

# **NATIONAL PAEDIATRIC HOSPITAL**

## **INDEPENDENT REVIEW**

**COMMISSIONED BY JAMES REILLY TD MINISTER FOR HEALTH**

**PART ONE : FINANCIAL ANALYSIS**

**VOLUME ONE : REVIEW**



## TERMS OF REFERENCE

This report has been commissioned by the Minister for Health, Dr James Reilly TD, to provide an independent review of the project to build the new National Paediatric Hospital on the site of the Eccles Street Hospital. It is presented in two parts.

**1. A financial analysis of the project**, the terms of reference for which were:

**To examine and independently verify the estimated cost differentials identified in relation to building, equipping and running the proposed National Paediatric Hospital (a) if constructed on the site currently proposed and (b) if constructed to the same specification on notional alternative sites.**

**2. A clinical review** with the following terms of reference:

**To examine whether the potential clinical benefits, if any, of locating a Children's hospital beside the Adult hospital on the Mater site outweigh:**  
**(i) Any cost differential; and**  
**(ii) Any design issues, including access to the hospital.**

**Financial analysis:** This document contains the financial review, which has been undertaken under the auspices of the European Health Property Network (EuHPN). A review panel has been nominated by John Cole, the chair of the EuHPN and has been appointed by the Minister. The panel is chaired by Jonathan Erskine, the executive director of EuHPN and led by John Cooper, of John Cooper Architecture and a UK health care architect. The full panel membership is identified on the following page.

**Clinical report:** The accompanying document contains the clinical review, which has been undertaken by four international experts drawn from the National Association of Children's Hospitals and Related Institutions (NACHRI) and the Children's Hospitals International Executive Forum (CHIEF). Three are paediatric clinicians with extensive experience of clinical practice and hospital management. The fourth has substantial experience in the organisation and running of Children's hospitals.

Dr James Mandell is a paediatric urologist and is Chief Executive Officer of the Children's Hospital Boston.

Dr James Shmerling is President and Chief Executive Officer of the Children's Hospital of Colorado.

Professor Peter Steer is a paediatrician and neonatologist and Chief Executive Officer of Children's Health Services, Queensland, Australia.

Dr Jane Collins is a paediatric neurologist and is Chief Executive of the Great Ormond Street Hospital for Children.

John Cooper has worked closely with this panel in the co-ordination and production of the two sections.

**The European Health Property Network (EUPHN)** is a network of European governmental and research organisations responsible for the strategic asset planning and management of all form of health property, from hospitals to health centres. The Network's aim is to promote better standards and more effective investment in, and management of, health property throughout the EU, by using the network capability to enable members to pool and share knowledge, and to keep pace with leading edge developments in this central dimension of health care.

**The National Association of Children's Hospitals and Related Institutions (NACHRI)** is a not-for-profit organisation of children's hospitals with 218 members primarily in the United States but also with membership from Canada, Australia, the United Kingdom, Italy, China, Mexico and Puerto Rico. NACHRI promotes the health and well-being of children and their families through support of children's hospitals and health systems that are committed to excellence in providing health care to children. It facilitates benchmarking programmes that document clinical outcome measurements and reporting across its membership organisations.

**The Children's Hospitals International Executive Forum (CHIEF)** is a forum of chief executives of the largest (over 150 beds) acute children's hospitals affiliated to NACHRI.

## PROJECT REVIEW TEAM: FINANCIAL REVIEW

### **Jonathan Erskine**

Executive Director of the EuHPN

Chair: Project Review Team

### **John Cooper**

Principal: John Cooper Architecture (London)

Lead: Project Review Team

Coordination and compilation of all inputs

Authorship and presentation of joint report and findings

*John Cooper is an experienced healthcare architect who has been involved in some of the largest hospital schemes in the UK and has designed many healthcare buildings. He is chair of Architects for Health in the UK and is a regular contributor to conferences and professional journals.*

### **Peter McHale**

Director: Bruce Shaw Partnership (Dublin)

Professional analysis and assessment of all cost options based on core work of existing design team

*Bruce Shaw is one of Europe's leading quantity surveying practices and has a proven track record in providing cost management services on major projects. The substantial number of healthcare projects which the practice has undertaken has created a demonstrable specialisation in this field and brings an informed and expert perspective to the review.*

### **David Brennan**

Director: BDP (Dublin)

Professional analysis and assessment of all engineering and infrastructure requirements and related costs for all options based on core work of the existing design team

*BDP is one of the foremost interdisciplinary practice of architects, designers, engineers and urbanists in Europe. David Brennan is the head of the Dublin studio which specialises in sustainability and low-carbon design.*

### **Jackie Cardiff**

CEO: HCP Social Infrastructure (London)

Professional analysis and assessment of overall clinical content, adjacencies of key departments, and schedules of accommodation

*HCP is working in three continents and provides a full range of services to public and private sector healthcare clients, from project inception with feasibility studies and business cases, to Design, Planning, Construction and Operational Management.*

### **Brian Fitzgerald**

Director of Finance: St. James's Hospital (Dublin)

Review of comparative operational / costs over a 16 year period for the various options

Production of cost tables, commentaries etc. for inclusion in the final report

### **FORMAL CLIENT**

**Minister for Health and Children (Represented by Fergal Lynch)**

### **CLIENT PROJECT LEAD**

#### **Charlie Hardy**

Department of Health and Children

Departmental point of contact for Review Team and primary point of liaison

#### **Gregory Canning**

Department of Health and Children

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# FINANCIAL REVIEW: VOLUME ONE

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## GLOSSARY

AUCC:	<i>Ambulatory and Urgent Care Centre</i>
Consolidation:	<i>Merging the three existing children's hospitals in Dublin into a single institution: the National Paediatric Hospital, referred to herein after as the NPH</i>
Co-location:	<i>Locating the NPH on the campus of an adult teaching hospital</i>
ECB:	<i>European Central Bank</i>
GSI:	<i>Geological Survey of Ireland</i>
HSE:	<i>Health Service Executive</i>
OCSC	<i>O'Connor/Sutton /Cronin : multidisciplinary consulting engineers who are part of the NPHDB integrated design team</i>
NAMA:	<i>National Asset Management Agency</i>
NPHDB:	<i>National Paediatric Hospital Development Board</i>
NPV:	<i>Nett Present Value</i>
RKW:	<i>Rawlinson, Kelly and Whittlestone, a health planning consultancy which was commissioned to write a report on the nature and location of the Ambulatory Care Centre, published 2007</i>
Tri-location:	<i>Locating the NPH and a maternity hospital on the campus of an adult teaching hospital</i>
WYG:	<i>White Young and Green, consulting engineers who are part of the NPHDB integrated design team</i>

## 1. REVIEW: CONTEXT AND METHODOLOGY

### CONTEXT

The case for consolidating the three existing children's hospitals in Dublin into a single tertiary facility is essential for clinical, operational and financial reasons and is not under review. Our Lady's Hospital for Sick Children, Crumlin, and the Children's University Hospital, Temple Street provide excellent care but many of their facilities fall well below today's standards for the care of children and their families.

There does not appear to be any opposition to this new hospital becoming the National Paediatric Hospital, providing specialist tertiary services for the whole country, regional services for Greater Dublin and more local secondary hospital services for the children of Dublin.

The purpose of this section of the report is to examine the financial implications of the decision to develop the new hospital on the Mater hospital campus, which provides co-location but is perceived in some quarters to have come at too high a price.

The selection of the site of the new NPH was undertaken in 2006 by a joint HSE/DoHC task force, advised by a panel of international experts from the USA, Australia and the UK. The criteria for selection were taken from the specially commissioned report by McKinsey and Co; *"Children's Health First: International Best Practices in the delivery of Tertiary Paediatric Services"*.

The process is fully recorded in the *"Report of the Joint HSE/DoHC Taskforce to advise on the optimum location of the new National Paediatric Hospital"* published in May 2006, which is appended.

The key criterion for selection was a site's ability to provide immediate co-location with an adult teaching hospital and potential tri-location for the development of a maternity hospital. The case for this level of tertiary

consolidation was considered so compelling that the short list for the location of the NPH was limited to the six teaching hospital sites in the Dublin conurbation, after the initial selection process had attracted 22 potential sites for consideration.

However, economic conditions are now very different to 2006. There is a body of opinion which considers that the re-location and construction of this development on a brown or green-field site outside the city centre will prove significantly more cost effective than the current proposals and provide better access for patients from outside Dublin.

### METHODOLOGY

This report will address the concerns which have been raised about the additional costs of city centre development. Three comparator sites have been chosen on the periphery of the city to provide green and brown field options for cost comparison. The sites are in private, public and possible NAMA ownership. It must be made absolutely clear that these have been selected for the sole purpose of cost comparison. The review panel has had no communication whatsoever with the owners of the privately held sites or the hospital executives at the Tallaght and Connolly hospitals about this comparison.

A generic design for the new hospital has been developed by the current NPH design team in consultation with the Review Panel. This design is based on providing the same clinical, educational, research and support functions as the current scheme. It is not site specific, and can be developed on each of the three comparator sites with minor modifications thus allowing a detailed cost comparison to be made. The three sites are described in Section 3.

### PROCESS

The sites were chosen by the HSE for the purpose of this exercise and their selection was endorsed by the Review Panel. The Panel requested and received a body of information, which included survey information, indicative site layouts, site specific parking requirements and desk top information about ground conditions, ecological and archaeological constraints, public utilities capacity, and drainage. An appropriately detailed examination of the road infrastructure around the three sites was prepared by OCSC to assess off site enabling works costs. The public transport accessibility of each site was identified as well. A project programme was developed for these comparator sites. The cost report was prepared by the current project design and project management teams and interrogated and endorsed by the Review Panel. The revenue cost comparisons have been produced by Brian Fitzgerald of the Review Panel.

Three meetings were convened in Dublin by the EuHPN team which were chaired by Jonathan Erskine and led by John Cooper. The Review Panel and the client and consultant NPHDB teams were fully represented at each meeting. Their purpose was to identify the information required and interrogate its content. This then allowed a concerted period of three weeks for collation, discussion and review. Two days of meetings were held on the 16th and 17th of June with a number of key stakeholder groups. John Cooper has viewed all the comparator sites and visited the three children's hospitals in Dublin with Jackie Cardiff.

An exercise of this nature, prepared in the timeframe requested, inevitably relies on a number of informed assumptions. The information on which this report is based has been provided, in the main, by others. The Panel believes that it is of sufficient quality and detail to establish the construction and equipping cost differentials.

**Table 2.1 - Summary Cost Comparison (refer to Section 7 for detail)**

	Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
<b>Difference in gross internal floor area</b>	0	-3,277	-3,568	-3,708
	Reference Site	Site A (€)	Site B (€)	Site C (€)
<b>Difference in construction costs</b>	<b>0</b>	-37.6m	-50.0m	-57.3m
<b>Difference in development costs: after equipment, fees, other costs, risk provision, VAT, inflation - summary figure</b>	0	-57.9m	-74.1m	-86.1m
Difference after prolongation inflation costs are factored in - summary figure	0	-30.1m	-47.0m	-59.5m
Difference after utilities and off-site road upgrades are factored in -summary figure	0	-26.1m	-27.6m	-51.7m
<b>Comparison of project costs</b>	<b>0</b>	<b>-26.1m</b>	<b>-27.6m</b>	<b>-51.7m</b>
<i>Further considerations</i>				
Non-recoverable costs - line item - see opposite		+24.0 m	+24.0 m	+24.0 m
Revenue savings lost through programme prolongation - line item - see opposite		+25.9 m	+25.9 m	+25.9 m



## 2. EXECUTIVE SUMMARY

**Summary:** This financial review has concluded from the information available that the cost of developing the National Paediatric Hospital on the Eccles Street site is similar to those costs which would be incurred if the project was developed on any of the three comparator sites. If the non-recoverable costs and potential revenue savings are considered our analysis shows there is little financial advantage to selecting any of the comparator sites.

We are of the opinion that, if prudent budgetary controls are continued, the development of the NPH on the Mater campus can be delivered within the €650 million budget if the current programme is met.

**Programme delay:** This lack of a cost differential can be partially attributed to a programme delay of two and a half years that will occur if a decision is taken to recommence the process of site selection and develop a new set of design proposals, after halting work on the current scheme. This prolongation will have significant financial implications for the capital cost of the NPH development on an alternative site. See **Sections 6 & 7**.

