

Report and Analysis of the West Hertfordshire Hospitals NHS Trust 'The Future of Services in West Hertfordshire' Draft Strategic Outline Case

Prepared on behalf The New Hospital Campaign

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The principal focus of this Report and Analysis is the construction options, cost estimates and programmes contained within 'The Future of Hospital Services in West Hertfordshire' Draft Strategic Outline Case (SOC) V0-10 Final Version, July 2019 with reference to the Acute Transformation SOC dated February 2017.

This new SOC supersedes the original February 2017 version following the rejection by NHS Improvement of the proposals made within it. It is referred to as the 'New SOC' in this report and analysis.

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1. Introduction

This report and analysis has been prepared by Robert Scott FCIOB on behalf of the NHC and follows the analysis of The West Hertfordshire Hospitals Trust's Acute Transformation Strategic Outline Case V1-0 issued February 2017. This report has also been prepared following consultation with a leading healthcare facilities consultancy serving the National Health Service.

The principal focus of the analysis is upon those elements in the SOC that cover the construction options, cost estimates and programmes. The suitability and viability of the various redevelopment options covering the existing estates and the alternative (rejected) Greenfield New Build Options have been examined. The appropriateness of the Trust's common application of the same broad based M² rates for the estimates for all options has been considered. The implications of the degraded conditions of Trust's buildings and infrastructures on hospital functionality before and during redevelopment works have been studied. Alternative costs and provisions have been made within this document where the SOC cost estimates are considered incorrect or deficient. The analysis also assesses the risk profiles of each option.

Note: Where the 'New SOC' states 'Greenfield New Build Options' this has been referred to as 'Clear Site New Build Options' in this report as alternative sites to the Trust's existing sites do not necessary have to be Greenfield.

Robert Scott - Career Resumé and Relevant Experience

Trained as Contractor's Quantity Surveyor with Marshall Andrew in the 1960's and qualified through HNC and the Chartered Institute of Building examinations, later becoming a Fellow the institute (Retired Fellow from 2015)

Contract Surveyor covering numerous large building projects for Marshall Andrew and thereafter Wiltshier following marriage and location change, progressing to Regional Surveyor and Surveying Director of Wiltshier London.

Approached and appointed Managing Director of Tellings, part of Speyhawk PLC in 1984 and developed the business, later becoming director of other group companies covering development, building design and construction.

Approached by Higgs & Hill to be appointed as Managing Director of Higgs & Hill Southern together with the acquisition of Tellings in 1993. Later received the additional appointments of Commercial Director of Higgs & Hill UK and other group subsidiaries.

Member of team negotiating the arranged sale of Higgs & Hill Group to HBG of Holland in 1996 for the purpose of forming the core of their future UK business. Retained for 2 years to support the transition (HBG now renamed BAM, one of the UK's largest commercial contractors)

Approached and appointed to establish, develop and manage a new specialist construction business within the Durkan Group in 1998 which was successfully sold by the owners in 2007.

Carried out part time construction management consultancy trading as RS Consultancy from 2007 until full retirement in 2015.

Past member of the CIOB international Fellowship appointment panel for 19 years.

Specific Relevant Experience

Project Experience

NHS hospital contracts overseen have included major new build projects at Gravesend, Worthing and Chelsea and Westminster and departmental refurbishments at Roehampton, Croydon (Mayday), Royal Marsden (Sutton) and Hillingdon.

Functional Experience

Development and site feasibility and viability studies, tender analysis and adjudication, cost planning, client value engineering services, risk analysis and management, risk and opportunity training, executive dynamic project monitoring.

2. Key Points Summary

The following Schedule lists the key points covered in this analysis of the 'New SOC' in respect of its construction-related contents for the purposes of providing readers with a succinct appreciation of what are considered to be critical deficiencies and errors found within it.

The Trust's stated purpose of the 'New SOC' is to arrive at proposals with the objective of 'Providing healthcare from fit for purpose buildings' within a capital expenditure cap of £350 million (at current day prices).

As was the case for the original SOC, the 'New SOC' rejected Clear Site New Build options in favour of redeveloping the Trust's existing emergency hospital in Watford in conjunction with retaining St Albans Hospital for planned care on the grounds of affordability.

The 'New SOC' arrived at a short list of four options which were all based on redeveloping the Watford hospital estate but with one (Option 4) incorporating a new replacement planned care hospital on a new alternative clear site. Like the original SOC the 'New SOC' selected the Watford and St Albans redevelopment option (Option 1) for the purposes of seeking the regulator's approval. Under this option WHHT proposes to only retain a small part of the Hemel Hempstead estate for use as a supporting medical centre.

The proposals for Option 1 fail to:

1. Offer any plans or solutions for providing continuity of safe and effective healthcare services through the redevelopment process.
2. Properly define the scope of the proposed works and provide any basic diagram showing the new block positions on the existing Watford estate.
3. Provide credible cost information demonstrating that the proposals (as far as they have been defined) could be delivered within £350 million.
4. Take proper account of the latest Six Facet survey that identifies essential remedial and replacement works, estimated to cost in the order of £380 million, required within the same period as the proposed redevelopment programme.
5. Achieve functional suitability (Condition B or above) for more than 50% of the Watford estate and nearly the whole or the St Albans estate after completion of the proposed redevelopment works.
6. Identify further redevelopment works, proposals and basic cost estimates, that would be needed to be carried out after completion together with proposed timetables.

