasgow for at least two decades should be brought to an end. We wish to see an early start to replacing the Southside's obsolete hospital buildings.

Ending the blight requires a decision on siting to be made within the next few months. If decisions become dependent on the most lengthy town planning processes, including public enquiry and the decision-making timescales that flow from a public enquiry, then the planning blight afflicting the Southside hospital service will remain rigidly unresolved for up to three years or more.

During that period of blight no resources could be committed to planning the new Southside Hospital in any meaningful detail, which in turn means that building would be unlikely to start until 2005 or 2006. The Southern General option is the only one which avoids this prospect of blight.

21. The Board has reviewed its decision matrix for the Southside which is as follows:

	Victoria + Queens Park Recreation	SGH (+ACAD at Victoria	Cowglen (+ACAD at Victoria)
Site Issues			
1. Site size	34.2 acres.	67 acres (SGH) +	73.6 acres (Cowglen) +
		5.5 acres (Victoria).	5.5 acres (Victoria).
2. Site availability	Highly uncertain.	Already owned.	Highly uncertain.
3. Site acquisition problems and cost	Highly uncertain. Need to include cost of reproviding playing fields and re-routing main sewer on Grange Road. Would enable sale of SGH site (?£7.5 million).	Nil (apart from 4 acres next to Annan Street). Would enable sale of part of Victoria site (? £6m) + Mansionhouse (? £2 million).	Highly uncertain. Would enable sale of SGH, part of Victoria site and Mansionhouse (? £15.5 m
4. Building work disruption	Low risk to hospital. Significant impact on local neighbourhood.	Medium risk but minimised by zoned nature of site and order of demolitions. Less intrusive impact on local neighbourhood.	Nil risk.
5. Environmental impact\issues	High. Removes local playing fields and open space. Heavier traffic in residential\ recreational\shopping area with congested roads already.	Minimal. No loss of public amenity space. No change in use of site. Modern buildings replace muddle of older buildings on site. Options available for resolving traffic impact. Sewage works nuisance being addressed by West of Scotland Water.	High. Loss of open space. Traffic impact unlikely to be a major problem.
<u>Accessibility</u>			
6. Number of patients affected by change of location.	All SGH patients = 450,000	VI in-patients + A & E less MIU = 75,000	VI in-patients + A & E less MIU + All SGH = 525,000
7. Number of patient unaffected by change in accessibility A31308927	All VI patients = 375,000	VI ACAD\MIU = 300,000 SGH = <u>450,000</u> <u>750,000</u>	VI ACAD\MIU = 300,000

Best. Current off-peak average journey of 34 minutes (based on Mr. Drewette's work). Best. Average off-peak journey of 11 minutes. Very difficult. Likely to take several years. Prospect of successful outcome is highly uncertain. Exports jobs from Govan to Langside\Queens Park area.	53 minutes average journey. Average of 17 minutes. Easiest of the three options. Unlikely to take years. Prospect of successful outcome is very good. Exports jobs from Langside\	48 minutes average journey time. Average of 12 minutes. Very difficult. Likely to take several years. Prospect of successful outcome is highly uncertain.
Very difficult. Likely to take several years. Prospect of successful outcome is highly uncertain.	Easiest of the three options. Unlikely to take years. Prospect of successful outcome is very good.	Very difficult. Likely to take several years. Prospect of successful outcome is highly
several years. Prospect of successful outcome is highly uncertain. Exports jobs from Govan to	Unlikely to take years. Prospect of successful outcome is very good.	several years. Prospect of successful outcome is highly
several years. Prospect of successful outcome is highly uncertain. Exports jobs from Govan to	Unlikely to take years. Prospect of successful outcome is very good.	several years. Prospect of successful outcome is highly
Exports jobs from Govan to Langside\Queens Park area.	Exports jobs from Langside\	
Exports jobs from Govan to Langside\Queens Park area.	Exports jobs from Langside\	
	Queens Park to Govan.	Exports jobs from Govan, Langside\Queens Park to Pollok.
Will require 3 major A & E Departments in Glasgow.	Consistent with 2 A & E Department configuration.	Will require 3 A & E Department configuration.
Not possible. Site too small.	Achievable.	Achievable.
Not possible. Site too small.	Achievable.	Achievable.
Not costed but would be no less than Cowglen option, certainly much more than SGH option.	£190 million.	£295 million
Not costed but would be similar to Cowglen option.	£11.1 million.	£18.4 million.
High.	High.	Medium (if PPP)
Yes. £41 million spent on new build at SGH in last 10 years (excluding refurbishment of old	No. Capital spending at Victoria has been refurbishment only.	Yes. £33 million at SGH.
_	Not costed but would be no less than Cowglen option, certainly much more than SGH option. Not costed but would be similar to Cowglen option. High. Yes. £41 million spent on new build at SGH in last 10 years	Not costed but would be no less than Cowglen option, certainly much more than SGH option. Not costed but would be similar to Cowglen option. High. High. High. Yes. £41 million spent on new build at SGH in last 10 years (excluding refurbishment of old

capital investment?			
Other risks			
Flexibility in provision of most appropriate bed numbers	Good flexibility.	Good unless done in single phase.	Low flexibility.
Risk of delayed start and planning blight.	Very high.	Low.	Very high.
Risk of phasing hiatus (e.g. non- completion of a second phase)	High. Two phases unavoidable.	High unless single phase approach is feasible.	Nil risk.

22. This analysis indicates that the **Southern General option** is significantly the **best in terms** of:

Factor

- 2 Site availability.
- 3 Site acquisition.
- <u>5</u> Environmental impact.
- <u>6\7</u> Access disruption to the smallest number of people.
- 10 Lowest town planning risk.
- 12 Fit with GGNHSB policies on A & E.
 - <u>15</u> Value for money in capital investment terms.
 - 16 Affordability and least adverse opportunity cost for other health care services.
- 18 Least 'sunk cost' penalty.
- 20 Minimum risk of further delay and planning blight.

On some **other factors** there is **little difference** between it and the Cowglen option.

- 1 Site size (both are large enough).
- 11 Employment.
- 13 Scope to re-locate Children's Hospital services (no difference).
- <u>14</u> Fit with GGNHSB policy on mental health services (no difference).
- 19 Flexibility on bed numbers (possibly some advantage to SGH).

For factor 17 (risk of capital cost overrun) is difficult to judge since it depends on whether the SGH scheme is phased or not (higher risk), or subject to Public Private Partnership (lower risk) or not.

In four factors Cowglen has an advantage:

- 4 Site disruption during building work.
- <u>21</u> Lower risk of phasing hiatus (although this would not be the case if the feasibility of a single phase approach at SGH proves to be possible.)
- <u>8</u> Public transport (but both involve the need to improve it. Current time differences between them are within a narrow band. We do not see this as a significant differentiator).
- <u>9</u> Car\taxi access (depending on how differences of 10 minutes or less are viewed).

But factors 8 and 9 need to be seen in the context of the Cowglen option causing access disruption to the largest number of patients (factors 6\7).

- 23. The Victoria Infirmary\Queens Park Recreation Site option falls, in our view, due to the significance of its position in relation to:
 - too small a site (factor 1) to address factors 14 and 13 (mental health and children.
 - its inevitable delay (factor 20).
 - its adverse environmental impact (factor 5).
 - its adverse impact on job opportunity in Govan (factor 11).
 - its cost disadvantages shared with the Cowglen option (factors 15 and 16).
 - its exposure to phasing hiatus (factor 21).
 - its much higher access disruption score (factors 6\7).
 - its lack of fit with GGNHSB policy on A & E provision (factor 12).

We do not see these as being outweighed by its advantages in relation to factors 4 (building work disruption), 8 and 9 (public transport and road access – many residents in the present Southern General catchment area would feel as much dismayed by their perception of increased travel difficulty to the Victoria as do many of those from the Victoria Infirmary catchment area who complained about this issue during the consultation period), 19 (flexibility on bed numbers).

- 24. Our conclusion therefore is to re-state our preference for the option of locating the Southside in-patient hospital at the Southern General, with an Ambulatory Care Centre (including Minor Injuries Unit) and 120 rehabilitation beds at the Victoria Infirmary campus.
- 25. Is this unambitious? We think not.
 - a. it meets a vision of clinical services significantly stronger than the present pattern and on a footing that will no longer compare adversely with other parts of the city.
 - b. it retains as much local access as possible.
 - c. it provides the Southside totally with all-modern buildings within which a high quality patient experience can be provided by well organised and supported teams of staff.
 - d. it is the solution capable of the fastest delivery.

- 26. Does this mean we have not taken notice of what has emerged from the consultation process? No, it does not. We have:
 - reviewed the arguments about Ambulatory Care and minor injuries in more depth and identified how to examine some detailed issues more fully in the next stages of planning.
 - revised the estimates of future bed numbers.
 - examined the public transport analyses carefully and now have a much clearer understanding of what we need to do to improve public transport (which applies as much to the Cowglen option as it does to the Southern General option).
 - recognised the need to explore more fully the scope for extended primary care services in Castlemilk, Rutherglen\Cambuslang, Pollok and Gorbals.
 - re-opened the issue of a possible single phase approach at the Southern General site.
 - understood more fully the town planning and alternative land use issues associated with Cowglen.
 - o checked West of Scotland Water's plan for Shieldhall Sewage Works.
- 27. We have also thought hard about how to deal with a number of pressing clinical service issues that need to be addressed in the period between now and the completion of the major capital investment later in the decade:
 - a. an urgent need to ensure that the Victoria Infirmary has stronger capacity to deal with the rising tide of medical emergency admissions during the next few years.
 - b. concentrating haemato-oncology (cancer of the blood and lymphatic systems) services.
 - c. concentrating gynaecology in-patient services.
 - d. concentrating breast cancer surgery.
 - e. concentrating in-patient vascular surgery services.
- 28. The biggest single clinical pressure at the Victoria Infirmary for years has been its lack of capacity to deal satisfactorily with **medical emergency admissions**. In part that was due to inadequate staffing (mainly medical and nursing) and a need for improved organisation. The Trust has been addressing these issues in the last 12 months, with significant additional financial support from GGNHSB. However, the problem will remain intractable for as long as there are too few medical beds. At present medical patients continue to "board out" in the wards of other specialties, principally general surgery. This makes it more difficult to manage the patients efficiently and it also causes significant disruption to general surgery, making it more difficult to improve waiting list performance.

Unfortunately the Victoria Infirmary does not have any vacant wards which can simply be staffed and re-opened.

In order to tackle the problem, and put the hospital onto a sound footing for the remaining years of its acute in-patient role, we suggest the following sequence of changes should take place:

- a. It is already the case that when in-patient ENT moves to newly created accommodation at the Southern General in 2001 (a move already agreed following earlier consultation), an adult ENT ward of 24 beds will become vacant at the Victoria Infirmary.
- b. It is proposed also that in-patient gynaecology should be concentrated at the Southern General Hospital by the autumn of 2001. The benefits and implications of this are explained more fully below. This transfer from the Victoria Infirmary will free up ward 12A (25 beds).

c. It is already the case that within the Victoria Infirmary general medicine bed complement 12 beds are allocated (in a 12 bed ward) for haematooncology. However, it is often the case that 3 or 4 haemato-oncology patients are also placed in another 11 bed general medical ward across the corridor.

Our proposal aims to produce a significant improvement in the Victoria general medicine capacity, simultaneously provide some small easement for general medicine capacity at the Southern General and improve quality of service for Southside haemato-oncology patients.

The current haemato-oncology ward at the Victoria Infirmary has single rooms with positive and negative ventilation systems to reduce risks of infection in patients whose treatment may make them vulnerable to infection. The ward across the corridor does not have this and haemato-oncology patients are placed alongside other patients with a range of general medical conditions. Haemato-oncology in-patients at the Southern General Hospital currently use 5 beds within a general medical ward. The proposal is to convert the ward adjacent to the existing haemato-oncology ward at the Victoria Infirmary so that an integrated unit for the whole of the Southside with suitable facilities and environment can be dedicated to this patient group. The cost of conversion would be around £200,000. This would affect 124 in-patient haemato-oncology admissions per year that currently go to the Southern General who would in future go to the Victoria for in-patient and day case care (375 attendances per year). Their routine out-patient consultation would continue at the Southern General.

This conversion would allow the concentration of haemato-oncology staff expertise in the Southside and would allow better cover for staff absences.

This manoeuvre would free up 5 extra beds for general medicine at the Southern General but would reduce the Victoria's designated general medical bed complement by 11 beds (slightly less in terms of current availability for general medicine), but

d) general medicine's bed complement would be increased by allocating to it the wards vacated by gynaecology (25 beds) and adult ENT (24 beds). There would thus be an extra 38 beds for the designated general medicine bed complement. GGNHSB would provide the revenue necessary for this expansion. This should provide significant easement of the Victoria Infirmary's difficulties in absorbing general medical workload and should significantly reduce the level of patients boarding out in general surgical wards. Waiting list performance will also benefit therefore.

We believe these changes would provide enormous benefit to the Victoria Infirmary and its busiest acute services.

29. As already indicated, this manoeuvre depends on a ward being vacated by **gynaecology**. What is the rationale for this and what are its implications?

Firstly **the clinical logic** flows from the advice of the Area Sub-Committee in Obstetrics and Gynaecology which favours co-location of gynaecology with obstetrics (maternity services) and urology. As is the case with other surgical specialties there are also trends towards the development of subspecialisation within gynaecology which are particularly difficult to accommodate at a time when legal and regulatory constraints on doctors' working hours (senior and junior doctors) are tightening. As specialisation continues so does the importance of ensuring as much continuity and

strength in depth among the dedicated nursing team (and other staff) for gynaecology, many of whom also develop specialist knowledge and skills.

The Glasgow-wide proposal for gynaecology envisages in-patient gynaecologybeing located at the Glasgow Royal Infirmary and the single in-patient hospital for the Southside. Ambulatory Care would continue to be provided at the Victoria Infirmary, Stobhill and Gartnavel (as well as at GRI and the Southside hospital), although the Gynaecologists share the caution of some other surgeons about day-surgery in stand-alone centres (an issue discussed earlier in this paper).

There are strong reasons for proceeding with the concentration of in-patient gynaecology on the Southside at the earliest opportunity:

- a. It allows the benefits of a larger clinical team (specialisation and better staffing cover) to be secured without waiting several years.
- b. It allows use to be made of currently idle ward space at the Southern General.
- c. It creates sorely needed space to expand general medicine at the Victoria Infirmary.
- d. It allows in-patient gynaecology services to be relocated from West Glasgow at an early opportunity, thereby freeing up room for manoeuvre to facilitate the highly desirable service changes that would release West Glasgow acute services from their present wholly unsatisfactory pattern of split-site services for in-patients during their episode of care.
- e. It will save about £300,000 a year, mostly as a result of a reduction in junior doctors' rota commitments and from more efficient use of beds. GGNHSB is currently underwriting that excess cost and no longer having to do so will allow that £300,000 to be spend on expanding general medicine capacity at the Victoria Infirmary.

30. The impact of these changes for patients would be as follows:

	Out-patient Attendances	Day Cases	In- patient episodes	TOTAL
Southern General	9,361	985	1,909	
Victoria Infirmary	9,746	1,296	2,390	
Western\Gartnavel	10,587	1,367	1,668	
No change	29,694	3,648	1,909	35,251
 Change	Nil	Nil	4,058	4,058

The total bed days in hospital for the 4,058 patients affected by change (based on data in the 1998\99 Blue Book) is 9,450, an average of 2.3 days per patient.

These figures assume that the patient population currently attending the West Glasgow hospitals would in future have their in-patient stays at the Southern General. GPs would be able to refer their patients to the GRI\Stobhill service if they wished for clinical or other reasons.

There is currently one 25 bed gynaecology ward at the Victoria Infirmary and one 25 bed gynaecology ward at the Southern General (located in the Maternity Block). There is also a vacant 25 bed ward in the Southern General Maternity Block.

The Trust would propose to upgrade the existing and vacant wards (Wards 40 and 49) in the Maternity Block at a cost of £1.2 million (£600,000 per ward). The service would also need to be supported by a triple theatre suite by the time gynaecology from West Glasgow joined the concentrated service. A site exists adjacent to the gynaecology wards in which to locate this.

If capital funding is available, this work could be started in the Spring of 2001, allowing gynaecology to vacate its ward at the Victoria Infirmary by the Autumn of 2001, it time for general medicine to occupy it before the winter of 2001\2.

The detail of the scheme to create a triple theatre capacity to accommodate the current West Glasgow in-patient workload would depend on whether the Southern General or Yorkhill was the location of the second of only two maternity delivery services in Glasgow (an issue subject to separate consultation – see Section 15).

Whatever the outcome of that, there is site space in which the necessary theatre capacity could be created.

If the need to expedite changes to split-site working for medicine and surgery between the Western and Gartnavel pointed to the desirability of transferring in-patient gynaecology from there to the Southern General in late 2001\2, theatre time would need to be accommodated. According to the 1998\99 Blue Book the number of operating theatre hours is as follows:

	Day cases (Hours per year) (Hours per year)	In-patient cases (Hours per year) (Hours per year)	Total needed at SGH
Victoria	Stays at Victoria	1,912	1,912
SGH	394	1,336	1,730
West Glasgow	Stays in West Glasgow	1,334	1,334
			4,976

4,976 hours equate to 103 theatre hours per week over a 48 week work year, which for 3 theatres equates to 34 hours per week each (7 hours per day).

The two upgraded wards would provide space for 50 beds. The transfer of in-patient Gynaecology from the Victoria Infirmary would see one of the two wards working on a day a week basis and one on a 5 day a week basis. When the West Glasgow service moved both wards would work on a 7 day a week basis.

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	<u>VI</u>	<u>SGH</u>	<u>Western\</u>
			Gartnavel
a) In-patient episodes	2,390	1,909	1,668
b) Average length of stay (days)	2.0	2.8	2.8
c) Beds days per year (a x b)	4,780	5,345	4,670
d) Victoria and Southern General combined	10,125		
(bed days)			
e) All combined (bed days)	<u>14,795</u>		

First phase (Victoria and Southern General combined)

25 beds @ 7 days per week x 85% occupancy = 7,756 bed days

25 beds @ 5 days per week x 85% occupancy = 5,525 bed days

<u>13,281</u>

Second phase (West Glasgow service included

50 beds @ 7 days per week x 85% occupancy = 15,512 bed days

This analysis demonstrates that the configuration provides sufficient capacity.

32. As far as **staffing implications** are concerned there would be a reduction in the number of Senior House Officer posts in gynaecology, but with the reduced number working in a pattern consistent with the new national agreement on working hours and pay.

The interim arrangement of one ward working 7 days a week and the other 5 days would require fewer nurses than at present but this will be more than compensated by the increase in general medical beds at the Victoria Infirmary. In overall terms the net change in capacity is created by reopening the closed Ward 49 and increasing theatre capacity at the Southern General. There will be no fewer overall jobs in nursing, professions allied to medicine, ancillary or administrative\clerical at the Victoria and slightly more overall at the Southern General.

33. The impending transfer of ENT in-patient services to the Southern General creates an opportunity to achieve a significant early improvement in the breast surgery service by concentrating its in-patient element at the Victoria Infirmary.

Currently there is a breast unit staffed by two consultant surgeons and their teams with high quality accommodation at the Victoria Infirmary – single rooms in a dedicated ward with its own team focused on a specific group of patients needing great sensitivity at a difficult and worrying time. At the Southern General one consultant surgeon specialises in breast surgery and the in-patients are managed within the general surgical bed complement.

The existing children's ENT ward at the Victoria is located next to the Breast Unit. It is proposed that in the summer of 2001 it be converted A51308927

(approximate cost £200,000) to the standard of the Breast Unit. Together the two wards would form an integrated Breast Unit to provide the in-patient care for the Southside breast service.

It would:

- a. create a 3 consultant team, giving better absence cover.
- b. strengthen the multi-disciplinary specialist breast care team.
- c. create a ward environment purpose-designed for all Southside breast surgery patients needing in-patient treatment.
- d. create a bed complement protected from emergency admission pressures, thereby reducing the risk of late cancellation of booked admissions.
- e. use a dedicated elective theatre, also protected from emergency admission pressures.
- f. create the capacity at the Southern General to allow a similar strengthening of the in-patient vascular surgery service (see below).

Out-patient clinics and day case surgery would continue to be undertaken a both the Victoria Infirmary and the Southern General.

The number of patients affected would be around 100 per year which in future would go to the specialist unit at the Victoria Infirmary rather than to the Southern General.

There would be no net change in staffing, although some change in the base hospital of a small number of staff would occur.

34. The creation of a single in-patient Breast Unit at the Victoria Infirmary would create the capacity at the Southern General simultaneously (i.e. in the second half of 2001) to form a single integrated vascular surgery service whose in-patient work would be based at the Southern General (out-patients and day cases still provided at the Victoria Infirmary).

The key features of this service would be:

- a. the creation of a 3 consultant team (compared with the current pattern of 2 at the Southern General and 1 at the Victoria Infirmary).
- b. a dedicated in-patient area for vascular surgery created at the Southern General, with a trained dedicated nursing team.
- c. more in-patients would be in closer proximity to the specialist Vascular Laboratory (mainly using ultrasound imaging) located at the Southern General (there is currently no dedicated equivalent at the Victoria).
- d. the Southside vascular service would be better placed to play a leading role in the South Clyde Vascular Network currently being developed with vascular service clinicians in hospitals in Argyll and Clyde.

Emergency vascular surgery could still be undertaken when necessary at the Victoria Infirmary by the surgeons going to the patient rather than vice versa. This is already the arrangement in Glasgow, where vascular surgeons work as a specialist network to cover out-of-hours emergencies.

The number of in-patients affected would be around 240 per year who would be treated at the Southern General rather than at the Victoria Infirmary.

There would be no significant impact on staff other than possibly a change of hospital base for a small number.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

NORTH GLASGOW SERVICES - CONTEXT

Sections 12 and 13 of this paper address a great deal of detail about proposals for change that have been developed during the consultation debate. We asked the North Glasgow Trust to develop specific proposals and that is what they have now done.

It is important not to let the detail obscure the fact that there is a strong degree of consensus within the Glasgow NHS about some major directions and principles:

- O there should be two in-patient centres in North Glasgow.
- O one of these should be the Glasgow Royal Infirmary, utilising its substantial stock of modern accommodation.
- O the other should be achieved by expanding Gartnavel to allow the closure of the Western Infirmary (approved in 1996) to proceed.
- O the Board's prognostications about the transfer of the smaller specialties away from Stobhill have been confirmed and the eventual transfer of general surgery and hence general medicine from Stobhill to the GRI (and Gartnavel) has been advocated and accepted (subject to the necessary facilities being fully fit-for-purpose).

The areas of disagreement during debate have concerned:

- O the pattern of A & E services.
- GGNHSB's wish to locate an Ambulatory Care Centre at Stobhill.
- O GGNHSB's wish to have a single orthopaedics in-patient centre in North Glasgow at the GRI
- O speed with which the Beatson Oncology Centre services should transfer.

12. THE GRI \ STOBHILL PARTNERSHIP

- 1. Leaflet 19 described the way in which the partnership between these two hospitals has been evolving and what its further direction was likely to be. The proposal to create an Ambulatory Care Centre at Stobhill was seen as a fundamental guarantor that Stobhill would have a long term future as a busy hospital, ensuring that 90% of local people's present contacts with the hospital would continue to be as local and accessible at Stobhill as they are now.
 - We identified that the future of in-patient services, especially in the smaller specialties of orthopaedics, gynaecology, ophthalmology, ENT and urology, was unlikely to be sustainable in the light of increasing specialisation, restrictions on doctors' working hours, and continuing reductions in already small bed numbers as lengths of stay reduce and day surgery increases. We concluded that general surgery would likely face similar pressures causing it to need to integrate onto one in-patient site at the GRI to provide a service for a population of 340,000 people. We asked whether people felt general medicine would be sustainable in the absence of general surgery.
- 2. Responses from clinicians have confirmed both our analysis of the smaller specialties and our prognostications about the future of general surgery and general medicine. The Stobhill Medical Staff Association wrote:

"The concept of a 3 acute hospital solution to Glasgow is recognised as being the best way forward but only in our view with 3 genuinely new built hospitals in modern facilities".

The Medical Staff Association's reservations are not about concept but about modernity of buildings and timescales. They went on to write:

"it was felt unanimously that acute medicine and surgery could not exist without each other, partly because of implications of associated anaesthetic back-up and intensive care unit. The meeting unanimously rejected any plans that would involve maintaining medicine in the Stobhill site without surgery".

3. General medicine and general surgery are seen as complementary in the arrangements for acute receiving. A patient might be referred with a vague diagnosis. If medical tests did not reveal a condition treatable by a physician, there could be a need for the patient to referred to a surgeon for investigation. Equally patients admitted for surgical treatment might also need medical care.

If there were no general surgery on site, then there would be no in-patient operations, thus reducing the activity in intensive care. This level would be so small that any intensive care unit would not be considered suitable for training of doctors and would have difficulty attracting staff. The unit could not function. This would leave general medicine on site without intensive care which would be clinically undesirable.

These interactions between acute in-patient services are rather "internal" but they serve to demonstrate that the two specialties, general medicine and general surgery, need to work together for as long as a site operates as an acute receiving site. Therefore, for as long as Stobhill remains an acute in-patient site they should both be there.

- 4. The model that there should be three in-patient sites for Glasgow two in the North and one in the South has been the subject of debate off and on in Glasgow for years. If there is agreement that there should be a single General Surgery service in the North and East, leaflet 19 made clear this would necessarily have its in-patient base at the GRI in support of the major Accident and Emergency service. This can only be achieved, however, when the GRI can provide suitable facilities for both in-patient general medicine and general surgery for North and East Glasgow, allowing those specialties to move together from Stobhill. Until that can be achieved they should remain at Stobhill.
- 5. In its response the North Glasgow Trust is quite clear on these points and it is worth quoting this part of their response in full:

"The debate in the North, especially in the North East, has concentrated on the future of in-patient facilities at Stobhill. The Trust has been explicit in its discussion at meetings that the outcome of the proposals will be the transfer of all in-patient services from Stobhill, principally to Glasgow Royal Infirmary but some to Gartnavel. The Trust wishes to register that it supports this move. The Trust recognises two points. Firstly, much of the detail of the distribution of specialties needs to be worked out with clinicians and this work is in progress. Secondly, many of the Stobhill's community expressed regret at what they perceive as a loss of service. They expressed favourable views of the service provided by Stobhill over the years. The Trust is well aware of the high esteem in which Stobhill is held by its community which reflects on the staff who have worked there.

In the debate with many of the Stobhill catchment area and with its staff the Trust has been clear that the outcome of these proposals inevitably means that there will be no in-patient facilities at Stobhill within seven years. This fact needs to be the subject of wider and explicit consultation. The Trust takes the view that the proposals set out in the Acute Services Review not only provide clarity about the future of Stobhill but do so in a way which means that that future can be a pioneering and innovative one for the future of health care".

GGNHSB notes the point about consultation. We would hope that the principle of consolidation of in-patient medicine and surgery principally to the GRI but probably with some, GPs deciding to make referrals to Gartnavel, can be agreed and approved

at the conclusion of this current consultation process. However, we recognise that the public and staff must feel confident that the precise timing and circumstances of such a move are satisfactory. The key requirements are that a satisfactory standard of accommodation and access to diagnostic, theatre and other support services can be provided at the GRI (and Gartnavel). The Trust estimates that it will be able to offer this "within seven years". We do not expect it to be feasible in much less than seven years unless there are unforeseen changes in circumstances.

We therefore propose that the transfer of general medicine and general surgery be approved in principle but that there be further local consultation in due course to confirm that the implementation arrangements meet the tests of adequacy.

- 6. In the meantime general medicine and general surgery will remain together at Stobhill Hospital. For much of their remaining time there they would be operating in tandem with the new Ambulatory Care Centre on site. This will help the local population to develop confidence in the significance, quality and accessibility of the Ambulatory Care Centre as a major and enduring feature of Stobhill's long term future as a busy hospital site.
- 7. We note the view held by some doctors that Stobhill should close altogether. For example, The Area Medical Committee's comments appear to imply this, supporting "early closure of Stobhill General Hospital when accommodation fit for the purpose is provided for Stobhill's patients at the remaining site".
 - We do not subscribe to this view. Our objective is that as many services should be as locally accessible as possible. By locating an Ambulatory Care Centre at Stobhill, the Health Board and the Trust will be able to achieve around 90% of all patient contacts remaining local.
- 8. During consultation debate about the plans for the **GRI** often focused on **shortcomings of this site**. These criticisms have sometimes been expressed so forcefully that it would be possible to overlook the fact that the GRI has been a busy hospital providing a service to the people of Greater Glasgow and beyond for decades.

The debate also overlooks the fact that it is not possible to plan in a vacuum. We need to take account of recent developments and those in progress. In the North and East commentators often asked why the consolidation of in-patient facilities should take place on the GRI and not Stobhill where people saw more room for expansion. At public meetings the North Glasgow Trust explained that Glasgow Royal Infirmary would have to form a major component of any future plan for acute services. Two major developments costing a total of £60 million will be completed there within the next two years. There can be no question that this level of investment of public money could be written off. We cannot plan to leave these developments before they are even opened.

The Trust also pointed out that the impact of the completion of this investment on the GRI site will be considerable and will address some of the criticism directed at the hospital. The existing A & E Department will be demolished, opening up the site. There will be a new site road system. Space will be created for a multi-story car park. Importantly, a nucleus of relatively new buildings will be created around the Alexandra Parade end of the GRI site. Further development here enables services to be moved out of the old buildings on the site. All clinical activity would then take place in buildings the oldest of which would be twenty-five years old.

9. A conclusion that the GRI will be the in-patient site for general surgery and general medicine for the North and East of Glasgow within seven years means that the planning for other inpatient specialties currently at Stobhill needs to be pursued in detail. This requires decisions to be made now, so that the resources for detailed planning can now be committed. A great deal of discussion has taken place on the future distribution of these services. In some cases, those discussions go back years but have never reached a conclusion.

A major synchronised planning of logistics is required of North Glasgow to ensure that the transfer of specialties takes place in an organised manner, when space is available elsewhere, when capital is available and, quite simply when it makes sense to implement the change in order to bring about the benefits for patients. All of this has to be achieved while maintaining the service.

Not all of the changes can take place at once. Therefore, although we consider that the bulk of general medicine and general surgery in-patient services will remain at Stobhill for some seven years, faster progress can and should be made with other specialties, especially those with smaller numbers of beds. The way that the benefits of consolidation, larger clinical teams, better infrastructure and medical cover can be secured across the North Glasgow Trust is described in the next few paragraphs. In each case it is essential to remember that out-patient and day case patients will continue to access their own local hospitals at Stobhill, the GRI and West Glasgow.

- 10. The consolidation of the **orthopaedics** in-patient service for the North and East at Glasgow Royal Infirmary has been the subject of discussion for nearly ten years. Agreement was reached by clinical staff many years ago on the need to achieve it. Actual implementation has always been hindered by operational and management problems. The orthopaedic clinicians of the North and East have co-operated across the two sites by arranging to carry out in-patient planned surgery at both the GRI and Stobhill with all trauma (accident and emergencies) treated at the GRI. These clinicians are also unanimously in favour of the single in-patient unit for orthopaedics in North Glasgow. They see it as necessary to improve the service. Specifically consolidation will enable them:
 - a. to develop departments with expertise in the various sub-specialties (hands, knees, shoulders, hip replacement, trauma and so on).
 - b. to work more closely with related disciplines such as rheumatology and plastic surgery.
 - c. to provide the best training opportunities for junior doctors, nurses and paramedical staff.

There is an opportunity to bring about the long delayed move of in-patient orthopaedics from Stobhill to the GRI very early in 2001. Adequate ward and theatre capacity has been identified within Glasgow Royal Infirmary which would enable this move to take place but also increase day care capacity, thereby reducing waiting times. It would entail the transfer of 17 orthopaedic beds at Stobhill. The number of in-patient cases at Stobhill in 1998\99 was 806 (compared with 90 day cases and 8,395 out-patient attendances which would remain at Stobhill). The average length of stay for Stobhill orthopaedic in-patients was 5.4 days.

Staff have been fully involved in the planning for this move.

11. In the case of **gynaecology** there is general agreement that Gynaecology and Obstetrics should be on the same site wherever possible. Many of the clinicians work in both specialities and there are clinical links between the two specialties.

The North Glasgow Trust has identified a location in the Queen Elizabeth Building at the GRI which would be suitable for gynaecology. The location needs some capital investment to convert it to clinical use and once this is complete, in-patient gynaecology would be in modern, fit-for-purpose accommodation, 30 beds and the necessary theatre capacity It will also be close to the Obstetrics Department which is opening in 2001.

As the alternative location and the capital to make the necessary changes have been identified, there is no good reason to delay the move of in-patient gynaecology from A51308927

Stobhill. The service and its patients will benefit from a move to new accommodation. The Stobhill Gynaecology service currently has 1989 admissions per year which would be affected by the transfer to the GRI. The move of gynaecology in-patients does not adversely impact on the specialties which will be remaining at Stobhill for the medium term. There is a need to conclude some discussion about where best to locate the inpatient gynaecological oncology service which is a regional component of the present Stobhill service. That discussion will continue during October\November, 2000.

GGNHSB hopes that there can be agreement to this transfer early in 2001, so that the transfer can be implemented by 2002. Planning for this transfer has been less advanced than for orthopaedics but staff will be closely involved in planning for implementation.

12. An **Ophthalmology** specialty review group set up by the North Glasgow Trust advised in early 2000 that all out-patient services should be maintained on the sites they are at present. They also proposed that there should be one adult in-patient site for Ophthalmology for the whole of Glasgow. The review group did not at that stage identify a site for this.

The review group felt that consolidation would open the way for increasing sub-specialisation and also allow the introduction of different models of care which would ensure a wider spread of expertise. This could speed access for patients to someone suitably qualified to treat their condition, whether this be an optometrist or a nurse practitioner as well as a member of medical staff. This sub-specialisation would see these different models adopted for the glaucoma, corneal and diabetic eye services. It would allow city-wide medical cover to be provided. GGNHSB believes that the key to achieving these ambitions is to encourage greater collaboration among the North and South Glasgow clinical teams, to monitor the progress of these new service models and let the future disposition of in-patient facilities be driven by the pace of change in clinical practice.

In the meantime there is a pressing practical reason for the transfer of in-patient Ophthalmology from Stobhill. In practice, there are only two designated in-patient beds for Ophthalmology at Stobhill (although sometimes three beds are in use). These are located in the Orthopaedics ward. Once Orthopaedics moves then these two beds would have to be transferred in any case. Transfer at that stage (early 2001) to join the other in-patient service in North Glasgow, at Gartnavel, makes sense. It would improve out of hours cover for Ophthalmology for North Glasgow as a whole because of the single-site presence of SHOs working a rota which complied with regulations.

This change would affect some 570 in-patient cases treated per year at Stobhill, with an average length of stay of 1.4 days. There is capacity at Gartnavel where there are 24 ophthalmology beds (equivalent to a potential capacity of 7,400 bed days per year at 85% occupancy) and two in-patient theatres. In 1998\99 there were 1,891 in-patients at Gartnavel with and average length of stay of 2.2 day (equates to 4,160 bed days). The annual theatre hours requirement was 3,200 hours, which equates to around 67 hours per week. The current Stobhill workload would require some 8,000 bed days and 700 theatre hours (equates to around 15 hours per week). There will need to be discussion to fine tune use of total theatre capacity between day case and in-patient theatres. The patients would also have the benefit of care from trained specialist nursing and junior medical staff in a more sustainable way than can be achieved with two beds located on an orthopaedic ward remote from the main ophthalmology centre.

The day case work (over 1,100) and out-patients (over 9,000 attendances per year) would continue at Stobhill.

13. A specialty review for **urology** was also set up by the North Glasgow Trust and has reported. The review group examined a range of options for the number of sites and also the distribution of services at each of the sites. There is agreement that out-patient services should remain dispersed at all the sites in North Glasgow. While the preferred option for the

in-patient service was for this to be on one site, there remains further work to be done to identify the site for this and to reach agreement on the interaction with day surgery services.

It is clear, however, that as with other smaller specialties currently at Stobhill, the North Glasgow Trust will seek to transfer in-patient Urology to link it principally to the GRI inpatient Urology service. This will affect a total of 1,593 in-patient cases per year, using 20 beds (16 beds in ward 6 plus 4 beds in the Gynaecology Ward which are used for female Urology patients only).

Although it is not yet clear whether this should be a transitional stage to a single inpatient Urology service in North Glasgow, it is clear that there are benefits in terms of sub-specialisation and junior doctors' rostering of out-of-hours cover which mean that within the next three years in-patient Urology in North Glasgow will only be provided from the GRI and Gartnavel and not at Stobhill. The practical logistics of achieving the transfer of the in-patient service from Stobhill can only be worked out as part of the wider jigsaw of achieving change across the North Glasgow Trust but GGNHSB hopes that there can be agreement to the principle of transferring the service from Stobhill into capacity to be provided at GRI and Gartnavel.

- 14. **ENT** is the only other small specialty (i.e. in terms of bed numbers) at Stobhill (it has 6 designated beds although at times when other beds are available move patients are admitted). Again it has been the subject of a specialty review in North Glasgow. This review considered the possibility of one in-patient ENT centre for the whole of Greater Glasgow but decided at this stage that it was more practicable to have one service for the North and one for the South. The North Trust will be planning to achieve this consolidation by the transfer of the in-patient service currently provided from 6 ENT beds at Stobhill to Gartnavel when the opportunity arises during the other changes being planned between Stobhill and Gartnavel. The implications of this transfer on beds and theatre capacity need to be worked through but this can be achieved in 2001\2. It would affect 1,050 in-patient cases per year with an average length of stay of 2.5 days.
- 15. Although the implementation jigsaw for change across the whole of the North Glasgow Trust is quite complex and not yet clear (because the major elements involving the transfer of services from the Western Infirmary to Gartnavel require large scale capital investment), the pathway to change involving Stobhill's acute in-patient services is much clearer:

by or in 2001

- In-patient orthopaedics to the GRI (facilities now available).
- In-patient ophthalmology to Gartnavel (using existing Tennant Institute facilities).

by or in 2002

- In-patient gynaecology to the GRI (capital available to convert accommodation in the Queen Elizabeth Building. Future of gynaecological oncology requires further discussion).
- In-patient ENT to Gartnavel (still requires detailed planning but only 6 beds and around 945 theatre hours per year at approximately 20 hours per week to be accommodated as part of wider jigsaw of change at Gartnavel).

by or in 2003

• In-patient Urology to GRI and (requires a detailed and practicable Gartnavel plan to be developed)

by 2007\8

- In-patient general medicine and (when robust and funded plans have general surgery to GRI (some been developed to meet the tests of to Gartnavel) adequacy)
- 16. Before moving on to consider the position for services in West Glasgow we wish to re-state here that one of the issues emerging from the consultation has been the concern expressed by people in the **East End** about their sense of being **too remote from many services**. During one meeting, for example, a man argued that in addition to the Glasgow Royal Infirmary there should be a new District General Hospital built on the site of the former Belvidere Hospital. Many more people pointed to the cost of public transport to the GRI or to the difficulty of using two different buses if they had to go to Stobhill.

While it is not feasible to produce a proliferation of new District General Hospitals located in Glasgow's more outlying areas and estates, we can and should seek to extend the role and capacity of primary care so that fewer people have to travel to hospitals or Ambulatory Care Centres in the first place. It should be possible to provide more local access to physiotherapy and other advice and treatment from nurse practitioners and professions supplementary to medicine. It should also be possible to provide better support to primary care in managing many chronic diseases. Similarly an enhanced "nurse treatment room" service on a "turn up and be treated" basis would reduce pressure on GPs themselves and give patients an alternative to going to the GRI when they feel they need that sort of service.

GGNHSB commits itself to working with LHCCs and the Social Inclusion Partnership to explore these possibilities for the East End of Glasgow.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

NORTH GLASGOW SERVICES - CONTEXT

Sections 12 and 13 of this paper address a great deal of detail about proposals for change that have been developed during the consultation debate. We asked the North Glasgow Trust to develop specific proposals and that is what they have now done.

It is important not to let the detail obscure the fact that there is a strong degree of consensus within the Glasgow NHS about some major directions and principles:

- O there should be two in-patient centres in North Glasgow.
- O one of these should be the Glasgow Royal Infirmary, utilising its substantial stock of modern accommodation.
- O the other should be achieved by expanding Gartnavel to allow the closure of the Western Infirmary (approved in 1996) to proceed.
- O the Board's prognostications about the transfer of the smaller specialties away from Stobhill have been confirmed and the eventual transfer of general surgery and hence general medicine from Stobhill to the GRI (and Gartnavel) has been advocated and accepted (subject to the necessary facilities being fully fit-for-purpose).

The areas of disagreement during debate have concerned:

- O the pattern of A & E services.
- GGNHSB's wish to locate an Ambulatory Care Centre at Stobhill.
- O GGNHSB's wish to have a single orthopaedics in-patient centre in North Glasgow at the GRI
- O speed with which the Beatson Oncology Centre services should transfer.

13. **SERVICES IN WEST GLASGOW**

A single site service

In leaflet 18, Better Access for West Glasgow Residents, we described the long-standing plan to transfer services from the Western Infirmary to Gartnavel. We made clear that this remained an essential objective. There has been little disagreement with the view that there should be a single in-patient site for West Glasgow for general medicine and general surgery and their sub-specialties. This will end the arrangements which see patients being shuttled backwards and forwards between the two sites during a single stay in hospital, often on more than one occasion. No one has disagreed with the need to achieve this.

 Gartnavel will become the in-patient site for West Glasgow for general medicine and general surgery. For the first time it will be an acute receiving hospital with the ability to treat medical and surgical emergencies referred by GPs.

Gartnavel will also for the first time be able to treat people who have minor injuries which previously would be treated in an A & E Department at the Western Infirmary. The addition of acute receiving and minor injuries unit to Gartnavel brings both these services into a location more widely accessible to the population of West Glasgow than the existing Western Infirmary. Gartnavel will also become the acute in-patient centre for specialties such as Ophthalmology and ENT. These developments will build on the other developments which have taken place at Gartnavel and which are described in

leaflet 18:

- The Brownlee Centre which opened in June, 1998.
- The new Homoeopathic Hospital building.
- A new Ophthalmology Department.
- A new Out-patient Radiotherapy Unit.
- The new Scottish National Blood Transfusion Service facility.
- 2. Earlier in this paper we describe the debate there has been about Accident and **Emergency Services**. We recognise that the majority of medical and public opinion in West Glasgow would wish there to be an Accident and Emergency Service at Gartnavel. However, our analysis in Section 5 of this paper sets out why we believe that the need for 'gold standard' A &E services to deal with moderately to seriously injured patients can be met by two centres in Glasgow rather than three and why the Southern General is the best strategic location for the second such unit if the GRI is the other.

We go on in Section 5 to analyse the range of numbers of patients we would expect to use a Minor Injuries Unit at Gartnavel. Based on the detail provided in Annex 6 our expectations would be as follows:

Current level of attendance at Western Infirmary = 55,000 per year. Of these, 1,200 are children whom we would expect in future to go to Yorkhill or to be treated by primary care. Another 12,000 are GP referrals. We would expect these to go to Gartnavel. Some 8,600 are adult 999 ambulance cases. We would expect most of these to go to the Southern General (the balance to We would expect between 13,300 and 19,900 to go to the Minor Injuries Unit at Gartnavel. Of the others we predict that no more than 6,600 would go to GRI (probably significantly fewer than this). The larger number would go to the Southern General.

So, of the present 55,000 attendances at the Western Infirmary our prediction for the future is that they would go instead to: Gartnavel 25,300 to 31,900

Yorkhill or primary care 1,200 GRI or Southern General 21,900 to 28,500

3. During consultation, people have raised anxieties about where they would be taken if they had a heart attack. The advice of the Accident and Emergency Sub-Committee on this issue is:

"It is recognised that (GP referred emergency) patients who have been assessed as stable by their GP and referred for in-patient assessment can be safely admitted via (medical and surgical) receiving units and that this is the current practice elsewhere. All un-assessed 999 self-referral patients, together with physiologically unstable patients and those that deteriorate in transit should be admitted and assessed by A & E staff in a fully equipped department medical and surgical receiving at hospitals without full A & E services should be limited to GP-referred stable patients".

GGNHSB has asked the A & E Sub-Committee to explain their advice more fully since others have said that they would expect patients with "obvious heart attack symptoms" to be taken to the medical receiving unit at Gartnavel. Their reply will be published when it is received.

4. In this context it is worth reminding ourselves what the **travel time differences** are.

The road pattern is such that anyone travelling from west of Anniesland will currently approach the Western Infirmary from there, either along the Great Western Road, cutting through to the Western Infirmary at some point or along the Clydeside Expressway or Dumbarton Road. Those coming from the Maryhill area or beyond will use Bearsden Road to Anniesland Cross or Clevedon Road or Maryhill Road, then cutting across Great Western Road at some point.

- From Anniesland Cross it takes around 11 minutes to drive to the Western Infirmary.
- From Anniesland Cross to Gartnavel is 4 minutes.
- From Anniesland Cross to Southern General is 8 minutes.

Thus although Gartnavel provides the shortest time, the Southern General provides a 3 minute improvement compared with present experience of going to the Western Infirmary.

For people currently living close to the Western Infirmary, for whom the present ambulance journey may be only 5 minutes or less, the future journey time to the Southern General would be around 10 minutes (measured from the Partick end of Byres Road) which is still significantly less than experienced by many patients in Greater Glasgow being taken to the present pattern of A & E Departments.

All of these times were measured in normal driving conditions, not in blue light conditions.

5. The other major area of debate during consultation has been the issue of whether there should be a separate **orthopaedic service** at Gartnavel or whether there should be a single orthopaedic service for the whole of the North Glasgow Trust with its inpatient facilities located at the GRI.

In our consultation proposals we indicated our preference for a single North Glasgow service with all of its in-patient services at the GRI, but undertaking out-patient and day case surgery work at all three sites (GRI, Gartnavel and Stobhill).

The Area Medical Committee in saying that it was "unable to support the withdrawal of in-patient orthopaedic services from the Gartnavel site" did so because it was "unconvinced that the change from five A & E sites to two can be safely managed in the current climate" and the presence of on-site orthopaedics is essential to the viability of an A & E service.

The Orthopaedic Sub-Committee itself did not submit a response to the consultation, almost certainly because opinion within it is divided. The orthopaedic surgeons at the GRI, Stobhill and Southside favour a "two orthopaedic unit" configuration for Glasgow. Those in West Glasgow advocate a "three unit" configuration.

- 6. The **arguments in favour of a single trauma and orthopaedic unit** in North Glasgow as described by the orthopaedic surgeons from the GRI and Stobhill are:
 - a. it allows departments to be developed with expertise in the various subspecialty areas of orthopaedics, including upper limb surgery, hand surgery, spinal surgery, lower limb surgery, complex trauma surgery and bone tumour surgery.
 - b. it provides the best possible training environment for junior doctors, nurses and paramedical staff.
 - c. it provides the most robust platform from which to co-operate with related disciplines, notably rheumatology, plastic surgery and oncology.
 - d. it provides the strongest possible basis for a University department of orthopaedics.
 - e. it complies most easily with the requirement to reduce junior doctors' hours.
- 7. The **arguments against**, advanced by the West Glasgow orthopaedic surgeons are a mixture of comment about the overall principles of our proposals:
 - the "split-site working" argument.
 - the risk management issue relating to day surgery in stand-alone Ambulatory Care Centres.

- opposition to Minor Injuries Units staffed by nurse practitioners.
- doubts about the capacity of the GRI A & E Department to cope.
- o a lack of detail in the GGNHSB proposals about how we should tackle the "blocked beds" issue.

and points specific to orthopaedics:

- a worsening of access for West Glasgow orthopaedic patients.
- access for visitors to elderly patients with hip fractures.
- the need for on-site orthopaedic support for patients of the Beatson Oncology Centre whose cancer involves the bones or who experience pathological fractures.
- a single North Glasgow service of 18 or more consultants would be too large to run efficiently "particularly since doctors could be working between three hospitals (Gartnavel, GRI and Stobhill)".
- synergies between orthopaedics and other specialties have been overlooked.
- there is no evidence that a single unit will improve the quality of care.
- 8. It is important to look closely at the arguments for and against. The issues around stand-alone Ambulatory Care Centres, Minor Injuries Units and the capacity of the GRI A & E Department are addressed earlier in this paper (see paragraphs 4.6, 5.6 and 5.22\23 respectively).
- 9. The issue of 'blocked beds' is undoubtedly important and is being addressed in conjunction with colleagues in Social Work services. Glasgow has many fewer 'blocked beds' to-day than it did two years ago and we intend to achieve further reductions. The consultation exercise about the reconfiguration of acute services cannot include every angle and cross-connection with other strategies - those wanting to be assured about such issues need to look at the Health Improvement Programme.
- 10. The question of "split-site working" is discussed in paragraph 4.7 of this paper but also needs to be seen in the context of how a larger unit might be organised.

The West Glasgow orthopaedic service has a potential complement of eight consultant orthopaedic surgeons, the GRI\Stobhill service would have nine when fully staffed. (The South Glasgow orthopaedic service will have twelve consultants).

The creation of larger teams provides scope to organise clinical commitments more confidently against the disruption caused by leave and other absence than is feasible in a smaller unit. It also provides more scope to cover trauma adequately by pairing consultants in a "buddy" system with improved continuity of patient care and more flexible receiving duties. At the same time this should maximise the amount of time available for clinics and elective operating.

In leaflet 10 (on Doctors' Working Hours) we gave an illustration of how this could work in practice.

The advice of general and orthopaedic surgeons is that single in-patient surgical and orthopaedic units on the Southside could each comfortably manage their emergency workload with single emergency teams in each specialty.

Every day on both sites in the South, we currently have 2 emergency orthopaedic teams, that is theatre nurses, anaesthetists and surgeons available to perform emergency operations. The reduction to a single emergency team would free up that resource to perform elective work and for example, 500 extra hip replacements in a year. A51308927 reduce our waiting list for elective procedures in orthopaedics. This would free up enough time to do, If we illustrated this point in terms of hours, an example might be as follows:

If each hospital has consultant emergency presence in the hospital from, say, 9 a.m. to 7 p.m. each day then the difference in requirement for consultant surgeon time is as set out below. It is expressed in very simple terms but it serves to illustrate the point:

9 a.m. to 7 p.m. dedicated time for emergency work = 3,650 hours per year.

So, 2 orthopaedic units with emergency cover require 7,300 hours a year whereas a single team\unit could do the same job using only 3,650 hours. Moving from 2 to 1 releases 3,650 hours a year to be used to reduce non-emergency waiting times without any adverse effect on ability to deal properly with emergencies. An individual consultant complying with EU working hours regulations can work 2,016 hours per year. So 3,650 hours is equivalent of nearly two consultants' clinical working time

There are many different ways of organising work programmes. An illustration of how moving from two separate orthopaedic services in South Glasgow to one could be expected to lead to significant benefits has been produced during the consultation period:

Possible Activity Gains from One-site Model

Assume 12 consultants, of whom 8 will have a trauma commitment and 4 will not. Each surgeon will work 26 fixed sessions per month, of which a basic 20 will be as follows:

TRAUMA SURGEONS

4 ortho clinics 8 elective theatres 4 fracture clinics 4 trauma theatres

ELECTIVE SURGEONS

8 ortho clinics 12 elective theatres

The balance of 6 sessions\consultant\month will comprise Day Surgery sessions, elective theatre sessions and special interest clinic sessions in proportions designed to fit each consultant's individual practice.

This will generate a total of 72 sessions, which assuming an equal split will lead to:24 day surgery sessions 24 elective theatres 24 special interest clinics

Assume each surgeon is available for 10 months (40 weeks).

Assume 16 patients are seen at each New OP clinic and half the Ortho clinics are for new patients. Assume 12 patients are seen at each Special Interest clinic.

In one year 5,120 patients will be seen at New OP clinics and 2,880 patients will be seen at the Special Interest clinics. This makes a total of 8,000 New OPs per year.

The total number of elective theatre sessions will be 1,360 per year.

This compares with current practice (where each surgeon does 8 elective theatres per month and 4 new patient clinics per month) as follows:

Status quo new model

New OPs per year 7,680 8,000 Elective theatre sessions per year 960 1,360

It is understood that the British Orthopaedic Association advocates 12 new patients per clinic in Teaching Hospitals (as opposed to 16 in this illustration) but the difference in productivity potential between status quo and new model remains significant even if applying a lower rate of new patients per clinic.

It is difficult to see why similar gains could not be achieved in patient activity (with all its benefits for reducing waiting times) in North Glasgow. This would need to take account of the larger trauma commitment from combining the workload for the entire North Trust. It is estimated that when combined with the increasing number of hip fractures in the elderly and pathological fractures from the Beatson Oncology Centre, this would require two Consultant teams working in two theatres, at least during the normal working day. Only one Consultant would be required for overnight cover but at junior staff level there would be a need for duplication to provide cover to both the elective and trauma wards as well as providing orthopaedic support to the A & E Department. For these reasons the move from two orthopaedic units to one would not result in a significant saving in junior staff on-call rotas.

What it does do is provide an opportunity of creating a large team of at least 16 consultants with better cover for absences due to leave and more flexible work programmes.

It is this efficiency which generates so many opportunities to strengthen subspecialisation, increase patient numbers, reduce waiting times and increase the richness of training and research opportunities for staff by providing the basis for a University Department of Orthopaedics.

11. What of the issues of access for patients? The current activity profile of the West

Glasgow service is:

	<u>Per year</u>	
Out-patient attendances	21,807	Would be at Gartnavel
Day case surgery cases	723	Would still be at Gartnavel
		Most of the trauma cases would go to the Southern
In-patient admissions	3,619	General. Elective cases would be undertaken at GRI.

Most trauma patients are ambulance borne and for them access is not an issue. For elective patients the issues become those of car parking and public transport access at the GRI, which we addressed in paragraph 6.4 of this paper. The number of patients affected is very similar to the numbers of patients who have to travel to a single centre in the city already for some services, such as neurosurgery (3,250 per year), plastic surgery (3,500), paediatric surgery (4,700) – certainly not as convenient as having a service on one's local doorstep but not an unusual experience when the benefits for patient care lead to some centralisation. In the case of orthopaedics the benefit to patient care derives from more robust continuity in sub-specialisation service provision and significant reduction in waiting times caused by the more efficient management of trauma demand.

- 12. In the case of **elderly patients and their elderly visitors** there is an issue which needs to be addressed regardless of where hospitals are located and that concerns the speed and effectiveness of rehabilitation services and discharge planning. We acknowledge the need to devote effort and resources to improve NHS (and local authority) performance in this area. Elsewhere in this paper we have examined the predicaments of visitors (see paragraph 6.12). Most West Glasgow trauma admissions would go to the Southern General which has adequate car parking space, is more accessible to more parts of West Glasgow than is the Western Infirmary and whose public transport links can be greatly improved by our proposal to sponsor a regular shuttle bus link to the Partick Station rail\bus interchange.
- 13. The issue of **synergy with other specialties** is difficult to get right in Glasgow since its size and the unavoidable need for some specialties (such as neurosurgery, plastic surgery and maxillo-facial surgery) to be highly concentrated onto single sites means that perfection is unattainable. (Clearly at the GRI there would be excellent synergy between orthopaedics, A & E services and plastic surgery). In the case of Gartnavel the key necessary **synergy is with cancer services**.

For the Orthopaedic Oncology service there is a need to provide out-patient clinics, diagnostic imaging with CT and MRI and a biopsy service in close proximity to the main Beatson Oncology Centre. This leaves a difficult decision on where to site the in-patient services for the small number of patients requiring major tumour surgery. On balance the expert opinion from

the specialists in orthopaedic oncology would prefer this to be with the major orthopaedic service because of the need to utilise specialised theatre facilities, equipment and instrumentation. These would be expensive to duplicate for a relatively small, but demanding, workload. It would also provide the additional advantage of easy access and collaboration with the Plastic Surgeons at GRI. However, this would create an additional need for the patients with pathological fractures from cancer deposits in bone to be transferred from the Beatson Centre to GRI for their surgery. The current estimates are that there would be 2 – 3 patients each week with this problem.

14. The final issue concerns the **rostering of junior doctors in orthopaedics**. The cost of paying for four emergency rotas when two would be quite adequate is not insignificant given the now punitive cost of junior doctors' out of hours working. In the case of orthopaedics in North Glasgow the current cost of 31 junior doctors is £1.2 million per year. If the present rota pattern continues unchanged, by 2002 the cost will have increased by £890,000 (i.e. almost doubled). It is urgent that the number of rotas is not sustained at this level, since we would be paying hundreds of thousands of pounds unnecessarily for no benefit to patients.

Our conclusion therefore is to maintain the proposition that there should be one single orthopaedic team for North Glasgow with its inpatient service located at the GRI, undertaking out-patient and day case work at all three hospitals (GRI, Gartnavel and Stobhill).

15. In leaflet 18 and in leaflet 21, Radiotherapy: Linear Accelerators - A Patient's Guide, we proposed that the **Beatson Oncology Centre** should remain on the Western Infirmary site while the general medicine and general surgery services were transferred to Gartnavel. We saw this as a temporary measure, lasting no more than ten years. Most responses have urged us to accelerate this process. In its response the North Glasgow Trust sums up the position thus:

"Discussion within the Trust had raised doubts that the Trust can sustain the delivery of cancer services over two sites for as long as ten years. These doubts have been reinforced by the action taken by the Trust to address the lengthening waiting lists for radiotherapy treatment. This led the Trust to accelerate the programme for the introduction of the three new linear accelerators at Gartnavel. These will now come into operation by December, 2001, eight months earlier than originally achievable.

Previously the more gradual commissioning programme for these machines would have meant they would have provided out-patient treatment to compliment the inpatient service provided from the Beatson Oncology Centre located at the Western Infirmary. The accelerated programme will mean that the provision of in-patient radiotherapy will be possible at Gartnavel earlier than planned. It would be provided from two sites, Gartnavel (from the new machines) and the Western Infirmary (from the existing machines).

The Trust does not believe that the provision of in-patient radiotherapy services from two sites is sustainable. Therefore, the Trust believes that the total service will need to be relocated to be close to the new machines sooner than originally planned. This would also satisfy the need for cancer services to be located close to surgery".

We agree with these arguments.

The Trust is now accelerating its planning and the development of an Outline Business Case for the transfer of these services from the Western Infirmary to Gartnavel General Hospital. The Trust plans to achieve this within the next five years. The Beatson Oncology Centre

will be relocated within that time with all its services then provided from Gartnavel.

16. This change of plan has an impact on one other element of the proposals. This relates to the centralisation of Cardiothoracic Surgery. Leaflet 20 "Why Centralise Cardiothoracic Surgery?" explained the reasons for the plan to bring together in one unit the services currently provided at the GRI and at the Western Infirmary. The objective of centralisation has not been questioned during the consultation. The proposal has been generally welcomed.

The proposal to locate the centre on the Western Infirmary site was made because it was already the location of one of the two elements of the service. It also ensured that, together with the continued presence of the Beatson Oncology Centre, greatest use was made of the relatively modern buildings at the Western Infirmary. Finally, it freed space in the GRI for other moves in the complex series of specialty transfer across North Glasgow.

As the Beatson Oncology Centre is now to be transferred earlier than planned at first, there is a question of whether the Western Infirmary site can sustain only one service, the Cardiothoracic Centre, for up to 10 years. The North Glasgow Trust has yet to work through the implications of this with the clinicians and others. There **might be a need to relocate this service earlier than originally suggested**.

Notwithstanding the timing of the move to Gartnavel, however, we propose to plan for a single Cardiothoracic Centre in North Glasgow. This will still be in two stages with an initial consolidation to the Western Phase 1 building and subsequent relocation to Gartnavel. The question of how long that subsequent relocation will take will be addressed during the next two months.

- 17. What of the position of **other specialties at Gartnavel?** We have already indicated in Section 12 that we propose to designate Gartnavel as the in-patient centre for the North Glasgow **Ophthalmology and ENT** services (with out-patient and day case work at all three hospitals).
- 18. **Gynaecology** currently based in West Glasgow faces the same clinical logic referred to earlier in relation to the Southside and North and East Glasgow which favours colocation with both obstetrics and urology. It also faces the same issues of declining bed numbers and inefficient rostering requirements for junior doctors. Co-location with obstetric services is not possible at Gartnavel. Creating a larger single site location for in-patient gynaecology at the GRI would require more space than is available there.

The debate sponsored by the North Glasgow Trust has confirmed an already emerging view that the most sensible way forward would be to colocate the current West Glasgow gynaecology service with the single gynaecology service being proposed for South Glasgow (see paragraphs 11.30 to 11.33 for details).

The outcome of consultation on the choice of whether to locate Glasgow's second maternity delivery unit at the Southern General or at Yorkhill cannot be anticipated. If the outcome is to choose the Southern General than colocation of gynaecology with both obstetrics and urology would be achieved. If the outcome is to choose Yorkhill, the obstetrics and gynaecology team supporting its operation would be separated from the Southern General by a relatively short journey through the Clyde Tunnel (approximately 10 minutes).

The issue of timing is set out in paragraph 11.32. Synchronised transfer of the West Glasgow and Victoria Infirmary in-patient gynaecology services to A51308927

the Southern General in the Autumn of 2001 would avoid gynaecology having to make a double move (from the Western Infirmary to Gartnavel and then to the Southern General).

We therefore propose that in-patient gynaecology should transfer from the Western Infirmary to the Southern General as soon as the necessary upgraded ward and theatre capacity has been provided (hopefully by the Autumn of 2001). Out-patient and day case work will continue to be done in West Glasgow.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

14. OTHER SPECIALTIES

- 1. The position on some other specialties needs further discussion.
- 2. During consultation, the dermatologists have produced a document which proposes a unified Dermatology service for Glasgow. The proposal combines a well developed vision of local ambulatory care at all hospital sites with a single in-patient unit (they propose 24 beds). The proposal is attached at Annex 8.

Dermatology is currently located at both the Southern General and the Western Infirmary. Clearly with the closure of the Western Infirmary some relocation is unavoidable. The questions is "to where?".

GGNHSB would want to encourage the dermatologists towards the achievement of their vision of excellence and accessibility.

We therefore endorse the principle of a single in-patient centre for Greater Glasgow and will now explore what the preferred location should be. As part of that process we seek views on the thinking set out in Annex 8.

3. Some months ago we requested advice on the organisation of **Nephrology** services (for kidney patients). In leaflet 4 we had indicated that we proposed one in-patient centre at the Southern General and one in North Glasgow. This reflected earlier advice from nephrologists that there should be two units in Glasgow and GGNHSB's own desire to see a nephrology service established in South Glasgow.

We are not sure whether professional opinion on this issue has shifted in the intervening months. Our view is that the major A & E centres proposed for the GRI and the Southern General should have on-site nephrology services in support. We are open to persuasion that Gartnavel and its mix of services may also need on-site nephrology services in support.

We wish to receive definitive advice on the pattern of provision for nephrology based on the disposition of other specialties now becoming clear through the present consultation exercise.

4. The position of **urology in North Glasgow** was discussed in paragraph 12.13 in relation to the transfer of in-patient urology services from Stobhill to the GRI and Gartnavel. The North Glasgow Trust has indicated that it is not yet clear whether such a transfer would be a transitional step towards a single in-patient service in North Glasgow or not. If there is a proposal to establish a single North Glasgow in-patient service it will be subject to separate consultation in due course.

In the meantime GGNHSB confirms its proposal to transfer in-patient urology from Stobhill to the GRI and Gartnavel as soon as appropriate capacity and support services can be provided (see paragraph 12.13).

5. The significance of **mental health services** has been raised in connection with several aspects of the consultation. There is of course a well developed Mental Health Framework and Implementation Plan which is currently being put in place throughout Glasgow as new facilities (e.g. the new wards at Stobhill) and revenue money become available. It was itself subject to extensive consultation during 1998 and 1999.

The three areas of significance in relation to acute services configuration are:

- a. the need for "liaison psychiatry".
- b. the replacement of Leverndale Hospital in South Glasgow.
- c. the future of Stobhill Hospital.
- 6. **"Liaison psychiatry"** recognises the connection between physical and psychiatric ill health. The Primary Care Trust's Psychiatric Medical Advisory Committee wrote

"Improving the psychological health of medical\surgical in-patients and out-patients improves the quality of life, reducing bed occupancy, investigation and procedural costs Each provider unit should provide facilities, both in medical wards and Accident and Emergency Departments which is sufficiently private, safe and properly furnished for interviewing patients concerning psychological, sexual problems and assessment of suicide risk".

In Glasgow there is a high level of need in relation to patients with drug and alcohol addictions and others who have committed deliberate self-harm.

We shall need, in the detailed next stages of planning, to ensure that liaison psychiatry is available whenever it is needed on all acute hospital sites.

- 7. The Primary Care Trust is planning the re-location of mental health services from their isolation at Leverndale and reprovision of existing mental illness beds at the Southern General currently provided in very old and unsuitable buildings. Their preferred option is to co-locate acute mental health services on the Southside's acute hospital site. This would:
 - a. help to make the provision of liaison psychiatry more efficient.
 - b. help to reduce the stigma of mental illness which is perpetuated by the existence of stand-alone "mental hospitals".

This service improvement goal is relevant to the choice of location for the Southside acute services in-patient hospital. Environment and design are important in good mental health care. High rise development is not appropriate and adequate dedicated recreation space is important. The requirements are therefore quite "land hungry". The need could not be met at the Victoria Infirmary\Queens Park Recreation site. The Trust's preference is for the Southern General site and space has been earmarked on the Coila Park site within the campus which neither interferes with the space needed to rebuild the Southern General nor add to the risk of site disruption during construction.

8. Some commentators have raised questions about the position of **mental health services at Stobhill** if there are no general acute in-patient services there. Such a change in Stobhill's role would not undermine the clinical effectiveness of the mental health services in any way. The fact that the Stobhill campus would still be an extremely busy general acute services site (with over 300,000 patient attendances per year) would mean that its atmosphere would be dominated by that activity rather than by the presence of a relatively small number of mental health wards. Most importantly the risk of mental illness being stigmatised would be reduced by Stobhill's multi-purpose healthcare role.

The presence of mental health services on the campus would help to provide liaison psychiatry support needed for Stobhill's Ambulatory Care Centre.

9. The issue of clinical support specialties such as **laboratory services** and **imaging** (x-ray, ultrasound, MRI) was not addressed in our original consultation material. Work is underway to develop an investment plan for imaging services in Glasgow and will be reported in our next Health Improvement Programme. In the case of laboratory services we recognise that capital investment is needed to modernise facilities, harness new technologies, create flexibility between disciplines and provide a platform for further new scientific development. We wish to work with the Trusts and laboratory medicine staff to consider what the most effective investment strategy would comprise.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

15. MATERNAL AND CHILD HEALTH

- 1. In leaflet 17 'Maternal and Child Health' we described the suggestion that had been made about the possibility of re-locating Yorkhill Trust's hospital services into brand new facilities. This would at the same time facilitate an on-site link with adult services which does not currently exist and strengthen the child-centred focus on some children's hospital services not currently provided by Yorkhill.
- 2. We acknowledged that the suggestion had not been developed in any planning detail but felt, in the spirit of early consultation on issues, that we should stimulate discussion about it.
- 3. The responses to consultation have not been studied in any depth since they only emerged at the last moment in the consultation period. We can summarise their gist but not get very far in any evaluation of them.
- 4. The Yorkhill Trust conducted extensive consultation themselves with a wide range of staff, family \ parent support groups and others with an interest in the health, development and healthcare of children. They report that over 100 written responses were received but have not shared those with GGNHSB. Instead the Trust Board has referred to the inevitability that a wide range of comments were received but has distilled a number of recurring themes emerging from their consultation exercise:
 - · accessibility.
 - · importance of retaining a child centred focus.
 - access to local amenities\environment for patients and families.
 - integration between child and maternity services.
 - concern that financial imperatives should not drive a decision.
 - · the need to avoid planning blight.
 - the perception of charitable organisations possibly being adversely affected by location within a predominantly adult campus.
- 5. GGNHSB itself received very few letters from the general public on this issue. Some thought the idea of re-location was worth exploring, some opposed it.
- 6. The trust developed 10 Key Principles which they feel should guide the continued development of Child and Maternal Services. These are shown at Annex 9.

The Trust's commentary (also shown in Annex 9) on how the principles would be met by the choice between re-locating children's services or leaving them at the present Yorkhill campus needs fuller analysis. For example:

- a. In Principle 1 (access), no reference is made to what the differences in travel might be in measurable terms nor is the significance of over 21,000 children attending adult A & E services at the Victoria and Southern General considered. The analysis given on access also excludes consideration of access for longer stay children and their parents\visitors.
- b. Principle 7 (advocacy for children) seems to be about Yorkhill's status as a separate Trust rather than about the difference that location might make to this Principle.
- c. There appears to be no recognition of the possibility that Principle 10 (a child and family focus) might be diminished depending on how location influenced the degree of achievement on Principles 4 (links with maternity services) and 5 (links with adult medicine).

- d. The analysis of Principle 5 (links with adult medicine) appears to be limited to the benefit it might have for children whose later care as adults would be served by the host adult acute hospital site. It is highly likely that the benefits of links with adult medicine will be greater than that, especially for older children and adolescents and for maternity patients.
- 7. The Trust also commissioned W.S. Atkins to provide an estate development plan for the Yorkhill site. The report has only just been received by GGNHSB and needs examination. However, it appears to have several main messages:
 - a. the existing Queen Mother's Maternity Hospital building is in "very poor physical and functional condition. Even with an investment of over £15 million, an upgrade would not address some of the fundamental functional problems that were inherent due to the building's structure. the constraints inherent in the existing structure and difficulty of site access do not lend themselves to the provision of 21st century maternity services. In addition construction work would be logistically extremely difficult, due to site access and especially if a clinical service had to be retained throughout".
 - b. there is site space to provide a new Ambulatory Care Centre at Yorkhill if the present Queen Mother's building is demolished.
 - c. the existing Royal Hospital for Sick Children's main block is in reasonably good condition. Physical and functional upgrading costing around £25 million would take it into the next 30 years.
 - d. the report does not appear to address whether and how the existing Main Block could eventually be replaced on site while continuing to provide its services. The suggested site development plan does appear to offer only what would in future be the hospital's main car park as a site but that would be immediately adjacent to the existing block (and therefore very disruptive during construction) and when completed would result in a less good functional relationship with the proposed Ambulatory Care Centre.
 - e. the cost of building a new maternity unit at the Yorkhill site would be £13.3 million (excluding VAT and equipment) on one of two suggested site development options or £14 million on the other.
 - f. the cost of redeveloping the Royal Hospital for Sick Children and give it its "30 year lease of life" would be some £23.5 million on one option or £28 million on the other. The second option is the most ambitious. The difference between the two is essentially that the second provides a brand new Ambulatory Care Centre while the first does not.

This is a useful piece of work which now needs closer examination.

- 8. By comparison the South Glasgow Trust had estimated that it would need to spend around £51.7 million (excluding equipment) in order to include Yorkhill's services at either Cowglen or at the Southern General campus.
 - This option too needs closer examination over the next few weeks. In particular its adequacy in terms of site space, internal functionality and service linkages needs to be tested.
- 9. The Yorkhill Trust's conclusion, following its consultation process, and its consideration of the 10 Key Principles and the W.S. Atkins Report was that it should remain on its present site, with progressive redevelopment of child and maternal hospital facilities on the site.

A number of other commentators took this view.

10. A different view was taken by the Area Medical Committee. It supported the provision of Maternity services at the GRI and on the South Glasgow site. With regard to children's services it said:

"there is strong and unanimous support for the longer term continuation of Glasgow's children's hospital, the Royal Hospital for Sick Children, providing services to children and maintaining its own unique ethos. The

Committee supports the principle that there are advantages to the Glasgow children's hospital and regional referral centre for children being co-located with an adult general hospital on a shared campus. The Committee is sensitive to the concerns of those who are unconvinced that the possible benefits outweigh the perceived dangers of the loss of facilities specially designed for the needs of children. Our children's hospital must not become 'just another department' in an acute Trust".