This delay will also lose the opportunity of achieving two and a half years of substantive revenue savings, occasioned by the consolidation of the three existing children's hospitals into a single institution. Further operational savings have been identified for the benefits of co and tri-location. See **Sections 7 and 8**.

**Cost summary:** A summary cost comparison is set out in Table 2.1 on the opposite page. The detailed analysis is in **Section 7**.

**Total construction costs:** It is estimated that the total construction costs for the NPH on each of the comparator sites (enabling works, the construction the new hospital, the hostel and all necessary parking structures and the site infrastructure works) will be

significantly cheaper than those on the scheme for the Eccles Street site.

**Total development costs:** However, when the development costs of the three comparator sites are estimated and programme delay, utility company connections and road upgrades are taken into account, the overall costs of developing the NPH on the comparator sites are very similar to the Eccles Street scheme - ranging from between 92% to 96% of the total costs of the current proposals.

**Non-recoverable costs:** The design proposals for the Eccles Street site have been in development for 20 months and the project management for much longer. The design is shaped by the site configuration and the inner city location. It is estimated that only 20% of the work that has been done to date is transferable to a new scheme on a different site. As a consequence, there will be significant abortive costs incurred by recommencing planning and design work, which have been estimated at €24 million. These will have to be written off, which may be politically sensitive, or the budget for an alternative site will have to be reduced by this figure to remain within the €650 million project envelope. We have assumed the latter. See **Section 7**.

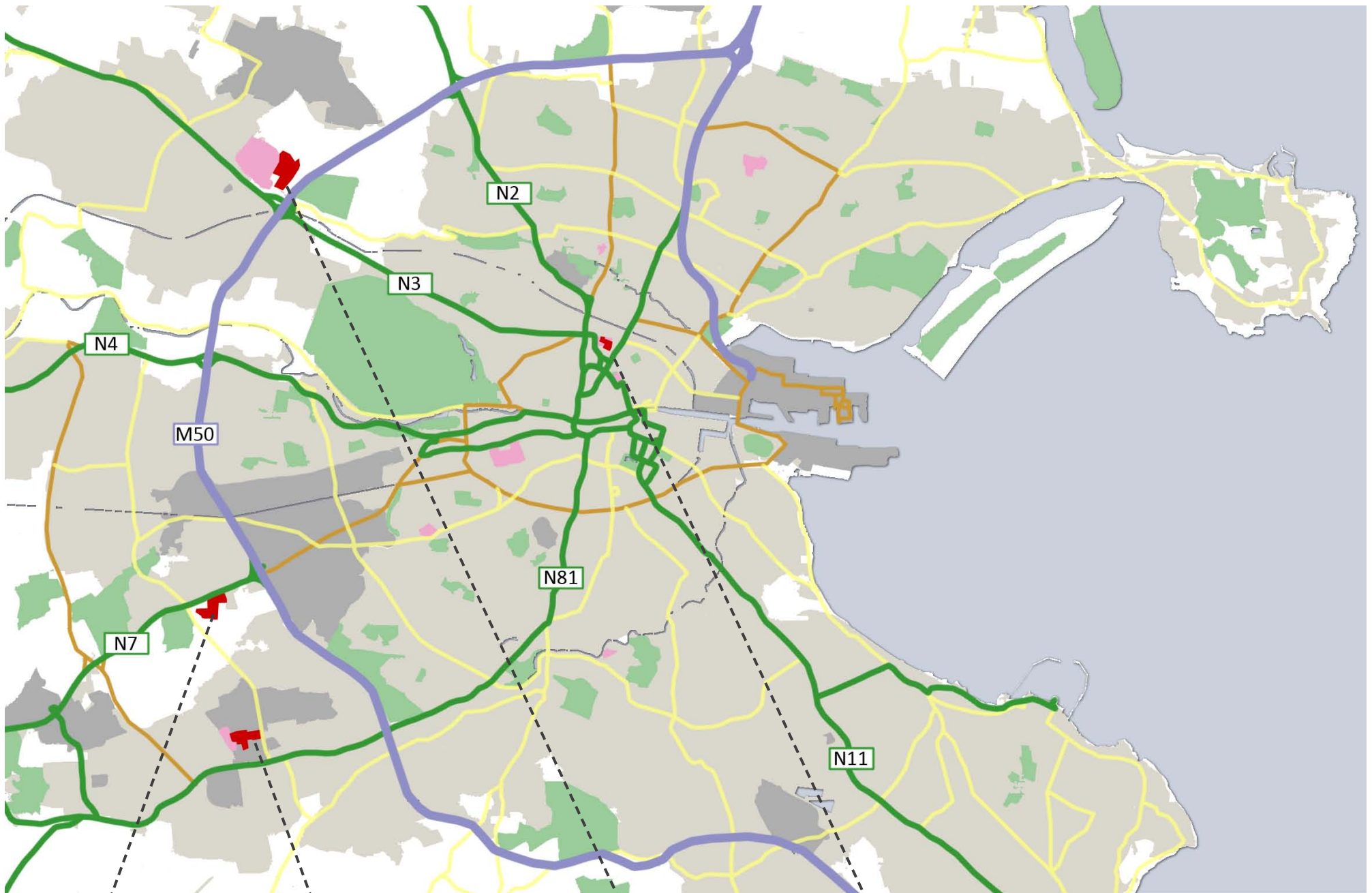
**Site acquisition costs :** There are site acquisition costs to be considered for the two comparator sites ( A and B ) which are partially or wholly in private ownership. The current property market in Dublin makes it very difficult to determine land values. Nonetheless an independent surveyor was appointed and has prepared valuations for all four sites, although these are not included in this report. They represent commercially sensitive information which we do not need to publish because the cost comparison, summarised in the table opposite, demonstrates that the development costs for the four sites are all broadly comparable without their inclusion.

**Potential revenue savings through consolidation:** The Review Panel has prepared a detailed estimate of the revenue savings which can be achieved when the three existing children's hospitals are consolidated into a single institution. These have been calculated at €23 million per annum. Given the current pressures on the operating budgets of the three children's hospitals it is likely that a proportion of these savings may have been achieved by the time that the NPH opens as currently programmed in December 2016. Therefore we have discounted the substantiated figure of €23 million by 55% to €10.35 million per annum for the purposes of this cost comparison. If consolidation is delayed by two and a half years, there will be a potential lost opportunity of saving €25.9 million in revenue costs. See **Section 8**.

**Potential revenue savings through co and tri-location:** The review panel has also prepared two further estimates which quantify the revenue savings which are additional to those achieved by consolidation, specific to: 1. co-location of the NPH with an adult teaching hospital and 2. tri-location of the NPH with an adult and a maternity hospital. See **Section 8**.

**Conclusion:** A change of site will not significantly reduce the development costs of the National Paediatric Hospital. If the non-recoverable costs and the lost opportunity of revenue savings are taken into account there is very little difference between the costs of developing Eccles Street and the comparator sites and therefore no reason to incur the risk of delaying the project for two and a half years.

If substantive reductions in budget are required, these can only be achieved by significant changes to the project scope or process. The questions which have been raised about the accessibility of the Eccles Street site and the opportunities for expansion are addressed in the second part of this report - Clinical Review.



Newlands - SITE B

Tallaght Hospital - SITE A

Connolly Hospital - SITE C

Mater Misericordia Campus -  
REFERENCE SITE

# National Paediatric Hospital

### 3. COMPARATOR SITES

Three sites have been selected by the HSE to enable a detailed cost comparison to be made and to evaluate the perceived advantages for access and parking that peripheral sites might provide. This selection has been endorsed by the Review Panel. These are adjacent to Tallaght Hospital (site A), Newlands Cross (site B) and adjacent to Connolly Hospital Blanchardstown (site C). Their boundaries have been drawn up by the HSE.

**Site A** is a brownfield site in multiple ownership, adjacent to Tallaght Hospital on the west side of the R113 Belgard road between the N7 and N81 junctions

**Site B** is a green-field site in private ownership, located immediately to the east of Newlands Cross on the south side of the N7.

**Site C** is a green-field site in public ownership immediately adjacent to Connolly Hospital on lands adjoining the junction of the M50/M3.

All the sites are located close to the orbital M50 motorway, are of sufficient area for a development of this scale and do not appear to present substantive development risks with regard to ground conditions, environmental impact, abnormal conditions or the capacity of their immediate infrastructure to provide sufficient drainage or the necessary public utilities.

All the sites, including the Eccles Street development, represent a risk with regard to gaining planning consent, although consultations with Dublin City Council are already advanced for the Eccles Street scheme, prior to submission of a planning application to Bord Pleanála.

All the comparator sites would require significant amendments to be made to the surrounding road infrastructure to accommodate the additional traffic which they would generate and provide adequate

access and egress to the sites. The necessary roadworks required for the Eccles Street development are included in the current cost plan for the project (see Section 7). Gaining agreement from all parties and some contribution to the funding of these roadworks does represent a risk. The need for these amendments and the extent of the works have been identified in the OCSC Review which is appended.

#### VEHICLE TRAFFIC AND PARKING

OCSC has estimated that the new hospital is likely to generate approximately 10 000 arrivals and departures per day. These represent the staff journeys, the journeys for the patients and their families/escorts which make up the national and regional tertiary referrals and those made by the cohort of patients and families from the Dublin conurbation using the new NPH as their local paediatric secondary service.

The calculation of the modal split between public and private transport is complex and the methodology is set out in some detail in the OCSC report. It is based on the assumption that the vast majority of the patients and families, regardless of location, would come by car. The allowance for patient parking is therefore the same for the Eccles Street and the three comparator sites -736 spaces.

The variations in the overall parking numbers are generated by the staff parking requirements. These are determined by the relative proximity of the sites to good public transport and an informed view being taken on the level of MMP (Mobility Management Planning) which can be achieved by the hospital management. These calculations exclude Metro developments which have yet to take place and, in the case of Eccles Street, the development of the MetroNorth (see Appendix). A very detailed traffic study of ambulance and vehicular

access to the Eccles Street site has been undertaken and is appended to the Clinical Review document.

The Eccles Street Misericordiae University Hospital (MMUH) has been very successful in reducing the numbers of its staff which use private transport to 30% of total staff numbers. It can be argued that an MMP for a city centre location is easier to achieve than a peripheral site. OCSC has identified a broad range for maximum and minimum staff parking numbers, depending on the success of an MMP and an average has been taken which generates the approximate car parking requirements for the comparator sites.

	Reference Site: Eccles St.	Site A: Tallaght Hospital	Site B: Newlands Cross	Site C: Connolly Hospital
Visitors	736	736	736	736
Staff	248	914	864	814
Total	984	1650	1600	1550

A limit of 1000 parking spaces for the NPH development on the Mater campus has been agreed in consultation with Dublin City Council and the staff parking numbers on the Eccles Street site – 248 – reflect this limit.

## SITE A

### TALLAGHT HOSPITAL SITE

**Location:** the site is to the east of the existing Tallaght hospital and to the north of the Tallaght Town Centre, adjoining the Institute of Technology and the South Dublin County Council Headquarters and is in close proximity to The Square Shopping Centre. It is bounded to the north by light industrial buildings.

**Size:** 11.184 hectares

**Local authority:** South Dublin County Council

**Current ownership:** in multiple ownership, private, public

**Current usage:** a brownfield site on which there are some spoil heaps and a number of buildings, some of which are reported to be in use, some of which are reported to be derelict.

**Accessibility by road:** on the west side of the R113 Belgard Road between the N7 and N81 junctions. The convergence of hospital and shopping centre traffic in the existing road network around the proposed site, coupled with the interface with the existing Luas crossing and the proposed MetroWest alignment on Belgard Road, has the potential to cause conflict and congestion. OCSC advise that significant road upgrades would be required to accommodate the levels of traffic which are anticipated.

**Accessibility by public transport:** good bus links (15 within a five minute walk of the site), the Luas Red line stop on Cookstown Way, and a stop at Tallaght East on the proposed MetroWest.

**Public utilities:** Early advice from ESB is that the site can be connected to the ESB MV Network without the need for a dedicated sub-station, although this might change if there are any other major developments in the vicinity. Bord Gais has advised that, at the present time, the local infrastructure can accommodate the proposed peak time load of 15MV, with similar caveats to the ESB advice.

**Ground Conditions:** the site appears to be relatively level. The industrial history of this site and the uncontrolled disposal of spoil make contamination likely and the cost plan has made allowances for remediation and soil disposal. Information from the Geological Survey of Ireland (GSI) indicates that there is stiff boulder clay beneath a layer of fill on the site and this desk top information has been used for costing purposes.