The evaluations and comparisons made between Option 1 and the Clear Site New Build Options are misleading and inadequate as a result of:

1. Insufficient research and/or the lack of information and consideration covering suitable sites.
2. No clear identification of the effective level of derogation that would have to be accepted for Option 1 and functional benefits and disadvantages between the redevelopment and Clear Site New Build options generally.
3. No estimates of the opposing running costs to take into account the savings that would be achieved as a result of operating from completely new efficient, virtually maintenance-free facilities, taking into account administration, facilities management and energy costs etc.
4. A lack of reasonable risk profiling.

The cost information, estimates and comparisons are erroneous, deficient and misleading as a result of:

1. The use of the same new build cost rates and similar allowances for risk (including Optimum Bias) irrespective of them being applied to non-standard construction in respect of complex phased overbuilding/redevelopment or standard construction on a clear site.
2. The omission of necessary works and underestimation of costs relevant to redevelopment.
3. Discrepancies within the 'New SOC' between the works described included in estimates of capital costs, and inappropriate treatment and allocation of contingent maintenance backlog liabilities. Supporting documents are referred to but not provided.
4. Potential receipts from the sale of land have been undervalued or not applied.
5. Inflation costs have been incorrectly applied and calculated.

This Report and Analysis includes recalculated option capital cost estimates, supported by costs recently achieved by other NHS trusts that demonstrate that the Clear Site New Build options would provide far better value for money, be more deliverable and provide far superior and efficient facilities than Option 1. Furthermore it also shows that the Clear Site New Build options would be the more affordable when properly accounting for the additional essential remedial and replacement works that would be required during and after the proposed works under Option 1 and from operational savings.

A more detailed presentation of the findings and a discussion of their implications can be found in Section 5 at the end of this Report.

3. Analytical Appraisal of WHHT's Proposals

Analysis of Construction Related Contents within the Trust's Draft Strategic Outline Case (New SOC) July 2019

The specific purpose of this report and analysis is to examine the correctness of the Trust's current conclusions to proceed with the 'redevelopment' of the existing hospital on the Watford site in conjunction with limited adaptation works at the St Albans and Hemel Hempstead sites (Option 1 of the 'New SOC') as opposed to the construction of a new hospital on a clear site. This section considers the broad validity of the Trust's case for selecting Option 1. The capital cost estimates contained within the financial content of the 'New SOC' is analysed separately under section 4 of this report and analysis.

Ref	New SOC ref/ Location	Construction and Consequential Implications
1	Page 3 & 4	<p>Condition of current estates (as established from the Six Facet Survey carried out September 2019)</p> <p>It is stated that the last Six Facet Survey confirms that 57% of the WHHT estates are below NHS minimum acceptable condition and 80% of the Watford Estate falls into this category. It is clearly not possible to transform the Watford estate alone (to the exclusion of the St Albans and Hemel Hempstead estates) through a £350 million partial redevelopment programme and certainly not on a sustainable basis.</p> <p>The basic cost of backlog maintenance is now stated at £189million and double this amount to implement with VAT, professional fees, contractors on costs and contingencies (a total minimum expenditure requirement of £378 million in itself). The original SOC issued in February 2017 estimated the maintenance backlog at circa £100 million. Notwithstanding any attempts made to reduce the backlog over the last two and a half years the total liability has been increasing at an astonishing rate of £71million per annum. This is in addition to the costs that the Trust has been incurring through emergency repairs together with losses caused through breakdowns disrupting hospital services. In the meantime the Trust's annual deficit continues to stand at circa £50million.</p> <p>The Six Facet Survey condition C categorisation (below NHS minimum acceptable condition) applies to most buildings and infrastructures with many elements of the estates shown to be failing, at end of life and constituting functional and potential health and safety risks.</p> <p>Six Facet Surveys are carried out assuming that the buildings and infrastructures covered are to be retained in normal conditions, not taking into account the additional stress and implications that would apply through heavy demolition and redevelopment works which would substantially increase the risks.</p> <p>The proposed scope of the redevelopment works would only result in renewing a moderate portion of the dilapidated elements of the estates to contribute towards reducing the backlog maintenance burden.</p> <p>These matters are examined in further detail later in this report and appraisal.</p>

		<p>Clearly the current conditions of WHHT’s estates significantly compromise the standard of care that can be provided to patients which is reflected in its performance ratings.</p> <p>This would come under much greater pressure from the inevitable disruption caused through overbuilding the existing hospital estates and give rise to significant health and safety risks.</p>
2	Page 7	<p>Options Consideration and the Separation of Emergency and Planned Care between ‘Hot’ and ‘Cold’ sites</p> <p>Healthcare facilities in west Hertfordshire have become increasingly fragmented over recent years with the outsourcing and the relocation of many services. This is part of an on-going programme that is causing confusion and the need for patients to make a growing number of visits to numerous locations sometimes relating to a single health issue.</p> <p>Fragmentation also complicates coordination that can lead to errors and additionally increases management time. A combined emergency and planned care hospital sited in an accessible location to best suit the whole population of west Hertfordshire would help to redress what is becoming a significant problem, particularly with an ageing population.</p> <p>While the Trust is seeking to improve clinical adjacencies within their proposals on a site by site basis, their selection of Option 1 that retains 3 existing hospitals with minimal investment allocated to the planned care sites, will not resolve this problem.</p> <p>The ‘New SOC’ rejects the long list Clear Site Single New Build Option on the basis that it could not be delivered within an expenditure cap set at £350 million. In principle this clearly is a correct conclusion but the ‘New SOC’ fails to competently establish that the costs of delivering Option 1 or the other three shortlisted options can be achieved within this limit either (considered later in this report and analysis).</p> <p>It is also the case that Option 1 is based upon the partial redevelopment of Watford Hospital and very little investment in St Albans and Hemel Hempstead sites. This would still leave a legacy of substantial elements of the estates in urgent need of further remedial works and functional improvement, thereby providing extremely poor value for money.</p> <p>The ‘New SOC’ development process should have therefore provided for full evaluation of the Clear Site New Build options based on thorough investigation of suitable available sites in order for comparative affordability and value for money to be properly measured before rejection.</p> <p>The Single Site New Build option would provide significant construction cost savings over the Two Site New Build option and result in lower operational costs.</p> <p>The standard and adequacy of healthcare services within west Hertfordshire is at an unacceptable level. The condition of hospital facilities play an overriding part</p>