Within the medical advisory machinery those supporting this view included the Area Anaesthetics, GP and Obstetrics and Gynaecology Sub-Committees. The Paediatric Sub-Committee rehearsed the pros and cons in an even-handed way and concluded that it did "not see the need to move RHSC from its present site at Yorkhill. Until it is clear what alterations are being offered it supports the view that Paediatric and neonatal services should continue to expand and develop on this site".

- 11. The Local Health Council felt more information about choices and benefits should be developed. It felt there was merit in exploring the matter further but that GGNHSB should not commit itself at this stage to a policy to transfer Yorkhill's services.
- 12. The issue needs to be seen alongside the future disposition of maternity services. In 1999 GGNHSB consulted on a recommendation from the Maternity Services Liaison Committee that in the light of falling numbers of births and the imminent surplus capacity in Glasgow once the new GRI Maternity Unit had opened, we should reduce the number of delivery units from 3 to 2. In other words GRI plus the Southern General or GRI plus Yorkhill.

The Maternity Services Liaison Committee has done further work on the factors that should affect this choice and GGNHSB expects to receive some suggestions in the next month or so. We shall then conduct public consultation as to what choice we should take.

- 13. Where does this leave the issue of Yorkhill's services for children? We need to examine the analysis of issues produced by the Yorkhill Trust, the W.S. Atkins Report and the issues of space, functionality and linkages of other options. We shall encourage those analyses to be conducted openly and on a shared basis, during the next two months.
 - If, by December 2000, GGNHSB felt that there was a justifiable case for considering the transfer of children's services from Yorkhill to brand new facilities elsewhere we would develop a fully worked up consultation paper for widespread consideration early in 2001.



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THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

16. FUTURE OF GLASGOW DENTAL HOSPITAL AND SCHOOL

- 1. In its response, the North Glasgow Trust has drawn to our attention the separate consideration which they have been giving to the future of the Glasgow Dental Hospital and School. Representatives from Dental Hospital and School staff, Glasgow University, Greater Glasgow Health Council, Postgraduate Education, and the Chief Dental Officer have been involved in discussion.
- 2. The status quo is not an option. The services provided at present from the Glasgow Dental Hospital and School will almost certainly have to move from their present site in Sauchiehall Street. Structural problems in this building have been identified. An option appraisal has indicated that any solution to these structural problems raises major affordability and practical operational problems.

The objectives of the review of the Dental Hospital and School needed to address clinical and educational issues:

Cadoanoria ioodeo.		
<u>Clinical</u>	<u>Educational</u>	
 a. reconfiguring clinics to gain more effective care. b. increasing chair efficiency through multi-use clinics. c. redesigning A & E Dental services and introducing one stop services. d. introducing new technology (e.g. teledentistry). e. developing local referral services. f. reconfiguring production laboratories. 	i) How to accommodate the additional BDS year taking place in clinics. ii) How to increase outreach for fifth year students. iii) how to introduce a screening clinic to ensure the suitability of referrals to student clinics.	

- 3. The review produced a short list of six options.
 - 1. Do minimum (repairs only) on current site.
 - 2. Repair, refurbish and reconfigure the tower block, decanting from the old block.
 - 3. Two possible sites for relocation at the Western Infirmary.
 - 4. Share of the New Build planned at Gartnavel.
 - 5. New Build at Stobhill.
 - 6. Share of the New Build planned at Southern General\Southside.
- 4. A workshop was held to identify the criteria for assessing these options. A further workshop involving staff, staff representatives, representatives from the Health Board, health Council and Chief Dental Officer was held to assess them. Some of the options were deemed unsatisfactory by those involved in the workshop.

	1. Do minimum on current site	
Δ51308927	2. Refurbish current site	costs, severe disruption, absence

	of real functional and structuralimprovement and high maintenance costs.
3. Relocation at the Western	The uncertainty surrounding the long-term future of Infirmary this site rules this out.
6. New Build in the South	A transfer to a different organisation at the same time as relocating the service adds avoidable complexity. The alternatives offer greater potential for patient benefit by enabling interaction with Oncology and Cardiology.

5. This left relocation to Gartnavel or Stobhill. Further work needs to be done on developing these options. In the meantime GGNHSB and the Trust would welcome feedback on the issues. In due course a formal consultation process will need to be pursued.



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17. SUMMARY OF PROPOSED DECISIONS AND FURTHER WORK AFTER DECEMBER, 2000

- 1. Some of the issues and propositions emerging from the consultation require decision at the end of the consultation process. Others are issues which would be addressed during subsequent detailed planning and the development of Outline Business Cases. In this section we set out which issues would be pursued in which way.
- 2. Issues which we believe will require Health Board decision in December, 2000 are as follows:
 - a. that there should be a single in-patient hospital on the Southside of Glasgow (a South Glasgow University Hospital).
 - b. that this will entail transferring in-patient services from the Victoria Infirmary to the new South Glasgow University Hospital.
 - c. that the Southern General campus should be the site for the South Glasgow University Hospital subject to confirmation in the option appraisal to be conducted as part of the Outline Business Case process.
 - d. that in implementing the 1996 Ministerial agreement to close the Western Infirmary and transfer services to Gartnavel, GGNHSB will be commissioning a Minor Injuries service there, while Accident and Emergency Services would be provided at the GRI and South Glasgow University Hospital.
 - e. confirming also that the role of Gartnavel will comprise:
 - medical and surgical receiving.
 - the single North Glasgow in-patient centre for ophthalmology and ENT.the Beatson Oncology Centre.
 - the Regional Cardiothoracic Centre.
 - local Ambulatory Care services.
 - a Minor Injuries Unit.
 - f. the early implementation of the following transfers of in-patient services:
 - centralise in-patient gynaecology from Victoria and Gartnavel to SGH in 2001.
 - centralise Southside in-patient haemato-oncology at Victoria in 2001.
 - centralise Southside in-patient breast surgery at Victoria in 2001.
 - centralise Southside in-patient vascular surgery at SGH in 2001.
 - transfer in-patient orthopaedics from Stobhill to GRI in 2001.
 - transfer in-patient gynaecology from Stobhill to GRI by or in 2002.
 - transfer in-patient orthopaedics from Western\Gartnavel to GRI when facilities are available.
 - transfer in-patient ENT and Ophthalmology from Stobhill to Gartnavel in 2001\2.

- transfer in-patient urology from Stobhill to GRI and Gartnavel by or in 2003.
- transfer of in-patient cardiothoracic services from GRI to the Western Infirmary as an intermediate step to transferring the whole service to Gartnavel. To be achieved as soon as space becomes available at the Western Infirmary.
- g. agreement in principle to transfer general medicine and general surgery from Stobhill to the GRI (some to Gartnavel) within seven years but to require further local consultation in due course to confirm that the implementation arrangements meet the tests of adequacy.
- 3. A number of issues would be pursued through the next stages of detailed local planning and preparation of Outline Business Cases. They include:
 - a. continuing planning for the Ambulatory Care Centres at Stobhill and the Victoria Infirmary.
 - b. seeking a faster move to Gartnavel for the Beatson Oncology Centre.
 - c. discussions with Strathclyde Passenger Transport Executive, bus companies and other interests to secure improvements in public transport and related issues.
 - d. discussions with SIPS, LHCCs and others about strengthening extended primary care services in those parts of the Greater Glasgow area most distant from hospital facilities (Clydebank, East End\Easterhouse, Rutherglen, Cambuslang, Castlemilk, Drumchapel and Kirkintilloch).
 - e. continuing examination of the planning issues concerning future major investment in Children's Hospital services and the future of the Dental Hospital and School, leading in due course to preparation of formal consultation material.
- 4. Work to commence consultation about the future of maternity services is well advanced and will be published soon.
- 5. The strategy agreed by the Health Board in December, 2000 will be submitted to the Scottish Executive for consideration, including endorsement of Health Board decisions as appropriate.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES **REPORT ON FIRST PHASE OF CONSULTATION**

ANNEX 1

LIST OF CONSULTATION LEAFLETS

Leaflet No.	<u>Title</u>	No. actually sent out
Summary	The Future of Glasgow's Hospitals – Let's Plan it Together!	426,750
1	The Patient's Experience	2,074
2	Getting It Right For Patients: What it Means for Organising Services	2,096
3	Cancer Services: Specialisation in Action	2,023
4	Why Specialisation Matters – And What We Propose To Do	2,054
	To Make Its Benefits More Available	
5	Creating More Responsive Accident And Emergency Services	2,087
6	Ambulatory Care : What Is It?	2,108
7	Minimally Invasive Technologies: Keyhole Surgery And The Like	2,013
8	The Overall Planning Challenge for Greater Glasgow –	2,154
	Acute Hospitals In A Wider Context	
9	Some Recent Background History	2,060
10	Impact of Regulations On Doctors' Working Hours	2,023
11	The Number Of Beds We Propose to Provide	2,058
12	Regional Services Provided By Glasgow Hospitals	2,116
13	Why Teaching And Research Matters	2,005
14	Staffing Matters	2,052
15	How The Finance Works	2,047
16	Detailed Analysis Of The Options For South Glasgow	2,169
17	Maternal And Child Health	1,999
18	Better Access for West Glasgow Residents	2,070
19	The GRI\Stobhill Partnership	2,072

20	Why Centralise Cardiothoracic Surgery?	1,995
21	Radiotherapy: Linear Accelerators – A Patient's Guide	1,992



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Greater Glasgow NHS Board Acute Services

Annex 2

The Process of Consultation on Greater Glasgow NHS Board's

Proposals to Modernise Glasgow's Acute Hospital Services

Background

1. Planning

1.1 The Health Board sought advice from the Public Relations Consultancy Shandwick on the most effective methods to use to engage effectively with its population. Shandwick were contracted to work for the Board and the Trusts from December 1999 – March 2000. Their remit was:-

> to describe a participative consultation process with the public and interested bodies which is informed and coherent, for the Board to seek views on its proposals for the future provision of acute health care in Glasgow.

1.2 Shandwick assisted in the drafting of the leaflets, identifying appropriate design and print production houses and liasing on behalf of the Chief Executive with the media stratregy.

2. Consultation Launch

- 2.1 Greater Glasgow NHS Board agreed at its meeting on March 21st to launch a consultation proposal to modernise Glasgow's acute hospital services. The consultation document comprised:
 - the consultation paper Modernising Glasgow's Acute Hospital Services;
 - a summary leaflet entitled The Future of Glasgow's Hospital Services: Let's Plan it Together; and
 - 21 topic specific leaflets on a range of issues and geographical information of interest to the public and staff in the health service.
- 2.2 The materials were issued week beginning April 10th to our consultee list and others who requested the consultation package, *see Appendix 1 and 1a*. The period of consultation was initially set for June 30th. Following representations from a number of organisations, the Health Board announced on May 15th that the consultation period would be extended until September 8th, 2000.
- 2.3 A series of presentations were arranged with key partners of the Health Service, local Councillors and MP/MSPs, on the proposals and the long term benefits for the provision and delivery of health services in Glasgow. These took place on March 21st, 22nd, 28th and 31st. Representatives from all the Trusts and the Health Board took part in presenting the proposals and details of those invited to attend (and those presenting) are contained within *Appendix 2*.
- 2.4 Extensive staff briefings in each Trust were also arranged to co-incide with the March Board meeting to inform staff immediately of the consultation. This included

scheduling meetings to ensure that staff on shifts also received the information at the earliest opportunity.

- 2.5 Meetings were arranged, through Shandwick, for the Chief Executive to meet with the key media editors to inform them of the basis for the consultation. Chris Spry met with the Herald, Evening Times, Daily Record, STV and BBC. The Evening Times commented that on an issue this big the embargo would not hold and in those circumstances they could not afford to be left 'standing at the post'. We sought to achieve the best result we could from the expected breaking of the embargo. The Evening Times were asked to check their material with us before publishing and this they agreed to do. The Evening Times ran a detailed analysis of the proposals on March 15th.
- 2.6 Following extensive interest, the Evening Times worked closely with the Board on a series of articles which identified the key issues raised by its readers and carried an official response on each issue. The Chief Executive also took part in a People's Jury on April 6th, organised by the Times to debate the key issues emerging from the Board's proposals.

3. Summary Leaflet

- 3.1 To ensure that as many people as possible who were interested in contributing in this debate had a clear understanding and easy access to the proposals, the Board decided to distribute the leaflet to every household in the GGNHSB area.
- 3.2 500,000 leaflets were printed comprising of 423,000 for the door-to-door distribution and the balance being distributed through hospital out-patient departments and clinics, GPs, Dentists, Opticians and Community Pharmacists, available at all the public meetings and from the key public outlets where the consultation documentation was available (libraries etc).
- 3.3 Scotmail on behalf of GGNHSB carried out the door-to-door distribution. Initial internal evidence suggested that the distribution of the leaflet had not been as comprehensive as we would have liked. This was also tested at the public meetings which indicated that a large proportion of people had not received the leaflet through their door. At the end of May, Scotmail were asked by the Board to survey postcode areas G3, G11, G12, G14, G32, G33, G44, G53, G61, G62, G64, and G81. The Health Board also requested that Scotmail survey geographical area G76 where reports that a high number of copies had not been received. The overall findings showed a 76% success rate in the distribution of the material by Scotmail (the areas surveyed had been chosen by Board officers following a survey of NHS staff and the survey included the householder signing for whether they recalled receiving the Summary Leaflet or not).
- 3.4 A number of minor errors occurred in some leaflets and the Board sought to correct these immediately. The Summary Leaflet referred to Leaflet 16 detailing options for the North it should have said South, and Leaflet 19 GRI/Stobhill Partnership contained errors in the bed numbers at Stobhill. Once these errors were identified, erratum slips were incorporated into the affected leaflets. More recently the basis for the figures in leaflet 11 The Number of Beds We Propose To Provide has also been shown to have errors due to a fundamental assumption wrongly made on the calculation of bed numbers by ISD. A re-calculation has been carried out and is attached to the main covering paper.

4. <u>Topic Specific Leaflets</u>

4.1 The scale of the consultation resulted in the key issues being explained individually within a series of topic/geographical specific leaflets. There were 21 leaflets cover A51308927

the following:-

- 1. The Patient's Experience
- 2. Getting it Right for Patients: What it Means for Organising Services
- 3. Cancer Services: Specialisation in Action
- Why Specialisation Matters And What we Propose to do to Make its Benefits
 More Available
- 5. Creating More Responsive Accident and Emergency Services
- 6. Ambulatory Care What Is It?
- 7. Minimally Invasive Technologies: Keyhole Surgery and the Like
- 8. The Overall Planning Challenge for Greater Glasgow Acute Hospitals in a Wider Context
- 9. Some Recent Background History
- 10. Impact of Regulations on Doctors' Working Hours
- 11. The Number of Beds we Propose to Provide
- 12. Regional Services Provided by Glasgow Hospitals
- Why Teaching and Research Matters
- 14. Staffing Matters
- 15. How the Finance Works
- 16. Detailed Analysis of the Options for South Glasgow
- 17. Maternal and Child Health
- 18. Better Access for West Glasgow Residents
- 19. The GRI/Stobhill Partnership
- 20. Why Centralise Cardiothoracic Surgery?
- 21. Radiotherapy: Linear Accelerators A Patient's Guide
- 4.2 Over 3,000 copies of each leaflet were produced for distribution to the public. Annex 1 of the main covering paper shows the distribution of each leaflet.

The leaflets could be requested via the telephone enquiry line, website, writing to the Board's Freepost address or by contacting the Board via letter, fax or telephone.

5. Events Schedule/Public Meetings

- 5.1 The consultation process included many formal and informal opportunities to explain and discuss the implications of the proposals for individual specialities and within the context of Greater Glasgow as a whole.
- 52. Greater Glasgow NHS Board, the North Glasgow Trust, the South Glasgow Trust and Yorkhill Trust undertook a range of meetings, some on a geographical basis and some with interested groups and organisations. Details of these meetings is attached as an Events Schedule covering March August at *Appendix 3*.

The attendance at the 44 public meetings (4 launches and other open meetings) was mixed – some with good attendances and some disappointing attendances.

Also attached is the detail of the place, date and lead officers for each public meeting and the questions raised and answers given – this includes the public meetings held by North Glasgow, South Glasgow and Yorkhill NHS Trusts.

There is no distillation of the issues raised, however, the points discussed have been fed into the process and considered by the Board and Trusts as the strategy has emerged to its next stage.

Issues for the future centre around how to engage the public more on issues of such importance and a greater concentration of engagement with Social Inclusion

Partnerships. These and other lessons learned will be discussed with the Trusts in order to improve our communications with the public in the future.

6. Newsletter

- 6.1 The Board issued a newsletter to further publicise the consultation and its main aims and issues. The first newsletter was issued on April 14th with a follow up on May 9th which picked up on some of the key issues arising from the Board's proposals in particular the issue of transport and the Chief Executive's meeting with Strathclyde Passenger Transport Executive.
- 6.2 The newsletters were issued to our consultee list, available through our website, placed in libraries and available on request.

7. <u>Telephone Inquiry Line</u>

- 7.1 Network Scotland were contracted to provide a telephone inquiry line for members of the public who required further information or literature about the proposals. The inquiry line operated as a freephone number (0800 85 85 85) and began on April 3rd. The service was available during the hours of 9.00am 6.00 pm weekdays and from 10.00 am 2.00 pm on Saturdays. Out of these hours callers could leave a message on an answering machine facility.
- 7.2 The number of callers was such that the service continued until May 24th. Within that period there was approximately 190 calls from people looking for leaflets, details of the public meetings or other specific information on the consultation.
- 7.3 Network Scotland also distributed copies of the leaflets. Over 2550 copies of the leaflets were requested and dispatched.
- 7.4 From May 24th, due to the low number of calls to the line, a message was left on the freephone number directing callers to the Health Board and indicating that further information or leaflets could be accessed using the Board's Freepost address.

8. Website (www.show.scot.nhs.uk/GGNHSB)

- 8.1 The Board's website has provided an easy route for people far and wide to access the detail of our proposals. This is the first time we have put our proposals for consultation on our main website and we have been told that some individuals were pleased to be able to access the documentation electronically. All the consultation documents, together with the final versions of the 21 leaflets, are available both in PDF format and HTML. The Acute Hospital Services section of the website was launched on March 17th.
- 8.2 Throughout the process the website has been updated regularly with details of the public meetings, the newsletter and copies of subsequent related Board papers. We also built in a facility to request leaflets and receive comments on our proposals through the web; the e-mail address being acuteservices@gghb.scot.nhs.uk. A number of comments were received this way.

We introduced a hit counter on the site in May: there have been over 1830 visitors to the Acute Services section of the Board's website since then.

- 9.1 A series of advertisements were placed in the Glasgow papers to publicise the series of public meetings. Adverts appeared in the Kirkintilloch Herald on April 12th and in the Herald, Evening Times, The Glaswegian, East End Independent, The Reformer, Clydebank Post, and The Extra on April 13th.
- Posters were produced and distributed to the Trusts to publicise their local meetings 9.2 within the hospitals and in local community settings.
- 10. A backdrop visual based on the Summary Leaflet was produced for the Board and Trusts' public meetings.

10. Response

Up until the last few days of August Board officers have been trying to answer in full responses received from the public and others, as well as enquiries and requests for additional information.

In the last 2 weeks, efforts have been concentrated upon analysing the responses to consultation received and putting the themes raised into a Board paper and summarising the responses received for the September Board meeting. Over 3,100 responses have been received as at 13th September 2000.

Appendix 1

Modernising Glasgow's Acute Hospital Services Consultation Documentation - Initial List of Recipients – April 3rd, 2000

Advisory Committees (Bulk supplies to Secretary with one copy to Chairman)

Area Dental Committee	(16 copies)
Area Paramedical Committee	(16 copies)
Area Medical Committee	(51 copies)
Area Nursing and Midwifery Committee	(21 copies)
Area Optometric Committee	(10 copies)
Area Pharmaceutical Committee	(21 copies)
Principal University of Strathclyde	(5 copies)
University of Glasgow	(50 copies)
Principal Glasgow Caledonian University	(10 copies)
North Glasgow University Hospitals NHS Trust	(50 copies)
South Glasgow University Hospitals NHS Trust	(50
Yorkhill NHS Trust	(50 copies)
Greater Glasgow Primary Care NHS Trust	(30 copies)
	(10 copies)

Joint Professional Organisation

(2 copies to the Secretary + 1 copy each Member)

British Dental Association

British Orthoptic Society

British Dietetic Association

Royal College of Midwifery

Hospital Physicists Association

Association of Clinical Biochemists

British Medical Association

Royal College of Nursing

<u>JTUC</u> (2 copies to Secretary + 1 copy to each Member)

AEEU

GMBATU/APEX (2 Members)

MSF

UCATT

TGWU

UNISON (3 Members)+

- Scottish Health Visitors Association
- British Association of Occupational Therapists

Chartered Society of Physiotherapists

Society of Radiograhpers

Community and District Nursing Association

Chair – Partnership Forum (Mr S MacLennan)

Main Public Libraries in GG Area

Mitchell (1 copy in English, Chinese, Punjabi and Urdu plus 1 copy of audio tape)

Giffnock

Mearns

Rutherglen

Clydebank

Bishopbriggs

Milngavie

Rest of Public Libraries in GG Area

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(1 copy in English, Chinese, Punjabi and Urdu plus 1 copy of audio tape)

Local Health Council (32 copies)

(including copies for Local Health Forums)

(Plus 2 copies in Chinese, Punjabi and Urdu plus 2 copies of audio tape)

Other Organisations/Professional Bodies

Scottish Asian Action Committee

Scottish Chinese Co-ordinating Committee

Strathclyde Community Relations Council

The Director of Social Work, Committee of Social Responsibility

One Plus

Bangladesh Association Glasgow

Indian Association of Strathclyde

Pakistan Muslim Welfare Society

East Pollokshields Project

Mr W G Alston,

Strathkelvin Health Forum

Glasgow Jewish Representative Council

National Federation of the Blind (West of Scotland Branch) (To receive audio tapes only – not printed version (2 copies)

Link - Glasgow Association for Mental Health

Castlemilk Youth Complex

Greater Pollok Health Group

Integrate

Soroptimist International (Glasgow West)

National Schizophrenic Fellowship

Glasgow Council for Voluntary Services

Archdiocese of Glasgow

Scottish Association for Mental Health

Soroptimist International (Glasgow West)

Glasgow Nursing Homes Association

Carntyne Clinic

c/o Soroptimists International

Nuffield Captre for Community Care Studies

(For consultations to do with Community Care only)

Royal College of Midwives (Scottish Branch)

Strathkelvin Health Forum

Glasgow Hospitals Auxiliary Association

Department of Nursing Studies, University of Glasgow

Mr A Tough, Health Board Archivist, University of Glasgow

Royal Pharmaceutical General Council (Scotland)

Royal College of Physicians and Surgeons of Glasgow

Glasgow City Council Social Work Department (3 copies plus 2 audio tape)

Glasgow and West of Scotland Society for the Blind (1 copy plus audio tape)

Multi-Cultural Elderly Care Centre (1 copy in English, Chinese, Urdu and Punjabi)

Glasgow Occupational Therapy Managers Group

Community and District Nursing Association

Scottish Association for Mental Health

SAMH North

SAMH South & East

SAMH Central

SAMH Glasgow & Ayrshire

Midwives Information & Resource Service (MIDIRS) (For consultations appropriate to Midwives)

Scottish Head Injury Forum

Professor of Primary Care

Marie Curie Centre (Huntershill)

All Scottish MSPs (129) (1 copy each)

Scottish Ambulance Service NHS Trust

All Scottish Health Boards (14) (3 copies each)

Unitary Authorities with Residents within Greater Glasgow (10 copies unless indicated),

City of Glasgow Council (20 copies)

North Lanarkshire Council

East Renfrewshire Council

South Lanarkshire Council

East Dunbartonshire Council West Dunbartonshire Council General Medical Practices within Greater Glasgow (220) General Dental Practices within Greater Glasgow (195) General Pharmaceutical Practices within Greater Glasgow (213) General Optometric Practices within Greater Glasgow (135) Local Medical Committee (1) Community Councils (130) Copies for Internal Circulation (one each unless otherwise shown):-Non-Executive Board Members **Chief Executive** Director of Finance (4) Director for Commissioning (5) Director of Public Health (12) Director of Health Promotion (2) **Nursing Adviser** Pharmaceutical Policy Adviser Consultant in Dental Public Health Head of Corporate Services (5) **Public Relations Manager** Chief Executive's Office Secretariat Officer Women's Health Co-ordinator (Sue Laughlin) Assistant Director for Commissioning (South Sector) Assistant Director for Commissioning (North) Greater Glasgow Health Service Librarians = (8) Spare (100) Appendix 1a Additional recipients of Modernising Glasgow's Acute Hospital Services Consultation **Documentation**

A51308927

Royal College of Physicians and Surgeons of Glasgow

Dr Alison Mack Mr David Thompson Mr D McGugan Ms Susan G Watters Ms Helen Drumond Mr Alberto Lanniello Liaison VAT Consultancy Mr Chris Johnston Mrs J Tottern Ms Kerin Wells Councillor Brian McKenney Mr Robert P French Mr Frank Harvey Rev E Hope Mr Blair Robertson Father S Dunn Ms Sheila Scott Mr Adrian Lucas Strathclyde Passenger Transport Executive Mrs Lorna Howieson Councillor Butler Dr Green Councillor McKenna Professor S B Kaye Mr Liam Purdie Mr Ian Davidson Ms Christine McNeill Mr John A McLintock Councillor Tony Devine Mr John Jolly Ms Marie Burns

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Dr Ian Gordon

Dr Hugh McNeill

Ms Alison Wood

Mrs Margaret Hinds

Ms M McAuley

Mr Calum Kerr

Mr D Hankins

Appendix 2

Consultation Launch – Lecture Theatre, North Glasgow Trust Headquarters, Stobhill Hospital

	Invited Attendees	<u>Presenters</u>
21.3.00	Chairmen, Executive Directors and Trustees of NHS Boards in Glasgow	Mr Chris Spry - Chief Exec.,GGNHSB Dr Tim Parke –Chairman, A&E Sub-
	Greater Glasgow Health Council MSPs	committee Mr Ian Sother –
	Jim Devine Media	Clinical Director, Orthopaedics, North Glasgow Trust
	Glasgow Alliance	Prof. Tim Cooke –
	Healthy City Partners	Chairman of Surgical Division, North Glasgow Trust
Δ513	Ambulance Service 08927	Dr Brian Cowan –

		Medical Director, South Glasgow Trust
		Dr Morgan Jamieson –
		Medical Director, Yorkhill Trust
22.3.00	Greater Glasgow Partnership Forum	Mr Chris Spry - Chief Executive, GGNHSB
	Professional Advisory Committees	Miss Maggie Boyle –
		Chief Executive, North Glasgow Trust
		Mr Robert Calderwood –
		Chief Executive, South Glasgow Trust
		Mr Jonathan Best –
		Chief Executive, Yorkhill Trust
28.3.00	Chief Executives, Directors of Social	Mr Chris Spry - Chief Executive, GGNHSB
	Work and Councillors of Glasgow City, East Dunbartonshire, West	Dr Tim Parke –
	Dunbartonshire, South Lanarkshire, North Lanarkshire and East	Chairman, A&E Sub-committee
	Renfrewshire Councils	Mr Ian Sother –
	Dean and Heads of Nursing etc at Glasgow, Strathclyde and Caledonian Universities	Clinical Director, Orthopaedics, North Glasgow Trust
	Social Inclusion Partnerships	Dr Brian Cowan –
	Secretaries of Community Councils	Medical Director, South Glasgow Trust
		Dr Angus Ford –
		Clinical Director, Yorkhill Trust
31.3.00	Chairman and General Managers of Local Health Care Co-operatives	Mr Chris Spry – Chief Executive, GGNHSB
	Local Medical Committee	Miss Maggie Boyle -
	Royal Colleges	Chief Executive, North Glasgow Trust
		Mr Robert Calderwood -
	Charities – Hospices, Marie Curie, Macmillan	Chief Executive, South Glasgow Trust
	Ethnic Minorities Advisory Group	Mr Jonathan Best -
		Chief Executive, Yorkhill Trust
		Dr Tim Parke -
		Chairman, A&E Sub-committee
		Dr Brian Cowan -
		Medical Director, South Glasgow Trust

Appendix 3

Greater Glasgow NHS Board Meetings

Date	Invited to Attend	Introductions	Nos.
9.3.00	Herald	Chris Spry	
	Daily Record		
	Evening Times		
14.3.00	STV	Chris Spry	
15.3.00	BBC	Chris Spry	
24.3.00	Greater Glasgow MSPs	Chris Spry/Prof. Hamblen	
31.3.00			
3.4.00			
17.5.00	Greater Glasgow Health Council	Chris Spry	
22.5.00	MSPs	Chris Spry	*
30.5.00	Executive Directors, Ayrshire & Arran Health Board	Chris Spry	
1.6.00	Greater Glasgow Primary Care Trust	Chris Spry	
9.6.00	GP/Consultants, Royal Alexandria, Paisley	Chris Spry	
21.6.00	GP/Consultants, Vale of Leven	Chris Spry	
22.6.00	East Dunbartonshire Council	Chris Spry	
23.6.00	Scottish Ambulance Service	Chris Spry	
23.6.00	Glasgow City Council	Chris Spry	
3.7.00	Stakeholders – Paisley	Chris Spry	
14.8.00	Stakeholders – Dumbarton	Chris Spry	
28.8.00	Deaf Connections	Chris Spry	25

^{*}cancelled due to lack of interest

North Glasgow University Hospitals NHS Trust Meetings

Date	Invited to Attend or Venue	Introductions	Nos.
11.4.00	Lenzie Public Hall	Maggie Boyle	20
12.4.00	Woodside Hall	Margaret Smith	3*
12 / A9130	8927 Irock Community Centre	Maggie Royle	2*

13.4.00	Demock Community Centre	iviayyie boyle	J
17.4.00	Partick Burgh Hall	Alan Boyter	39
18.4.00	Kirkintilloch Town Hall	Maggie Boyle	47
19.4.00	Ruchazie Community Centre	Maggie Boyle	3*
20.4.00	Milngavie Town Hall	Maggie Boyle	43
25.4.00	Clydebank Town Hall	Maggie Boyle	37
26.4.00	Westerton Hall	Maggie Boyle	38
27.4.00	Provanhill Neighbourhood Centre	Maggie Boyle	3*
2.5.00	Campsie Memorial Hall	Alan Boyter	9
3.5.00	Springfield Centre	Bill Anderson	2
4.5.00	Auchinairn Public Hall	Brian Steven	14
8.5.00	Broomhill	Maggie Boyle	???
9.5.00	Shettleston Hall	Brian Steven	4
10.5.00	Bishopbriggs War Memorial Hall	Maggie Boyle	22
11.5.00	Roystonhill Recreation Centre	Maggie Boyle	1*
16.5.00	Brunswick Centre, Springburn	Maggie Boyle	22
17.5.00	Drumchapel Community Centre	Maggie Boyle	5
18.5.00	Scotstoun Primary School	Brian Steven	100
22.5.00	Edinbarnet Primary School	Maggie Boyle	2*
24.5.00	Blue Vale Community Centre	Maggie Boyle	4
25.5.00	Dental Hospital	Alan Boyter	0*
30.5.00	Blairdrum Community Centre	Brian Steven	
31.5.00	Garrowhill Primary School	Alan Boyter	
1.6.00	Dalmuir Community Education Centre	Maggie Boyle	
12.6.00	Faifley Regeneration Centre		
15.6.00	Cranhill Parish Church	Maggie Boyle	

South Glasgow University Hospitals NHS Trust Meetings

Date	Invited to Attend or Venue	Introductions	Nos.
2.5.00	Bellarmine High School		
5.5.0Q ₅₁₃₀	ջջ <i>բ</i> naside Hall		

0.3.33		
12.5.00	Cooper Institute	
17.5.00	Clarkston Hall	
22.5.00	McLeod Hall	
24.5.00	Trinity High School	
12.6.00	Castlemilk Community Centre	
19.6.00	Mosspark Labour Hall	

Yorkhill NHS Trust Meetings

Date	Venue	Introductions	No.s
17.4.00	Shettleston Hall	Jonathan Best	
26.4.00	Possilpark Health Centre		
27.4.00	Partick Burgh Hall		
2.5.00	Langside Hall		
3.5.00	Family Support Groups		
10.5.00	Family Support Groups		
11.5.00	Local Councillors		
12.5.00	MSPs/MPs		
13.5.00	MSPs/MPs		



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES REPORT ON FIRST PHASE OF CONSULTATION

ANNEX 6

A & E SERVICES A MODEL FOR GAUGING FUTURE FLOWS

The absence of sophisticated data collection systems in A & E Departments makes it difficult to assess future figures. The model below is based on a one week survey of A & E attendances in 1998. There is some mismatch between survey data and the way the Ambulance Service classifies between Urgent Calls and Emergency Calls. All 'Urgent Calls' will be from GPs but some 999 calls will also be for very urgent GP referrals. Column (b) extrapolates from the one week survey and column (c) nets (b) off from the total of annual Emergency Calls and Urgent Calls recorded by the Ambulance Service.

Table A

	(a)	(b)	(c)	(d)	(e)
Hospital	Total A & E	Of which	GP	999 Ambulance	Net Total
	Attendances	Children =	referrals =	Cases (adults)	(a – (b+c+d)
1. Victoria	75,000	14,000	8,320	7,644	45,036
2. Western	55,000	1,200	12,012	8,632	33,156
3. Stobhill	45,000	9,800	8,944	845	25,411
4. GRI	68,000	7,000	8,892	14,891	37,217
5. Southern General	40,000	7,400	6,136	5,034	21,430
6. TOTAL	283,000	39,400	44,304	37,046	162,250

Column (a) includes children who attend adult A & E Departments. Most children presenting at the Western A & E Department are directly referred to the Yorkhill A & E Department. A specialist review group on children's A & E services in Glasgow recently advised that all children should attend the Yorkhill A & E Department (which is receiving additional staffing) and should not be seen in adult A & E Departments. It also estimated that around 10,000 of all current children attending A & E Departments (Yorkhill included) had injuries or illnesses that could be managed within primary care. As the data in column (d) in Table B implies, that might be an underestimate. 10,000 children between 220 GP practices implies about one child per practice per week. Even if it were as high as 30,000 that would still equate to around 3 children per practice per week.

Based on the 1998 one-week survey the approximate number of children currently attending each adult A & E Department would be:

TABLE B

	(a)	(b)	(c)	(d)
	In one week	Extrapolated	Number in column	Extrapolated to
A51308927	Survey	to one year	(a)arriving by ambulance	one year

Victoria	268	14,000	12	624
Western	24	1,200	1	52
Stobhill	188	9,800	5	260
GRI	135	7,000	15	780
Southern General	143	7,400	3	<u>156</u>
		<u>39,400</u>		<u>1,872</u>

The figure in column (b) is slightly higher than that identified by the Paediatric A & E Review Group but is broadly reconcilable with their figures (they suggested a range of 32,000 to 37,000) which were themselves approximations. The low figure in column (d) suggests that the number of children who could in future be treated closer to their homes if primary care were organised and resourced to provide a "walk-in" service is potentially quite high.

In interpreting scenarios in the model, the impact of the vast majority of children being seen in Yorkhill's A & E Department (or more likely, in an extended primary care service) is netted off. This is shown in column (b) in Table A.

<u>Scenario 1 – Conservative about Minor Injuries</u> (cuts, sprains, grazes and bruises and virtually

nothing else. See Exhibit 2 of 1996 Audit Commission Report on A & E Services) with <u>flows</u> based on Ambulance Service view of catchments

i) Assume that figures in column (c) go to separate Emergency Receiving Units at GRI,

Gartnavel and Southside Hospital.

- ii. Assume only 33% of column (e) is treated in Minor Injuries Units.
- iii. Assume that this is what gets treated at Victoria, Stobhill and Gartnavel Minor Injuries Units (i.e. 33% of 1(e), 3(e) and 2(e).
- iv. Assume that for 1(d), 65% goes to GRI, 35% to Southside Hospital.
- v. Assume that for the balance of 1(e), 62% goes to GRI, 38% to Southside Hospital.
- vi. Assume that for 2(d), 7% goes to GRI, 93% to Southside Hospital.
- vii. Assume that for 2(e), 2% goes to GRI, 98% to Southside Hospital.
- viii. Assume that for 3(d) and the balance of 3(e) 100% goes to GRI.

The percentages in (iv) to (vii) reflect ambulance service advice as to where they would take patients in future. Those new "catchments" are then applied to data from the one week survey which showed ambulance arrivals for each hospital by originating postcode and non-ambulance arrivals by originating postcode.

This scenario would see:

Minor Injuries Cases

Victoria	14,900
Gartnavel	10,900
Stobhill	8,400
	34,200

			· · · · · · · · · · · · · · · · · · ·	
A51200027	(f)	(g)	(h)	
ASI3UØ9Z/	"	ii.	ii	

	Current adult A & E attendances (GRI and SGH) less GP referrals	Flows from other Hospital areas (excl. GP referrals)	Total
Southside	26,464	43,966	70,430
GRI	52,108	42,558	94,666

Of the figures in column (h), a minimum of 12,300 (GRI) and 7,100 (Southside) would be treated in the hospital's Minor Injuries Unit (assuming 33% of Table A, column (e) is 'minor injuries').

In addition to a conservative assumption about self-referral and\or triage into minor injuries units, this model also pessimistically assumes that patients choosing to go under their own travel arrangements to GRI or Southside who would formerly have gone to the Victoria, Western or Stobhill do not turn out to be treatable in a Minor Injuries Unit. This is a highly pessimistic assumption. If 10% of those accounted for by assumptions (v) and (vii) above turned out to be suitable for treatment in a Minor Injuries Unit, the total treated in the GRI and Southside Hospital's Minor Injuries Units would be:

GRI 12,300 + 4,300 = 16,600

Southside 7,100 + 4,400 = 11,500

Scenario 2 – As before but a modest increase in suitability for Minor Injuries treatment

Same as 1, except assume that 40% of column (e) in Table A is treated in Minor Injuries Units.

This scenario would see

Minor Injuries Cases

Victoria	18,000
Gartnavel	13,300
Stobhill	10,200
	41,500

	(f)	(g)	(h)
	Current adult A & E attendances (GRI and SGH) <u>less</u> GP	Flows from other hospital areas	<u>Total</u>
	referrals	(excl. GP referrals)	
Southside	26,464	40,436	66,900
GRI	52,108	38,788	90,896

Of the figures in column (h), a minimum of 14,900 (GRI) and 8,600 (Southside) would be treated in the hospital's Minor Injuries Unit (assuming 40% of Table 1, column (e) is 'minor

injuries').

Like Scenario 1, this model is also pessimistic about patients "diverting" from other hospital catchment areas and travelling under their own arrangements being suitable for Minor Injuries treatment. 10% of those patients would equate to around 3,200 at GRI and 3,000 at Southside Hospital being suitable for Minor Injuries treatment.

Scenario 3 – As before but with 60% of patients suitable for treatment in Minor Injuries Units

Minor Injuries Cases

	62,100
Stobhill	15,200
Gartnavel	19,900
Victoria	27,000

	(f)	(g)	(h)
	Current adult A & E attendances (GRI and SGH) less GP	Flows from other hospital areas	<u>Total</u>
	referrals	(excl. GP referrals)	
Southside	26,464	30,548	57,012
GRI	52,108	28,076	80,184

Under column (h), a minimum of 22,300 (GRI) and 12,900 (Southside) would be treated in the hospital's Minor Injuries Unit (assuming 60% of column (e) is 'minor injuries'). If 10% of those diverting from other hospitals were also Minor Injuries, the total treated in the GRI and Southside's Minor Injuries Units would be:

GRI 22,300 + 2,500 = 24,800

Southside 12,900 + 2,000 = 14,900

<u>Scenario 4 – Same Minor Injuries treatment rate as Scenario 1 (33%)</u>

but more patients going to GRI

Assume that flow from Western Infirmary is not in 90 : 10 Southside : GRI ratio range seen in Scenarios 1 to 3, but 50 : 50 Southside : GRI.

Also assume that flow from Victoria Infirmary is not in the 35 : 65 Southside : GRI ratio range seen in Scenarios 1 to 3, but 25 : 75 Southside : GRI.

This is a combination of assumptions that is different from the ambulance service view of how they would carry their patients (equating to around 10% of current total A & E attendances at the Victoria and 16% of current attendances at the Western). It also assumes that all patients currently living east of Anniesland and at Bearsden\Milngavie would. All go to GRI. Likewise it assumes that not only do all patients from Govanhill, Rutherglen, Cambuslang, Toryglen, Cathcart, Castlemilk and Gorbals but half of those from Pollokshaws, Newlands, Giffnock, Clarkston and Newton Mearns also go to the GRI rather than to, for the purposes of illustration, Southern General. It is improbable that so many

people from these places would actually make that choice. Nevertheless the scenario is useful in showing the upper limits of probability of burden on the GRI.

Minor Injuries Cases

Victoria 14,900

Gartnavel 10,900

Stobhill 8,400

<u>34,200</u>

	(f)	(g)	(h)
	Current adult A & E attendances (GRI and SGH) less GP	Flows from other hospital areas	<u>Total</u>
	referrals	(excl. GP referrals)	
Southside	26,464	24,889	51,353
GRI	52,108	61,635	113,743

Scenario 5 – As Scenario 4 (i.e. upper limits of probability of flows to GRI)

but with high level of Minor Injuries Unit treatment (60%)

Minor Injuries Cases

Victoria 27,000

Gartnavel 19,900

Stobhill <u>15,200</u>

<u>62,100</u>

	(f)	(g)	(h)
	Current adult A & E attendances (GRI and SGH) less GP	Flows from other hospital areas	Total
	referrals	(excl. GP referrals)	
Southside	26,464	17,364	43,828
GRI	52,108	41,260	93,368

Summary of locations of Treatment

	Scenarios						
	1	2	3	4	5		
Victoria - Minor Injuries Unit	14,900	18,000	27,000	14,900	27,000		
Gartnavel - Minor Injuries Unit	10,900	13,300	19,900	10,900	19,900		
Stobhill - Minor Injuries Unit	8,400	10,200	15,200	8,400	15,200		
GRI - Main A & E	82,366	75,996	57,884	101,443	71,068		
- Minor Injuries Unit	12,300	14,900	22,300	12,300	22,300		
Southside - Main A & E	63,330	58,300	44,112	44,253	30,928		
- Minor Injuries Unit	7,100	8,600	12,900	7,100	12,900		
	199,296	199,296	199,296	199,296	199,296		

Medical and surgical emergency receiving (GP referrals) will be managed at GRI, Southside and Gartnavel by the medical and surgical receiving teams. The position of children (39,400 currently treated at adult A & E Departments) depends on the development of services at Yorkhill and in primary care but since the number of children arriving by ambulance is around 5%, this suggests that if parents continue to take their child to the nearest hospital regardless of advice, the impact is likely to fall on local Minor Injuries Units and not on GRI or the Southside Hospital's main A & E Departments.

Conclusions

Of these Scenarios we would regard something between Scenarios 2 and 3 to represent the highest probability of how people behave in practice in terms of self-referral judgements and travel.

The key issues in debate concerned the capacity of the GRI A & E Department. What will be needed is:

Scenario

<u>2</u> 3

Minor Injuries 14,900 22,300

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<u>181,08 896,09 lstoT</u>

In addition the hospital would have to provide space for the reception of medical and surgical emergency admissions referred by GPs. Further discussion is needed about the probabilities of having to manage children but we would expect anyway a separate space to be provided for children, with staff trained to care for children.



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Greater Glasgow NHS Board Acute Services

THE FUTURE OF GLASGOW'S HOSPITAL SERVICES

REPORT ON FIRST PHASE OF CONSULTATION

ANNEX 10

ACUTE HOSPITAL SERVICES - HOW IT LOOKS TO US NOW

1. We've learned a lot during the consultation

Literally hundreds of documents, letters and meetings – with public groups, staff, MSPs, Councils, the Local Health Council – have given us a strong sense of what people want and what issues cause them problems (like public transport difficulties). A lot of detailed contributions have been received. They've helped us to think hard about how we should go about modernising Glasgow's hospital service and how it should connect with other parts of the health care system.

As in all debates the headlines concentrate on areas of disagreement but underneath all that everyone's agreed on one thing – we've got to make change happen. We can't stay locked in a pattern of run down hospitals, and services that are fragmented or overstretched.

It's not possible to meet everyone's expectations. There are too many contradictions to reconcile but the way that debate has tested ideas and raised new suggestions has been great.

Myth

"Nothing's changed as a result of consultation"

Wrong! There are some hugely important changes. And we go forward with so much better understanding than we had before. Read on!

2. What's new as a result of consultation?

A lot!

promise of a faster plan to get the Beatson Regional Cancer Service onto a single site at Gartnavel.

- a clearer set of proposals about how to provide stronger specialist teams <u>and</u> tackle the doctors' working hours issue north of the river.
- recognition that we need to expand fast access to a wider range of healthcare in areas most distant from hospitals (East End, Easterhouse, Drumchapel, Clydebank, Rutherglen, Cambuslang, Castlemilk and Kirkintilloch).
- o confirmation that people really do want a new Southside Hospital and as soon as possible. We weren't sure of that before consultation began.
- o a fuller understanding of what needs to be done to improve public transport access to all hospitals.

That sounds OK – but what about other issues?

Actually nothing has been untouched by what we learnt during the consultation exercise. There are some difficult choices to make. We've likened the challenge of bringing Glasgow's hospital service into the 21st Century to a Rubik's Cube. Change one part of the puzzle and you find it's put something else out of shape in another part of the system. There are some parts of our original proposals which look very much the same as they did before but they've been tested under the fire of vigorous debate and we still feel confident about them. They include judgements that:

the Southern General campus is the right place for a new South Glasgow University Hospital (SGUH).

a pattern of two Accident and Emergency Departments (GRI and SGUH) supported by locally accessible Minor Injuries Centres at the Victoria, Stobhill and Gartnavel <u>is</u> in the best interests of the different types of patients and is workable.

3. For the vast majority of people, they will still go to the same hospital as they do now

And in future, those hospitals will be modern and efficient for the patient.

• "I have to go to the chest clinic every month, where will I go in future?"

To exactly the same hospital as you do now.

• "I'm attending physio sessions following an accident, where will I go?"

To exactly the same hospital as you do now.

• "I've sprained my ankle, where can I get it dealt with?"

At your local hospital – the GRI, Stobhill, Gartnavel, Victoria or new South Glasgow University Hospital. Go wherever is most convenient.

• "My GP's referred me for an x-ray, where will I go?"

To the same hospital as you do now, unless it's a very specialised examination (but it's already the case that not every hospital meets all local needs for specialist x-rays).

• "I've had an earache for several days, where will I get that dealt with?"

You should go to your GP who is very locally accessible. Accident and Emergency Departments aren't intended for that sort of problem.

For 85% to 90% of what patients go to hospital for, they will still go to the same place.

- 4. We're aiming to spend a lot of extra money to bring Glasgow's hospitals up to date
 - A South Glasgow University Hospital. A new Ambulatory Care Hospital at the Victoria Infirmary.
 - o A new Ambulatory Care Hospital at Stobhill.
 - o New wards, Accident and Emergency Department and Maternity Hospital at the GRI.
 - New departments at Gartnavel to make it a complete hospital at last.

By 2010 virtually all the old buildings will have gone, replaced by new state-of-the-art facilities. As well as spending a lot of money to build them, we'll also be spending a lot of <u>extra</u> money to run them.

Myth

"The plans as just about saving money"

Wrong! We will spend millions of pounds more.

5. The new pattern will mean shorter waiting times

There are 4 reasons why:

- Ambulatory Care Centres\Hospitals will protect their patients from playing second fiddle to in-patients in accessing equipment, facilities and staff time, which is what happens now in to-day's higgledy-piggledy hospitals.
- Larger consultant teams will make it easier to prevent the disruptions that currently lead to cancellation –
 unexpected absence of a consultant; doctors having to cover emergencies while doing something else at
 the same time.
- Larger pools of beds will make it easier to cope with peaks of demand so, fewer cancellations.
- o One-stop clinics mean fewer return visits, so more time to see new patients.

6. Public Opinion favours a new South Glasgow Hospital on a new site

So they do. People also told us they were fed up with decades of hospital planning blight. So are we. The consultation process has flushed out more information about sites. A new hospital needs more than 50 acres. Scottish Enterprise-Glasgow is also looking for sites this size. They couldn't find any that we hadn't already identified. Many people favoured Cowglen but the National Savings Bank site is not for sale and the other site at Cowglen is Green Belt. Horrendous town planning problems. Years of delay if we pursued it. Little prospect of success at the end of it. No site, no new hospital.

7. The Southern General site is big enough and ready now

And that's why we should go for it. The tunnel makes it an excellent second site for Accident and Emergency to match the GRI – very accessible for ambulances from West Glasgow as well as from most of the Southside.

In 10 years the South Glasgow University Hospital will be an all modern campus.

Myths galore

"You're just tarting up the Southern"

Wrong! It'll be all new build.

"It's on the edge of its catchment area"

Wrong. It's central for its A & E role for the west side of Glasgow north and

south of the river. Ambulatory care services – 90% of all patient experiences – will still be provided at the Victoria , as central for those patients as ever. For those inpatients who do have further to travel the trade-off is safer, more consistent specialist care for the most serious illnesses.

"The Vicky is going to close"

Wrong! There will be a large new-style hospital built there, its focus on Ambulatory Care. If you currently go to a clinic at the Vicky, you'll still go to a clinic at the Vicky.

"You're ignoring travel problems"

No. We pledge ourselves to improving public transport, including some express shuttle bus routes. For most people travel will be improved. Whatever site is used for a new hospital, public transport would have to be improved.

8. The Queens Park Recreation\Victoria suggestion as a site for a single Southside Hospital won't wash

Some people have suggested that this site could be readily made available as a site for a new South Glasgow hospital. We strongly disagree:

•

the site isn't big enough. as designated Open Space, it would take years of town planning process before we even knew if it was actually available.

- o the traffic impact in the locality would worsen an already congested local road system.
- its delay and uncertainty would prolong the blight that everyone wants to end. it's in the wrong place to complement the GRI as part of our two "gold standard Accident and Emergency" strategy.

But we <u>do</u> think the location is an excellent place for an Ambulatory Care Hospital which will meet most people's needs for hospital services in a very locally accessible way.

9. What about Ambulatory Care Centres?

This has been an interesting debate. All sorts of different agendas. The bottom line is that Ambulatory Care is what we do already. – out-patients, routine diagnostics, physio, other therapies and day surgery. New multi-million Ambulatory Care <u>Hospitals</u> are simply about doing it better from the patients' point of view – fewer visits, fewer reception desks to negotiate, fewer corridors to trek, fewer delays. All in a thoroughly modern environment.

Everyone likes the idea. Some people have raised a question about a tiny part of their role the day surgery bit amounts to around 5% of what an Ambulatory Care Hospital would do. Some of those who oppose Ambulatory Care Hospitals for the Victoria and Stobhill just don't want to have to spend time working away from what they see as their 'base' (GRI, Gartnavel or the South Glasgow Hospital). We want these Ambulatory Care Hospitals at Stobhill and Victoria because they'll provide most of what people currently use these hospitals for. We can't let a 5% tail wag the whole dog – which is about local access to services, which is what everyone says they want.

Complication rates in day surgery?

Are <u>very</u> low and are usually slowness to recover from anaesthetic.

Myth

They're just glorified Health Centres

Hardly! These places are big and complex. They do almost everything that conventional hospitals do – but an easier experience for patients.

10. The proposals secure the long term future of Stobhill

The new Ambulatory Care Hospital for Stobhill will be big, busy and built to serve the population who currently use Stobhill. It will be the guarantee that most of what people use Stobhill for, they will continue to use.

For the in-patient experiences, people will be referred to GRI or Gartnavel (or to Southside, as already happens for some conditions). Longer travel, yes, but the benefits will come from the ability of clinical teams to provide their expertise in a much more sustained and responsive way in an era where the notion of "working all hours doctors" is no longer acceptable.

11. The new pattern of Accident and Emergency Departments will save lives

Yes – a bold statement but clinical audit shows too many seriously injured patients not being seen by a consultant. We intend to invest in two "gold standard" A & E Departments. There aren't enough of the seriously injured to justify three gold standard departments – instead we want well organised Minor Injuries Units at each hospital – GRI, Stobhill, Gartnavel, Victoria and South Glasgow – to provide fast service for the "walking wounded". Fewer delays for them because they won't be competing for attention with the more seriously injured cases.

12. The Ambulance Service will be up to the job

It's already investing in extra crews and getting a paramedic on every 999 vehicle. We shall invest more on top to match the new pattern of Accident and Emergency Departments.

It's speed of response to the scene of incident that saves lives. Subsequent journeys of no more than 25 to 30 minutes to the nearest Accident and Emergency Department are not unusual in the UK. In many areas of Glasgow the journey times will be much less. The current average journey time from scene to hospital is about 10 minutes – it will not change much. For people in West Glasgow, the ambulance time to the South Glasgow Hospital site will be around 3 minutes shorter than the current journey time to the Western.

13. We've got a better handle on public transport access problems than we've ever had

The consultation has confronted us with the problems that many patients have in getting to the present pattern of hospitals. Whatever change is made for the future pattern, something has to be done to improve public transport. This is not a problem that the NHS alone can solve but we will do our bit, including commissioning some express shuttle buses, working with Strathclyde Passenger Transport Executive to get better information about bus routes.

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14. We've flagged up some more work that needs to be done on:

- bed numbers
- Yorkhill
- Dental Hospital
- expanding the new Accident and Emergency Department at the GRI

Beds

A lot of people were worried abut there being fewer surgical beds in future (we had proposed there should be <u>more</u> medical beds). We've agreed to review what we expect future average lengths of stay and trends in day surgery to be. And how the <u>new</u> concentrations of beds will deal with peaks of demand. We'll publish the results of that work as soon as we can. Our aim is to ensure that there will be enough beds. We will be opening extra medical beds at the GRI (27) this year and 38 at the Victoria if gynaecology transfers to the Southern General next year. There will also be extra medical beds for the winter at Gartnavel, Stobhill and, this winter, the Mansionhouse Unit.

Yorkhill

The Trust have produced some useful work on choices for the future which we will be exploring with them and others. If a proposal to build a new Children's Hospital does emerge we will consult on it. Already it is clear that some people favour a move, others don't.

The Dental Hospital

One of the new issues that has emerged during the consultation period. People want to know its future, bearing in mind the building is not in good condition. We've published a note on progress so far.

GRI Accident and Emergency Department

The new Department will need more space. There is space available. The Trust will plan the details.



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13.0 AIR QUALITY

Summary

There are no major point sources of air pollution close to Southern General Hospital. Local air quality is dominated by the effects of traffic emissions in the immediate area and more widely within the Glasgow/Central Belt conurbation. The adjacent Shieldhall Waste Water Treatment Works is currently a significant source of odour nuisance, although this is likely to reduce as a result of planned works within the next decade. Without the proposed redevelopment, local concentrations of NO₂ will remain well within the relevant air quality objectives, whereas annual mean concentrations of dust (PM₁₀) may exceed the 2010 objective.

During the construction period, the existing hospital and local housing will be highly sensitive to any adverse impacts on air quality and may experience minor adverse effects during periods of dry breezy weather and high levels of dust release from construction activity. The work will also give rise to emissions of PM_{10} and NO_2 from diesel plant and construction related traffic. The net effect will be a small increase in local concentrations of PM_{10} and NO_x/NO_2 however current objectives are likely to be met.

Construction emissions should not exceed the 2010 PM_{10} annual mean objective. Off site PM_{10} concentrations should meet the current objective, but may be exceeded in the hospital's operational areas during prolonged dry weather if inadequate mitigation measures are employed. On completion, the increase in traffic flow will have a small adverse effect on local concentrations of PM_{10} and NO_2 , however, local air quality objectives should still be achieved.

Mitigation measures will be required to control emissions during construction. Even with good control measures, there will be a minor impact on air quality (PM_{10}) and a moderate impact on dust nuisance within operational parts of the hospital, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The offsite impacts of construction will be much smaller.

A more detailed assessment is recommended of air quality impacts and dust emission mitigation measures during construction when the detailed construction programme is available. The proposed redevelopment will not result in significant effects on local or regional air quality.

13.1 Introduction

This report describes the existing air quality in the vicinity of the New South Glasgow Hospital (NSGH) development site and assesses the potential air quality impacts of the redevelopment of the hospital complex. It includes a review of the relevant legislation, a description of the assessment methodology, identification of receptors and a prediction of impacts.

The aims of the air quality assessment were to:

- Establish the baseline pollutant concentrations at representative locations in the vicinity of the site.
- Assess the impacts associated with the proposed redevelopment of the hospital site
- Consider the local and regional air quality impacts of traffic emissions arising from predicted changes in traffic flow.

13.2 Air Quality Objectives

13.2.1 Air Quality (Scotland) Regulations 2000

European Union directives on air quality were enacted in UK law through Part IV of the Environment Act 1995, which established the process known as Local Air Quality Management (LAQM). Guidelines for local air quality were published in the 1997 National Air Quality Strategy (NAQS) and associated guidance and technical guidance, revised in 2000 and 2001. The latest air quality objectives are set out in the Air Quality (Scotland) (Amendment) Regulations 2002 and the Air Quality (Scotland) Regulations 2000. These objectives are based on the medical evidence of the effects of each pollutant on human health, taking account of the costs, benefits and technical feasibility of achieving the objectives. Of the target pollutants, only sulphur dioxide is not considered to have a predominant road traffic source. Most of the air quality objectives that have been set in Scotland have been based on the standards proposed by the Department for the Environment, Food and Rural Affairs and Devolved Administrations' Expert Panel for Air Quality Standards (EPAQS). These standards have been recommended for the protection of human health.

Table 13.1: Summary of objectives outlined in the Air Quality (Scotland)
Regulations 2000 as amended in 2002

Pollutant	Objective	Averaging time	Date to be achieved by
Benzene	16.25 ugm ⁻³ 3.25 ugm ⁻³	running annual mean	31/12/03 31/12/10
1,3-Butadiene	2.25 ugm ⁻³	running annual mean	31/12/03
Carbon monoxide (CO)	10 mgm ⁻³	running 8 hour mean	31/12/03
Lead (Pb)	0.5 ugm ⁻³ 0.25 ugm ⁻³	annual mean annual mean	31/12/04 31/12/08
Nitrogen dioxide (NO ₂)	200 ugm ⁻³ (105ppb) not to be exceeded more than 18 times a year 40 ugm ⁻³ (21ppb)	1 hour mean	31/12/05 31/12/05
Particles (PM ₁₀)*	50 ugm ⁻³ not to be exceeded more than 35 times a year 40 ugm ⁻³ 50 ugm ⁻³ not to be exceeded more than 7 times a year 18 ugm ⁻³	24 hour mean annual mean 24 hour mean annual mean	31/12/04 31/12/04 31/12/10 31/12/10
Sulphur dioxide (SO₂)	350 ugm ⁻³ not to be exceeded more than 24 times a year 125 ugm ⁻³ not to be exceeded more than 3 times a year 266 ugm ⁻³ not to be exceeded more than 35 times a year	1 hour mean 24 hour mean 15 minute mean	31/12/04 31/12/04 31/12/05

Notes on Table 13.1

*PM₁₀ is approximately equivalent to the ISO thoracic fraction (ie those particles small enough to penetrate to the lung) and represents a log normal sampling efficiency (with respect to particle size) with a median cut off of 10 um aerodynamic diameter.

13.2.2 Nuisance

There are no formal standards with respect to dust nuisance. Generally, the deposition of visible dust on surfaces would be deemed to be unacceptable. This level of deposition might equate to a dust deposition rate of 200 mgm⁻²day⁻¹ (as a monthly mean; PAN50, Annex B). Visible dust nuisance might occur at lower levels of dust deposition where there is a marked difference in colour between the dust and the affected surface.

13.3 Assessment Methodology

13.3.1 Baseline Air Quality

A visit was made to the site to identify any existing local sources of air pollution and the main potential receptors with respect to potential impacts of the development project. A search was also made of the National Emissions Inventory (www.naei.org.uk) to identify any major industrial sources of air pollution within the immediate area of the development site.

Information about current concentrations of air pollutants at the site was derived from the NETCEN maps published on the National Air Quality Archive website (www.airquality.co.uk). The NETCEN maps provide information about background concentrations of air quality strategy pollutants in 2001 and their predicted concentrations for target years for the various air quality objectives. Further information was obtained from Glasgow City Council's (2005) air quality assessment.

13.3.2 Impact Assessment

The impact assessment for air quality strategy pollutants was based on the Technical Guidance for Local Air Quality Management TG(03) published by DEFRA et al (2003). The assessment also took account of the Scottish Transport Appraisal Guidance (STAG) published by the Scottish Executive¹). Concentrations of nitrogen dioxide and PM₁₀ are of particular concern, both with respect to compliance with the objectives of the Air Quality Strategy and also their potential effects on human health

An appraisal was made of the planned development to identify the potential sources of air pollution associated with the development. The impact of the identified sources was then assessed on the basis of the Technical Guidance in TG(03), experience from other sites and consideration of factors such as wind direction and local topography (including that of the built environment) in governing the dispersion of emissions associated with the site. The effects of traffic emissions were estimated using the DMRB spreadsheet as recommended in TG(03) and available on the Highways Agency website². Traffic flow predictions were provided by JMP for 2012 with and without the development.

The impact assessment for dust nuisance was based on previous experience and the limited published information about impacts from construction projects and earth moving operations (Department of the Environment, 1990, PAN50 Annex B, DEFRA and the Devolved Administration's Air Quality Expert Group (AQEG), 2004).

The criteria used to assess the magnitude of predicted air quality impacts are tabulated overleaf (Table 13.2). Impacts that would have no measurable effect on the parameter of interest were deemed to be negligible. The Air Quality Standards are

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¹ www.scot-tag.org.uk/stag/06.htm

² http://www.highways.gov.uk/business/238.aspx

those set by EPAQS and the Objectives are those set by the Government with respect to the maximum number of occasions these Standards should be exceeded.

Table 13.2: Criteria used to assess impacts

Impact	Magnitude						
	Neutral	Minor	Moderate	Large			
Air pollutants regulated under the NAQS	Emission of pollutant(s) leading to no measurable change in predicted concentrations	Predicted concentrations are less than relevant EPQAS Standards*	Predicted concentrations would occasionally exceed relevant EPAQS Standards*	The predicted number of excedences of a relevant air quality standard is greater than the Government's objective			
Dust Deposition	No discernible dust deposition	No discernible dust deposition	Rates of dust deposition sometimes sufficient to give rise to visible dust layer	Rates of dust deposition sufficient to give rise to visible dust soiling			

^{*}or where these standards are already exceeded, the development would not make an important difference (minor) or only a small difference (moderate) to the number of days on which exceedences occur.

13.4 Receptors

The hospital will continue to be used through the redevelopment process and represents a highly sensitive receptor. Individuals with pre-existing respiratory or cardiovascular illness are believed to be particularly sensitive to the adverse effects of air pollution, particularly fine particulate such as emitted in diesel exhaust. Dust deposition on surfaces is also likely to present particular difficulties in the hospital environment where high standards of cleanliness are required.

There are hundreds of residential properties within 300 metres of the site boundary (Table 13.3). All of these homes are within 300 m of major roads and/or the M8.

There are several schools at distances of about 250 to 500 m east of the site: Drumoyne Primary School, Govan High School, Langlands School and Elder Park School.

Table 13.3: Residential properties within 300m of site boundary

Name / Location	Approx no. of Houses	Approx. Distance from Site (Metres)	Direction from Site
Hardgate Drive	85	100	south
Hardgate Gardens	48	200	south
Hardgate Road	15	200	south-west
Shieldhall Gardens	32	300	south, west
Langcroft Place	23	200	south
Cowden Street	10	150-200	south
Langcroft Road	39	100	south
Langcroft Terrace	18	100-200	south-east
Shieldhall Road	34	200-300	south

Receptors continued

Carleith Quad	100	100	east /south
Skipness Drive	48	150	east
Greenloan Avenue	65	200	east
Greengairs Avenue	61	250	east
Langlands Avenue	40	150	east
Govan Road	12	100	north-east
Peninver Drive/Burghead Place	Tenements >100	200-300	east

13.5 Baseline Conditions

There are no major point sources of air pollution within 1 km of the proposed development (Table 13.4). The M8 however passes to the south and west of the site at a distance of about 250 m at its nearest point. The eastern boundary of the site is delineated by the A809, a dual carriageway feeding into the Clyde Tunnel is a heavily trafficked road. Air quality in this area is likely to be dominated by the effects of traffic emissions in the immediate area and more widely within the Glasgow/Central Belt conurbation.

Table 13.4: Emissions (tonnes per annum per km²) within 1 km of G514TF in 2003

Pollutant		Sectors as defined in the National Emissions Inventory									Tota
r onutant	2	3	4	5	6	7	8	9	10	11	Total
1,3-butadiene		03	04	05	06	07	08	09	10	11	0.19
Benzo[a]pyrene		- 2		-	-	0.18	0.010		. 2	-	0.061
Benzene	0.030	-	0.00043	- 2	- 1	0.049	0.00028	0.0019	*5	0.0097	0.36
Carbon Monoxide	1.6	0.00021		0.013		0.27	0.049	0.0016			131
Carbon Dioxide as C	1954	0.019	8			121	5.7	1.8	0.0085	0.40	5405
Lead		6.2		- 0		3229	10	206	0.061	1.2	0.60
Nitrogen Oxides as NO2	8.1	-	-	15		0.20	0.0022	0.40	-		64
PM10 (Particulate Matter < 10um)	0.12	0.091		œ	9	54	0.37	1.6	0.00024	0.013	2.1
Sulphur Dioxide		0.0013	0.051	- 12	0.24	1.3	0.034	0.29	-	0.064	1.3
Non Methane VOC	0.33				i.e	0.30	0.024	0.99			27

2: Combustion in commercial, institutions, residential and agricultural sectors; 3: Combustion in industry 4: Production processes; 5: Extraction and distribution of fossil fuels; 6: Solvent use; 7: Road transport; 8: Other transport and machinery; 9: Waste treatment and disposal; 10: Agriculture; 11 Nature, land use change and other

The Scottish Pollutant Release Inventory lists several installations within a distance of 1 mile of the hospital site (www.sepa.org.uk/spri/index.htm). These include the Shieldhall Wastewater Treatment Works (WWTW) which is immediately to the north-west of the site, at a distance of less than 200 m at the closest point. The WWTW is listed by the Scottish Executive as being amongst the 35 WWTWs with the greatest record of public complaint about odour. There was a discernable sewage odour within 300 m of the WWTW on a blustery March day when the site visit was undertaken. Odour nuisance on warmer, stiller days would be expected to be considerably greater. Work to upgrade

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the WWTW in order to reduce odour emissions is scheduled to be undertaken between 2010 and 2014³.

Other installations within 1 mile include Princes Soft Drinks in Bogmoor Road where canned drinks manufacture is undertaken. Thales Optronics Ltd in Linthouse Road, about 300 m north-east of the site, is a chemical works producing a wide range of inorganic chemicals. Cohen Alloys Ltd in Barfillan Drive which undertakes smelting, including the alloyage, of non-ferrous metals, including recovered products, (refining, foundry casting etc.). There is also a steel fabrication works in Hardgate Road about 300 south- west of the site, although it is unclear whether this is an active production site. Further west, but within 800 m of the site there is a Timber Yard, Civic amenity site/recycling centre and small business including two undertakers and suppliers of catering equipment, marble fireplaces/tiles and plastics. The civic amenity site is a potential source of odour and dust nuisance with odour clearly discernible when the site visit was undertaken. None of the other industrial sites is a major emissions source.

Modelled background concentrations of pollutants in the area around the site are well within the Air Quality Objectives for NO₂ and the current Objective for PM₁₀ (Table 13.5). The predicted 2010 concentration for PM₁₀ listed in the air quality archive slightly exceeds the 2010 objective, although Glasgow City Council currently predicts that the 2010 PM₁₀ objective is likely to be met at the development site and in its immediate vicinity (Glasgow City Council, 2005). Some exceedences of the 24 hour 50 ugm⁻³ standard for PM₁₀ may occur during either cold still weather or hot dry weather, but the 2010 objective of no more than 7 exceedences in a year should be met. On the basis of the guidance for Local Authorities undertaking local air quality assessments (TG(03)), the 1 hour 200 ugm⁻³ objective for NO₂ is likely to be met as the annual mean concentration is well below the objective.

Table 13.5: Predicted background (annual mean) concentrations of pollutants at the development site (national grid reference: (25356655) - information from the National Air Quality Archive (www.airquality.co.uk).

Pollutant and year	Concentration ugm ⁻³		
NO _x 2005	42.8		
NO _x 2010	34		
NO₂ 2005	26.7		
NO ₂ 2010	23.1		
PM ₁₀ 2005 (gravimetric)	20.5		
PM ₁₀ 2010 (gravimetric)	19.2		
PM ₁₀ secondary 2004 (gravimetric)	3.44		

Concentrations of pollutants at the development site would be expected to be slightly lower than measured values at the nearest monitoring sites in central Glasgow because of the lower levels of traffic congestion and better dispersion (Table 13.6). Measurements of NO₂ made by Glasgow City Council using diffusion tubes at Mallaig place, about 300 m south-east of the site are well within the 40 ugm⁻³ objective. The nearest air quality management area (AQMA) to the development site is about 3 km to the east and encompasses central Glasgow. It has been declared in order to address concentrations of NO₂ that exceed 40 ugm⁻³ as an annual mean. Glasgow City Council (2005) has established that exceedences of NO₂ objective are also likely at Royston Road (about 7 km east of the site), North Street/Glasgow 1 (St Patricks

³ www.scotland.gov.uk/Topics/Environment/Pollution/Noise-Nuisance/Odour/Odour

School, about 4 km east of the site). Byres Road, (about 3 km, north-east of the site), Dumbarton Road (about 2 km, east-north-east) and Parkhead Cross. These are expected to form the basis of further AQMAs. The NO₂ objective is also likely to be exceeded at Napiershall Street (about 3 km east) but further assessment is required before an AQMA is declared. None of these proposed AQMAs are close to the development site. Background concentrations of PM₁₀ and NO₂ are expected to fall over the next 15 years.

Table 13.6: Automatic monitoring data for central Glasgow (Netcen, 2005)

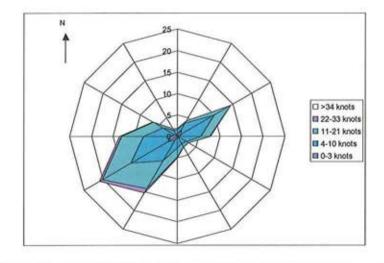
Pollutant	Index	Glasgow Centre	Glasgow City Chambers	Glasgow Kerbside
СО	annual mean mgm ⁻³	0.4	0.4	0.4
	maximum running 8 hour mean mgm ³	5.6	2.4	2.3
NO2	annual mean ugm-3	36	49	68
	exceedences of 1 hour AQS	0	0	14
NOx	annual mean ugm ⁻³	70	101	263
PM10	annual mean ugm-3	-		27
	exceedences of 24 hour AQS		T.	31
SO2	annual mean ugm ⁻³	2		
	Exceedences of AQS	0		-
Ozone	annual mean ugm ⁻³	37	4	-
	Exceedences of AQS	13		-

13.6 Impacts of Development

13.6.1 Dispersion of emissions

Winds in central Scotland are dominantly from the west and south-west (Fig. 13.1). There is minor secondary node from the east-north-east and winds are rarely from the south east or northwest. Winds from these directions are usually very light. The wind is almost never directly from the north. The wind rose for Bishopton presented by Glasgow City Council is almost identical to that for the airport.

Figure 13.1: Wind rose for Glasgow airport showing percentage of time between 1970-1994 that winds of different strengths blow from each direction category. The distance along each axis relates to the proportion of time that winds are from that direction.