**Environmental impact:** The industrial nature of the site makes it reasonably unlikely that there would be rare or protected species on the site with the possible exception of bat roosts

**Archaeology:** A desk top study indicates that the archeological remains on the site do not constitute an appreciable risk to the development of this site.

**Risks:** Site acquisition, contamination, planning permission, agreement to and funding of, off site roadworks



Aerial View looking WEST

Aerial View looking SOUTH





## SITE B

### NEWLANDS CROSS

**Location:** Immediately east of Newlands Cross on the south side of the N7, east of the Belgard Road and close to the M50/M7 junction. Adjacent to a large graveyard and light industrial premises, in close proximity to a crematorium.

**Area :** 12.95 hectares

**Local authority :** South Dublin County Council

**Current ownership :** Privately owned

**Current usage :** Agricultural pasture land with some farm buildings and hedgerows. The site is currently zoned as greenbelt.

**Access by road:** The general location provides excellent road access for patients and families from outside the Dublin conurbation and from the south of the city. However the current road network around the site and the proposed Newlands Cross upgrade make access onto the site problematic. Significant investment would be required to amend the existing junctions and road network, with the probability that this would require third party involvement.

**Access by public transport :** There are currently 9 regular bus services within a 10 minute walk of the site and others in the vicinity if the site is linked to the Belgard road. The Luas Red line terminus and Park and Ride are 800 metres away.

**Public utilities:** Early advice from ESB is that the site can be connected to the ESB MV Network without the need for a dedicated sub-station, although this might change if there are any other major developments in the vicinity. Bord Gais has advised that, at the present time, the local infrastructure can accommodate the proposed

peak time load of 15MV, with similar caveats to the ESB advice.

**Ground Conditions:** There is a shallow fall across the site towards the south. The geo-technical records from GSI indicate considerable rock outcrop just to the north of the N7. Basement excavation should be limited single or double storeys. It is envisaged that pad/strip foundations, bearing on this limestone layer can be used.

**Archaeology:** There may be archaeological remains but these are anticipated to be eroded as a consequence of agricultural cultivation and do not constitute an appreciable risk to development.

**Environmental impact :** The site contains fields, some hedgerows and small patches of woodland. There may be bats and other protected species on the site and surveys would have to be undertaken.

**Risks:** Site acquisition, environmental impact, planning consent, agreement to and partial funding of significant off site roadworks



Aerial View looking NORTH

Aerial View looking SOUTH





Newlands Cross

Potential Site

Graveyard

Crematorium

N7 National  
Primary

Luas Park  
and Ride

Red Cow  
Junction (M50)

Site B

## SITE C

### CONNOLLY HOSPITAL BLANCHARDSTOWN

**Location:** the site is located in Blanchardardstown, immediately to the east of the existing hospital on fields and woodland which adjoin the M50/M3 junction

**Size:** 15.753 hectares

**Local authority:** Fingal County Council

**Current ownership:** in public ownership

**Current usage:** agricultural land under cultivation and patches of woodland. The site is currently zoned as Open Space.

**Accessibility by road:** the site is located at the junction of the M50 and the M3, on a prominent point in the Dublin highway system. Access and egress arrangements to the existing hospital site are quite complex and it is considered likely that current restrictions would require to be relaxed and the campus opened up from the north and west. These works would form part of significant amendments to the existing road network, which would be required to accommodate the NPH.

**Accessibility by public transport:** there are 2 bus services currently serving the hospital campus and a further 7 within a 10 minute walk of the site. The Castleknock Railway Station is over a kilometre away. The MetroWest is proposed to run to the west of the site with the Sports Campus stop appearing to be the closest to the site.

**Public utilities:** Early advice from ESB is that the site can be connected to the ESB MV Network without the need for a dedicated sub-station, although this might change if there are any other major developments in the vicinity. Bord Gais has advised that, at the present time, the local infrastructure can accommodate the proposed

peak time load of 15MV, with similar caveats to the ESB advice.

**Ground Conditions:** there is a considerable fall of approximately 5 to 7 metres south east across the site toward the Tolka Valley. The land is currently in mixed agricultural use with some areas of woodland. The geo-technical information in the GSI indicates “Dublin Boulder Clay” varying in depth to a maximum of 4-5 metres over limestone bedrock. It is proposed to limit basements to one or two storeys. Foundations could be formed with pads and strips.

**Environmental impact:** Buildings near the site are known roosts for bats and the woodland areas are reported to support badgers, hedgehogs, wood mice and shrews. Surveys would be required to establish if this level of wildlife was present.

**Archaeology:** A desk top study indicates that the archeological remains on the site do not constitute an appreciable risk to the development of this site.

**Risks:** environmental impact (likely presence of protected species), planning consent, significant off site roadworks



Aerial View looking NORTH EAST



Aerial View looking EAST





N3 National Route

Connolly Hospital

N3/M50 Junction

Potential Site

M50 Motorway

Site C

#### 4. COMPARATOR DESIGN PROPOSALS

The design for the NPH on the MMUH campus is site specific. The current design team was asked to prepare a simple generic design model for the NPH which could be located on each of the three comparator sites, with minor amendments to accommodate the specific conditions on each site. This design is based on the same clinical design principles which have shaped the current proposals and has achieved similar clinical adjacencies, although some modifications have been made to take advantage of the greenfield nature of these sites.

**Gross internal floor area of generic design:** The gross internal floor area of the generic design is approximately 3 500 m<sup>2</sup> less than the Eccles Street scheme, because there are no link structures and the area for 'Communications' is smaller.

The clinical content, and therefore the area for this, is the same as the Eccles Street scheme. The area for the support spaces differs slightly between the three comparators and the Eccles Street scheme because of varying opportunities on the Eccles Street site and Sites A and C to share support functions with the adjoining adult hospitals.

The percentage for interdepartmental circulation in the Eccles Street scheme (32%) is very efficient and has been used for the generic design.

The percentage allowance for Communication and Plant in the Eccles Street scheme is above benchmark (35%) due to the height of the proposed scheme and a lower figure has been used for the generic design (32%).

These terms are explained in **Section 7.1**

**Specification:** This generic design model can allow an informed cost comparison to be made.

The massing and height of this generic model is significantly lower than the current proposals - a building on nine levels (including a basement), appropriate for the green/brown field nature of these sites.

The specification and therefore the cost rates for the external envelope of the generic design are the same as those which have been applied to the external envelope of the lower podium building on the Eccles Street scheme.

The specification and therefore the cost rates for the internal fit out and finishes of the generic design are exactly the same as the Eccles Street scheme. The servicing strategy for the generic design is also very similar to the current scheme. The diagram for the generic design is set out below and an indicative stacking plan is shown on the opposite page. The site specific sketch designs for the three comparator sites are set out on the following pages.

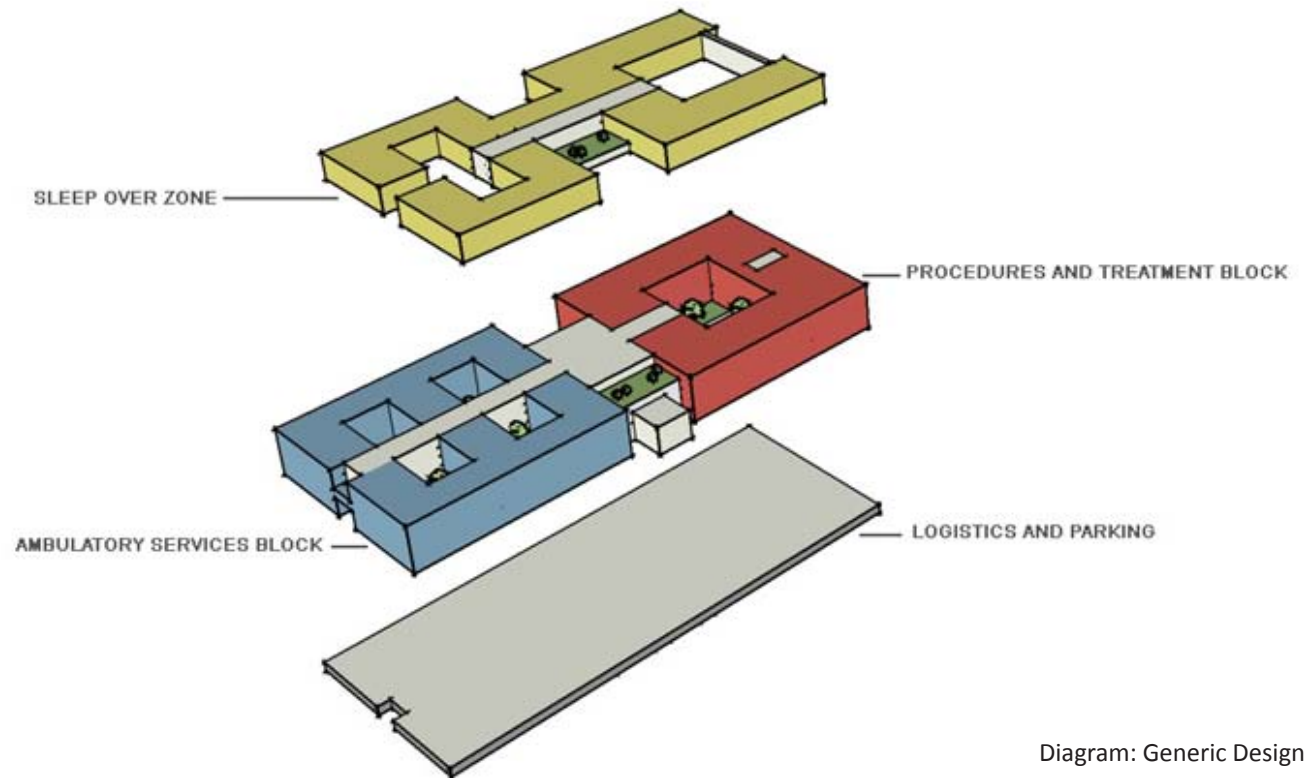
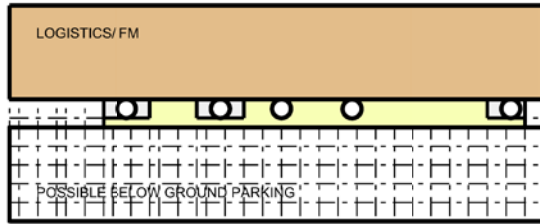
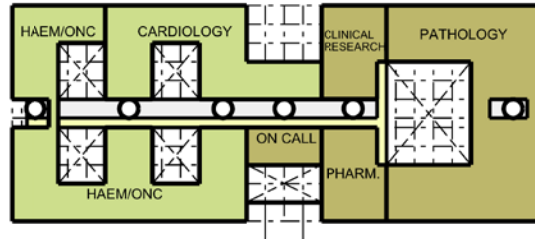


Diagram: Generic Design

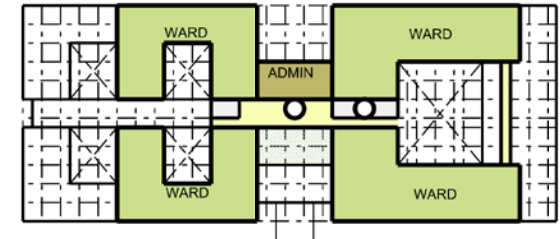
o'connell mahon + **nbbj** architects



Level -01



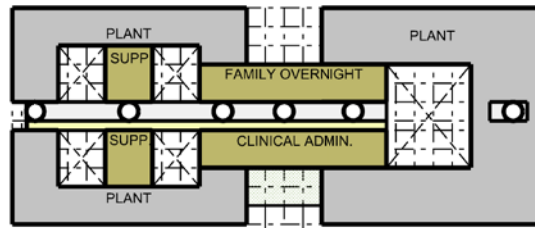
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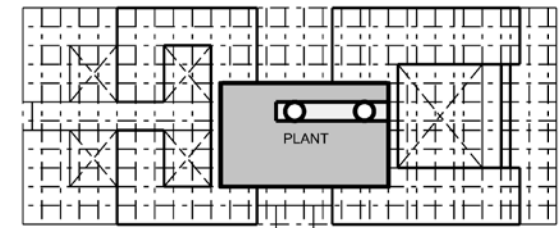
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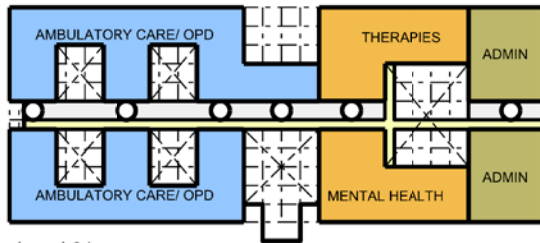
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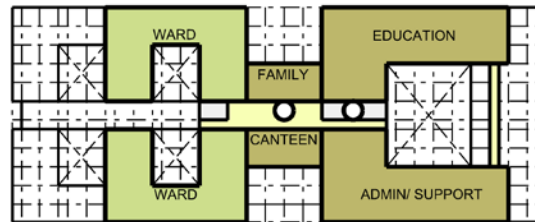
Level 04