		<p>in enabling staff to fulfil their functions and serve patients effectively, efficiently and with all due care.</p> <p>It is vitally important that the decision that is made through the SOC process does not compromise the ability for future services to be brought up to acceptable NHS standards on a sustainable basis and this cannot be assured and certainly not sustainably achieved with any of the Redevelopment options.</p>
<p>3</p>	<p>Pages 8 and 10</p> <p>See also Table 66 on page 102</p>	<p>Summary of Shortlist Options and Architects Images</p> <p>No layouts have been provided that show how the proposed the new blocks and extensions would be incorporated and configured on the existing Watford estate. This is surprising as ‘emerging preferred way forward slides’ were presented at the public engagement meetings that provided more information but in places the contents of the ‘New SOC’ appears to be in conflict with these.</p> <p>In the ‘New SOC’ as a whole the most comprehensive information covering the proposed works for Option 1 is summarized in Table 66. This will be analysed later in this document.</p> <p>It is difficult to understand how the Architect’s images relate to the limited scope of works proposed under any of the redevelopment options and again it certainly does not show how the new and refurbished buildings sit with those to be retained. It is however evident that the multi-storey car park is remote from the principal blocks leaving steep pedestrian access routes presenting a major problem for infirm patients and visitors.</p> <p>The Trust’s primary responsibility is to maintain safe and disruption-free hospital services but the original SOC and the ‘New SOC’ fail to provide any solutions as to how this would be achieved throughout the proposed redevelopment process. It is not by any means certain that that could be achieved, particularly with the very fragile condition of many of the existing buildings and services infrastructures that would be subjected to considerably more stress during heavy demolition and construction works.</p> <p>Without establishing a basic practical redevelopment scheme with site and block layouts, phasing and transition plans and the methodology for achieving them safely without disruption to hospital services, the whole feasibility of the proposals are seriously questionable. Furthermore, the construction costs and durations cannot be properly estimated.</p> <p>Given the conditions of all the Trust’s hospital estates, together with the complexity of the redevelopment proposals, it is not competent to simply base estimates on generic database costs and leave everything to OBC (Outline Business Case) stage to seek solutions. This treatment does not provide a credible basis for properly evaluating and comparing the redevelopment options against clear site new build alternatives.</p>

<p>4</p>	<p>Pages 21 to 24</p> <p>See also pages 30 and 31 Table 35 on page 77, and Table 66 on page 102</p>	<p>The Conditions of WHHT's estates</p> <p>This part of the 'New SOC' has been considered on a site by site basis as follows.</p> <p>Watford</p> <p>It is important to consider the Trust's proposals for WGH in conjunction with the findings of the latest Six Facet Survey that 80% of the estate is below NHS minimum acceptable condition and from Table 66 on page 102 it is clear that only approximately 50% of the buildings and infrastructures are proposed to be replaced or refurbished under Option 1 that provides for the maximum redevelopment work at WGH.</p> <p>The 'New SOC' appears here to be relating the whole of the essential remedial and replacement works, the basic cost of which is estimated to be £189 million in the Six Facet Survey, to be entirely in respect of backlog maintenance at the WGH whereas it is based on the conditions of all of the Trust's estates. Nonetheless it also states that of this total, only £20 million is the minimum required to address the 'high and significant risks'. All of these figures are expected to double when VAT, fees, contractors on costs and contingencies are added. The 'high and significant risk' elements should not be considered as part of the 'Refresh' proposals, they should be considered as an urgent requirement and remedied now. The Survey otherwise regards it necessary for the whole backlog to be cleared within 5 and 10 years, very close to the completion of works shown in Table 35 on page 77 which erroneously only provides for a 3 year construction period (see later comments in this report and analysis).</p> <p>Based upon the Six Facet Survey the principal PMoK Block, as shown in Table 3 on page 23 requires replacement or major investment within 5 years but under Option 1, Table 66 shows this Trust proposes to leave 63% of it untouched and 29% only to be given a light or medium refurbishment with the balance to be subject to heavy refurbishment. The 'New SOC' also fails to mention that the main concrete structure of the building is defective, the implications of which are expressly excluded in the Survey report. This should be the subject of thorough investigations and evaluation by structural engineering consultants but this can only be reliably undertaken by the level of invasive examination possible after taking it out of use.</p> <p>The 'Refresh' makes little reference to the estate services infrastructures although the Survey report makes it clear that much if it is at end of life with cables and pipework carried in underground ducts and buried in earth, some of which can no longer be safely accessed, partly due to the presence of asbestos.</p> <p>The service plant, distribution and drainage network is clearly fragile under normal use but redevelopment works would place much greater stress on the installations, particularly with the need for temporary diversions and adaptations prior to essential replacement. It is noted on page 31 that the WGH is currently experiencing over 1,000 reactive maintenance call-outs per month and many instances where critical hospital services are disrupted or suspended. These occurrences must be expected to increase considerably during major redevelopment works.</p>
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Irrespective of whether buildings are to be retained or replaced the services infrastructures are in urgent need of renewal but such provision has not been made within the 'New SOC'.