13.6.2 Construction

Emissions

The demolition of existing buildings on site that are due to be replaced and associated earth movements will give rise to emissions of airborne mineral particles (dust) from earth moving and materials handling operations. In addition, dust will be emitted as a result of windblow across stockpiles or uncovered truckloads of granular materials such as soil or aggregate and from vehicle movement across muddy surfaces. This includes dust raised by traffic travelling on mud contaminated roads in the local area. Emissions from all these sources are likely to be greatest during dry, breezy weather. The timing of work involving earth moving, materials handling or transport will have a substantial effect on dust emissions. In most years, soils and similar materials dry out to become potential dust sources most readily during late spring and summer. During this period, rates of moisture evaporation from soils normally outstrip rainfall. Dust emissions would normally be much lower during the autumn and winter, when soils and other granular materials are slow to dry out and moisture binds mineral particles to each other and to other surfaces, preventing particles from becoming airborne.

The construction of the proposed scheme will also give rise to emissions of PM_{10} and NO_2 from diesel plant. One excavator with a power rating of 120 kW that meets the EU Stage II emissions limits (Directive 97/68/EEC) would emit up to 10 mg of particles per second during use. If used for an average of 40 hours a week would give rise to annual emissions of 72 kg. Annual emissions of NO_x from the same excavator would be 2.2 tonnes of which only a proportion would be NO_2 .

The construction site will also generate traffic including trucks supplying materials/removing waste and workers vehicles, and will also cause some delays and diversions leading to longer journeys for other local vehicles. The net effect of these impacts on traffic flow will be a small increase in local concentrations or PM_{10} and NO_x/NO_2 , although the additional traffic emissions during construction would be expected to be much less than the total impact of additional vehicle emissions once the housing development is completed and occupied.

Dust nuisance

Dust nuisance is likely to be greatest during prolonged periods of dry weather during the late spring, summer or early autumn, particularly if combined with a light to moderate breeze and/or active work on site. In addition, during warm weather the opening of windows may lead to dust soiling of interior surfaces in addition to nuisance caused by the soiling of drying laundry and exterior paintwork including vehicle surfaces. Dust soiling can also cause lose of amenity arising from the discoloration of hedgerows, trees and other vegetation. Dust nuisance is generally caused by the larger particles emitted from site works and most of these particles are deposited within a few tens of metres of source with concentrations giving rise to an exponential decrease in dust levels with increased distance from the site. Dust emitted from construction sites can be a cause of dust nuisance at properties up to several hundred metres from source, but the effects are greatest within 100 m of active works with maximum impacts at distances of less than 25 m.

The prevailing south-westerly winds are often associated with wet weather which would limit dust pick up and transport. Although winds from the east occur less commonly than westerly winds, easterly winds are more commonly associated with prolonged dry weather when dust pick up and transport may be enhanced. Emissions arising from earth-moving are likely to be confined to a few weeks at specific points

during the construction programme, but there may be ongoing impacts if the road becomes covered in mud that can dry to generate airborne dust.

The potential for offsite dust nuisance during the redevelopment process is relatively small. The closest houses to the site in Hardgate Drive and in Carleith Quad Road are relatively unlikely to experience significant dust nuisance because winds from the north-east or north are extremely unusual in central Scotland and would not be expected to coincide with a prolonged dry spell. Houses in Skipness Drive are at slightly greater distance from the site and given that winds from the west are often associated with damp weather, the potential for dust nuisance is small. The potential for onsite dust nuisance affecting operational parts of the hospital is considerably greater because of the proximity of the hospital buildings to redevelopment works. The potential consequences of dust nuisance are also likely to be more severe within the hospital than for local residents with potential adverse effects on hospital hygiene and equipment function.

Airborne particles

There have been relatively few studies of the impacts of construction sites on local concentrations of PM10. A major construction project undertaken adjacent to the automatic air quality monitoring site in Cardiff during 1994 gave rise to an annual mean concentration of PM₁₀ that was 12 ugm⁻³ higher than the average annual mean during the subsequent three years of monitoring. The rise in PM₁₀ associated with the Cardiff site, however, occurred within a confined built-up city centre area where dispersion is likely to have been much poorer than would be expected for a more open site. More recently, construction work close to the air monitoring site in Marylebone Road in London was associated with elevated concentrations of PM₁₀ during working hours (AQEG, 2004). Short term peaks in concentrations of 800 ugm were measured. The highest daily mean concentration measured was 139 ugm⁻³ but daily mean concentrations only exceeded 50 ugm⁻³ on 27 days during the 8 month period during which construction work was undertaken. A US study found an increment in concentrations of 80 ugm⁻³ within 20 m of a construction site, falling to 40 ugm-3 at a distance of 80m from the site (EQAG, 2004). Overall, it seems likely that the redevelopment of the hospital complex would lead to a slightly increased risk of exceedences of the 24 hour mean 50 ugm⁻³ standard for PM₁₀ in the local area, particularly within 100m of active works. The number of exceedences will depend on the mitigation measures employed, the weather and the total duration of site works. The offsite impacts of the redevelopment process on local air quality will be relatively small, with houses within 100m of the site (Hardgate Drive, Langcroft Road, Langcroft terrace, Carleith Quad, Govan Road) likely to experience the greatest (but still marginal) increase in airborne particulate concentrations. The impacts may be greatest in Govan Road where properties are immediately downwind of the site with respect to the prevailing wind. The onsite increase in airborne particles is likely to be much greater with mean concentrations of PM₁₀ in operational parts of the hospital being potentially raised by several ugm⁻³ over a period of months, coupled with an increased frequency of days on which the 50 ugm⁻³ standard is exceeded. The potential consequences of raised concentrations of PM₁₀ are also likely to be more severe within the hospital than for local residents as it is believed that people with pre-existing illness, particularly cardiovascular or respiratory illness, are most at risk of experiencing adverse effects as a result of exposure to air pollution. It is possible that the current objective of no more than 35 exceedences of the 50 ugm⁻³ standard per year would not be met on site and likely that the 2010 objective of no more than 7 exceedences would not be met. It is likely that the offsite impacts will be less severe and that the number of exceedences of the 50 ugm⁻³ will be within the current and 2010 objectives.

The annual mean objective for NO₂, and the one hour objective for NO₂ are also likely to be met both on and offsite during the reconstruction process.

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Mitigation

Given the planned continued use of the hospital during its redevelopment and the potential sensitivity of many patients to the adverse health effects of air pollution, it will be extremely important to ensure that dust and exhaust emissions are adequately controlled. A number of measures can be used to control emissions of mineral dust from construction sites. Where a particular access route is to be used over a period of weeks, a wheel wash should be used to prevent mud being carried onto local roads. In the absence of a wheel wash, road cleaning should be undertaken, Dust emissions from internal haul roads should be minimised by restricting vehicle speeds and by damping down dust with water, if required. Site runoff of water or mud should be prevented. Granular loads should be covered during transport to and from the site. Dust pick up from stored granular materials can be reduced by keeping materials wet or covered or by the use of screening to reduce wind speeds across stockpiled materials. Screening can also be used to reduce dust emissions from active building and demolition works. The minimisation of drop heights will minimise dust emissions while tipping material from trucks. A solid barrier at the site boundary can be used to minimise impacts on adjacent properties. No bonfires should be permitted. The timing of operations will have a crucial effect on the dust impact as dust emissions are likely to be lowest during wet weather. Where possible dust generating activities should be kept to a minimum on dry windy days.

It is proposed to fit additional filters to air intakes of air handling plant on buildings close to construction or demolition sites that may create dust, for example theatres/ITU/Cancer-Bone Marrow treatment.

Evaluation of impacts

The continued operation of the hospital during its redevelopment means that it is highly unlikely that minor adverse effects on air quality and associated slight dust nuisance could be entirely avoided in parts of the hospital where patient treatment is undertaken. The proximity of existing residential properties to the hospital site will make it difficult to completely avoid nuisance arising from dust emissions from construction activities during dry weather, particularly at within parts of the hospital and properties within 100m downwind of active works. The timing of construction activities will have a critical effect on the likelihood of substantial dust nuisance arising and on the likelihood of not meeting the air quality objective for 24 hour mean concentrations of PM₁₀. Impacts would be greatest if these operations are performed during dry warm weather and least if performed during cold wet weather.

Within the grounds of the hospital, the development process is likely to have a minor impact on air quality (PM_{10}) and a moderate impact on dust nuisance, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The exact location of works relative to operational areas of the hospital will determine the extent and scope of nuisance. Dust emissions during wet weather are likely to be negligible and would not give rise to any nuisance on the hospital site or at nearby properties. Given the comparative rarity of prolonged periods of dry weather in Central Scotland, it is likely that dust nuisance will be at worst of moderate significance and would last, for at most, only a few days during the redevelopment work.

13.6.3 Impacts once development is complete

Effects on local air quality

The main effect of the proposed redevelopment of the hospital on air quality would be an increase in concentrations of NO_x, NO₂ and PM₁₀ resulting from increased traffic

flow. The predicted effects on PM₁₀ and NO₂ are small and would not be reliably detected by a measurement campaign (Table 13.7). The increased traffic flow will contribute to the predicted exceedence of the 2010 objective for annual mean concentrations of PM₁₀ but the predicted increments in concentration are of insufficient magnitude to make an important difference to the achievement of the objective. Daily mean concentrations of PM₁₀ will occasionally exceed the 50 ugm⁻³ standard, but are likely to remain within the objective of no more than 7 exceedences. The predicted annual mean concentrations of NO₂ are well within the annual mean objective and therefore the 200 ugm⁻³, one hour mean, objective is also likely to be met (DEFRA et al, 2003). Increases in other pollutants for which air quality objectives have been set are predicted to be extremely small and the objectives for these pollutants should be readily met within the hospital and the surrounding area.

Table 13.7: Predicted impact of increased traffic flow arising from the proposed redevelopment of the hospital site on local concentrations of NO_x, NO₂ and PM₁₀.

	2012 Baseline without development				2012 with development			Increment due to development			
	Annual	mean		Days	Annual	mean		Days	Annual mean		
	NO.	NO ₂ ugm ⁻³	PM ₁₀ ugm ⁻³	PM ₁₀ > 50 ugm ⁻³	NO _x ugm ⁻³	NO ₂ ugm ⁻³	PM ₁₀ ugm ⁻³	PM ₁₀ > 50 ugm ⁻³	NO _x ugm ⁻³	NO ₂ ugm ⁻³	PM ₁₀ ugm ⁻³
Housing				1000							
Hardgate Road	42.0	25.3	20.13	4	45.1	26.1	20.53	4	3.9	1.1	0.47
Shieldhall Road W	44.8	26.0	20.20	4	46.0	26.3	20.32	4	3.8	1.1	0.35
Shieldhall Road E	58.7	29.3	21.50	5	60.4	29.7	21.66	6	4.8	1.3	0.45
Govan Road	58.0	29.2	21.34	5	60.1	29.6	21.54	6	3.8	1.1	0.34
Hospital											
Maternity Hospital	38.6	24.4	19.78	3	42.5	25.4	20.29	4	4.9	1.4	0.64
New Childrens Hospital	34.8	23.2	19.30	3	35.4	23.5	19.37	3	0.8	0.2	0.10
New Adults Hospital	34.6	23.3	19.26	3	34.8	23.3	19.29	3	0.3	0.1	0.03
Spinal Injuries Unit	42.9	25.5	20.03	3	43.1	25.6	20.05	3	0.6	0.2	0.06

Overall, the output from the DMRB screening model indicates that increase in local traffic flow following the redevelopment of the hospital site would not be expected to make an important contribution to the possible exceedence of the 2010 objective for annual mean concentrations of PM_{10} and would not give rise to any exceedence of the NO_2 objectives. The frequency of occasional exceedences of the 50 μ 0 ugm⁻³ standard for PM_{10} may be slightly increased as a result of the increased traffic flow.

The potentially elevated background levels of PM₁₀ at the hospital location and also the existing odour nuisance associated with the WWTW are of potential concern given the likely greater susceptibility of hospital patients to adverse effects in comparison to healthier members of the population.

Effects on regional air quality

Table 13.8 summarises the pollutant emissions from the predicted increased traffic flow that may arise as a result of the redevelopment of the hospital site. The

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increased traffic flow that would arise from the development has a minimal effect on regional emission levels.

Table 13.8: Comparison of predicted emissions from the increased traffic flow arising as a result of redevelopment of the hospital site with those from baseline traffic flows alone the same routes

Pollutant	Total traffic emissions without development	Total traffic emission with development	Increment due to development	Units
co	133,277	150,997	17,720	kg/year
THC	19,055	21,408	2,353	kg/year
NO _x	94,123	104,527	10,404	kg/year
PM ₁₀	2,487	2,783	296	kg/year
CO2	29,715	33,377	3,662	tonnes/year

13.7 Residual Impacts

Table 13.9 summarises this preliminary assessment of overall impact of redevelopment of the hospital site on air quality. Both dust nuisance and air quality impacts in operational parts of the hospital during the redevelopment process could be of moderate significance. Careful planning will be required to minimise dust and exhaust emissions arising from the redevelopment work. The predicted increase in traffic flows following the redevelopment of the hospital would be expected to have a minor adverse effect on local air quality.

Table 13.9: Summary of residual air quality impacts of hospital development

	Construction	Following redevelopment
Dust nuisance	Moderate (on site) Minor (off site)	None
Local air quality	Moderate (on site) Minor (off site)	Minor
Regional air quality	Minor	Minor

13.8 References

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Department of the Environment, Food and Rural Affairs in partnership with the Scottish Executive, the Welsh Assembly and the Department for the Environment for Northern Ireland



2009 Campus Masterplan





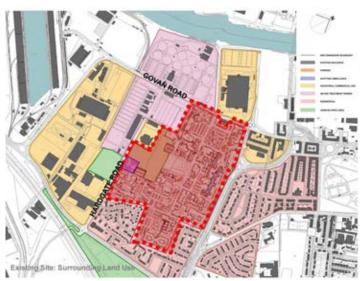
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Existing Southern General Hospital Site

1.0 INTRODUCTION

1.1 New South Glasgow Hospitals Concept

NHS Greater Glasgow and Clyde (The Board) has over the past ten years been developing its Acute Services Review (ASR) to modernise the acute adult health service within its area. The second phase includes the provision of a new Adult Acute Hospital, a new Children's Hospital, laboratory facilities, and associated support areas and other site facilities and infrastructure on the existing hospital site at the Southern General Hospital in Govan, Glasgow.

The new Adult Hospital will be one of the most advanced acute hospitals in the UK with facilities including 1,109 adult beds, and the biggest critical care complex in Scotland, catering for an estimated 110,000 A&E attendances per year. The Adult Hospital building is anticipated to be complete by the first quarter of 2015. This will provide a total of 1,700 beds on campus to meet the healthcare needs of the local, regional and national population that the hospital campus serves.

A new 240 bed Children's Hospital will also be built on the site and will be integrated with maternity and adult hospital services to ensure immediate access to specialist services of all kinds and therefore the highest quality and safety standards for mothers, children and babies. The Adult and Children's Hospitals will be built as a single integrated building. The Children's Hospital is anticipated to be complete in tandem with the adult acute facilities.

As part of the campus these new facilities will sit alongside, and be physically linked to, some retained existing facilities including the National Spinal Injuries Unit, the Institute of Neurosciences and the Maternity Unit, which is currently being upgraded with a new Neonatal unit.

A new Laboratory Facility will be built on the Southern General site and will be detached but physically linked to the new hospitals via a service tunnel. The new laboratory build will accommodate haematology, biochemistry, medical genetics, microbiology, and mortuary and post mortem services.

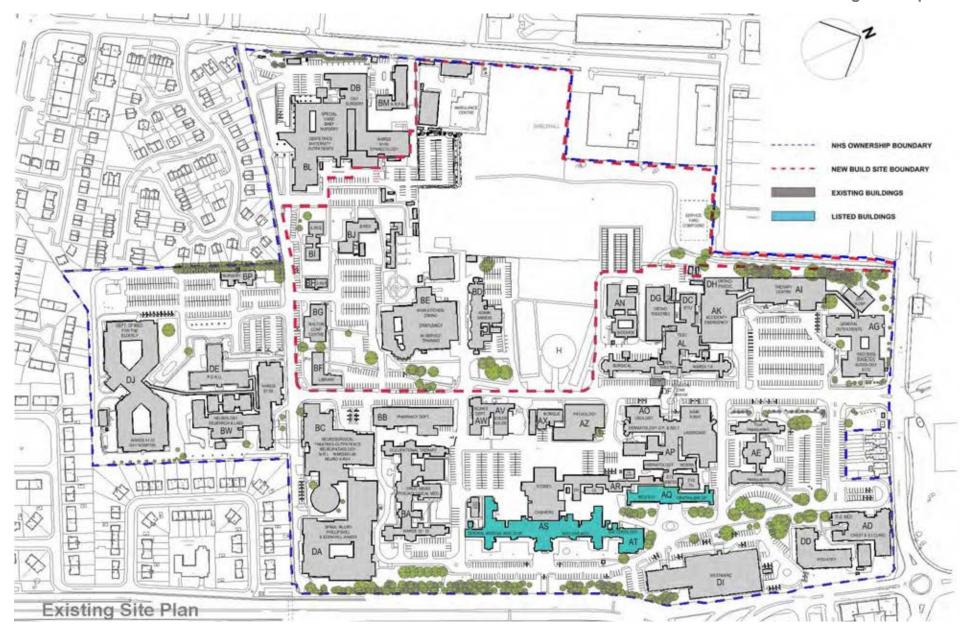
The Maternity Hospital building will remain with an upgrade and redesign already underway, which will meet all the challenges of leading edge clinical care in a safe and family-friendly environment.

1.2 2009 Campus Masterplan and Exemplar Design

This document summarises work undertaken by the Board and its technical advisers following on from the grant of Outline Planning Consent by Glasgow City Council in January 2008 which is subject to a range of conditions and the conclusion of a Section 75 legal agreement regarding transport and access issues.

In May 2008 the Scottish Government confirmed that the Board should change its method of procurement for the project from a PPP route to Treasury finance. This instigated a review of the procurement process and the re-tendering of the technical adviser role for the project.

A team lead by Currie & Brown and including HLM and BMJ Architects, URS Corporation, Wallace Whittle, Harley Haddow, Hirst Landscape Architects and Buchan Associates was appointed in August 2008 to develop the project on a two stage Design and Build basis. The team in conjunction with Ironside Farrar (Planning and Environment) and JMP Consultants (Transportation) has taken the project forward by utilising the existing exemplar design prepared by the 2007 Davis Langdon team with Avanti Architects. Further concept and design work has advanced and developed the themes and vision contained in the 2007 Campus Development Plan. Some of the key strands of the design have been re-visited and developed into strong themes and ideas in the exemplar design which the team has developed for the site and the main hospital buildings. In parallel with this design work the team have been developing a full set of tender documentation (ITPD) for a Design and Build Contract through a competitive dialogue engagement.



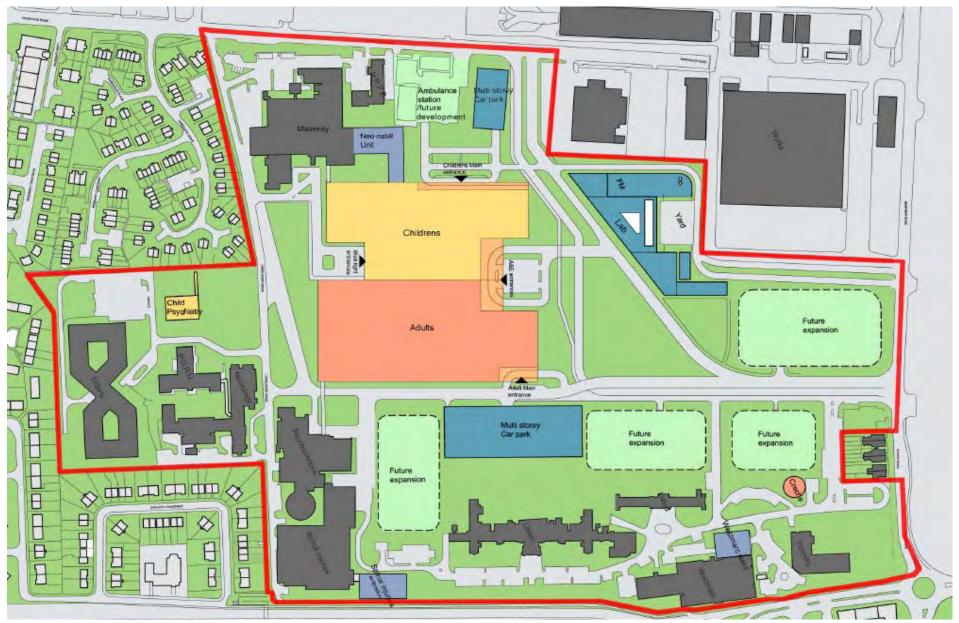
1.3 Delivery by Design and Build Contract

The Board are currently seeking a private sector partner to 'Design and Build' the New South Glasgow Hospitals Project, including an extended defects liability/compliance period post-construction. The Board issued a notice in the Official Journal of the European Unit seeking applications from candidates who could fulfil the necessary requirements. Three consortia are currently preparing design proposals and tenders for submission in September 2009. The contract will be awarded through the use of the competitive dialogue procedure under the Public Contracts (Scotland) Regulations 2006.

The three design and construction consortia are using the exemplar design as a basis to develop their design solutions as part of the bids to be submitted to the Board on 11th September 2009. Each of the teams preparing bids are internationally renowned in terms of construction and design pedigree and the Board are anticipating the submission of three exciting design proposals in response to their project brief.

The bids will be evaluated by the Board and their advisors over a six week period, and after review through the Board's governance structure it is hoped to announce the preferred bidder during the first week of November 2009. The successful team will win the opportunity to undertake the following construction and design work:

- Stage 1 Laboratory Block complete detailed design work with BMJ Architects (RIBA Stages E-G) and then commence construction of the laboratory block first guarter 2010 to complete on site by end of 2011.
- Stage 2 Adult and Children's Hospitals commence detailed design in November 2009 for next 10-11 months to conclude with a full business case submission for these new builds by November 2010.
- Stage 3 Adult & Children's Hospitals construction to commence January 2011 with completion around January 2015.
- Stage 3A Infrastructure Works once the new buildings have been completed and commissioned, existing buildings will be demolished and the central park completed. Car park 1B will also be taken forward during this stage.



2007 Campus Development Plan

2.0 2007 CAMPUS DEVELOPMENT PLAN

2.1 Summary of 2007 Campus Development Plan

The 2007 Campus Development Plan was prepared in support of the proposed redevelopment of the Southern General Hospital over a 10-year period. The Plan provided a framework which would guide the long-term redevelopment of the Southern General Campus resulting in the significant rationalisation and modernisation of hospital services on the campus. The Plan set out the Board's vision for the creation of a modern healthcare facility to serve the wider Glasgow area and outlined the opportunities and constraints which would impact on its future redevelopment. The Plan concluded by setting out a broad nine stage phasing strategy of construction and demolition activity over a 5-10 year period.

2.1.1 General Site Layout

The Southern General Hospital site is located close to and south of the River Clyde in the Govan district of Glasgow. The predominant land classification around three sides of the site is mixed commercial and industrial use, with private housing along the southern boundary. The area can be described suburban in character and there is a sparsity of local context with which to anchor or link the new developments on site. The local environment is low in quality and most of the built form is industrial in design and poor quality in terms of fabric and finished materials.

2.1.2 Description of Project

The Board's proposals would see an investment package being put into the 28 hectare Govan site, providing new and improved facilities to work alongside the existing clinical units which operate from modern, fit-for-purpose accommodation. The new 1109-bed Adult Acute Hospital would include facilities for coronary care unit, a surgical unit, a medical receiving unit, operating theatres, intensive care unit, high dependency unit, modern pharmacy facilities; and continuing refurbishment of medical facilities. The site would also provide new outpatient, diagnostic and treatment facilities for patients, a new 240 bed children's facility integrated with maternity facilities allowing specialised adult, maternity and children's facilities to be located together on the same site.

2.1.3 Siting and Campus Development Plan Approach

The exemplar design was developed in response to the phasing studies which identified the available site area in 2009/2010. The Board would release the land between the Maternity and the Neurosciences buildings to ensure that the new Hospitals could be located such that they link with these two existing buildings.

The 2007 Campus Development Plan laid out the site as a series of blocks with different activities zoned according to their function. Large and small open spaces were created between these blocks and particular emphasis was placed on the large green space in the centre, which faced the public entrances to both the children's and adult's hospital. This space was further broken down to create distinct entrances for the adults, children and emergency departments. The frontage to the Children's Hospital looked over a large play area and there were options to include a dedicated cinema/media centre for which charitable funding might be available. The first impression upon arriving at the Children's Hospital would be a place of play incorporating colour and stimulating materials. The entrance to the Adult Hospital had easy access to the landscaped central park which included paths, ponds and sitting areas. I

The Campus Development Plan supported a separate route for Fastlink through the centre of the site with stops immediately adjacent to the adult and children's entrances. A new through road was formed on the opposite side of this open space well away from the new public entrances. This road entered via the existing entrance off Govan Road and exited via a new entrance onto Hardgate Road. This effectively short circuited any through traffic and de-stressed the remaining routes within the campus to make them more attractive to cyclists and pedestrians.

The new Laboratories, Mortuary and Facilities Management and Energy Centre areas were located in a separate zone to the north of this road with a separate discrete access road.

The listed buildings formed one side of a new administration, training and research zone on the east side of the site. To protect the setting of the listed buildings the Campus Plan required that any new adjacent buildings proposed for the eastern side of the site be of a scale and massing in keeping with the listed buildings.

The Campus Development Plan recognised the need to separate facilities for longer-term elderly care and rehabilitation located at the southern end of the site from areas of busy hospital activity and the main public entrances. A small 1 to 2-storey development associated with Yorkhill was also proposed in this quieter part of the site. This provides mental health services for children and requires access to dedicated and safe external play areas away from the public gaze.

2.1.4 Transport Proposals

The extended hospital would generate a wider pattern of movement with some specialist facilities serving all of Scotland together with Glasgow wide responsibility for children and a significantly extended catchment throughout south Glasgow and to the immediate north of the River Clyde. In the short to mid term staff travel distances were also likely to increase as a consequence of relocation.

A transportation access strategy was developed to cater for these extended demands. This maximised the benefits of the current accessibility to the strategic road network, particularly outwith peak periods, and provided a public transport strategy which included Fastlink plus significant increased public transport penetration of the site and improved walking and cycling links through investment in walking and cycling infrastructure.

The principal on-site components of infrastructure improvement included a new single carriageway road connection between Govan Road and Hardgate Road, a segregated Fastlink corridor and a walking and cycling strategy which linked with Glasgow's emerging core paths and cycle route strategy.

Emergency ambulance accesses to the new hospitals were located together on the south face of the new buildings away from public areas. This was close to Maternity's existing ambulance entrance. Ambulances approaching the site from the south and west would continue to enter via the southern Hardgate Road entrance. Ambulances from the north and east would enter the site via the Govan Road entrance, pass along the new road and then through the same Hardgate Road entrance. This strategy ensured that emergency vehicles did not travel long distances within the site.

The plan identified the need for both retained surface and new multi-storey carparks and to retain sufficient land for landscaping and future development. New car parks were sited close to entrances to improve accessibility and allowed their phased construction to reflect the growth of on-site patient services.

A hierarchy of vehicle routes was established within and across the site defining access for service, blue light and private vehicles.

2.1.5 Landscape Strategy

The landscape strategy sought to create a quality hospital environment conducive to the care and healing of patients, and which inspired confidence in the public's perception of the hospital and the levels of hygiene and care provided. The landscape of the new campus integrated the hospital redevelopment with the existing landscape of the surrounding communities, and incorporated the required sustainable transport links including the Fastlink.

The 2007 Campus Development Plan provided a series of spaces which were categorised based upon their primary function in order to break down the large area of the campus into the following distinct zones for landscape purposes: main entrance, general open space, Children's Hospital breakout area, main clinical entrances, civic space and breakout area, access and circulation routes, parking areas, children's psychiatric unit, facilities management/pathology, boundary treatments, discrete developments and retained hospital landscape.

2.2 Grant of Outline Planning Permission

In April 2007 the Board lodged an outline planning application with Glasgow City Council which was accompanied by an Environmental Statement. The planning application and ES were the subject of consultation with an extensive range of statutory and non statutory bodies, agencies and the general public. The application was reported to the Council's Development and Regeneration (Development Applications) Sub Committee in January 2008, with a recommendation for approval. The Sub Committee voted to grant outline planning permission subject to 43 planning conditions and the signing of a Section 75 Agreement.

When the planning consent is issued subsequent planning approvals will be dealt with as 'Reserved Matters'. This two-stage approach means that there will be a requirement for reserved matters applications to be scrutinised by the planning authority to determine whether further environmental information and assessment is required to allow the detailed consideration and determination of reserved matters.

The proposed Condition No. 1 of the Outline Planning Consent states that:

Prior to submission of the first reserved matters application, a finalised master plan which re-affirms an overall 'vision' set within a clear design and development framework, reflecting the strategic design guidance on built form and landscape contained in the South Glasgow Hospitals Campus Development Plan, April 2007, shall be submitted and agreed in writing by the Planning Authority. The submission should include:

- (i) An audit of the changes between the finalised master plan and the indicative campus master plan ref: 05017-02-100, 'development option C'; identified in the South Glasgow Hospitals Campus Development Plan, and
- (ii) An assessment of the extent to which the finalised masterplan accords with the Environmental Statement (ES) submitted as part of the outline planning application. Thereafter the Council will determine whether the finalised masterplan accords with the outline consent and whether a reserved matters/full planning application accompanied by an EA is required.

This 2009 Campus Masterplan report addresses the requirement of Condition No. 1 listed above.

2.3 Section 75 Agreement

Under the terms of Section 75 of the Town & Country Planning (Scotland) Act 1997 an Agreement will be established between Glasgow City Council as Planning Authority and the Scottish Ministers per NHS Greater Glasgow and Clyde. In this Section 75 Agreement the Glasgow City Council requires the Board to make provision for the following:

- A Travel Plan defined in terms of the Glasgow City Plan 2
- A financial contribution towards the cost of the measures designed to mitigate the impact of the development upon the strategic and local road network, including improvements to pedestrian and cycle routes
- Reservation of sufficient parts of the site for Fastlink
- A financial contribution to Fastlink
- Control of On-street Parking
- Enhanced bus services and other public transport improvements

Travel Plan

The Travel Plan will include a series of detailed information, including measures required by the Board to put in place the infrastructure to facilitate the Travel Plan implementation and a strategy to demonstrate how private cars accessing the hospitals can be parked on-site without spilling onto the local road network.

Pedestrian/ Cycle Routes

This requires the Board to provide a financial contribution indexed towards the cost of carrying out the walking/ cycling upgrade works arising from the development.

Fastlink Land

In respect to the Fastlink proposal, this requires the Board to use reasonable endeavours to accommodate a turnback loop and for the Board not to erect any buildings or structures or create any rights of way or wayleaves, which may affect the Fastlink route.

Fastlink Contribution

This requires the Board to provide a financial contribution indexed towards the cost of the Fastlink scheme as a means of enhancing sustainable access to the site.

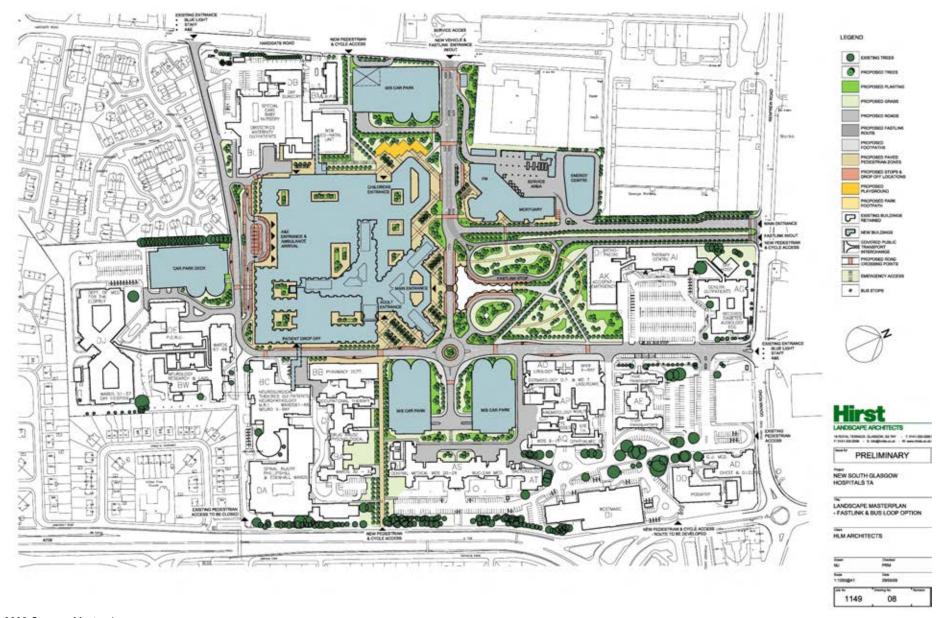
Control of On-Street Parking

This requires the Board to provide a financial contribution indexed toward the costs of carrying out the controlled parking measures arising from the development.

Enhanced Bus Services and other Public Transport Improvements

This requires the Board to undertake public transport improvements including an increase in direct bus services through the site in order to meet travel objectives. In addition, the Board shall:

- Undertake to commit the public transport contribution indexed towards the delivery
 of the public transport improvements
- Identify traffic improvements necessary to improve accessibility to the site for staff, patients and other users of the development, and
- Submit prior to commencement of development, detailed proposals for the construction and implementation of a Public Transport Super Stop.



2009 Campus Masterplan

3.0 EVOLUTION OF 2009 CAMPUS MASTERPLAN

3.1 Site Context

The New South Glasgow Hospitals site contains a mix of buildings of varying ages and architectural style and quality. The buildings are arranged in a Campus layout, with the oldest group of buildings concentrated to the east of the site. There have been a number of more modern additions to the campus over the last five years.

The Grade B listed Central Medical Block provides the most architecturally significant building to be retained within the Southern General campus. Erected in third quarter of the 19th century the symmetrically shaped, 3-storey stone building is topped by a distinctive clock tower, currently visible from most parts of the site, with clock faces on four sides. As a secondary landmark and a link between the old hospital and the new developments it has been considered desirable to maintain views of the clock tower, to have the mechanisms overhauled and to frame this prominent feature as a working timepiece visible around the site.

New structures recently completed and those nearing completion within the site also provide a reference for the new builds. In particular they will help form the basis for a palette of materials and building form for the peripheral buildings around the new Adult and Children's Hospitals.

The existing built form on-site is between four and six storeys. The retained buildings around the new builds will link into the lower level podium of the new hospitals. This will allow the built form of the finished complex to rise towards the middle of the site as a focal point, and so reduce overshadow and prevent the retained buildings from being overlooked.

3.2 Design Vision

Many of the themes and functional ties originally developed as part of the 2007 Campus Development Plan still remain and are key to the 2009 Campus Masterplan that the Board now present. The scale of the development at the Southern General Hospital will mean that there can be a total population of 6000-7000 patients, visitors and staff onsite at any one time, which equates to a small town. The new facilities will be one of the largest in-patient hospital sites in the UK and, like any healthcare facility, will provide a locus where people encounter many of life's more traumatic and stressful emotions and challenges.

The design and layout of the new hospitals must make the patient experience as stressfree as possible and be welcoming and visually understandable the visitors as they approach and enter the buildings. The site organisation must be legible and approach to the buildings visually ordered by roads, landscape and signage, with main entrances to both the Adult and Children's Hospitals separate and clearly visible.

The scale of the new hospitals provides the opportunity to make a significant visual statement. The built form, size and mass generated by the exemplar design solution will be a citywide landmark and will be seen from high ground tens of miles away. A new landmark requires careful design and composition to create a building worthy of civic pride by not only the local community in Govan but also by the residents of the Glasgow conurbation and the West of Scotland.

The approach to a complex of buildings of this scale is best ordered along a formal route that allows the first time visitor to take in the scale of the site, read the language of the buildings and decide through a number of media, including signage, the location of their point of arrival, where they can drop off their passengers and where they can park their vehicles. Similarly public transport needs to cater for high volumes of footfall to the new hospital buildings and provide easy access for bus, Fastlink and taxis to a designated public transport hub close to the front doors of the new hospitals.

In an urban setting large buildings sit close together in their city blocks, and Glasgow is well known for its grid pattern of densely developed streets. Glasgow is also well known for its city parks and formal open spaces which populate many districts within the conurbation. These spaces often provide offset and vistas to large civic buildings, and provide open space for building users and the surrounding population for rest and relaxation. These themes are embodied in the exemplar design and can be articulated as follows:

- The central park provides a locus for the development, a green heart, a space for staff, patients and visitors to sit and reflect, wait for a bus, eat their lunch, use the trim track, a setting for art or a pleasant route to walk to work.
- The main complex overlooks the central park which provides a pleasant outlook for the many wards and other buildings which overlook this high quality green space.
- The central park will be easily assessable from all parts of the site and linked by suitable footpaths with pedestrian crossings across the main access roads.
- Access to the park will be boundary free and the desire to locate public transport stops at the front door needs to be carefully balanced against bringing the park to the front of the building.
- The buildings organised around the central park, including the podium for the Adult
 and Children's Hospitals and the laboratory buildings, are of a similar height and
 scale which will provide enclosure to this large space. The Ward Tower will
 overlook the park and provide a focal point.

The main entrances to the buildings should be clear, visually signed by elements of the building, with external built form and landscaping assisting and leading the visitor to the









main doors. There will be two entrances to the main complex, one for Adult Hospital and one to the Children's Hospital and each should be separate, distinct and designed in a way to allow easy access and progress into the main thoroughfare of the hospitals.

Buildings of this scale require an arrival point that is spatial yet provides the visitor with clear direction to their destination preferably through the internal design and layout of the arrival space. These spaces should ideally provide a two or three storey atrium or arcade, illuminated by natural light from above and the side, with a volume appropriate to a main thoroughfare in a major public building. This space should provide space for shops, café, patient information and waiting linked to the main circulation routes through the building. There should be opportunities for views into adjacent landscaped courtyards, internal landscaping, art, interior design through link bridges, which should all contribute to making these spaces vibrant, yet calming. Sensory keys such as water (noise) and internal planting (smell) should be a part of the interior design proposals.

Key circulation routes to upper levels and other parts of the hospitals should be located off this space and be visible to the visitor from the main arrival points. A main information desk and patient registration area should also be located close to the arrival point for patient and visitor orientation.

Main circulation routes should wherever possible be lit from external courtyards, providing daylight into the heart of what will inevitably be a building with a deep floor plan in some areas. The height of the podium should be restricted to 3-4 storeys to maximise the amount of light reaching down to ground level, helping to avoid dark damp lightwells, and allowing landscape to thrive and making the spaces potentially usable by patients, visitors and staff. The width of spaces could be variable to accommodate sitting areas, reception spaces or small areas for quiet reflection.

Much is written in this document and in the Employers Requirements about the some of the other demands of the brief, not least clinical functionality, maintainability and low running costs. What must be achieved is the provision of modern 'fit-for-purpose' facilities that are well designed, flexible to changing healthcare demands and provide a modern and stress-free environment for the delivery of healthcare in the 21st century.

3.3 Masterplan and Site Layout

The layout of the site remains similar to that developed in the 2007 Campus Development Plan, as many of the key drivers that set the location of the main building blocks of the design remain the same. Some of these drivers are clinical in function and important in terms of design organisation and the eventual operation of the complex. These key drivers are articulated below:

• The 8-hectare development site is constrained by the requirement to maintain in operation all current on-site hospital services for the duration of the construction

- period of the project. It should be noted that the briefed floor area for the two hospitals could cover the whole site with a single two storey building.
- The new hospital services must link with hospital services currently on site with minimum disruption. The key clinical adjacencies and linkages are the Children's Hospital to the new Maternity Unit to the west and the Adult Hospital to the Neurosurgical Block to the east, both for patient and staff transfers and the colocation of key services.
- The arterial road system within the site must be maintained at all times during the construction of the new buildings. As a result, new entrances must be developed to service the new build site.
- The scale of the development and resultant traffic generated will require the enhancement of the road network and junctions within the site and onto Govan Road and Hardgate Road.

The proposed landscape design addresses the evolution of the central park, its place within the site and its relationship and function to the main complex. The Board also wish to develop other areas or secondary spaces around the buildings which will be more intimate or perhaps associated with particular functions. Listed below are a few concepts which are explored in more detail in Chapter 5.

- Children's Garden external play area and garden for exclusive use by the Children's Hospital, with play equipment, landscaped areas designed for children to explore and de-stress, a chance for fresh air and release from the hospital environment.
- Internal courtyards providing usable external space within some of the courtyard spaces to provide opportunities for areas such as café, staff dining and rest.
- Rooftop space there will be large flat roof areas overlooked by the ward tower. It
 will be desirable to utilise these spaces in part for roof garden areas, external
 seating or simply green roof technology to break up the potential visual impact of a
 large expanse of flat roof.

3.4 Review of Clinical Adjacencies and Functionality

A review of the clinical adjacencies and functionality of the 2007 design identified some key changes to the design which would have a knock on effect to the overall building layout and masterplan.

The 2009 Campus Masterplan has been developed in consultation with various stakeholders, including User Groups, Architecture + Design Scotland, the Carbon Trust, Strathclyde Partnership for Transport, Civil Aviation Authority (CAA) and Glasgow City Council Planning Department. The aims of the Masterplan are to achieve clarity of spaces and routes within the existing Southern General Hospital Site.

3.5 Adult and Children's Hospitals - Building Organisation and Clinical Planning

The exemplar design has been developed through extensive consultation between the Board, Clinicians and the Board's advisors. The clinical departmental adjacencies have been signed off by the Board. It adopts an approach which places intensive clinical activities on the lower three floors with the emergency department on ground floor and critical care and theatres on first and second floors respectively. Imaging is placed centrally on ground and first floors where it can be accessed by all departments as required.

Outpatient services are placed close to main entrances on the lower floors for ease of access. This establishes a diagram whereby 'hot' areas are zoned to the west and 'cold' areas to the east. This ensures that those attending for only a short period do not have to penetrate too deeply into the plan before finding the appropriate department or vertical stairs and lifts to upper floors. The separation of 'hot' and 'cold' routes throughout the plan and section ensures that staff and inpatients can move throughout the buildings without coming into contact with members of the public. This separation provides a much higher degree of security in clinical areas and allows patients to be moved with maximum dignity.

In line with the Board's brief, the indicative design places the Children's Hospital immediately beside the existing Maternity Building and provides the first floor link between the new Neonatal Unit and PICU/Children's theatres. This link also allows Adult Critical Staff based on the same level to travel across and down to the obstetric theatres in Maternity in the event of an emergency. The hot link at first floor level effectively joins all the acute activities in Neuroscience, Maternity, Adult Acute and Children's Hospitals. Direct links to this route are available from ambulance entrances, resuscitation areas and the rooftop helicopter landing pad which optimises the speed whereby seriously ill patients can be moved to key treatment areas.

Significant consideration has been given to travel times within the building and these were compared as different options emerged. If arranged on a single floor, the new floor area of the combined hospitals would be equivalent to a building 1.4km long by 140m wide, including allowance for internal courtyards. Clearly it would be impractical to accommodate this on the site. To illustrate the problem, the Board's advisors prepared three diagrams which tested the effect on abstract journey times as the required floor plate was placed in different stacking arrangements. This demonstrated that travel time between two distant points in a single storey option, even if practically possible, would be very inefficient. Accepting that the hospital cannot operate on one floor, lifts have to be introduced once the building is two storeys and above. Once lifts are required, lift waiting has a greater effect on travel time than lift travel distance. This is one consideration that has led the Board to favour a taller building on the site but it is true that travel times result from subtle relationships between plan and section and a future detailed scheme may achieve the same criteria in a different way. The Board has also





adopted a lift strategy which provides resilience such that if a lift is out of action the remaining lifts will still provide an efficient service.

Consideration has also been given to the number of wards on a floor. Modern hospital wards now include therapy and other support areas to allow certain treatments and therapies to take place closer to patient beds. A single ward will not in itself generate sufficient activity, but a number of wards clustered together begin to allow these shared support areas to function more effectively. The health planners employed by the Board have established that four wards sharing support areas are an optimal arrangement. Other requirements such as means of escape and horizontal evacuation also have an impact on ward footprint.

The indicative design therefore adopts in the adult hospital an arrangement whereby four adult wards are arranged on each floor served by a central support core, plus bed and facilities lifts. Visitors arrive at an entrance which serves two wards on each floor via their own dedicated lifts and stairs. This effectively ensures separation of public and inpatients all the way to the ward itself and provides the flexibility between two pairs of wards on each floor.

3.6 Revisions to Facilities Management, Laboratories, Mortuary and Energy Centre

In the 2007 Campus Development Plan the Facilities Management, Laboratories, Mortuary and Energy Centre were located on a triangular site adjacent to the western boundary of the site and with a frontage onto the new diagonal road line between the existing Govan Road entrance and the proposed new entrance onto Hardgate Road. With the introduction of the new entrance boulevard in the 2009 Campus Masterplan, further consideration was given to the location of this complex of buildings.

Two options were considered for the New Laboratory Facilities: Option 1 adjacent to the new Neonatal Unit; and Option 2 adjacent to the Scottish Water site. Option 2 was identified as the preferred option for the following reasons:

- The site has capacity to include the Energy Centre, thus bringing all facilities based accommodation to a centralised location on the campus.
- Larger site allowing for adequate delivery vehicle and mortuary access.
- Site capacity for accommodation requiring ground floor location.
- Scope for front façade onto primary access route from Govan Road to provide architectural presence and gateway.
- A separate dedicated service access road from Hardgate Road, removing all service vehicles from the main public access routes servicing the campus.
- The site offers open aspects on all sides.
- Scope for provision of an underground service access route for the robotic transfer of goods, samples and refuse to and from the new main hospital complex.



Site location for Laboratories, FM, Mortuary and Energy Centre



Ground Floor Plan of FM and Mortuary

The Energy Centre will be co-located on this site in a physically separate building. The Energy Centre will provide heating, cooling, power and standby generation, and maintenance accommodation. The Energy Centre will be procured separately at a later date by another design team.

3.7 Retention of a Larger Number of Buildings in the Medium Term

The Board have reviewed the clinical requirement and affordability of the new hospital development and for this phase of the development, there is a need to keep (in the medium term) some of the buildings previously identified for demolition. These retained buildings will be utilised for clinical and non-clinical staff offices and will be adapted to their allocated use once vacated by clinical services in 2015. The following buildings will be retained in addition to the two listed buildings which were already being re-used for administrative/educational purposes. (Refer masterplan drawing 1149 04B for block locations).

Block Code	Current Function
Block AK	Accident & Emergency Department
Block Al	Therapy/Rehabilitation Department

Block AG Out-patients Department
Block AO Urology and X-Ray
Block AE Management Offices

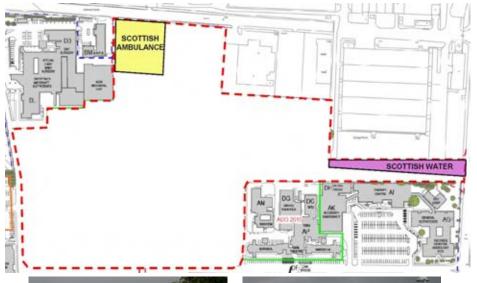
The Board have undertaken a comprehensive space planning exercise to establish the best possible use for these buildings based on office and educational support functions.

3.8 Land Acquisitions from Scottish Ambulance Service and Scottish Water

The 2009 Campus Development Plan is based on a slightly larger footprint resulting from the proposed acquisition of land. The Board has established that it would be desirable to purchase two parcels of adjacent land from Scottish Water and the Scottish Ambulance Service. This is progressing through discussion with both organisations.

The area of the site adjacent to the proposed Children's Hospital is currently occupied by the Scottish Ambulance Service's Shieldhall Ambulance Station and South Workshop. The acquisition of this land from the Scottish Ambulance Service was identified as a way of achieving an appropriately sized car park and to open up a second access to the site from Hardgate Road.

To achieve the new principal access to the site from Govan Road and take account of the retained existing buildings on the site (including existing A&E) a strip of land 125x15metres within the Shieldhall Wastewater Treatment Works has been identified for acquisition from Scottish Water.











3.9 Access and Transportation

3.9.1 New Entrance Boulevard

The approach to a new facility of this scale is important to allow visitors to orientate themselves within the site. As the design developed, it became clear that a new central access boulevard approach from Govan Road would provide this key design aspiration.

The site-wide strategy focussed on the public approach to the new hospitals with clearly identifiable access to Adults, Children's and A&E. This fixed the entrances which in turn allowed a clear transport infrastructure to be developed around the campus.

A new entrance boulevard will be created from Govan Road which will border the new Laboratory, FM & Mortuary and Energy Centre and provide clarity on approach to the new Children's and Adults' facilities. The new boulevard will meet a new east/west link between Hardgate Road and the existing main access road through the campus.

The new boulevard will primarily distribute traffic from a new signalised junction on Govan Road to the Children's Hospital, including drop off points in close proximity to the entrance and utilising the new multi-storey car parking facilities to the east of the Campus.

The existing main access road which runs from Govan Road to Hardgate Road maintains a significant role within the Masterplan, not least in serving as the primary 'blue light' route through the campus. This existing access would become a managed 'blue light' and staff entrance to the site as well as providing an access route for local bus services.

The 2009 Campus Masterplan seeks to improve entrances to the site, traffic flows around the site and enable all visitors to the new hospitals to orientate themselves quickly within the Campus.

3.9.2 Public Transport Provision

Bus

Public bus routes will remain on the existing road network through the hospital site between Govan Road and Hardgate Road. The masterplan also includes provision of a bus stance adjacent to the main frontage of the Adult and Children's Hospitals as part of the transport hub. Additional bus stops will be provided along the bus route including bus stops at key entrances.



View looking south along the main entrance boulevard towards the Wards Tower with the central park on the left and Laboratory Block on the right.



View looking south from the existing Govan Road entrance towards the Wards Tower with the twin multi-storey car parks on the left and the central park on the right.

Revised Layout for Fastlink

The requirements of the Fastlink transport proposals means that the masterplan has to accommodate a new dedicated transportation route which allows Fastlink vehicles to enter the site from both Govan Road and Hardgate Road with the ability to turn within the hospital site. In addition, a public transport stop/hub in close proximity to the building entrances is provided. In compliance with Condition No. 30 Fastlink is given priority at junctions and within the road geometry. Signalised junctions will be included at all junctions along the route of the Fastlink where there is interaction with general traffic.

Taxis

Taxis will access the site from the two entrances off Govan Road and the two entrances off Hardgate Road. Taxi drop-off points will be located at the main entrances to the Adult and Children's Hospitals, A&E and the laboratory block. In compliance with planning condition No. 23, two taxi ranks have been located at the main public entrance to the Adult Hospital and adjacent to the public transport hub.

Transport Hub

The public transport network requirement for Fastlink to run through the site created the demand for a highly visible transportation hub adjacent to the new Adult and Children's Hospitals' entrances while still addressing the remainder of the buildings on the site. In compliance with planning condition No. 21 the transport 'hub' is located centrally on the site and provides direct and sheltered access to the new hospital entrance. This hub will allow bus, Fastlink, taxi and private car drop-off within immediate walking distance to the entrances. The hub will include enhanced facilities for passenger including dedicated stops, shelters and real time information with repeaters in the hospitals' foyers.

3.9.3 Emergency Vehicles (Road and Air)

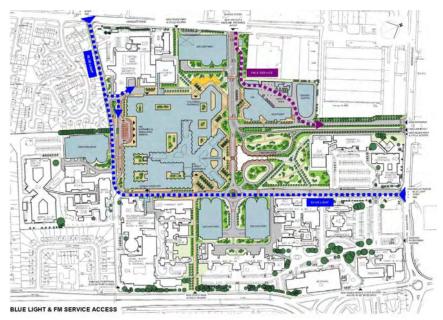
In compliance with planning condition No. 30 the east junction at Govan Road and the south junction at Hardgate Road will be upgraded to include priority control measures for 'blue-light ambulances'.

The exemplar design and employer's requirements include the provision of a rooftop helipad and associated services, including access requirements and safety facilities in full compliance with current national standards. General guidance for the size of Helipad requires a rectangle with sides at least 25m long (or a circle at least 35.4m in diameter) as a minimum requirement to accommodate all helicopter types likely to make use of the facility.

















3.9.4 Service Vehicles

The new link from Hardgate Road, again via a signalised junction, will act as entrance for vehicles utilising the west car parking. It will also serve drop-off areas adjacent to the Laboratory, FM & Mortuary areas and service access to the Laboratory, FM & Mortuary and Energy Centre. The service access will be quickly separated from main flows. Egress from the service areas will direct delivery vehicles to Govan Road via the new boulevard. The exemplar design includes provision for an underground pedestrian and AGV (robot) service tunnel between Facilities Management and the Adult and Children's Hospitals for the robotic transport of supplies.

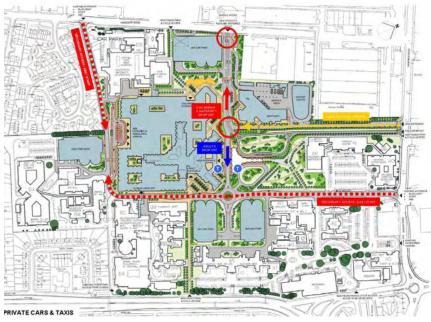
3.9.5 Private Transport Provision

The approach to a new facility of this scale is important to allow visitors to orientate themselves within the site. As the design developed, it became clear that a new central boulevard from Govan Road would provide this key design aspiration.

Public access and drop off via private car become immediately clear on the approach to the Adult and Children's Hospitals along the boulevard with the traffic circulation flow allowing drop-off adjacent to the relevant entrances and then onwards to the respective car parking zones.

The 2007 Campus Development Plan included provision for 3,500 parking spaces based on Glasgow City Council's parking standards for hospital staff, patients and visitors. The 2009 Campus Masterplan provides for the same number of parking spaces in four locations: two 5-storey carparks adjacent to main entrance to the Adult hospital (Car Park 1A: 700 spaces and Car Park 1B: 700 spaces); one 6-storey carpark providing 1000 spaces adjacent to the main entrance to Children's Hospital (Car Park 2); and an additional single deck to the existing west surface carpark to provide parking for the new Emergency Department.

Car Park 1A is required to replace the existing parking provision which is located on the site and which is to be cleared to facilitate the construction of the Adult and Children's Hospitals. This car park is currently the subject of a separate detailed application for planning consent (Ref: 09/0036/DC). Car Park 1B, which is planned to be adjacent to Car Park 1A, will not be able to start construction until the temporary catering/dining block moves in to the new hospital so will not start works until summer 2015, with construction duration say 9 months. Car Park 2 off Hardgate Road, currently shown on the Scottish Ambulance site will also provide the opportunity to construct a HV electrical substation as part of the structure. Car Park 3, the single deck 312 space car park adjacent to the residential area off Hardgate Drive does not need to be available until the new builds complete in January 2015.







3.9.6 Pedestrian and Cyclist Routes

Pedestrian routes through the site and within the building have been developed to assist in the wayfinding strategy. In compliance with planning condition No. 26 a network of pedestrian and cycle routes has been formed to link the Adult and Children's Hospitals with existing buildings, public transport hub and the established external pedestrian and cycle routes.

Pedestrian circulation will be extensive throughout the site. The key pedestrian routes are parallel to the road network, including the provision of dedicated crossing points, with footpaths across and around the new central park. These crossing points provide linkages between the transport hub and the main entrance to the main hospital buildings including the internal concourse which runs east west from the Adult Hospital entrance to the Children's Hospital entrance.

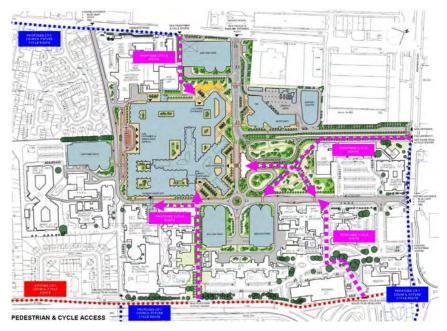
To comply with planning condition No. 28 three new cycle routes are proposed:

- one adjacent to the new Neonatal Unit which will connect with the Council's proposed cycle route along Hardgate Road
- one adjacent to the new entrance boulevard which will connect with the Council's proposed cycle route along Govan Road
- one adjacent to the Central Medical Building which will connect with the proposed new access point and the existing Council cycle route along Langland's Road together with the proposed cycle route via the Langland's Road underpass.

The proposed cycle paths within the site are shared with pedestrians and are off road. The cycling network will include the provision of appropriate levels of safe, secure and sheltered cycle parking for staff and visitors. In addition, the employer's requirements include provision for shower and changing/locker facilities for hospital staff cycling to work.

3.10 Revised Proposals for Central Park

The 2009 Campus Masterplan includes revised proposals for the creation of a large central park in front of the Adult Hospital for the use of patients, visitors and staff. This will provide a multi-functional space for social interaction and relaxation as well as facilitating access for pedestrians and cyclists through the site. The park will also provide opportunities for informal exercise with marked walking routes and a trim trail. The park will provide a network of principal and secondary paths for pedestrian and cycle use and will include boulevard tree planting to create a visual structure together with appropriate lighting for safe use during the hours of darkness. The open space will include public artworks and sculpture for both incidental interest and to assist with wayfinding.







A major walkway will link the hospital front entrance and the proposed Fastlink stop into the heart of the open space. The detail design of this zone will reflect the highest standards of 21st Century civic/public realm urban design incorporating high quality paving materials and contemporary street furniture and lighting. The area will be covered to provide a contemporary all-weather link between the Fastlink/bus drop-off and the main hospital entrance.

The detail design will include an appropriate amount of free open space within the park to allow for flexibility of use in terms of informal gatherings, games and general amenity. For further details see Chapter 5.

3.11 Removal of SUDS Water Feature

In the 2007 Campus Development Plan the requirement for a sustainable urban drainage system was used to create the opportunity for a large body of open water with associated environmental and biodiversity benefits located in front of the main entrance to the Adult Hospital. This proposed water body was potentially in conflict with the site's location within the 13km safeguard contour for Glasgow Airport which would require specific design parameters including netting and steep sides to ensure that the waterbody would not be attractive to birds. To address this potential risk and to reduce maintenance requirements, the waterbody was removed from the landscape design proposals. The SUDS proposals will now take the form of underground retention tanks.





View looking east from the new Hardgate Road entrance along main north frontage of the Children's and Adult Hospitals towards the Central Medical Block clock tower.

4.0 2009 CAMPUS MASTERPLAN COMPONENTS

4.1 Building Typology

The Adult and Children's Hospitals comprise of several functionally distinct zones each of which by virtue of its differing requirements in terms of spatial, structural and environmental characteristics demands a slightly different building typology. These have been expressed in the development of the exemplar design as follows:

- Outpatients Clinics
- Emergency Medicine/ Assessment/ Critical Care facilities
- Diagnostic and Treatment facilities (Radiology and Operating Theatres)
- Inpatient Wards
- Clinical Support (Laboratories, Mortuary etc)
- Non-clinical support (Facilities Management Centre, Energy Centre, Car Parks, Offices)

The exemplar design has a shared three/four storey podium with a compact diagnostic and treatment core around which the outpatients and emergency medicine/ assessment/ critical care have been wrapped. The outpatient clinics are located on the main public facades to the west and north of the podium with the emergency medicine etc placed on the less public south and east facades.

The inpatient wards for both the Adult and Children's Hospitals will sit on top of the podium away from the hustle and bustle of the rest of the hospital where they will enjoy the best natural light and outlook afforded by this particular site.

The main clinical support functions are to be housed in the new and distinctively modelled Laboratory Services building.

Most of the non-clinical support functions such as Facilities Management and Energy Centre are co-located with the Laboratory Services. Other non-clinical support functions are located within the basement of the new hospitals and in the service cores on each of the upper floors.

Other non-clinical functions such as the new multi-storey car parks will be expressed in an appropriate architectural language and building typology whereas the staff office functions will largely be housed within existing buildings within the retained estate.

These distinct building typologies can be expressed by means of built form, fenestration, selection of materials and the use of colour and texture to achieve an overall campus development with significant architectural design integrity.

4.2 Adult Acute Hospital

The new Adult Hospital will be one of the largest acute hospitals in the UK and one of the most advanced in Europe. It will have one of the largest Emergency Departments in Scotland with an estimated 110,000 patients coming through its doors every year as well as being home to major specialised services such as renal medicine and transplantation, and vascular surgery.

The new hospital will have 1109 beds, in single room accommodation with the exception of critical care multiply bedded areas. Twenty state-of-the-art operating theatres will offer the best available equipment to staff and patients. The new Adult Hospital will be integrated with the Children's Hospital, albeit with separate functions and entrances. A physical link for patients and staff is planned from the new hospitals into the Maternity and Neurosciences buildings.

Exemplar Design

The exemplar design has been developed in consultation with the Board and user groups to identify key clinical co-locations and develop block plans for the New Hospitals. The exemplar design is intended to reflect these discussions and provide an advanced level of briefing that will enable the contractor's response at the end of the bid period to be more advanced in terms of understanding of the Board's and users' functional, clinical and quality requirements. The exemplar design is also intended to represent a design quality benchmark against which the Contractor's proposals will be measured.

The exemplar design is not intended to constrict the contractors' proposals to a particular solution nor stifle innovation or creativity. However, functional relationships indicated in the exemplar represent the culmination of a process of detailed consultation with the Board and users to determine their requirements. As a result it is not expected that the Contractor will require to revisit the functional relationships or design principles.

Adult and Children's Hospitals Identity

The exemplar design proposes a single overall building footprint subdivided into the Adult and Children's facilities, creating two distinct but adjoining hospitals. In acknowledgement of the benefits to be exploited through the co-location of the Adult's and Children's Hospitals, detailed consideration has been given to identifying these benefits in the brief and in the design of the two hospitals.

The Children's Hospital will operate as a hospital in its own right with dedicated clinical staff and management, with some shared facilities. The Children's Hospital brief requires an appropriate degree of clinical and patient separation between the two hospitals and the maintenance of the distinct identity of the Children's Hospital both externally and within the patient and public areas. This requirement is expressly

reflected in the exemplar design which indicates two separate entrances for the Adult's and Children's Hospitals.

Podium

A significant proportion of the overall building footprint is dedicated to integrated acute facilities which will be housed in the 3 storey podium. The podium will include such departments as Operating Theatres, Radiology, Critical Care and Outpatients Departments. The key drivers behind the location of departments are the necessities of co-location for functionality along with appropriate public/private zoning of the facilities. For example Outpatients and Accident Emergency Departments are located on the ground floor towards the external boundary of the footprint to ensure an appropriate level of public accessibility is achieved while the core of the footprint is reserved for private treatment and diagnostic areas such as Radiology where greater privacy is required.

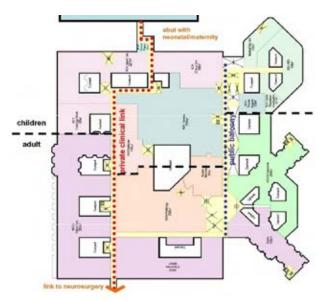
Ward Tower

Located above part of the footprint of the podium will be the thirteen storey 4-wing adult ward tower providing single bedroom ward accommodation across a range of departments including Renal, Vascular, Hemato-Oncology etc. In total the facility includes the provision of 1,109 adult and 240 children's beds. While not all bed spaces noted will be accommodated in the ward towers, the ward tower typology was developed as being the most appropriate and achievable method by which these bed numbers could be accommodated. The tower's wings are positioned and orientated to provide best use of views across the site, provide appropriate levels of natural light and to achieve patient privacy by preventing overlooking from other ward accommodation.

Main Entrances

There are nine staff/patient/visitor entrances on the ground floor of the two hospitals.

- Adult Main Entrance
- Children's Main Entrance
- Adult 24 Hour/Staff Entrance
- Children's 24 Hour/Staff Entrance
- Adult Acute Assessment Entrance, and
- Adult/Children's Emergency Department Entrance
- Adult Emergency Department Ambulant Entrance
- Adult Emergency Department Ambulance Entrance
- Children's Emergency Department Ambulant Entrance
- Children's Emergency Department Ambulance Entrance



First Floor Plan of Podium with links



Ground Floor Plan of Podium with entrances

Atrium including Retail Space

The exemplar has a linear atrium linking the main entrances of the Adult and Children's Hospitals. This concourse performs a number of different functions:

- Provides a link between Adult and Children's Hospitals
- Provides clear horizontal and vertical links to all areas of the hospital facilities with the incorporation of stairs, lifts and escalators as necessary
- Provides a clear route for patients, staff and visitors to frequently attended departments such as the Outpatient's Department
- Provides access to the pharmacy
- Provides access to retail facilities such as the cafeteria to allow users to purchase drinks, food and to consume them in a pleasant and relaxing environment
- Continues the quality of the main entrance spaces which will be reflected in the choice of robust materials for flooring, walls, ceilings, balustrades etc, and
- Provides opportunities to incorporate art, lighting techniques and TV/video display screens to enhance the quality of the space.

4.3 Children's Hospital

The aim of the Children's Hospital design is to facilitate the provision of state-of-the-art medical care to children in a safe, happy, child-friendly environment. The new hospital is required to be a worthy successor to the Royal Hospital for Sick Children at Yorkhill and will be linked to Maternity Services and the Adult Hospital in order to provide the best possible care for new babies and their mothers. It will have 240 beds with 83% in single rooms. There will be nine operating theatres providing a range of treatments with the adjoining paediatric intensive care providing support for the existing Maternity building via a link at first floor level.

Exemplar Design

From the outset the required adjacencies with the neighbouring Maternity Hospital and the new Neonatal Unit on the campus were fundamental in developing the overall masterplan. In that respect they follow closely the 2007 layout and its position on-site. However an increase in the number of beds and the proportion of single beds prompted a review of the ward design.

The need for a direct link from the new Neonatal Unit to paediatric intensive care, theatres, and their associated facilities automatically determined the location of a number of departments at first floor level.

Ancillary to the establishment of these departmental locations there was on-going development at ground level of the main entrance and associated outpatient departments which have strong relationships with the car parking strategy and wayfinding within the site. Equally important was the need to have ready access to the Emergency Department that was separate from the adult hospital and with clear access not complicated by proximity to the adult A&E.

The culmination of these requirements and the on-going development of the masterplan has resulted in a rectangular plan shape running parallel to Maternity and organised across four floors plus a plant floor. This south-west to north-east axis follows the layout principles behind the Adult Hospital so that on the ground floor the Emergency Department is followed by Imaging which is followed by a public mall running parallel to it and providing access for outpatients. Wrapping round the top of the mall and extending into a 'pod' at one end of the rectangular shape are the main outpatients departments. This large 'pod' also frames the main entrance and is located directly opposite the Children's Hospital car park. With its shape and height it also echoes the new Laboratory building which will be sitting opposite.

The ward floors are located above ground and first floors. These are designed around courtyards because with an increased number of single bedrooms from the 2007 masterplan there was a need to maximise the available wall perimeter to provide daylight and a view to every bedroom.

On the second floor Acute Receiving and the Schiehallion Ward are co-located, with the latter positioned to enjoy maximum views over the central park as many of their patients are long stay. Acute receiving is essentially short-stay and its criticality in terms of location within the Children's footprint is to theatres and the Emergency Department. Nevertheless it is designed so that all bedrooms have daylight and an outlook.

The triangular ward shape of the generic wards on the topmost levels was determined by the need to avoid extended travel distances from within the wards from within the hospital and from the entry points to the building. By locating an interstitial plant floor between first and second floor accommodation, better views were secured over the neighbouring Maternity building. With courtyards and ward support between the Maternity building and the adult tower block maximum privacy from overlooking was achieved.

Architecturally, the physical form of the Children's Hospital has evolved through the working up of key adjacencies and clinical relationships, whilst at the same time inputting the additional social, environmental and spatial factors that are an essential requirement for any children's hospital. Account has been taken of the imposing form of the Adult Hospital and the development of the Laboratory building opposite. The creation of a 'pod' opposite the latter - and which reflects its form - has allowed a strong shape to be achieved identifying this is a separate building. By continuing it up out of the basic podium it also helps to shape and define more cogently the public open space at the centre of the development.

In terms of the use of materials it is anticipated that opportunities will exist to highlight that the Children's Hospital literally has its own identity, with coloured external panels, a distinctive entrance canopy, strong signage etc. This will be augmented by opportunities for artwork and sculpture in an adjoining children's park which will act as an extension of the landscape right up to the front door.

It should be noted that this exemplar plan demonstrates to bidders the key clinical relationships being sought, and that each bidder is not constrained from interpreting these with their own design solution.

4.4 Revisions to the Clinical Design of Adult Hospital and Children's Hospital

The 2007 exemplar design established the 'Podium and Tower' solution which has been confirmed by the development of the 2009 exemplar design.

Establishing a clear functional building diagram was the priority of the review. The sitewide masterplan also developed to address the changes in the clinical adjacencies within the building and the traffic flows around the site.

The key links with the adjacent Maternity and Neuroscience Institute are critical drivers to the masterplan layout in respect of locating the new hospital facilities. The new Children's Hospital requires to be located adjacent to the Maternity and Neonatal buildings and the Critical Care Department within the Adult Hospital has a required proximity to the link to the Neurosciences Building.

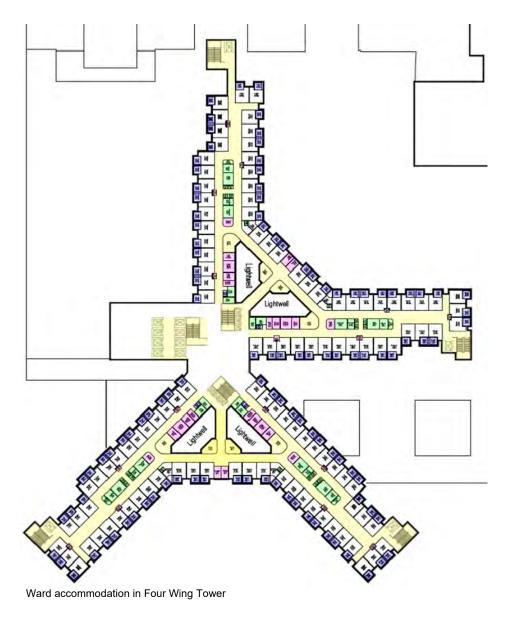
The central location of the Imaging Department with the other departments surrounding it drove the ground and first floor plans. The Outpatient Department will be located adjacent to the new main entrance and the Emergency Department has been designed to be to the west side of the new hospital buildings and gives a clear building diagram to the functionality and hierarchy of spaces and departments within the building. The clinical requirement to accommodate the twenty adult theatres on the same level has established the podium footprint on the second floor.

4.5 Revisions to Ward Accommodation in Four Wing Tower

The key clinical change from the 2007 exemplar design is the requirement to provide 100% single bedroom accommodation within the adult ward tower. A number of options were developed and reviewed with the clinicians and ward user group. Key aspects of the design required to reflect the following:

- Patient Privacy and dignity
- Good light into and views out of patient bedrooms
- Good observation of patients
- Nursing clusters
- Length of wards (for staffing and patients)
- Flexibility between wards
- · Control of visitors
- Proximity of support accommodation
- Clean and dirty Facilities Management flows

The finalised ward design addresses all of these points and also looks at the siting of the tower on the podium.



4.6 External Design and Materials Palette for Adult and Children's Hospitals

The exemplar design has been developed to ensure the clinical requirements of the Board are met by the Bidders Proposals in terms of sheer functionality. However, it is the aim of the exemplar design to facilitate a holistic approach to the overall design in terms of the quality of the public realm elements such as the hard and soft landscaping immediately adjacent to the proposed buildings; the amenity spaces themselves; the road infrastructure and of course the buildings. The exemplar design masterplan clearly articulates the expectations of the Board's design vision and their desire for this large complex to be ordered around a new "park" within the city to create a composition worthy of civic pride.

A new formal tree lined avenue will lead the visitor into the heart of the campus with the scale of the new buildings rising up to from 4/5 storeys to the tower block signifying the Adult Hospital. The visitor will be able to establish on arrival that all buildings within the development have aspects on to the new central park, the 'green heart' to the development. In fact on arrival the first new development which a visitor will see is the new Energy Centre which will itself act as the 'Gatepost' to the new development.