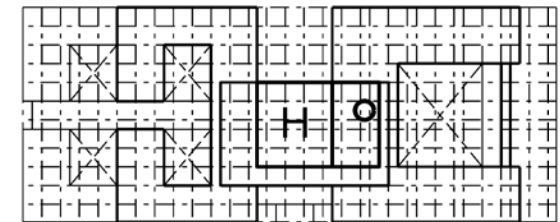
Level 08



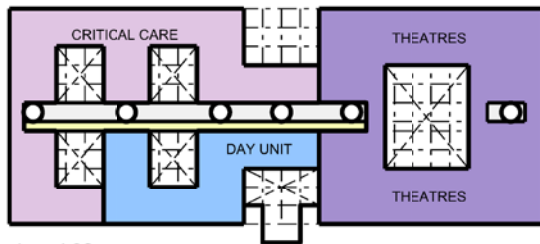
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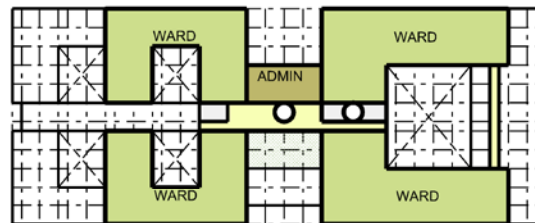
Level 05



Roof Level



Level 02



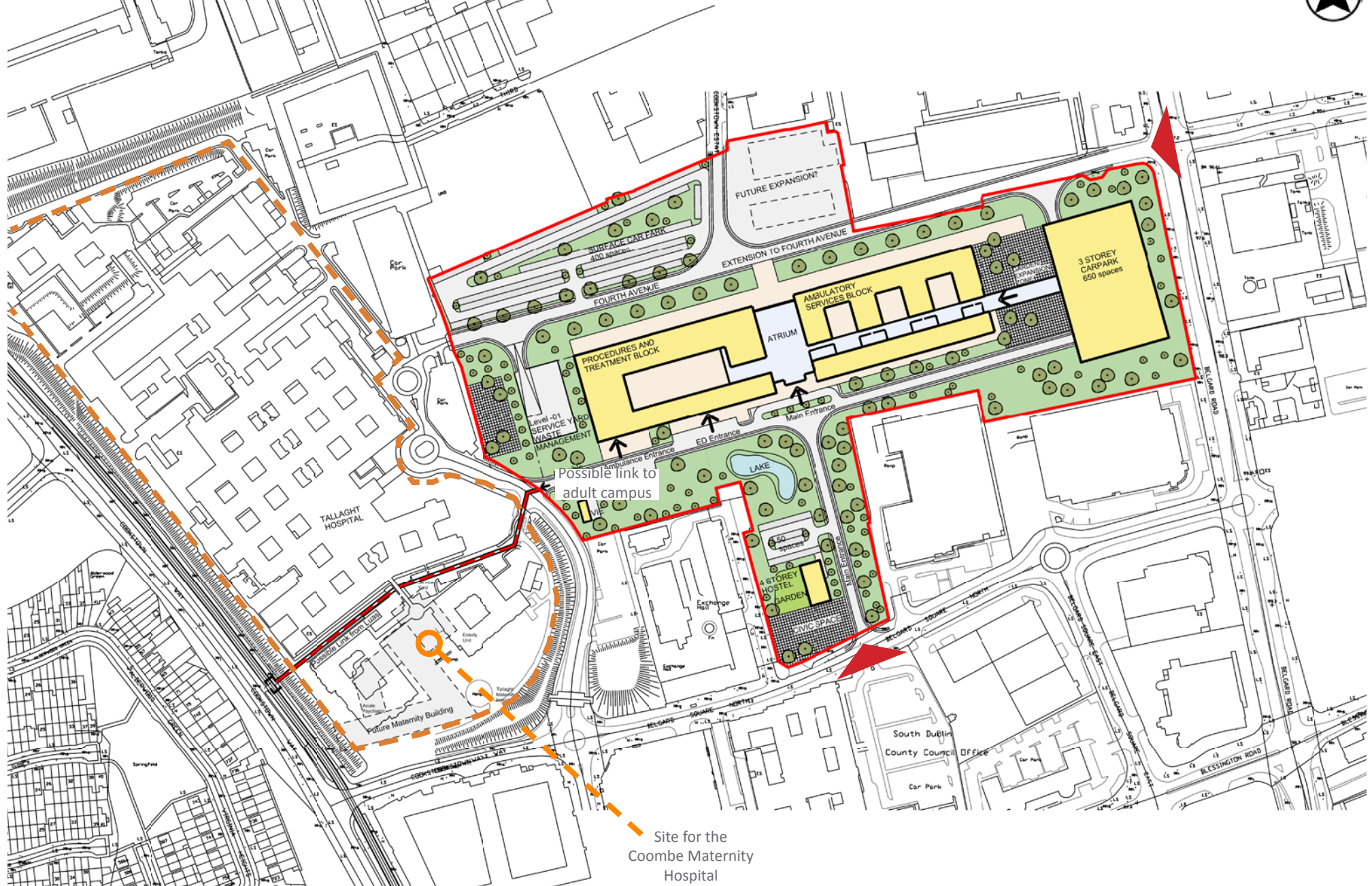
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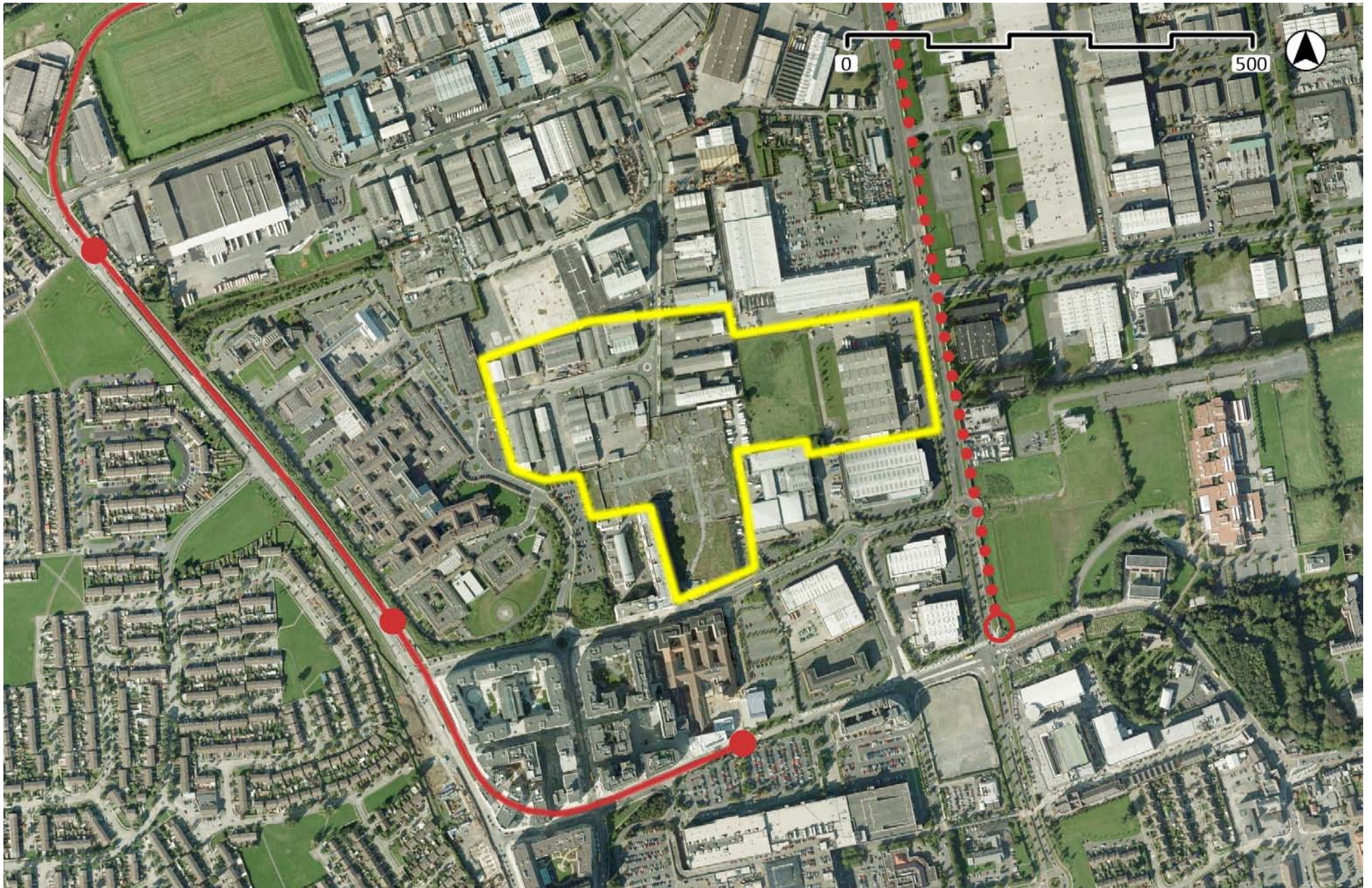


Stacking Diagram: Generic Design

o'connell mahon + **nbbj** architects

# Site A Adjoining Tallaght Hospital





Aerial View Site A

# Site B Newlands Cross

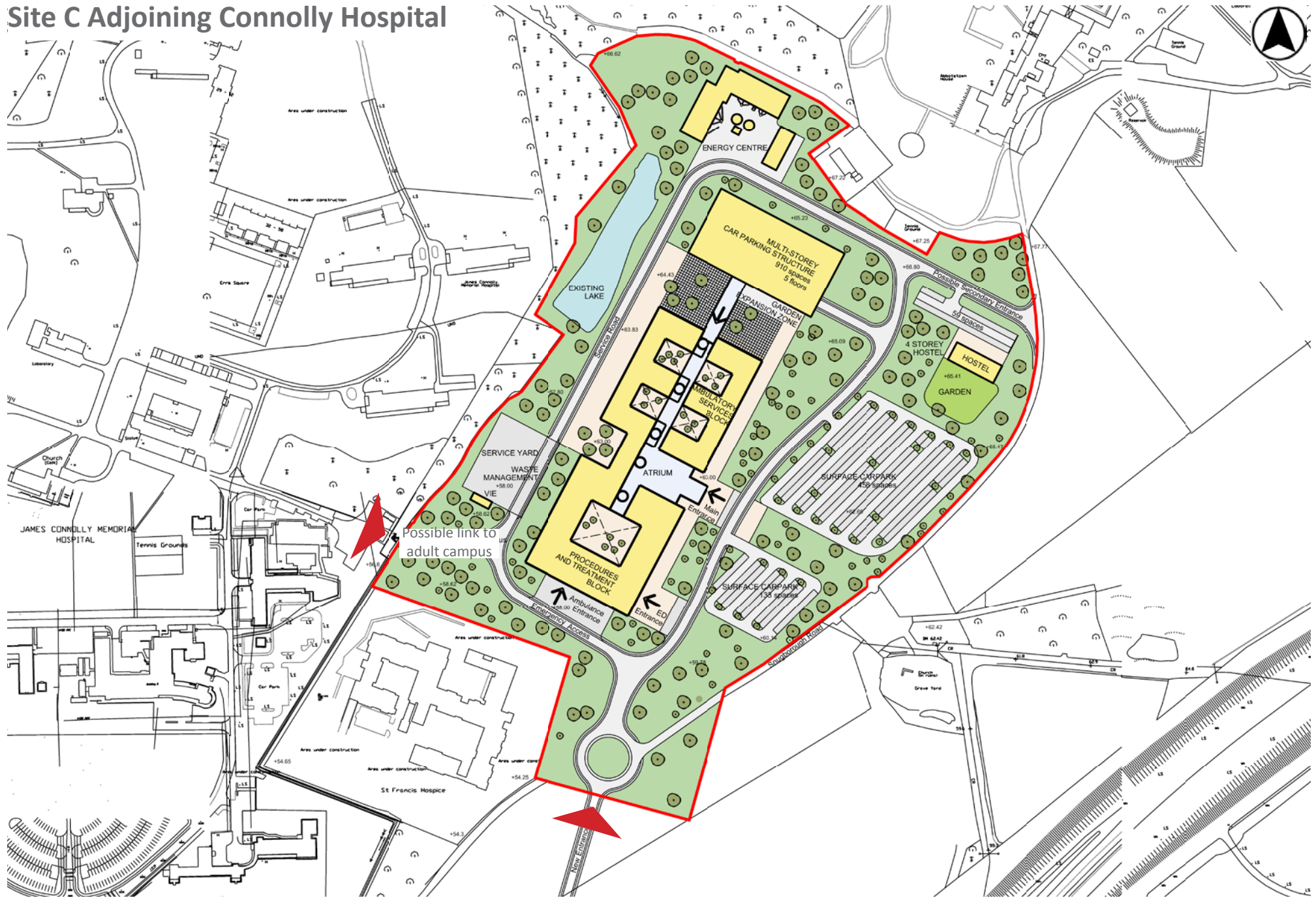


Development of the Newlands Cross site might require land acquisition for a new entrance