The AAU block is a temporary modular building comprising interconnected Portakabin units that will reach end of life before the Trust's stated completion date for the proposed redevelopment works but under Table 66 it is noted that the building is expected to be retained and left untouched.

Table 3 states 'rebuild required' for the Shrodells block but under Table 66 it is not proposed to be touched. The future intended use of this building is unclear.

Specific reference is made to the fact that the failing windows and absence of air conditioning in the principal PMoK and WACS blocks and the Trust's concern regarding infection and temperature control. These are again matters that are stated as requiring remedial action in the Six Facet Survey. Whilst all of the redevelopment options provide for the WACS block to be replaced and PMoK block extended and partially refurbished, this cannot be achieved on the Watford estate without major demolition and construction works being carried out very close to patient wards and clinical areas that suffer from these problems. Not only would the works give rise to airborne pollution and contamination but also considerable noise and vibration.

The majority of the buildings housing the Trust's offices and Admin facilities including Willow House and H Block are scheduled for demolition and replacement whereas this should not be a priority with the extremely limited expenditure cap.

St Albans

While Table 4 on page 25 shows that without exception all of the building require major investment or replacement now or within the next 5 years, with all but the Gloucester block currently falling below NHS minimum acceptable standards, it is proposed that nearly 80% of the buildings would be left untouched. This is despite the planned extension of services to be provided at the hospital.

The 'New SOC' separately states that Moynihan Wing will require replacing or major refurbishment within 5 years, but refurbishment is almost certainly unviable for a building that's structure has serious defects and is already over 50 years old. The summary of the works covering the Moynihan Wing under Option 1 in Table 66 would require a significant investment in a building that is recognised as having a remaining lifespan shorter than the time that would be required to complete the redevelopment programme.

Car parking facilities on the site are already inadequate and the proposed extension of services would exacerbate this problem with no solution evident within the 'New SOC'.

Hemel Hempstead

Healthcare services at this hospital site have been progressively reduced over the last 10 years and proposals under the Trust's preferred Option 1 are that further reduction would be made and more services transferred to SACH essentially leaving the Hemel Hempstead site as a medical support facility with urgent care services. This would allow the remaining services to be provided from the Verulam Block and all other buildings demolished to release most of the land for sale. Table 66 shows a provision for approximately 50% of the building to be refurbished.

Whilst the estate has contained two significant unoccupied buildings for a number of years and current services are provided from two main blocks (one of which is the Verulam Block) they are currently serviceable although stated under Table 5 on page 27 as requiring major investment or replacement within 5 years.

Whilst the Verulam Block is in the best condition of all those contained within the estate it is the least accessible with patients and visitors having to climb a long steep gradient from the town and public transport locations. The proposals for this site appear to be based upon releasing land for sale that would return the greatest development value rather than providing the most appropriate healthcare facilities.

The estate is approximately twice the area of the SACH site.

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The Trust's declared that the 'New SOC' criterion was to arrive at a solution for transforming hospital facilities and services in west Hertfordshire in order to deliver safe, effective and efficient high quality care on a sustainable basis within an expenditure cap of £350 million. It was made clear at the public engagement meetings that the cap must be considered as the total expenditure and not part of other identifiable requirements that would give rise to requiring further capital expenditure.

The scope of the proposed redevelopment works do not satisfy the above criterion and certainly do not provide for the works necessary to bring the estates to acceptable NHS standards as set out in the Six Facet Survey report. Not only does the Survey identify backlog maintenance but also significant risks of failures that if not satisfactorily addressed could lead to serious disruption to hospital services and health and safety issues.

It should be clearly understood that Six Facet Surveys are carried out on the basis that the buildings and infrastructures covered remain in normal use and do not take account of the additional stress on them and any other implications of major construction work to them or around them.

Clearly there are many buildings and elements of the estates infrastructures that have been identified as in need of substantial remedial works or replacement within 5 and 10 years before the Trust's anticipated completion of the redevelopment works. This, in addition to the cost of the general backlog

		<p>maintenance, should therefore be calculated and added to the estimated cost of the currently proposed redevelopment works.</p> <p>The cost implications of the above will be covered later in this analysis.</p> <p>Failure to satisfactorily address the matters identified here would risk disruption to hospital healthcare service as well as general health and safety.</p>
5	Page 78 Figure 38	<p>Redevelopment Programme</p> <p>The timeline in Figure 38 shows a core construction period of 2 years and 9 months with a further 15 months for final refurbishment at Watford with planned care works running parallel with core construction. Nothing contained within the 'New SOC' provides any meaningful information in respect of the physical redevelopment plans proposed, new block layouts and phasing plans, without which it is not possible to arrive at reliable programme times.</p> <p>An overall construction period of 3 years is an extremely short period for a redevelopment scheme as complex as that proposed and is remarkably shorter than the 10 years that the Trust considered was required in the original SOC.</p> <p>While the proposed works on the Watford site have been reduced they are still substantial and spread across most of the site, and they require to be carefully phased in order to provide full continuity of healthcare services without disruption and risk to patients, staff and the public.</p> <p>The works will involve renewal of much of the services infrastructures and require temporary diversions and adaptations that will need to be carefully programmed.</p> <p>The Watford estate has little space to accommodate major building works spread across it and safely segregate the public from construction traffic.</p> <p>A more realistic and prudent construction period for the Trust's timeline at this stage would be at least 5 to 6 years. This would result in a prolonged risk of disruption to hospital healthcare services and risk also to the health and safety of patients, staff and visitors.</p>
6	Pages 95, 96 Tables 57 and 58 and Page 117	<p>The Residual Life Spans of Existing Buildings</p> <p>It is clear that the residual lifespans shown in Tables 57 and 58 are merely based on standard financial accounting assumptions and in no way assess the realistic remaining lifespan derived from appraising the current condition of the buildings. All buildings save those of temporary modular construction have been based upon 60 year life spans. This is misleading information that cannot be relied upon as an indication of when buildings should be replaced or their residual asset value.</p> <p>The lifespan shown for the AAU in Table 57 is 25 years but the Surge Units only 10 years. They are both of similar modular construction formed of interconnected Portakabin units. 25 years is a quite excessive life expectancy for a temporary building of this nature particularly given its usage. The maximum</p>