The overall architectural morphology on the site will be developed to provide a cohesive aesthetic which binds the development to the landscape but clearly allows each of the buildings to be articulated separately. The laboratory facility will be the first building to be constructed to the masterplan and the aesthetics have now been developed for this building, and comprises of a glass and metal clad 4 storey office 'pod' and a 5 storey laboratory block with a dark solid masonry base course and 4 upper floors split into 2 vertical zones creating a higher more transparent façade relating to the scale of the larger hospital.

It is not the intention that the hospital's should follow the aesthetic of the laboratory block but it will instead inform the hospital design on terms of it's architectural morphology. Nevertheless the scale of the children's hospital, which will be of similar height to the laboratory building and will consist of a robust masonry base, with upper levels of higher more transparent materials and with a vertical emphasis to the overall fenestration pattern. Moreover, it is the Board's desire to see the morphology of the laboratory office 'pod' to be adopted for the Children's hospital both in terms of shape and the use of colour. Thus bringing together a consistency of composition on the south west corner of the new campus park.

It is envisaged that this scale will continue along the southern edge of the campus park in the form of a 'plinth' to the main acute hospital thus providing a unified height along the southern and western edges of the campus park. Sitting on top of the 'plinth' will be the multi-storey acute hospital overlooking the park.

As with the laboratory block and the children's hospital the 'plinth' will be constructed of robust masonry materials up to the first floor level and then revert to more lighter panel material above. Again it is envisaged that the fenestration will have a vertical emphasis. The 'plinths' will be punctured by main glass elements signifying main entrances to the adult's and children's hospitals. These will relate to the main transport hub within the campus park.

The hospital tower will rise up from the plinth with it's external envelope of a light cladding material and an emphasis on vertical fenestration panels which will reinforce the verticality of the composition.

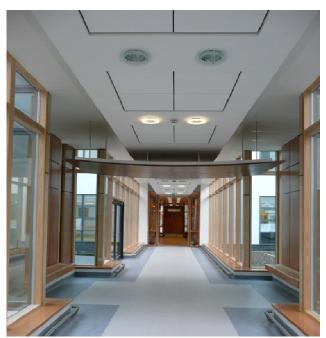
With a tower and podium solution there will be a significant area of roof which will be overlooked from the tower. Therefore, there will be a requirement to provide green living roofs and to enclose plant within sculptural plantroom forms.

The overall development will sit within a high quality landscape environment linking back to the campus park and transport hub; providing a high quality civic development within the city.















4.7 Laboratory Facilities, Facilities Management, Mortuary and Energy Centre

4.7.1 Strategic Requirements

The proposed Laboratory facilities are required to provide a high quality new building of approximately 24,000m² to support the centralisation of hospital based laboratory services providing Cat II Laboratory accommodation, high quality cellular and open plan office space and areas to accommodate Facilities Management (FM) and the Glasgow City Mortuary.

The most important aspects of the design of this building relate to user requirements, quality of the internal environment for staff, external image, and functional integration within the overall master plan and building services. All of these factors addressed correctly will enable and support high quality science.

Due to the rapid pace of scientific development it is imperative that maximum flexibility is designed-in at this stage to cater for future needs. This has lead to the modular design generic in its nature. This has meant designing for the known current needs and making allowance for the probable expansion in certain areas. The design team believes this has been addressed in the development of the building services design. The building must offer robust engineering solutions to allow and facilitate future adaptability and quality architecture to create an inspirational building and working environment.

4.7.2 The Design Proposals

Ground floor locations are required for FM and the City Mortuary, as both require frequent access for vehicles of different types. CAT II Laboratory accommodation will be provided at upper floor area.

FM provides a stores distribution centre for the whole campus. Up to 150 goods vehicles of various sizes will be delivering and collecting from the facility per day. FM also accommodates refuse services for the whole campus therefore the FM brief has two components - clean and dirty, each of which would benefit from physical separation.

The Mortuary facility is to be designed to cater for a maximum of 327 bodies at any one time. This is to cover the requirements for both the new Adult and Children Hospitals as well as providing facilities for other hospitals in the Greater Glasgow area.

4.7.3 High Quality Working Environment and Sense of Community

The production of high staff motivation levels and high quality work requires the provision of a high quality physical environment. It will also be important to project an image of high quality to visitors to the laboratory building.

A variety of different types of work spaces and social space are planned to reflect the different types of activity, with comfortable physical conditions and the users having some control over their immediate environment, including access to opening windows where possible. The principal work areas of all staff, including support staff, should have contact with daylight, sunlight and good external views. The overall interior environment, as well as being functional and comfortable, must be stimulating through the use of colour, texture and detailing of all finishes.

Laboratory work is generally conducted in teams which may be interdisciplinary but it will nevertheless be important to promote contact between all staff to encourage the exchange of ideas, knowledge and skills even though they may not be formally associated in their current work. It is therefore important that the design of the building encourages incidental contact between staff and provides opportunities to exploit this, especially in shared areas such as circulation spaces, where informal seating can be provided at lift waiting areas. Opportunities should be created in shared areas to display and publicise the work carried out by other departments. Although much of the work requires compartmentalised accommodation, it will be important also to cut across this and promote a sense of community in the building as a whole. For example, a well lit, full height atrium space to provide the main vertical circulation routes, including many internal and external views, can effectively promote a sense of community throughout the building, even is quite small in footprint area. The provision, location and design of common social, meeting and eating facilities are also crucial to ensure that both scientific and support staff are included in the collaborative and community ethos.

4.7.4 The Fifth Elevation

From the eye level of a pedestrian generally buildings have four elevations, perhaps a front, back and two gables. This building has a hugely important fifth elevation, its roofscape. The planned close proximity of the main hospital tower will afford views from a high level down onto the roof of the laboratory block from a substantial number of patient bedrooms. Therefore, a servicing strategy for the facility has been adopted so that we may deliver a design that is free of roof level plant that would normally be associated with a building of this type.

All plant servicing the laboratory facility is accommodated in vertical plant pods, which are positioned to the extremities of the floor plates at the open ends of the horseshoe and are designed to be tied back to the energy centre at a later date. Thus all Lab areas are serviced horizontally with a skeleton of primary services and an exo-skeleton of secondary services which are all contained within the external skin.

The proposal is to treat the roof with green (sedum) roof technology and enclose plant within sculptural plant pods where necessary to retain an interesting outlook from the Ward Tower









Two areas of rooftop plant to house 3m flue stacks within two sculptured extract towers. The scale and sculptural potential of the towers will transform their simple functionality. These potent compositional elements will act as strong, vertical and solid counterpoints to the lighter, horizontal and more transparent envelope of the office space and the regimented laboratory accommodation. The towers will provide a unique identity for this project.

4.7.5 Concept Design to accommodate Growth and Change

Change is an inevitable and inherent characteristic of laboratory based work and the building therefore requires being able to respond to this requirement. Wherever possible, design should not be tailored precisely to the specific needs of the initial users and instead should aim to provide generic modular facilities that can accommodate a range of scientific activity without the need to carry out changes to the fabric.

Fixed elements of the building, such as the structure, vertical duct shafts, lifts, staircases, together with specialist accommodation with particular services and facilities, including toilets, can usefully be grouped together and located to minimise constraints on the reconfiguration of the generic modular facilities.

Maximum energy efficiency and sustainability are important objectives for the design and operation of such a facility and while the design of the building fabric will contribute significantly, the design of the engineering services and specification of equipment will be dominant in energy conservation considerations.

Some specific aspects of laboratory operations make sustainability objectives difficult to pursue, including the impact of safety margins and experimental conditions, high volumes of air and water usage and limits on energy reclaim and recirculation owing to cross contamination issues.

4.7.6 Arrangement of Building Blocks

The concept is that the Energy Centre, Laboratory Facility and the Podium to the main hospital all read as an urban edge to the proposed park area proposal which is the focal point of the whole master plan. The urban edge is all planned to be of comparable height thus providing the visitor with a uniform top edge that will lead the eye around the new development to the tower of the main hospital, which provides a very strong vertical emphasis. It is through the uniformity of building scale, height and mass that continuity between each of the very different building types is created.

Laboratory Block

The main laboratory block forms a horseshoe wrapping around the service yard with the open end looking toward a portion of the site which is planned to accommodate an

Energy Centre for the whole site. Laboratory facilities are further divided into two units. The main block houses general facilities and those requiring greater access to public areas. The second lab block to the rear of the site, being more secure in its location accommodates the specialist laboratory areas and those which require greater security.

Office Block 1

The heavy requirement for office accommodation has necessitated a dedicated office block. This block is physically divorced from the main Laboratory block by an atrium which at ground floor forms the main entrance area and primary social cafeteria space. This is intended to be the social heart of the building and provides facilities for staff; this area also doubles as a breakout space for meeting and seminar space at this level. The office block is designed to be minimally serviced unlike the main laboratory block which is entirely serviced to CAT II standards. However on the external periphery of the main Lab block has been zoned for use as offices, all of which capitalise on natural daylight and the potential for natural ventilation thus reducing the load on the building heating and cooling system.

Office Block 2

A second block of offices is located to the rear of the complex above the FM accommodation

Energy Centre

The Energy Centre has been designed as a separate building. It will be procured and constructed as part of the main hospital contract. It is envisaged that the new Laboratory Facilities together with Facilities Management and the Mortuary may be able to capitalise on their adjacency to a new Energy Centre. Due to its proximity and links to the Laboratory Building it is important that its scale, mass and aesthetic language respond closely to that of the Laboratory building. The design team have incorporated a potential shell and layout for this Energy Centre adjacent to the Laboratory and have undertaken an initial assessment of its requirements.

4.7.7 Architectural Treatment and Aesthetics

In order to visually break and reduce its scale, the laboratory proposals have been split into three distinct areas each materially treated in a manner that reflects the nature of the accommodation use internally. The proposed materials require to address the Podium and Tower elements of the main hospitals building.



Sheffield University



Galizia Fashion Plaza, Germany



Bridgewater Shopping Centre, Arklow, Co. Dublin



Secondary school, Austria



Maggie's Centre, Inverness.

Unknown

Office Blocks

The dedicated office block on the main building frontage is separated from the main laboratory block by a shared social space where the public/private division occurs. All public areas are accessed directly off this area to the office block side while the controlled areas are accessed through a single security point on each floor level.

To address the stigma associated with laboratory buildings the design team have maximised transparency into and through the building. The location of the office block on the primary façade and its predominantly glass façade has helped to reduce the closed and private nature of the building type.

The main office frontage will be clad in materials that assist in achieving particularly high sustainability requirements, using a mixture of standing seam copper cladding and glazing with designed-in solar shading facilities each achieving high BRE green guide ratings. Social and seminar facilities are located at ground floor where the building is stepped back to reduce the building's mass where it meets the ground.

Laboratory Block

The central laboratory block forms a horseshoe wrapping around the service yard with the open end looking toward a portion of the site which is planned to accommodate the Energy Centre.

Laboratory Areas

The laboratories require highly controlled environments. All face into the central courtyard area to allow the design team to zone each floor plate so that skin of office accommodation can be wrapped around the main facades. As the offices are generally not used on a 24h cycle, light pollution should be minimised.

The cellular but modular nature of office provision has allowed the design team to develop a façade treatment that fits a defined module of 1100mm. This module has been stamped around the out-looking facades in a bar code style to provide relief from the large surface area. Further, as the lab facility is predominantly horizontal in its nature, in order to instill within this a vertical theme the five storey lab block has been split into three visual elements.

It is proposed that the base course is constructed from a solid masonry construction (vandal proof) in a stack bonded fashion beginning to instill verticality through use of this material. This will also assist with increasing security around this publicly accessible skin.

The four upper lab floors 4.2m high each have been split into two vertical zones of 8.4m each thus creating a façade module of 1.1m x 8.4m visually treating two floors as one

externally. The placement of transparent and solid units have been offset thus to create a random affect in such a modular regimented façade. The proposed materials are intended to bring across the nature of the science going on internally with simple clear elements, structured regimented layout, high quality machining and elegant simple detailing.

The courtyard elevations are intended to be simple facades with the same base course treatment all around. Above this the elevations are to be clad with an insulated render system of matching colour to the main facades. Due to the extent of services that are required in the fabric of this façade to cater for the laboratories behind, windows are smaller and punched through in style. The vertical nature instilled in the main facades will be carried through on the courtyard facades through the use of recessed work and movement joints.

Energy Centre

Though the Energy Centre does not form part of the detailed planning application for the laboratories it is important that an outline representation of this be included for the purposes of providing an understanding of scale and mass. The design team have conducted initial assessments of the requirements for the Energy Centre and developed an outline assessment of the scale of the facility. It is proposed that, due to the nature of the function of the Energy Centre, this component is treated as a sculptural element in the master plan composition and may make use of a similar palette of materials to each of the multi-storey car parks proposed around the site while maintaining visual transparency.

The Energy Centre will in effect become a gate post on the entrance and arrival to the site on the proposed main vehicular artery to the new hospital immediately adjacent to the Laboratory facility. It is important that the Energy Centre reads as part of an integrated complex with the laboratory building which in turn also must respond to the proposed Children's Hospital development and the rest of the podium to the main hospital.

4.7.8 Site Access, Parking and Security

All staff access to the laboratory block will be pedestrian as no provision for vehicle parking on this site will be made as part of the current proposal. Staff parking is to be provided elsewhere on the site as part of the overall master plan.

Vehicular delivery access to the site will be off Hardgate Road to the west, it is proposed that Hardgate road will be re-linked to Govan Road and that this will become solely an access road for hospital vehicles and delivery access to the campus. It if further proposed that a dedicated secure access to the new Laboratory facility, FM, Mortuary and the Energy Centre will be provided off Hardgate Road.









Palette of materials on the new extension to the Maternity Hospital

4.8 Maternity and Neonatal Unit

The existing Southern General Maternity Unit provides a wide range of services for mothers and babies. In March 2008, Glasgow City Council approved plans to extend and refurbish the Southern General Maternity Unit, marking the latest milestone of an ambitious strategy to improve services for mothers and children across the city. This will enable the Unit to become one of two maternity hospitals serving the city, alongside the Princess Royal Maternity Hospital.

Among its world-class facilities will be a brand-new foetal medicine department providing specialist diagnostic facilities and treatment of unborn babies from across Scotland. The hospital will also be a national centre for certain specialist services for newborn babies and provide state-of-the-art intensive care services.

Other key features include a new labour suite and two new obstetric theatres. Existing facilities will also be completely refurbished to provide modern, attractive accommodation for day care, assessment and early pregnancy advisory services.

The approved plan will increase existing capacity and it is expected that around 5,200 babies will be born at the redeveloped Southern General Maternity Hospital every year.

4.9 Multi Storey Car Parks

Three main multi-storey car parks (MSCP) are proposed adjacent to the separate Adult and Children's Hospitals' entrances to reduce walking distances from parking spaces to the main entrances.

The first MSCP is currently the subject of a planning application to Glasgow City Council (Ref: 09/0036/DC). The MSCP comprises a five-storey building, with the top floor an open deck. It is located on the site of an existing carpark along with the existing Boiler House and associated chimney which to be demolished.

In its basic form the MSCP is a rectangle with the footprint fully occupying the available site. The two access ramps are located at the west end of the building and their curved form breaks from the rigid rectangular form of the remainder of the building. Located along the main frontage to the existing road the distinctive forms of the twin ramps will act as readily identifiable markers to visitors arriving via the Govan Road entrance, fully addressing the current lack of legibility that can be distressing for both patients and visitors.

The five floors are of equal size and consistent storey heights, with the majority of the disabled driver spaces located on the ground floor. All vehicles will enter and leave the building on its south elevation off an existing roadway. All pedestrian entrances/exits will be at ground level.

There are three stair towers with the largest 'main' tower, which also contains lifts and toilets, located at the southwest corner of the propose building. The other two stair towers are at either end of the west façade, opposite the projecting south wing of the existing Central Medical Block. All stair towers rise full height to give access/exit to all floors with the 'main' tower slightly higher to accommodate lifts. These are major features and their simple forms and transparency will contrast against the louvred and mesh panels to the main facades. Frameless 'structural' glazing is proposed to the outer walls of the stair towers allowing daylight to flood in and to give views out. The solid 'inner' walls and roof fascias will be finished externally in smooth white render enhancing the simple, clean lines and forms of the stair towers, which will act as beacons at night.

Externally, buff ashlar is proposed as a 1200mm high screen wall to the ground floor storey on all elevations, acting as a 'plinth'. The ashlar 'plinth' continues around the base of the circular ramps, with the sloping top following the profile of the ramps behind. This use of natural sandstone reflects the same material that occurs on the existing listed buildings which are being retained. It also provides an aesthetically pleasing but robust surface at the points where pedestrians might be expected to come into close contact with the proposed building.

The white render to the outer faces of the stair tower sidewalls and roofs will frame the frameless glass facades with white painted steelwork and stairs behind. In contrast, and to make them readily identifiable, the entrance doors to the stairs at ground level will generally be solid and painted in bright colours. The internal doors from the stairs into each level of the car park will be visible from the outside and will be treated in a similar manner. A white rendered 'goalpost' concrete frame will mark the vehicular entrance/exit on the south façade.

The vertical Siberian or Scottish larch planks to the two curved ramps fully express their striking shape, making the MSCP easily recognised from near and far. Similar cladding is used in panels and along the top of each of the three main elevations. However, in these locations they will be fitted horizontally, with variations in vertical spacing. The louvred panels will frame panels of woven stainless steel mesh, which will provide

solar shading and significantly reduce glare, while maintaining views out. The panels will extend from the top floor slab edge to first floor slab edge, creating a discrete veil, while appearing solid or transparent depending on which angle it is viewed and weather conditions.

To address the visibility of the top floor car parking from the new Adult Hospital, careful consideration has been give to parking surfaces and lighting. High quality lamp standards and coloured surfacing are proposed, with parking bays, roadways and pedestrian walkways marked out.











Landscape proposals are very minimal, limited to the areas around the boundaries of the building. See Chapter for 5 Landscape Design for further details. It is proposed to use grass and trees to line the new section of road proposed to run parallel to the MSCP along it north façade and the spacing of mesh panels along this façade are set to match that of the new trees.

The design of this MSCP has been the subject of detailed pre-application consultations with Glasgow City Council. The recurring theme has been the requirement for good quality design and materials and the proximity to the existing B listed Central Medical Building for which the adoption of a muted tonal palette of materials will provide visual continuity. The use of natural ashlar to the ground floor screen walls, as per the Neonatal building, will act as a visual link between the existing and new. This is further enhanced by the proposed stainless steel mesh panels, which mirror the 'veils' on the Neonatal building. The use of white render to the proposed stair towers also ties in with the stair towers of the Neonatal Building.

The Board see benefits in repeating the general design and composition of Car Park 1A for the other car park developments on site to provide a visual link for all car parks on site and assist with visitor wayfinding.

4.10 University and Education

The Southern General Hospital is one of two teaching hospitals within the city. As such, facilities for Universities, training and education require to be provided on campus. While space has been embedded within the new hospitals, the bulk of the requirement will be located in specialist building(s) providing facilities such as study areas, library, multi-function seminar rooms, lecture theatre, training rooms and office and administration support.

Proposals for the facilities are still being developed by the University of Glasgow in discussion with the NHS and it is likely that the facilities will be provided in both new and refurbished buildings. A site has been identified for a new build, adjacent to the Neurosurgical Block that is currently the site for mental health services and pharmacy services. Plans are underway to relocate the Mental Health service to Leverndale Hospital, this move is planned to take place in 2012/13. Once vacated the plan is to build and complete the new education facility to be available when the new hospitals come into operation in 2015. The site is ideally located close to the new builds and could be directly linked into the proposed eastern bridge link between the new Adult Hospital and Neurosurgery (Block BC).

4.11 Mental Health

Mental Health services within the south-west of the city are currently the subject of a strategic review. Plans are being formulated to establish Leverndale Hospital as one of

the main centres for these services in the city. Mental health services currently located within the Southern General campus are planned move to Leverndale in 2012/13 which will vacate a site for University and educational use as noted above.

The Perinatal service which is currently located within the existing unit maybe retained on the site as it is has links with the Maternity Unit in respect of Obstetrics cover. A site has been identified adjacent to Block AE currently the management offices, to locate a small unit of around 8-10 beds with support accommodation. The Board will update the masterplan for this service in parallel with the developing Mental Health strategy for this part of the city which is due to be completed later in 2009.

4.12 Catering Strategy

The catering and dining facilities at Southern General Hospital are within the development site for the new build hospitals and require to be relocated and the redundant buildings demolished during 2010. The interim strategy for Southern General is to provide transitional accommodation for the dining facilities and change production methods from conventional to regeneration production. To enable a regeneration solution within the Southern General campus, areas have been identified within each of the existing in-patient buildings to enable a regeneration ward kitchen to be situated at each block to allow transportation of the food by trolleys.

Staff dining facilities will be provided in a temporary two storey catering and dining unit located to the rear of the Central Medical Block (Block AS) on what is currently a car park and works compound. A planning application for this structure is currently with Glasgow City Council for consideration.

Work is due to complete on site by January 2010, and post transfer of services will allow the old facilities to be demolished in second quarter of 2010. On completion of the new builds and occupation in August 2015, this unit will be removed and works commenced to construct Car Park 1B.

4.13 Site Infrastructure

The Masterplan is supported by the infrastructure which forms the ground based framework for the other components of the Masterplan to be realised. The roads, footpaths, drainage and utilities which make up the infrastructure of the site are planned sufficient to serve the proposed development and, where practicable, improve on the existing Campus infrastructure to the effect of meeting current standards and good practice.

The provision of utilities represent key element of the masterplan. Similarly, the pedestrian and cycle access is recognised as a key component of the Masterplan, and this strategy is outlined at Section 3.6.







View looking east from the existing Hardgate Road entrance at the Maternity Unit along the south façade of the Children's and Adult Hospitals' podium.



View looking west from between Car Parks 1A and 1B along main north frontage of the new Adult and Children's Hospitals.

The road layout of the Masterplan has been derived with many aspects in mind, and balances the many facets that the NSGH seeks to provide. At the very basis level, this is the provision of access and egress to and from the various areas of the site. More intrinsically, the roads infrastructure provides:

- prioritised measures for 'blue light' emergency traffic and the proposed 'Fastlink' public transport system
- for local transport and taxi services,
- part-dedicated provision for servicing and the facilities management which will be such an important part of the hospitals operations.
- Management of private vehicles, recognising the range and scale of trip-functions that the development will generate.

The operation of the roads network and the aspirations of the management of all road users are defined further in Section 3.6. The construction of the roads will meet the standards required for local authority adoption, and provide the geometry appropriate to the specific uses of the site.

The assessment of the drainage impact of a new development is important on several levels to a number of stakeholders and is often a central facet of the planning process requiring prudent, early forward consideration. The 2009 Campus Masterplan is supported by a Drainage Impact Assessment and Strategy Report which recognises the specific requirements of the key stakeholders involved in the assessment of both foul and surface water drainage management, principally Glasgow City Council, SEPA and Scottish Water. It also determines the necessary design parameters and the levels of flood protection to be adopted as part of the development. The report outlines:

- The pre-planning application consultation with Glasgow City Council, SEPA and Scottish Water to discuss the development and to understand the requirements of the various stakeholders
- An assessment of the required design criteria to mitigate future flood risk identified through the various consultations
- An assessment of the impact, if any, of the proposed development on the surface water and waste water drainage systems
- the principal drainage strategy to serve the proposed development
- the further work required in mitigation of impact of the elements above

The key findings of the Drainage Impact Assessment and Strategy Report include:

- The existing development appears to discharge either directly to the Linthouse Burn or into the existing combined drainage infrastructure with little treatment or no attenuation. This situation will be improved by serving the new development on a separate foul and surface water drainage network.
- By removing an appreciable volume of surface water from the combined drainage system, the operation of the wastewater network is significantly improved.
- Surface water run off will discharge direct to the River Clyde via the Linthouse Burn following appropriate treatment.

- The development of the site could potentially reduce existing spillage volumes and corresponding environmental impact associated with existing Scottish Water combined sewer outfall given the removal of a large area of surface water runoff currently discharging to the said network.
- The proposed development looks to promote appropriate SUDS to protect the receiving watercourse.
- The site does not appear to be at fluvial flood risk from the River Clyde.
- The report outlines the parameters to protect the site from the 1 in 1000 year storm event plus climate change.

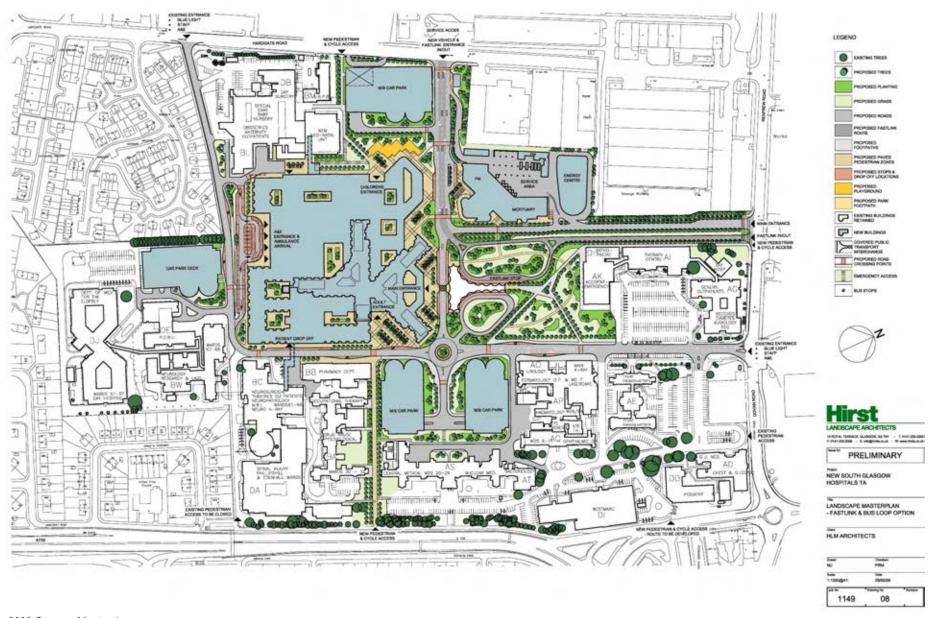
4.14 Phasing of the Projects

The current development programme, as prepared by the Joint Project Team which was established in September 2008, sets out the following phases/ timelines:

September 2009	Commence Construction of Car Park 1
January 2010	Commencement of Laboratory Construction
April 2010	Demolition of Library, Conference Centre, Admin Block and
	former Nurses Homes
November 2010	Commence construction of Adult Acute and Children's Hospitals
	including Car Parks 2 and 3
December 2011	Completion of Laboratories
April 2011	Occupation of Laboratories
January 2015	Completion of Adult Acute and Children's Hospitals
August 2015	Occupation of Adult Acute and Children's Hospitals
October 2015	Demolition of Theatres and Surgical Block to create green space
	Removal of Catering facility
November 2015	Commence construction of Car Park 1B and conversion of
	vacated clinical facilities into office/support accommodation
August 2016	Completion of landscaped area and Car Park 1B

Within the Master Plan there are further potential developments referred to including Ronald MacDonald House, Education and Training Centre and Psychiatric Ward. Whilst it is proposed that these facilities are operational in line with the occupation of the hospitals in August 2015, their programming within the overall timeframe for the project has still to be determined.

The migration of services into the new facility will be undertaken in a phased and coordinated manner which has still to be planned in detail but will involve transfers from the sites at Southern General, Western Infirmary, Victoria Infirmary and The Royal Hospital for Sick Children, Yorkhill. The Board have developed expertise in commissioning large hospital buildings with the completion and bringing into operation of the new Beatson Oncology Unit, and the new hospitals at Stobhill and Victoria. Operations to commission and occupy the new builds at Southern General will



2009 Campus Masterplan

5.0 LANDSCAPE DESIGN

5.1 The Existing Site

The existing hospital campus generally presents a poor quality environment for visitors, patients and staff. It is dominated by large expanses of blacktop roadway and vehicles, disparate and scattered buildings, open yards, service bays and large flat areas of featureless and exposed open space. The site does include a number of mature trees which are subject to a Tree Preservation Order (TPO). The majority of these are to the eastern side of the campus, visible from the approach to the Clyde Tunnel, away from the principal area of the proposed new hospital development. The few mature trees remaining on the proposed site of the new hospital will need to be removed to facilitate the required building footprint and infrastructure.

5.2 Masterplan

In accordance with the principles of 'Designing Places – A Policy Statement for Scotland' (Scotlish Executive 2001), the proposed landscape masterplan sets out a framework for the creation of external spaces that are distinctive, safe and pleasant, easy to get to and move around, welcoming, adaptable and resource efficient. The landscape masterplan seeks to address many of the negative landscape issues currently affecting the campus and to provide the framework for the development of a high quality, coherent, well organised and welcoming external environment to enhance the experience of staff and patients alike. This includes the provision of a major new access from Govan Road together with rationalisation of existing internal roads and paths to provide clear and direct approaches to the proposed new hospital and improved links throughout the campus.

The proposed layout attempts to integrate private vehicular access, public transport and the new Fastlink route with pedestrian and cycle circulation to provide a vibrant but coherent new public realm within the heart of the Campus. In particular, the masterplan sets out the framework for the creation of high quality public realm and street frontages to the entrances associated with the proposed hospital within a strong landscape framework of formal avenue and informal tree planting. This is an essential component of the masterplan to create both a high quality setting and to provide the space and human scale necessary to offset any negative influence from the visual dominance of the size and physical mass of the building envisaged.

5.3 Central Park

The masterplan envisages the creation of a large central open space within the heart of the campus to be developed as a park for the use of patients, visitors and staff alike. This will provide a multi-functional space for social interaction and relaxation as well as facilitating access for pedestrians and cyclists through the site. The park will also provide opportunities for informal exercise with marked walking routes and a trim

trail. The major pathways and structural routes will be a minimum of three metres wide to facilitate joint cycle and pedestrian access and shall include boulevard tree planting for visual structure using semi-mature stock together with appropriate lighting to facilitate lighting safe access through the park at night time. The secondary path system will be pedestrianised and be paved in a different surface material or colour to distinguish it from the principal routes. These paths will be associated with more informal planting and be lit with lawn level lighting to ensure safety and use throughout the night time.

The open space is envisaged as space for public artworks and sculpture for both incidental interest and as focal points to assist with wayfinding and orientation on site. The masterplan envisages a major path link between the hospital front entrance and the proposed Fastlink stop into the heart of the open space. The detail design of this zone will reflect the highest standards of 21st Century civic/public realm urban design incorporating high quality paving materials and contemporary street furniture and lighting. The area shall be covered to provide an all-weather link between the Fastlink drop-off and the main hospital entrance. This canopy shall also be of a high quality contemporary design appropriate to the setting and the environs of the new hospital building.

The design of the park shall provide for a variety of formal and informal spaces together with a range of plant material and mixes to provide seasonal variety and assist with orientation and wayfinding. It is envisaged that the space will be a mix of formal paths and avenue planting with more informal planting and open grass within the sub divisions. The detail design will include an appropriate amount of free open space to allow for flexibility of use in terms of informal gatherings, games and general amenity.

5.4 Hard Landscape Design/Public Realm

Areas of hard landscape and public realm shall demonstrate a high quality of detailed design, utilising sustainable and durable materials. The choice of materials will reflect both the quality and importance of the proposed new building as well as the aspirations in the masterplan to create a people friendly external environment. The masterplan envisages a hierarchy of spaces and circulation and consequently surface treatments and materials will vary to reflect this.

At the top of this hierarchy in the spaces associated with the frontage of the building and the main entrances, high quality paving with clean, crisp detailing and edging together with striking and vibrant paving patterns and designs commensurate with the very best of 21st Century urban design are envisaged. At the bottom of the hierarchy the minimum standard for a pedestrian footpath within the site shall be asphalt with pre-cast concrete flat-top pin kerb edges to GCC Roads Department adoptable standards. Between these two, the paving and hard landscape design will reflect a gradation of hierarchy in terms of intermediate public spaces and major footpath and cycle routes around the site and within the new central park.

5.5 Roads and Vehicle Access

New access roads and vehicular circulation routes will incorporate traffic calming and speed control measures to reduce vehicle speeds and contribute to a pedestrian friendly environment. Along the hospital frontage at drop-off points and where large numbers of patients and visitors will be expected to congregate and enter the building, a change in surface material for the carriageway will be utilised that provides the appropriate visual signals for both pedestrians and vehicle users alike and is commensurate with the high quality paving design and external environment required for the building frontages.

Pedestrian crossing points will be provided at frequent intervals at key locations and integrated into the overall street design to contribute to the traffic calming strategy and provide for logical pedestrian flows.

Roundabouts and important junctions will be landscaped distinctively to provide a clear visual orientation point within the site and to reduce the apparent expanse of road and hard standing in these areas. Where possible public art or sculpture shall be incorporated in the roundabout designs to reinforce their distinctiveness.

5.6 Cycle Access, Cycle Parking and Shelters

The masterplan provides for cycle access points from Govan Road and from the east via the underpass beneath the A739 as well as creating new cycle access paths through the site to the hospital. New or modified cycle access will be off-road and shared with pedestrian traffic wherever possible. Shared pedestrian and cycle paths shall be a minimum of 3 metres wide in order to comply with current guidance from Sustrans and where cycle lanes are provided either as separate routes or on roadways, the minimum dimensions and layout shall be in accordance with Sustrans guidance.

Cycle parking will be provided to achieve compliance with Glasgow City Plan Policy TRANS 6. Cycle shelters will be designed to provide secure and sheltered space for the parking of bicycles in a secure and visible location. Cycle storage areas will be located adjacent to or as near as possible to building entrances to ensure direct safe and easy access/egress. Cycle shelter areas and their approach paths will be lit to adoptable street lighting standards and shall be capable of being overseen by CCTV both day and night.

5.7 Street Furniture

Street furniture will be robust, practical and fit for purpose demonstrating a contemporary high quality design in stainless steel. Street furniture will form a key component of the external landscape design, especially in the public realm, at





























entrance areas surrounding the building and within the parkland. Consequently a well considered and coherent design that presents a suite of complimentary elements integrated into the overall public realm and landscape design is envisaged.

5.8 Seating

A wide variety of seating and seating opportunities will be integrated into the design. The majority is envisaged as purpose made seating or seat items however opportunities for informal seating within the landscape in the form of low walls, steps and grass mounds, will also play a key role in the overall provision,

Within the formal seating provision at least half will include backrests and armrests to ensure there is a range of seating for all ages. Seating shall be designed and located as a key element of the overall landscape design and adequate seating and rest points will be provided at regular intervals along pathways and walking routes.

5.9 Children's Play Area

A children's play area will be created adjacent to the main entrance to the Children's Hospital to provide a relaxed and welcoming child friendly entrance whilst at the same time actively making provision for children's play, whether children are outpatients or visitors to the hospital.

The play area will include a mix of equipment suitable for a broad range of ages and abilities appropriate to the context of the Children's Hospital (from toddlers through to young teenagers) and include a degree of open or free space. Seating for casual supervision by parents and carers will be included into the design.

5.10 Courtyards

The design of the new hospital building envisages the creation of a number of external courtyards for use by staff, visitors and patients. The courtyards will serve a variety of purposes including opportunities for meeting and social interaction as well as quiet reflection and privacy. Where appropriate, courtyards and external spaces within the building will be designed with a practical and/or therapeutic purpose, for example the incorporation of steps and ramps to assist with physiotherapy, as well as simply providing a view of plants, green space and natural light from within the interior of the building. All courtyard spaces will be developed on the principle of free access regardless of ambulant ability.

Courtyards shall include high quality paving and planting design that incorporates a variety of domestic/garden scale plants including a mixture of evergreen, deciduous and herbaceous material together with bulb planting. Courtyards will provide a variety of seating opportunities for both quiet and private contemplation and social interaction

for group discussion. Courtyards will feature low level external lighting for evening and night time use where appropriate and the detail design of the courtyards will maximise opportunities for seating and areas of social interaction in their overall design, utilising a variety of means including low walls and edgings at seat height as well as purpose made seating.

Wherever possible, tree planting will be incorporated into the courtyard design to provide some height and to offset the potentially oppressive effect of the courtyards being surrounded by tall walls on four sides. The courtyard designs shall also incorporate undulations and changes in level and provide visual relief from the prospect of a flat plain. The courtyard designs will provide a range of both open and intimate, enclosed spaces.

The detailed design of the courtyards will serve to provide a variety of visually distinct spaces in order that they can contribute to the wayfinding strategy and orientation round the building for patients, visitors and staff. Courtyards will also include the installation of artworks to augment this approach and form a key element of the campus wide artwork strategy.

5.11 Planting Design

In accordance with the principles of 'Designing Places – A Policy Statement for Scotland' (Scotlish Executive 2001) the planting and soft landscape design shall contribute towards the creation of external spaces that are distinctive, safe and pleasant, easy to get to and move around, welcoming, adaptable and resource efficient.

The landscape of the existing campus is largely flat, featureless and unwelcoming. The masterplan envisages substantial tree planting to:

- provide immediate and long term landscape structure and impact within the campus grounds.
- create a distinctive and appropriate landscape setting for the new hospital complex
- mitigate against the visual impact of the buildings, roads, car parking and hardstanding across the site and provide human scale.
- mark progression along key routes and lend identity to the different spaces that will be created.

It is envisaged that semi mature and larger nursery stock trees will be utilised along principal avenues, paths and thoroughfares to achieve early visual impact.

The detail planting design and specification shall provide an appropriate mixture of seasonal variety, height and colour for all year round interest. It shall provide both

immediate impact and medium to long term growth and be capable of delivering a high quality landscape that will develop and mature over the medium to long term. The detail design layout and choice of plant material shall be appropriate to the immediate context, such as public realm, pathways and circulation zones, private/ quiet space, spaces for adults, children, visitors and patients, whilst paying due regard to environmental and climate factors. The planting design shall help to provide shelter and shade as well as assisting users to orientate and locate themselves. The planting and landscape design should be developed to reinforce wayfinding strategies through the creation of readily identifiable and distinguishable spaces.

5.12 Retention & Protection of Existing Trees

As far as possible, the final campus layout will seek to maximise the retention of existing mature trees on site and incorporate them into the overall layout and landscape design. All trees to be retained in the medium to long term will be protected in accordance with BS 5837:2005, the exact method to be agreed with the Planning Authority as the detail design develops and planning conditions are addressed in detail.

5.13 Felling of Existing Trees & Vegetation Clearance

In accordance with the Wildlife & Countryside Act 1981, any tree felling and shrub clearance shall be carried out outside the bird breeding season (March to August). Contractors will be requested to take due cognisance of this requirement in any work programming. Where this is not possible a qualified ecologist will examine all potential breeding sites before any clearance takes place. If occupied nests are found, clearance and felling works will cease until the nest is no longer in use. Where any tree work is undertaken this shall conform to BS 3998 "Recommendations of Tree Works and current HSE/AFAG safety leaflets

5.14 CAA Restrictions

The site lies approximately 3 km from Glasgow Airport, well within it's 13km 'safeguard circle' and therefore detailed consultation with the CAA will be required to develop proposals in detail that minimise any increased risk of bird strike. The landscape and planting design will therefore form an integral part of a 'Bird Hazard Management Plan'. The detailed landscape design will comply with the CAA publications CAP 772 – 'Birdstrike Risk Management for Aerodromes' and Advice Note 3 – 'Potential Bird Hazards from Amenity Landscaping and Building Design'. It is likely that adherence to this guidance will impact on the specification of plant material and mixes, therefore early consultation with the CAA to establish their requirements will be undertaken as part of the detail design and approval process.































5.15 Landscape Design and Sustainable Urban Drainage (SUDS) Integration

Landscape design associated with SUDs will need to comply with CAA Advice Note No.6 - 'Potential Bird Hazards from SUDS'. Any surface water features associated with the detailed SUDS design for the site will be fully integrated with the landscape design. Consultation with the CAA to determine the nature of the SUDs strategy solution for this site, in particular, the acceptance or otherwise of any open water and its potential extent and implications for detail landscape design and management will be required as part of the detail design programme.

5.16 Biodiversity

The contractor design team will be required to develop a 'Biodiversity Action Plan' for submission to the Planning Authority as part of their landscape design solution.

The new landscape framework for the campus will link areas of established green networks as far as possible, including SUDS proposals and movement networks (roads, footpaths and cycle paths) to habitat retention and creation, minimising the impact of the development on wildlife and vegetation. The detail design will require to reconcile the requirements of the Planning Authority with the restrictions that may be required by the CAA as noted above, together with maintenance regimes on site in the detailed landscape and planting design. Contractors will be required to undertake a detailed habitat assessment using a qualified ecologist to establish the baseline situation at the start of the contract to inform the landscape design development and Biodiversity Action Plan.

5.17 Sustainability

The landscape design solution shall contribute fully to the Board's requirement to achieve a BREEAM 'excellent' rating. In conjunction with 'Biodiversity' above, a qualified ecologist will be required to undertake a habitat survey to establish the baseline situation at the start of the contract to inform the detailed landscape design development with a view to achieving maximum points available and contribute towards the required "excellent" rating.

The contractor's attention is drawn to the need to ensure long term sustainability and the Board's requirement to achieve the BREEAM Healthcare "excellent" rating. In this regard due reference shall be paid to the BRE "Green Guide to Specification" to maximise the use of materials and specifications achieving an A rating or better, as far as is practicable with regard to other technical and specification requirements in terms of adoption and compliance with standards and legislation noted elsewhere.

5.18 Plant Material

The specification criteria for plant material in general shall conform to either the National Plant Specification or BS 3936 and other related British Standards. The specification criteria for Semi Mature and Root-Balled Trees shall be to BS 4043. The handling, transportation, storage and establishment of plant material shall be in accordance with the Horticultural Trades Association publication 'Handling and Establishment of Landscape Plants'. Contractors will be responsible for developing a robust and technically competent specification for all the soft landscape and planting works in accordance with the best industry standards and practice.

The choice of plant species and provenance of plant material shall be appropriate to achieve the purpose required by the design and for the location, scale and situation in question. There is no general limitation on the type and range of plant material envisaged with the following exceptions:

- Thorny or spiny plant material shall be avoided, especially within the body of the site within the ornamental species mixes. This type of material traps litter and debris which is then extremely difficult to clear and consequently encourages the nesting of vermin. Possible exceptions might include the use of Hawthorn or other native hedgerow plants along the site boundaries in association with structure or woodland planting, depending upon the final design layout.
- Plants with skin irritants on contact with foliage/stems.

Planting densities and size at planting shall be appropriate to ensure a careful balance between immediate and short term impact and long term growth.

Tree planting pit/trench size and design shall be appropriate to ensure the long term establishment and future growth of all new trees. This shall include where required the use of drainage, irrigation tubes and root protection barriers adjacent to services. All semi mature trees shall be underground guyed using an approved proprietary product such as the Platipus system (or equivalent). All tree staking shall be double short stakes with cross bar.

All semi mature tree planting shall be provided with a 5 year establishment guarantee from the supplier(s). The defects period and contractors' liability for replacement planting shall extend to the full period of the guarantee, subject to standard industry limitations. The defect period for tree planting in general shall extend to a minimum of two growing seasons following agreed completion of the contract.

General grass areas shall generally be established through seeding of appropriate mixes for the locations and intended use. Immediately adjacent to the building, at entrances and around the children's play area, grass areas shall be established using high quality turf to BS3969 general purpose (with no perennial ryegrass).

5.19 Maintenance

The contractor shall develop and submit a fully detailed maintenance schedule of the completed landscape design for implantation by him during the defects liability period for approval. Maintenance shall generally conform to the relevant sections of BS 7370 and be designed to ensure the long term establishment and development of the new landscape and planting design.

It is intended that the landscape will be handed over to the Board at the end of the defects period (or any extended defects period). The contractor shall in addition provide to the Board for approval a fully detailed management plan and maintenance schedule for the landscape for implementation by the Board following the end of the defects period.

5.20 Public Art Landscaping

Projects should be designed to appeal to all the senses, create both relaxation and play opportunity, encourage walking. Work should extend into campus gardens, circulation routes, and car parks and into shared land use beyond the NHS boundary walkways, community gardens where applicable.







6.0 ART STRATEGY

6.1 Integration of Healing Arts Strategy

Art and Architecture is a key strand of the Board's Arts and Health Strategy. The Board recognises that good design in healthcare buildings makes a measurable difference to the experience of patients, visitors and staff.

As part of its Design Action Plan, the Board are committed to the development and integration of Art and Therapeutic Design within the new developments at New South Glasgow Hospital and this will include:

- New Adult Acute Hospital
- New Children's Hospital
- New Laboratory Block (part of novated design), and
- External space and general landscaped areas within the site boundary

The Art strategy will be developed in the context of:

- current Board arts strategy work already being undertaken in Glasgow as part of ASR I and the new Maternity Unit at Southern General Hospital
- the range of cultural, regeneration, funding partnerships already established within Greater Glasgow and Clyde, and
- the need to ensure a local arts perspective is developed that reflects international level of quality.

6.2 Art Strategy Vision

Integration of artist-led projects and art sector thinking at an early stage into the master planning of a project will help to produce a bolder, more lateral and imaginative vision. Projects with artists, art and therapeutic design principles 'built in' also help to:

- Facilitate joint problem solving
- Promote efficient planning and use of budgets
- Support social and economic development
- Cement good working relationships between art, architecture and building con tractors

The Art Strategy Vision planned and implemented in stages:

Stage 1 Art concepts and works integrated into the planning and implementation of the physical buildings and campus landscape to create permanent works as a fusion of art and architecture or as separate art works or planting.

Stage 2 Exhibitions and events (Post occupancy). Cement partnership arrangements to provide a regular flow of creative and performing arts activities and events.

The Art Strategy will aim to influence and connect with Glasgow City Public Art, regeneration partnerships and projects, galleries and museums. The Art Strategy will include the following key elements:

Concepts/ Themes: These should be drawn from the cultural and historical context, community engagement research and in dialogue with the client body and arts sector.

Location: The art strategy should work to enhance patient, staff and visitor way finding, stimulation and wellbeing. Key areas to consider are *Public Spaces* from approach routes, car parks, entrances, link corridors, waiting areas, consultation and treatment rooms, toilets, dining rooms and the *Sanctuary Spaces*.

Considerations: Contemporary art and design practices in health care and the public realm is an evolving and emerging practice with exemplary work taking place in contexts around the globe. It is important that the vision of this project supports acknowledges up to date practice for working in a sustainable and responsible manner which connects with Glasgow arts and regeneration plans and community engagement.

Capacity: Capacity should be drawn from national and regional expertise and partnerships via a competitive process so that the project is informed by best quality expertise as well as investing in established and emerging arts sector and subcontractors from the region.

Funding: Funding should be sourced in collaboration with NHSGGC and partnerships.

Future maintenance: Zero-low ongoing maintenance or within sustainable partnership arrangements. These arrangements should be designed with projects and organisations, providing ongoing benefit to all.

6.3 Competitive Dialogue Stage (May - September 2009)

In the employers requirements bidders are asked to clearly demonstrate within their written and drawn responses how they will develop and deliver an Arts and Therapeutic Design Strategy that reflects:

Integrated art, specimen art, interior design and landscaping (e.g. stained glass, bespoke art, special lighting, floor designs, therapeutic colour choices, special procurement of non clinical looking furnishings, landmark way finding, gardens and sensory planting);



- Art enabling works (e.g. electrical infrastructure, lighting, wall niches and strengthened walls and ceilings to host future art works);
- The provision of programmable spaces (e.g. future exhibitions, performance or sculpture); and
- Architectural elements (e.g. entrance canopy, art doors, curved walls, specially designed stairways and car parks);

Bidders are asked to prepare a detailed proposal of how they will provide resources and capacity to support the Board's aspirations to develop and deliver this strategy in conjunction with a wide range of stakeholders including patients, managers, clinicians and fundraisers ensuring that the Art strategy and design proposals are fit for purpose and in line with contract management/ build timelines.

6.4 Broad Plan for Developing and Delivering an Arts Strategy

The Arts strategy should be developed with a tiered approach based on priority areas for art and therapeutic design to be implemented on a discretionary basis reflecting levels of finance available. The table below gives an indicative format, but bidders should bring forward proposals which they feel will develop the most rewarding strategy. Bidders are strongly recommended to have dedicated resource for the inputs below in terms of architecture, arts and technical requirements.

Art Strategy—Implementation Stages

Stage	Tasks	Resources
Stage 1 Competitive Dialogue	Develop Art Strategy as part of bid proposals. The strategy developed by your team will form part of the evaluation process.	Identify bidder resources that will be provided during Stage 2 design and anticipated costs over the time period for stage, along with assumptions on frequency of meetings etc. The proposals should therefore ring fence money and time for Stage 2.
Stage 2 Design Development	The successful bid team will develop their strategy along with Board managers and other associated groups as noted earlier. As a key member of the Board's Arts Development Group you will meet monthly to develop, plans and incorporate a full arts strategy into the detailed designs for the new builds. Prepare detailed costs and budgets for these works for Board consideration. Working to the Arts Development Group will be the artists and designers who will meet weekly through design development forum to discuss concepts, plans, detailed and help prepare detailed costs.	The successful bid team will be required to take forward the strategy subject to Board involvement and work with teams to develop a workable proposal that is both achievable, realistic and affordable in the run up to FBC and approval to proceed with construction of the adult and children's hospitals. Note: costs for the arts strategy may be included within the contractors price, or funded by external Board source, or from a combination of these.
Stage 3 Construction of Adult and Childrens Hospitals	Incorporate the agreed art strategy design into the new builds	Manage the construction and full integration of the approved strategy on site by the successful bid team. Attend periodic meetings (quarterly) to review progress.
Stage 4 Commission- ing	Fully commission any loose art works requiring service connections.	This would occur during post hand- over Board equipping stage, detail and input from bidders would be developed during Stage 2.















7.0 HEALTH IMPACT ASSESSMENT AND COMMUNITY ENGAGEMENT

7.1 Introduction

A Health Impact Assessment (HIA) is a process that seeks to identify the potential – or actual – health and equity impact of a proposal on a given population. It aims to enhance the positive impacts of a proposal and to remove or minimise the potential negative impacts on health, well-being or inequalities that might arise or exist. These may include:

Socio Economic Physical Environment Social and Community Environment Individual or family lifestyles Fixed/ Constitutional

7.2 Background

Following discussions between NHS Greater Glasgow and Clyde and Development and Regeneration services as part of ongoing dialogue relating to planning, it was agreed that a HIA would be beneficial as part of evaluating the design quality of the of the new Hospitals. Further discussions between NHS Greater Glasgow and Clyde, DRS and the Glasgow Centre for Population Health have outlined the following proposal, to be developed in partnership.

7.3 HIA Proposal

An HIA is an impartial, systematic consideration of the likely health consequences of implementing a policy, plan, programme or project on a population and the distribution of effects within the population. NHS Greater Glasgow and Clyde is looking to use an HIA to assess the likely impacts of the design of the New South Glasgow Hospitals and identify ways in which the positive effects may be enhanced and any negative effects minimised.

In undertaking this process it is proposed to work in partnership with local partners including Glasgow Centre for Population Health, South West Community Health and Care Partnership and Development and Regeneration Services.

The overall HIA report will be completed in winter 2009 and will present recommendations for partners' consideration. In undertaking the analysis, it is proposed to engage communities in scoping the extent of the analysis to be undertaken and in appraising the impact of the design solution in relation to health.

The Glasgow Centre for Population Health (GCPH) has agreed to fund two days support for this project. In addition the Scottish Health Impact Assessment Network (SHIAN) have indicated a willingness to support the project and assist in facilitating discussion.

7.4 Scoping Exercise

Scoping is the process where decisions are taken about which elements of the proposal are to be considered in the HIA. The scoping stage will include an interactive one-day event which has been organised for 30^{th} July 2009, to provide stakeholders with an opportunity to begin prioritising key health and wellbeing impacts related to the design of the new hospitals. This would consider work which has already been undertaken in relation to the proposal i.e Social and Economic Benefits Analysis and how the HIA process can contribute positively to the design process.

The scoping exercise would be a facilitated discussion by GCPH, SHIAN and NHS Greater Glasgow and Clyde's Community Engagement Team.

7.5 HIA Process

It is proposed to undertake a facilitated HIA process focussing on the elements identified as part of the earlier scoping exercise. This process would be supported by the New Hospitals project team and bidding consortia in producing information required to facilitate the HIA process.

The HIA would be a rapid participatory appraisal process, similar to the process undertaken in the East End, supported by an evidence based literature review. Participants would be drawn from different stakeholders to be agreed but would include representation from:

Local communities Partner organisations Patients (Adult/ Children's) Staff (Adult/ Children's) Project Team

In order to fit with the project key milestones, it is proposed to undertake the HIA in November 2009 with a final report available by year end.







Working with



8.0 SUSTAINABILITY

8.1 General Objectives and Targets

Sustainability and low carbon design are fundamental to the design quality evaluation of the project and bids will be scored significantly on these aspects. The contract requires the eventual design build contractor to provide a design which offers inherently low carbon operation and a highly sustainable building.

A BREEAM* 'Excellent' is a fundamental requirement and achievement of the final rating will be part of the building acceptance procedure. The BREEAM process answers many of the planning permission reserved matters as defined in the Sustainability and BREEAM section

Furthermore, there is a requirement for a Low Carbon design process which will be monitored and evaluated by a Carbon Trust accredited consultant. There are both design and operational energy targets.

Designs and specifications consider the environmental impact of all elements of the design including choice of materials. The project will meet good practice levels of waste minimisation and management throughout the project in accordance with WRAP guidelines and by adopting the most significant cost-neutral opportunities to increase waste recovery. Opportunities will be investigated under two streams:

- Reused and recycled content
- Site construction waste management and minimisation

The contract documents address the key documents referred to in the Planning Committee report:

- Energy Efficiency and Micromanagement: Achieving a low carbon future,
- A Strategy for Scotland the Scottish Government, March 2007.
- SPP 6: Renewable Energy;
- PAN 45: Renewable Energy Technology 2002
- PAN 84: Reducing carbon emissions in new development
- NHS Environmental Assessment Tool (NEAT) this is now replaced by a fully audited BREEAM for Healthcare which will be adopted for this scheme and references following relate to BREEAM not NEAT
- The Targets identified in SPP 6 Renewable Energy.

8.2 Low Carbon Design and Energy Efficiency

8.2.1 General Approach

An integrated approach to low carbon design will be implemented. In summary this is as follows:

- Project plans will include requirements for low carbon design, energy targets and auditing at key stages.
- A design and operational energy target has been set.
- Calculation and modelling of the target at key stages will be undertaken.
- There will be monitoring and review mechanisms for the design and operational energy target and failure to meet targets are contractually significant.
- A design monitoring tracker will ensure the brief is being adopted.
- The appointed team, team leader and individuals working on the project will be selected to have a sufficient skill set and access to adequate software for the demands of the project.

8.2.2 Design Energy Targets

- 1 The design energy target is an asset rating of no more than 40 as required for BREEAM excellent. This represents an improvement over compliance with current building regulations of approximately 20%.
- The operational energy target is 80kgCO2/m2 per annum as measured at the incoming energy meters to the energy centre. This represents best practice in operational energy in the NHS UK wide.
- 3 The energy calculation will be undertaken using a full dynamic model.
- Formal reporting is required at the key points in the project so that corrective action can be taken if necessary.
- Training and awareness of energy issues relating to the building will be given by the contractor to the building users and the maintenance staff to promote energy efficiency in operation.
- Operational energy will be measured and reported for every 3 months for 3 years from occupation of the building by the contractor. Should operational energy be found to exceed predicted operational energy, then investigation and remedial action will be undertaken by the contractor with remedial action provision in the contract.

2009

8.2.3 Priorities for Low Carbon Design

The priorities are broadly as follows in order of the least amount of capital expenditure for the most amount of carbon saved.

Passive/demand side items are focussed on reducing carbon demand and are the highest priority in considering strategy. These will include:

- User expectations and requirements, including foreseeable changes in use / occupancy
- Building form, orientation and massing
- Function relationships and internal planning of clinical/non-clinical spaces to ensure that areas which can benefit from daylighting and natural ventilation are positioned on the periphery of the building
- Structure thermal properties, including exposed mass
- Architectural arrangements for maximising use of daylighting to displace artificial lighting
- Passive ventilation strategy
- Reduced air leakage
- Exposed mass
- Glazing specification
- Increased shading
- Increased insulation
- Controlling equipping loads (this may occur earlier in the list for buildings with high equipment loads)
- Heat recovery (this may occur earlier in the list for buildings with high fresh air requirements)

Measures which integrate demand and supply side to minimise operating cost will include:

- Lighting controls
- Building services controls
- Metering and monitoring

Measures which reduce supply side carbon will include:

- Overall site energy strategy and choice of central/ decentralised plant, Combined Heat & Power (CHP), cooling strategy
- Choice of distribution media (generally steam being least efficient, decentralised being most efficient but dependant on overall site energy strategy)
- Solar hot water generators
- Local CHP
- Other renewable energy sources

Each measure will be considered from feasibility stage through to final design and action taken. Each item will be considered in terms of whole life cost and not just capital expenditure.

8.3 Sustainability and BREEAM

8.3.1 Process and general issues

The contractor will undertake a BREEAM Healthcare assessment of the main hospital development and PHLS laboratory buildings.

A BREEAM 'Excellent' is required and this will monitor the design, procurement and construction processes, with the certificate being awarded following construction to ensure the sustainability objectives are met throughout the project. The process is audited and verified by BRE.

A BREEAM standard covers ten categories of sustainability including:

- Management
- Health & Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution
- Innovation

Each category consists of a number of issues as summarised below. Each issue seeks to mitigate the impact of a new building on the environment by defining a performance target and assessment criteria that must be met to confirm the target has been achieved. Where a performance target has been achieved the number of available BREEAM credits can be awarded.

Mana gement	Waste
 Commissioning Construction site impacts 	Construction waste Recycled aggregates
Security	Recycling facilities
Health and Wellbeing	Pollution
Daylight Occupant thermal comfort Acoustics Indoor air and water quality Lighting	Refrigerant use and leakage Flood risk NO _x emissions Watercourse pollution External light and noise pollution
Energy	Land Use and Ecology
 CO₂ emissions Low or zero carbon technologies Energy sub metering Energy efficient building systems 	Site selection Protection of ecological features Mitig ation/enhancement of ecological value
Transport	Materials
Public transport network connectivity Pedestrian and Cyclist facilities Access to amenities Travel plans and information	Embodied life cycle impact of materials Materials re-use Responsible sourcing Robustness
Water	Innovation
 Water consumption 	 Exemplary performance levels
Leak detection	Use of BREEAM Accredited Professionals
 Water re-use and recycling 	 New technologies and building processes

8.3.2 Relationship of BREEAM to Conditions Attached to Planning Consent

Many of the BREEAM credits address the conditions attached to the planning consent detailed in the Committee report. The implementation of the measures will be monitored through the BREEAM audit process. The key issues covered by BREEAM from the planning conditions are as follows:

Condition	Response
05	A detailed tree survey and arboriculture report – a baseline ecological report will be undertaken including these issues.
06	A Biodiversity Action Plan – the ecology report will provide this plan
07	How the proposals, including its construction phase, fulfils sustainability building design and construction standards - encompassed by the BREEAM process .
	All retained trees on site shall be protected – this measure is part of two BREEAM credits.

- Any topsoil removed will be appropriately stored and re-used the ecology report will address this requirement.
- Light from the use of the facility shall not give rise to light pollution and nuisance to neighbours this measure is part of a BREEAM credit.

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- Noise from or associated with the completed development shall not give rise to a noise level, assessed with windows closed, within any dwelling or noise sensitive building this measure is part of a BREEAM credit.
- Suitable provision shall be made for refuse storage including provision of appropriate refuse bins and recycling facilities. This measure is part of a BREEAM credit.
- A strategy to mitigate the effects of noise, dust, safety etc on the local community including site management, construction and operational measures. This measure is part of a BREEAM credit.
- An on-site public transport hub shall be formed within the centre of the site, adjacent to the main public entrance to the new Hospital building. The public transport hub shall be of a sufficient size to accommodate Clyde Fastlink/ LRT, the enhanced bus services and passengers (i.e. dedicated stops, shelters and real time information with repeaters in the hospital foyers).
- Detailed proposals on the routing, frequency stop facilities and hours of operation of an internal shuttle bus service within the NSGH site.
 - A network of internal pedestrian and cycle routes shall be formed within the site to link the new hospital buildings with existing buildings, public transport hub and external pedestrians and cycle routes.
 - Appropriate levels of safe, secure and sheltered cycle parking shall be provided for staff and visitors in accordance with Policy TRANS 6 of the Glasgow City Plan. The cycle parking shall be evenly distributed around the site, serving all new buildings within the site and suitably linked to internal and external cycle routes. Appropriate shower and changing/locker facilities should be provided for staff cycling to work.
 - No development shall commence until the developer has concluded a Section 75 Agreement with the Planning Authority for the implementation, monitoring and enforcement of appropriate aspects of the Green Travel Plan.

- All phases of development shall treat the disposal of surface water in accordance with the principles of the Sustainable Urban Drainage System (SUDS) Manual (C697) which was published by CIRIA in March 2007. This is also covered by a BREEAM credit.
- A strategy setting out details covering the management/ eradication of Japanese Knotweed - this will be covered by the ecology report and recommendations
- 41 All site shrub clearance shall be undertaken outwith the bird breeding season (March to August). This will be covered by the ecology report and recommendations.
- 42 No tree felling should be conducted during the nesting season (April to July inclusive). This will be covered by the ecology report and recommendations
- Prior to any demolition works or works to retained buildings a bat survey shall be undertaken. This will be covered by the ecology report and recommendations.

Note: The above measures 21, 22, 26, 28 & 29 are covered by BREEAM transport credits. Regarding issues 36-38: The avoidance of habitat which will attract birds is a conflict with requirements in other measures to enhance biodiversity on the site and needs further consideration.

8.4 Renewable Energy Sources

Renewable energy sources are allied to the low carbon design approach outlined in section 10.2. Once all passive reduction and demand reduction measures have been considered, the feasibility of low and zero energy sources will be considered. An energy centre is proposed to supply the new development and part of the retained estate.

A detailed feasibility study will be undertaken encompassing the proposed buildings, the proposed energy centre and the whole site to determine the optimum energy supply solution for the site. This will be undertaken during the outline design phase and is monitored through the low carbon tracker and BREEAM processes.

Incorporation of renewable energy technologies for central plant will form the base of the renewable energy strategy and is likely to include CHP and may also include sustainable cooling and/or trigeneration (electrical energy, heat and chilled water).

In addition, there is an expectation from the NHS Greater Glasgow and Clyde that there will be building mounted and/or visible renewable energy sources such as building mounted wind turbines, photovoltaic panels and or solar panels to demonstrate the commitment of the board to sustainability.

8.5 Waste and Recycling

NHS Greater Glasgow and Clyde is committed to improving the environment performance of their construction projects. Designs and specifications will consider the environmental impact of all elements of the design including choice of materials.

One important contribution to sustainability goals is the efficient use of finite natural resources, diverting waste from landfill. This can be achieved by meeting good practice levels of waste minimisation and management throughout the project in accordance with WRAP** guidelines and by adopting the most significant cost-neutral opportunities to increase waste recovery. Opportunities should be investigated under two streams:

Reused and recycled content Site construction waste management and minimisation

8.5.1 Reused and Recycled Content

To deliver measurable performance, the contractor is required to exceed a threshold outcome defined as follows: At least 10% of the total value of materials used in the construction project must be derived from recycled and re-used content in the products and materials selected.

The contractor is required to identify and implement the most effective cost-neutral opportunities (Quick Wins) to increase the value of materials deriving from recycled and re-used content, and quantify the improvement in the total recycled content above 'baseline practice' for the project. The contractor shall specifically investigate the use of demolition material resulting from existing structures on site to contribute to and exceed this target.

To assess the baseline recycled content level of the project and identify the quick wins, the WRAP Net Waste Tool will be utilised.

8.5.2 Waste Minimisation and Management

The Contractor is required to implement where possible cost-effective methods of good practice waste minimisation during the design of the project and thereafter during construction.

The Contractor is also required to meet specified minimum waste recovery rates for the waste streams with the largest cost-effective recovery potential (selected Quick Wins). The Contractor is required to identify and agree with the Employer's Agent the key opportunities for Quick Wins on the project and set minimum recovery rates to be achieved.

To assist the effective delivery of the above requirements, the Contractor is required to develop and implement a Site Waste Management Plan (SWMP) to achieve good practice waste management on the project.

The SWMP is required to be developed and implemented following the DEFRA and WRAP guidelines and incorporating the good practice measures above. Implementation of the SWMP can be facilitated through the use of the WRAP Template (Excel based freely available template) for SWMPs. The Contractor is free to use other tools or templates for implementing the SWMP.

Where relevant, the Contractor is required to employ a systematic approach to good practice in the recycling and re-use of locally available construction, demolition and excavation waste materials (on-site and from nearby sites) – for example, applying the methodology outlined in the Demolition Protocol (published by ICE, London Remade and Envirocentre).

Further guidance on recycled content, good practice waste management and minimisation and the SWMP can be obtained from WRAP and Envirowise.

- * BREEAM Building Research Establishment Environmental Assessment Method
- ** WRAP Waste and Resources Action Programme

9.0 AUDIT OF CHANGES AND REVIEW OF KEY ENVIRONMENTAL ISSUES

9.1 Approach

An Environmental Statement was submitted to GCC in April 2007 to accompany the Outline Planning Application. An Environmental Scoping Exercise, which included consultations with GCC and Statutory Consultees identified the key issues to be addressed in the ES. The ES considered potential impacts for the following environmental factors:

- Land use and infrastructure
- Ground Conditions
- Policies and Plans
- Community, Pedestrians and Cyclists
- Townscape and Visual impacts
- Water quality and drainage
- Noise and vibration
- Air quality
- Cultural heritage
- Ecology and nature conservation

For each environmental factor, the ES considered mitigation proposals and assessed the impact significance in terms of magnitude, characteristics and receptor sensitivity. For the purposes of this review, each environmental factor is reconsidered to determine whether there has been any significant change in impact since the submission of the ES.

In compliance with Condition 1 to be attached to the Outline Consent this chapter provides an audit of the changes between the indicative campus master plan ref: 05017-02-100, 'development option C'; and the finalised master plan and provides an assessment of the extent to which the finalised masterplan accords with the submitted Environmental Statement. Each section provides the following:

- a brief introduction
- a summary of the conclusions of the 2007 Environment Statement
- a review of changes to baseline information
- a summary of project evolution/design changes
- a description of the potential impacts of the design changes
- a statement on the change in significance of the impacts.

Table 9.1 provides an EIA scoping of the evolution from the 2007 Campus Development Plan to the 2009 Campus Masterplan. The table lists the main changes which have be incorporated into the 2009 Campus Masterplan, and identifies the EIA factors which they are considered and assessed in the subsequent paragraphs.

Table 9.1 EIA Scoping of evolution from 2007 to the 2009 Campus Masterplan

	olution of the 2009 Campus sterplan	Land Use & Infrastructure	Ground Conditions	Policies & Plans	Community Pedestrians &	Townscape & Visual	Water Quality & Drainage	Noise & Vibration	Air Quality	Cultural Heritage	Ecology, Nat Con &	Sustainability	Disruption due to	Cumulative impacts
1	Retention of larger number of buildings in the medium term	•				•				•	•		•	
2	Additional land acquisitions: Scottish Ambulance Service and Scottish Water land	•	•				•							
3	Creation of new principal access to the NSGH site from Govan Road	•			•	•					•			
4	Revised layout for Fastlink, with access and egress from Govan Road			•	•	•					•			
5	Inclusion of major area of public open space/hospital park	•		•	•	•					•	•		
6	Removal of SUDS water feature						•				•	•		
7	Revisions to the Clinical Design of Adult Hospital and Children's Hospital			•		•								
8	Revisions to ward accom- modation in four wing tower			•		•		•		•		•		
9	Revisions to the on-site vehicular circulation pattern: cars, buses, HGVs, blue light			•										
10	Re-siting of three multi-storey car parks (1A, 1B & 2) and decking car park 3	•				•				•	•			
11	Revisions to FM, Laboratories, Mortuary and Energy Centre complex	•				•								
12	Revisions to landscape design proposals					•					•			

9.2 Land Use and Infrastructure

9.2.1 Introduction

Chapter 6 of the ES considered impacts on Land Use and Infrastructure. The proposed development covers an area of some 28 hectares. Located in the south side of Glasgow, surrounding land uses consist of a mixture of residential and commercial development, with hi-tech industry to the north and a sewage works to the north west. The site is currently used by the hospital and the land is therefore classified as Class 8 under the Use Classes Order 1997. There is also an area of public open space in the west of the site. The site is currently serviced by all utilities: gas, electricity, water (supply and drainage) and telecoms.

Potential land use issues were identified as:

- Impacts on continuing site hospital use
- Impacts on neighbouring land uses
- Cumulative impacts from other development in the area
- Risk of damage to underground services during construction
- Existing services capacity

9.2.2 Conclusions of 2007 Environmental Statement

The ES concluded that land use and infrastructure impacts were both beneficial and adverse impacts were assessed as being of negligible to minor significance, provided that the assumptions made with regard to services as noted below can be confirmed. The land use impacts of the development were summarised as follows:

Impact	Significance	Comment
Hospital land use	Neutral	Improved quality of open space
Community land use	Negligible	No significant changes
Commercial/ industrial land use	Negligible	No significant changes
Residential land use	Negligible	No significant changes
Cumulative land use impacts	Negligible	No significant changes
Services infrastructure	Negligible	Assumes adequate capacity Assumes mitigation during con- struction

9.2.3 Review of Changes to Baseline Information

There has been no change to baseline land use information since April 2007.

9.2.4 Project Evolution/ Design Changes

Potential design changes which have implications for land use impacts noted below.

Proposed changes	Potential impacts of design changes	Change in significance of impact
Slower change to existing land use pattern	The phasing of the project over a longer period will provide a less radical and more sequential regeneration of the site	Positive
Revised red line boundary to include land to be acquired from Scottish Water and the Scottish Ambulance Service. Scottish water land outwith planning consent boundary	Scottish Water land to be included in the separate detailed planning application for the Lab and FM buildings Additional landtake makes provision for new main access to the NSGH site, and dedicated Fastlink access/ egress to Govan Road	Positive
Dedicated main hos- pital access from Govan Road	Additional access will provide for: a more coherent road layout a high quality green entrance corridor a new definitive entrance to the NSGH site	Positive
Changes to open space strategy	Provision of new central park adjacent to main entrance to Adult Hospital and public transport hub will provide recreational opportunities for patients, staff and visitors	Neutral
Revised vehicular circulation patterns	Better definition to vehicular circulation, with specified routes for 'blue light' traffic, buses and taxis, Fastlink, service vehicles and private cars Fastlink route's west entrance/exit now aligns with Fastlink corridor on the adjacent housing site on the west side of Hardgate Road	Positive Positive

Continued:

Proposed changes	Potential impacts of design changes	Change in significance of impact
Revisions to the distribution of car park provision on the site	Good pedestrian access from MSCPs to central concourse of the Adult and Children's Hospital	Positive
	MSCP 1A & 1B (1400 spaces) adjacent to Adult Hospital. Change from one to two build- ings and revised orientation provides for cen- tral landscaped area	Neutral
	MSCP 2 (1000 spaces) adjacent to Children's Hospital and Maternity Unit. Larger footprint provides for inclusion of electrical sub-station, a less cluttered layout and scope for a more cohesive design	Positive
	Carpark 3 (300 spaces) including a single deck which requires screen tree planting to rear of adjacent residential properties on Hardgate Drive	Negative
Revisions to the shape and area of laboratories, FM and Energy Cen- tre site	Location of these buildings adjacent to new main entrance and Fastlink halt on a rectangu- lar site will provide opportunity for a new high quality landmark building at key location on NSGH campus	Positive

9.3 Ground Conditions

9.3.1 Introduction

Chapter 7 of the ES described existing ground conditions within the development site and assessed the potential impacts the ground conditions may have on the development and vice versa. Potential environmental receptors were noted as soils, geology and the development itself. There are no geological designated sites in the vicinity. The presence of localised contamination will require to be confirmed by a programme of site investigations prior to construction, and suitable mitigation implemented.