Aerial View Site B

# Site C Adjoining Connolly Hospital





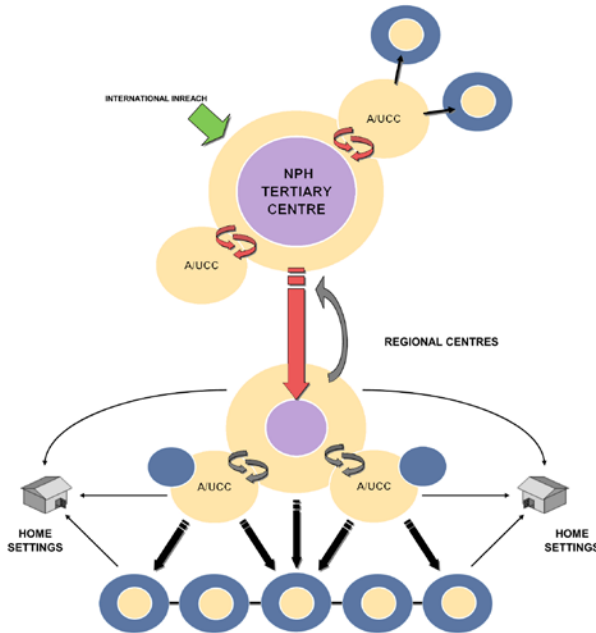


Aerial View Site C



## 5. THE AMBULATORY AND URGENT CARE CENTRE

This secondary development has attracted much comment and requires some discussion. The McKinsey Report recognised that the NPH will be a part of a national paediatric service, which will be organised on a hub and spoke model, best illustrated by the diagram opposite. This is a proven model for paediatric healthcare, the most celebrated example having been developed by the Children’s Hospital of Philadelphia – CHOP. It is important to emphasise that this model of paediatric care is not defined by location but by care pathway, in a network in which the centre provides support via outreach, telemedicine, joint appointments and staff rotation to achieve an integrated model.



The functional content and location of the proposed AUCC was developed in the subsequent report by RKW health planning consultants entitled: *National paediatric Hospital : Ambulatory and Urgent Care Centres for Greater Dublin October 2007*.

We understand that the AUCC which is currently proposed to be developed on the Tallaght site will be the local centre for the South Dublin conurbation and provide day case, ambulatory and urgent care services for this cohort of patients and their families. There may be a case for a further review of the detailed functional content of this facility and the split of services between the NPH and this centre but that is outside the remit of this financial review and will be considered in the accompanying Clinical review.

### Comparator site developments:

If the NPH is developed on Sites A or B, which are to the south west of the city the location of the AUCC will need to be moved to North Dublin to serve this large cohort of patients and families. The Eccles Street site has been identified as a possible location but this has not been discussed in any great detail and may prove impracticable, since the site will revert to the Sisters of Mercy if the NPH is not developed on this site.

If the NPH is developed on Site C beside the Connolly Hospital a new location for the AUCC will also have to be found, south of the river.

The area of the AUCC will differ in each of the comparator site solutions to reflect the size and profile of the patient population it will serve.

### PROGRAMME 1A: NATIONAL PAEDIATRIC HOSPITAL MATER CAMPUS

ID	Task Name	Duration	Start	Finish	2010			2011			2012			2013			2014			2015			2016			2017		
					Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1	<b>Current Status/Forecast</b>	<b>1669 days</b>	<b>Fri 28/05/10</b>	<b>Tue 28/02/17</b>																								
2	<b>Ministerial Review</b>	<b>0 days</b>	<b>Tue 02/08/11</b>	<b>Tue 02/08/11</b>																								
3	Ministerial Approval to Proceed with Planning & Design	0 days	Tue 02/08/11	Tue 02/08/11																								
4	<b>Planning</b>	<b>170 days</b>	<b>Tue 16/08/11</b>	<b>Tue 24/04/12</b>																								
5	Submit Main Hospital Planning Application	0 days	Tue 16/08/11	Tue 16/08/11																								
6	Public Observation period (Statutory Duration)	40 days	Wed 17/08/11	Tue 11/10/11																								
7	DCC Observation period (Statutory Duration)	50 days	Wed 17/08/11	Tue 25/10/11																								
8	ABP Responses to Third Party Submissions (Estimated Duration)	20 days	Wed 26/10/11	Wed 23/11/11																								
9	Commitment of Financing for Oral Hearing from NPHDB	0 days	Wed 31/08/11	Wed 31/08/11																								
10	Preparation for Oral Hearing	20 days	Wed 14/09/11	Tue 11/10/11																								
11	ABP Oral Hearing (Estimated Duration)	20 days	Thu 24/11/11	Wed 21/12/11																								
12	ABP Review period (Estimated Duration)	90 days	Wed 12/10/11	Thu 23/02/12																								
13	<b>Conditional Grant of Planning</b>	<b>0 days</b>	<b>Thu 23/02/12</b>	<b>Thu 23/02/12</b>																								
14	Application for Leave (Judicial Review)	40 days	Fri 24/02/12	Tue 24/04/12																								
15	<b>Issue Final Grant of Planning</b>	<b>0 days</b>	<b>Tue 24/04/12</b>	<b>Tue 24/04/12</b>																								
16	<b>Design Process</b>	<b>409 days</b>	<b>Fri 28/05/10</b>	<b>Thu 26/01/12</b>																								
17	Concept Design Approved	0 days	Fri 28/05/10	Fri 28/05/10																								
18	Preliminary Design Approved	0 days	Wed 08/12/10	Wed 08/12/10																								
19	Preliminary Design 2B Addendum	60 days	Mon 16/05/11	Thu 11/08/11																								
20	Exemplar Design	110 days	Wed 17/08/11	Thu 26/01/12																								
21	<b>Main Contractor Procurement</b>	<b>268 days</b>	<b>Thu 18/08/11</b>	<b>Fri 14/09/12</b>																								
22	Issue Pre-Qualification Questionnaire (SAQ)	0 days	Thu 18/08/11	Thu 18/08/11																								
23	Pre-Qualification Period & Evaluation	95 days	Fri 19/08/11	Mon 09/01/12																								
24	Approval to proceed to Tender	0 days	Mon 09/01/12	Mon 09/01/12																								
25	Issue Main D & B Tenders	0 days	Thu 09/02/12	Thu 09/02/12																								
26	Tender Period & Evaluation	140 days	Fri 10/02/12	Fri 31/08/12																								
27	Cooling Off Period	10 days	Mon 03/09/12	Fri 14/09/12																								
28	Contractor Appointed	0 days	Fri 14/09/12	Fri 14/09/12																								
29	<b>Construction</b>	<b>1050 days</b>	<b>Mon 17/09/12</b>	<b>Mon 12/12/16</b>																								
30	D&B Design	240 days	Mon 17/09/12	Wed 04/09/13																								
31	Construction Period	1030 days	Mon 15/10/12	Mon 12/12/16																								
32	<b>Facility Commissioning</b>	<b>180 days</b>	<b>Fri 10/06/16</b>	<b>Tue 28/02/17</b>																								
33	Commissioning Period	180 days	Fri 10/06/16	Tue 28/02/17																								
34	Main Hospital - Live	0 days	Mon 12/12/16	Mon 12/12/16																								

◆ Completed     
 ◆ Forecast Milestone     
  Forecast

## 6. PROGRAMME CONSIDERATIONS

### 6.01 CURRENT PROJECT PROGRAMME

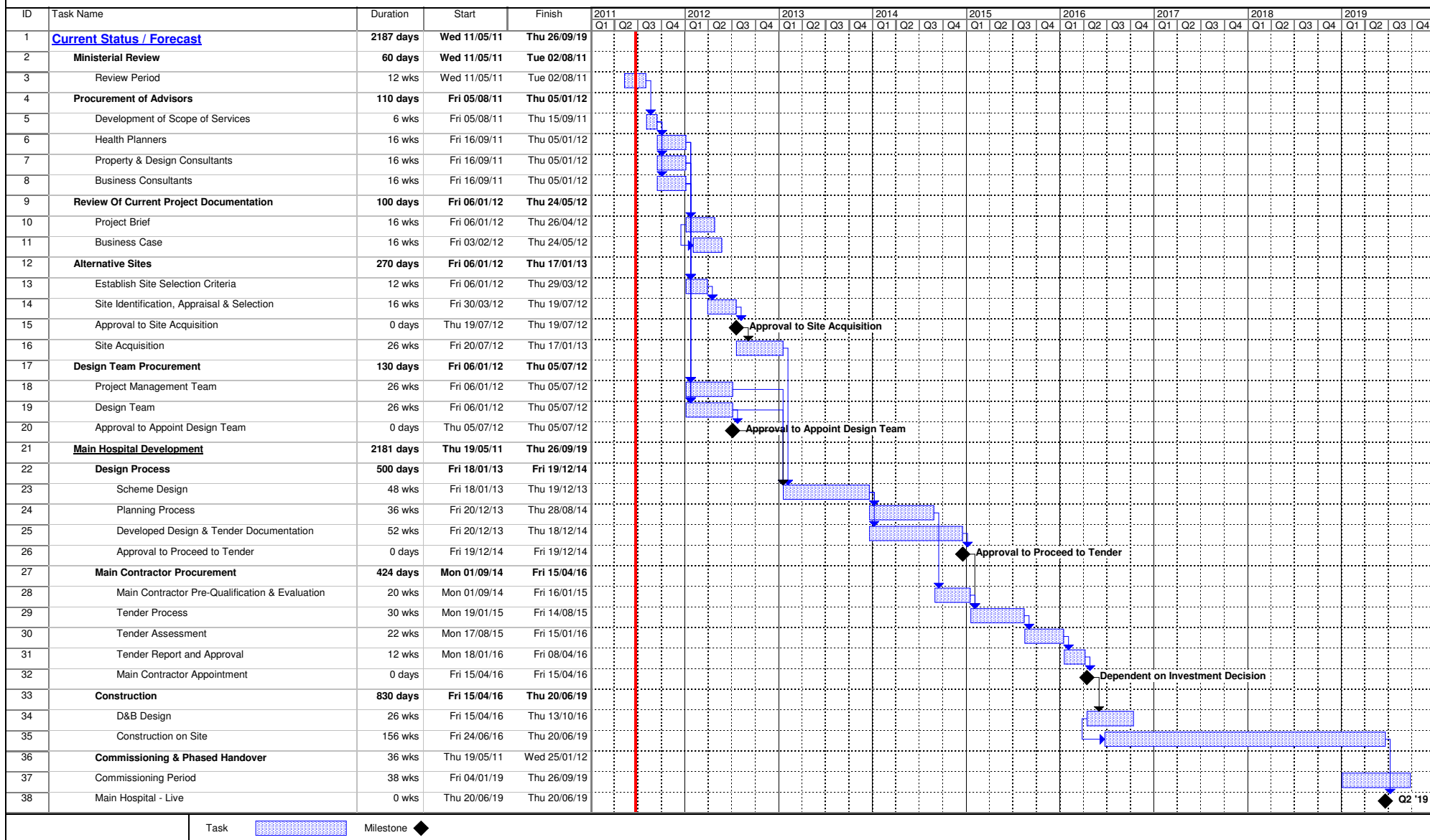
The current programme for the design and construction of the NPH (Programme 1A), on the opposite page, outlines the key dates:

August	2011	Submit a planning application
August	2011	Commence detailed design
January	2012	Complete detailed design
February	2012	Issue Design and construct tenders
October	2012	Commence construction
December	2016	Operational readiness

If a decision is made to halt the current project and re-open the process of site selection there will be a very significant delay to the project. A draft programme on the following page identifies the components of this prolongation.