		<p>life expectancy should be 15 years, thus replacement should occur by 2024.</p> <p>The residual lifespans stated for PMoK and Shrodells Blocks are clearly not reflective of the Six Facet Survey reports and Table 3.</p>
7	<p>Pages 109 and 110 Table 74</p>	<p>Building Lifecycle and Backlog</p> <p>The residual cost liability for backlog maintenance identified in the latest Six Facet Survey, that would not be reduced through the proposed redevelopment works, under Option 1 (as is the case for the other shortlisted options) has been inappropriately spread over 30 years under ‘Operating costs’. Only the basic cost of £38 million has been included whereas the full costs of the rectification works would be double this amount. This therefore bears no relationship to when the costs need to be expended as the Survey stipulates maximum periods for rectification between up to 5 and 10 years and is in any event an inadequate provision. The future operating cost estimates should otherwise make proper provision for further maintenance works (based upon past increasing liability levels) to cover the buildings and infrastructures that are not included for replacement under Option 1.</p> <p>As the identified remedial works are necessary to bring the Trust’s estates up to minimum acceptable NHS standards within the same timescale as the proposed redevelopment works and must avoid the risk of disruption to hospital healthcare services, the full identified costs have been allowed for in the recalculated capital cost estimate in Table 3 in this Report and Analysis.</p>

4. Financial Analysis

1. Basis of 'New SOC' Short List Option Cost Estimates

Whilst the information provided by WHHT and HVCCG within the 'New SOC' is very limited it is clear through analysis that the estimates applied to the long and short list options contain many flaws and discrepancies and do not provide any credible and reliable basis for ascertaining and comparing capital costs. The deficiencies identified in this and the preceding sections of this Report and analysis result in erroneous and misleading cost information.

The cost estimates provided in the 'New SOC' were limited to the summaries covering the rejected Long List options in Tables 62 and 63 (see pages 98 and 99) and Short List Options 1 to 4 in Table 71 (see page 108). References were made in the tables to documents that the totals contained within them were taken from, but these were not provided. A Freedom of Information Request was made by a member of NHC to HVCCG immediately following the issue of the 'New SOC' asking for these documents to be provided but they were only released on 23 August 2019 following legal intervention. Other Freedom of Information Requests were made in March and June 2019 asking for relevant documents showing the Trust's detailed financial and other grounds for rejecting the Clear Site New Build options but no further information has been provided. The following analysis has been based upon the Information contained within the 'New SOC' and the Arcadis Strategic Outline Case – Business Case Cost Forms that are purported to be the documents used to arrive at the cost estimates.

2. Schedule of Arcadis Strategic Outline Case – Business Case Cost Forms Provided (Following NHC legal intervention)

Ref	Date	Option Description	Cost Estimate Excl Inflation £
Option 1	May 2019	Emergency Care Redevelopment at WGH Planned Care Redevelopment at HHH (medical Centre)/SACH	349,797,449
Option 2	May 2019	Emergency Care Redevelopment at WGH Planned Care Redevelopment at SACH	349,635,613
Option 4	May 2019	Emergency Care Redevelopment at WGH Planned Care New Build Greenfield (Clear) Site	362,548,904
ID M2	Dec 2018	<i>Emergency Care New Build at WGH Planned Care New Build at SACH, Redevelopment at HHH</i>	875,002,588
ID M4	Dec 2018	<i>Emergency Care New Build at WGH Planned Care Greenfield (Clear) Site New Build – Both Derogated</i>	811,671,167
ID M6	Dec 2018	<i>Emergency Care Greenfield (Clear) Site New Build Planned Care Redevelopment at WGH – Both Derogated</i>	777,587,322
ID M6	Mar 2019	Emergency Care Greenfield (Clear) Site New Build Planned Care Redevelopment at WGH – Revised	745,230,459
ID M6	May 2019	<i>Emergency Care Greenfield (Clear) Site New Build Planned Care Redevelopment at WGH – Revised</i>	740,528,617
ID M7	Dec 2018	<i>Emergency Care Hospital New Build WGH – Derogated (78,462M2)</i>	764,165,002
ID M7	Mar 2019	Emergency Care Hospital New Build WGH – Revised (77,820M2)	695,821,162
ID M8	Dec 2018	<i>Single Site Combined Hospital Greenfield (Clear) Site New Build – Derogated (78,462M2)</i>	703,719,358
ID M8	May 2019	<i>Single Site Combined Hospital Greenfield (Clear) Site New Build (91,289M2)</i>	732,864,894