9.3.2 Conclusions of 2007 Environmental Statement

The ES concluded that the residual impacts of the proposals on ground conditions would be negligible and that residual impacts of site geology and soils on the proposed development will be negligible to minor. The impacts were summarised as follows:

Impact	Significance	Comment
Mineral Reserves	No impacts	-
Designated Sites	No impacts	-
Soils	Negligible	-
Geological fea-	No impacts	-
tures		
Stability	Negligible	Ground stability to be
		confirmed by Contractor
Contamination:		
Construction	Minor	SI required to confirm
phase	Negligible	
Operational phase		

9.3.3 Review of Changes to Baseline Information

There has been no change to baseline geology and soils information since April 2007.

9.3.4 Project Evolution/ Design Changes

Potential design changes which have implications for land use impacts are noted below.

Proposed changes	Potential impacts of design changes	Change in signifi- cance of impact
Proposal to acquire land from Scottish Water for main hos- pital access off Govan Road.	Potential for contamination of Scottish Water Site	Potentially negative To be assessed when SI complete and available.

9.4 Policies and Plans

9.4.1 Introduction

The ES reviewed the compliance of the New South Glasgow Hospitals proposals with national, regional and local policies and plans. The Development Plan for the site included the Glasgow and Clyde Valley Joint Structure Plan (2002) and the Glasgow City Plan (2003). The proposals were found to be in compliance with National Policies and Guidance in relation to economic development, archaeology, flooding, natural heritage, waste management, transport, noise, open space, urban design and drainage.

While the Structure Plan remains unchanged, there is now in place Glasgow City Plan 2, Finalised May 2007, which must be considered as a material consideration in planning applications. City Plan and City Plan 2 policies are listed below, noting any significant changes relevant to the NSGH proposals.

9.4.2 Conclusions of 2007 Environmental Statement

Key Structure Plan policies relating to the Strategic Management of Travel Demands and Strategic Environmental Resources are supported by the proposals. The site was identified in the City Plan for civic, hospital and tertiary education, and key policies related to transport infrastructure, vehicle parking standards, pedestrians and cyclists, urban design, listed buildings and landscape design are all supported by the development proposals.

When the Outline Planning Application and ES were submitted in April 2007 the Development Plan for the NSGH site included:

- Glasgow & Clyde Valley Joint Structure Plan, 2006
- The Glasgow City Plan, adopted in August 2003.

The ES identified the following Structure Plan Policies:

Strategic Policy 3 – Strategic Management of Travel Demands
 Strategic Policy 7 - Strategic Environmental Resources
 Strategic Policy 9 – Assessment of Development Proposals

The ES concluded that the proposals were in support of Structure Plan Strategic policies.

The ES identified the following City Plan policies as relevant to the NSGH proposals:

DEV 9	Civic, Hospital & Tertiary Education
DEV 13	Transport Infrastructure
TRANS 4	Vehicle Parking Standards
TRANS 5	City Cycle Network and Providing for Pedestrians and Cyclists in
	New Development
TRANS 6	Cycle Parking Standards
DES 1	Reinforcing Local Character and Identity
DES 2	Urban Design
DES 4	Design Statement
DES 9	Barrier Free Access
HER 2	Listed Buildings (Buildings of Architectural and Historic Importance)
ENV 11	Tree Preservation Orders (TPO)
ENV 12	Landscape Standards in New Developments

The ES concluded that the proposals were in support of City Plan policies.

9.4.3 Review of Changes to Baseline Information

City Plan Policy (2003)	City Plan 2 Policy (2007)	Change
City Plan Policy (2003)		
DEV 9: Civic, Hospital &	DEV 9: Civic, Hospital & Tertiary	No signifi-
Tertiary Education	Education	cant change
DEV 13: Transport Infra-	DEV 1 Transport Infrastructure	No signifi-
structure	To encourage proposals which support the integrated and sustain-	cant change
To encourage proposals	able transport network	
which support a sustainable	able transport network	
transport network	TDANO 4 Valida Dadina Otan	Nicono
TRANS 4: Vehicle Park- ing Standards	TRANS 4: Vehicle Parking Standards.	Now re- guires to be
Green Travel Plan and	Parking provision to be determined	determined
TA for major develop-	by the outcome of the Transport	by TA and
ments. Appropriate maximum	Assessment, where the agreed mode share target is used to modify	DG: TRANS 1: Transport
provision for hospitals is;	the parking provision	Assess-
1 space per 6 beds and 1		ments
space per 8 staff TRANS 5: City Cycle	TRANS 5	No signifi-
Network and Providing	Providing for Pedestrians and Cy-	cant change
for Pedestrians and Cy-	clists in New Development	
clists in New Develop- ment	·	
1115111	TRANS 6: Cycle Parking Standards	Higher
TRANS 6: Cycle Parking Standards		cycle park-
	1 space per 20 beds	ing require-
I space per 25 beds 1+1 space per 20 staff	1+1 space per 20 staff	ment
DES 1: Reinforcing Local	DES 1: Design Development Princi-	No signifi-
Character and Identity	ples	cant change
	Includes requirements for Tall Build-	
	ings	
DES 2: Urban Design	DES 2 Sustainable Design and Construction	No signifi- cant change
	DES 1 Design Development Princi-	No signifi-
DES 4: Design State-	ples	cant change
ment	Includes requirement for Design	Jane Shango
	Statement	

Continued

City Plan Policy (2003)	City Plan 2 Policy (2007)	Change
DES 9: Barrier Free Ac-	DES 1 Design Development Princi-	No signifi-
cess	ples, includes accessibility requirements	cant change
HER 2: Listed Buildings	DES 3 - Protecting and Enhancing	No signifi-
(Buildings of Architectural	the City's Historic Environment	cant change
and Historic Importance)		
ENV 11: Tree Preser-	ENV 8 Trees, Woodland and Hedge-	No signifi-
vation Orders (TPO)	rows	cant change
ENV 12: Landscape	ENV 2 Civic and Open Space provi-	No signifi-
Standards in New De-	sion	cant change
velopments		

9.4.4 Project Evolution/ Design Changes

Potential design changes which have implications for planning policy are noted below.

Proposed changes	Potential impacts of design changes	Change in sig- nificance of impact
Proposal to acquire land from Scottish Water for main ac-	SW land acquisition not within red line boundary. Require to revise red line boundary	Minor loss of land identified in City Plan 2 for
cess off Govan Road. Also acquisition of Scottish Ambulance Service site	Scottish Water site identified in the City Plan 2 Proposals map as new/ upgraded waste disposal/ recycling site.	new/upgraded waste disposal/ recycling sites- Neutral
off Hardgate Road.	Potentially negative	Neutral
Changes to Fastlink proposals - DEV13 Transport Infrastruc- ture,	Need to assess final proposals for com- pliance with DEV 1 Transport Infra- structure – no policy change	Positive
Changes to Open Space provision	Improved public open space provision in terms of ENV 12	Positive
Improved Public Access	Compliance with DES 1. No significant changes	Positive
DES 9 Barrier Free Access	140 Significant changes	
Revised Design Statement	Need to provide revised Design Statement	Neutral

9.5 Community, Pedestrians and Cyclists

9.5.1 Introduction

The 2007 ES noted that community impacts of the NSGH would be twofold:

- Impacts on the hospital community: staff, patients and visitors. The hospital
 currently has around 900 beds with around 4,200 full and part-time staff. The
 new facility on completion will contain around 2000 adult and children's beds
 with some 10,000 staff. In addition, the hospital is used daily for a wide range of
 specialist services.
- Impacts on the surrounding communities to the north, south, east and west of the hospital site including Linthouse, Shieldhall and Govan.

9.5.2 Conclusions of 2007 Environmental Statement

The 2007 Environmental Statement concluded that:

There is currently limited pedestrian and cyclist access through the hospital site and there is little interaction between the hospital site and the local community. No historical through routes are identified on historical maps.

The construction phase of the development is likely to give rise to adverse impacts on community amenity, as a result of noise and dust nuisance and visual impacts. Construction traffic will result in minor severance impacts on the local road network. On completion of the construction phase, the community would benefit from improved access through the site and improved access to cycling and pedestrian links to the wider area and to green networks.

Considerable improvements were proposed for public transport, which together with the implementation of a Travel Plan and a comprehensive parking strategy would effectively 'cap' development traffic to existing levels during the AM and PM peak periods. The development would result in no additional severance of local communities as a result of traffic increases. Community impacts ranged from minor adverse to moderate adverse during the construction period, but during the operation of the hospital, impacts on pedestrians, cyclists and community would be beneficial.

The ES summarised the residual community impacts during the construction and operation phases as follows:

Impact Description		Impact Sig- nificance	Comment
Communi- ties	Construc- tion Operation	Minor Negligible	Safety plan and safety and security measures Negligible increase in traffic
Community Facilities	Construc- tion Operation	Negligible Minor benefi- cial	No significant impacts Improved facilities within site. No impacts on surrounding community facilities. Contribution to Green Net- work
Access and road net- work	Construc- tion Operation	Minor Neutral	Temporary traffic disruption Negligible increase in traffic in local and trunk road networks
Pedestri- ans	Construc- tion Operation	Minor Minor benefi- cial	Temporary traffic disruption Benefits for pedestrians - improved access and through routes
Cyclists	Construc- tion Operation	Minor Minor benefi- cial	Temporary traffic disruption Benefits for cyclists – improved access and through routes
Public Transport	Construc- tion Operation	Minor Moderate beneficial	Temporary traffic disruption Benefits for hospital users and local community
Parking	Construc- tion Operation	Moderate Minor	On-site parking will be displaced Potential impacts on surrounding residential areas
Community Initiatives	Construc- tion Operation	Negligible Minor benefi- cial	No significant impacts Contribution to Green Network Strategy
Socio- economics	Construc- tion Operation	Minor beneficial Moderate beneficial	Opportunity for social and economic regeneration in wider area

9.5.3 Review of any changes to Baseline Information

There has been no change to baseline pedestrians and community information since April 2007.

9.5.4 Project Evolution/ Design Changes

Potential design changes which have implications for land use impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in sig- nificance of impact
Provision of dedi- cated main public access to the site	Improved sense of arrival, clearer access definition and clarity of site layout and circulation pattern.	Positive/ community bene- fit
Changes to pedes- trian/ cyclist network on the site	Improved pedestrian and cycle routes increase permeability of hospital site for local community use	Positive/ community bene- fit
Changes to public open space provision	Together with improved pedestrian/ cycle access, provides improved open space for patients, staff, visitors and the local community.	Positive/ community bene- fit
Changes to public transport provision	Improved access to site	Positive

9.6 Townscape and Visual Impact

9.6.1 Introduction

The regeneration of the NSGH site will lead to significant changes in the character and fabric of the local urban landscape. This will in turn lead to changes to views of the site, affecting the local residential and working population and people passing through the area.

The 2007 EIA townscape and visual assessment was carried out in accordance with published guidance. This described the townscape context of the site, then evaluated the site's townscape structure and character. The site's visibility was then determined, the potential visual receptors identified, the townscape and visual receptors sensitivity to change determined, then the nature and extent of the changes described and

evaluated. From this information an assessment was made of the potential significance of townscape and visual impacts.

9.6.2 Conclusions of 2007 Environmental Statement

The 2007 ES assessed the Townscape Impacts of the Campus Development Plan proposals against accepted urban design objectives which were to be integral to the design and implementation of the Campus Development Plan. Townscape impacts were assessed as moderate/ substantial beneficial over most of the site.

A representative range of visual receptors was assessed, concentrating on areas of public access including main thoroughfares (such as M8, A814 Clydeside Expressway and Govan Road) and viewpoints (such as Dawsholm Park and Gleniffer Braes Country Park). A range of private residential properties was also assessed. Impacts were assessed as insignificant and neutral for most of the public and private receptors, although some nearby residential receptors may have experience significant adverse impacts due to the dominant size of the Adult and Children Hospital buildings.

The townscape and visual impacts of the development were summarised as:

Impact	Significance	Comment
Townscape Impact (Construction Phase)	Moderate Adverse	Impacts are mainly short to medium term and affect specific parts of the site at any one time.
Townscape Impact (Post Completion)	Moderate/ Substantial Beneficial	Beneficial impacts dependent on Campus Development Plan implementation and quality of design and materials.
Visual Impact Views from roads and public accesses	Moderate Beneficial	Beneficial impacts dependent on Campus Development Plan implementation and quality of design and materials.
Visual Impact Views from resi- dences	Moderate Adverse and Moderate Beneficial	Adverse impacts relate to proximity to large scale development but may be balanced to an extent by improved character of townscape, landscape and public realm.
Visual Impact Views from commercial, industrial and institutional properties	Neutral	Beneficial impacts relate to views from industrial locations. Adverse impacts relate to views from institutional locations.
Visual Impact Views from public open spaces	Neutral	Changes merge into surrounding town- scape when viewed from more distant viewpoints.

9.6.3 Review of changes to Baseline Information

There has been no significant change to baseline townscape and visual information since April 2007.

9.6.4 Project Evolution/ Design Changes

Potential design changes which have implications for townscape and visual impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in signifi-cance of impact
Longer phased redevelop- ment of the site with longer retention of existing build- ings located in the north and north east sectors of the site.	Slower pace of townscape and visual change.	Positive
Provision of new main hospital access	Greater visual clarity to site layout and sense of arrival at destination	Positive
Changes to public transport provision	Greater visual clarity to public transport provision	Positive
Changes to open space provision	Creation of major open space will contribute to quality of the public realm. Central location of public open space in front of main entrance to the Adult Hospital will create high quality landscape setting for hospital and wards tower block.	Positive
Change to physical composition of Adult and Children's Hospitals	New building form, height, materials etc	Neutral

Proposed changes	Potential impacts of design changes	Change in significance of impact
Change to composition design and siting of multistorey car parks.	Relocation/siting and form. height, materials etc. Replacement of single east carpark with carparks 1A & 1B. Distinctive twin ramps will provide identifiable visual markers and aid site legibility. Careful massing and final treatment of elevations, aesthetics and the selection of muted of materials and ashlar 'plinth' intended to provide visual continuity with the Central Medical Building. Use of stainless steel mesh panels and white render to the stair towers selected to provide visual continuity with new Neonatal Building. Design continuity between the four MSCPs will contribute to the architectural, townscape and visual qualities of the site.	Positive Positive
Change to composition and siting of Labs, FM and Energy Centre	New building form, height, materials etc	Neutral

9.7 Water Quality and Drainage

9.7.1 Introduction

The ES considered the impacts of the proposed development on water quality, water quantity and drainage issues. Information on baseline water resources was obtained from existing data on the site. An assessment was made of the significance of impacts and appropriate mitigation measures identified. A key aspect of the proposals for water and drainage was the introduction of a Sustainable Urban Drainage System (SUDS). Site development would include measures to address contamination which could affect groundwater.

The proposed hospital development includes various works which will fall within the remit of the WFD and CAR. Discussion will be required with SEPA as the design progresses to address licensing issues and ensure the appropriate authorisations are obtained.

9.7.2 Conclusions of 2007 Environmental Statement

The ES summarised the water and drainage impacts are noted below:

Impact	Signifi- cance	Comment
Groundwater quality, quantity and flow	Negligible	Assumes further SI and appropriate mitigation for soil contamination
Silting up of sewer during construction	Negligible	Assumes standard pollution prevention measures implemented
Surface water drainage	Negligible	Assumes appropriate SUDS implementation
Flooding	Minor	Assumes appropriate SUDS and foul drainage implementation

9.7.3 Review of changes to Baseline Information

There has been no significant change to baseline water quality and drainage information since April 2007.

9.7.4 Project Evolution/ Design Changes

Potential design changes which have implications for water quality and drainage impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in significance of impact
Land acquisition from Scottish Water	Potential contamination of land to be acquired from Scottish Water and impact on drainage regime	Currently un- known. SI required
Change to SUDS pro- posal from open water body to underground storage facility	Discussions with SEPA required	Negative

9.8 Noise and Vibration

9.8.1 Introduction

The ES addressed the possible noise impacts that have been identified at the outline planning stage in respect of the New South Glasgow Hospital. The noise issues of relevance at this stage are:

- traffic noise on the wider and local community
- helicopter noise impact on the local community and future hospital occupants
- construction noise impacts on both the local community and the existing hospital occupants

9.8.2 Conclusions of 2007 Environmental Statement

An assessment of potential noise and vibration impacts was undertaken at a level commensurate with the outline planning status of the project. It was determined, based on the Transport Assessment that the proposed development would have no impact on the trunk road network (undertaken by JMP) and that in terms of the local network the proposal will have a negligible impact on traffic levels.

Prior to commencement of work the Contactor should establish whether or not the Local Authority wishes to employ Best Practicable Means as an approach to control noise or whether a baseline noise survey is required. If the latter is deemed necessary the procedure to be adopted must be agreed with the Local Authority.

When detailed method statements for construction are available an assessment of hospital noise and vibration sensitivity should be undertaken and adequate controls put in place prior to the commencement of any construction/demolition work.

Finally, in relation to helicopter noise a detailed assessment will be required for the temporary relocation site and the planned new site. It should be noted that at the Royal London Hospital secondary glazing was offered to all residents within a specified distance of the landing pad. A detailed assessment of likely qualifying properties will be required based upon a predetermined significance of impact criteria. The local authority should be included in agreeing the trigger level.

9.8.3 Review of changes to Baseline Information

There has been no significant change to baseline noise information since April 2007.

9.8.4 Project Evolution/ Design Changes

Potential design changes which have implications for noise and vibration impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in sig- nificance of impact
Location of the temporary heli- pad during the construction period.	Potential increase in noise impacts	To be assessed on selection of temporary location.
Potential change to the location of the permanent rooftop helipad in relation to adjacent residential development	Potential increase in noise impacts.	To be assessed on final design.

9.9 Air Quality

9.9.1 Introduction

The ES noted that there are no major point sources of air pollution close to Southern General Hospital. Local air quality is dominated by the effects of traffic emissions in the immediate area and more widely within the Glasgow/Central Belt conurbation. The adjacent Shieldhall Waste Water Treatment Works is currently a significant source of odour nuisance, although this is likely to reduce as a result of planned works within the next decade. Without the proposed redevelopment, local concentrations of NO_2 will remain well within the relevant air quality objectives, whereas annual mean concentrations of dust (PM_{10}) may exceed the 2010 objective.

A more detailed assessment is recommended of air quality impacts and dust emission mitigation measures during construction when the detailed construction programme is available. The proposed redevelopment will not result in significant effects on local or regional air quality.

9.9.2 Conclusions of 2007 Environmental Statement

A preliminary assessment was undertaken of the overall impact of redevelopment of the hospital site on air quality.

During the construction period, the existing hospital and local housing will be highly sensitive to any adverse impacts on air quality and may experience minor adverse effects during periods of dry breezy weather and high levels of dust release from construction activity. The work will also give rise to emissions of PM_{10} and NO_2 from diesel plant and construction related traffic. The net effect will be a small increase in local concentrations of PM_{10} and NO_x/NO_2 however current objectives are likely to be met

Construction emissions should not exceed the 2010 PM_{10} annual mean objective. Off site PM_{10} concentrations should meet the current objective, but may be exceeded in the hospital's operational areas during prolonged dry weather if inadequate mitigation measures are employed. On completion, the increase in traffic flow will have a small adverse effect on local concentrations of PM_{10} and NO_2 , however, local air quality objectives should still be achieved.

Mitigation measures will be required to control emissions during construction. Even with good control measures, there will be a minor impact on air quality (PM_{10}) and a moderate impact on dust nuisance within operational parts of the hospital, if major works involving soil or aggregate moving coincide with a prolonged period of dry weather. The offsite impacts of construction will be much smaller.

The residual air quality impacts of hospital development were summarised as follows:

	Construction	Following redevel- opment
Dust nuisance	Moderate (on site) Minor (off site)	None
Local air quality	Moderate (on site) Minor (off site)	Minor
Regional air quality	Minor	Minor

Both dust nuisance and air quality impacts in operational parts of the hospital during the redevelopment process could be of moderate significance. Careful planning will be required to minimise dust and exhaust emissions arising from the redevelopment work. The predicted increase in traffic flows following the redevelopment of the hospital would be expected to have a minor adverse effect on local air quality.

9.9.3 Review of changes to Baseline Information

There has been no significant change to baseline air quality information since April 2007.

9.9.4 Project Evolution/ Design Changes

There are no design changes which have implications for air quality.

9.10 Cultural Heritage

9.10.1 Introduction

AOC Archaeology Group was commissioned by Ironside Farrar Ltd on behalf of the Board to undertake a cultural heritage assessment for an Environmental Impact Assessment prior to the redevelopment of South General Hospital Glasgow.

9.10.2 Conclusions of 2007 Environmental Statement

The direct impacts on cultural heritage sites were identified as follows:

Site No	Name	Archaeologi- cal Signifi- cance	Magni- tude of direct impact	Significance of impact
1	1345 Govan Road, Southern General Hos- pital	Regional	Low	Minor-Moderate
2	1345 Govan Road, Southern General Hos- pital, Administration Block	Regional	Low	Minor-Moderate
3	Shield Hall House	Negligible	None	None
4	Shieldhall, Hardgate Road Barrage Balloon Site	Negligible	None	None
5	Southern General Hospital	Local	Marginal	Negligible
8	Shieldhall	Negligible	None	None

Continued

Site No	Name	Archaeologi- cal Signifi- cance	Magni- tude of direct impact	Significance of impact
9	Merryflatts House	Negligible	None	None
10	Merryflatts	Negligible	None	None
11	1345 Govan Road, Mother & Baby and psychiatric unit: former asylum	Local	High	Moderate
12	1345 Govan Road; early 20 th century build- ing	Local	High	Moderate
13	Shieldhall	Negligible	None	None

Visual Impacts on cultural heritage sites were identified as follows:

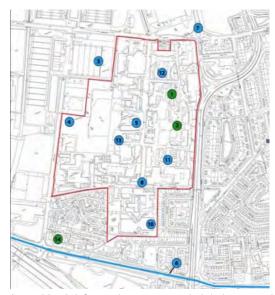
Site No	Name	Archaeological Significance	Magnitude of visual impact	Significance of impact
1	1345 Govan Road, Southern General Hospital	Regional	Negligible	Negligible
2	1345 Govan Road, Southern General Hospital, Admini- stration Block	Regional	Negligible	Negligible
14	Luma Factory	Regional	Negligible	Negligible

The ES chapter on Cultural Heritage concluded that the proposed development would have a possible direct impact of minor-moderate significance on the two Listed Buildings on the NSGH site (Sites 1 & 2) and a negligible visual impact on these same buildings. Sites 11 & 12, also dating to the early development of the hospital would be demolished between 2009-2010 which would constitute a moderate significance of impact. The

location of buildings and archaeological remains is shown in Figure 9.1 below.

In compliance with national and local planning policies, it was recommended that that a programme of Historic Building Recording be undertaken prior to any alterations which may be required to facilitate the reuse of the Listed Buildings (Sites 1 & 2) and prior to the demolition of Sites 11 & 12. In addition, an archaeological watching brief was recommended, to monitor the groundbreaking works required to assess the condition of the foundations of the Listed Buildings (Site 1 & 2).

Figure 9.1 Location of Cultural Heritage Sites



A watching brief was also recommended during ground breaking works associated with the demolition of Sites 11 & 12. Given the extent of recent development and disturbance which has occurred within the proposed development area, it is not thought that any archaeological remains of significance will survive intact below the modern ground surface; as a result no further mitigation was recommended.

The 2007 Campus Development Plan included retention of the listed buildings for several reasons:

- Only the facades are protected by their listing and there are opportunities to remodel them internally
- The buildings currently accommodate clinical functions that cannot be relocated until the new hospital is constructed. This means that even if permission to remove these buildings was granted, their sites could not easily be utilised for the main phase of development
- Reuse of the buildings for administrative support or teaching functions makes both economic and environmental sense as their building form lends itself to this type of conversion without resorting to demolition
- These buildings have been listed as being of architectural and historic interest and as such ought to be found a new function and rehabilitated so that their future conservation is secured

The plan was therefore to retain the listed buildings to form one edge of the teaching and administration zone n the eastern side of the site. In order to protect the setting of the listed buildings the Campus Plan required that any new adjacent buildings proposed for the eastern side of the site would be of a scale and massing in keeping with that of the listed buildings.

The backs of the listed buildings could be improved to provide a face into a central linear garden. This space would be terminated at the north end by an 'object building' forming the new staff crèche relocated from the south of the site. This space would support pathways along and through to allow ease of movement from one side to the other. The buildings surrounding this space would be sympathetic in scale with the listed buildings.

9.10.3 Review of changes to Baseline Information

There has been no significant change to baseline noise information since April 2007.

9.10.4 Project Evolution/ Design Changes

Potential design changes which have implications for cultural heritage impacts are noted below

Proposed changes	Potential impacts of design changes	Change in signifi- cance of impact
Longer phasing of demolition and redevelopment	Delay to impacts on listed buildings and their setting	Positive
Change to design of Adult and Children's Hospitals	Change to impact of new hospital buildings on setting of listed buildings	Neutral
Change to the siting and design of the Labs Complex	Change to impact of new labs complex on setting of listed buildings	Neutral
Change to composition and design and siting of multi- storey car parks	Change to impact of car parks on setting of listed buildings	Neutral

9.11 Ecology, Nature Conservation and Biodiversity

9.11.1 Introduction

SKM was commissioned in February 2006 by Greater Glasgow Health Board to carry out a preliminary ecological appraisal of the proposed development site. The purpose of the appraisal was to collect information on ecological issues to be addressed in an Environmental Impact Assessment (EIA). The scope of the appraisal was to identify any ecological issues, including the likelihood of protected species (e.g. bats, water voles etc) and the presence of Japanese Knotweed (*Polygonum cuspidatum*) on the site

9.11.2 Conclusions of 2007 Environmental Statement

The site lies within a built-up urban area and comprises a mixture of buildings of varying age, scale and construction, mowed grass, hardstanding and partly wooded greenspace. More than 350 trees are identified in a Glasgow City Council Tree Preservation Order for the site.

The site and its surroundings have no nature conservation designations. An ecological walkover survey identified no potentially significant impacts on habitats, birds, invertebrates or plants. A bat survey found no evidence of bats on site, but several buildings have potential for bat roosts. Precautionary measures were proposed to

ensure no adverse impacts on bat species. Measures to avoid the spread of invasive plants, particularly Japanese Knotweed, are also proposed. Ecological impacts resulting from the proposed development were assessed as negligible, provided all appropriate mitigation was implemented. The ES summarised residual ecology impacts as follows:

Impact	Significance	Comment
Habitat: Loss of small trees, scrub & grassland	Negligible	Construction and operational phases
Plants: Spread of invasive species	Negligible	Construction phase only
Birds: Disturbance and loss of foraging and nesting sites	Negligible	Construction and operational phases
Mammals: Loss of bat roosting sites, disturbance	Negligible	Construction and operational phases
Invertebrates: Loss of habitat	Negligible	Construction and operational

9.11.3 Review of changes to Baseline Information

There has been no significant change to baseline ecology/nature conservation/biodiversity information since April 2007.

9.11.4 Project Evolution/ Design Changes

Potential design changes which have implications for ecology/nature conservation/biodiversity impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in signifi- cance of impact
Longer phasing of demolition and redevelopment	Delay to impacts on ecology and trees (including TPOs)	Positive
Provision of new Main Hos- pital Access Road	Loss of trees subject to TPOs between the Therapy Centre and Scottish Water site.	Short term Negative
	Landscape proposals include compensatory planting of avenue of trees along the new main entrance boulevard.	Long term positive
Changes to Fastlink route within hospital grounds	Potential loss of trees subject to TPOs.	Short term Negative
	Landscape proposals include compensatory planting of avenue of trees along the new main entrance boulevard.	Long term positive
Changes to areas of public open space	Opportunity to contribute to site's biodiversity	Positive
Replacement of SUDS water feature with underground storage ponds	Loss of opportunity for enhancing biodiversity	Negative
Change to composition design and siting of multistorey car parks	Potential loss of trees sub- ject to TPOs to re-sited multi-storey car parks	Neutral

9.12 Sustainability

9.12.1 Introduction

The ES provided a non-quantitative assessment of the project's impacts on sustainable development targets and indicators, both national and local. Adverse impacts identified included air quality issues relating to traffic generation and the demolition rather than re-use of existing buildings. These would be offset by considerable beneficial impacts relating to the appropriate use of land, efficient energy use and protection and enhancement of existing green space. In addition, the site's central location and excellent transport links are designed to encourage the use of

public transport, walking and cycling rather than the private motor car, thereby promoting sustainable development.

9.12.2 Conclusions of 2007 Environmental Statement

The ES summarised sustainable development impacts as follows:

Topic	Criteria	Impact
Land Use	Appropriate use of land, buildings and infrastructure	+
	Minimisation of greenfield development	+
Transport	Safety for all road and transport users	-
	Dependence on the private car	+
	Encouragement of walking and cycling	+
Natural Environ-	Protection/ enhancement of:	
ment / Pollution	Areas for recreation	+
	Air, land and water quality	-
	Diversity of wildlife plants and habitats	-
Cultural Heri-	Conservation of important historic and cultural as-	-
tage	sets	
Use of Re-	Energy efficiency in development layout and design	+
sources	Prudent use of natural resources	+
	Waste Minimisation and sustainable procurement	0
Socio-	Wider benefit to people and communities	+
economics	Employment opportunities	-
Public Aware- ness/ Environ- mental Respon- sibility	NHS NEAT tool targets for sustainable development	+

Key

- neutral
- 0 adverse
- + positive

9.12.3 Review of changes to Baseline Information

There has been no significant change to baseline ecology/nature conservation/biodiversity information since April 2007.

9.12.4 Project Evolution/ Design Changes

Potential design changes which have implications for meeting sustainability targets are noted below:

Proposed changes	Potential impacts of design changes	Change in significance of impact
Changes to open space/ public park provision	Enhance opportunity for informal recreation and biodiversity	Positive
Replacement of SUDS water feature with underground storage ponds	Loss of opportunity for enhancing biodiversity	Negative
Change to physical composition of Adult and Children's Hospi- tals	Revisions to design of hospital buildings should reflect NEAT environmental targets	Neutral

9.13 Disruption due to Construction

9.13.1 Introduction

Implementation of the New South Glasgow Hospitals Campus Development Plan will, unavoidably, impact on existing residents of the site and the surrounding area. In addition, the occupants of the early development phases will be affected by the later phases. The assessment considered the temporary impacts arising from construction works on people and the natural environment and considered the impacts from construction works on existing occupants and users of the development area.

Construction impacts can arise from a number of sources including the operation of plant and machinery and the movement of heavy vehicles. The sources can create noise, dust and loss of amenity. Although such sources of potential impact may be temporary they can nevertheless result in significant nuisance to people in the area, in their houses, in hospital buildings (as staff, patients or visitors) or whilst driving, cycling or on foot. These impacts can occur to varying degrees between the start of preconstruction works such as ground investigations, through to the end of the contract period when all the accommodation works are completed and all temporary works are removed. Studies have shown that at least half the people living within 50 m of a site boundary are seriously bothered by construction nuisance in one form or another. Beyond 200m less than 20% are bothered. In addition, impacts on water quality, ecology, cultural heritage, landscape, and traffic can occur.

9.13.2 Conclusions of 2007 Environmental Statement

The ES concluded that, during the construction phase, impacts would arise from a number of sources: noise, emissions and dust arising from vehicles, plant and machinery; visual impact of construction sites and plant and impacts of construction traffic on local roads. Construction impacts would occur during each of the construction phases, and the long term nature of the project would result in these impacts being felt over a period of some 10 years. Users of the buildings completed in the early phases would experience disruption from later phases of development.

The main receptors of construction impacts were likely to be existing users of the hospital site: staff, patients and visitors, residents and occupants of the nearest properties, local communities, and other users of the site. Some construction impacts would be unavoidable, and would require to be controlled and mitigated by the standard conditions, restrictions and responsibilities placed upon site development contractors. Some traffic diversions may be required during construction No significant environmental impacts were predicted due to the short duration of these diversions. However, these impacts should be reviewed when further project implementation details are available. Mitigation measures should reduce most construction impacts to a minor level of significance, although noise, dust and amenity impacts were likely to be of moderate adverse significance for the nearest residents, hospital users and local communities.

The ES summarized the residual construction impacts as follows:

Impact Description	Impact Sig- nificance	Comments
Land use & Infrastruc-	Minor	Land use change is not significant. Diver-
ture		sion of utilities apparatus will be required
Ground Conditions	Minor	Construction workers at risk from soil contamination impacts
Traffic and Transportation	Minor	Disruption possible during construction period
Townscape and Vis- ual	Minor/ mod- erate	Short to moderate term and will not affect the whole site at any one time
Community	Moderate	Amenity impacts on hospital community and nearby communities
Water Quality and Drainage	Negligible	Provided mitigation measures are implemented
Noise and Vibration	Moderate	Impacts on those closest to construction works
Air quality	Moderate	Impacts on those closest to construction works. Hospital is sensitive receptor
Cultural Heritage	Negligible	Visual impacts on setting assessed in L&V section
Ecology	Negligible	Provided mitigation measures are implemented
Sustainability	Minor	Provided sustainable construction methods are implemented
Polices and Plans	None	·
Cumulative Impacts	Moderate	Mitigated by construction programming
Health and Safety	Minor - mod- erate	Minimised by mitigation

All impacts are considered to be adverse unless otherwise stated.

9.13.3 Review of changes to Baseline Information

There has been no significant change to baseline construction information since April 2007.

9.13.4 Project Evolution/ Design Changes

Potential design changes which have implications for construction impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in significance of impact
Longer phasing of demolition and redevelopment	Delay/extend construction impacts on road network and local residents	Neutral

9.14 Cumulative Impacts

9.14.1 Introduction

Cumulative impacts may be broadly defined as impacts that arise from the accumulation of a number of individual impacts For the NSGH they may result from various types of interaction, including the following.

- The accumulation of impacts of the same type at different locations. For
 example air quality impacts resulting from construction traffic or activities may
 not be significant at each one of a number of sites, but can result in a significant
 wider area impact or the loss of greenspace on one site may be insignificant, but
 when considered together with similar losses on other sites in the wider area
 may result in a significant impact.
- Impacts that arise from the accumulation of different impacts (e.g. noise and visual intrusion during construction) at a specific location. Individually, these impacts can often be considered minor, but when considered with other impacts can become more significant.

9.14.2 Review of Major Projects

At the Outline Planning stage a number of potentially concurrent developments were identified. The current status of these is as follows:

M74 Extension

Construction of the extension began in May 2008, with a completion date of August 2011. No additional impacts or interactions with NSGH have been identified

Clyde Waterfront Initiative

This long term regeneration project includes a wide range of small and large scale projects including transport, residential, business and leisure facilities, together with education, training and community initiatives. Consultation with Clyde Waterfront / GCC will be required to identify key projects which may impact with the NSGH programme to result in cumulative environmental impacts. Key projects with potential for cumulative impacts with the NSGH project include:

- Central Govan Action Plan

Implementation started in Summer 2006 and current projects include housing at Rathlin Street and Harhill Street and public realm improvements at Govan Cross. The scale of projects is relatively small and unlikely to result in cumulative impacts with NSGH.

- Elder Park Regeneration

Proposals for physical work and events. No significant cumulative impacts with NSGH likely

Govan Campus

Multiplex school to replace three primary schools and a nursery. Due for completion early 2010. No cumulative impacts likely.

- Govan Flood Management

Proposals for flood defences, quay wall stability and public realm are at planning stage.

Glasgow Harbour

Ongoing regeneration of brownfield site for mixed use. Started in 2004 and running until 2015. Located on the north side of the River Clyde there is potential for a cumulative visual impact with the new adult and children's hospital buildings at NSGH.

Clyde Fastlink

Proposals include Fastlink through NSGH Campus. Continued liaison required with GCC/ SPT as proposals progress.

Clyde Waterfront Green Network Strategy

One of two launch projects for the Glasgow and Clyde Valley Green Network Partnership. Strategic report setting out action themes and projects was published in and notes that 'The redevelopment of the Southern General site should, if possible include provision of an additional space or spaces for use by

patients, visitors and staff. Greenspace has been shown to have therapeutic properties and the increase in users of this site suggests that it will form a significant part of the community in its own right that would benefit from its own supply of usable spaces. This could partly compensate for potential loss of semi natural space as a result of the development'.

9.14.3 Project Evolution/ Design Changes

Potential design changes which have implications for cumulative impacts are noted below:

Proposed changes	Potential impacts of design changes	Change in signifi- cance of impact
Change to physical composition of Adult and Children's Hospitals	Revisions to design of hospital build- ings may result in more significant cumulative visual impact	Neutral
Changes to construction programme	May result in changes to cumulative traffic impacts if coincides with construction of other major development projects.	To be assessed when information on construction programmes are available

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Summary Report May 2006

Children's Hospital Consultation Event

Prepared for Jim Whyteside NHS Greater Glasgow & Clyde, Dalian House, 350 St Vincent St, Glasgow G3 8YY

Contract No:



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1 Introduction

1.1 Background

In 2004 the Minister for Health allocated £100 million for a new children's hospital to be 'triple co-located' in Glasgow by 2010/11, i.e. where maternity, children's and adult acute services can all be located on one site. NHS Greater Glasgow (as it was called at that time) was asked to consider all possible sites within this timescale and an independent group, chaired by Professor Andrew Calder, was also established to support and advise the Board.

Both the Board and the Calder Group deemed the best site to be the Southern General campus and the Health Minister has accepted this recommendation. However, the Board must formally consult on the transfer of children's acute services to a new build hospital on the Southern General campus by 2010/11. NHS Greater Glasgow & Clyde (NHSGG&C) initiated consultation with the public and other stakeholders on 3rd Aril 2006 around the proposal for a new children's hospital in Glasgow. The consultation process involved an event for representatives of patients/parent organisations, charitable bodies and partner organisations to hear what the consultation is about and have an opportunity to give their views. This report summarises the issues raised by participants.

1.2 Objectives

The objectives of the event were simply:

- to provide an opportunity for representatives of patients/parent organisations, charitable bodies and partner organisations to hear more about the consultation; and
- to provide them with an opportunity to discuss the issues and give their views, which can be incorporated into the wider consultation process.

1.3 Approach

Potential participants were invited from the NHS Greater Glasgow & Clyde Involving People database in addition to the event being advertised on the website and in the local press. The event was held on Thursday 27th April 2006 at the Holiday Inn, Glasgow. It commenced at 6.30pm, with a duration of 2.5 hours. Approximately 80 participants attended, with some representation by young people.

Participants heard a series of presentations from NHS Greater Glasgow & Clyde staff to ensure they had some information before they participated in discussions. The speakers and the focus of their presentations are noted below.

- Morgan Jamieson, Medical Director, New Children's Hospital Project, gave some background to the consultation.
- Fiona Mercer, Planning Manager, Acute Planning Directorate, spoke of some of the issues around the consultation and the objectives to be met.
- Niall McGrogan, Head of Community Engagement, gave an outline of the plans for stakeholder engagement for the new hospital.

A short plenary was held following the presentations, where all those presenting and other relevant NHSGG&C personnel participated in the panel: Catriona Renfrew, Director of Corporate Planning & Policy; Dr Iain Wallace, Medical Director Women's & Children's Services; and Rosslyn Crocket, Director Women's & Children's Services.

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Participants were then split into five workshop sessions to consider the five themes presented within the consultation document, as follows:

- location;
- young people's services;
- ante-natal care in West Glasgow;
- emergency services for children; and
- long-term engagement.

Each workshop was facilitated independently by a consultant from FMR Research, with a NHS member of staff (those who had been on the panel) on hand to answer any factual questions. The exception to this was a dedicated workshop for young people, facilitated by Niall McGrogan of NHSGG&C and supported by FMR. All five workshops came together briefly at the end of the event to hear a brief re-cap from FMR on some of the key points from the workshop discussions.

This report provides an overview of the key points to emerge from the discussions.

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2 Key findings

2.1 Overview

This section raises the main issues and concerns to be raised by workshop participants at the event. It is structured around the five topics which each workshop considered over the course of an hour and a quarter or so.

2.2 Location of the new children's hospital

The consultation document states that the preference for the Southern General site is driven by two things:

- the location of adult and maternity services (only the Southern and the Royal will have both following the move from six to three adult inpatient hospitals);
 and
- land on site to accommodate a new build similar in size to the current hospital (the Southern is a big site with space for development whilst the Royal site is very tight for space – the only option would be a ten storey tower on top of a planned seven storey block, with no direct physical link to maternity, which would be unlikely to gain planning permission).

The consultation sought views on the site, with particular focus on any barriers to access which should be considered.

Nearly all participants were in favour of the concept of triple co-location of services and many felt that the Southern General was the most appropriate of the two sites for the children's hospital given the issues outlined above. This was not universally the case, however, with a few participants stating that they had not been convinced of the case for closure of either Yorkhill or the Queen Mother's prior to or at the event.

However, whilst the Southern General was overall perceived to be the most appropriate site of the two, it was not necessarily perceived to be in the best location in terms of access and other issues so there were a number of concerns expressed which participants felt must be addressed in order for this to work as well as the theory suggests it should.

2.2.1 Gold standard provision

Participants were very keen that the new hospital should be of as high a standard as possible, with combined elements to truly meet the aims of triple co-location, i.e. not just on the same site or even with linked corridors but for services for mothers, babies and children to be integrated as fully as possible.

2.2.2 Transport

There were significant concerns around public transport, or perceived lack of it, to the Southern General, in each of the workshops. This related to the number of options for public transport, the proximity of stations/stops, the connectivity of different forms of transport and the timing of services. For example, the nearest train station was considered to be Cardonald station but this is some distance away across the M8 and not readily accessible to all. If people are accessing the hospital via bus, many will have to take two buses (a lengthy and expensive process) or incur the expense of a taxi. Access was perceived to be a particular issue for those living in the north of the city, e.g. Drumchapel. The subway does not have disabled access, so it was suggested that this requires to be upgraded, along with Cardonald station. It was stressed that access must be provided at different times of day – early morning

through to evening, as is often not the case at present. Connectivity should be considered for those outwith Glasgow too. The new rail link to the airport and proximity to airport were both seen to be positive opportunities to build upon. It was suggested that buses going through the Southern General site and a train station at the site would be ideal and must be considered now to be incorporated into the plans.

Having said this, access to Yorkhill by public transport was also considered to be poor. Participants suggested that transport structures need to be developed in partnership between those providing services and those using them, in addition to dovetailing with wider regeneration projects on the river, for example. There was a call for a solid commitment to more direct transport to the Southern General site.

Participants recognised that those who would be accessing the hospital via public transport were more likely to be those with less disposable income. The suggestion was made that reduced cost travel could be provided to patients on the production of a letter or appointment card.

It was recognised by participants that many visitors will prefer to drive to the site, particularly if it is not easy to reach by public transport, and sufficient car parking to accommodate this must be taken into account when designing the new developments.

There was also some discussion around reducing environmental impacts and it was suggested that the new site should be 'bike friendly' as far as possible, with safe cycle routes to the hospital and somewhere to safely leave bikes once at the hospital. This was perceived to benefit staff, patients and visitors alike.

There was concern about the closure of the Clyde Tunnel (for repairs) and the impact this may have on those trying to access the Southern General site from the north of the city, particularly in emergency situations.

2.2.3 Signage

The lack of signage on the current Southern General site was also raised as an issue which requires to be addressed, so that anyone arriving on the site knows where to go. This was a particular issue with regard to A&E services for parents bringing children and ambulances (see later section on A&E).

The need for visual signage for D/deaf people was also highlighted, e.g. having visual signage linked to any audio intercom system. It was recommended by several workshops that organisations such as Deaf Connections should be consulted at the design stage to ensure these sorts of issues are taken into account.

2.2.4 Branding

The 'Sick Kids' brand was also raised by one of the workshops as being particularly strong in raising funds for the hospital and it was hoped that this brand would transfer to the new children's hospital.

2.2.5 Accommodation and support for families

It was noted in the main Q&A session that accommodation for families who need to be located near children who are staying in the children's hospital long term must be considered. The very close location of Ronald McDonald House and other services and the support provided by staff was very much appreciated and vital for families. (It was noted by NHS personnel that discussions were ongoing with the relevant current accommodation providers at Yorkhill and with housing associations local to the Southern General who may be able to provide accommodation locally.) There was a concern that the NHS might feel that housing associations could provide a similar standard of support to that available at present as the current services go far beyond

the provision of accommodation. Accommodation for briefer stays is found at Yorkhill in B&Bs, so this also requires to be considered early in the planning process.

2.2.6 Proximity to sewage works

The proximity of the Southern General to sewage works and the potential risks this may present was also raised. Medics present reassured participants that no links between sewage works and infections in this way had been proved. It was recognised that the related odour may not be pleasant but that this could now be addressed under new legislation (as it is now classified as a public nuisance).

2.2.7 Funding levels

There was a concern that £100 million was insufficient for a state of the art children's hospital in addition to upgrading maternity facilities at the Southern General. It was noted by NHS personnel that other new facilities have required a similar level of investment and £20 million has already been put aside to upgrade the maternity facility, so the £100 million will solely fund the new children's hospital.

2.2.8 Cognisance of other service changes in developing the new facility

It was noted by participants that other services are changing in Glasgow and the wider area, so the new hospital must take into account new models of care and reflect this in the way the hospital and its services are designed, for example with regard to bed numbers and the typical length of stay (assumed to be very short or very long and intensive rather than the couple of weeks for minor procedures of the past).

2.3 Expansion to provide services for young people up to 16 years old

The children's hospital at Yorkhill treats children up to the age of 12 currently and the consultation document proposes that the new children's hospital treats young people up to the age of 16 years. New models of care will be considered in addition to the physical environment, aiming to smooth the transition for young people with chronic health problems to adult services. The consultation sought views on this change.

2.3.1 Agreement to expansion

Participants clearly recognised that young people aged 13 – 16 were not children or adults and so required services tailored to their own needs. Many teenagers' needs were considered to be more closely aligned to children's than adults so there was support for the age group to be extended to 16 (or even 18 and beyond in some instances) for the new children's hospital, provided it is recognised that they are not children and their needs are different to the under 12s.

2.3.2 Comments on provision

A number of suggestions were then made on how services should be provided for young people. For example, this might include the facility to make toast or tea if they wanted, or to have a choice of meals appropriate to them. It was considered to be key to make the environment in which they are treated to be as comfortable, welcoming and as much like 'home' as possible. A separate lounge for them to relax in was also requested (from a participant who had asked young people what they wanted).

The number of young people who were in isolation was also raised, with a request to consider other facilities such as PC and broadband connections for them to access at their bedside.

Others requested drop-in facilities, like a youth club, at night time where young patients can speak to someone and can build their self esteem, etc. "in a club type environment, not a medical environment". It was suggested that youth work could be conducted in hospital as ill young people have other issues they may wish to address too. Having company when doing things was seen to be really important to young people, including things targeted specifically for teenagers, not just younger children. Young people considered there to be a need for this kind of provision on the ward in addition to any other specific rooms for them, as sometimes they cannot leave the ward because of their treatment. Simple things like having appropriate magazines were also suggested as making a big difference.

Younger patients were often seen to get preferential treatment in terms of activities but also meals – for example, they choose first so older patients have no choice and have to take what is left. Catering portion sizes were also considered to be too small for teenagers: "I think they should be made a lot bigger because all you are getting is sandwiches, a packet of crisps and a yoghurt and a wee small carton of juice and that's it for teenagers, they need a lot, lot more for lunch and dinner".

The point was made that wards currently have a mix of age groups and teenagers find it difficult enough to sleep without toddlers/babies on either side of them crying in the night. It was requested that this is taken into consideration when designing the new hospital.

2.3.3 Special and complex needs

The point was made that children and young people with learning disabilities or very complex needs also need to be considered – 16 may be an artificial cut-off for them to move to adult services. This was particularly an issue for those whose chronological age is 16+ but their needs may still be better met in a young person's facility rather than an adult one, with continuity of care from those who understand their condition.

2.3.4 Cancer treatment

The suggestion was made that the Teenage Cancer Trust (TCT) should be approached with regard to building a unit within the new hospital, as there was meant to be a TCT unit at Yorkhill but this was put on hold pending the move.

2.3.5 Widening of services

One workshop raised the issue of the need for different services to be provided if the age group is raised, for example there was a view that sexual health services may require to be provided and this will have an impact on staffing. This was seen to have benefits in other ways, however, as services such as sexual health and mental health which young people may find difficult to access in a stand alone setting (because of stigma) they could access in a facility which treats many other issues.

2.3.6 A&E implications

Allied to the following section, there were expressed concerns around the age group of access to the A&E. It was suggested that the increase in age will present different problems at the children's A&E (participants were thinking particularly of drug or alcohol induced violent behaviour by young people). Other participants were reassured to hear that children would be treated in a separate A&E to adults who may behave violently, with particularly reference to alcohol and drugs, so this is a difficult issue to address satisfactorily.

2.3.7 Transition to adult services

Regardless of the upper age limit at the children's hospital, the point was well made that the transition to adult services must be managed well.

2.4 Views on emergency services for children

The strategy for Accident & Emergency (A&E) services in Glasgow is for adults to be served by the Royal Infirmary and the Southern General, with children having a dedicated children's A&E at the new children's hospital. All adult sites (Victoria, Stobhill, Gartnavel, etc.) will have Minor Injuries Units and children can go to these for sprains, minor burns, stitches, etc., where they will have quick, local access to staff trained to deal with children and young people during the day. More major injuries and illnesses will be treated at the children's hospital A&E, which will also have a local catchment for minor injuries. This consultation sought feedback on this.

2.4.1 Education and awareness

A key comment to emerge from the discussions was "how will parents know what is a major and what is a minor injury?". There was considered to be a real need for education/awareness raising so that parents know where to go if their children require treatment: "people are inclined to panic if there is something wrong with a child, it is just a question of information".

2.4.2 Signage

Signage was raised as a general point but also as a very specific point with regard to A&E services – it was perceived that when people are rushing to have their injured child attended to they will not necessarily pick up on whether signs are for adult or children's services. This suggested the need for A&E services for children's A&E services to be sited next to adults. Participants were clear that they can have separate doors and separate facilities but should not be at different ends of the campus.

2.4.3 Staff skills

The point was made that "children are not just mini adults, they need very complex types of treatment" so there was concern that staff should have appropriate skills, particularly in the Minor Injury Units across the city. This point was linked to one made around the re-organisation of health services across Scotland, where hospitals are becoming larger and so the new children's hospital will not appear as large in comparison to other local hospitals. It was therefore commented that perhaps the new generation of local hospitals will have more specialist paediatric care than is currently the case. In any case, it was suggested that the increasing use of tele-medicine will have an impact on the location of treatment versus input from specialists at the new children's hospital.

It was noted that the Kerr Report stated that all children up to the age of 16 should be treated in an appropriate children's setting but that the Minor Injuries Units would deal with children. The real concern about this focused on the lack of skilled staff, given that "sick children's nurses are at a real premium" and staff would be required for the specific children's A&E at the Southern.

2.4.4 Changes in adjacent areas

It was noted that A&E services are being changed in Lanarkshire and requested that these changes are taken into account when designing the new hospital.

2.5 Ante-natal care in west Glasgow

With the transfer of services from the Yorkhill campus, alternative arrangements need to be made for expectant mothers in the west of the city and this will be addressed in detailed planning for the closure of the Queen Mother's Hospital. This consultation also sought views to inform this planning process. There was less discussion on this issue, partly because there were strong views on the other aspects of the consultation and also because it was known that it would be addressed more fully at a later date.

2.5.1 Don't lose current good practice

A key point to emerge from discussions was that the positive aspects of current provision must not be lost when designing new provision in this area. The antenatal services provided at the Queen Mother's were considered to be "hard to better" and participants were keen that expectant mothers' needs were met fully in the transition and important appointments were not missed and women know where they are meant to be going.

2.5.2 Community midwife provision

Confidence was also expressed in the skills of midwives, which participants felt should be maximised within the community setting throughout the city, not just in the west. "In this day and age women should not be trailing back and forward to an acute site or a maternity hospital for basic care, midwives could do it."

This could perhaps be facilitated via GP surgeries, as people were keen to "keep it local" for example like the current service at Rutherglen Health Centre, although it was recognised that space is tight given the increase in services provided locally now. Other opportunities for local antenatal care which may be appropriate to maximise include the Children's Centre which was recently announced by the Health Minister for Drumchapel. This was seen to be particularly relevant for more vulnerable members of the population.

2.5.3 Targeting need

It was suggested that the population/deprivation statistics should be considered when looking at what services would be provided in what locations, to ensure that priorities are targeted appropriately. For example, the west end has the highest proportion of breastfed babies but adjacent areas have amongst the lowest.

2.6 Long-term engagement

NHSGG&C recognises that a range of different people (individuals, patient representatives, voluntary organisations, children's charities, partner agencies, etc.) will wish to be involved in the development of the new children's hospital and must be involved to ensure that it meets needs as fully as possible. This consultation initiates the process but also sought views on how stakeholders should continue to be involved. A number of issues emerged from the workshops, as follows.

2.6.1 Timescales and publicity

The amount of notice given to groups to attend events/respond to consultation documents was considered to be far too short and this requires to be addressed in future. Some groups meet at four to six week intervals so invitations to participate/respond need to take this into account. Allied to this, there is often perceived to poor publicity about such events and consultation generally. For example, a participant had not seen any posters about the event/consultation in Yorkhill Hospital – an obvious place to target interested stakeholders. Posters in NHS

premises (hospitals, GP surgeries) and other workplaces were suggested as a means of improving publicity and therefore participation levels.

2.6.2 Harder to reach groups

It was recognised that some minority groups are harder to reach than other stakeholders so the consultation process needs to work harder to ensure they are included. This means that any engagement should reflect a diversity of approaches to ensure that there is something to suit different sorts of stakeholder. The event format of the evening was welcomed, although participants did not feel it would be appropriate for all target groups. It was suggested that existing structures which are in place to access the views of particular groups should be utilised as far as possible. For example, it would be useful to access the views of D/deaf people via Deaf Connections.

2.6.3 Building on current practice

It was recognised that there are already ways to engage with children and young people at Yorkhill, so this should be utilised and built upon rather than starting from scratch. User participation was perceived to be particularly important for longer term users of the children's hospital, e.g. renal or cardiac patients. A radio phone-in for Radio Lollipop was also suggested, or someone going around the children in the hospital asking them what they would like the new hospital to be like. However, others did not think Radio Lollipop was well used as the equipment wasn't consistently good at bedsides and it was perceived to be pitched to a younger age group, not teenagers.

It was acknowledged that other structures exist for young people to give their views and these should also be tapped into. The role of schools and school councils was raised as an obvious route to access young people's views on the design and provision of services, possibly involving an educational element with teacher input. A benefit of this is that the NHS is not relying on children and young people to come to them to give their views (which we know is harder to achieve) as the NHS is going to them, where they already are.

Links to the National Youth Parliament and national youth agencies were also suggested as worthy of exploration. It was also suggested that the Commissioner for Children and Young People may be worth talking to, to learn from her experiences in engaging with children and young people.

2.6.4 Mechanisms appropriate to young people

Niall McGrogan has spoken of engaging with young people via text, etc., as this is how they prefer to communicate and this was encouraged by participants. Use of mobile phones is obviously restricted in hospitals at present, so this needs to be considered. It was noted in the young people's workshop that a website, with chatroom facility, is being developed for and by young people using Yorkhill to improve access to information and networking. A newsletter is also in development, again written and produced by young people, which should be out this summer.

2.6.5 Learning from other areas

The young people's group suggested going outwith the UK to learn what works well in other countries, either by web links (like the recent link to Dublin for the Christmas party) or physical visit. It was seen to be critical to involve children and young people in the design of the new hospital, requiring liaison with architects. It was suggested that the building should look different from other hospitals, e.g. "Balamory colours!"

2.6.6 Advocacy

Participants highlighted that some young people who would use the new hospital would not be able to give their views, with a request that their parents and siblings are involved in the process as their advocates instead.

2.6.7 CHCPs

Participants recognised that CHCPs would have participatory structures at local level but it was also important to involve those who actually use the service and their families.

2.6.8 Staff input

The views of staff were also perceived to be very important to the development of the new hospital, in addition to patients and parents. It was noted that this should go beyond the Women and Children's Directorate.

2.6.9 Trust and responsiveness

Participants clearly felt that they had been asked to give their views on NHS proposals before but had not been listened to, as the final version of strategies and plans for developments did not take comments made into account. It is vital that the new children's hospital listens to the comments and suggestions made during the consultation process and demonstrates that it has used that feedback in order to refine and inform future plans. Many communities of interest feel that they have been "consulted to death" but not listened to – not a situation which will result in continued engagement.

2.7 Additional comments

A number of other comments and suggestions were made at the event which do not necessarily fit into the five topics listed above. These are noted below.

- There was a perception that the decision to move the children's hospital to the Southern General has already been made, regardless of people's views.
- It was suggested that there is a need for a drug rehabilitation unit for babies/small children and that the existing Yorkhill/Queen Mother's site could be used for this purpose. Representation has been made to Tony Blair on this matter and he has passed this on to the Scottish Executive who have responded that they are considering it.
- The comment was made that Community Councils had not been invited to other meetings about the closure of Yorkhill, e.g. at St Andrew's Square, and others commented that insufficient notice was given to Community Councils of this event.
- The point was made that Yorkhill currently has a fast track system for patients who need to get into hospital quickly, without having to go through A&E first and it is important not to lose this.
- It was requested that the new children's hospital has better beds, which children cannot fall out of and hurt themselves (as is currently the case at Yorkhill).
- The catchment of the maternity unit at the Southern was also queried, with particular reference to the Clyde area now adopted by NHS Greater Glasgow.

- It was considered that the triple co-location may make this a more attractive maternity hospital to give birth in and so may present capacity issues.
- There was some comment that the planned reduction in number of maternity, A&E and other acute hospitals in Glasgow is too much of a reduction. It was suggested that Gartnavel requires an A&E but could also accommodate a maternity hospital on the site. This was considered to be the case by some because of the scale of Glasgow's population and others because of accessibility the North/West was not perceived to be served sufficiently well in terms of acute provision in the new plans.
- There was also some comment on the quality of ambulances run by the Scottish Ambulance Service, not passing OFCOM standards and the Glasgow area not having sufficient vehicles for its needs.
- A number of participants were very keen to talk about the closure of the Queen Mother's and the impact this would have on maternity services, mothers and babies and the existing children's hospital. This was emotively described as "the severing of the umbilical cord" and there was significant concern that the decision had been taken to close the Queen Mother's without having plans in place to ensure continuity of service provision and safety for mothers and babies.

3 Concluding comments

The event on 27th April 2006 comprised one of several different means of consulting stakeholders on the proposals for the new children's hospital and this consultation process is just the start of an extensive period of engagement on the issue. The key points to be made at this stage are summarised below.

1. Location of the new children's hospital

Whilst there was support for the concept of triple co-location, and the Southern General was perceived to be a more sensible option in terms of site capacity, etc., than the Royal Infirmary, the location of the Southern General was a concern for many participants.

Transport was perceived to be a critical factor – public transport is not perceived to be good now to either the Southern General or Yorkhill. Participants urged this to be considered as early in the planning process as possible, working with users of the services as well as providers to ensure integrated public transport is provided directly to the hospital, at appropriate times of day. Car parking must also be considered, as should access for cyclists.

Signage must also be addressed on such a large site, particularly with regard to A&E services and to be accessible to all.

The 'Sick Kids' **brand** was perceived to be particularly strong with regard to fundraising and this should be retained.

Accommodation and support for families is provided locally and well at present and participants wish to see this continue for those with both long and short stays. This is about more than just accommodation – additional support to families is vital.

There was some concern about the proximity to **sewage works** at the Southern General with regard to potential infection (reassured by NHS personnel) and odour.

There were also some concerns about the level of **funding** available in order to upgrade the maternity hospital in addition to building a new children's hospital, to ensure that the new hospital really is 'gold standard'.

There was recognition that **other services are changing** so this must be taken into account when designing the services and facilities for the new hospital.

2. Expansion to provide services for young people up to 16 years

Participants were in **agreement** that the age limit for those treated at the new children's hospital should be increased to (at least) 16 years of age. There were a number of suggestions on how this should be provided, for example as much like home as possible, with separate areas for young people to meet, with some degree of freedom to make tea/toast, drop-in facilities, having PC/broadband access for those in isolation, appropriate magazines, increasing catering portions, considering the allocation of beds by age group.

Some young people have **special and complex needs**, and it was requested that 16 should not be a hard and fast cut-off if their needs could be better met in a young person's facility rather than an adult hospital.

It was requested that the **Teenage Cancer Trust** be approached with regard to a unit in the new hospital, as this has been on hold pending the move from Yorkhill.

Participants recognised that **additional services** may require to be provided if the age limit is increased, e.g. to include sexual health services. This may have additional benefits as participants suggested young people may feel more comfortable attending a general hospital for issues which may carry stigma, e.g. sexual or mental health.

Consideration was also given to the fact that increasing the age group would have an impact on the **types of problems presenting to A&E**. If people are more comfortable that children attend a separate A&E and are not exposed to difficult adult behaviour (alcohol or drug induced in particular), this presents a challenge as older young people may well present with similar issues.

Regardless of the age limit at the new children's hospital, participants clearly stated that they wished the **transition to adult services** to be as seamless as possible.

3. Views on emergency services for children

The key comment to emerge from the discussion focused on **education and awareness**: how would people know what was a major or a minor injury and therefore where to take their child?

Signage was an issue for people with regard to A&E – on entry to the site, it must be clear where to go and it was suggested that adult and child A&Es be sited next to each other to avoid confusion.

Specialist skills to work with children were highlighted as a concern, particularly as there was perceived to be a shortage of these at present. These are required in the new children's hospital, the children's A&E and Minor Injuries Clinics across the city.

Changes to A&E services are also being introduced in **neighbouring areas** and it was requested that these are taken into account when designing the new hospital.

4. Ante-natal care in west Glasgow

It was considered to be key **not to lose current good practice** exhibited by the Queen Mother's and not to 'lose' any women from the system during the transition period.

Community midwives were rated highly and their skills should be maximised across the city, perhaps learning from current experiences in Rutherglen. It was suggested that population and deprivation statistics are taken into account in order to target services most appropriately.

5. Long-term engagement

A number of points were made with regard to long-term engagement around the new children's hospital. The **timescales** for consultation and **publicity** to raise awareness of events such as this were criticised, as many community groups meet infrequently and no notices had been seen in Yorkhill, for example.

Any engagement must recognise that one size does not fit all, so **harder to reach groups** may require to be engaged with in different ways. Existing structures should be used to ensure that minority groups' views are incorporated, e.g. via Deaf Connections.

Whilst this is the start of the engagement process, there is already engagement with children and young people so **current practice should be built upon** rather than

replaced/duplicated. This includes existing practice at Yorkhill and other structures such as schools/school councils, the Youth Parliament, national youth agencies, and learning from other relevant stakeholders such as the Commissioner for Children and Young People, etc. Participants were reassured to hear that young people will be engaged by **means appropriate to them**.

Young people were keen to **learn from other areas** and participants generally were keen that children and young people are involved in the design of the new hospital. Where children or young people cannot do this themselves, then parents and siblings should be involved in the process as their **advocates** instead, rather than just relying on other participatory structures such as those at the CHCP level.

Staff views were also perceived to be critical to ensuring the new hospital meets needs, and this must go beyond the Women and Children's Directorate.

Critically, there is a view that communities of interest have been consulted to death, but not listened to so there is a **lack of trust** that engagement will be worthwhile. NHSGG&C must clearly demonstrate that it has listened and adapted plans accordingly.

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Brookfield

Ventilation and Air Treatment Design Strategy

Purpose of ventilation

Ventilation in the healthcare environment can be naturally or mechanically driven and serves a number of purposes which can be summarised as follows:

Providing fresh air for normal respiratory purposes Diluting the level of CO² in the space Removal of odours and pollutants Control of temperature and humidity Control of infection Specialist process requirements Occupants experience a feeling of wellbeing

The use of natural ventilation will minimise the need for energy to drive fans. However many clinical requirements, in for example Operating Theatres, necessitate the use of mechanically driven ventilation for close environmentally controlled spaces and departments having high equipment heat gains. Furthermore, despite carefully considered planning, building constraints invariably lead to spaces that do not have access to natural ventilation.

The other major consideration with regard to the ventilation strategy for the building is the construction. The thermal mass and 'u' values or thermal characteristics of the structure have been carefully selected as they determine the optimum thermal lag of the building which controls the rate of heat transfer into the space and therefore how quickly the space may overheat.

Studies have been carried out into particular areas of the hospitals – wards, for instance, which make up a significant proportion of the hospital – to determine whether natural ventilation can be employed to achieve the purposes as set out above, within the targets set down by the Board in the ITPD documents.

Use of natural ventilation

As indicated above the main benefit of employing a natural ventilation strategy in a hospital building is the reduction in energy consumption. Windows aid a feeling of connection for the occupant with the outside world and manual opening can increase the perception of control over their internal environment.

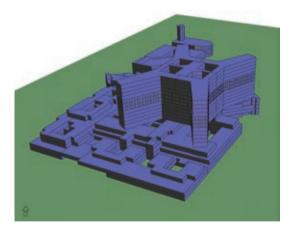
However there are a number of situations in which natural ventilation may not be suitable or desirable. The ventilation solution needs to take into account a number of local factors, which include, but are not restricted to, the following:-

- Air permeability Building Regulations now legislate for the airtightness of buildings in order to help reduce heating requirements by minimising the uncontrolled infiltration/exfiltration of external/conditioned air.
- Outdoor air quality The quality of outdoor air needs to be considered when determining the use natural ventilation where treatment of the incoming air is not available.
- Indoor air quality Natural ventilation from windows on the external face of the building will only be effective internally for a zone of 5-6m from the openings.
- Pollution In addition to common airborne pollutants, the site is susceptible to other sources of pollution including the noise and downdraft from the emergency helicopters landing on the helipad and the odour from the nearby sewage works.
- Thermal comfort The disadvantages of natural ventilation include the increased risk of overheating in summer and low external temperatures in winter may discourage the opening of windows. Both situations will lead to poor air quality if insufficient ventilation is provided.

As stated above the new hospital building will contain departments or some rooms within departments that have to be mechanically ventilated however consideration has been given to naturally ventilating the maximum possible number of areas. The analysis below has concentrated on the option of naturally ventilating the wards as they form a large proportion of the building.

Analysis of the ventilation strategy for the building

The Building Regulations recommend acceptable limits for overheating based on the number of hours experienced per year over a limiting temperature. However, the analysis has been based on an amendment to the ITFD documents which stated that the overheating threshold was to be set at '50 hours per year above 26°C'. A virtual 3-dimensional thermal model has been produced, as shown below, based on the floor layouts and the thermal mass and properties of the selected constructions. Using the model extensive thermal dynamic modelling has been undertaken to determine the rooms in which overheating is likely occur.



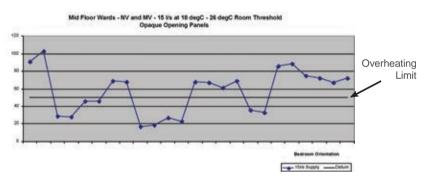
The thermal modelling has concentrated on the typical ward layouts on the 3 mid-tower floors and three top-floor wards and specifically considered two adjacent ward bedrooms located on each face of the tower. In association with the thermal modelling, daylight simulation calculations have been undertaken as part of a strategy to achieve a BREEAM 'Excellent' rating for the new hospital. These calculations determined the optimum window sizes required for the daylighting percentage. Due to the low envelope air permeability mechanical make-up ventilation

Brookfield

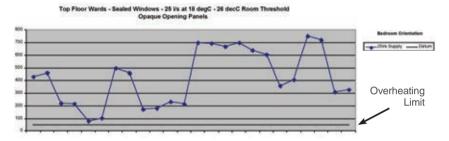
is provided to the bedrooms to match the extract from the adjacent bedroom en-suite toilet/shower rooms. This adds the benefit of being able to condition this air, particularly in warm weather, to assist in reducing overheating.

Below are two examples of simulations that were carried out to reach a final solution, however, these are the culmination of many other simulations carried out using differing design criteria and options.

A simulation for the three mid-tower floors was undertaken with the bedroom mechanical ventilation set to 15 litres per second at 18°C supply air temperature to provide only sufficient make-up air for the en-suite extract together with natural ventilation provided via an opaque 200mm high opening louvred panel. A full height section of high performance glazing was used on all the elevations. The results in the graph below show that overheating would be experienced on approximately 60% of the elevations:



A similar simulation of the three top-floor wards was undertaken with mechanical ventilation set to 25l/s at 18°C supply air temperature. There is no natural ventilation provided via the full height section of high performance glazing or the opaque section as all the windows were sealed to avoid nuisance from helicopter noise and downdraft. The results in the graph below show that overheating would be above the threshold on a 100% of the elevations:



Odour Control

The issue with the problem of odours from the adjacent sewage works in association with the design of the mechanical ventilation has been addressed with the provision of carbon filters on the fresh air side of the air handling units.

Conclusion

Both sets of results show that in the wards a mixed mode, natural and mechanical ventilation combination, together with optimising the glazing area and type does not provide the solution to meeting the overheating criteria in the majority of the rooms. It is proposed that all ward rooms be provided with a means of mechanical cooling in the form of an active

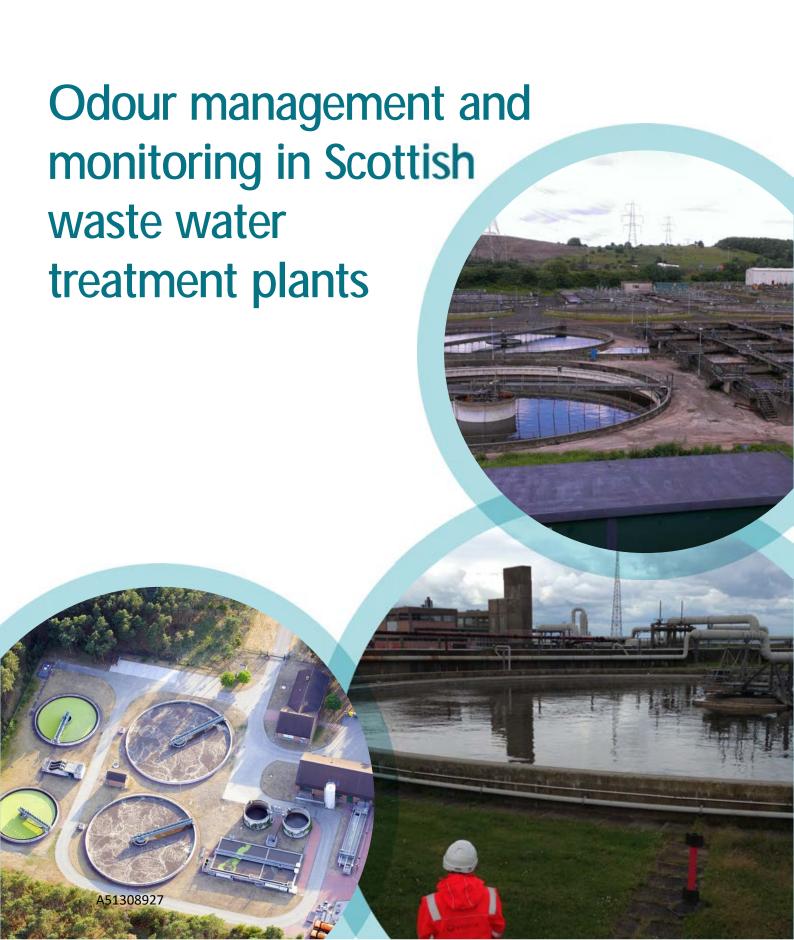


chilled beam as pictured below. The active chilled beams operate most effectively with the windows sealed as this reduces the likely hood of condensation.

It is envisaged that generally only small perimeter non clinical rooms with low occupancy and low heat gains will be able to be solely naturally ventilated. Other similar but larger more densely populated rooms will employ a mixed mode system. Then as stated above the majority of the clinical spaces will be mechanically ventilated or mechanically or air conditioned.

With the overheating design target set at '50 hours per year above 26°C' and the summer external design temperature also 26°C the target is an onerous one to achieve with natural ventilation. In progressing the ventilation design strategy a number of calculations have been carried using '50 hours per year above 28°C' (in accordance with the guidance in SHTM 03-01) as the target and it has been found that the mixed mode method is a feasible solution in the majority of the ward rooms.