Date: Tue 21/06/11

### PROGRAMME 2A: NATIONAL PAEDIATRIC HOSPITAL ALTERNATIVE SITE SCENARIO



## 6.02 COMPARATOR PROJECT PROGRAMME

The programme opposite shows that the project completion date would extend from December 2016 to June 2019, which would have profound implications on the success of this project and its costs.

1. At the moment the project is expected to go out to tender in February 2012. These are unusual times in the Irish construction industry. There are the obvious risks of sub-contractor insolvency, which have been recognised in the cost report in Section 7 Item 14 (other cost) but the scheme should benefit from this unusually propitious tender climate if the current tender date is held.

In the revised programme the project would not go the market until first quarter 2015 when the market may well be less advantageous. This loss of opportunity cannot be quantified and so the cost summary in Section 7 has applied the same construction rates to the comparator sites as the Eccles Street scheme. However, the costs of an additional two and a half years' inflation have been applied to the comparator sites, using the ECB target rate of 2%, which in the current climate is quite conservative.

2. We have been advised that the contracts for the existing consultant teams would have to be re-tendered, since the change in the scope of service will exceed the allowed variation to the terms of their appointment. The scope of service would require re-definition and the procurement of new teams would have to be advertised in the OJEU. It is uncertain that the same teams would be appointed and there is the chance of significant knowledge loss to the project. There may, however, be savings to be made if the contracts are re-tendered.

3. The decision to abandon the current scheme would result in substantial abortive costs which would almost certainly become public knowledge and attract unfavourable comment.

When these sensitivities are discussed within the wider context of Dublin's troubled property market and the state of the national economy, it is not unreasonable to suppose that the selection of a new site would become a very public and probably protracted affair; the course of which could delay the project beyond the dates shown opposite.

4. Many members of the client team have been working on this project for five years. The current design is site specific and is highly unlikely to be replicable in its plan form or massing. Its clinical planning is the product of a process of consultation and collaboration between the clinical communities, other stakeholders and the design team. This part of the process has already taken over a year and the clinicians and support staff would have to repeat this process again on a new design with a new design team. This does not engender confidence in the process or the outcome, nor does it represent an efficient use of the clinicians' valuable time.

5. The quantifiable costs of prolongation have been identified in the cost comparison. However there are unquantifiable and more damaging costs – a loss of momentum and purpose, a loss of public confidence in the management and direction of the project and a loss of belief within the clinical community that the project would ever be realised.

Table 7.1: Summary Table

		Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
1.0 Area	Nett Departmental Area	0	512	292	212
	Gross Departmental Area	0	677	385	280
	Gross Internal Floor Area	0	-3,277	-3,568	-3,708
	Ambulatory and Urgent Care Centre (GIA)	0	1,111	1,111	1,287
		Eccles Street (€)	Site A (€)	Site B (€)	Site C (€)
2.0 Base Construction Costs		0	-4.6m	-5.3m	-5.1m
3.0 Building Form Abnormals		0	-22.2m	-22.2m	-25.7m
4.0 Car Parking			-17.5m	-23.9m	-26.5m
5.0 External Works					
6.0 Abnormal Services Diversions / Demolitions					
7.0 Total External Works Summary (5 + 6)		0	4.8m	-0.6m	-1.9m
8.0 Hostel Accommodation		0	1.9m	1.9m	1.9m
<b>9.0 Total Construction Summary Position ( 2- 8)</b>		<b>0</b>	<b>-37.6m</b>	<b>-50.0m</b>	<b>-57.3m</b>
10.0 Summary Position – as above					
11.0 Carry over figure – as above					
12.0 Equipment		0	1.7m	1.7m	1.7m
13.0 Design Team Fees		0	-1.0m	-1.3m	-1.7m
14.0 Other Costs		0	-10.1m	-10.1m	-10.1m
15.0 Risk Provision		0	-2.6m	-3.4m	-5.9m
16.0 Value Added Tax		0	-6.4m	-8.3m	-9.7m
17.0 Inflation		0	-1.9m	-2.7m	-3.1m
<b>18.0 Summary Position at this point ( 2 - 18)</b>		<b>0</b>	<b>-57.9m</b>	<b>-74.1m</b>	<b>-86.1m</b>
19.0 Additional Inflation Due to 2.5 year delay		0	27.8m	27.1m	26.6m
<b>20.0 Summary Position at this point ( 2 - 19)</b>		<b>0</b>	<b>-30.1m</b>	<b>-47.0m</b>	<b>-59.5m</b>
21.0 Deductions/cost neutral / 22.0 / 23.0					
<b>Summary</b>		<b>0</b>	<b>-30.1m</b>	<b>-47.0m</b>	<b>-59.5m</b>
24.0 Additional Road Upgrades Outside the Site Boundaries		0	4.0m	18.9m	7.0m
25.0 ESB Contributions		0	0	0.5m	0.8m
<b>26.0 Total Project Costs – Summary Position Excluding Land Costs</b>		<b>0</b>	<b>-26.1m</b>	<b>-27.6m</b>	<b>-51.7m</b>
27.0 Total development cost variance ( 2 - 25) as above					
28.0 Non-recoverable costs		0	24.0	24.0	24.0
29.0 Land costs		-	-	-	-
30.0 Lost opportunity costs		-	-	-	-
31.0 ITT costs		-	-	-	-



## 7. COST APPRAISAL

### Introduction

The Panel, as part of this study, has undertaken a review of the €650 million budget for the current project on the Mater campus, in accordance with the project brief. In the time available this has been, of necessity, a high level overview. The Panel has been reliant on the cost information provided by the consultant teams for the current project, which has been prepared in considerable detail with supporting documentation.

Having reviewed this information the Review Panel are of the opinion that prudent and reasonable budgetary allowances have been made for the development of the NPH on the Mater campus and that the project can be delivered within the €650 million budget.

It is important to note, however, that the current cost plan is based on the project being tendered in line with the current programme. If there is a significant delay there will be a negative cost impact and the advantages offered by the current tender climate will be lost. It is also important to confirm that the provision of ICT is not included within this budget.

The Review Panel has worked closely with Davis Langdon and The Project Management Group to ensure that the information which has been prepared is in a format which allows a comprehensive comparison to be made between the development costs of the Eccles Street site and the three comparator sites. The Panel has interrogated this information and received an appropriate level of back up information and substantiation for the figures which have been used.

The final summary document produced by Davis Langdon, has produced the content and organisation of the information, layout and information content, as requested by the Review Panel. Each of the line items

in this report is now supported by comprehensive and explanatory notes.

This section is an executive summary of the Davis Langdon report, prepared by Bruce Shaw, to set out the comparative development costs across the Eccles Street site and the comparator sites. The Davis Langdon report is not reproduced in full, because it contains commercially sensitive material for a project which may be going to tender in the near future. We are happy to provide the Minister with a full copy of the report.

The reference system in this executive cost summary is the same as the line items in the Davis Langdon report.

The way in which the cost information is presented in this section is as a commentary with comparative tables of costs for each element in the cost plan for the three comparator sites and the Eccles Street scheme. Each line item has the costs for the three comparator schemes expressed as a comparative figure, with a higher (+) or a lower (-) € cost for this element than the Eccles Street scheme (0).

## AREA AND COST COMPARISON

### 1.0 Area

Notes 1.1 to 1.9 in the DL document summarise the approach to the analysis of areas for the Eccles Street site and the three comparator sites.

### AREA EXPLANATION

The National Paediatric Hospital will be a very large and complex building with an area of approximately 1.245million square feet and many thousand rooms. The way in which the gross floor area of a hospital is calculated needs explanation, for it is often misunderstood.

The **nett departmental area** is the sum total of the internal floor area of every room in the hospital, expressed in departmental totals

The **gross departmental area** is calculated by adding a percentage to the nett departmental area to allow for:

1. circulation – the corridors and lobbies which are needed to connect all the rooms in a department together
2. the partitions and internal structures which enclose the rooms
3. small areas that are not scheduled but accommodate plant such as electrical switchgear

The **'Communications'** allowance (16 – 19%) is a percentage addition to allow for the connecting horizontal and vertical spaces which are required to connect the departments together – hospital streets and main corridors, lift shafts and stair enclosures.

The **'Plant'** allowance (12 – 14%) is a percentage addition to allow for all the major plant areas which are within the building's envelope, the server and hub rooms and main vertical ducts and risers. An energy centre is always identified separately in the schedule of accommodation and is not included in the Plant allowance.

All these percentage figures are target figures which are replaced by measured totals, once the scheme design is developed.

The **Gross Internal Floor Area** for the building is the sum of the **Gross Departmental Area** and the **Communication and Plant** areas and this is the figure which is used for all budgetary and reporting purposes.

The **Nett Departmental Area** is usually around 56-60% of the total floor area of the hospital.

### AREA COMPARISON

The area of the current design on the Eccles Street site has been very thoroughly measured as part of the detailed cost planning exercise which has been recently completed. **All the allowances for the Eccles Street scheme are measured areas not percentage allowances.**

The **nett departmental areas** for the three comparator sites are slightly higher than the Eccles Street scheme because they cannot share as many support services with an adjoining hospital.

Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
0	+512	+292	+212

The **gross departmental areas** for the three comparator sites are higher, since the measured circulation percentage of 32% which has been achieved on the Eccles Street scheme (which is a very efficient ratio) has been used on the three comparator sites.

Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
0	+677	+385	+280

The **'Communication and Plant'** measured area on the Eccles Street scheme (35%) is relatively high, due in the main to the height of the building and the large number of lifts in the current design. A lower allowance of 32% has been applied to the three comparator sites. There is also a link structure of 1600m<sup>2</sup> at the Eccles Street which is site specific.

When all of these are taken into account The **Gross Internal Floor Areas** for the comparator schemes are lower than Eccles Street, due to the lower **Communications** areas and the absence of a link structure.

Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
0	-3,277	-3,568	-3,708

**Ambulatory and Urgent Care Centre:** The gross internal floor areas for the AUCC on the comparator proposals are all higher than the Eccles Street scheme because they will not be located at Tallaght (refer to Section 5) and will serve larger patient populations than the current location. The areas noted here for the AUCC are additional to the table above.

Eccles Street site	Site A (m <sup>2</sup> )	Site B (m <sup>2</sup> )	Site C (m <sup>2</sup> )
0	+1,111	+1,111	+1,287

## 2.0 Base Construction Costs

The approach to this section is to identify the base building costs. To facilitate comparison a single rate for sub-structures has been applied to all four schemes. The abnormal **sub-structure** costs for the Eccles Street site, which are the product of the height of the building and the four storey basement car park, have been identified in Section 4 – Basement car parking in which these costs for the four sites are tabulated for comparison. The table below represents the base construction costs for the NPH and the AUCC on the four sites.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-4.6m	-5.25m	-5.14m

## 3.0 Building Form Abnormals

The approach to this section is to identify the abnormal building costs associated with each of the sites. Notes 3.1 to 3.8 of the DL document contain a comprehensive summary of the assumptions made with regard to the identification and costing of abnormal construction costs. The variation in construction costs between the Eccles Street scheme and the comparator schemes is explained principally by the height and prominence of the reference scheme and the impact that this has on the costs of certain elements such as the frame, external envelope, fire engineering measures, lift numbers/speeds, etc. An allowance has been made for roof gardens on all sites, since the inpatient floors on the comparator sites will require external spaces, and these are not on the ground floors. The allowance for roof gardens on the comparator sites is 33% lower. There is also a premium to be paid on the Eccles Street site for its city centre location with regard to preliminaries, material handling, infection/dust control, noise abatement measures and other such considerations.

The difference between the comparator sites themselves is marginal, reflecting the fact that building heights, engineering approaches etc are similar for all three sites under consideration.