Each of the above listed documents contain a Capital Costs Summary (Form SOC1), Departmental and Equipment Cost Schedule (Form SOC2), Site Specific On-Costs (Form SOC3), Fees and Non-Works Costs Schedule (SOC4) and a Schedule of Key Assumptions & Exclusions. Figures for inflation on some but not all of the Capital Cost Summaries have been taken up to assumed tender dates therefore in all of Cost Estimates above inflation has been excluded for comparison purposes. None of the documents provide for the sale and/or purchase of land. **The Cost Estimates in the documents listed in italics do not either feature or reconcile with the summaries in the Tables 62, 63 and 71 in the 'New SOC' but some, where relevant, have been used as the basis of this Financial Analysis rather those in 'New SOC' as they contain the only builds-ups made available.**

It is noted that the same department by department rates for new build and refurbishment (Categorised as A for adaptations for alternative use or C for upgrading existing building retaining current use) have been used irrespective of the site that they apply to. Site specific costs are added in Form SOC3 but they do not provide for all of the different factors that apply such as the significantly higher costs that apply due to the design constraints integrating new space on an existing site as opposed to on a clear site that allows a 'clean slate' design. It is also noted that there is a lack of consistency between costs provided for in SOC3's between Options even though the same site and conditions apply.

The Trust and HVCCG have stated at their public engagement meetings and on other occasions that the 'New SOC' is a 'Refresh' of the Feb 2017 (original) SOC and that the costings making up the capital cost estimates in both are broadly comparable for each of the Options (see WHHT and HVCCG's joint Responses to frequently asks questions information sheet published 15 July 2019). The recently provided Arcadis documents show that this is not the case and the following differences exist:

1. The cost estimates in the original SOC were built up using broad M2 rates for new build and three categories of refurbishment (light, medium and heavy) applied to the Trust's assessed overall space requirements, whereas departmental space requirements have been identified within the 'New SOC' to which individual M2 rates have been applied to arrive at the total space requirements and costs.
2. The cost risk contingencies that were added to the basic construction costs in original SOC comprised Client Risk that varied between 10% for the Clear Site New Build option to 12% for Redevelopment, additional risk contingencies applied to the refurbishment works ranging between 10% and 25% depending upon the grade and Optimism Bias that was standardised across all options at 25%. The 'New SOC' is stated to have 5% built into the rates, a planning contingency that varies between 5% and 8% and Optimism Bias ranging from 20% to 25%.
3. Broad based site related 'typical abnormalities' and 'unusual abnormalities' allowed for in the original SOC have been substituted by site specific on-costs in the 'New SOC' that cover more items.
4. The assumed site location and hospital size, partly attributed by the view in respect of derogation, has changed, as it substantially the case for the redevelopment options.
5. The provisions for inflation and land costs and sales revenues have also be treated completely differently.

The Trust's and HCCG's claims that the cost estimates in the 'New SOC' are based upon those contained in the original SOC has been misleading and withholding release of the Arcadis cost forms has precluded any meaningful analysis and consideration of the financial grounds for rejecting the Clear Site New Build options and the selection of Option 1 during the public engagement period.

3. Option 1 Analysis

The first part of the Financial Analysis focuses on the Trust's selected Option 1 that is based upon a partial redevelopment proposal involving all three of the existing sites. The main relevant parts of the 'New SOC' to consider are covered by Figure 30 on page 53, Table 66 on page 102 that provides a reasonably comprehensive summary of works covering the option and Table 71 on page 108 that summaries the capital cost estimate (together with those for Options 2 to 4) and refers to the build-up documents. This must therefore be considered in conjunction with Arcadis Strategic Outline Case-Business Case Cost Forms Scheme: option1.

In studying these documents it is evident that there are a number of inconsistencies and anomalies:

1. Table 66 provides for demolishing the Admin Block and Willow House Offices but not for replacement buildings.
2. Table 66 shows the Pathology building that also includes the Mortuary as 'untouched' but provides for a new Pathology Hot lab and Mortuary. This building is located in a position that the Trust have previously stated would be required for a new extension to the PoMK block.
3. Arcadis Form SOC2 shows three different work categories denoted by N for new build, A for adaptations for alternative use and C for upgrading existing building retaining current use whereas Table 66, in common with descriptions in the original SOC shows new build and light, medium and heavy refurbishment. The Arcadis form places 4,696M2 under category N against 33,247M2 shown in Table 66 for new build but this appears to be incorrect referencing as the descriptions of works placed under different categories imply that it is new build and the rates are also consistent with those for similar or the same as new build works shown on other Arcadis forms. Adjusting for these accordingly the total quantities for new build on the Arcadis form increases to 32,480. However, the total of all work categories in Table 66 amounts to 51,443M2 compared with 35,478M2 plus 5,322M2 for circulation space in Arcadis form, even though Arcadis allow for 1,093M2 for a replacement Admin, Mortuary and Pathology Hot Lab buildings that are missing in Table 66. This constitutes a very significant difference.
4. The summary of the costs from all the Arcadis Forms for Option 1 are correctly transferred to 'New SOC' Table 71, however there are a number of unexplained omissions from Arcadis Forms. On Form SOC2 there are a number of descriptions under the identified minimum scope of works that have no quantities and costs against them. On Form SOC3 (Site Specific On-Costs) there is very small provisions for drainage (presumably including sewers), the combined heating plant, electrical mains and other services apart from cold water mains and storage, despite all of these critical elements being identified as regularly failing and at end of life in the last 'Six Facet' Survey. Similarly there is a heading and descriptions of diversion and reinforcement works that will be required to enable the redevelopment works to be carried out without any costs applied to them. The costs allowed for demolition are far too low particularly when taking into consideration the special measures that will need to be taken in when carrying out such works in an operating hospital environment. Whilst the additional preliminaries allowance for phasing (depending upon the methodology that still has to be determined) may be sufficient there is no provision for special working restrictions, double handling of materials, segregation arrangements and temporary adaptations etc to ensure that the building works do not disrupt hospital healthcare services and there is no risk to public health and safety.
5. Under the heading of Key Assumptions and Exclusions in the Arcadis Forms it states that 'no allowance is made for specific massing requirements or other site imposed effects on the building 'and no allowance for backlog maintenance on the existing hospitals is included'. Arcadia make it clear that they have not been party to deciding the areas and levels of refurbishment required.