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Executive Summary

Background

Wastewater treatment works in Scotland have evolved substantially in the past 20 years. During the 1990s, major investments were made to comply with the Urban Wastewater Treatment directive. These investments were designed to protect the environment from the adverse effects of urban waste water discharges, and were not specifically focused on odour control. Odours continued to present issues at some sites, and in 2005, a statutory Code of Practice (CoP) for odour control at sewage works in Scotland was published by the Scottish Executive.

Sewage works operators have been working under the CoP since the implementation of the Sewerage Nuisance (Code of Practice) (Scotland) Order in April 2006. At the same time, a number of sites have moved into private sector operation under the Private Finance Initiative (PFI). These changes have delivered ongoing improvements in odour performance. However, odours continue to be reported by local communities living close to some sites. Consequently, CREW has commissioned this project on behalf of Scottish Government, with the aim of reviewing and identifying good practice for odour management and monitoring at wastewater treatment plants in Scotland.

The full report is available from the CREW library at http://www.crew.ac.uk/publications.

Research undertaken

The focus of the project was firstly to draw together and

summarise existing statutory and non-statutory guidance on odour control relevant to sewage works in Scotland. Additional research was carried out to investigate the existence of potentially relevant odour monitoring and control methods, so that any new methods could be integrated into the analysis. Based on this, a "site odour potential framework" was developed to enable appropriate odour controls to be identified for an individual sewage works.

Detailed discussions were then held with facility operators and with local authority officers responsible for regulating odours associated with sewage treatment works in Scotland. Five specific sites were evaluated (Shieldhall, Ardoch, Dalmuir, Seafield and Levenmouth). The odour controls in operation at these works were evaluated against the controls that would be expected at these sites based on the odour potential framework. The odour performance of these sites gives an insight into the effectiveness of the controls applied. Based on this discussion and the supporting information, a streamlined guide to management of odours at sewage works in Scotland was development. This was designed to enable effective odour management techniques to be identified, taking into account the odour potential of individual sites.

An odour management and monitoring workshop consisting of representatives from Scottish water, regulators representing a number of local authorities, and operators was held. Feedback from the workshop has contributed to this report.

Recommendations

The analysis highlighted 10 principles for effective management of odours

Effective site management is fundamental to good control of odours.
Effective treatment of odour & sludge is likely to result in minimal odours.
Careful attention to siting can be helpful in minimising odour risks.
Good housekeeping is an essential & low-cost means of minimising odours.
It is important to understand the nature and variability of influent.
Engagement with the regulatory authorities is important for managing odour incidents.
Engaging with the public, both individually and via elected representatives, is important.
Any sewage works is likely to benefit from an Odour Management Plan.
Odours are particularly likely to arise at locations on the works where sewage is agitated or aerated.
Operators should have a contingency plan in place to deal with fluctuations in influent flows, stormwater surges, failure of key plant, changes in wind direction etc.

A matrix was developed which can be used to assess a site's odour potential. This leads on to identification of appropriate odour management measures depending on the likelihood of odours occurring at the site.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)		
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.				
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains				
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing				
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 properties within 750 metres	More than 200 properties within 750 metres				
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres				
History of genuine complaints	5	Fewer than 10 genuine complaints per year	10 to 50 genuine complaints per year	More than 50 genuine complaints per year				
Very low potential: Less than 65								
Low potential: 65 to	Total weighted							
Medium potential: 8	Medium potential: 81 to 95							
High potential: More	e than 95							

Depending on the odour potential of a particular site, an appropriate range of odour management measures can be identified, from a wide range of potentially effective measures under the following headings:

- Odour control through process management
- Odour control through site management
- Odour control through low cost measures
- Odour control through capital investment measures
- Odour control through monitoring
- Odour control through stakeholder and public engagement

Guidance is provided on the specific measures likely to be appropriate for an individual site, depending on its odour potential. More extensive odour control measures are likely to be appropriate at sites with higher odour potential.

This was exemplified through consideration of five case study sites with a range of odour potentials and features of interest.

Key words

Odour, sewage works, sewage treatment, wastewater treatment, abatement, nuisance, guidance

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1.0 Introduction

1.1 Context

Wastewater treatment works in Scotland have evolved substantially in the past 20 years. During the 1990s, major investments were made to comply with the Urban Wastewater Treatment directive. These investments were designed to protect the environment from the adverse effects of urban waste water discharges, and were not specifically focused on odour control. Odours continued to present issues at some sites, and in 2005, a statutory Code of Practice (CoP) for odour control at sewage works in Scotland was published by the Scottish Executive¹.

Sewage works operators have been working under the CoP since the implementation of the Sewerage Nuisance (Code of Practice) (Scotland) Order in April 2006. At the same time, a number of sites have moved into private sector operation under the Private Finance Initiative (PFI). These changes have delivered ongoing improvements in odour performance. However, odours continue to be reported by local communities living close to some sites. Consequently, CREW has commissioned this project on behalf of Scottish Government, with the aim of reviewing and identifying good practice for odour management and monitoring at wastewater treatment plants in Scotland.

The project comprised a literature review and extensive consultation with process operators and regulators at a range of sewage works across Scotland. Based on this analysis, a number of principles for effective odour control have been developed. We have gone on to develop a "site odour potential framework" to enable appropriate odour controls to be identified for an individual sewage works. We have looked in detail at five case study sites, and evaluated the odour controls in operation at these works against the controls that would be expected at these sites based on the odour potential framework. The odour performance of these sites gives an insight into the effectiveness of the controls applied.

1.2 Legislative and policy context

The legal framework for odour control is set out in the Scottish Code of Practice for sewage works,¹ from which the text below is adapted.

The two primary methods of regulatory control of odours are Statutory Nuisance and IPPC. The controls applied by Statutory Nuisance are largely reactive (they only allow action where a nuisance exists, or is likely to exist or recur). The powers under IPPC are proactive (that is they allow the permitting of processes by establishing conditions for all aspects of the design, operation and management of processes). However, they only apply to certain aspects of some WWTWs.

1.2.1 Statutory Nuisance

The starting point for odour control is set out in Part III of the Environmental Protection Act 1990. This requires that operators of WWTW must not cause a Statutory Nuisance due to odours. These provisions are enforced by local authorities. If a local authority is satisfied that a Statutory Nuisance exists, or is likely to occur or recur, the authority must serve an Abatement Notice. The person on whom an Abatement Notice is served has the right of appeal to the sheriff. Grounds for such an appeal include:

- that the Notice is not justified (i.e. no nuisance exists)
- that the authority has refused to accept alternate means of compliance to those specified in the Notice
- that the time limit specified for compliance is insufficient

- that the 'best practicable means' (BPM) have been used to prevent or counteract the effects of the nuisance. If this defence is used, it is for the WWTW operator to establish that BPM was used. It is ultimately a matter for the Courts to determine whether in a particular instance the controls adopted are reasonable or the costs are excessive taking account of local conditions and characteristics of the odour nuisance. BPM is interpreted by reference to the following provisions:
- (a) "practicable" means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;
- (b) the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;
- (c) the test is to apply only so far as compatible with any duty imposed by law;
- (d) the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances

If a local authority considers that service of an abatement notice would afford an inadequate remedy, the local authority can taking proceedings in the Sheriff Court or the Court of Session to seek an interdict. Finally, the Environmental Protection Act 1990 allows an individual aggrieved by the existence of a Statutory Nuisance to seek an order from the Sheriff to abate and prohibit the recurrence of the nuisance.

The Statutory Nuisance regime does not provide for the complete avoidance of odours, or even for the complete avoidance of odour nuisance. It requires that odour nuisance should be avoided, and if they occur, that BPM should be used to prevent their occurr2.2ence or recurrence.

1.2.2 Pollution control legislation

A small number of WWTW in Scotland fall under the Integrated Pollution Prevention and Control (IPPC) regime and are regulated by the Scottish Environment Protection Agency (SEPA) under the Pollution Prevention and Control (PPC) Regulations. These Regulations require that operations for the treatment of waste are subject to the IPPC regime, including for example:

- (a) The disposal of hazardous waste (other than by incineration or landfill) in a facility with a capacity of more than 10 tonnes per day.
- (b) The disposal of waste oils (other than by incineration or landfill) in a facility with a capacity of more than 10 tonnes per day.
- (c) Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by
 - i. biological treatment or
 - ii. physico-chemical treatment.
- (d) Making solid fuel from waste using any process involving the use of heat, other than making charcoal

Permits set under the IPPC regime will normally contain a condition stating: "All emissions to air from the permitted installation shall be free from offensive odour, as perceived by an authorised person, outside the site boundary." Again, this does not guarantee an odour free environment, but if fully implemented would avoid offensive odours at offsite locations.

Scottish Executive, "Code of Practice on Assessment and Control of Odour Nuisance from Waste Water Treatment Works," April 2005, Paper 2005/ 9

² SEPA and Natural Scotland, "Odour Guidance," Version 1, 2010

1.2.3 Waste management legislation

Any WWTW importing controlled waste such as sludges, septic tank sludge or screenings from out with the curtilage of the works is required to hold a Waste Management Licence (WML) under Waste Management Licensing (Scotland) Regulations 2012. The standard condition used in WML odour conditions is 'Waste operations shall be carried out so that offensive odours from the site as perceived by an authorised SEPA officer, do not become detectable beyond the boundaries of the site.' There are around 10-20 sites holding a Waste Management Licence in Scotland.

Some sites importing controlled waste can apply annually to SEPA for a Paragraph 10 exemption for the 'reception and treatment of specified waste at a water/sewage treatment works' if they meet the relevant criteria such as ensuring that waste is managed without endangering human health and without using processes or methods which could harm the environment and in particular without:

- (a) Risk to water, air, soil, plants or animals; or
- (b) Causing nuisance through noise or odours; or
- (c) Adversely affecting the countryside or places of special interest;

Registering a Paragraph 10 exemption exempts the sites from the requirement to hold a Waste Management Licence. Around 40 sites in Scotland currently have a Paragraph 10 exemptions registered.

1.2.4 Planning control legislation and guidance

Development of new WWTW, and modifications to existing sites, require planning permission. The Code of Practice refers to National Planning Policy Guideline (NPPG) 10–Planning and Waste Management. However, this has now been withdrawn, and there is no specific reference to WWTW in Scotland's Third National Planning Framework. Advice is set out in Planning Advice Note (PAN) 63-Waste Management Planning, and PAN 51-Planning and Environmental Protection, which sets out the relationship between planning and environmental controls.

In cases where WWTW come under the control of IPPC, the IPPC permitting process should be used to ensure that control measures are implemented to avoid the creation of odour nuisance. Where WWTW are not subject to IPPC control, the careful use of planning conditions to require inclusion of odour control measures and to establish operating conditions may be appropriate.

PAN 51 states that where the possibility that the release of smell might result in nuisance or loss of amenity from a proposed facility subject to planning control, this may be regarded as a material consideration for planning reasons. There is also a need to carefully consider the proximity of proposed new development to existing WWTW, as this can lead to significant problems.

Under the Environmental Assessment (Scotland) Regulations 2011, proposals for WWTW may require an Environmental Impact Assessment (EIA) to be carried out in support of any planning application. Larger WWTW (in excess of 150,000pe) fall under Schedule 1 of the Regulations and therefore require an EIA. Smaller sites (in excess of 1,000 square metres area) are covered by Schedule 2 of the Regulations and would require to be screened to establish whether they were likely to have significant environmental effects. If this proves to be the case then an EIA is required.

If a planning authority decides that a statutory EIA is not required, it is still open to the authority to use its powers under article 13 of the General Development Procedure Order to request additional environmental information.

1.3 Structure of the guidance

This guidance is described to enable a sewage works to be evaluated in order to establish a level of odour control which is likely to be appropriate.

- Chapter 2 provides a matrix to enable a preliminary assessment of odour potentials to be carried out.
- Chapter 3 describes the key sources of odour at sewage works. The report goes on to describe an appropriate level of odour management, control and monitoring which experience shows is likely to be effective in managing odours at sewage works in Scotland. This chapter provides a list of odour control measures, and identifies what measures would be appropriate for consideration at sites with a range of potential for causing odour problems.
- Chapter 4 describes five case studies of sewage works in Scotland. Supporting information for these case studies is provided in Appendix 1.

1.4 Who is the guidance for?

This guidance is for:

Regulators:

- local authorities, who should have regard to the guidance when dealing with odours under the statutory nuisance regime and the Code of Practice;
- the Scottish Environment Protection Agency (SEPA) in relation to odours from sewage sludge processing

Operators who are best advised also to have regard to it when planning future investments and in the operation of their installation;

Members of the public who may be interested to know what the Scottish Government considers, in accordance with the legislation, amounts to appropriate conditions for controlling odours from the generality of installations in this particular industry sector.

2 Site odour prioritisation matrix

This chapter provides a means of evaluating the odour potential associated with a sewage works as a starting point. The matrix below provides a framework for stakeholders, including regulators, operators and neighbouring communities, to discuss and develop appropriate odour management solutions at individual sites. The matrix is designed to assist in benchmarking the level of odour control that can be expected at a sewage works.

There may be site-specific considerations which would justify a greater or lower investment in odour control at an individual site, but the approach set out here enables a preliminary assessment to be carried out. This can then be used as the starting point for justifying a lower level of odour control, or alternatively requesting/requiring a higher level of odour control, in the light of local circumstances.

The matrix set out in Table 1 describes how a site can be evaluated in order to classify it from the perspective of odours as: very low potential; low potential; medium potential; or high odour potential. This matrix differs from the "Odour Risk Assessment Matrix" in Natural Scotland's Guidance on Statutory Code of Practice on Sewerage Nuisance – Assessment and Control of Odour from Waste Water Treatment Works. The Natural Scotland matrix is designed to assist in making objective assessments of likely nuisance by enabling an independent evaluation of reported odours to be carried out.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	130,000 p.e.: 1	10
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	Neither: 1	5
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	Full treatment: 3	30
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 prop- erties within 750 metres	More than 200 properties within 750 metres	40 properties: 1	5
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres	1 property: 2	10
History of genuine complaints	5	Fewer than 10 genuine complaints per year	10 to 50 genuine complaints per year	More than 50 genuine complaints per year	No complaints for 3 years:	5
Very low potential: Less than 65						
Low potential: 65 to 80						
Medium potential: 8	31 to 95					Low potential
High potential: More	e than 95					

The steps in the prioritisation process are as follows:

Step 1: Identify the sewage throughput of the site in terms of population equivalent (p.e.).

Step 2: Characterise the risk posed by the sewage arriving at the site, in terms of the length of mains and/or the presence of significant industrial effluent.

Step 3: Characterise the activities carried out at the site in terms of whether screening, primary treatment and/or sludge processing are carried out at the site

Step 4: Calculate or estimate the number of properties within 750 metres and 100 metres of the site. Two separate distances are included because odours can affect a relatively wide area surrounding a sewage works, but the intensity of odours is potentially higher at locations close to the works. Including two evaluations enables both aspects of odour dispersion to be taken into account.

Step 5: Summarise the number of genuine odour complaints received. In this context, a "genuine" complaint means a complaint which has been investigated by the regulatory authority and/or the site operator, and it is likely or plausible that the complaint was due to an odour which resulted from activities at the site. Complaint history is included in this matrix as an indicator of the extent to which the site neighbours are already aware of odours associated with the sewage works.

Step 6: Enter the score for each parameter in the column headed, "Your Score (1, 2 or 3) (B)." Multiply the score for each row (B) by the value in the column headed "Weighting (A)". Enter this number in the column headed "Weighted score (A \times B)". Add up the values in this column to give the total score.

Step 7: Determine the preliminary site odour potential based on the total score, as follows:

o Very low potential: Less than 65

o Low potential: 65 to 80

o Medium potential: 81 to 95

o High potential: More than 95

3 Odour control at sewage works

3.1 Sources of Odour

The layout of a particular sewage treatment process depends on the type of influent to the works, the location, the size and quality of receiving water. A conceptual wastewater treatment plant flowsheet is provided in Figure 1.

The main functions of a WWTP are:

- Removal of pollutants, (mainly toxic material) and retention of re-usable material
- Treatment of water to permit safe re-use
- Treatment and disposal of the sludge

The steps of a sewage treatment process are often divided into primary, secondary and tertiary. Primary treatment is largely a mechanical process to separate solids, secondary treatment is a largely biological process whilst tertiary treatment is polishing step for further purification possibly for specific contaminants. The main aim of treatment is to reduce biochemical oxygen demand (BOD) and suspended solids (SS) to acceptable levels. The removal of the solids and reduction of BOD produces sludge that can be recovered for beneficial land use after further treatment or sent for disposal.

Preliminary Treatment

Waste water entering the inlet works is usually screened to remove plastics, paper, cloth and other large debris. During periods of high flow the influent may be diverted to storm water tanks and this may occur before or after screening. Any influent diverted to storm water tanks will be processed as soon as flows return to normal. Effective management of storm water tanks is a key area in the reduction of odour.

Primary Treatment

The mechanical removal of solids is called 'primary treatment'. Finer solids are then removed in a settling or sedimentation tank, where the waste water spends a number of hours to allow the solids to settle or float and the sludge produced (primary sludge) is scraped along the base of the tank for desludging.

Secondary Treatment

The primary-treated waste water (primary effluent) is passed to an aeration tank, called 'secondary treatment', where oxygen is provided to the active sludges. In the aeration tank, the bacteria in the activated sludge consume the organic substances in the waste water and the secondary sludge is produced.

Sludge Processing

The excess sludges produced in the process are treated to reduce the liquid content of the sludge and volume to minimise downstream costs and stabilise the sludge to allow safe beneficial use for land conditioning or alternate disposal methods. The stabilisation process minimises the potential for odour generation and also destroys the pathogens.

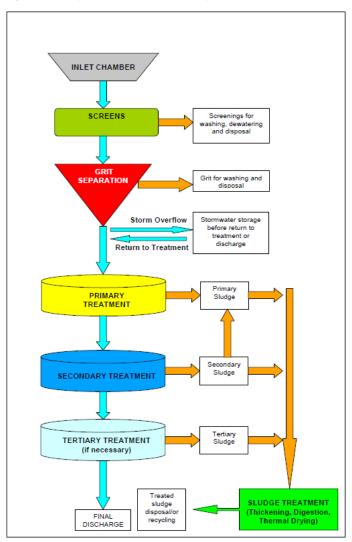
The primary odours from WWTW are the result of biological degradation of organic matter by microorganisms under anaerobic conditions. The development of anaerobic conditions in sewage is often referred to as 'septicity'. Septicity can be enhanced by elevated temperature, high BOD, high sulphate levels and the presence of reducing chemicals.

The potential emission sources for odours are specific to each

particular process and operation, however, the following are key sources which should be reviewed at all sewage treatment plants:-

- Inlet works strong odours in influent may be affected by unfavourable sewer conditions (long retention times, brackish water infiltration, poor maintenance, industrial discharges) and long pressure mains – also the inlet works effectively vent any sewer gases
- Storm water storage usually due to storage for excessive period leading to septicity or due to infrequent or insufficient flushing of the tanks after emptying
- Primary settlement highly odorous feeds or excessive sludge accumulation which goes septic – emissions can be caused by excessive turbulence of wastewater
- Secondary treatment if highly loaded or odorous feed
- Storage and treatment of sludge especially non-stabilised sludge
- Biogas leaks from anaerobic digesters and first point of sludge discharge.
- Odours can be transported through the system and become airborne at turbulent locations.
- Where the odour abatement equipment comprises a scrubber, emissions of materials which are added to the scrubber for improved performance (such as acids, hypochlorite, sodium hydroxide etc.) may be released with the plume if the scrubber and mist eliminator are not properly managed

Figure 1: Conceptual wastewater treatment plant flowsheet



3.2 Overview of effective odour management

3.2.1 Principles of effective odour control

The general principles set out in this section apply to any sewage works

- Principle 1: Effective site management is fundamental to good control of odours. This covers the full range of skills required to operate a sewage works. A good manager will understand how the plant operates, how to get the best performance out of the plant, and what steps to take when things change.
- Principle 2: A sewage treatment plant which delivers
 effective treatment of odour and sludge is likely to result
 in minimal odours. The odours produced from effective
 sewage treatment are likely to be relatively low intensity and
 consistent in nature, and if required, can be treated using
 established odour abatement techniques.
- Principle 3: For new sites and new plant and equipment, careful attention to siting can be helpful in minimising odour risks. New installations should take into account the locations of site neighbours including residential properties, hospitals, leisure facilities etc. They should also take into account factors such as local meteorology and topography.
- Principle 4: Good housekeeping is an essential and low-cost means of minimising odours. This involves ensuring that building doors, windows and other openings such as access hatches are kept closed. Keeping the site clean will minimise low-level odours from spilt material. At a psychological level, presenting a clean and tidy site gives a good impression to neighbours and visitors, which may help to reduce potential hostility towards the site and its operations.
- Principle 5: It is important to understand the nature and variability of the effluent arriving at a sewage works.
 Working with the sewerage network managers and effluent producers is important in enabling all parties to understand the constraints that different stakeholders are operating under.
- Principle 6: Engagement with the regulatory authorities is important to enable odour incidents to be managed. Ensure that those likely to receive calls and complaints from the public are aware of any potentially odour-generating activities going on at the site e.g. cleaning storm tanks. This will enable them to make a constructive and professional response to enquiries which may result from an odour being caused.
- Principle 7: Engaging with the public, both at an individual level and via elected representatives, is important. This does not have to be a frequent discussion an annual newsletter, open day or meeting may be sufficient. Opening lines of communication may enable a site operator to understand if there are any issues which could be readily addressed at low cost or no cost. It may also give the opportunity for a site operator to explain something about the site, the work that is carried out, and any planned investments relevant to odour control. Public engagement may give local politicians the opportunity to take a lead in representing their communities in relation to odours
- Principle 8: Any sewage works is likely to benefit from an Odour Management Plan (OMP). These can vary in length and level of detail depending on the nature of the site. A good OMP forms an integrated document with the overall site management plan, and is used during the day-to-day

- management of the site to ensure that odours are minimised and properly managed as a key part of site operations.
- Principle 9: Odours are particularly likely to arise at locations on the works where sewage is agitated or aerated. Such locations typically include the inlet works, screens, channels and primary tank weirs. Attention should be focused on these parts of the works to ensure that odour generation potential can be minimised, for example by ensuring a high standard of housekeeping, managing flows, minimising drop heights, and/or chemical dosing. If enclosure, air extraction and odour treatment is required, this should focus on these parts of the works.
- Principle 10: Operators should have a contingency plan
 in place to deal with contingencies such as fluctuations
 in influent flows, stormwater surges, failure of key plant
 for odour management, changes in wind direction during
 odour generating activities. It may be appropriate to have
 a contingency plan as part of the OMP, or this may take the
 form of a working plan for a specific activity such as cleaning
 storm tanks.

3.2.2 Odour management plan

All sites with the potential to generate odours should have an odour management plan. The odour management plan should address the following issues:

- The activities which produce odour and the point of odour release
- Possible process or control failures or abnormal situations which could arise
- Potential outcome of a failure in respect of the likely odour impact on local sensitive receptors
- What actions are to be taken to mitigate odour episodes, identifying timescales for actions and details of the persons responsible for the actions at the site
- Record keeping.

The plan should be reviewed periodically and following the receipt of complaints or after any corrective actions have been undertaken

The Code of Practice identifies a range of example issues for consideration in the odour management plan for a sewage works:

 Factors with potential to affect the process and the generation of odour

The operator should normally have made arrangements for factors such as:

- Materials input (seasonal variation in weather may affect odour of influent and intermittent discharge of odorous substances to the sewerage system)
- Process parameters (changes in temperature, aerobic conditions)
- Rate of throughput or increased hours of operation
- Development of anaerobic conditions
- Routine maintenance and inspection.
- 2. Factors with potential to affect the ability to abate/minimise odour

Factors which may be best dealt with by management actions may include:

- Start-up and shut-down of key plant and equipment
- Power failure (although the provision of backup facilities should be considered)

- Poor performance of biofiltration or poisoning (if not the result of poor maintenance or maloperation)
- Flooding of the biofilter due to abnormally high rainfall
- External failure of other utilities, e.g. water supply (This should also be considered
- where the operator has signed up to an interruptible gas supply).

The operator should normally have made arrangements for factors such as:

- Mechanical breakdown of abatement equipment such as pumps, fans etc
- Power failure
- Compaction of the biofilter or surface fissures
- Saturation of a carbon filter bed and subsequent breakthrough of odours
- Below optimum temperature of a thermal oxidiser or boiler etc
- Saturation of scrubber liquor, blocked injection nozzles etc.
- Routine maintenance and inspection.
- Factors with potential to affect the ability to contain odour (where releases are not normally permitted)

Factors which may be best dealt with by management actions may include:

- Building damage which affects integrity due to for example storms
- Power failure

The operator should normally have made arrangements for factors such as:

- Failure of automatic doors, i.e. in open position
- Failure in procedures to maintain containment (human error)
- Routine maintenance and inspection.
- 4. Factors with potential to affect dispersion between the source and sensitive receptors

Factors which may be best dealt with by management actions may include:

- Short term weather patterns which fall outside of the normal conditions for that area (ie highly unusual, not just the normal meteorological pattern - for example inversions and other conditions unfavourable to dispersion should have been considered in designing the process).
 - The operator should normally have made arrangements for factors such as:
- Weather wind direction, temperature, inversion conditions
 if these are normal variants of local weather. When designing
 and implementing odour management measures, operators
 should be aware of the prevailing wind direction in the local
 area, as well as factors which may influence the dispersion of
 emissions, such as local topography (e.g. for a site in a valley
 location) or coastal meteorology (e.g. the occurrence of sea
 mist (also known as "haar") or onshore winds).
- Loss of plume buoyancy/temperature

Odour management plans developed for Dalmuir and Seafield sewage works can be provided by contacting the report authors. The following sections identify specific odour control measures which may be appropriate for sites with an odour potential ranging from very low, through low and medium to high odour potential.

Each section sets out a set of control measures for consideration, and provides a "good practice guideline" as a benchmark for

an appropriate level of odour control at high, medium, low and very low odour potential sites. This guidance is designed to assist site operators, regulators and other stakeholders in fulfilling the requirement of the CoP which requires that "a timely, realistic, cost effective and proportionate approach is taken to resolve odour issues."

3.3 Odour control through process management

3.3.1 Overview

The starting point for effective odour management is good process design and management. A site which is appropriately designed for the quantity and composition of sewage treated, and which is run well to deliver effective sewage and sludge treatment, can also be expected to minimise odour formation. Although some odour formation is inevitable, odours from a well-run sewage works will typically be the well-known "earthy" smell characteristic of treated sewage, rather than the more objectionable odours of anaerobically decomposing material. Avoiding anaerobic conditions and sewage septicity is important for all aspects of site operations, but is particularly critical for minimising odour problems. A key part of this is good

management of sludge levels in primary settlement tanks to avoid the build-up of solid material with the risk of anaerobic conditions developing.

This requires the site managers and operators to have a good understanding of normal operations at the sewage works, as well as sufficient experience and expertise to be able to take action to deal with abnormal operating conditions. Site managers will understand the importance of odour control alongside other aspects of the site operation, and will take steps to minimise process odours and prevent problems arising. This may require investment in infrastructure to improve the effectiveness, capacity and/or resilience of the sewage treatment process, if this is sub-optimal. Such improvements can be expected to bring wider benefits in consistent operational performance, avoidance of "crisis" operational conditions, and a high standard of final effluent quality and sewage quality.

3.3.2 Good practice guideline

Table 2: Process management measures for odour control

	Odour control measure and description	Measure appropriate for:				
		Very low potential	Low potential	Medium potential	High potential	
1	Entire site: minimising turbulent discharges	✓	✓	✓	✓	
2	Entire site: working with other stakeholders to optimise influent sewage quality		✓	✓	✓	
3	Entire site: where possible, preferentially operate plant located further from site neighbours		✓	✓	✓	
4	Inlet works: maintaining aeration	✓	✓	✓	✓	
5	Screening: cleaning to ensure efficient operation of screens and avoid build-up of odorous material	✓	✓	✓	✓	
6	Primary treatment: maintaining aeration	✓	✓	✓	✓	
7	Primary treatment: appropriate process for wastewater quantity and characteristics	✓	✓	✓	✓	
8	Primary treatment: effective and reliable removal of sludge	✓	✓	✓	✓	
9	Secondary treatment: appropriate process for feedstock	✓	✓	✓	✓	
10	Sludge treatment: rapid dewatering and treatment of sludge	✓	✓	✓	✓	
11	Sludge treatment: avoidance of contact between primary sludge and the atmosphere; effective containment of digestion process	✓	✓	✓	✓	

Good practice guideline for odour control: Process management

Very low potential sites:
 Low potential sites:
 Medium potential sites:
 High potential sites:
 Complete at least 3 measures
 Complete at least 5 measures
 Complete at least 7 measures
 Complete at least 3 measures
 Complete at least 3 measures

3.4 Odour control through site management

3.4.1 Overview

Good housekeeping is important for minimising avoidable odour releases from sewage works. The majority of good housekeeping is good working practice, and consequently poses little or no additional cost in relation to odour control.1

Some key aspects of good housekeeping include avoidance of a build-up of scum or foam, prompt cleaning of spillages (and feeding back into the site design and upgrade process in the event of ongoing spillage problems); and good management of wastes such as screenings and grit, as well as digested sludge;

3.4.2 Good practice guideline

Table 3: Site management measures for odour control

	Odour control measure and description		Measure app	ropriate for:	
		Very low potential	Low potential	Medium potential	High potential
1	Working areas: daily check and clearing of any standing water	✓	✓	✓	✓
2	Working area: daily check, reporting and rectification of any obvious leakage	✓	✓	✓	✓
3	All plant: Annual inspection and repair programme	✓	✓	✓	✓
4	All plant: Maintenance of critical spares on site			✓	✓
5	Inlet works: daily check with cleaning as required		✓	✓	✓
6	Screening: daily cleaning to remove odorous material; prompt removal of screenings containers	✓	✓	✓	✓
7	Primary treatment: Checking to ensure no build-up of solids, scum or foam; cleaning where needed			✓	✓
8	Secondary treatment: Checking to ensure no build-up of solids, scum or foam; cleaning where needed				✓
9	Sludge treatment: Checking to ensure no build-up of solids; cleaning where needed		✓	✓	✓
10	Sludge tankering: check vehicles arriving at site and liaison with contractor if necessary			✓	✓
11	Sludge tankering: ensuring vehicles clean on leaving site			✓	✓

Good practice guideline for odour control: Site management

Very low potential sites: Complete at least 4 measures
 Low potential sites: Complete at least 5 measures
 Medium potential sites: Complete at least 6 measures
 High potential sites: Complete at least 8 measures

3.5 Odour control through low cost measures

3.5.1 Overview

In order to prevent or abate odour pollution, different types of control measures should be considered. Appropriate management may provide low cost measures to tackle odour issues. The following measures should be reviewed at all sites:

- Odour sources should be located away from site boundary, where possible
- Chemical or physical methods can be used to partly control many odorous chemicals:
- Flexible covers can be used on screening skips to restrict 0 dispersion of odours (this can also discourage bird scavenging). Covering other sources (e.g. inlet works, screens, sludge treatment) without investing in air extraction and treatment is not recommended, due to the likely formation of a corrosive atmosphere with the risk of adverse effects on plant and equipment. Sludge storage normally takes place in buildings.
- Reduce septicity and the amount of odour by dosing

- chemical (e.g. oxygen, hydrogen peroxide, potassium permanganate, nitrate or ferric salts) and improve ventilation. This process results in potentially odorous sulphides forming solid iron sulphide precipitates and being removed in the sludge. While beneficial in reducing the odour potential of the treated effluent, this could potentially increase the quantity of sludge, and its potential for releasing sulphides during treatment, storage and disposal.
- In principle, it is possible to collect and treat displaced air from tankers during filling with sludge. However, there is no industry standard tanker vent design, and consequently direct connection from a tanker to an odour control unit is not feasible. At present, tanker filling takes place in an enclosed building at one site (Shieldhall) to enable collection and treatment of displaced odorous air.
- Minimise the potential storage of sludge before treatment and storage for unstabilised sludge on site
- Avoid open storage of sludges or sludge cakes. At one site, sludge cakes are chemically treated prior to loading for transport off-site, to reduce the potential for odours affecting local residents.

3.5.2 Good practice guideline

Table 4: Low cost measures for odour control

(Odour control measure and description	Measure appropriate for:			
		Very low potential	Low potential	Medium potential	High potential
1	Entire works: Where possible, locate potentially odorous activities away from site boundary	✓	✓	✓	✓
2	Entire works: chemical dosing with oxidant (e.g. ferric sulphate) to avoid septicity		✓	✓	✓
3	Screening: flexible cover on screening skips to limit dispersion		✓	✓	✓
4	Sludge treatment: fixed cover on sludge storage	✓	✓	✓	✓
5	Sludge treatment: ensuring treated sludge is rapidly removed from site	✓	✓	✓	✓
6	Sludge tankering: Recirculation of displaced air from sludge tankers, if vent design can be standardised			✓	✓
7	Scheduling potentially odour generating activities to minimise impacts (e.g. by reference to wind direction)	✓	✓	✓	✓

Good practice guideline for odour control: Low cost measures

Very low potential sites with no odour problems: Measure 1 Low potential sites with no odour problems: Measure 1 and 5

Medium potential sites with no odour problems: Measure 1, 3 and 5 High potential sites with no odour problems: Measure 1, 3 and 5

If problems persist, a site-specific evaluation should be carried out to identify and implement appropriate low-cost odour control measures

Very low potential sites if odour problems persist:

Low potential sites if odour problems persist:

Medium potential sites if odour problems persist

High potential sites if odour problems persist:

Measure 1, 5, 8, 9 as appropriate

Measure 1, 2, 3, 4, 5, 7 as appropriate

All measures as appropriate All measures as appropriate

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3.6 Odour control through capital investment measures

3.6.1 Overview

Some odour control measures may involve capital investment to prevent or reduce odour releases. If odour problems persist, the following measures should be reviewed at all sites:

- Relocation of odour source activities away from site boundary, where required
- Lowering discharge points to minimise turbulence and volatilisation of odours
- Using flexible or fixed cover on the inlet works, screening, primary treatment, secondary treatment, sludge treatment and sludge storage to reduce the rate of evaporation of odours
- Reducing the hydraulic retention times in the primary sedimentation
- Recirculation of nitrified final effluent during low flow and avoiding the recirculation of secondary sludge
- Increased aeration in the secondary aerobic treatment by methods which minimise the generation of aerosols and maintain the activated sludge flocs in suspension

- Replacement of lagoons and drying beds in sludge handling, storage and processing with mechanical dewatering plant will help minimise retention and contain odours
- Air extraction and ventilation sent to odour-abatement equipment

All odour control measures must meet the Code of Practice requirement to be technically justifiable and take into account the balance of benefits and costs. This is particularly relevant for capital investment measures, where there are likely to be significant cost and technical issues to be considered.

Particular care should be given to investment in covering, extraction and abatement of potential sources of odour. While some Scottish Water sites are completely or partially covered, this is not necessarily fully effective in dealing with odours (e.g. any odours from the sewerage network would continue). Covering a source results in the creation of a confined space, and careful consideration should be given to issues such as ensuring a safe working environment, the potential for forming an explosive atmosphere, difficulties in monitoring performance, and access to the covered area for tasks such as maintenance and cleaning. Carrying out maintenance during a total site shutdown is an option, but this reduces operational flexibility, and can itself give rise to odours.

3.6.2 Good practice guideline

Table 5: Capital investment measures for odour control

	Odour control measure and description	and description Measure appropriate for:				
		Very low potential	Low potential	Medium potential	High potential	
1	Entire works: Where required, relocate potentially odorous activities away from site boundary	✓	✓	✓	✓	
2	Inlet works: flexible or fixed cover on inlet works where sewage is first aerated with air extraction and treatment	✓	✓	✓	✓	
3	Screening: flexible or fixed cover on screens with air extraction and treatment	✓	✓	✓	✓	
4	Primary treatment: cover on primary treatment tank weirs, with air extraction and treatment			✓	✓	
5	Primary treatment: flexible or fixed cover on primary treatment tanks, with air extraction and treatment				✓	
6	Secondary treatment: flexible or fixed cover on secondary treatment, with air extraction and treatment				✓	
7	Sludge treatment: flexible or fixed cover on sludge treatment, with air extraction and treatment	✓	✓	✓	✓	
8	Sludge treatment: flexible or fixed cover on sludge storage, with air extraction and treatment	✓	✓	✓	✓	
9	Sludge tankering: Collection and treatment of displaced air from sludge tankers by appropriate vent design, or tanker filling within an enclosure		✓	✓	✓	

Good practice guideline for odour control: Capital investment measures

Very low potential sites with no odour problems: None
 Low potential sites with no odour problems: None
 Medium potential sites with no odour problems: None
 High potential sites with no odour problems: None

If problems persist, a site-specific evaluation should be carried out to identify and implement appropriate capital investment odour control measures.

Very low potential sites if odour problems persist:

 Low potential sites if odour problems persist:
 Measure 1, 2, 3, 7, 8 as appropriate

 Measure 1, 2, 3, 7, 8, 9 as appropriate
 Measure 1, 2, 3, 7, 8, 9 as appropriate
 Measure 1, 2, 3, 4, 7, 8, 9 as appropriate

High potential sites if odour problems persist:

All measures as appropriate

3.7 Odour control through monitoring

3.7.1 Monitoring of process emissions

The aim of setting and monitoring emissions limits is to ensure that adequate controls are applied to prevent where practicable, or otherwise reduce emissions and in the case of odour to ensure that they are not offensive to human senses and do not cause a statutory nuisance.

Setting appropriate emission limits in terms of odour levels of chemical constituents can be a key part of achieving and demonstrating compliance with an appropriate standard of odour control at a sewage works. SEPA guidance further indicates the expected odour removal efficiency for installed abatement plant.

Adsorption e.g. activated carbon systems:
 Depending on chemical species involved, efficiency can be >99%

Peat and heather type bio filters: Up to 95%
Soil type bio filters: >99%
Bio-scrubbers: >99%

Absorption (wet scrubbers)
 >90% (2 stage water scrubber)
 >99% (chemical/catalyst type)

Thermal oxidation/Incineration: >99%

Emissions monitoring can be useful to demonstrate that an appropriate removal efficiency is being achieved. The need for and scope of testing and the frequency and time of sampling

depend on local circumstances, operational practice, and the scale of operation. As part of proper supervision the operator will monitor emissions, make tests and inspections of the process and keep records.

Table 6 below summarises the requirements for continuous monitoring for odour control equipment:

Adverse results from any quantitative emission monitoring activity (both continuous and non-continuous) should be investigated by the operator as soon as the monitoring data has been obtained/received, and appropriate corrective action should be taken. The operator should respond to any odour control equipment malfunction, any incident of odours being detected during the site inspection and to complaints. In cases where odour nuisance and/or offensive odours are detected beyond the process boundary, the operator should investigate process operations and odour abatement plant performance.

In addition to the continuous indicative monitoring outlined in Table 6, the odour control equipment should be inspected at least once a day to verify correct operation and to identify any malfunctions.

The destruction efficiency of the odour abatement equipment required to meet performance criteria for odour removal should be tested by dynamic olfactometry in accordance with the main procedural requirements of BSEN13725 at least once a year.

Table 6: Continuous monitoring requirements for odour control equipment

Item	Type of odour abatement equipment	Continuous performance monitoring parameter	Conditions indicating a potential performance issue
1	Thermal oxidiser	Carbon monoxide And/or Temperature	Carbon monoxide above 100 mg/m3 Temperature less than 850oC
2	Scrubber	pH or Redox and Liquor circulation	pH or Redox outside normal range Liquor circulation failure
3	Bioscrubber	Pressure drop And Liquor circulation	Pressure drop outside normal range Liquor circulation failure
4	Biofilter	Pressure drop	Pressure drop outside normal range
5	Condenser	Cooling liquid circulation	Cooling liquid flow failure
6	Adsorption (volume > 250 litres)	Pressure drop Hydrogen sulphide	Pressure drop outside normal range Hydrogen sulphide above 1 mg/m ³

3.7.2 Site surveys

Monitoring of odour at the boundary-fence/perimeter line – monitoring can range from straightforward and inexpensive "sniff" tests to complex quantitative measurements (e.g. sampling and analysis of specific odorous compounds, such as H2S). The technique used should be fit for purpose to demonstrate continuing effectiveness of the control measure.

The Arizona Instruments "Jerome" series of reduced sulphur analysers are used in the wastewater treatment industry for providing rapid measurements of hydrogen sulphide and other sulphides with a limit of detection as low as 0.02 parts per billion. The purchase cost for these instruments is several thousand pounds. Studies have also been carried out using an Odalog instrument with a purchase cost of the order of one thousand pounds, but the limit of detection is 100 ppb at best, and this would not be useful for site boundary monitoring. The Odowatch system includes an electronic nose sensor and/or hydrogen

sulphide analyser with a limit of detection of 2 ppb to detect environmental odours. These units can be integrated with the site process management systems. Analyses have also been carried out to identify other potentially odorous volatile organic compounds, but no substances likely to contribute significantly to offsite odours have been identified.

The "sniff" test is probably the most common technique for assessing the (continuing) effectiveness of odour control measures. It should, however, be regarded as only semi-quantitative even when the subjective factors have been minimised by the use of a trained assessor with a sense of smell calibrated as lying within the normal range, following a documented protocol. Sniff tests can be useful around specific areas of the site to identify any specific odour issues, and/or as a site boundary measure to check the overall impact of the site on odours. Such surveys would have a cost in terms of the staff time to carry out the survey, but may well provide an operational benefit – for example, in giving early warning of developing problems.

3.7.3 Good practice guideline

Table 7: Monitoring measures for odour control

(Odour control measure and description	Measure appropriate for:				
		Very low potential	Low potential	Medium potential	High potential	
1	Daily walkover/site boundary olfactory survey	✓	✓	✓	✓	
2	Daily walkover or targeted survey by staff with calibrated sensitivity to odour	✓	✓	✓	✓	
3	Daily walkover using handheld hydrogen sulphide analyser	✓	✓	✓	✓	
4	Targeted survey using handheld hydrogen sulphide analyser	\checkmark	✓	✓	✓	
5	Sampling and laboratory analysis of ambient air – olfactometry			✓	✓	
6	Sampling and laboratory analysis of ambient air – VOCs			✓	✓	
7	Sampling and laboratory analysis of emissions from odour abatement plant – olfactometry				✓	
8	Sampling and laboratory analysis of emissions from odour abatement plant – H2S, VOCs			✓	✓	
9	Electronic nose system for odour management				✓	
10	Meteorological measurements			✓	✓	

¹ Sara Abdikheibari, Ho-myon Song, Jeong-il Cho, Sung-jin Kim, Su-cheol Gwon, Kyoohong Park, Benildo Maluleque, Nyoman Marleni, Li Shu, Veeriah Jegatheesan (2016) "In-situ evaluation of predictive models for H2S gas emission and the performance of optimal dosage of suppressing chemicals in a laboratory-scale sewer" International Biodeteriation & Biodegradation 106:25-33

² Odowatch (2015) "Odowatch continuous monitoring systems" http://www.odotech.com/en/odowatch/; accessed 16/08/2016

³ Eric C. Sivret, Bei Wang, Gavin Parcsi, Richard M. Stuetz (2015) "Prioritisation of odorants emitted from sewers using odour activity values" Water Research 88:308-321

Good practice guideline for odour control: Odour monitoring

- Very low potential sites with no odour problems:
- Low potential sites with no odour problems:
- Medium potential sites with no odour problems:
- High potential sites with no odour problems:
- Very low potential sites if odour problems persist:
- Low potential sites if odour problems persist:
- Medium potential sites if odour problems persist
- High potential sites if odour problems persist:

None

Measure 1

Measure 1, 2

Measure 1, 2, 10

Measure 1, 2, 3, 4 as appropriate

Measure 1, 2, 3, 4 as appropriate

Measure 1, 2, 3, 4, 5, 6, 8, 10 as appropriate

All measures as appropriate

3.8 Odour control through stakeholder and public engagement

3.8.1 Overview

Maintaining effective, regular and frequent communications with regulatory authorities (normally the local authority, and including SEPA for sites regulated under IPPC) is essential for effective operation and management of odours. In addition to fulfilling their regulatory role, these authorities are often contacted by local residents when odours arise, and pro-active engagement to ensure that the public authorities are aware of activities at the site can be very helpful in minimising the impact of odours on members of the public. The sewage treatment works operator should ensure there is liaison with the local authority Environmental Health Practitioner on the continuing effectiveness of the control measures and any problems that have been encountered or expected.

Complaints are a very important indicator of nuisance and other community dissatisfaction. As described in Section 3.2.2, it is important that complaints are properly and systematically dealt with and acted upon. Barriers to complaints should be minimised, wherever possible.

A standard Scottish Water odour complaint logging form is reproduced as table 8.

It would be helpful if this form requested provision of email contact details (subject to data protection requirements) to assist in responding to complainants in the most cost-effective way. Additionally, operators have found that the question "Is there a wastewater treatment works in the area?" encourages complainants and responders to immediately associate a complaint with the site, even when this is not necessarily justified. For example, a sewage-like odour could be associated with the sewerage network or activities such as agricultural slurry spreading. It would be preferable for this to be replaced with a more open question, asking the respondent for their views on the possible source(s) of the odour.

Clear and effective communication and the provision of useful information are essential when working with local communities who may be or are being affected by offensive odours. Engagement can include a wide variety of activities, but establishing appropriate channels of communication between the sewage treatment works operators, local authorities, local residents and community representatives (e.g. Councillors and MSPs) is considered a key aspect. Liaison and communication could involve:

- · writing to affected people
- face to face meetings
- attending community group meetings
- providing a reliable source of information to the community and being available to hear what they have to say
- contacting and discussing issues with local and/or national

elected representatives

- informing local authorities and the local community, especially if the operator is planning to undertake any non-routine activity which could give rise to odour, for example cleaning of equipment. One approach for doing this could be via social media. A notice placed on a relevant social media group (e.g. account run by the site operator or relevant community group) would trigger notifications for anyone who has registered with the group. This could be a useful back-up to website, email and house-to-house notifications.
- informing the public of the possible sources of odours and the complaints procedures

In the event of significant odour issues, members of the public can be encouraged to maintain odour logs and odour diaries. Such tools can be used to help monitor and maintain the effectiveness of abatement measures introduced to deal with an odour incident.

Table 8: Scottish Water odour complaint logging form

WATER	Odour Co	mplaints Logging Form	
WAIEK		LLA LIE STOLEN	
PART A (To be completed b	y the CSC)		7.0
Service Request Number		SR Creation Timestamp	
PART B (To be completed b	y the person rece	riving the complaint)	
Completed by:		Position:	
1. Name and address, include	fing postcode		*
2. Telephone number, for co	ntact or additiona	i information requests	
3. When was the odour first	detected? Date a	nd specific time if possit	ble.
4. Where they detected the			sing the actual location of
odour. Note: this may or ma			enc <u>e</u> ntral properties of the contract of the
Is the odour still present in	the same location	on?	
5. Is the odour still present in	the same location	on?	
6. Description of odour (As n	nuch information	as possible please. Info	
6. Description of odour (As n	nuch information	as possible please. Info	
6. Description of odour (As n	nuch information	as possible please. Info	
5. Description of odour (As in field; e.g. sulphur, eggs etc.)	nuch information An indication of	as possible please. Info the strength of the odou	
6. Description of odour (As in field; e.g. sulphur, eggs etc.)	nuch information An indication of	as possible please. Info the strength of the odou	
6. Description of odour (As a field; e.g. sulphur, eggs etc.) 7. Is there a wastewater trea	nuch information An indication of the	as possible please. Info the strength of the odou se area?	r is also important.
6. Description of odour (As a field; e.g. sulphur, eggs etc.) 7. Is there a wastewater trea	nuch information An indication of the	as possible please. Info the strength of the odou se area?	r is also important.
6. Description of odour (As a field; e.g. sulphur, eggs etc.) 7. Is there a wastewater trea	nuch information An indication of the	as possible please. Info the strength of the odou se area?	r is also important.
6. Description of odour (As a field; e.g. sulphur, eggs etc.) 7. Is there a wastewater trea 8. If yes, what is the name of	nuch information An indication of interest works in the first works in the first works in the site? What is	as possible please. Info the strength of the odou se area?	r is also important.
6. Description of odour (As a field; e.g., sulphur, eggs etc.) 7. Is there a wastewater trea 8. If yes, what is the name of	nuch information An indication of interest works in the first works in the first works in the site? What is	as possible please. Info the strength of the odou se area? Is the name of the localit estigating the complaint)	r is also important.
6. Description of odour (As a field; e.g., sulphur, eggs etc.) 7. Is there a wastewater trea 8. If yes, what is the name of the field; e.g., what is the name of the field by:	nuch information An indication of it itment works in th if the site? What is by the person inve	as possible please. Info the strength of the odou te area? In the instruction of the locality the stigating the complaint) Position:	y as a clue to naming site?
6. Description of odour (As a field; e.g. sulphur, eggs etc.) 7. Is there a wastewater trea 8. If yes, what is the name of PART C (To be completed b Completed by:	nuch information An indication of it itment works in th if the site? What is by the person inve	as possible please. Info the strength of the odou te area? In the instruction of the locality the stigating the complaint) Position:	r is also important.
6. Description of odour (As a field; e.g., sulphur, eggs etc.) 7. Is there a wastewater trea 8. If yes, what is the name of the part of the completed by the part of the part	nuch information. An indication of items works in the site? What is by the person investigation was a south of the site?	as possible please. Info the strength of the odou te area? In the instruction of the locality the stigating the complaint) Position:	r is also important.
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3.8.2 Good practice guideline

Table 9: Monitoring measures for odour control

(Odour control measure and description		Measure app	ropriate for:	
		Very low potential	Low potential	Medium potential	High potential
1	Liaison committee between regulators, contractors, sewerage network operators, and Scottish Water	✓	✓	✓	✓
2	Newsletter to keep residents informed of planned investment and performance against odour management plan		✓	✓	✓
3	Mailshot to inform residents of actions being taken to deal with ongoing issues		✓	✓	\checkmark
4	Dedicated contact number to report odour issues to Scottish Water or authorities				✓
5	Provision of odour diaries		✓	✓	✓
6	Meeting with elected representatives/ community leaders	✓	✓	✓	✓
7	Site open day				✓
8	Provision of information on company website and/or via social media		✓	✓	✓
9	Appointment of independent expert to represent community interests				✓
10	Appointment of Odour Reporting Officer				✓
11	Engagement of public relations company or appointment of PR officer				✓

Good practice guideline for odour control: Public engagement

Very low potential sites with no odour problems: Measure 1
 Low potential sites with no odour problems: Measure 1
 Medium potential sites with no odour problems: Measure 1, 2, 8
 High potential sites with no odour problems: Measure 1, 2, 7, 8

Very low potential sites if odour problems persist: Measure 1, 2, 8
 Low potential sites if odour problems persist: Measure 1, 2, 6, 8

Medium potential sites if odour problems persist Measure 1, 2, 3, 4, 5, 6, 8

High potential sites if odour problems persist: Measure 1, 2, 3, 4, 5, 6, 8; consider 9, 10, 11

4 Case studies

4.1 Case study 1: Shieldhall sewage treatment works (2016)

The Shieldhall site was classified as "Medium potential" using the matrix approach described in Chapter 2.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)	
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	3 585,000 p.e.	30	
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	2 Long mains; no major industrial component	10	
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	2 Sludge handling and occasional treatment	20	
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 100 properties within 750 metres	More than 100 properties within 750 metres	3 >200 properties within 750 m	15	
	5	No properties within 100 metres	1 to 10 properties within 200 metres	More than 10 properties within 100 metres	No sensitive properties within 100 m	5	
History of verified complaints	5	Fewer than 10 verified complaints per year	10 to 50 verified- complaints per year	More than 50 verified complaints per year	1 7-10 complaints per year	5	
Very low potential: Less than 65							
Low potential: 65 to	85						
Medium potential: 8	Medium potential						
High potential: More							

Shieldhall is a large sewage works located in the centre of Glasgow's south side. The site treats mainly domestic effluent, and also handles sludge from a variety of sources which is then usually pumped to Daldowie. Odour control is provided for the sludge handling processes. The inlet works (screens and grit removal) is covered to reduce the escape of odours, but does not have odour treatment. There has been significant investment in covering and providing odour control for the main potential sources of odour, including inlet works, screens, grit removal, sludge thickening, transfer and disposal. This site also shows good control and optimisation of effluent flow through the system. In the majority of respects, this conforms with the odour controls that would be expected of a "medium" potential site. Evaluation using the tools in the guidance may highlight the further options for reducing odour emissions from the site.

The sewage works is adjacent to the Queen Elizabeth University Hospital. The proximity of the hospital means that odour problems do arise periodically, particularly in the summer months. Odour problems are not strongly influenced by the extent of the sewerage system: the Council officer considers that the problems are to some extent inevitable when treating a large quantity of sewage in close proximity to a hospital and residential properties. There is a potential source of odours from the Glasgow City Council cleansing / recycling plant in close proximity that is thought to contribute to odours in the area.

The matrix assessment in Chapter 2 and description of odour controls in Chapter 3 indicate that a site of this nature should also focus on site management and good housekeeping, and engagement with the site neighbours.

4.2 Case study 2: Ardoch sewage treatment works (2016)

The Ardoch site was classified as "Low potential" using the matrix approach described in Chapter 2.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	1 130,000 p.e. (design)	10
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	1 Mains up to 6 km; industrial compo- nent 20% of total	5
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	3 Full treatment and sludge biological treatment & thickening	30
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 properties within 750 metres	More than 200 properties within 750 metres	3 Well over 200 properties within 750 m	15
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres	2 Approximately 10 properties within 100 m	10
History of verified complaints	5	Fewer than 10 verified complaints per year	10 to 50 verified complaints per year	More than 50 verified complaints per year	2 7-43 complaints per year	10
Very low potential: I						
Low potential: 65 to	80 low potential					
Medium potential: 8	low potential					
High potential: More						

Ardoch is a medium sized sewage works located at the foot of cliffs on the River Clyde to the west of Dumbarton, and takes sewage from Castlegreen, Cardross and Dalmoak. A distillery contributes approximately 20% of industrial effluent flows. There has been significant investment in covering and providing odour control for the main potential sources of odour, including inlet works, screens, grit removal, sludge thickening, transfer and disposal. This conforms with the odour controls that would be expected of a "medium" potential site, but there would remain further options for reducing odour emissions from the primary settlement tanks if required, in accordance with the measures outlined in Chapter 3.

However, despite the investments in odour control infrastructure, and preliminary assessment of "low" odour potential, odour

complaints have continued at reasonably high levels in recent years. Odour incidents typically result from low flow conditions during dry weather. The local authority has issued abatement notices in the past, although there are none current at present. The sewage works is located close to residential areas of Dalreoch, which are located at a higher elevation from the site, and downwind of the prevailing wind direction from the sewage works. This may tend to increase the potential impact of any odours released from the site.

The matrix assessment in Chapter 2 and description of odour controls in Chapter 3 indicate that a site of this nature should also focus on site management and good housekeeping, and engagement with the site neighbours.

4.3 Case study 3: Dalmuir sewage works (2016)

The Dalmuir site was classified as "Medium potential" using the matrix approach described in Chapter 2.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	3 650,000 p.e. (design)	30
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	2 Long gravity mains; 95% domestic	10
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	3 Full treatment and sludge treatment & thickening	30
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 properties within 750 metres	More than 200 properties within 750 metres	3 Well over 200 properties within 750 m	15
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres	No properties within 100 metres	5
History of verified complaints	5	Fewer than 10 verified complaints per year	10 to 50 verified complaints per year	More than 50 verified complaints per year	1 5 - 10 complaints per year	5
Very low potential: Less than 65						
Low potential: 65 to 80					95	
Medium potential: 81 to 95					Medium potential	
High potential: More than 95						

Dalmuir is a large sewage works located on the River Clyde in Glasgow, and takes sewage from much of central and northwest Glasgow. About 95% of the sewage is domestic. The implementation of the Code of Practice enabled improvements in odour control to be mandated by the regulatory authorities. Considerable improvements have been made in management of the site and specific odour controls. The site management now understands and can manage fluctuations in the effluent arriving at the site. The site is well managed, for example ensuring that critical spares are kept at the site. Investment has been made in covering of key parts of the site, and odour collection, treatment and monitoring. The site operates in accordance with an extensive and detailed odour management plan developed with the local authority. This is used by the site manager as a general operational manual as it covers all aspects of the site.

Sewage arriving at the site is dosed with ferric sulphate solution to facilitate the complexing of sulphates and sulphides into the sludge, ensure oxygen levels remain high, and thereby avoid septicity. Sulphides in the effluent react to form solid ferric sulphide which is removed via the sludge. While not specifically designed as an odour control method, dosing with ferric sulphate has a beneficial effect on odour risk. The injection point is changed during the summer to ensure that potential odours are mitigated.

Odorous air is collected from all areas where strong odours could arise, comprising sludge pumps, wet wells and tanker discharge point, and sludge storage tanks. A scrubber system is used to abate odours, with caustic soda dosing to ensure effective collection of hydrogen sulphide and mercaptans. Activated carbon is used as a final polishing stage. Hydrogen sulphide and total hydrocarbons are monitored in the discharge stacks from odour treatment plant.

Further investment in odour collection and abatement is planned for the distribution chamber between pre-treatment and secondary treatment. The turbulent flows in this chamber can result in odours during the summer. These controls conform with the requirements that would be expected of a "high" potential site.

These measures have been effective in reducing the incidence of odour complaints to low levels for a site in an urban centre setting. In view of the preliminary assessment of "medium" odour potential, achieving fewer than 5 odour complaints per year represents a good performance for this site. Occasionally, complaints are made which are due to a different source of odours (e.g. slurry spreading on fields). There is now little public interest in the site, and hence no requirement for ongoing public or stakeholder meetings.

4.4 Case study 4: Seafield (2016)

The Seafield site was classified as "High potential" using the matrix approach described in Chapter 2.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	3 300,000 m3/day ~1,500,000 p.e.	30
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	1 Almost all domestic	5
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	3 Full treatment and sludge treatment & thickening	30
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 properties within 750 metres	More than 200 properties within 750 metres	3 Well over 200 properties within 750 m	15
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres	2 Approximately 12 properties within 100 metres	10
History of verified complaints	5	Fewer than 10 verified complaints per year	10 to 50 verified complaints per year	More than 50 verified complaints per year	2 11 - 15 complaints per year	10
Very low potential: Less than 65						
Low potential: 65 to 80					100 High potential	
Medium potential: 81 to 95					riigii poteittai	
High potential: More than 95						

Odours from the Seafield works have been a long-established problem for many years. Around 2003, there were 400-500 complaints received per year, and improving this situation was viewed as an urgent priority by City of Edinburgh Council (CEC). CEC issued an Abatement Notice, which was subsequently appealed and then quashed. One key problem was that residents expected that the substantial investment to meet EC directive requirements for water treatment at that time would result in the complete elimination of odours, whereas this was never the focus of this investment.

Following the abatement notice, a steering group was set up to discuss and agree the way forward. A range of options were considered which had to be evaluated on a "best value" basis – that is, having regard to cost. An £18m investment programme was agreed, which was designed to deliver a 70% reduction in odour emissions and complaint numbers, based on a modelling

analysis. To secure a further 2% reduction would have required a further £10m investment, so the specified solution was clearly indicated as "best value". Delivering the agreed improvements took 3-4 years. This has been effective in reducing odour impacts and complaints as part of ongoing improvements over a 20 year period.

The investment programme has focused on parts of the site where potentially odorous flows are aerated, potentially leading to the release of odours. The inlet works, channels and sludge treatment processes are now fully enclosed. The primary tank weirs are partially enclosed. Air is extracted and treated in chemical scrubbers (bulk flows) and activated carbon scrubbers (lower flows). The main operating cost is the energy requirement for the fans to deliver the required air extraction. Other costs, such as filter media, chemicals and monitoring costs, are lower.

Figure 2: Grit skips with flexible covers to minimise odour release



Figure 3: Brush covering on primary tank weirs



Figure 4: Covering on channel from inlet works to primary tanks



Figure 5: Chemical scrubber for air extracted from inlet works and primary tanks



Figure 6: Activated carbon scrubber for air extracted from thermal hydrolysis sludge plant



Site management continues to be a key focus, with the emphasis on maintaining a low sludge level in the primary tanks. The site preferentially uses primary tanks located further away from the closest residential properties to minimise odour impacts. Despite these improvements, odours have not been completely eliminated, and people continue to be dissatisfied whenever odours occur, and are quick to make complaints. One problem was that meetings in the early days were not well handled. The site management at that time were perceived as not taking complaints seriously. Scottish Water stepped in to improve liaison with residents. The residents have access to an independent expert paid for by Scottish Water. This has been a useful step in giving residents confidence in the investments being carried out, and the expert has been able to meet and discuss with residents individually. However, this has been a mixed experience for CEC. One issue with the Code of Practice is that operators are considered to have complied with the COP if an odour is caused, but then measures are put in place to deal with the circumstances giving rise to the odour. There is little incentive on an operator to put preventive measures in place.

The investments carried out have focused on improvements to inlet works, covering of inlet works and detritors, and partially covering the primary tanks. Odour control is applied to air extracted from these sources. Further abatement could theoretically be applied to primary tanks, but this would have considerable cost and practical implications. It is more important

to focus on site management to minimise odour impacts. For example, the key to dealing with odours from primary settlement is to manage them properly and avoid the build-up of sludge. It is important to carry out storm tank cleaning when the wind is blowing offshore, but it may be necessary to step in to process effluent in the storm tanks before it turns septic, even if the wind is onshore. This may cause a short-term problem, but prevents a much greater problem which would arise if the effluent turns septic. One-off activities of this nature are managed using an established protocol. The Council and Scottish Water are made aware of plans, so that they can deal with any calls from the public. Additionally, a daily report is provided on activities at the site (e.g. level of sludge in the primary tanks). The operator takes account of the best available meteorological forecasts, and has a contingency plan in place in the event of a change in wind direction.

Site liaison meetings are currently held on a 6 weekly basis. These include the local authority, SEPA Scottish Water, Veolia and Stirling Water representatives. Meetings are held with public representatives annually: these are important, but tend to be less effective in relation to the operation of the site.

The odour management measures implemented at the site are in accordance with the expected level of odour control for a "high" odour potential site.

4.5 Case study 5: Levenmouth (2016)

The Levenmouth site was classified as "High potential" using the matrix approach described in Chapter 2.

Aspect	Weighting (A)	Low: Score 1	Medium: Score 2	High: Score 3	Your score (1, 2 or 3) (B)	Weighted score (A × B)
Throughput	10	<150,000 p.e.	150,000 to 500,000 p.e.	>500,000 p.e.	2 402,000 p.e. (design)	20
Sewage odour potential	5	Neither industrial component; nor long rising or gravity mains	Either industrial component; or long rising or gravity mains	Both industrial component; and long rising or gravity mains	3 Long (12 miles) mains; partly above ground affects influent quality; 85% domestic	15
Activities carried out	10	Screening only	Screening; primary treatment; no sludge processing	Screening; primary treatment; sludge processing	3 Full treatment and sludge treatment, thickening and drying	30
Proximity of neighbours	5	Fewer than 50 properties within 750 metres	50 – 200 properties within 750 metres	More than 200 properties within 750 metres	3 Well over 200 properties within 750 m	15
	5	No properties within 100 metres	1 to 20 properties within 100 metres	More than 20 properties within 100 metres	2 5 properties within 100 m	10
History of verified complaints	5	Fewer than 10 verified complaints per year	10 to 50 verified complaints per year	More than 50 verified complaints per year	3 29 - 173 com- plaints per year, not verified	15
Very low potential: Less than 65						
Low potential: 65 to 80					105 High potential	
Medium potential: 81 to 95					riigii potentiai	
High potential: More than 95						

The Levenmouth site was commissioned in 2004. Odour assessments were carried out at that time, but in retrospect, this was carried out on an optimistic basis. These assessments indicated that there would be no detectable odours, but this was not realistic in practice. Consequently, a large number of complaints were received, which has taken a substantial investment of time and funds from both Scottish Water and the local authority to address.

One of the key issues is that sewage is collected from a wide area with a long flow time (up to 14 hours) with part of one sewage main above ground. Consequently, sewage can arrive at the site having undergone anaerobic decomposition. Consequently, a number of measures have been introduced to improve influent quality. Two stormwater works have been constructed on the sewage main, and chemical dosing is carried out to reduce septicity. Telemetry has been implemented to provide real time data on BOD, COD, suspended particles and sulphide levels in the sewage, enabling additional dosing to be carried out if required. Further improvements might focus on reducing the extent of above ground sewage main, or interim treatment of sewage prior to arrival at the Levenmouth site although this would have considerable cost and practical implications.

The site operates in accordance with an Odour Management Plan. Housekeeping and management at the site are considered to be good. Preliminary and secondary treatment plant is fully covered with odour extraction. Sludge holding tanks and storm channels are also covered, with partial odour extraction. Odour treatment consists of bio-filters and chemical scrubbing as appropriate.

Air is also extracted from the sludge treatment and sludge cake export buildings, and treated using chemical scrubbing, activated carbon filters and thermal oxidation. Hydrogen sulphide levels are monitored continuously in discharges from odour treatment plant, and at the site boundary.

The site is located in a bowl, which may contribute to relatively poor dispersion of odours. Taller stacks have recently been constructed on the drier building and sludge processing building. The site has in the past employed a liaison officer. The liaison officer was effective in enabling residents to bring their concerns to Scottish Water's attention. A liaison group continues with representation from local residents, Councillors, MSPs, council officers and site management. This has been worthwhile. The local authority used to attend in response to every complaint received. The Council is now not able to do this because of resource issues, and the improvements in odour performance at the site.

All sludge and odour treatment processes are regulated under PPC where specific environmental management and environmental limit conditions are to be complied with. The sites' OMP also falls under the licence conditions.

The management and controls on odour conform with the requirements that would be expected of a "high" potential site. These measures have been effective in reducing the incidence of odour complaints, although odour complaints remain at a relatively high level. Further improvements would potentially focus on management of sewage upstream of the site.

Appendices

Appendix 1: Supporting evidence

A1.1 Shieldhall sewage works

Table 10: Shieldhall site characteristics

Item	Description
Throughput (population equivalent or m3/day)	Treat up to 7500 L per second or 655,000 m3 per day plus same again to for storm tanks. This is maximum capacity.
	Population equivalent: 585,000
Nature of sewage	South part of Glasgow extending towards Cambuslang.
Description of sewerage mains	Lots of pump stations feeding into site, largest is Kinning park.
	A lot gravity fed to pumping stations then pumped here. Most pumped from stations. 2 sewers come in from Renfrew and Kinning park estimate 50/50
	Vast majority at some stage is pumped.
What sewage/sludge treatment activities are carried out at the site?	Screening (coarse and fine), grit removal, primary settlement (PST), biological aerated system, final settlement tanks. No tertiary treatment.
	Desludging and PST pumped to Daldowie. Have centrifuges on site and used occasionally if Daldowie can't take sludge
How many residential properties are within	Very large Hospital, located next to the site.
400 m of the site?	Within 400 m housing only to the east of the site along Govan Rd, up as far as the Clyde tunnel. Mostly apartments, ~60-100.
	Scrap yards and docks on other sides, so not many houses.
How many verified odour complaints have been received each year for the past 5 years? Please provide details of local authority	2 in last few days, have sent on Odour complaints logging forms. These complaints came from east of the site in Linthouse Buildings, Glasgow G51 4RG and North of the river Dumbarton Road, Glasgow G14 9TR.
contact	There is a cleansing/recycling plant close by run by Glasgow City Council that also has smells so not sure where smell comes from.
	Most calls go to SW, previously had staff on site here to deal with but gone now.
	Process is Caller – SW; SW – person on standby on site – they then follow up with customer and form to fill in for investigation.
Describe the sewage and sludge treatment process. Highlight any specific measures you	A lot of imported sludge is brought on site from septic tanks and other smaller works. Pumped from here to Daldowie. Not treated, straight into sludge tank.
use to ensure that the process is as effective as possible	Septic tanks sludge water sludge and septic tanks etc. goes through process.
	Sludge tanks underground. Have new odour control systems. Tanker bay discharge. Scrubbers.
	Centrifuge used on occasion. Pump sludge across road, Centrifuged then liquid pumped back. This may create odours? Not always sealed. Liquid gravity feedback to low level sewer, bottom of screw pump and fed back into treatment process. Increase in use of centrifuge. Add ferric so will mean take sum of Dalmuir sludge here. Will run more in new year. Dalmuir have centrifuge, but can't do it all. If backlog or too much ferric sent to Shieldhall.
	Sludge, from Dalmuir pumped to shiedhall with sludge from Erskine, but not at same time. Laypark (Paisley) pumped in separate line to Shieldhall. Then all pumped to Dalmarnock who add their sludge and then all goes to Daldowie vents along the way, air valves, release pressure
	Certainly areas such as storm tanks and PST are the issues where odour coming from under better control than previously, but no odour control for those
Describe your procedures for normal site	Do have OMP.
management, including regular inspection, cleaning and other housekeeping measures	Jerome hydrogen sulphide measurements are undertaken on occasion, at various locations on site. Have more robust procedure for emptying scraping storm tanks and dropping the flow to primary settlement tanks. Drop and empty some PST if flow low. More likely in summer.
	Housekeeping measure: storm scrapers and empty PST tanks to keep flow consistent.

Table 10: Continued

Item	Description
Describe any site management measures (and their frequencies) introduced specifically	PST and storm tanks procedures and Jerome test on occasion. Not a set procedure on a regular basis. As soon as flow drops off PST and empty storm tanks
for odour control, e.g. olfactory surveys, monitoring, control of material residence times	Put flow rate into a formula on spreadsheet and tells how many PST tanks to run. Done on a daily basis. Not fool proof. Total flow in and tell tanks, but issue with time lag for flow works to a degree. Need to know rain or not, have tanks open ready for rain, then close down when low flow. Keep consistent speed of flow in plant. If flow is too low and spend too long in system can go septic.
	Final tanks and aeration takes a few hours PSDs speed up a bit
	PST overflows into storm tanks Good to scrape settlement tanks before emptied. Not as much as a smell.
	Nothing stands out to create odour. Summer is more difficult than winter.
	Odour control is as good as it can be in Shieldhall. It has become easier to manage storm tanks since staff taken off shifts. More men to put resources towards maintaining. But now site is unmanned at night (on standby) so this can result in issues. Manage PST and storm tanks better than when shifts on. They are putting an RTC system that will manage the whole process better / more efficiently.
Describe any physical measures (and where	Odour control for imported sludge
they were applied) introduced specifically for odour control, e.g. chemical dosing, moving or covering potentially odorous plant, air	Odour control for desludging PDS. Desludging within a chamber in separate building, underground tanks.
extraction, odour abatement (e.g. biofilter,	Screens and grit removal own building, no odour treatment
scrubber or thermal oxidiser)	Keep doors and windows closed & locked. All doors fixed in sludge pipework gallery. Have put covers on inlet and at end of PST to reduce odours.
Do you anticipate making any further investment in odour control?	An odour testing system is due to be installed.
Describe any public engagement measures you have carried out, either regular or one-off. For example, open days, newsletter, public notification ahead of improvement works	None
Describe any public engagement measures you have carried out specifically related to odours	None in past few months.