The table below sets out the comparative difference across the various sites.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-22.2m	-22.2m	-25.7m

## 4.0 Basement / Car Parking

This section looks at the different car parking solutions/costs which would apply to the Eccles Street site and the comparator sites. Given the issues such as site restrictions, land available, site location, accessibility to public transport, etc., which apply to each of the sites under consideration, the car parking solution and the car parking numbers required for each vary, as set out in Section 3.

The parking solution for the Eccles Street site is a four storey deep basement under the footprint of the proposed hospital, which is an inherently expensive solution. A combination of single storey basement, multi-storey parking structures and surface parking has been utilised for the comparator sites. The costs for the Eccles Street site also reflect the cost of providing a “Metro Box” – the construction of a structure that provides a shell under the Children’s Hospital for a future Metro Station.

The cost differences between the comparator sites vary, reflecting the different site specific parking strategies which have been adopted. The table below sets out the comparative difference across the sites with regard to the cost of providing car parking.

Type of Parking	Ref. Site	Site A (€)	Site B (€)	Site C (€)
	0	-17.5m	-23.9m	-26.5m
% Mix per Site				
Surface	0	24%	40%	42%
Multi-storey	0	33%	44%	58%
Single Storey Basement	0	43%	16%	0
Deep Basement	100%	0	0	0

## 5.0 External Works

### 6.0 Abnormal Services Diversions / Demolitions

### 7.0 Total External Works Summary

Each of the sites has been separately considered by the current design team and there are site plans for each of the comparator sites (Section 4), which have been used to facilitate a detailed costing exercise, undertaken by Davis Langdon.

The sums for external works take into account the roadworks within the site, landscaping and other external works. These vary because of the different site configurations and conditions. Whilst the Eccles Street site is in a city centre location with a requirement for greater demolitions/diversions, this is offset by its reduced requirement for extensive external works, given its compact site area.

There are differing levels of demolition on each of the four sites. Site A which is a brownfield site will require a significant amount of site clearance, whilst sites B and C are on greenfield locations. On Site A allowances have also been made for the remediation of contaminated land and the removal of soil.

The table below sets out the comparative differences across the sites:

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>+4.8m</b>	<b>-0.6m</b>	<b>-1.9m</b>

### 8.0 Hostel Accommodation

There is a building on Eccles Street which is suitable for new hostel accommodation. It is proposed that the fitting out of this building will be funded by a third party and is therefore outside the development budget.

It has been assumed that the schemes on the comparator sites will be required to provide an equivalent area of hostel accommodation. An allowance has been made for the construction of a hostel on each of the comparator sites. Only the construction of the shell has been costed as it has been assumed that it will be fitted out by others as per the Eccles Street Campus.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>+1.9m</b>	<b>+1.9m</b>	<b>+1.9m</b>

### 9.0 / 10.0 / 11.0

#### SUMMARY TOTAL AT THIS POINT

Items 1-8 above represent the construction costs of the four sites under comparison. The cost variance is set out in the summary table.

#### SUMMARY TABLE

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>-37.6m</b>	<b>-50.0m</b>	<b>-57.3m</b>

### 12.0 Equipment

The equipping costs include the supply of Groups 2, 3 and 4 equipment and the fitting of Groups 3 and 4. The same specification has been applied to all four sites. The cost difference is explained by the Eccles Street scheme having the benefit of the use of a PET/CT scanner which is located on campus in the adjacent adult hospital.

The provision of a PET/CT Scanner has been included in the equipping costs for the three comparator sites.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>+1.7m</b>	<b>+1.7m</b>	<b>+1.7m</b>

### 13.0 Design Team Fees

This heading includes the fees for the design team.

The consultant and client advisory fees are based on a percentage of the gross construction costs, hence the difference between the four site options. The fees set out in this column represent the total fee for the design of the NPH from project commencement to completion, thus enabling comparisons to be made. The design of the reference scheme is site specific and only a small proportion of the design work which has been carried out to date will be capable of re-use. If one of the three comparator sites is selected and design work has to start again significant abortive costs will be incurred. These have not been factored into this cost comparison, since they are unrecoverable. They are, however, identified below the line as a component in Item 28.0 - Non-recoverable costs.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>-1.0m</b>	<b>-1.3m</b>	<b>-1.7m</b>

### 14.0 Other Costs

Other costs include those relating to site investigations, utility companies connection charges, development contributions payable to local authorities and local infrastructure upgrades outside site boundaries which may be carried out by others. Also included in this category are the costs of the Client Organisation, Business Services and Project Management Teams which have been calculated similarly to those in Section 13. Contributions to adjoining hospitals for shared infrastructure works and any hospital commissioning costs of equipment not covered by the construction contract are also captured here.

Amounts included for development contributions reflect the exemptions agreed with Dublin City Council at Eccles Street for such contributions. It is assumed that the same exemptions will be secured on the comparator sites. The majority of the cost difference in this section is explained by the upgrading works to Eccles Street, adjacent to the Mater site and the work associated with structures/properties/services adjacent to the Mater Site

Note that if the project on Eccles Street is abandoned, much of the consulting works carried out to date will not be capable of being reused. These costs are not included for in this section of the report.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
<b>0</b>	<b>-10.1m</b>	<b>-10.1m</b>	<b>-10.1m</b>

### 15.0 Risk Provision

The risk provisions included within the costings has been calculated following a number of risk workshops involving the project team for the Eccles Street site. A standard risk costing methodology has been used; risks

have been identified, mitigations allocated and residual risks assigned probabilities and impacts. Risk costs have been subject to Monte Carlo simulation for the calculation of contingency allowances.

The comparator sites relative to this model have been reviewed at a high level and it has been identified that many of the risks are industry type risks common to all sites; such risks include items such as contractor insolvency, planning conditions, etc. However there are some site specific risks which will be unique to the Eccles Street Campus, given its city centre location, and this is reflected in the table below.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-2.6m	-3.4m	-5.9m

#### 16.0 Value Added Tax

VAT calculations reflect the approach used for the reference site and similarly provide for abatements on philanthropically funded equipment.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-6.4m	-8.3m	-9.7m

#### 17.0 Inflation

The Eccles Street budget includes an inflation allowance from the base date of the original cost plan for the proposed new building undertaken in Q4 2010 up to scheduled completion in Q4 2016. It also includes an allowance for the impact of inflation on medical equipment over this period.

Inflation for the comparator sites has been calculated on the same programme and will be less, reflecting their lower construction costs. The inflation costs of programme prolongation are identified in Section 19.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-1.9m	-2.7m	-3.1m

#### 18.0 SUMMARY TOTAL AT THIS POINT

The total development costs (items 1.0 to 17.0) for the four schemes are compared in the summary table below.

##### SUMMARY TABLE

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-57.9m	-74.1m	-86.1m

#### 19.0 Additional Inflation Due to 2.5 year delay

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	+27.8m	+27.1m	+26.6m

If the project is developed on one of the comparator sites it is forecast that there will be a delay of 2.5 years, which will result in substantive additional costs, due to price inflation. The allowance for this must be considered as indicative - the rate has been set at the ECB target inflation rate of 2% per annum, which may well be an underestimate in the current circumstances.

#### 20.0 Sub Total At this Point

Set out in the table below is the sub total at this point in the exercise for all of the foregoing items (1.0 to 19.0)

##### Variance across all the sites – summary position

##### SUMMARY TABLE

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-30.1m	-47.0m	-59.5m

#### 21.0 Deductions

A value engineering exercise is currently being undertaken by the project team on the Eccles Street scheme to achieve savings, (€15 million) to align the project with the budget. For the purposes of comparison this figure has been applied to the three comparator sites.

#### 22.0 Total / 23.0 Total variance as above

#### 24.0 Additional Road Upgrades Outside of Site Boundary

This is the cost of providing primary access into the various sites and making amendments to the existing road networks around the three comparator sites, such as bridges and traffic junctions. These are based on the detailed analysis within the OCSC report, which is appended.

These costs may either arise in the form of capital contributions or they may be conditions imposed by the local authorities,

In the case of Site B significant capital upgrades are required. It has been assumed that these costs will be shared by adjoining sites and that the NPH scheme will only carry a proportion of these. This is considered to be a best case option and it is possible that the local authority may impose the full costs on the NPH development. It must be noted that whatever the proportion of these costs which is contributed by the local authority, this will still be a cost to the Exchequer.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	+4.0m	+18.9m	+7.0m

## 25.0 ESB Contributions

This is the cost for ESB to provide suitable power connections to the comparator sites. These costs have been advised by the WYG report, which is appended. The costs below are additional (extra over) to the capital contribution required on the Eccles Street Campus.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	0	+0.5m	+0.8m

## 26.0 TOTAL PROJECT COSTS / 27.0 SUMMARY POSITION

The figure below represents the difference in the total development costs of the Eccles Street scheme and the three comparator sites, without factoring in the non-recoverable and land costs.

Eccles Street site	Site A (€)	Site B (€)	Site C (€)
0	-26.1m	-27.6m	-51.7m

## 27.0 Non-recoverable costs

If the current scheme is abandoned and an alternative site is selected and design work recommences, the project will incur significant abortive costs, which the PM team has calculated as being approximately **€24 million**. The greater part of the work which the Client Organisation, and the Business Services, Project Management and Design Teams have undertaken will not be transferable and will have to be redone.

However, for the purposes of comparison the same whole project costs for the client and consultant teams have been included in Sections 13 and 14 for all four schemes from project inception to completion. The non-recoverable costs cannot be included in this cost comparison, since this would constitute double counting

and unfairly prejudice the comparison of the comparator sites with the Eccles Street in the latter's favour.

Nonetheless the total budget for this project is €650 million. If an alternative site is chosen and this budgetary envelope is to be maintained, the budget for the comparator site will have to be reduced to €626 million or, alternatively, these abortive costs will have to be written off. In the current financial climate the latter course of action appears unlikely.

## 28.0 Land Costs

The greater part of Site A is in private ownership and the whole of Site B is privately owned. The acquisition costs of these sites and any land required for access from the adjoining highways have to be factored into the cost comparison.

The current property market in Dublin makes it very difficult to determine land values. Nonetheless an independent surveyor was appointed and has prepared valuations for all four sites, although these are not included in this report. They represent commercially sensitive information which we do not need to publish because the cost comparison demonstrates that the development costs for the four sites are all broadly comparable prior to their consideration. Suffice it to say that Site A is considered to be significantly more valuable than Site B.

## 29.0 Lost Opportunity Costs

The Eccles Street site has been valued, somewhat conservatively, at €15 million. If the NPH is developed elsewhere, this site will revert back to the Sisters of Mercy and could be potentially lost for public use. We have been informed that the CUH has indicated that the Temple Street site would be made available to the NPHDB, if the development on the Mater campus goes

ahead. If the NPH is developed in an alternative location this opportunity will also disappear.

## 31.0 ICT Costs

The ICT costs for the new NPH are not included within the €650 million project budget, which is a project risk that affects all the sites under comparison. We can only report what we have been told.

*Historically, healthcare capital projects funded through the Health Service Executive (HSE) do not account for ICT costs in the project's capital costs which are allocated through the HSE Capital Development Plan. ICT costs (ICT infrastructure outside the infrastructure included in the build, ICT systems and their ICT project implementation costs) are accounted for in the HSE ICT budget.*

*The NPHDB has made a high level cost estimate for ICT of the cost of procuring and implementing the required ICT systems of circa €60M. This estimate assumes the HSE will provide national ICT systems for the children's hospital and the AUCC, including access to the national data warehouse and health information exchange capability.*

*This €60M estimate covers core network and infrastructure costs for the hospital, ICT systems required to manage clinical information to support the Hospital and AUCC Model of Care, as well as operational and business systems (Enterprise Resource Planning) for the management of the hospital and AUCC. It includes systems, such as an integrated Electronic Patient Record to support the requirement for real-time access to clinical information in different locations (hospital and AUCC) to support the two site model of care delivery of paediatric services and to ensure ICT capability that meets the HSE strategy to drive a programmatic national approach to paediatric healthcare services.*

## 8. REVENUE SAVINGS

This section sets out the estimated operational cost savings that might be achieved on the current and the three comparator sites.

### Summary

**Consolidation:** the operational savings which can be achieved by the consolidation of the three existing children’s facilities into the National Paediatric Hospital have been verified as €23 million per annum. These annual revenue savings will apply to all four sites.

**Prolongation:** If there is a 2.5 year prolongation to the programme for the development of an alternative site, the opportunity for €57.5 million of potential revenue savings (2.5 years x € 23 million) will be lost.