In addition to the above due account should be taken of the following factors:

1. The risks of encountering unforeseen costs and delays that could also increase costs that are the typical nature of redevelopment works to and around operational hospital buildings have not been adequately provided for and it is evident that save for some provisions for obvious site specific additions work requirements the same new build cost rates have been used irrespective of whether they apply to construction on a clear site or an existing site.
2. The same M2 rates for new build have been used irrespective of whether the work is to be carried out on a clear site or redeveloping an existing operational hospital site. Redevelopment and overbuilding preclude the opportunities to employ the most effective and cost efficient design solutions and substantially increase construction costs.
3. Nothing is provided to show the level of effective derogation that would have to be accepted under Option 1 and how it would affect functionality for proper consideration and comparison with the Clear Site New Build options.
4. No consideration or basic solutions have been identified to achieve the proposed redevelopment while providing continuity of hospital healthcare services and ensuring the safety to patients, staff and visitors. A baseless redevelopment timeframe of between 3 and 4 years has been stated that would not be achievable. Any solutions found will inevitably have significant cost implications.
5. The redevelopment works scheduled include very little of the essential remedial and replacement works identified in the last Six Facet Survey as being required within the same timeframe as is proposed for the redevelopment works. This, in itself, would have a major negative impact on the viability of the whole proposal to retain the Watford and St Albans sites. Option 1 would require a substantial investment for a very limited redevelopment and refurbishment scheme that would still effectively leave both sites unfit for purpose and demanding even greater investment immediately thereafter.
6. Inadequate consideration of the implications of the proposed redevelopment works on the fragile and failing services infrastructure, much of which is stated as at or reaching end of life in the last Six Facet Survey and is unlikely to have the capacity to serve the new building proposed. Temporary diversions and adaptations will be necessary to undertake the redevelopments works that have not been properly provided for and would also impose greater stress on the plant and distribution networks risking serious failures and breakdowns. The existing systems do not comply with current requirements and energy efficiency standards.
7. No consideration has been given to the need for further capital expenditure after the proposed redevelopment works. Refurbishment works are scheduled to be carried out in the PMoK Block at Watford and Moynihan Block at St Albans. Both have serious structural defects and should be replaced now. Many other buildings on all of the Trust's estates are in poor condition and reaching end of life but many have not been properly assessed. Their residual life has been based upon initial 60 year lifespan assumptions irrespective of form of construction and current condition. Replacement or major investment in these buildings will be required in the short and medium terms after completion of the redevelopment programme.
8. There is inappropriate applications of Client Risk and Optimism Bias provisions resulting in inadequate allowances for the Redevelopment Options and excessive allowances for Clear Site New Build.

4. Basis used for Recalculating Capital Cost Estimate for Option 1 Estimate

Table 66 in 'New SOC' sets out the scope of works for Option 1 and other than where errors and omissions have been identified and described in this analysis it has been regarded as principle basis determining the Trust's proposals and the Arcadis Cost Form SOC2 as scheduling the required departmental splits and cost rates.

Due to the limited information provided within the 'new SOC' it is not possible to identify the level of effective derogation or facility compromising to enable proper comparison with the Clear Site New Build Options.

The costs included in Arcadis Cost Form SOC3 provide for Site Specific On-Costs including 'Abnormals' that have been reviewed as part of this analysis and amended where considered appropriate as described in the Analysis Table. The percentage additions for Fees have been reviewed and treated similarly.

In the 'New SOC' the treatment of risk provisions and the format for showing capital cost estimates has been changed from that contained within the original SOC. The original SOC identified 'Client Risk' as a separate provision and applied 12% to the net cost of works of the redevelopment options. In addition differing percentages were applied to light, medium and heavy refurbishment rates that ranged between 10% and 25%. Optimism Bias was applied at 25% across the board to every option.

The 'New SOC' does not show 'Client Risk' separately, but Arcadis state under General Assumptions in their Business Case Cost documents that the HPCG (Department Cost rates) include 5% for 'design' risk.

The 'New SOC' also introduces what is, presumably, a new risk related provision under the heading of 'Planning Contingency' that is shown at 6% for Option 1. Optimism Bias has been added at 24.5% and is rightly at the higher range shown in the Green Book Guidance given that Option 1 rates as non-standard construction and the nature of the works and sites pose high risks of necessitating additional unforeseeable works and delays to progress.