Note of discussion with environmental protection officer for Shieldhall

A1.2 Ardoch sewage works

Table 11: Ardoch site characteristics

Item	Description
Throughput (population equivalent or m3/day)	Pe 64000 Design 130000
Nature of sewage	Domestic 80% Industrial 20% Main trader is Loch Lomond Distillery
Do you anticipate making any further investment in odour control?	An odour testing system is due to be installed.
Description of sewerage mains	Three pumped flows to works. Castlegreen to Ardoch 2km rising main. Cardross to Ardoch 6km rising main. Dalmoak to Ardoch 1km rising main 4km gravity sewer
What sewage/sludge treatment activities are carried out at the site?	Full biological treatment using fine bubble diffused air. Sludge thickening by drum thickeners
How many residential properties are within 400 m of the site?	Approx. 400
How many verified odour complaints have been received each year for the past 5 years? Please provide details of local authority contact	2009-10 - 33 2010-11 -43 2011-12 - 18 2012-13 - 7 2013-14 (to Feb) 0

Table 11: Continued

Item	Description
Describe the sewage and sludge treatment process. Highlight any specific measures you use to ensure that the process is as effective as possible	Treatment process run via SCADA with control set points. All major kit is in odour controlled buildings (inlet works, screens, grit removal) PST weirs are covered. Sludge thickening, transfer and disposal are in odour controlled buildings.
Describe your procedures for normal site management, including regular inspection, cleaning and other housekeeping measures	Site manned daily Monday to Friday, Critical tasks identified and carried out to ensure works meets consent standards set. All Kit have MST's set
Describe any site management measures (and their frequencies) introduced specifically for odour control, e.g. olfactory surveys, monitoring, control of material residence times	The works was constructed with odour abatement as part of the design.
Describe any physical measures (and where they were applied) introduced specifically for odour control, e.g. chemical dosing, moving or covering potentially odorous plant, air extraction, odour abatement (e.g. biofilter, scrubber or thermal oxidiser)	As above.
Do you anticipate making any further investment in odour control?	Capital maintenance to be carried out on the odour treatment plant during SR15
Describe any public engagement measures you have carried out, either regular or one-off. For example, open days, newsletter, public notification ahead of improvement works	Local Environmental health dept notified of capital work being carried out that may result in odours being generated. Open day held in 2004. Odour forum set up around 10 years ago with local residents, local councillors and SW management team. Lasted about 1 year.
Describe any public engagement measures you have carried out specifically related to odours	Public meetings held about 10 years ago

Note of discussion with environmental protection officer for Ardoch

A1.3 Dalmuir sewage works

Table 12: Dalmuir site characteristics

Item	Description
Throughput (population equivalent or m3/day)	650,000 pe 150,000 – 380,000 m3 per day
Nature of sewage	Mostly domestic, 95%
	Of industrial 3/4 are a few big industries. Devro, sausage skins manufacturer. DRX, (Scottish water), Irn Bru and a distillery,
Description of sewerage mains	Mostly gravity mains
	1 pumping station at Partick for city centre sewage
	70% gravity. Info with Scottish Water
	Mains is mixed, sewage and rain water. So need to include that in questionnaire issue with concentration and speed. Q how much rain water run off or are they separate network or mixed network?
What sewage/sludge treatment activities are carried out at the site?	Pre-treatment (filtering) Primary: settlement, grease treatment Secondary: aerated activated sludge Tertiary: nitrification Sludge treatment: Sludge thickening, pumped to Daldowie for incineration.
How many residential properties are within	Lots
400 m of the site?	Map of area for each site flats on Dunbarton road, between here and plant is roughly 400 m. Includes blocks of flats Hundreds, 300ish?
How many verified odour complaints have	5-10 pa.
been received each year for the past 5 years? Please provide details of local authority contact	Complaint through Scottish Water sent to them and west Dunbartonshire council. Go on site usually linked to network odour issue or doing something special on site. Pat Hoey is contact from West Dunbartonshire Council
	Pat has suggested to use SAUR as an example of a plant that is working well

Table 12: Continued

Item	Description
Describe the sewage and sludge treatment process. Highlight any specific measures you use to ensure that the process is as effective as possible	Similar to 4th question Details can be found in the Dalmuir odour management plan
Describe your procedures for normal site management, including regular inspection, cleaning and other housekeeping measures	Odour management plan. Area by area, risk assessment on odour undertaken. Divided up into areas with proper processes to reduce or minimise odour. Developed in house. Occurs at each SAUR site, but specific to location. Share with city council in Clydebank. Pay Hoey has added comments.
Describe any site management measures (and their frequencies) introduced specifically for odour control, e.g. olfactory surveys, monitoring, control of material residence times	All in document odour management plan Have online monitoring. Have odour treatment on site. All covered. H2S and hydro carbon monitor at neck and end of stack. Odour treatment to wash gas. Gas taken from all areas where strong odour, pre-treatment and sludge treatment mainly. 3 other treatments. Contaminated air is collected and taken to tower, undergoes recirculation; gas washed; caustic soda and bleach, react with H2S = H2SO4, that is why add caustic soda, neutralise acid. Higher pH better to catch H2S gas and mercaptans. Captured at higher pH. Main treatment. Activated carbon treatment also. Sludge is mix of both treatments, chemical scrubber and active C More details in the odour management plan.
Describe any physical measures (and where they were applied) introduced specifically for odour control, e.g. chemical dosing, moving or covering potentially odorous plant, air extraction, odour abatement (e.g. biofilter, scrubber or thermal oxidiser)	Ferric sulfate best treatment for odour. Catching phosphate and H2S precipitation of FeS catch in water and no odour part of process. If don't include will generate more odour. Odour performance on site is linked to its use. Not specific of odour but has impact on odour as using it change injection point during summer to catch odour Was known already, all French WWTP use it. Also known as chemical dosing Chemical dosing main one in odour management plan
Do you anticipate making any further investment in odour control?	Yes, one area where there is odour generation, going to cover and treat. Distribution chamber between pre and secondary treatment turbulence and waterfall and in summer smell. Going to cover and odour treatment. 2-3 years link to other treatment system. Local but same treatment as exits.
Describe any public engagement measures you have carried out, either regular or one-off. For example, open days, newsletter, public notification ahead of improvement works	Annual city council audit and odour management plan on site all odour complaints go through SW.
Describe any public engagement measures you have carried out specifically related to odours	None. They are in the process of looking for ISO14001, looking at reducing impact on environment. Take into account all interested parties. Communicate policy in terms of pollution to environment, from outfall to odour around the area. Target Oct 2016, but optimistic, end of year submission

Note of discussion with environmental protection officer for Dalmuir

A1.4 Seafield sewage works

Table 13: Seafield site characteristics

Item	Description
Throughput (population equivalent or m3/day)	Average flow ~ 300,000 m3/d
Nature of sewage	Domestic. Minimal industrial flows.
Description of sewerage mains	The site is served by two major gravity sewers (the western and eastern interceptors). These flows converge at a siphon house prior to the works from which they are fed directly to the inlet works. There is also a pumped main delivery ~10% of the flows which arrives at the site and is lifted by two Archimedes screws.
What sewage/sludge treatment activities are carried out at the site?	Sewage treatment is by means of coarse and fine screening; grit removal; primary settlement and FBDA activated sludge. Sludge treatment includes picket fence thickening of primary sludge; belt thickeners for secondary and imported sludge; thermal hydrolysis for all sludge followed by anaerobic digestion. The final sludge product is de-watered by centrifuges.

Table 13: Continued

Item	Description
How many residential properties are within 400 m of the site?	I do not have a no. but from a very basic assessment I would say no more than 30 properties.
How many verified odour complaints have been received each year for the past 5 years? Please provide details of local authority contact	2013/14 = 15 2014/15 = 11 2015/2016 = 14 All complaints verified by site inspection by City of Edinburgh Council.
Describe the sewage and sludge treatment process. Highlight any specific measures you use to ensure that the process is as effective as possible	See above.
Describe your procedures for normal site management, including regular inspection, cleaning and other housekeeping measures	The Veolia BMS requires daily and weekly checks across the site. This is supported by management audits undertaken at least monthly. The Odour Management plan also includes strict requirements for responding to spillages,
Describe any site management measures (and their frequencies) introduced specifically for odour control, e.g. olfactory surveys, monitoring, control of material residence times	All activities are covered by the site OMP. This includes checks of odour control units, olfactory sampling in response to complaints or detection of odour, the cleaning of storm tanks and conditions for undertaking any works with a high potential for odour.
Describe any physical measures (and where they were applied) introduced specifically for odour control, e.g. chemical dosing, moving or covering potentially odorous plant, air extraction, odour abatement (e.g. biofilter, scrubber or thermal oxidiser)	A drawing showing the extent of the site where odour control is in place is included. There are numerous odour control plants ranging from activated carbon, chemical scrubber and biological processes.
Do you anticipate making any further investment in odour control?	No.
Describe any public engagement measures you have carried out, either regular or one-off. For example, open days, newsletter, public notification ahead of improvement works	A yearly stakeholder meeting takes place which is attended by representatives of local residents and politicians. We also host site visits for key stakeholders; specifically MPs and MSPs.
Describe any public engagement measures you have carried out specifically related to odours	A sitev visit by the local MSPs is scheduled for June the 17th.

Note of discussion with environmental protection officer for Seafield

Odours from the Seafield works have been a long-established problem for many years, going back before East of Scotland Water handed over to Scottish Water.

SG has been involved since 2003, at which point there were 400-500 complaints received per year. At that time it was viewed as an urgent priority by City of Edinburgh Council (CEC).

CEC issued an Abatement Notice, which was appealed by Scottish Water. This was prior to the introduction of the Code of Practice. The outcome of the lengthy appeal process was that the Abatement Notice was quashed, and SW and CEC were given 6 months to sort out the problems. SG considers that the Abatement Notice process was not helpful to speedy resolution of the odour problems, and probably delayed a satisfactory resolution. SG's view is that the problems experienced in Edinburgh led to the introduction of the statutory Code of Practice.

A key problem was that residents expected that the £100m investment to meet EC directive requirements for water treatment would result in the complete elimination of odours. SW has been involved at the site since the mid-1990s. At that time, there was always an odour in the vicinity of the site, whereas now there is normally no odour detectable other than in the near vicinity of the primary tanks. This represents a massive improvement. However, odours have not been completely eliminated – some problems

always occur – and despite the improvement, many residents feel let down by the process. At the time of the Abatement Notice, there was a groundswell of opinion that people felt left behind and expected better environmental conditions. An organised group was pressing for improvements.

A steering group was set up to discuss and agree the way forward. The Steering Group considered 32 options for improvement. Under the new legislation which introduced the CoP, odour management measures had to be introduced on a "best value" basis, i.e. with regard to cost. An £18m investment programme was agreed. This was designed to deliver a 70% reduction in odour emissions and complaint numbers, based on modelling analysis. To secure a further 2% reduction would have required a further £10m investment, so this was clearly indicated as the "best value" solution.

Delivering the agreed improvements took 3-4 years. This has been effective in reducing odour impacts and complaints. However, people continue to be dissatisfied whenever odours occur, and are quick to make complaints. One problem was that meetings in the early days were not well handled. The site management at that time were perceived as not taking complaints seriously. Scottish Water stepped in to improve liaison with residents.

The residents have access to an independent expert paid for by

Scottish Water. This has been a useful step in giving residents confidence in the investments being carried out, and the expert has been able to meet and discuss with residents individually. However, this has been a mixed experience for CEC.

The investments carried out have focused on improvements to inlet works, covering of inlet works and detritors, and partially covering the primary tanks. Odour control is applied to air extracted from these sources. If further steps were to be carried out, this would presumably involve complete covering of primary tanks. As well as the cost, this would have significant problems with regard to health and safety, tank cleaning etc. The key to dealing with odours from primary settlement is to manage them properly and avoid the build-up of sludge.

The Odour Improvement Plan has delivered to the expectation of CEC, but not to the expectation of local residents. Complaints are currently running at c.80 per year. There was a spike in 2012, resulting from four separate management incidents.

There is a lot of useful material in the Code of Practice – e.g. guidance on how to measure odour. However, SG identified two key issues with the Code of Practice.

- (a) The CoP requires odours to be minimised, whereas residents expect odours to be eliminated. There is a cost element, particularly as any improvements have to be paid for by ratepayers and/or taxpayers.
- (b) In the event of an odour incident, if the operator can show that they have remedial measures in place, this does not constitute a breach of the CoP. E.g. CEC issued an Enforcement Notice a few years ago regarding a spillage from the containment building which caused a substantial odour. This was appealed, and CEC was advised that they should not contest the appeal, because the operator had put clean-up measures in place, and thereby complied with the CoP. This is viewed by residents as effectively a licence to cause odours: as long as remedial measures are in place, there is no sanction on the operator for causing what could be a substantial odour incident. There is no law of private nuisance in Scotland, so individuals cannot bring their own proceedings.

SG's view is that all the investments in odour control at the site have been effective in managing odour, but good site management is the biggest single factor. E.g. ensuring no build up of sludge in the primary tanks. E.g. managing the storm tank cleaning process when the wind is blowing offshore, but stepping in to process effluent in the storm tanks before it turns septic if necessary – this may cause a short-term problem, but prevents a much greater problem which would arise if the effluent turns septic.

CEC carries out a monitoring and response programme.

- Handling complaints: CEC operates a laboratory next to the works, and can respond to a complaint in as little as 15 minutes. This enables complaints to be verified, and any odours potentially traced back to the works. Mostly, officers detect no smell on arrival.
- 2. Routine assessment visits: Now down to 1-2 visits per month. Drive around 12 points close to the site, and sample at each location following CoP protocol. This enables a response to be made to complainants. The cost of the current regime is c.£6-7k per year, but was up to £70k/year in the past.

CEC has not looked into the use of electronic nose technology.

The odour complaint protocol is that calls are handled by the call

centre. There is a defined workflow which sends complaints to Public Health dept and Veolia Control. This allows the operator to verify and investigate. There are standby teams available at night, but this is under significant financial pressure at present.

Liaison meetings are held on a 6 weekly basis. These include SEPA representatives, and Craig Carr from Scottish Water.

One-off activities are managed using an established protocol. The Council is made aware of plans, and a daily report is provided on activities at the site (e.g. level of sludge in the primary tanks). The operator takes account of the best available meteorological forecasts, and has a contingency plan in place in the event of a change in wind direction.

Summary

- The Code of Practice requirement for "minimisation" rather than "elimination" of odours does not meet residents' expectations.
- The Code of Practice provisions which allow a smell to be caused as long as steps are being taken to deal with the odour makes the authorities look bad, and could reduce the incentive for the operator to manage the site effectively.
- It is difficult or impossible to publish, or for the regulator/ operator to take credit for, improvements in odour control.

A1.5 Seafield sewage works

Table 14: Levenmouth site characteristics

Item	Description
Throughput (population equivalent or m3/day)	Consent pe = 402,000 Actual pe (2015 average @ 60g/h BOD) = 125,000 Consent DWF = 88.5 MI/d Actual Flow (2015 average) = 58M//d
Nature of sewage	Originally 50% trade, 50% domestic However, paper mill decline has put this at approx. 15% trade, 85% domestic
Description of sewerage mains	Rising mains (PFI assets) = 1.5 miles Gravity sewer (SW assets) = 15 miles (approx.)
What sewage/sludge treatment activities are carried out at the site?	Preliminary, secondary and tertiary. High rate activated sludge, thickening, dewatering and thermal drying.
How many residential properties are within 400 m of the site?	Approximately 200 properties.
How many verified odour complaints have been received each year for the past 5 years? Please provide details of local authority contact	Complaint numbers received: 2012- 168 2013- 173 2014- 46 2015- 29 2016- 4 None of these complaints were verified by either SEPA or the Local Authority. Details of all complaints received by Scottish Water were passed to the regulators. Local Authority primary contact: Don Taylor,
Describe the sewage and sludge treatment process. Highlight any specific measures you use to ensure that the process is as effective as possible	A wide combination of pumping, screening, de-gritting, biological oxidation, settlement, UV, dewatering, drying and pelletising. Site manned 24/7 with comprehensive Control Room SCADA facilities that monitor process parameters. EM&I partners provide out of hours call-out service to deal with priority breakdowns. On site 7d/w manned laboratory that carries out daily sample and analysis on a wide variety of areas across the waste water treatment process. Daily results produce a rich and ready appraisal of process health and performance to which staff can make sound judgements for change or corrective action.
Describe your procedures for normal site management, including regular inspection, cleaning and other housekeeping measures	Site manned 24/7 with a combination of shift/daily/weekly/monthly operational routines.
Describe any site management measures (and their frequencies) introduced specifically for odour control, e.g. olfactory surveys, monitoring, control of material residence times	All sludge and odour treatment processes are regulated under PPC where specific environmental management and environmental limit conditions are to be complied with. The sites' OMP also falls under the licence conditions. Site manned 24/7 with SCADA control room monitoring of various plant, equipment and instrumentation. This includes process conditions, site boundary H2S and stack H2S emission levels.
Describe any physical measures (and where they were applied) introduced specifically for odour control, e.g. chemical dosing, moving or covering potentially odorous plant, air extraction, odour abatement (e.g. biofilter, scrubber or thermal oxidiser)	Preliminary – all enclosed in dedicated building with channel/tank coverings with odour extraction. Influent sewage is monitored for septicity and chemical dosing is applied when required. Secondary – all RAS de-sludge chambers and channels covered with odour extraction. Tertiary – all sludge holding tanks and storm channels are covered with part odour extraction. Preliminary, secondary and tertiary has dedicated odour treatment consisting of bio-filters and chemical scrubbing. Sludge Treatment Building has various point source odour extraction points and general building ventilation to a combination of chemical scrubbing, activated carbon filters and thermal oxidation. Sludge cake export operations (when required) are done inside a building with odour extraction. This is also supplemented with a bespoke chemical dosing treatment to minimise cake odours from lorries. 2015 – Replacement of 2 x 15m odour stacks to 30m stacks.
Do you anticipate making any further investment in odour control?	Not at this time but is constantly reviewed under BAT, emerging technology and continuous improvement.

Table 14: Continued

Item	Description
Describe any public engagement measures you have carried out, either regular or one-off. For example, open days, newsletter, public notification ahead of improvement works	Stakeholder group set up consisting of local elected Councillors, MSP, MP, Environmental Health, SEPA, representatives from the local action group (FLAG), representatives from the PFI Company's and Scottish Water.
	Notifications of any onsite activities that could impact on the local community distributed via email to the stakeholder group.
	Letter drops carried out in the local area to advise improvement works onsite that would be visible in the community.
	Over 7000 newsletters distributed within the community to provide updates regarding onsite activities.
	Dedicated Levenmouth WWTW internet page set up on the Scottish Water website.
	SW and CELTS employees have carried out volunteer work within the local area.
Describe any public engagement measures you have carried out specifically related to odours	Site based SW Community Liaison Officer employed for 18 months to investigate odour complaints, liaise with the local community and conduct odour surveys in the area. Contact cards distributed to residents to allow real time reporting of perceived odour issues and prompt investigation.
	Information evening events held in local community centres that were open to all residents with representatives from both Scottish Water and CELTS in attendance. These were advertised in the local media and on SW website.
	Notifications sent out to the stakeholder group advising of any activities onsite that could potentially have an impact on odour.
	Stakeholder group notified of any offsite activies eg cake export lorries from the site that could potentially be noticed by the community.
	JHI conducted social study through customer focus groups to allow residents to freely express their opinions regarding odour issues at the site and the impact on the community.
	SW Customer Contact Centre telephone customers following investigation of odour complaints to provide feedback.
	Regular Odour Working Group meetings held representing SW, PFI, SEPA and Fife Council to discuss operations, compliance and communication.
	2013/14 – Odour Action Group formed consisting of multi-representation from SW and PFI independently chaired by leading expert. Various in-depth technical studies and actions carried out under a holistic root-to-branch approach from operation and management of SW catchment assets through to the PFI treatment works and assets. SW customer communication was also focused on.

Note of discussion with environmental protection officer for Levenmouth

Key points:

- Site commissioned in 2004. Not enough attention paid to odour control at that stage: odour modelling was carried out, but on an optimistic basis. People were promised "no odours" – this made it harder to regain trust
- 2. Complaints arose from the word go. This sensitised the population and made future odour management much more time-intensive and expensive
- Following initial complaints, odour controls were put in place. Not much change to processes, as the site was already more or less state of the art.
- Complaints carried out after these investments from 2007.
 Partly due to sensitised population
- 5. Professor Jackson carried out a study, and highlighted that the main issue was to do with influent. The sewage comes from a wide area with a long flow time (up to 14 hours) with part of one sewage main above ground. Consequently, don't have diurnal peaks in flows, and sewage can arrive at the site having undergone anaerobic decomposition.
- 6. Some measures have been implemented to improve influent quality: 2 stormwater works on the sewage main; introduced some pre-treatment (chemical dosing) to reduce septicity. Telemetry to provide real time data on BOD, COD, suspended particles, H2S. Dose if needed. H2S trigger level of 5 ppm. This has a cost implication

- Ideally, DT would like to see the above ground sewage main buried, but this would be very costly. Upstream treatment may be an alternative option.
- Housekeeping at the site is good. DT considers that Dave Thomson and the PFI team manage the site well. Other sites are not so good, e.g. interceptor chamber cover left open.
- Prof Jackson also highlighted topography influences. The site is in a bowl, ground rises to the east. Consequently, taller stacks have been constructed on the drier building and sludge processing.
- 10. A lot of complaints referred to a "burnt" sewage smell.
- 11. The site has in the past employed a liaison officer. She was effective and did a good job, although some "hard core" residents remained aggrieved.
- 12. Site has a liaison group with local residents, Councillors, MSP, council officers etc. This has been worthwhile.
- 13. A sociologist at James Hutton Institute carried out an analysis from sociological perspective. This was interesting.
- 14. The Council used to go straight out in response to every complaint received. No longer do this, as the odour problem is less severe than previously, and resource issues. The Council has not identified an odour nuisance for over a decade.

- 15. Some key learning points:
- a. Don't promise no odour
- Be very conservative at the design stage, particularly when designing on the basis of odour model results – this will save a lot of time, effort, investment later
- c. Consider and manage influent issues
- Important to get odour control right from the start, otherwise it is difficult or impossible to fully recover trust of local communities

A1.5 Professor Robert Jackson

A meeting was held with Professor Robert Jackson. Professor Jackson has acted on behalf of Scottish Water and local residents groups in relation to the assessment and control of odours at sewage works. The notes of this meeting are as follows:

RJ has been involved with sites at Seafield, Dalmuir and Levenmouth. He is currently working with the local community at the Nigg site in Aberdeen.

Seafield

RJ's acted here from 2003 as independent consultant for the residents, paid for by Scottish Water. His role was to ensure that information provided by/on behalf of SW was robust – "not pulling the wool over their eyes."

A report was produced by WRc which was the focus of investment plans. RJ's advice to Edinburgh City Council was to highlight that there was an odour problem, but leave the identification and implementation of solutions to Scottish Water. ECC did "step up to the plate" by issuing an abatement notice. However, in the event, ECC identified which of the measures in the WRc report they thought SW should implement.

Consequently, while measures implemented have been effective, SW has not implemented the most far-reaching and expensive option, of fully covering the primary settling tanks. SW has also not addressed the issues that can occasionally occur when cleaning the storm tanks, and the wind direction changes to blow odours towards site neighbours.

Site investments have led to a substantiasl reduction in complaint numbers. This is the only metric we have to judge effectiveness of interventions. RJ considers that the key factor in relation to odours is frequency. Duration, type, intensity are relevant, but frequency is the key factor.

The model of using an independent expert funded by the company is useful. The key factors are trust in the impartiality of the expert, and confidence in the expert's competence.

RJ's role at Seafield has therefore been:

- Review WRc report
- Attend stakeholder meetings (this gives comfort to residents that the steps being taken are worthwhile.) These meetings are now quarterly.
- Dealing with ad-hoc calls from residents as and when new problems arise.

Levenmouth

RJ's role here was as chair of a task force to evaluate odours and develop solutions. The task force comprised the contractor, Scottish Water, sewerage network managers and trade effluent producers. RJ considers that getting the stakeholders together to inspect each others' installations was instrumental in securing improvements to the overall performance of the network and sewage works. This enables each operator to understand the

constraints that other parties are operating under, and to take steps to improve the management of sewage. Managing the sewerage network and treatment plants as one is very important in dealing with odour issues.

One of the key issues here is the extensive catchment area, and solar gain in above-ground pipework, leading to "cooking" and septicity of the sewage before it arrives at the site. Previously, two paper mills in the area contributed significantly to sewage flows. These have now closed, resulting in a decrease in solids and flow through the system, and hence an increase in flow times. The closure of the paper mills also means that there is not enough demand to run the driers continuously. This can cause issues due to the intermittent nature of this source, and the need to stockpile material to ensure that there is enough to operate the driers. The drier stacks at Levenmouth were recently raised. One key benefit of this is that it is a visible measure, and residents can see the difference.

RJ considers that the Levenmouth works is now well managed. It has a small footprint and is energy intensive due to the range of processes carried out at the site. The Levenmouth site is located in a housing estate – this leads to problems.

The operator monitors the oxygen level in the sewage and doses to reduce septicity when needed. This system is useful, but it is better to prevent issues arising at source if possible.

The operator employed a liaison officer at the site for a period of time – developed an approach based on "phone don't moan". She was effective, and took the time to meet with complainants. Local residents appreciated the personal contact, and this was very positive.

Dalmuir

RJ was involved at Dalmuir many years ago, but has not worked there since SAUR has been operating the site. There was an issue related to storm tank cleaning at that time.

Nigg (Aberdeen)

RJ is now working at Nigg as independent consultant for the community council – a statutory consultee on development proposals (equivalent of the parish council in England)

A "Torrey Odour Response Officer" is employed at Aberdeen, similar to the liaison officer at Levenmouth. The TORO can speak directly to Scottish Water and get action on specific issues. This has again been effective, but contract expires in September, and not clear what arrangements for reporting odours will follow.

Summary

- Odour management is not about assigning blame, it's about understanding causation and taking action.
- A holistic approach is often required, ensuring that Scottish Water, the PFI contractor and network teams work together.
- Half is engineering/science; half is communications and public engagement
- A good Odour Response Officer can be very helpful in dealing with problems as they arise, and dealing with complaints.
- An independent expert can be useful in giving residents confidence in measures being taken. It is particularly helpful if the expert is willing and able to speak to the media.
- Honesty in giving bad news is helpful. RJ often takes the view that "the more problems we identify, the better," as it enables action to be taken.
- Stakeholder meetings can be useful, but tend to have a political element which may not be helpful. An independent (non-political) chair can be useful.

Appendix 2: Odour control workshop notes

CREW Odour management workshop 25th August 2016; University of West of Scotland, Paisley.

The bullet points summarise the discussion that took place following each presentation. It does not reflect the contractor presentation itself; which was circulated to delegates following the workshop. The text has been anonymised as far as possible.

Study context: Dr Richard Allen

No discussion

Overview: Dr Brian Quinn

- Some of those attending classified their sites based on the proposed risk matrix. One site, which is a high risk site, would be classified as a low risk site based on this matrix.
- Distance from WWTW to receptor: there can be odour complaints from outwith 400m.
- Action: This will be reviewed if it can be shown there is a need to do so.

Update: Changed to refer to wider area (750 m) and near field (100m) zones

- Complaint history: One site in Scotland was the most complained about in Scotland due to one person calling every day; an EHO will investigate to determine if the complaint is warranted, if it's not then it won't count of LA numbers but for returns to the Scottish Government it does. It was felt that this toll may not be useful if a site is classified as 'low risk' but there are complaints about odour from the site.
- Verification: It would be beneficial if the term 'verify' had a
 definition. Any complaint from a stakeholder / public it is a
 valid complaint. It would be difficult to maintain credibility
 with the public if complaints are dismissed.
- Action: A definition of 'verify / verification' will be added to the text.

Update: The term "verified complaint" is already in use, so an alternative term "genuine complaint" has been introduced and defined.

- There appeared to be confusion as to why there needs to be a new matrix given that there is an odour matrix in the Code of Practice (CoP) and confusion to what it's there to do e.g. that it won't help with Statutory Nuisance complaints. It was noted that this matrix is not there for Statutory Nuisance complaints.
- Action: There needs to be a disclaimer saying that there is a matrix in the CoP and that the two matrices are not the same thing and should to complement each other – i.e. one does not overrule the other.
 Update: Added
- It was suggested that the descriptors may need to be changed because it would become a public document and therefore the wording needs to be clarified to ensure that there is no confusion, particularly the 'history of verified complaints'.

Update: See comment on "verification" above. The term "odour risk matrix" has been changed to "odour potential matrix"

- There was a discussion on the addition of topography and prevailing wind direction to the matrix however there was a lack of consensus amongst delegates. It is likely that the wind direction will change depending on season and weather e.g. at Seafield the prevailing wind generally takes odour out over the sea however on hot days there may be stagnant, nonmoving air.
 - **Update:** the influence of topography and prevailing wind direction has not been included in the odour potential matrix. Reference has been made to the importance of considering these factors in Section 3.2.2.
- It was felt that there is no resource to apply this matrix at every site therefore the history of complaints will be where they start. As a tool for understanding current concerns it may be beneficial to have a flow chart to show where you start and the steps that need to do, i.e. where do as EHOs prioritise. However that is outwith the scope of the brief of the project. It will be up to Scottish Government to advise how they envisage this guidance should be used, and for regulators, Scottish Water and contractors to implement accordingly.
- Action: Recommend that the matrix provides a framework for users but that there needs to be a discussion on how this will be applied.

Update: Comment added in Section 2.

 Also recommend review of call handling procedure/phone logging form including taking e-mail addresses and targeted approach on number of complaints.
 Update: Comment added in Section 3.8.1

Case Studies - Dr Mark Broomfield

The following bullet points summarises the discussion that took place following the case studies presentation:

- Members of the public can distinguish between sewage smell
 and other odours. Those who have lived near the site for a
 while don't tend to complain however some new residents
 may complain as they are not used to it. Also sewerage
 odour has a particular resonance with the public and may not
 accept that odour is from another source
 Update: Reference made to sewerage odours in 3.8.1
- There can be network issues; after a dry season and the first flow there will be complaints as there are vented sewer covers. It was raised that when a customer phones Scottish Water the call handler follows a script i.e. is there a WWTW nearby? There isn't a discussion about the network. It was agreed that the level of investigation only depends on the information given by the public.

Update: Comment and recommendation added in Section 3.8.1

- Problem with sludge
- Code of Practice (CoP) doesn't specifically refer to storm tanks.
- The CoP also refers to 'minimisation' whereas residents expect 'elimination', which can make it problematic explaining that as a regulator / operator that everything has been done to minimise odour when an odour still exists. If the CoP is implemented then it does make a difference e.g. only 1 complaint in July and 2 in August compared to hundreds before however the residents aren't buying into it. It would be beneficial for short document for residents to summarise the CoP and make it more understandable.
- Action: Scottish Government may wish to consider producing a summary guide to the CoP for members of the public

- There was discussion on how often and associated time and costs of when an odour survey is carried out. Currently it's done as and when; there is a duty to respond when there is a complaint so will try and deal with in real time (if possible) by sending out an officer to smell. In favourable circumstances (e.g. Seafield site, where there is a Council laboratory at the sewage works site), this can be achieved in as little as 10 minutes. Timewise it takes about an hour and a half to do full circuit of monitoring locations around the Seafield site.
- It was noted that if an odour moves up the political agenda
 (i.e. because residents contact their Elected Member) then
 monitoring may need to increase. There would be a cost
 associated with increased monitoring, that would need to be
 agreed as an additional spend, or allocated within operational
 budgets.

Dalmuir WWTW: Frederic Carbonnier: Saur Dalmuir

- There was discussion on extra capacity for storm water. It appears that Seafield is the only site in Scotland with extra tanks but that is due to the money being spent to manage odour.
- Delegates were asked if operators meet up with the network providers to discuss odours that don't arise from the WWTW plant but from the network? Yes and there has previously been discussion for some form of CoP for networks but there wasn't the appetite to have one; statutory nuisance would not apply because odour from sewerage networks is not released from a premises as specified in the nuisance regulations.

Discussion Session 1: Controlling by managing sewage treatment process

- When a site is compliant from the outset then it's generally going to be fine all across the process. There needs to be action up front to ensure the front end of the process is correct. It is when things go wrong that you need to start investigating why/how it is wrong i.e. firefighting. There is a knock on effect if one thing goes wrong. The front end of the plant must work correctly. This is reflected in the integrated approach to odour management exemplified throughout the report
- There needs to be public engagement; it may not necessarily be a compliance issue or odour from WWTW. You need to show the community that you are complying with the odour management plan.

Update: Comment added to Table 9 measure 2

- There was recognition at one site that improvement work had to look at the inlet works; therefore they had to be fixed at the same time as the odour improvement i.e. the work had to be done as a package. This is reflected in the integrated approach to odour management exemplified throughout the report
- Nothing had to be changed or included in the 'Process Management Table'.
- Delegates were asked what chemicals were used, e.g. some sites use ferric sulphate or ferric chloride to form a complex with incoming waste. Other chemicals have been used e.g. hydrogen peroxide, potassium permanganate. At one site a large volume of chemicals is used because of their small footprint. Using ferric sulphate does have disadvantages including chemical cost, potential risk of explosion depending on amount of ferric and downstream systems, other H&S risks, SEPA discharge limits and creation of more sludge.

It was commented that ferric sulphate is not always the preferred option.

Update: comment in 3.5.1 expanded to reflect discussion

- A discussion on H&S considerations followed. With regards to the storm screens as soon as you cover something you create a confined space, and a lot of consideration needs to go into the risks associated with the confined space from the perspective of monitoring performance, maintenance etc. If working in a closed building then there needs to PPE breathing apparatus and ensuring the temperature isn't too high for workforce. Total shutdowns are an option but can open doors which can create an odour but you need to find a balance. You need to ensure that none of the buildings create an explosive environment (under DSEAR) e.g. methane from untreated sludge.
 - Update: comment in 3.6.1 expanded to reflect discussion Discussion Session 2: Effective communication and public engagement
- It is important that the public is aware of the actions taken to remove odour through careful, scientific explanation however it is a slow process as it has been found that if one issue is resolved members of the public will move on to a different issues.
- Operators and regulators do have meetings with all stakeholders however non-PFI sites do not necessarily communicate with the public well. It was agreed that there is a lot to gain if you proactively engage with the public when something goes wrong (covered under Table 9 Measure 3).
- There was discussion on using social media to communicate.
 This would have to be maintained at a corporate level but more work needs done to hone the message
 Update: reference to social media added to Table 9 measure 8
- Communication is a good thing particularly if there is a
 problem or maintenance is being carried out. The difficulty is
 when people buy houses in an area their expectation of what
 they want may not meet what can be physically done at the
 plant.

Discussion Session 3: Monitoring methods, their applicability and abatement

- Unless there is some form of adequate ventilation / extraction then tanks will rot as you are dealing with a very corrosive environment. In terms of a skip then it may work as it's emptied within a day; it won't work for permanent installations. Also simply covering skips may not necessarily work but there is perception benefit and it also stops seagulls taking things off site. Update: comment expanded in 3.5.1 and 3.5.2 to reflect discussion. Options for covering without ventilation removed from Table 4
- Staffing costs also need to be taken into consideration e.g. a technician that does a check first thing in the morning or a night shift.

Update: comment expanded in 3.7.2 to reflect discussion

- In terms of capital investment there are constraints in terms of budget cycles and that needs to be recognised. Also covering channels can work but there is still an odour.
- In terms of odour treatment processes there can be a problem due to displaced air from tanker discharges; as tankers are all different sizes there is not an industry standard size extraction unit that could be used; at present Shieldhall is the only place a tanker can be discharged in an enclosed environment.

 Update: comment expanded in 3.7.2 to reflect discussion
- With regards to sludge cake exporting one site employs a bespoke treatment where it is treated before going on the lorry

Update: comment expanded in 3.5.1 to reflect discussion



CREW Facilitation Team

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CREW is a Scottish Government funded partnership between the James Hutton Institute and Scottish Universities.







SOUTH GLASGOW UNIVERSITY HOSPITAL & ROYAL HOSPITAL FOR SICK CHILDREN

BUILDING USER GUIDE (GENERAL)

Address	SGUH & RHSC
	Southern General Campus
	Govan Road
	Glasgow
	G51
Building user Guide Issue No.	Gen 01
Date	19.01.15 (NA)
This Building User Guide should be	FM Helpdesk
kept at all times in:	
Prepared by	Brookfield Multiplex



CONTENTS

INTRODUCTION

BUILDING USER GUIDE UPDATES & REVIEWS

1.0 Building Information

- 1.1 Design Team
- 1.2 General Building Information
- 1.3 Building Activities
- 1.4 Building Plans/Layouts
- 1.5 Building Environment BM (M&E DP INPUT)
- 1.6 Lifts, Escalators Updated Schindler Text & Plans Included
- 1.7 Security & Access Control -BM (M&E DP INPUT) Boston Networks, Scotshield -Outstanding
- 1.8 Roofs Green & Brown Gilespies Text Inserted
- 1.9 Helipad Text Inserted
- 1.10 ETFE Roof Smoke Control & Smoke Clearance Text Inserted

2.0 Emergency Information - NHS Update

- 2.1 General Information Screenshot BM(JW)/ZUTEC
- 2.2 Fire Response & Alarm NA(Justin L)/WSP(Kenny Hamill) Text Inserted
- 2.3 Fire Evacuation Procedure NA(Justin L) Text Inserted
- 2.4 Fire Fighting Equipment OK
- 2.5 First Aid -OK

3.0 Building Utility And Environmental Information - Update

- 3.1 Practices NHS Final Edit KC
- 3.2 Staff Facilities NHS Final Edit KC
- 3.3 Annual Building Energy Consumption BM (M&E –DP INPUT) Update on figures for NSGH &NCH
- 3.4 Energy Conservation OK
- 3.5 Building Services BM (M&E DP input) update set point para Updated Ok
- 3.6 Fault reporting BM (M&E DP input) insert para on IPS

4.0 Water Management

- 4.1 Water Strategies BM (M&E –DP input) check comments 4.2 Water services BM (M&E DP input) update
 - 4.3 Specialist Areas Hydrotheraphy Pool Renal & RO (Insert Post PC)

5.0 Materials and Waste Management

- 5.1 Policy OK, Some comments/review required by NHS John Green
- 5.2 Service Standards NHS to review KC/JG 5.3 Not used

6.0 Transport Facilities & Service Yard Operation -NHS general section review/update - Mark McAlister

6.1 Transport



- 6.2 Parking
- 6.3 Service Yard
- 7.0 Refit and Rearrangement Considerations
 - 7.1 Re-fit Building / Building section WW Updated Section Ok
 - 7.2 Re-arrangement / Addition of Furniture -OK
- 8.0 Reporting Provision Edit of complete section OK
 - 8.1 Reporting Procedures
 - 8.2 Responsible Parties
- 9.0 Training Edit of complete section OK
 - 9.1 Compulsory Training
 - 9.2 Additional Training
- 10.0 Links & References OK
- 11.0 General (This section is not applicable)
- 12.0 NSGH & NCH Laboratory Specific training Edit of complete section OK
- 13.0 Safety & Emergency Procedures Full re-write required NHS KC
- 14.0 Energy & Environmental Strategy Update narrative required for Imaging Equipment NHS KC/FW

Not used

16.0 Best Practice Checklist – Edit of complete section OK

Appendix A - Fire Strategy -= NHS KC - review/update required



INTRODUCTION

The Building User guide for the SGUH & RHSC building is intended to provide the user / occupants with a simple, quick and easy guide to the everyday functions of the building, in order to ensure a safe healthy working environment. It also allows ongoing building energy performance and major alterations to be recorded.

Please ensure that this log book is kept up-to-date and in a readily accessible (designated) position. It contains important information for anyone carrying out work on the building and its services.



BUILDING USER GUIDE UPDATES AND REVIEWS

The user guide should be reviewed on a six monthly basis and updated when changes to the structure, layout, fabric or services have been made. Any changes made to the user guide should be recorded on the table below.

REVIEW DATE	DESCRIPTION OF UPDATES	PAGES UPDATED / REMOVED	SIGNATURE
12.12.14	GENERAL UPDATE OF 'DRAFT' DOCUMENT INCORPOATING NHS COMMENTS		JM
22.12.14	ACTIONS ADDED TO CONTENTS PAGES		JM
19.01.15	NA ACTIONS ADDED		JL
21.01.15	FURTHER 'DRAFT' UPDATE TO INCLUDE LIFT GRAPHICS, LOW CARBON ETC		JM



1.0 **BUILDING INFORMATION**

1.1 **DESIGN TEAM**

The report has been prepared in conjunction with members of the Design Team, as noted below: -

Brookfield BM MULTIPLEX

Principal Contractor Brookfield Multiplex

Hardgate Road

Govan Glasgow G51 4SX

www.brookfieldmultiplex.com



Architectural Lead Consultant Nightingale associates

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London W1T 3EY



Civil & Structural Engineering WSP UK

Centurion Business Park

5 Seaward Place

Glasgow **G41 1HH**

Building Services Wallace Whittle & Partners & IT Infrastructure

8 Elmbank Gardens

Glasgow G2 4NQ





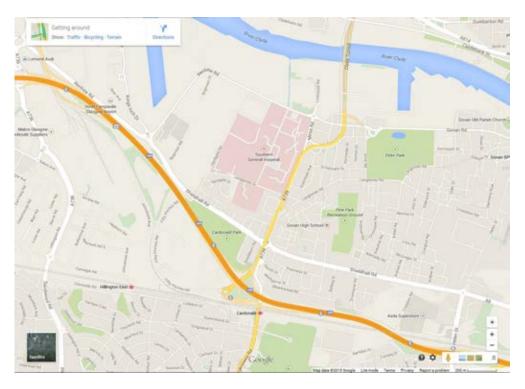
1.2 GENERAL BUILDING INFORMATION

BUILDING DESCRPTION

The New Southern General Hospitals comprise of a new build 14 storey (including a helipad at roof level to SGUH ward tower) 1109 bed adults and 4 storey 256 bed children's hospital, with a combined total floor area of approx. 171,000 m2. The structure is mainly concrete frame with a combination of external facade cladding used to enclose the building envelope, ranging from insulated metals panels, insulated render, stone cladding and integrated glazing units.

The new building also link into existing Neuro science and maternity services via newly constructed external link bridges.

LOCATION MAP



VISITORS INFORMATION

When booking appointments for visitors, please provide them with the relevant information from Section 6 of the User Guide.

All visitors to the building will report to the reception desk, or will follow the check-in guidance provided on their appointment letter, as appropriate.

BUILDING SHARED FACILITIES

The building is primarily occupied by one tenant (NHS), however there are retail units located at ground floor level to both RHSC & SGUH, which will be shared with a third party.



1.3 BUILDING ACTIVITIES

	JILDING ACTIVITIES	
FLOOR	DEPARTMENT	PHOTOGRAPH
L-1	FM SERVICES/FACILITIES PLANT SERVICES TUNNEL CONNECTION TO LAB BUILDING	Insert Details of Signage When Installed
LO	RECEPTION/WAITING AREAS OPD SUPPORT SANCTUARY (RHSC) OBSERVATION WARD (ADULTS) REHAB AND THERAPIES RADIOLOGY EMERGENCY DEPARTMENTS DECONTAMINATION UNIT ACUTE ASSESSMENT DISCHARGE LOUNGE (ADULTS) PATIENT SUPPORT RETAIL PHARMACY/DISPENSARY MEDICAL ILLUSTRATION PATIENT INFORMATION/FAMILY SUPPORT	
L1	CRITICAL CARE CCU RADIOLOGY THEATRES (RHSC) OPD (ADULTS) STROKE WARD SANCTUARY (SGUH) MDU NUCLEAR MEDICINE PRE-OP (SGUH) RESTAURANT & VISITORS DINING SPECIAL FEEDS	
L2	SCHIEHALLION WARD ANAESTHETIC OFFICES DAY CASE UNIT ASEPTIC SUITE ACUTE RECEIVING WARD (RHSC) PLANT/M&E SERVICES (RHSC) THEATRES/SGUH CCW)	



		x MISC OSEN GOIDE (GENTENAL)
	THEATRES MEDICAL PHYSICS	
	TRANSPORT BASE (RHSC)	
	ENDOSCOPY	
	DERMATOLOGY WARD (SGUH)	
	NSGH RENAL DIALYSIS (SGUH)	
L3	IN-PATIENT WARDS (RHSC)	_
	WARD SUPPORT (RHSC)	
	NSGH HEALTH RECORDS	
	STAFF ACCOMMODATION	
	NCH RENAL DIALYSIS	
L4	DCFP (RHSC)	_
	PLANT/M&E SERVICES (RHSC)	
	RENAL WARDS (SGUH)	
	WARD SUPPORT (SGUH)	
	HAEMO-ONCOLOGY WARD	
	(SGUH)	
L5 – L11	GENERIC WARDS (SGUH)	
	WARD SUPPORT (SGUH)	
	PLANT/M&E SERVICES (RHSC)	
L12	NSGH PLANT/M&E SERVICES	
L13/14	EQUIPMENT STORE/PPE STORE	
	HELIPAD (LEVEL 14/15)	



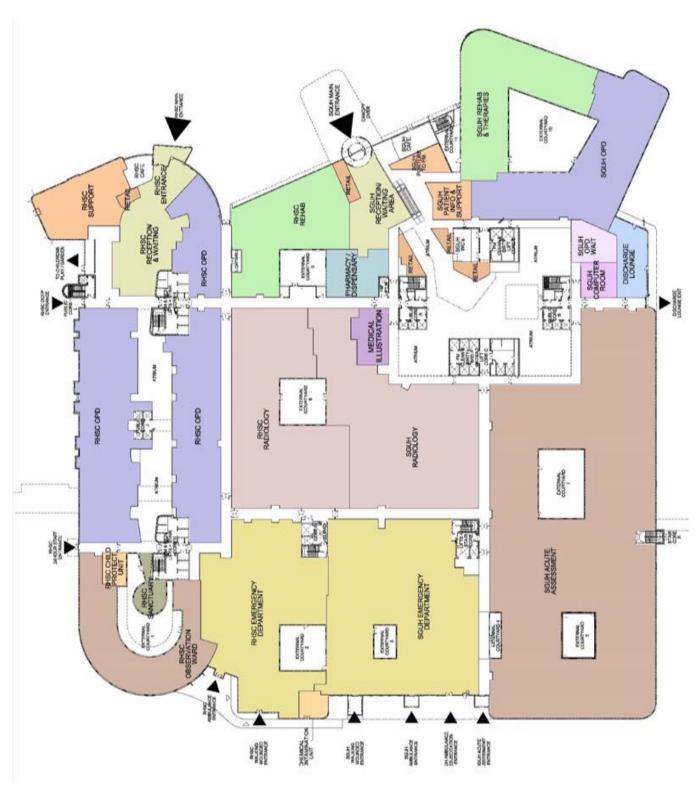
1.4 BUILDING PLANS/LAYOUTS

Level -1 Basement, FM services/facilities, Plant services, Tunnel connection to Labs building.



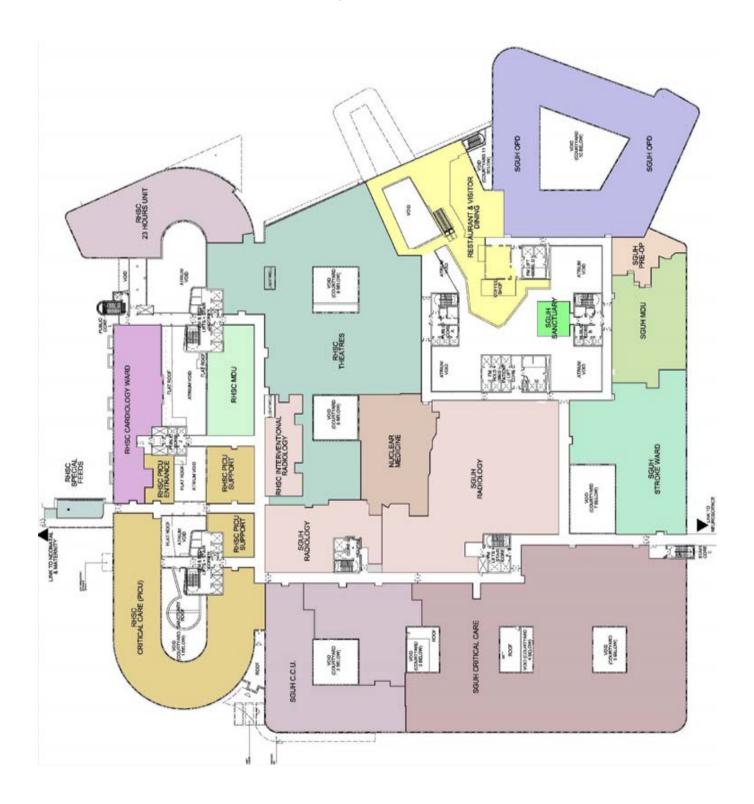


Level 0, Ground Floor: Reception/waiting areas, OPD, Support, Sanctuary (RHSC), Observation ward (SGUH) Rehab and Therapies, Radiology, Emergency departments, Decontamination unit, Acute assessment, Discharge lounge (SGUH), Patient support, Retail, Pharmacy/Dispensary, Medical illustration, Patient information/Family support.



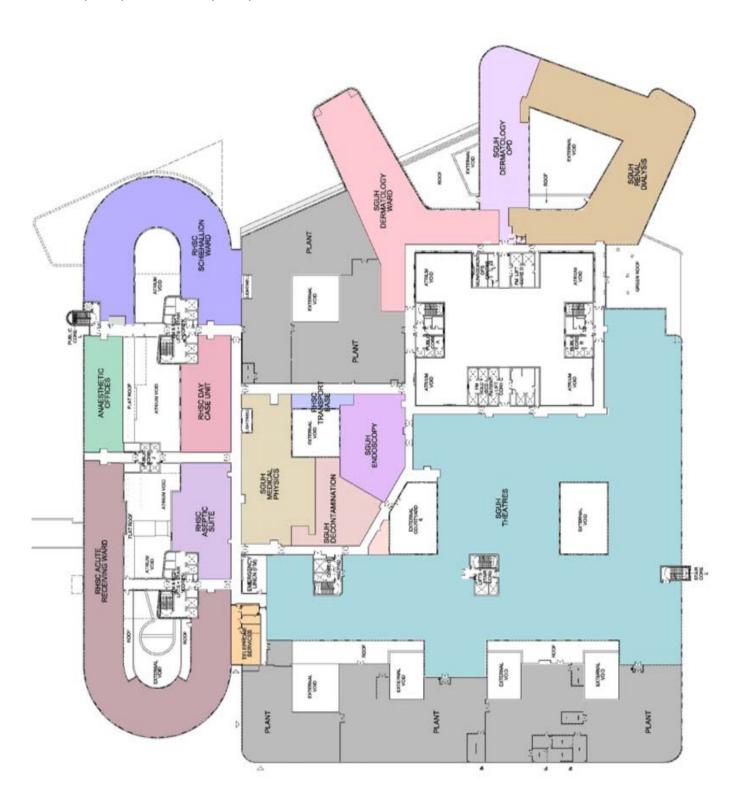


Level 1, Critical care, CCU, Radiology, Theatres (RHSC), OPD (SGUH), Stroke ward, Sanctuary (SGUH), MDU, Nuclear medicine, Pre-OP (SGUH), Restaurant & visitors dining, Special feeds.



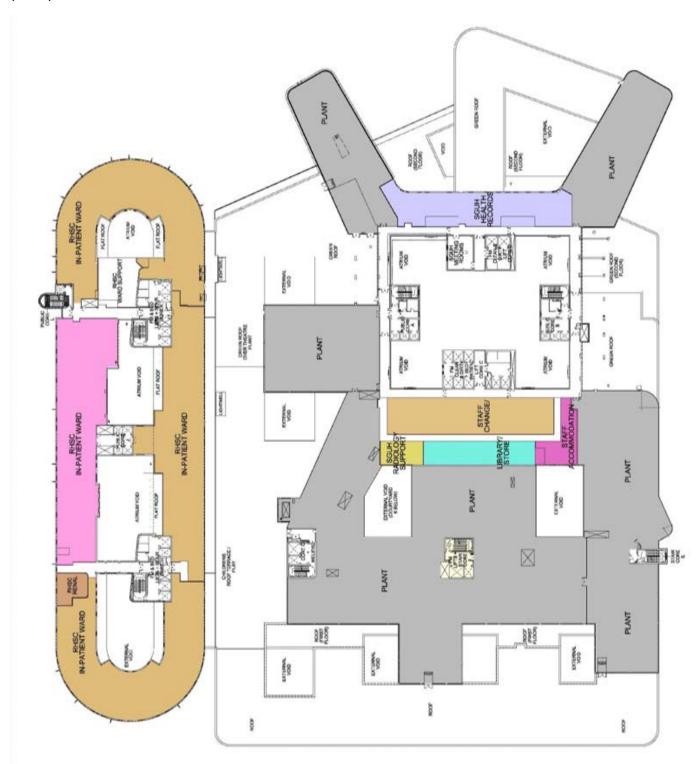


Level 2, Schiehallion ward, Anaesthetic offices, Day care unit, Aseptic suite, Acute receiving ward, Theatres (SGUH), medical physics, transport base (RHSC), endoscopy, dermatology ward (SGUH), Renal dialysis (SGUH), Plant/M&E services (RHSC) theatres/CCW (SGUH).



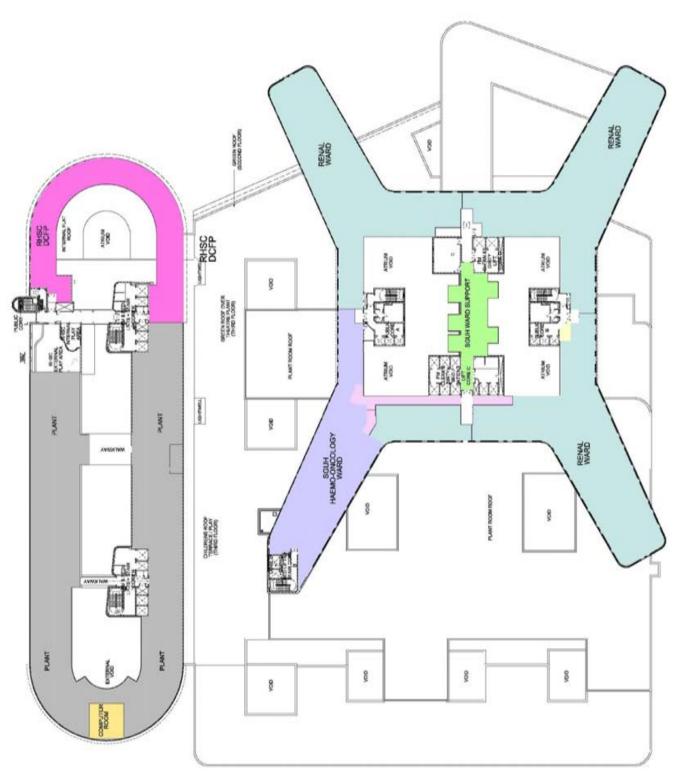


SGUH & RHSC USER GUIDE (GENERAL)
Level 3, In-patient wards (RHSC), Ward support (RHSC), Health records (SGUH), Staff accommodation, renal dialysis (RHSC).



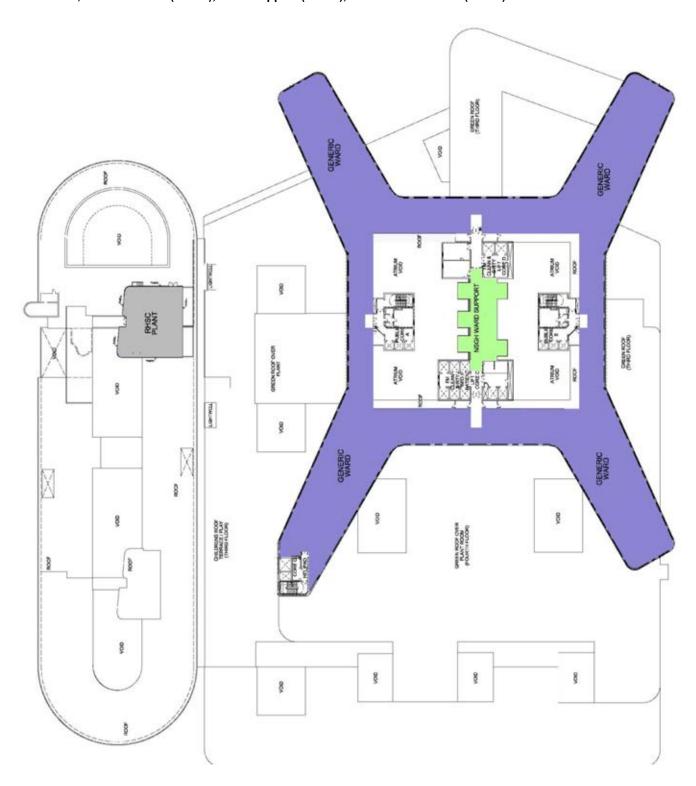


SGUH & RHSC USER GUIDE (GENERAL)
Level 4, DCFP (RHSC), Plant/M&E services (RHSC), Renal wards (SGUH), Ward support (SGUH), Haemo-oncology (SGUH).



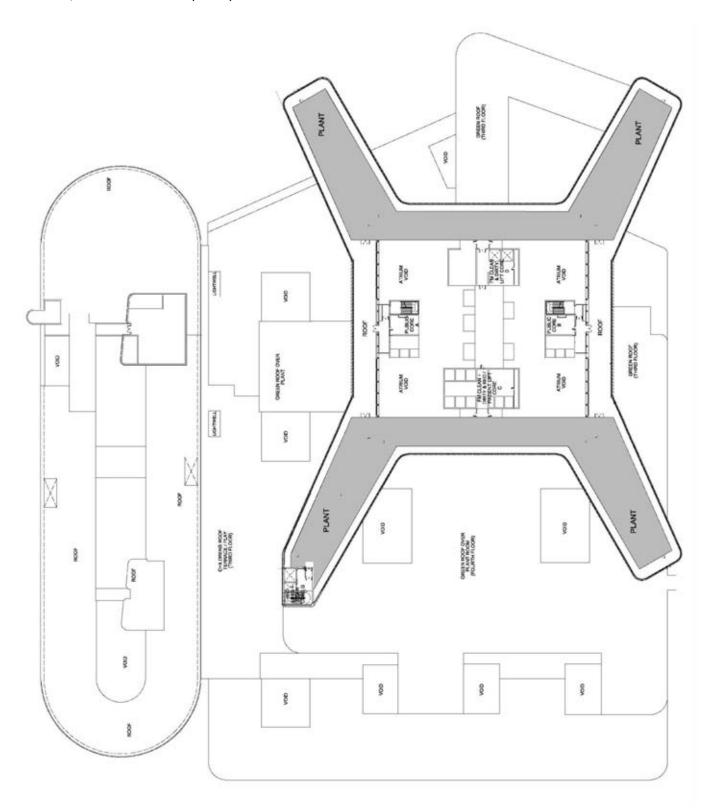


SGUH & RHSC USER GUIDE (GENERAL)
Level 5 - 11, Generic wards (SGUH), Ward support (SGUH), Plant/M&E services (RHSC)

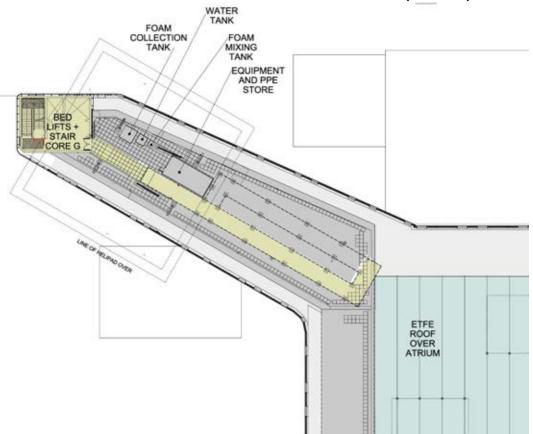




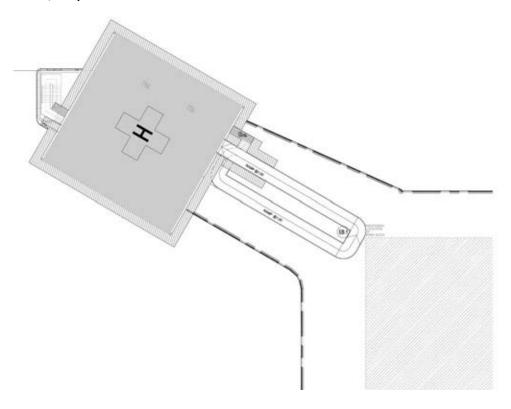
Level 12, Plant/M&E services (SGUH)







SGUH, Helipad level





1.5 BUILDING ENVIRONMENT – UPDATE REQUIRED FOR SGUH & RHSC –MER DESCRIPTION & PHOTO UPDATE – TYPICAL BEDROOM, OFFICE, U/FLOOR HEATING UNIT

LIGHTING

System details	Description
Plant Description	Power to lighting is provided from dedicated Lighting Distribution boards located within plant rooms and electrical cupboards within the building feeding out to lighting marshalling boxes. Lighting circuits are plugged directly into the marshalling boxes.
	Switching is provided by wall mounted single and multi-gang switches within the hospital rooms and offices and ceiling mounted PIRs in toilets stores etc. The light switches are Extra Low Voltage (wired as part of KNX control system).
	The lighting scheme is generally provided via high frequency florescent fittings with electronic DALI ballasts. Lighting with in the clinical room space and offices are dimmable via the wall mounted light switches
	External lighting is provided around the building perimeter and within the courtyard
Control Strategy	The lighting control is provided from the BMS via the KNX and DALI systems.
	The lighting is fully dimmable via the local light switch and will automatically switch off when there is no presence. The light need to be manually switched on.
	The external lighting is controlled via a BMS time schedule and is also dependant on light levels.
Safety Features	Circuit protection provided by RCBO circuit breakers within the distribution boards
Energy Conservation	Energy management carried out by BMS system
	Lighting will automatically switch of in all areas with the exception of plant rooms and stairwells where there is no presence.
	Lighting within various back of house perimeter rooms will automatically dim when high external lighting levels are detected.
Maintenance	All the lighting equipment should be maintained in accordance with manufacturer's recommendations. A full Preventative Planned Maintenance (PPM) regime can be found within the O&M Information provide on Zutec.



Element Description	Distribution Method	Photographs
Heating & Cooling Ventilation—	The majority of heating is provided by either ceilig perimeter radiant panels, active chilled beams or 4 pipe fan coil units. Air is delivered through ventilated chilled beams mounted within the ceiling grid. Air curtains are also provided above entrance doors	
Extract Ventilation	The building is largely sealed with limited openable windows in order top control the internal environment within the spaces. The various departments to match their function are served by a number of ventilation Air Handling Systems. Specialist systems are provided to isolation rooms	
Corridor Heating		Inset Photo
Toilet Heating	Heating within the general toilets is provided by radiant panel heaters located within the ceiling grid	
Entrance & Reception Area Heating	The heating to the entrance area and reception is via underfloor heating coils with electric fan heaters located at the external doors	Insert Photo



Temperature Control		Photographs
Time Schedule	The heating and cooling controls work on a fixed times. If rooms are unoccupied they will revert back to setback temperature. When the presence detector within the room (pictured) is activated then the temperature will revert to comfort setting	
Toilet and corridor set points	Toilet and corridor heating is controlled via thermostatic radiator Valves (pictured) and are set at 2-3 to give a space temperature of 18°C - 20°C	
Out of hours operation	NHS TO ADVISE Out of our operation can be arranged by contacting the FM helpdesk (Extension 5555)	N/A



1.6 LIFTS - PROVIDE GENERAL DESCRIPTION TOGETHER WITH COLOUR CODED PLAN DETAILING DIFFERENT LIFT CLASSIFICATIONS/TYPES/USAGE AS NOTED BELOW:

System Details	Description		
Plant	The following lifts and escalators have been installed within the building:		
Description	(see attached plans)		
	Core A – Public lifts 1 to 3 serving floors 0 to 11 – lift 2 is firefighting		
	Core B – Public lifts 4 to 6 serving floors 0 to 11 – lift 5 is firefighting		
	Core C – Bed lifts 7 to 9 serving floors 0 to 11		
	Core C – Bed lifts 10 to 12 serving floors -1 to 11		
	Core C – Housekeeping lifts 13 and 14 serving floors -1 to 11		
	Core D – Goods lifts 15 and 16 serving floors -1 to 12		
	Core F – Housekeeping lift 17 serving floors -1 to 3		
	Core F – Goods lift 18 serving floors -1 to 3		
	Core G – Helipad lift 19 serving floors -1, 0, 1, 2, 12 & 13		
	Core G – Goods lift 20 (backup for the helipad lift) serving floors -1, 0, 1, 2, 12 & 13		
	Core H – Bed lifts 21 and 22 serving floors -1 to 3		
	Core H – Goods lift 23 serving floors -1 to 4		
	Core H – Housekeeping lift 24 serving floors -1 to 4		
	Core J – Public lifts 25 to 28 serving floors 0 to 3		
	Core K – Bed lifts 29 and 30 serving floors -1 to 4		
	Core K – Housekeeping lift 31 serving floors -1 to 4		
	Core K – Goods lift 32 serving floors -1 to 4		



Core L – Public lift 33 serving floors 0 to 4

Core M – Housekeeping lift 34 serving floors -1 & 0

Main entrance - Escalators 1 and 2 serving floors 0 to 1

The following lifts can be used by the AGV's:

Core C - Lifts 13 & 14

Core D - Lifts 15 & 16

Core F – Lifts 17 & 18

Core H - Lifts 23 & 24

Core K – Lifts 31 & 32

All the lifts with the exception of lift 20 are machine room less with the control panel located at the top floor served. Lift 20 has a machine room located above the lift with access from the roof level.

The two escalators are self-contained with all drives and controls located within the structure of the escalators.

Control Strategy

All the lifts are connected to a lift monitoring and control system (Schindler Lobby Vision – brochure attached) with the servers being located within the main hospital and the monitoring station located in the Laboratory Building Security Room. Lobby Vision is used by the AGV's to operate the AGV enabled lifts as required.

The Public lifts in cores "A", "B" and "J" are fitted with Schindler Miconic 10 Destination Control, this provides passengers with shorter waiting times and quicker journey times.

All the Bed lifts are fitted with Schindler Miconic 10 Destination Control to provide shorter waiting times and quicker journey times, Schindler ID is also fitted to give



	SGUH & RHSC USER GUIDE (GENERAL)
	enhanced security and control over the use of the lifts by the use of security cards.
	All the remaining lifts have conventional control systems fitted.
0.64.5.4	The escalators are turned on and off via a key switch located on the inner deck of each escalator at the "0" floor level, emergency stop switches are located at each end of each escalator. Safety pictograms are affixed to the glass balustrade at each end of each escalator.
Safety Features	All the safety features required by BS EN81 have been included within the lift installation.
	This includes the provision of an alarm system within each lift car that allows two way
	communication with the 24 hour call centre in the event of persons becoming trapped in a lift.
	All the safety features required by BS EN115 have been included within the escalator installation.
Maintenance	The lifts and escalators should be maintained in accordance with the manufacturers recommendations and instructions.
	Full details of the recommended planned maintenance can be found within the O & M information provided on Zutec.
OPERATING THI	
	Description To call a lift proce the landing button in the direction you wish to travel (Up or Down)
Standard Operation	To call a lift press the landing button in the direction you wish to travel (Up or Down).
·	When the lift arrives enter the lift and press the button in the car for the floor you wish to go to.
	The door open and close buttons will operate whilst the lift is at floor level.
Miconic 10 Operation – See attached Chart	On the Miconic 10 keypad on the landing select the floor you wish to travel to (Pressing the "Wheelchair" button before you select your floor will allow more time to enter the lift and leave more space). The display on the keypad will indicate which lift you should use. When the designated lift arrives enter the lift and you will be taken to your selected floor (there are no floor buttons in the lift).



	Soon a kind of the lateral
	The door open and close buttons will operate whilst the lift is at floor level.
Schindler ID	The bed lifts are fitted with a Schindler ID card reader below each Miconic 10
	keypad, if activated the keypad will not accept calls unless a valid card is presented
Operation	
	to the reader first. Once a call is placed the lifts operate as per the Miconic 10
	Operation above.
In case of	In an emergency pressing the alarm button for 3 seconds will connect you to the 24
emergency	hour call centre. Speak clearly to the operator and follow any instructions you are
omorgoney	given. Do not panic. Do not attempt to climb out of the lift until help arrives, you are
	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	perfectly safe either stood or sat in the lift.
	Each lift is fitted with an inductive loop for the hard of hearing – hearing aids should
	be switched to the "T" position if fitted.

Insert Plan

Insert Paragraph on PTS - MER
Insert Paragraph on AGV's — Refer to Zutec

Text updated for SGUH

HOW TO OPERATE LIFTS		
Procedure	Description	Photographs
Standard Operation	A call button (up or down) is located at each floor. Floors can be selected by depressing the appropriate button within the lift car. The doors can be open /closed from within the car by depressing the door open/close button	440
In case of Emergency	In the event of the lift stopping and a passenger becomes trapped depress and hold (for 3 seconds) the alarm button, you will then be connected to an emergency operator – speak slowly and clearly and follow the instructions given. The intercom is fitted with an induction loop system for the hard of hearing	

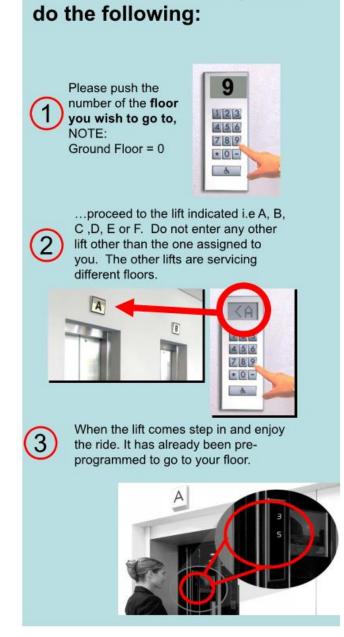


HOW TO OPERATE LIFTS		
Procedure	Description	Photographs
Fire Activation	In the event of a fire alarm activation do not enter a lift If already within the lift car, the lift will alight at Level O or Level 1 (Level O or level -1 within the goods and robotics lifts), leave the lift car and leave the building by the nearest exit.	
Good and Robotics	In addition to the standard operating procedure the goods, robotics and mortuary lifts are fitted with key switch which can be used to park the lift at a desired floor, the lift will then become stationary at the floor until the key position is altered	



Southern General Hospital PASSENGER LIFT CALL SYSTEM





When you see the keypad or touch terminal please



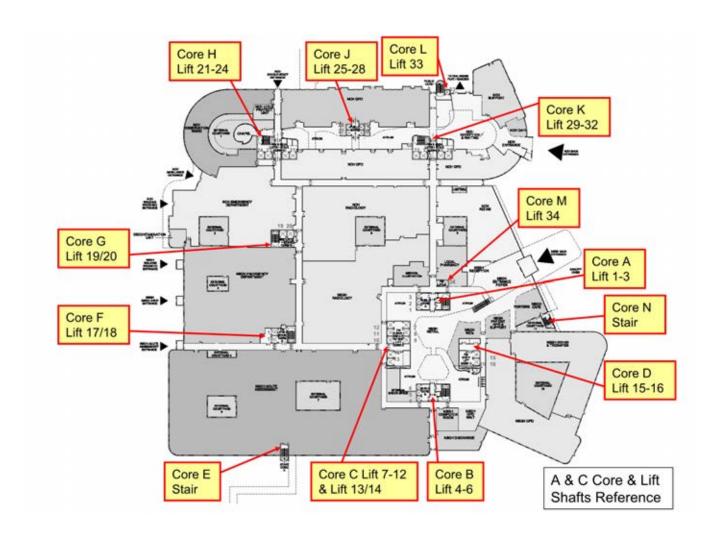


Lift locations and designations

Core.	Lift No.	UNIT No.	Lift Designation.
Α	1	10478877	Public
Α	2	10478877-1	Public / Firefighting
Α	3	10478877-2	Public
В	4	10478877-3	Public
В	5	10478877-4	Public / Firefighting
В	6	10478877-5	Public
С	7	10478877-6	Bed
С	8	10478877-7	Bed
С	9	10478877-8	Bed
С	10	10478877-9	Bed
С	11	10478877-Z	Bed
С	12	10478877-B	Bed
С	13	10478877-C	Housekeeping
С	14	10478877-D	Housekeeping
D	15	10478877-E	Goods
D	16	10478877-F	Goods
F	17	10478877-G	Housekeeping
F	18	10478877-H	4000kg Goods
G	19	10478877-I	Helipad / Firefighting
G	20	10478877-J	Helipad / 4000kg Goods
Н	21	10478877-K	Bed
Н	22	10478877-L	Bed
Н	23	10478877-M	Goods
н	24	10478877-N	Housekeeping
J	25	10478877-0	Public
J	26	10478877-P	Public
J	27	10478877-Q	Public
J	28	10478877-R	Public
K	29	10478877-S	Bed
K	30	10478877-T	Bed
K	31	10478877-U	Housekeeping
K	32	10478877-V	Goods
L	33	10478877-W	Public
М	34	10478877-X	Housekeeping
Main	1	10478927	Escalator - 1
Entrance	2	10478927-1	Escalator - 2

AGV Lift







1.7 SECURITY AND ACCESS CONTROL – UPDATE FOR SGUH & RHSC – UPDATED 23.01.15

INTRODUCTION

Access Control (FM) - Move Para to FM Guide

The design of the access control systems for the doors has been carefully considered in relation to clinical requirements and patient, staff and public safety. This has included in depth review with the NHS who will be responsible for the management and safe running of the healthcare facility.