It is highly likely that budgetary restrictions over the next five years will encourage the current children’s hospitals to make very substantive savings prior to the completion of the NPH.

Therefore in the Executive Summary we have discounted these annual revenue savings of €23 million by 55% to €10.35 million, which, despite this discount, presents a total lost opportunity cost of circa €25.9 million for each of the three comparator schemes for the 2.5 year prolongation. The figure of €23 million, which is fully substantiated, is reproduced, however, in Table 8.2.

The operational savings achieved by co and tri-location have been identified separately for the adult, maternity and children’s hospitals in Table 8.2.

**Co-location:** the Review Panel has calculated that there are significant savings in the operational costs of the adult and maternity hospitals to be achieved by co-location, which will benefit the schemes at the Eccles Street site and Sites A and C - see Table 8.2.

**Tri-location:** the review panel has calculated that there are significant savings in the operational costs of the NPH to be achieved by tri-location, which benefit the schemes at the Eccles Street site and Site A - see Table 8.2.

**Location:** There are also estimated operational cost advantages, with regard to patient transport and staff in education, which derive from the city centre location of the Eccles Street site – see Table 8.2.

### Scope and Approach of Exercise

The opportunities which the four sites provide for consolidation, co-location and tri-location are set out below.

**Table 8.1: Hospital Configurations**

	Ref. Site Eccles Street	Site A Tallaght	Site B Newlands Cross	Site C Connolly
NCH	Yes	Yes	Yes	Yes
Mater Adult Hospital	Yes			
Rotunda Maternity Hospital	Yes			
Tallaght Adult Hospital		Yes		
Coombe Maternity Hospital		Yes		
James Connolly Adult Hospital				Yes

## Results and Findings

**Table 8.2:**

### Existing Hospital Budgets and Estimate of Savings

Based on these configurations the following information was sourced to identify the specific operational cost savings which can be derived from consolidation, co-location and tri-location:

1. Clinical and non clinical support services which might be shared with adult and/or maternity hospitals – prepared by the NPHDB project team.
2. Financial information for each of the hospitals identified above.
3. Staffing analysis for each of the hospitals identified above.
4. The exercise identified specific operational functions which have the potential to deliver tangible financial savings for the hospitals other than the NPH.

In addition, this review sought and received financial information and other input from all the hospitals concerned, the Health Services Executive and the project team for the NPHDB.

	Note	Eccles Street	Site A	Site B	Site C
Hospital		Budget €M	Budget €M	Budget €M	Budget €M
NPH	1	252.2	252.2	252.2	252.2
Mater Adult Hospital	2	204.8			
Rotunda Maternity Hospital	2	44.4			
Tallaght Adult Hospital	2,3		175.6		
Coombe Maternity Hospital	2		46.4		
Connolly Hospital Blanchardstown	2				89.5
Total site budget		501.4	474.2	252.2	341.7
<b>Total estimated savings for consolidation of paediatric facilities</b>	<b>7</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>23</b>
Estimated operational savings for the adult and maternity hospital components derived from co or tri-location					
Eccles Street - Mater Adult (Co-location)		2.778			
Eccles Street - Rotunda (Tri-location)		1.087			
Tallaght - Adult (Co-location)			2.718		
Tallaght - Rotunda (Tri-location)			1.050		
Newlands Cross - (no tri/co-location benefits)				0.348	
Connolly - (Co-location)					1.282
Totals (rounded)		3.9	3.8	0.35	1.3
Estimated operational savings for the NPH component derived from co and tri-location - per Project Team for NPHDB	4,10	2.00	1.89	Nil	1.36
Estimated patient transport imputed cost	5		-0.2	-0.2	-0.2
Estimated staff education/training imputed cost	6		-0.1	-0.1	-0.1
<b>Total estimated site specific co-location/tri-location etc. operational savings (excl. consolidated paediatric savings)</b>		<b>5.9</b>	<b>5.39</b>	<b>0.05</b>	<b>2.36</b>
Percentage of total site budget		1.2%	1.1%	0%	0.6%
<b>Overall total consolidated paediatric and co-location / tri-location etc. site specific operational savings</b>		<b>28.9</b>	<b>28.39</b>	<b>23.05</b>	<b>25.36</b>
Percentage of total site budget	8	5.8%	6%	9.1%	7.4%
<b>Net present value of merger and co-location / tri-location etc. operational savings (16 years)</b>	<b>9,11</b>	<b>304.50</b>	<b>299.13</b>	<b>242.86</b>	<b>267.20</b>
Nominal value of merger and co-location / tri-location etc. operational savings	9,11	518.68	509.53	413.69	455.15



## Table 8.2 Notes:

1. Based on 2011 projected financial out-turn for OLHSC Crumlin, the CUH Temple Street Hospital and the paediatric unit at Tallaght Hospital
2. Based on the financial integrated management report provided by each hospital as at 30th April 2011.
3. It was noted that Tallaght Hospital had a materially greater proportion of support staffing compared to the Mater adult hospital.
4. The NPHDB project team estimate a saving of €2m for NPH tri-location and this figure has been accepted as a reasonable estimate. Note: this figure has been pro rated for the purpose of co-location on the Connolly site.
5. The NPHDB project team estimate that approximately ten neurosurgery patients per annum will be transferred between NPH and Beaumont and forty patients per annum requiring radiation therapy will be transferred between NPH and St. James's Hospital. Sites A, B, C are at least twice the distance from Beaumont / St. James's compared with Eccles Street site. Therefore this is a reasonable estimate of the imputed additional transport cost. In total it represents approximately 500 transport episodes (each way).
6. This represents an estimate of the additional cost of providing education/training capability for sites outside the city centre, since the Eccles Street site is connected locally to a wide range of teaching/research facilities.
7. Reference review and commentary on the business case prepared by the project team for the NPHDB.
8. It is reasonable to assume that the opportunity for generating a more material amount of operational cost savings can be achieved on a site which will hold a larger budget. For example, the Eccles Street site will have a tri-located budget of €501m compared with the Newlands Cross site which will have a budget of €252.2.
9. The NPV and nominal calculations represent a sixteen year period. This period was chosen to mirror the NPHDB project team business case and the direction of the Department of Finance for medium term public development projects. It is assumed that savings will decrease by 2% in year 2 (2012) because of budget reduction pressures and increase again by 2% per annum years 3 to 16. Note: a discount rate of 6.7% has been used in the NPV calculation.
10. Reference NPHDB Project Team business case.
11. Reference appendix one and appendix two attached operational cost savings and NPV calculation.

1 Tallaght Hospital has not provided the financial budget associated with the paediatric unit. As such the estimate calculated by the Project Team of the NPHDB has been accepted.

2 As per Department of Finance for medium to long term projects.

3 As per Department of Finance for medium to long term projects.

## CONCLUSION

### Financial Savings

Table 8.2 above outlines the operational financial saving estimates associated with the various site options. As outlined the Mater and Tallaght sites have the potential to produce the higher cost savings at €28.9m and €28.39m per annum respectively and consequently NPVs of circa €300m over a sixteen year period. The Newlands Cross and Connolly Hospital sites produce a somewhat reduced potential annual operational saving of €23.05m and €25.36m respectively, with NPVs in the region of €250m for a sixteen year operating period. Note: the density of operational budgets may have an impact in terms of delivering the percentage savings outlined for the Newlands Cross (9.1%) and the James Connolly (7.4%) sites.

The savings of €23m identified by the NPHDB project team represent 9.1% of the 2011 projected net expenditure outcome and the calculation was deemed to be a reasonable estimate of operational savings based on the consolidation of the existing paediatric facilities.

### Education / Training / Research Financial Considerations

An imputed cost of circa €100,000 per annum is included for some of the sites above on the basis that the Mater site has access to a large cohort of current education, training and research facilities and resources within close proximity to the campus. In addition, the site is less than 2km from St. James's Hospital and circa 3km from Beaumont Hospital, both of which have a density of education, training and research resources and facilities. The estimate of €100,000 per annum, which represents the costs of replicating these resources outside the city and lost opportunity costs for city centre research funding is considered to be a relatively conservative figure.

### Potential Delay Costs

If the project is delayed, the opportunity for making a large amount of the operational savings identified above cannot be realised.

If the opening of the NPH is delayed until 2019 – 8 years hence – we have sought to identify whether the facilities at OLHSC Crumlin and CUH Temple Street, some of which are in urgent need of repair and/or replacement, will require capital investment to meet health and safety, current standards, fire code certification etc. if the programme is extended.

At the time of writing, Our Lady's Hospital has identified the need to upgrade inpatient accommodation and Temple Street had identified a number of requirements for minor capital investment – monies which need not be expended if the Mater opens in 2016.

### Potential Pre Merger Paediatric Operational Cost Savings

All Irish hospitals face material budget reductions in 2011 and in future years and will be required to make substantive operational cost savings. Therefore the hospitals in Tables 8.1 and 8.2 are all likely to be taking active steps to reduce their respective operational costs prior to the completion of the NPH. We know that the current paediatric facilities are in the process of trying to achieve cost reductions across a range of operational services.

It is very likely that, in these circumstances, a sizeable proportion of the €23m of annual operational cost savings which consolidation will achieve will have to be delivered prior to the current 2016 opening date for the NPH. However, it is reasonable to assume that the vehicle which will deliver the major proportion of these savings will be the opening of the NPH.

Please note: the following caveats and assumptions are highlighted in the context of producing the estimates outlined above.

- *The estimates exclude the impact of pension related costs because these costs are more than offset by pension related employee salary deductions.*
- *The hospitals will be limited in the development of outsourcing arrangements due to the Croke Park agreement which will run until 2014.*
- *The hospitals will face underlying cost inflationary pressures in 2011 and beyond, specifically incremental pay increases and energy price increases.*
- *The hospitals currently have a material opportunity to improve on private patient income. This is likely to be addressed before the merger and may be impacted on Government plans for the implementation of universal health insurance.*
- *The HSE is currently targeting €200m of National procurement savings in the area of non-pay good and services by negotiating reduced prices with vendors. Consequently, the calculations above do not include estimates of non-pay savings.*
- *The costs of haemophilia products circa €4m (OLHC) and enzyme replacement therapy circa €6m (CUH) are likely to be extracted from these hospitals and held centrally by HSE or other entity. Therefore there may be the loss of potential cost reductions based on probable negotiated price reductions for these products.*

Taking into consideration these caveats and other assumptions, it is not unreasonable to conclude that the merger of the three older facilities and operations (currently three emergency departments etc.) into a newly built facility will produce the operational savings identified above. However, the precise mechanics of these savings will require specific planning and refining from now until the opening of the new facility. In particular, the assumptions that there will be zero or minimal savings in medical and nursing pay costs will require further investigation and scrutiny.



## 9. NATIONAL PAEDIATRIC HOSPITAL DEVELOPMENT BOARD

### CONSULTANT TEAMS

Much of the information under review has been prepared by the three teams of consultants which are currently engaged on this project.

#### Business Services Team

The Business Services Team was appointed to the develop the comprehensive project requirements for the Eccles Street site including Project execution Plan, Project Design brief, Business Case, Project Cost Plans, Project schedule, Shared services model, Models of Care, Equipment schedules and equipping strategies, funding and Risk analysis.

**Team leaders /Managers :** Project Management Group

**Solicitors :** Beauchamps Solicitors

**Health Design Specialists :** The Health Partnership

**Accountancy specialists:** BDO Partnership

#### Project Management Team

Project Management Group were appointed as Project Managers to the Eccles Street project

Their responsibility is to manage the timely delivery of both the Business Services and Design

Team elements of project delivery at the Mater campus.

**Project Managers :** Project Management Group

#### Integrated Design Team

The Integrated Design Team was appointed in 2009 and provides a comprehensive building design service under the leadership of O'Connell Mahon Architects from feasibility through to project completion. In Mid 2010 the team was augmented with the appointment

of specialist consultants in the fields of Fire Safety, Town Planning and Health and safety.

**Architects:** O Connell Mahon Architects with NBBJ Architects

**Quantity Surveyors:** Davis Langdon

**Consulting Engineers:** O Connor Sutton Cronin Consulting Engineers

**Services Engineers :** White Young Green

**Consultants novated to the IDT in Mid 2010 are as follows;**

**Fire Safety Consultants:** Maurice Johnson and Associates

**Town Planning Consultants :** RPS

**Health and Safety :** Willis