In areas of the hospital that have less than 60 members of the general public during operating hours; the doors across escape routes will be free swinging or held open and released to a free state on alarm. Where they form part of a secure boundary they will be fitted with electromagnetic locks linked to the fire alarm system to cause them to release to a free state when required for escape, or release on withdrawal of power or system error to BS EN 7273-4: 2007. During normal use these locks will be released on the secure side by way of a green push button located on an adjacent wall in compliance with BS EN 54: Part 11: 2001.

Access Control (General)

The design of the access control systems for the doors has been carefully considered in relation to clinical requirements and patient, staff and public safety. This has included in depth review with the NHS who will be responsible for the management and safe running of the healthcare facility.

In areas of the hospital that have less than 60 members of the general public during operating hours; the doors across escape routes will be free swinging or held open and released to a free state on alarm. Where they form part of a secure boundary they will be fitted with electromagnetic locks linked to the fire alarm system to cause them to release to a free state when required for escape, or release on withdrawal of power or system error (fail safe). During normal use these locks will be released on the secure side by way of a green push button located on an adjacent wall.

FIRE ALARM & DETECTION

System details	Description
Plant Description	A fire detection and alarm system (BS5839 L1 detection category) has been installed within the building with the main panel located within the L0 Security Room. A mixture of smoke, heat and aspirating detector system are located throughout the building with electronic sounders and Xenon beacons that will activate in the event of fire / smoke detected with alert tones going off in Adjacent Zones.
	Networked Fire alarm panels are provided in the following locations: Plantrooms Electrical Cupboards Ano Meet & Greets Plantrooms Plantrooms
	A Fire Alarm graphics package (Win-mag) has been provided within the LO Security Room and at each meet and greet point.



	The fire alarm is interfaced with a multitone sentinel unit that will send a signal	
	to the Hillington Contact Centre in the event of a system fault or fire activation.	
	The fire alarm system is also connected to an offsite contact centre via a dual	
	comm monitored line.	
Control Strategy	In the event of a fire alarm activation the following actions will take place:	
	 Sounders and Beacons will activate 	
	 Hillington Contact Centre alerted (Via Multitone) 	
	 Fire & Rescue Service alerted (Via Dual Comm) 	
	 Lifts will return to safe floor (LO, L1 or basement) or 2 dependant on lift 	
	type.	
	 Ventilation Plant will shut down (with the exception of critical systems 	
	such as Cat 3 Suite, Fume Cupboards etc.)	
	 Incoming Gas Valve will close (this is a manually reset valve) 	
	 Hold Open Doors will close 	
	• Shutters will close	
	PA will silence	
	 Door Access doors will open 	
	 PTS will shut down if fire in zone it passes through 	
	 Gas suppression systems input in to show activation 	
Safety Features	Fire detectors installed throughout the building	
Maintenance	The fire Alarm equipment should be tested in accordance with BS5839, Insurers	
	requirements and maintained in accordance with manufacturer's	
	recommendations.	
	A full Preventative Planned Maintenance (PPM) regime can be found within the	
	O&M Information provide on Zutec.	



SECURITY SYSTEMS

System details	Description
Plant Description	Intruder Alarm
	An Intruder detection and alarm system has been installed within the building
	comprising of perimeter detectors and door contacts. The Intruder alarm
	keypads are located in the following locations:
	Adults
	 Security Porters Office ENT -022 (This keypad will control the entire
	system in the adults.)
	 Cashiers Office ENT- 032 (this keypad will be grouped, and will allow
	setting and
	 Unsetting of the cashiers office)
	 Dispensary PHA-009 (This keypad will be grouped to control dispensary
	and pharmacy areas)
	 Pharmacy THE-030 (This keypad will be grouped to control dispensary
	and pharmacy)
	 Computer Room 101 FMA0-011(This Keypad will be grouped to control
	Computer room)
	Children's
	 Security Porters Office OPD-006 (this keypad will control the entire
	system in the children's)
	 Computer Room 102 PLT-001 (This Keypad will be grouped to control the
	Computer room)
	Access Control
	Electronic Access control to various doors has been installed throughout the
	building with access to all secure rooms and areas being restricted to personnel
	with swipe card access. To gain access to the floors or areas the swipe card
	should be presented at the door reader with egress via the push buttons. Both
	will release the magnet locks at the top of the doors. An emergency break glass
	has been provide at each door that when broken will isolate power to the door
	magnets.
	The access control panels are located in various areas throughout the building
	The access control panels are located in various areas throughout the building with the control PCs located within Comms rooms 101, the Security Room and
	FM Helpdesk on the ground floor. From the PC swipe cards and access rights can
	be programmed and door security altered.
	be programmed and door security aftered.
	CCTV
	A closed circuit television system has been installed within the building and
	externally with a mixture of fixed cameras and Pan, Tilt, Zoom (PTZ). The
	cameras are connected to a server via the CAT6a data infrastructure and the NHS
	VLAN network. CCTV controllers are located within the FM Helpdesk and 2
	Porters Rooms (external camera view only) with viewing also available at the
	BMS PC.



-	SGUH & RHSC USER GUIDE (GENERAL)
	Disabled Assistance
	Disabled assistance alarms have been fitted within all disabled toilets throughout the building. They are operated via pull cords which will sound an audible alarm within all local receptions and the main reception. The display panel will provide details of the toilet room number where the alarm has been activated. The alarm can be reset via the reset button within toilet.
	A refuge alarm and communication system has been installed on each floor level of all escape stairwells. When depressed an audible alarm will operate within the Security Office Control panel where a telephone handset can be lifted to allow two way communication with the person at the stairwell refuge. The control panel will identify the located of the alarm and can be rest when required.

System details	Description
Control Strategy	Intruder Alarm
	In the event of an intruder alarm activation the internal and external sounders
	will activate and an offsite monitoring station will be contacted who will in turn
	contact the police and the Hillington contact centre.
	A coope Combrel
	Access Control
	The access control system can be overridden (to unlock all doors) by the key
	switch located within the main entrance.
Safety Features	A Panic Alarm has been installed at the front reception desk which when
	operated will signal a sounder/beacon within the LO FM Helpdesk. The alarm can
	be reset via the key reset on the panic alarm unit at the reception desk
Maintenance	The security equipment should be and maintained in accordance with
	manufacturer's recommendations.
	A full Preventative Planned Maintenance (PPM) regime can be found within the
	O&M Information provide on Zutec.

Entry Procedure (Main Building)	Photographs
The main entrance doors are open to the reception between the core	
hours of 8am – 8pm after those hours the building can only be entered if	
you are in possession of an appropriate swipe card. To enter swipe the	
card against the card reader and open the automatic pass door (right	
hand side of	
Exit procedure (Main Building)	



To exit the building depress the green button or the disabled access button



Entry Procedure (all floors)

The SGUH &RHSC can be accessed via the Passenger lifts or atrium stairwell. Each entrance is locked via the door access system and to gain entry you must have an appropriately programmed swipe card. The swipe card should be presented at the card reader (which will go green when access is granted) then pull open the door.





Exit procedure (all floors)

To exit the Labs depress the green button and open the door



Entry Procedure (Office all floors)

The Office can be accessed via the Passenger lifts or atrium stairwell. Each entrance is locked via the door access system and to gain entry you must have an appropriately programmed swipe card. The swipe card should be presented at the card reader (which will go green when access is granted) then pull open the door.

Access to the office can also be granted by depressing the video intercom button and a staff member releasing the door from the video phone.





Exit procedure (Office all floors)	
	N/A
To exit the building depress the green button and open the door	

1.8 ROOFS – GREEN AND BROWN – GILESPIES TEXT INSERTED – SECTION OK

Courtyards

The podium level of the hospital includes eleven courtyards and light wells to enable natural light to penetrate the lower levels of the building and introduce planting within the hospital design. Whilst these courtyards are not accessible to the public or patients they still provide a valuable role in bringing nature and green spaces within the layout of the hospital.

The courtyard spaces have been designed to be: high quality and provide visually distinctive spaces that contribute to the way finding strategy.

They include high quality hard and soft designs with a variety of surface treatments, trees and shrubs offering textural interest and seasonal change.

Roof Gardens

Both the DCFP roof garden and Children's Roof Garden have been designed to provide easy access to external spaces for play and well-being, as part of the facilities associated with these departments.

These gardens have been introduced to create a physical link between the upper levels of the children's ward rooms and a secure outdoor garden environment for families, play, education, relaxation and occupational therapy, including access for beds and wheelchairs.

The DCFP includes brightly coloured safety play surfacing themed around a beach and incorporates a number of play features; mound and tunnel, balance spinner, basketball hoop and football goal with wipe board for keeping score.

In addition, a low planter with a variety of flowering shrubs and climbers provides a backdrop to the garden area providing season interest, texture and scent.

The larger Children's Roof Garden includes a variety of surface finishes; slabs, resin bonded aggregate, artificial turf and brightly coloured safety surface with integrated raised planters, trellises and tensile structure ensuring an attractive and appealing external space. The differing colours and textures are attractive year round.



The design of the Children's Garden includes an active play area with mounding to contrast with the formal and regular character of the hospital interior, whist quiet areas are available as part of the raised planters and pergolas with areas of the planting beds available for patients to enjoy hands-on experience by getting involved directly.

Access to such spaces is recognised as having significant therapeutic and healthcare values aiding treatment and recovery.

Environmental Roofs

These roofs have been included within the Adult hospital design to add to the site biodiversity, supporting a number of habitats that will be more wild in nature and undisturbed by people, providing additional habitats for birds and insects.

The advantages of these roofs, in addition to the primary role of increasing biodiversity, is: reduced run-off, enhanced roof insulation, increase in roof lifespan by through the protection of the underlying waterproofing system; attractive visual appearance, provision of green spaces in urban areas; and reduction in urban heat island effect.

The roofs have been constructed using a specialist lightweight, recycled material providing the substrate and growing medium for the roof. Areas of the roof areas have been planted with sedum plugs and perennial plant species, in groups, and the entire roof was covered with a wildflower seed mix and sedum cuttings providing a start to the planting, with these plants spreading in time to cover the whole of each roof area.

Further habitat characteristics will form part of the design through the inclusion of dead wood log piles.

1.9 HELIPAD -

The helicopter landing pad is located on the roof of the inpatient block, on the end of the south-west facing wing. The principal justification for this location is driven by the relationship the helipad must have with the key hospital departments which it serves, i.e. the adult and paediatric accident and emergency departments located at ground floor level with access . The Helipad landing pad measures 25mx25m in plan and access ramp gradient is 1 in 12 and has been designed o receive the latest S92 Helicopter. The Helipad operation is managed by a specially trained response team operating from a roof top control room. Dedicated lift provision from Helipad direct to Theatres via. – Lift 19 with Lift 20 as back up......

1.10 ETFE Roof -

Smoke Control – Adult Hospital Atrium

The ETFE roof natural ventilation system and the ETFE 'hot wire' system provide a life safety smoke control system.



The provision of the natural ventilation vents at the roof level of the adult hospital shall provide a degree of smoke control that are automatically activated by the fire alarm detection system within the atrium.

The provision of the ETFE 'hot wire' system allows the atria spaces (if required) to be manually vented to the outside air to effectively create an external courtyard.

The smoke control measures are designed to maintain a steady buoyant layer of smoke at least 3 m above the uppermost opening in the atrium enclosure (level 3 balconies).

Power supplies for active smoke control measures are provided in accordance with BS EN 12101-10.

The 'hot wire' system consists of an MIC cable incorporated into three sides of each venting ETFE cushion. The system is activated by sensor and the MIC cable is energised causing the cushion to open and vent the products of combustion into the atmosphere. The system can be non-destructively tested as required by ensuring the conductivity of the MIC Cable wire.

Within the adult atria arrangements for make-up air are incorporated into the design at level 3 to ensure sufficient stack effect can occur.

Smoke Clearance - Children's Atrium

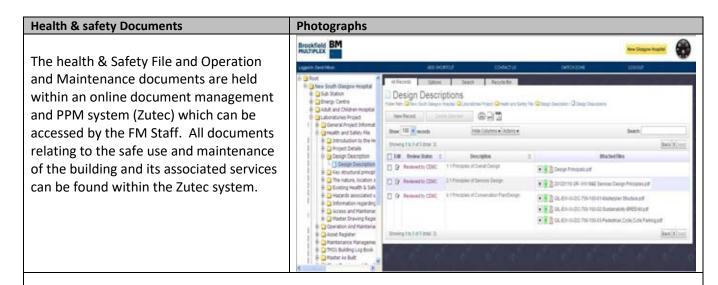
A mechanical smoke-clearance system has been designed to provide replacement air at six air changes per based on the total volume of the atrium.

Power supplies for the smoke-clearance system are provided in accordance with BS EN 12101-10.



2.0 EMERGENCY INFORMATION – UPDATE FOR SGUH & RHSC

2.1 General Information



All staff members will be given the appropriate training to allow them to work (and operate any of the building system where authorised) safely within the building



2.2 FIRE RESPONSE AND ALARM – UPDATE FOR SGUH & RHSC – Section OK

+ Sprinklers & (ETFE Burn Off, Smoke Clearance to NCH in FM guide – See details contained in 1.10), Air Sampling to Theatres/Atria,

Evacuation

The basic strategy for fire evacuation of patients is to move them, to a safer area on the same floor (progressive horizontal evacuation).

To assist in the safe horizontal evacuation of the occupants, every compartment has been divided into at least 2 sub-compartments. By providing a series of barriers, patients will be able to remain in the building and avoid the need for complete evacuation.

There are three main stages of evacuation:

- Stage 1 horizontal evacuation from the sub-compartment where the fire originates to an adjoining subcompartment or compartment;
- Stage 2 horizontal evacuation from the entire compartment where the fire originates to an adjoining compartment on the same floor;
- Stage 3 vertical evacuation to a lower floor substantially remote from the floor of origin of the fire (at least two floors below), or to the outside.

Fire Alarm Detection System

A fire alarm detection system is installed throughout the building.

The system is designed on the principle that if a detector detects smoke or heat or someone operates a break glass unit (manual break point), then alarm sounders / visual indicators operate to warn others in the building that there may be a fire.

The system is interconnected allowing information to be made available at a number of agreed staff -bases and fire entrance points informing staff and the fire authority of fire alert and evacuation information.

The main fire alarm panel is at reception with repeater panels at certain staff bases.

Automatic detection comprise of either CO₂, heat or optical smoke detectors as appropriate (i.e. single-point detectors) for the area being protected.

The fire alarm system is interfaced as necessary (e.g. with the mechanical ventilation system smoke actuated dampers, fire doors).

Escape Bed Lifts

The Escape Bed lifts require to be operated under the direction and control of lift wardens using an agreed evacuation procedure.

The rated speed of the lift is such that it will run its full travel in not more than one minute. The car is clearly and conspicuously marked on its use procedure.

A standby electrical supply is provided to ensure the escape bed lifts and their associated facilities continue to be available in the event of normal supply failure.

An intercom system or similar device is provided for two way speech communication between the evacuation control point and each landing, the lift car and the lift machine room.

The escape bed lifts are provided with an evacuation control switch to enable the lift wardens to obtain immediate control of the lift.

Operation of the evacuation control switch will ensure:

- Lifts travel to the evacuation control point without stopping
- All landing call buttons and any group collective control system are rendered inoperative



- All car preference switches are rendered inoperative
- The evacuation communication systems are operative

Locks

Access Control (General)

The design of the access control systems for the doors has been carefully considered in relation to clinical requirements and patient, staff and public safety. This has included in depth review with the NHS who will be responsible for the management and safe running of the healthcare facility.

In areas of the hospital that have less than 60 members of the general public during operating hours; the doors across escape routes will be free swinging or held open and released to a free state on alarm. Where they form part of a secure boundary they will be fitted with electromagnetic locks linked to the fire alarm system to cause them to release to a free state when required for escape, or release on withdrawal of power or system error (fail safe). During normal use these locks will be released on the secure side by way of a green push button located on an adjacent wall.

Escape Lighting

Essential lighting circuits are installed throughout the hospital and designed to provide not less than 30% of the normal lighting level.

In areas where a 15 second response time would be considered hazardous, (e.g. a stairway), emergency lighting is provided by battery back-up giving a response time of not more than 0.5 seconds.

Operation of Ventilation Plant

The ventilation plant will not be automatically shut down on the operation of the automatic fire detection and alarm system. In the event of a fire emergency the system will operate to inhibit the spread of smoke and be provided with the facility for shut-down and start-up under the instruction of the Fire Service. Depending on the route of the ductwork ventilation will be terminated by actuation of dampers. Fire Service control is from panels located either at department entrances or adjacent to the main fire alarm indicator panels.

Sprinklers

The building is provided with a life safety sprinkler system.

The visible part of the sprinkler system within each room is the sprinkler head; this is where the water spray will come from. Each sprinkler head is held closed by a heat-sensitive glass bulb; this acts as a plug to prevent water from flowing until the ambient temperature around the sprinkler reaches the design activation temperature of the individual sprinkler. Because each sprinkler activates independently when the predetermined heat level is reached, the number of sprinklers that operate is limited to only those near the fire, thereby maximizing the available water pressure over the point of fire origin.

The bulb breaks as a result of the thermal expansion of the liquid inside the bulb.[12] The time it takes before a bulb breaks is dependent on the temperature. Below the design temperature, it does not break, and above the design temperature it breaks, taking less time to break as temperature increases above the design threshold.

Other Suppression

Certain rooms such as server rooms are provided with gas suppression systems – these rooms all have warning signs to indicate that such a system is installed.



Gas Systems work by releasing the gas (extinguishing agent) to the enclosed space in order to achieve a concentration of the agent (volume percent of the agent in air) adequate to extinguish the fire. These systems are operated automatically by fire detection.

Such systems in enclosed spaces presents a risk of suffocation. To prevent such occurrences, additional life safety systems are typically installed with a warning alarm that precedes the agent release. The warning, usually an audible and visible alert, advises the immediate evacuation of the enclosed space. After a preset time, the agent starts to discharge.

Fire Fighting Stairs

Two fire-fighting shafts are provided to assist fire-fighters to access the fire and if necessary escape from the fire in relative safety. These stairs have a $1m^2$ smoke vent for fire service use at the top of each stair to clear any smoke entering stair enclosure.

Fire Fighting Lifts

Fire-fighting lifts are provided to allow fire and rescue service personnel to transport equipment to a floor of their choice as quickly as possible. The lift also allows fire-fighters to access several floors quickly to assess the situation and to rescue any casualties.

The fire-fighting lift landing doors are fire doors.

The lifts may be used in normal times as passenger lifts but, in order to prevent the risk of the entrance being obstructed when the lift is required to go into the fire-fighting mode, it is essential that it is not used for moving refuse, nor for moving goods.

The lift doors are power-operated.

Type of Alarm System	Photographs
A fire detection and alarm system (detection category L1) has been installed within the building. The main fire alarm panel is located at Level 0 reception with repeater panels located on each floor and main entrance. The fire alarm panels should only be operated by FM staff.	
The fire alarm and detection system is linked directly to an off-site call centre (via a BT Redcare telephone line) and also to the Hillington Contact Centre. In the event of a fire alarm, Strathclyde Fire & Rescue will be contacted directly and the Fire Response team will be paged.	N/A



The fire alarm system can be activated by either a manual call Point, a smoke detector, a heat detector or aspirating system.

When a fire alarm is activated, sounders and flashing beacons will activate and the whole building will be evacuated.

The fire detection and alarm system will be tested on a weekly basis. Dates and times will be advised



2.3 Fire Evacuation Procedure - Update for SGUH & RHSC, Narrative & Graphics. Progressive Horizontal Evacuation

Emergency Procedure Photographs

All staff must attend a formal Fire lecture during the Building Induction sessions

It is the responsibility of each staff member to be familiar with the fire evacuation procedure (Identified within Appendix one of this user guide). Each department will have local fire safety policies and procedures relevant to their department and these must be adhered to.

There are 11 escape stairwells in the building. Members of staff should familiarise themselves with all fire escapes from the building and especially the one nearest their place of work

Staff member should treat all alarm activations as real fire situations unless they have been clearly informed otherwise prior to the alarm

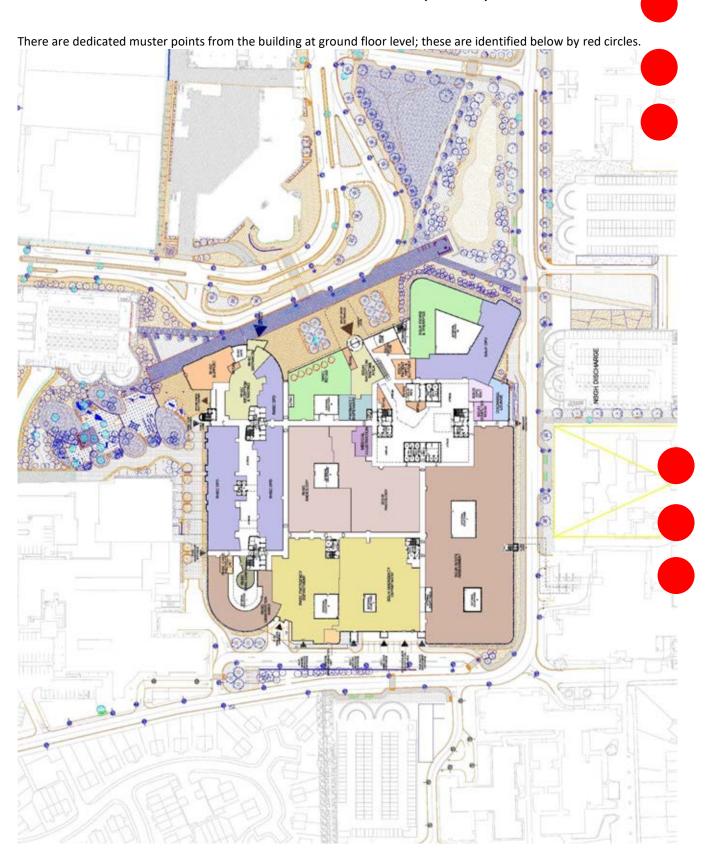
A refuge point is located on each level of the fire escape stairs. Should you need assistance in evacuating the building then proceed to the nearest escape stair and activate the refuge alarm system by depressing the silver button. A member of the fire response team will be able to communicate with you and arrange evacuation

Insert Photograph

If you discover a fire, raise the alarm by pressing one of the Manual Call Points and then leave the building via the nearest fire exit as shown on the drawing below.









2.4 Fire Fighting Equipment

Use of Fire Fighting Equipment

Fire fighting equipment is located through the building (particularly within the corridors, Touchdown Bases & Call Points).

Fire fighting equipment should only be used if you have been trained on their use and only if it is safe to do so. For further information contact the FM Helpdesk.

2.5 First Aid

Calling for assistance

If you or someone around you requires first aid then, all wards/departments are responsible for having a first aider on duty at all times.

In the event of a serious injury / incident call 999



3.0 BUILDING UTILITY & ENVIRONMENTAL INFORMATION - UPDATE FOR SGUH & RHSC

3.1 Energy & Environmental Practices

NHS GG&C Policy & Protocol

Staff Facilities

As part of our environmental strategy, NHS Greater Glasgow and Clyde (NHSGG&C) is committed to responsible energy management and will practice energy efficiency throughout all our premises, plant and equipment, wherever it is cost effective to do so.

The NHS GG&C Energy & Environmental policies can be viewed on the website:

www.nhsggc.org.uk/content/default.asp?aType=63&aSType=183&page=s107 5 - (NHS TO CHECK WEB SITE)

Photographs

3.2 Staff Facilities – Final Edit by Karen C - NHS

Staff Facilities	Pnotographs
Central facilities are located within the main Atrium including Restaurant, Cafe, Vending, Retail & Cash Dispensers. Additional facilities are lo cated within departments – refere to your department head for details Chilled water dispensers are located throughout the building.	
A Staff kitchen and staff room are provided	
Staff changing Karen C –NHS tp provide text	



3.3 Annual Building Energy Consumption

Management Monitoring - Sub Section OK

Identifying areas of energy consumption within the building is the first step in understanding where we can improve efficiency and make saving. To aide this electrical, gas, heat and water meters have been fitted within the building to allow monitoring of the energy used. This information is picked up by the Building Management System (BMS) which is used to trend energy use in within the building and its sub departments.



The main energy consumption (kWh/year) within the building is provided by grid electricity and natural gas.

Indicative Annual Gas Consumption – Indicative Annual Electricity Consumption – (Excludes external lighting) MWh Update MWh Update

The Laboratory Medicine building benefits from the Combined Heat & Power (CHP) unit installed within the Energy Centre. This provide 20% of the heat and power used within the building

An Energy Performance assessment has been carried out on the building with a certified Band B achieved, The energy rating is 34 -TBC. The Energy Performance Certificate (EPC) is displayed at the building reception.

Low Carbon Design – 80kg – Text Inserted – Section OK

3.31 Low Carbon Design -

As part of the Employer's Requirements (ER's) the design of the hospital and Laboratory/FM Building are to achieve and operational energy target of 80kgCO2/m2 per annum.

In order to achieve the energy target the dynamic thermal model and Energy and CO2 Model have been regularly updated as the design has progressed to monitor the predicted energy and CO2 emissions from the hospital when in operation

Summary

The final energy model is predicting the building's CO2 emissions to be 80kgCO2/m2/year which meets the operational energy target as set out in the Employer's Requirements. The overall emissions for the combined hospitals and lab/FM building are discussed in a separate report.



Final design data for the dynamic heating and cooling demand from IES has been brought in to the energy model. In addition to this, results from the HVAC tool within IES has been used to cross check data from the energy model for a number of systems. The results from this investigation are detailed within Section 7.2 of the NSGH Carbon Report – Stage 3 – ZBP-XX-XX-DC-600-381 – March 2014.

The England & Wales EPC and Scottish EPC have been calculated. The final Stage 3 asset ratings are as follows:

EPC type	Rating	ER's Met
England & Wales EPC	23(A)	Yes
Scottish EPC	28(B)	Yes

Background and Progressive Development

The energy and carbon modelling of the hospitals has been progressively reviewed as the detailed design of the hospitals evolved from the benchmarked set on the final Stage 2 report issued in November 2011.

Detailed Design for the hospitals was commenced in January 2011 and was carried out on a zonal basis to suit the sequence of construction. This phase of the project was known as Stage 3 and the energy and carbon report has been updated and issued at key points in this design process.

3.4 Energy Conservation – Section ok

Actions that affect Energy Efficiency and Conservation

The building is provided with automatic controls and monitoring to minimize energy use.

The temperatures within the offices and laboratories are controlled directly from the BMS and cannot be altered locally

Avoid blocking radiators or ventilation grilles with furniture and books as this will result in a lack of heating/ventilation.

Avoid blocking temperature sensors with furniture

Thermostatic radiator valves (TRVs) have been set to the required temperature. Do not use them as ON/OFF switches. If you turn these fully OFF on Friday night then don't expect heat on Monday morning.

Do not use local heaters for personal comfort as this can conflict with the zonal comfort controls and result in unnecessary heating or cooling.

Unnecessary closure of blinds can prevent the lighting automatic dimming operating correctly. This has been fitted to dim the lights when natural light levels are high to cut down on the lighting energy used.

Do not overheat or over-cool your space as this increases running costs and causes extra emissions of CO2 into the external atmosphere, contributing to global warming.



Only switch the lights ON as and when necessary as they result in significant emissions of CO2 into the external atmosphere, contributing to global warming.

Ensure that PCs, printers etc. are not left ON unnecessarily and have any energy saving features enabled as this will prevent your space from overheating and save energy, thereby reducing CO2 emissions to the external atmosphere that lead to global warming.



3.5 Building Services – UPDATE FOR SGUH & RHSC – Text Inserted - OKHEATING

System details	Description
Plant Description	Each half of the Energy Centre houses four 4000kW boilers. The boilers provide Medium Temperature Hot Water at 110oC flow and 80oC return. The MTHW is distributed to the plantrooms in the main hospital, where it is stepped down to Low Temperature Hot Water, for Air handling Units, Domestic Hot Water and space heating.
	The ground floor contains tanks for approximately 1.4 million litres of diesel which is to provide standby fuel for the boilers, should there be a problem with the gas supply and also to provide fuel for the generators, should there be a problem with the grid electricity supply. The gas fired CHP plant is also located on the Ground Floor to provide approx 3000kW of electrical power and 3600kW of heat.
	Primary heating circuits emanate from the Energy Centre arranged as A and B circuits fed from their respective boiler system. Each of the A and B pipework circuits is sized to provide the full hospital heating requirement.
	From the hospital header, MTHW radial feeds run via the basement corridors and risers to the hospital's plant areas to serve plate heat exchanger stations and domestic hot water calorifiers.
	Plate heat exchange units convert MTHW to Low Temperature Hot Water (LTHW) to serve ventilation plant and perimeter heating systems. The purpose of the plate heat exchanger installation is to positively separate the primary MTHW and secondary LTHW circuits to create smaller strategic load centres in a manner which improves system integrity and operational requirements.
	The units selected provide one unit as complete standby, in the event of planned maintenance or breakdown (e.g. 2 @ 100% or 3 at 50%, etc).
	From the plate heat exchangers installed within the plantroom areas, the secondary heating circuits systems emanate to serve specific zones of the hospital.
	Heat emitters are generally ceiling located providing inherent safety in respect of patient care. Where heat emitters are within touch of patients or the public, the emitters shall be of the low surface temperatures type with a mean surface temperature below 43oC.
	The majority of heating is achieved by either ceiling perimeter radiant panels, active chilled beams or four pipe fan coil units. Air curtains are also provided above entrance doors to alleviate drafts.
Control Strategy	The Building Management System will automatically control the LTHW systems



	based on temperature demand from AHUs, FCUs and space	e ter	nperature
	demands.		
Operating Set Points	Primary MTHW Flow Temperature	-	105°C
	Primary MTHW Return Temperature	-	75°C
	Secondary LTHW Flow Temperature	-	75°C
	Secondary LTHW Return Temperature	-	60°C
	Secondary LTHW VT Flow Temperature	-	75°C
	Secondary LTHW VT Return Temperature	-	70°C
	Secondary LTHW VT Chilled Beam Flow Temperature	-	60°C
	Secondary LTHW VT Chilled Beam Return Temperature	-	50°C
Safety Features	Frost Protection – refer to BMS for full description		
	Loss of System pressure - Pumps and boilers shutdown		
	Heat detection in plantrooms – Local gas supply and boiler		
	Emergency Stop Button depressed - Local gas supply and b	ooiler	's shutdown
Energy Conservation Energy management carried out by BMS syst			
	temperature circuits alter dependant on external tempera		
	Heat Meters have been provided on circuits as detailed in	the (D&M docs
Maintenance	All the heating plant and equipment should be maintained manufacturer's recommendations.	l in a	ccordance with
	A full Preventative Planned Maintenance (PPM) regime ca	n be	found within the
	O&M Information provide on Zutec.		



COOLING

System details	Description	
Plant Description	Cooling for the new hospital is provided by four 1000kW air cooled chillers located on one half of the Energy Centre roof, with three 1000kW air cooled chillers (plus the condensers for the absorption chiller) on the other half of the roof.	
	Primary Chilled water is distributed to the plantrooms in the hospitals where it is used for chilled beams, fan coil units and air handling units.	
The department are arranged in a number of zones to suit the contro requirements, varying heat gains and use of the spaces.		
	Active chilled beams and fan coil units are also provided for comfort cooling in areas where there is a need for separation or where high heat gains make these a more appropriate choice of systems.	
	The supply air ventilation plant heats or cools the air as required by the control system to provide the correct condition in the various rooms/zones.	
Control Strategy	The Building Management System will automatically control the CHW systems based on temperature demand from AHUs, FCUs and space temperature demands. The chillers will automatically operate based on the system demand.	
Operating Set Points	Primary Chilled Water Flow Temperature - 6°C	
	Primary Chilled Water Return Temperature - 14°C	
	Secondary Chilled Water Flow Temperature - 8°C	
	Secondary Chilled Water Return Temperature - 13°C	
	Chilled Beam Flow Temperature - 15°C	
	Chilled Beam Return Temperature - 18°C	
Safety Features	Frost Protection – refer to BMS for full description External pipework is trace heated Loss of System pressure - Pumps and chillers shutdown	

The temperature set points within the Hospital are dependant on the time of year (summer or winter) and if the room is occupied or unoccupied. . When the room is entered (the PIR in the ceiling will activate) the set point will change to Comfort mode

Not as specific for SGUH & RHSC – Re-write of paragraph required



System details	Description
Energy Conservation	Energy management carried out by BMS system. The chillers will operate on a



	low energy free cooling mode when external temperatures dictate.
Maintenance	All the cooling plant and equipment should be maintained in accordance with manufacturer's recommendations. A full Preventative Planned Maintenance (PPM) regime can be found within the O&M Information provide on Zutec.

VENTILATION

System details	Description
Plant Description	The building is largely sealed with limited openable windows in order to control the internal environment within the spaces and limit the impact of odours from the Scottish Water works adjacent to the site.
	The Hospital is mechanically ventilated:-
	 Throughout all internal rooms that have no access to natural ventilation Perimeter areas where mechanical ventilation is required for clinical reasons Perimeter areas where mechanical ventilation is required for operational and environmental control reasons. Deep plan perimeter areas where necessary to assist the
	natural ventilation The various departments to match their function are served by a number of ventilation air handling systems.
	In general, each air handling system is served by a packaged air-handling unit containing all components necessary (e.g. fans, coils, filters, etc.) to provide the correct environmental control of those spaces/rooms served.
	On full fresh air systems, heat recovery devices are provided, to exchange heat between exhausted extract air and incoming fresh air wherever significant energy savings can be achieved.
	Generally, temperature control is by means of room or duct-mounted sensors which operate, via the automatic control system software the control valves on the hot water and chilled water to the heating and cooling coils respectively.
	Areas are controlled in zones or as individual rooms as necessary to achieve the conditions required by the ADB Sheets
Specialist Systems	<u>Isolation Rooms</u>
	Each lobbied isolation room is provided with its own dedicated ventilation system in line with SHBN 04.



Air is transferred to the room via a wall mounted pressure stabiliser and then extracted from the suite via the bedroom and en suite WC, and ducted by fire-clad ductwork to a dedicated extract fan in the plantroom.

Each extract fan unit comprises an isolation damper and a centrifugal cased extract fan, with the motor located out of the air stream, where possible ductwork discharges 3.0 metres above roof level. In the Level 2 plantroom serving the Critical Care Ward it is not possible to achieve a safe discharge height of 3.0 metres above roof level. In this case the extract air is HEPA filtered through 'safe change' filter units in the plantroom before being discharged to atmosphere with all other ventilation exhausts.



Electrical Services Photographs

Electricity is supplied to the building from the Primary Sub Station on Hardgate Road and into the High Voltage Transformers within the Building. The electricity supply is then transformed down to Low Voltage before being distributed around the building. Power is generally supplied via dado and wall mounted sockets.

In the event of a mains power failure, the building will be powered via generators located at the Energy Centre. The essential services within the building (Comms Rooms, Fire alarm panels, security panels, BMS controls etc.) are provided with a Uninterruptable power Supply (UPS) which ensure no loss of power between a mains failure and start up of the generators. Insert Paragraph on IPS

Lighting to the laboratories and offices can be switched via the local wall mounted switch which can be operated as below.

Lights On: Press left hand button
Lights Off: Press right hand button

Dim down light level: Press and hold right hand button Increase Light level: Press and hold left hand button

The lighting within some of the offices and labs will automatically dim should the daylight levels increase. This can be overridden if required by pressing the light switch.

If there is no movement detected within a lab / office then the lights will automatically go off. To switch the lights back on press the left hand button on the light switch — Paragraph OK

The lighting within the toilets, stores, corridors etc. are controlled via ceiling mounted PIRs which will automatically switch the lights on when movement is detected. The lights will automatically switch off when there is no movement. –Paragraph OK





In the event of a lighting / power failure battery operated emergency lighting will automatically switch on. – Statement OK



Communications

Data outlet are provided throughout the building for PC equipment and telephones



Wireless access points have been fitted within ceiling grid to give wireless connectivity throughout the building

For access to the building communications network please contact the FM Helpdesk (5555) for Telecomms and IT Helpdesk (#650) for Network

Building Management System

A fully integrated building management system (BMS) is operational within the building that controls the building environmental conditions, monitors the lighting control, emergency lighting, Fire Alarm system, Access Control system and CCTV system.

The Front end PC for the BMS is located within the Security room on the ground floor

3.6 Fault Reporting - OK

Fault Reporting

To report any problems with the building services installation please call the FM Helpdesk (extension 5555)



4.0 WATER MANAGEMENT

4.1 Water Strategy

Water Supply & Management Strategy

Water is supplied to the building from both Hardgate Road and Govan Road (for security of supply) and enters the building at the basement level.

Both the incoming mains water supplies are metered as they enter the building. All meters are monitored by the BMS

The domestic water to the building (feeding toilets, cleaners sinks, wash hand basins etc.) has been separated from the . Both supplies are fed from different tanks (located in the basement Update paragraph making reference to Break-Tanks and emphasis of system resilience.

Insert paragraph on guidance where rooms are out of use for 24hour, also shower usage run free periods and operational usage of Hydrotheraphy pool

Water Saving Features

All tap outlets within the building have been fitted with flow restricting devices (Require to Check)

The toilets and urinals have been provided with low water cisterns and the majority of WCs are dual flush. The large button should be depressed for a long flush and small button for a short flush.



A solenoid valve has been fitted on the supplies to the gents WCs which will automatically open when presence is detected in the room to allow water into the cistern. The valve will then close to stop the water supply (Require to check)



Water Leaks - OK

The external and internal meters are monitored by the BMS and will alert if a difference between the meter readings is detected which will indicate that there is an underground water leak which should be investigated.

All Comms Room and the basement water tank room have been fitted with a water leak detection system. Should water on the floor be detected then a local alarm will sound and an alert generated on the BMS.

Landscape Irrigation

All external plantings rely initiallylon temporary mechanical irrigation systems to allow establishment of plants, this system becomes sacrificial after 2 years

4.2 Water Services

Potable Water – **UPDATE FOR SGUH & RHSC**

There are two distinct water supplies throughout the building - Domestic Water and Laboratory water. The laboratory water serves the lab sinks and equipment. This water should not be used for drinking. The domestic water serving the wash hand basins and break out area sink units is classified as potable and can be drunk

Drinking water coolers are provided at various locations throughout the building



Hot Water - UPDATE FOR SGUH & RHSC

Hot water is provided on the same basis as the cold water either from Domestic Supplies The hot water is generated by LTHW calorifiers and electric water heaters.

Water temperatures at tap outlets are generally between 41° C and 43° C (anti scald) with the exception of cleaners sinks and other sink outlets where the temperature is between 55° C and 60° C. These outlets are identified as "Hot Water" Chilled Water Dispensers at ward level located within Pantries





4.3 Specialist Areas

Hydrotheraphy Pool – Output Specifications and narrative to follow PC

Renal & R.O. – Narrative to follow PC



5.0 MATERIALS AND WASTE MANAGEMENT

5.1 Policy

Philosophy of Service

The Waste Management Policy is designed to govern the management and disposal of Waste generated All operational procedures will be completed in accordance with NHSGG&C Waste Policy. This includes

- a. The safe management and disposal of hospital waste
- b. The minimisation of hospital waste
- c. The reduction of costs associated with the disposal of waste through management monitoring and good practice.

It is the responsibility of all staff within NHS GGC premises to ensure that wastes are entered into the correct disposal stream.

Description of Service / Work Activity

Waste management services will be provided by FM Integrated Services. This will be in the form of suitable waste containers stored within the disposal hold at floor level. These disposal holds will hold segregated containers of clinical and domestic,. The frequency of the exchange of the waste containers will be in accordance to the agreed schedules A full waste cart will be exchanged for an empty.

The site waste compound is located in the Laboratory & FM service yard. Third party contractors will uplift the waste from the waste compound and transport to the point of disposal. The waste containers will be washed in the Laboratory & FM service yard.

Portering services shall:

- Minimise the risk to patients, employees, staff, visitors and the environment.
- Provide a duty of care in its waste management responsibilities including the final disposal consigned to lincensed contractors.
- Comply with statutory standards and requirements, law, codes of practice. Scottish Hospital Technical Note 3, NHS Scotland Published Technical Requirements and related NHSGG&C Waste Disposal Policies.
- Shall promote a clean and tidy impression of the Board and its facilities.
- Ensure required standards are achieved through the use of the right mix of staff and equipment, effective management systems, clear performance targets and appropriate levels of monitoring. Waste collection and storage areas will comply with the requirements described within Appendix A Service Standards Table 2.

The Board will provide all receptacles, storage containers, consumables and equipment for the provision of the service including, but not limited to those items detailed in Appendix A.



Adherence to Board Policies

The Site Facilities Manager will ensure that Board Policies are adhered to by all members of facilities services staff.

The Facilities department will operate policies and procedures which will cover all aspects of the tasks undertaken as well as information regarding uniform policy, the reporting of sickness absence, annual leave requests etc.

Hours of operation

Waste will be produced continuously by department throughout the building. Waste uplifts will be scheduled in accordance to their activity

Quality Standards

The Facilities Management Team will carry out regular service monitoring on a planned basis with set performance indicators. These performance indicators are indicated in Table 3. Check table 3

Relevant Legislation - JOHN GREEN - NHS TO REVIEW & UPDATE

In all areas the Waste Management Service will comply with the following legislation and guidelines as a minimum:

- a) The Controlled Waste Regulations 1992
- b) Special Waste Regulations 1996 (and amendments)
- c) Environmental Protection Act 1990
- d) Environmental (duty of care) Regulations 1991
- e) The Health and Safety (consultation with employees) Regulations 1996
- f) The Transport of Dangerous Goods (Safety Advisors) Regulation 1999
- g) Transport of Dangerous Goods (Safety Advisors) Regulations 1999
- h) Carriage of Dangerous Goods and use of Transportable Pressure Receptacle Regulations 2004
- i) Scottish Hospital Technical Note No. 3 Management and Disposal of Clinical Waste 2002
- j) The Radioactive Substances Act 1993
- k) Safe Disposal of Clinical Waste issued by HSAC (2nd edition) 1999

In addition the following best practice guidance should be applied:

- a) Scottish Executive Health Department Mel (93)21
- b) Health Services Advisory Committee Safe disposal of clinical waste 1999



Space Utilisation

Dedicated wastecollection areas are provided for segregation and storage. From these locations waste is transported to holding yard at Laboratory and FM Building using AGV's

Waste Training requirements

The Board requires all employees, including Clinical Staff, to

- Dispose of all items of waste safely and appropriately;
- Comply at all times with waste disposal procedures and the NHSGG&C Waste Policy;
- * Report any problems with waste disposal to their line manager;
- * Attend any training courses provided and deemed necessary to provide staff with instructions on waste handling.

Nursing and FM Staff will be responsible for removing waste sacks from bins when full and transferring to appropriate bin in the disposal hold.

Persons responsible

Facilities, Ward and Departmental Managers are responsible for ensuring the Board's Waste Policy is adhered to. All staff are responsible for ensuring that they comply with their Health and Safety duty of care requirements in relation to waste disposal.

Facilities Services provision is the responsibility of the Site Facilities Manager .



5.2 Service Standards – NHS TO REVIEW

Waste Type	Minimum Standard
Group A Clinical Waste	 Orange approved plastic bag; Bags are sealed with a plastic tie closure for clinical waste sacks NOT staples; Containers and bins are provided with lids that are sealed prior to collection Replaced when two-thirds full and in any case daily; Bags and or containers are labelled clearly to indicate their origin, the name of the hospital and department.
Group B Clinical Waste	 BS 7320 approved properly constructed sharps containers; Containers are stored away from public areas, radiators, direct sunlight; There is adequate supply of spare containers; Replaced when "fill to line" reached and in any case weekly; On replacement containers should be removed, sealed and labelled; Sharps containers should not be placed inside clinical waste bags; Damaged containers shall be placed inside larger, secure, rigid containers which are labelled in accordance with HSAC Safe Disposal of Clinical Waste 2nd Edition 1999.
Group D Clinical Waste	In accordance Special Waste Regulations 1996. NHS Guidance and Board Policy;
Group E Clinical Waste	In accordance with HSAC Safe Disposal of Clinical Waste 2 nd Edition 1999.
Domestic	 Black bags; Replaced when two-thirds full; Containers are stored away from public area.
General	 Appropriate protective clothing is worn at all times when handling Waste; Bag weight limits are observed and not exceeded; All containers shall be stored out of the sight of Patients and Visitors; Containers shall be Waste type-specific, labelled accordingly and used only for storage and transportation of that Waste type; Bags and containers are sealed and labelled with the source of Waste; Handling Staff are offered immunisation for certain diseases that may be carried in the waste materials e.g. Tetanus, Hepatitis B.



6.0 TRANSPORT & SERVICE YARD - NHS - MARK MCALLISTER TO REVIEW & UPDATE

6.1 Transport

Public Transport

The building is situated approximately 2miles from the Govan Subway station which has direct links to Glasgow City Centre.

For bus routes please refer to Strathclyde Passenger Transport or Travel Line Scotland website:

www.spt.co.uk www.travellinescotland.com

Alternative Transport

Staff members are encouraged to use public transport or care share options for commuting to work.

Cycle racks have been provided near to the front entrance of the building to allow staff to leave a bike and showers and changing facilities are provided within the building.

6.2 Parking NHS – SCOT YOUNG TO REVIEW & UPDATE

Parking

There is no parking facilities provided directly for the SGUH & RHSC Buildings. Car Parking facilities are provided elsewhere within the Southern General Hospital Campus with pedestrian links to the Laboratory Medicine Building.

A drop off area is provided at the from entrance to the building



6.3 Service Yard

Service Yard Operation

The Service Yard is the main delivery point for incoming goods for the Laboratory/FM Building and campus and also accommodates a compound area which will allow the wide range of waste products generated by the hospitals to be appropriately segregated, stored and secured until removed from the site.

The service yard and waste compound will accommodate the deliveries and waste generated by the laboratory medicine building and will become fully operational in 2015 when the hospital opens.

The service yard will accommodate:

- Deliveries
- Ad hoc deliveries
- Hospital and police mortuary deliveries
- Medical gas deliveries
- Equipment Maintenance/Service Deliveries
- Royal Mail

The service yard will be secure with controlled access. Authorised vehicles wishing to gain access must do so through the controlled entry system with an intercom between the entry gate and the Traffic managers office and Helpdesk. CCTV will be used to monitor access and activity within the yard.

Deliveries to the mortuary will be controlled by intercom linked directly to mortuary staff

Un athorised pedestrian access to the service yard is not permitted.

Access will be 24/7.



7.0 REFIT AND REARRANGEMENT CONSIDERATION – FULL M&E UPDATE -TEXT INSERTED IRED –

7.1 Re-fit Building/Building Sections – Section OK

General

- Care must be taken when re-positioning tall furniture / cupboards etc, do not obstruct paths for ventilation
- When refitting areas for clinical use, refer to record information to ensure air change rates are appropriate for the intended use.
- Refer to the Major and Minor Equipment Schedules before installing items of equipment which dissipate heat into a space.
- The hospital drainage installation includes more than one type of specialist drainage system and separate rainwater system. Care must be taken not to mix the systems during any future works.
- No air admittance valves are to be installed on any of the drainage systems, particularly the chemical and radioactive systems.
- Flexible hoses are not to be installed on any domestic water systems to prevent the growth of pseudomonas and legionella bacteria.

Environmental consideration is crucial in any future refit. The building has a BREEAM rating and any refit could compromise this rating if not considered properly. The use of natural ventilation, Green Guide A rated materials, reuse of other materials etc, the potential impact of increasing occupancy and any provision made in the original design to accommodate future changes can impact on the BREEAM rating

Building Services Design Levels		
Element	Temperature	
External Design Temperature (Winter)	-6 degrees C	
External Design Temperature (Summer)	26.2 degrees C DB 18.5 degrees C WB	
Secondary LTHW Flow Temp	75°C	
Secondary LTHW Return Temp	60°C	
MTHW Boiler Flow Temp	105°C	
MTHW Boiler Return Temp	75°C	
HWS Storage Temp	65°C	
Primary Chilled Water operating Pressure	3.0 bar	
Primary Chilled Water Flow	6°C	



Primary Chilled Water Return	14°C
Secondary Chilled Water Flow	7°C
Secondary Chilled Water Return	13°C
Air Change Rates	Refer to ADB Sheets



Additional Building services -OK

The following must be considered as they will impact upon the sustainable functionality of the building:

- The power supply ratings have been agreed during the master planning of the site any increase outwith the design contingency shall require to be agreed with the main infrastructure team.
- The heating and hot water loads have been agreed during the master planning of the site any increase outwith the design contingency shall require to be agreed with the main infrastructure team.
- Any impact on the site standby generators load scheduling will require to be agreed with the main infrastructure team.
- The internal environment is controlled by a BMS systems any modifications will require changes to the controls

Materials & Waste Management Policies -OK

In the event of any refurbishment, rearrangement, repair or replacement of internal fabric or fittings, full consideration should be given to the policies. (refer to section 3.1 & 5.1)

7.2 Re-arrangement / Addition of Furniture

Furniture & Fittings -OK

The designed layout of furniture and fittings has been made with careful consideration to the building services and building fabric.

When considering re-arrangement or addition of furniture the considerations in section 3.1 and 5.1 should be considered and reviewed together with section 7.1

Temporary Furnishings -OK

Any temporary placement of additional items should be carefully considered (as temporary placement has the potential of becoming permanent) as they can have a significant impact on the internal environment.



8.0 REPORTING PROVISION

8.1 Reporting Procedures

Conditioning Requirements -OK

Should you find that the temperature within your working space is too hot or cold then report the situation to the FM Helpdesk giving them as much detail as you can. The temperatures in each area of the building can be monitored by the FM team on the Building Management System (BMS)

General Maintenance Requirements -OK

The FM department operate a Planned Preventative Maintenance regime where maintenance activities will be carried out i a planned fashion. However if you come across any damage to the building or items requiring maintenance (light not working, leaking tap etc.) then please contact the FM Helpdesk who will programme any repairs or maintenance activities as required.

Operational Maintenance Requirements

When faults occur that have a direct effect on the working environment or health and safety in the work place please contact the following as a first response:

- On matter relating to the Building Services and Telephones (Mechanical, electrical, lifts etc.) call the FM Helpdesk
- On matter relating to , networks connections, or computers software / hardware problems call the IT department
- On matter relating to Health & Safety in the work place contact your department manager
- On matter relating to Fire safety contact site Fire safety Officer

Emergency Requirements

For any emergency requirements that have a direct effect on the working environment or health and safety in the workplace (burst pipes, overflowing toilet, electrical short circuit etc.) please contact the FM helpdesk as soon as possible.



8.2 Responsible Parties - OK

Department	Contact Information	
FM Helpdesk	5555	
IT Heldesk	#650	
FM Manager	Name: Ronnie Clinton	
	Telephone:	
	Email:	
Estates Manager	Name: Jim McFadden	
	Telephone:	
	Email:	
H&S Officer	Name: John Green	
	Telephone:	
	Email:	
Fire Officer	Name: Gibby Donnelly	
	Telephone:	
	Email:	



9.0 TRAINING

9.1 Compulsory Training

Site Inductions	
Visitors	All visitors to the building are the responsibility of the person they are visiting. The following should be identified to each visitor on entry to the building: • Fire Alarm Procedure • Fire Exit Locations • Assembly Point • Toilets • Refreshment Area
Staff	All new staff should be given a building induction by their local manager and provided with access to local corporate induction procedures. The induction will include building familiarisation, Fire safety and evacuation procedures and any Health & safety guidelines.

Specialist Training for Building Services Staff -OK

New member of the Building service FM staff will be given training in the operation and maintenance of the plant and equipment installed within the building as required.

Emergency Procedures -OK

All emergency procedures will be covered within the building Induction Sessions with specific training given to the following groups:

- Fire wardens
- FM Staff

9.2 Additional Training

Additional Training -OK

If a member of staff feels that additional training is required on elements of the building or equipment installed then contact either your department manager or the FM Manager.



10.0 LINKS & REFERENCES OK

For detailed information on the above items please refer to the Building Health & Safety File which contains manufactures literature, the Mechanical & Electrical Operation and maintenance manuals which is provided on the Zutec Database

The following links are useful:

Carbon Trust: www.thecarbontrust.co.uk

The Carbon Trust is a not-for-profit company providing specialist support to help business and the public sector boost business returns by cutting carbon emissions, saving energy and commercialising low carbon technologies.



11.0 GENERAL

This section is not applicable

12.0 SGUH & RHSC SPECIFIC TRAINING – THIS SECTION IS NOT APPLICABLE

INDIVIDUAL DEPARTMENT RESPONSIBILITY FOR TRAINING – ALL GGC STAFF TRAINED TO MANDATORT, STATUTORY AND JOB SPECIFIC REQUIREMENTS

Training

Individual Department responsibility for training – All GGC Staff are trained to mandatory, statutory and job specific requirements



13.0 SAFETY & EMERGENCY PROCEDURES – FULL REWRITE REQUIRED FOR SGUH & RHSC - KAREN C NHS

Safe handling of hazardous materials and substances

All Laboratory Users are required to follow the COSHH process. The full COSHH process is detailed in the Laboratory Code of Practice for Safety. The Laboratory Code of Practice for Safety also includes the management of other Laboratory hazards such as electrical and physical hazards.

Refer to:

- Laboratory Code of Practice for Safety (available from Q-Pulse)

Security procedures for the laboratory operation

All personnel are responsible for maintaining the security of the building, this includes fire exits being kept shut and all external doors with the exception of the front door should be locked.

The new building has access control and CCTV installed throughout and there are intruder alarms on the ground floor windows and doors.

The main entrance will be opened from 8.00am to 8.00pm and the doors will be opened and secured by the receptionist. During the out of hours period all external doors should be locked and windows shut, people needing access to the building can be admitted through the secure entrance.

There is a panic alarm installed at the main reception desk and is connected to the FM Helpdesk.

Access to the service yard is controlled by electronic gates and a barrier which have audio visual controls connected to the FM Helpdesk on the Ground Floor.

The security controls which have been installed in the building have taken cognizance of the specialist nature of the work to be undertaken.

Refer to:

Laboratory Code of Practice for Safety (available from Q-Pulse)
 Laboratory Medicine Building Operational Policy(available from Laboratory Services Strategy Staffnet page:

http://teams.staffnet.ggc.scot.nhs.uk/teams/acute/diagnostics/laboratoryservicesstrategy/default.aspx



Procedure for evacuation, disinfection, decontamination in case of emergency

All Laboratory users must adhere to the Building Operational Plan which outlines the procedure to be followed in the event of a fire. Additionally each department has a local fire plan which is distributed to Laboratory Users and is available electronically.

The Laboratory Code of Practice for Safety details the disinfection/decontamination procedure to be followed in the event of a chemical or sample spillage.

Refer to:

Building Operational Plan (available from Laboratory Services Strategy Staffnet page: http://teams.staffnet.ggc.scot.nhs.uk/teams/acute/diagnostics/laboratoryservicesstrategy/default.aspx

- Local Fire Plan (available from appropriate Technical Service Manager)
- Laboratory Code of Practice for Safety (available from Q-Pulse)

Emergency telephone numbers.

In the event of an emergency NHSGGC staff should call the NHSGGC Helpdesk on ext: 5555 to report the incident. The Helpdesk will then co-ordinate the appropriate response. The Helpdesk is open 7am – 7pm Monday – Friday. Out with these hours NHSGGC staff should continue to call ext: 5555 and they will be diverted to an automated service which will navigate the user to an appropriate out of hours contact.

All Laboratory telephone numbers can be accessed via the Laboratory Telephone directory, which is available electronically on the Laboratory SharePoint Site or in hard copy throughout the Laboratory.

Additionally, the following Laboratory Management telephone numbers are highlighted for Laboratory users:

Update Table of Contacts

Name	Designation	Telephone Number
II		



14.0 ENERGY & ENVIRONMENTAL STRATEGY

ASEPTIC SUITE ISOLATORS & MICROBIOLOGICAL SAFETY CABINETS

System details	Description
Plant Description	The Pharmacy Aseptic Suite houses 2No isolators for the preparation of cytotoxic products and 6No Class 2 type Safety Cabinets used for the production of antibiotics, steroids etc.
	Special Extract fans installed in plantroom 41 serve the FC and MSCs.
Control Strategy	The FCs and MSCs are controlled from the local unit mounted controllers. The Special Extract Fans are controlled via the Building Management System and demand from the FCs and MSCs
Operating Setpoints	Refer to Mach-Aire documentation on the O&M file
Safety Features	In the event of a loss of ventilation at the isolators and MBSCs, a local alarm will sound. The user should stop using the unit immediately.
	The exhaust ducts from the isolators and MBSC's are clearly labelled "Biohazard" and discharge at a safe distance 3 meters above the plantroom roof.
Maintenance	Prior to carrying out any maintenance on the isolators and MBSCs and associated fans and ductwork the laboratory technicians should be contacted to ensure that the equipment has been decontaminated if required.
	The isolators and Microbiological Safety Cabinets should be maintained in accordance with manufacturer's recommendations. A full Preventative Planned Maintenance (PPM) regime can be found within the O&M Information provide on Zutec.



Efficient use of Fume Cupboards & Microbiological safety Cabinets -Aseptic

When using any containment systems such as Fume Cupboards and Microbiological Safety Cabinets consideration should always be given to efficient operation. Many of the Fume Cupboards within the laboratory utilise a variable air volume system (VAV) which means that when the sash is closed the associated extract fan will slow down to reduce the air volume extracted from the cupboard.

The following guidance should followed for safe and efficient use of the Fume Cupboards

- 1. Do not use the fume cupboard to store chemicals and equipment
- 2. Close the sash when not working at the fume cupboard
- 3. Reduce the sash to the lowest height that still allows normal working
- 4. Switch the fume cupboard off when not in use (including the under bench chemical store)
- 5. Switch Cupboard

The following guidance should followed for safe and efficient use of the Microbiological safety Cabinets.

- 1. Do not work at the safety cabinet with the glass panel removed
- 2. Close the panel when not working at the safety cabinet
- 3. Switch the safety cabinet off when not in use
- 4. When filters (HEPA) become damaged or dirty then replace immediately
- 5. Switch Cabinet light of when not required



Equipment Testing & Maintenance

All equipment used within the Building should not be used unless it has been PAT (portable Appliance Test) tested. Each item of equipment should be checked both for a PAT label and via the PAT register (Available from the Estates Department). If in doubt do not use the equipment and contact the Department Manager

All equipment within the Building should be regularly calibrated and maintained in line with manufacturers guidance and an statutory authority guidance. If in doubt do not use the equipment and contact the Department Manager

Insert Paragraph - Refere tlo Major Clinical Imaging Equipment - MRI,CT'S Gamma & 'X'-Ray

General Building Environmental Guidance

For general building environmental guidance please refer to Section 3.0 of this User Guide



15.0	MATERIALS & WASTE
-	





16.0 BEST PRACTICE CHECKLIST

General

All users are responsible for leaving their work area in a clear and safe state. All hazardous materials should be appropriately stored in accordance with Code of Practice for Safety. All paper files should be appropriately stored in order to ensure confidentiality.

For further Information on your particular department, please contact the Department Manager



APPENDIX 1 FIRE SAFETY -Ok

Fire Safety

The NHS Greater Glasgow and Clyde Fire Safety Policy sets out the framework through which the Board will comply with its obligations under the 'Fire (Scotland) Act 2005 as amended'. These obligations include a responsibility to ensure the safety in the vent of fire of persons within our premises. The obligation extends to patients, employees, visitors and others who have cause to be present within our premises e.g. contractors. Anyone who has control to any extent of premises will have some responsibilities for ensuring that those occupying premises are safe from harm caused by fire. In a healthcare setting it is a particularly onerous responsibility where vulnerable and disabled persons may be at risk in the vent of a fire outbreak or where we have the potential for fire outbreak due to industrial processes, storage of combustible and dangerous materials and operation of laboratories.

The Policy is designed to minimise the risks from the effects of fire through a process of risk assessments, the implementation of high standards of fire safety and protection and the appropriate training of our staff. Where fire does break out, established and well tested procedures will be followed to minimise the risk of injury and loss of life.

The main objective of the policy are:

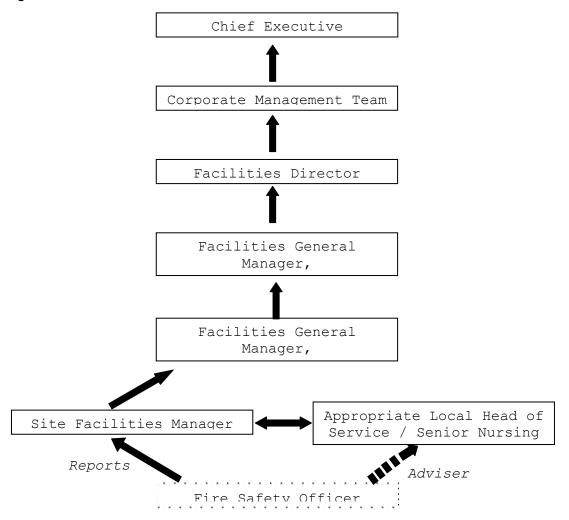
- To have a clearly written unambiguously defined Fire Safety Policy covering all premises which are owned or occupied or managed by NHS Greater Glasgow & Clyde.
- To have an effective fire safety management system which provides for the preparation and upkeep of fire safety
 policies and the co-ordination of fire safety management throughout the Board.
- To ensure that procedures are in place to undertake fire risk assessments throughout the Board and monitor these on a regular basis to ensure that they remain relevant.
- To ensure that means of ensuring emergency evacuation procedures for all areas are in place.
- To ensure that the patient care areas, appropriate emergency response teams are established and the staff are available at all times to provide assistance with patients evacuation in a fire emergency. In smaller premises a Fire Response Team may not be necessary (e.g. community premises, small health centres etc), however, clear arrangements must be in place to ensure a proper response during an alarm. This should include evacuation procedures.
- To ensure that procedures are in place within the Board to provide annual fire safety training for all staff, appropriate to the duties of the staff and their place of work. Fire Safety Training is under review during the period of this policy.
- To ensure that appropriate training exercises are undertaken at least annually for the fire response teams and other staff who are involved in patient evacuation.
- To ensure that whenever Board occupied buildings are in use, the senior member of staff present, or duty officer, has an appointed responsibility for fire safety, and that they are provided with appropriate training to enable them to undertake their duties effectively.
- To ensure central notification of all fire incidents (or issues of a fire related nature) from staff members via Datix and for them to be reviewed by the Board's Fire Officers and appropriate action taken to reduce their reoccurrence.

The following Building Operational Fire Procedures have been compiled to ensure that the New Laboratory & Facilities Management Building complies with the objectives of the NHSGGC Fire Policy. These should be read in conjunction with the departmental Fire Action Plans and the Fire Risk Assessments.



Fire Management Structure

SGUH & RHSC USER GUIDE (GENERAL)



Fire Response Team

The role of the Fire Response Team through the team leader is to coordinate and manage all the various parties efficiently to reach a satisfactory conclusion.

In the even of a site alert at the Laboratory & FM Building the SGH Fire Response Team will respond.

The Team Make Up: Core hours 9.00am to 5.00pm Mon - Fri:

Site Facilities Manager or Deputy Senior Nurse/Bed Manager for Site Estates Officer Portering Staff Estates Shift Electrician/Engineer

Out with core hours 5.00pm to 9.00am & weekends

Bed Manager/Senior Nurse for Site Estates Shift Technician Portering Staff



Responding to an Alert -NHS TO REVIEW/AMEND -KAREN C - NHS

- On the activation of the fire pagers the Fire Response Team should respond and assemble at the main entrance
 of the Lab/FM building.
- 2. The Fire Response Team Leader will ensure that all those present have been allocated their role(s) and responsibilities.
- 3. The person tasked to meet the Fire Brigade will be identifiable by a high visibility vest.
- 4. The appointed Fire Marshal & Fire Wardens will evacuate the whole building on the alarm being sounded.

Outside the Building

- 1. The Fire Response Team will meet the Fire Brigade on their arrival and guide them to the location of the fire alert.
- 2. Ensure all access roads and routes are clear and remain clear for emergency appliances and emergency personnel.
- (a) Portering staff will carry out this role and will be assisted by the building Fire Wardens;
- (b) Deployment of barriers across any roadways as required.
- 3. Positioning Portering Staff/Fire Wardens at entrances, exits and lifts to stop any unauthorised staff or visitor from entering the building or from using the lifts.
- (a) This would also apply to internal corridors if safe to do so.
- 4. The Fire Response Team Lead will check with the building Fire Marshal that all persons have been evacuated from the building.

Note

If the Fire and Rescue Service is not in attendance within 10 minutes of the pager alert, a member of the Fire Response Team will call the Fire Brigade using the nearest phone/mobile and dial 999.

AT THE SCEME OF THE FIRE ALERT

- 1. Limit the number of people within the fire alarm zone.
- (a) Only the Fire Response Team Leader and Facilities Site manager should be within the Fire Alarm Zone.
- (b) All others should remain out with the Fire Zone until requested to enter.
- (c) The Fire Safety Advisor may also attend at this project if on site.
- 2. Confirm the location of the fire.
- (a) If this is found to be different from previously indicated then the Fire Response Team Leader will inform Switchboard immediately.
- (b) Switchboard should then contact the Fire & Rescue Service, if they are not already in attendance, to pass on the correct location.
- 3. Ensure all staff and visitors have left the building. This also includes contractors.
- 4. Be aware of physically or otherwise impaired staff or visitors at places of safety within the building.
- (a) This will have been reported by the Fire Marshal which in turn will have been passed onto the Fire & Rescue Service immediately on their arrival.



(b) Circumstances may require prompt action to evacuate those, who are disabled from places of safety within the building.

A CONFIRMED FIRE

- 1. Assess the situation and take further action as and when required.
- 2. Be aware of the possible requirement to turn off various medical or other gases entering the ward or department.
- (a) This should already have been carried out by department staff in accordance with their Departmental Fire Action Plans.
- 3. Where necessary coordinate the evacuation procedure and ensure adequate assistance is available.
- 4. All vehicle access points to the fire location are kept clear of pedestrians and onlookers.
- (a) Porters are positioned to ensure quick and unrestricted access to the appointed area by emergency personnel.
- 5. Ensure all approaches to the fire location are kept clear of pedestrians and onlookers.
- 6. Allow internal access to the area for the Fire & Rescue Service. However do not put yourself in danger by entering the building.
- 7. The Fire Response Team will liaise with the Senior Fire & Rescue Service Officer on his arrival.
- (a) Inform him of any persons that are unaccounted for and any action you have taken so far.
- (b) Answer any additional questions as and when they arise.
- 8. Be aware also that the Senior Fire & Rescue Officer may require the electricity, gas or water supply to be turned off.
- (a) Have the appropriate Estates Staff standing by should this be required.
- 9. Be the only point of contact for the Fire & Rescue Service throughout the incident.
- 10. Ensure when a serious fire is confirmed that the relevant personnel have been informed, e.g. General Manager, On-Call Manager etc.
- 11. The Fire Response Team Leader may have to brief the Senior Manager on duty on the progress and subsequent damage so they can give accurate reports to the press or television.



FIRE MARSHAL & FIRE WARDENS - UPDATE FOR SGUH & RHSC REQUIRED - KAREN C - NHS

Heads of departments will appoint adequate numbers of Fire Wardens for their areas of responsibility. Furthermore:

- Fire Wardens will be appointed based on a minimum of two persons per each floor, part floor or separated area one member of staff to deputise for the other.
- A Senior Co-ordinating Fire Warden will be nominated to liaise with the departmental Fire Wardens, as well as
 the Fire Response Team or to deal with an liaise with the Fire & Rescue Service until the arrival of the Fire
 Response Team.
- It is recommended that a member of staff who has a working knowledge of the layout, functions and hazards
 associated with the building or department's activities be appointed as Senior Co-ordinating Fire Warden.
 Appropriate training will be provided for Fire Wardens on a regular basis with suitable records kept by the
 department.
- Heads of Departments must consult with their employees (or their representatives) about nomination to perform special roles (Fire Warden) and about their proposals for improving the fire precautions within the department.
- The proposed number of Fire Wardens required to be on duty are as follows:

Floor	No. of Wardens
-1	2
0	8
1	8
2	8
3	10
4	4

Senior Coordinating Fire Warden

A senior member of staff in the building will be nominated to become a Senior Co-ordinating Fire Warden. Their duties are:

- a) To co-ordinate, the department Fire Wardens.
- b) To liaise with departmental Fire Wardens to ensure a nominated Senior Co-ordinating Fire Warden is on duty go give assistance to the Fire & Rescue Service and Fire Response Team.
- c) Administer and organise the duties of the departments Fire Wardens, as required.

There will be sufficient levels of local organisation within the building for departments to deal with incidents and liaise with the Fire & Rescue Service and Fire Response Team on their own. This is an important task, as in many cases there may be no one else to take charge and resolve immediate problems resulting from a fire incident. The Senior Co-ordinating Fire Warden will identify themselves to the Fire & Rescue Service and other persons in authority by wearing a high visibility jacket or some other distinguishing marker.

TRAINING

All staff must attend a Fire Safety Lecture annually.

There will be special training provided for members of the Fire Response Team and Fire Wardens.

Fire Safety Training will be included in the Induction Training provided to all members of staff who will be working in the new Laboratory & FM Building during the commissioning/migration period.

Further details of the above training will be provided by the Fire Safety Advisor.



Fire & the Disabled -UPDATE REQUIRED FOR

Departments will ensure that their 'duty of care' to persons with disabilities has been undertaken by ensuring that any disabled staff who need assistance in the event of an emergency are identified. Ensure that a Disability Emergency Evacuation Risk Assessment and a Personal Emergency Evacuation Plan (PEEP) has been completed which can be found in the Personnel Emergency Evacuation Plan Guidance & Information & Forms (Appendix 2).

This will help identify suitable managerial and practical assistance to those with disabled persons to achieve safe egress from the building in the event of a fire emergency – by establishing:

- The Head of Department to assist all persons with disabilities within the department to conduct individual PEEP plans.
- How their disability might effect the fire evacuation of themselves and others!
- Whether they can make their own way out or do they need assistance.
- · Whether they will need to be placed in one of the temporary waiting spaces or other steps taken.
- If and where temporary waiting spaces are required to place disabled persons in, awaiting further evacuation
 procedures to take place or while awaiting the arrive of the Fire & Rescue Service.
- Who will accompany or escort the disabled person out of the building, or stay with them if they are placed in the temporary waiting space.

Further information regarding fire and the disabled is available in the **Fire & Disabled Information & Guidance Notes in Appendix 3**.

Insert paragraph detailing approach/treatment of disabled visitors – treated as patients during progressive horizontal evacuation

Further Information on Fire Safety & Advice

Further information can be found on the following website on Staff net.

http://www.staffnet.ggc.scot.nhs.uk/Acute/Facilities/Fire%20Safety/Pages/FireSafety.aspx

or alternatively contact: Gibby Donnelly, Fire Advisor, SGH





Bundle of documents for Oral hearings commencing from 13 May 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 28

Documents referred to in Impact and Infection Risk of QEUH and RHC site choice expert report by Allan Bennett