When comparing the basic cost estimates of similar works between the original SOC and the 'New SOC' it is clear that in real terms (after deducting the stated 5% 'design risk' contingency and a further 5.8% for construction tender price inflation that has occurred between the dates of the two SOC's) the costing levels are now between 10% and 15% lower. This represents a substantial reduction considering that the Trust's redevelopment scheme that has not been properly defined, design and construction solutions have not been identified and by its nature it will inevitably involve many conditions and additional work requirements that will only be identifiable during the progress of the project. The recalculated estimate in Table 1 re-instates a similar level of contingency cover as included in the Trust's estimates in the original SOC but this still cannot be considered safe given the circumstances described. The 12% 'Client Risk' contingency that was provided in the original SOC has therefore been reinstated in the Recalculated Capital Cost Estimate.

Inflation has been added to provide the basis of a more representative comparison between the various options and estimate the level of future funding requirements. For this purpose a annual inflation rate of 3.5% has been assumed that has been taken through the likely

duration of the works. Given that Option 1 would entail significant phasing the construction period has been assumed to be 6 years rather than the much shorter, unrealistic, period shown in Figure 38 of the 'New SOC'.

For similar reasons, estimates of the receipts and costs of land sales and acquisitions have been included in the Recalculated Capital Cost Estimates. Land values of the Trust's existing estates have been based upon the last known professional valuation carried out by Deloitte in 2015.

5. Analysis Table 1

Cost Headings		Adjustments	Cost £M	Total £M	Reasons for Adjustments
Departmental Costs		As Table 71 (Incl VAT)	142.53	142.53	
	1	1,860M2 New Build @ average rate £3,033	5.64		Based on Table 66 Summary of works plus Admin, Hot Lab and Mortuary making a total 51,978M2 less 35,478M2 and 5,322M2 for circulation space costed in Arcadis Form SOC2
	2	9,338M2 Refurb @ average rate £1,728	16.14		
	3	Add VAT on above	6.19	27.97	
On-costs		As Table 71 (Incl VAT)	66.63	66.63	
	1	Increase to drainage provision incl sewers	1.29		Much at end of life and failing., unable to withstand works and changes Noted as services diversions, much at end of life and requiring replacement Nominal allowance made only but mains capacity will require upgrading Required during the redevelopment period. See Table 66 Inadequate for demolishing builds on operational hospital estates Similar allowance as for Option 2 in respect of St Albans site For segregation measures, double handling, additional supervision etc
	2	Increase to CHP, heating, hot water and gas	1.90		
	3	Increase electrical mains and sub-stations	1.27		
	4	Backlog maintenance and essential renewals	38.02		
	5	Increase demolition	3.07		
	6	Allowance for Watford site constraints	3.00		
	7	Increase preliminaries	3.01		
	8	Add VAT on above	9.83	61.39	
Works Cost Total				298.52	
Project Fees		15.04% on total of the above excluding VAT	36.04		Fee levels on Form SOC4 do not make adequate provision for the additional administration involved with multiple contracts over three separate redevelopment sites. Total Fee rate in Form SOC4 increased 1% to 15.04%
Non-Works Costs	1	As Cost Form SOC4 plus VAT	6.28		
Equipment Costs	1	20% on Departmental Costs with additions totalling £170.50	34.10		
Planning and other Contingencies	1	6% Planning Contingency on total of all above totalling £374.94	22.50		Whilst 5% risk is stated to have been included in the cost rates , for all options the new build rates are the same and unlike the Feb 2017 SOC no additional risk contingencies have been added to the refurbishment rates. A reasonable percentage needs to be added to the Departmental Costs, Site Specific On-Costs and Fees to provide for the inevitability of finding unforeseen conditions and additionally required works during redevelopment
	2	Client Risk 12% on £334.56	40.15		
Sub Totals			139.07	437.59	
Optimism Bias		24.50% as SOC1 rate	107.21	544.80	
Inflation Adjustment		Based upon 3.5% construction tender price inflation to completion of works		124.90	Table 71 includes a percentage of 16.7% for inflation up to tender date only assuming commencement April 2022. This should be taken through to the completion of works that is likely to take 6 years.
Land Sales Revenue	1	Watford	10.00		Amounts approximately in line with Deloitte's 2015 valuations commissioned by WHHT
	2	Hemel Hempstead	15.00	25.00	
Total				644.80	

Key Exclusions:

- 1. No allowances have been made in this nor the 'New SOC' estimates for any remedial works to the structural defects identified in PMoK Block in Watford and Moynihan Block in St Albans.**
- 2. No allowances have been made for the residual functional suitability deficiencies identified in the Six Facet Survey. The basic costs of rectifying all issues across all of the Trust's estates was reported as £111.56 million.**
- 3. This Option can only be regarded as a partial or interim solution as it excludes the replacement of many buildings that have been identified in the last Six Facet Survey as below NHS minimum acceptable condition. Replacement is stated to be required within 5 to 10 years, effectively within the same period as the time that will required to complete the works covered herein.**
- 4. See also Arcadis Key Assumptions & Exclusions stated at the end of their Strategic Outline Case – Business Case Cost Forms Scheme: Option1 that this Recalculated Capital Cost Estimate is based upon and also apply.**

6. Further Essential Block Replacement Works

Tables 3, 4 and 5 on pages 24 to 28 schedule buildings on all three estates that have been shown as requiring major investment or replacement following the Six Facet Survey due to their current conditions. Many of these buildings have not been included for replacement or even refurbishment in the works scheduled under Option 1.

For the Watford estate these include PMoK that is only scheduled for partial refurbishment and is stated to require major investment or replacement within 5 years. Given the structural defects in this building only replacement would be viable. In addition Shrodells and the Surge Units plus a balance of 8,000 M2 of non-clinical space and 4,000 M2 of other clinical space is stated to require major investment or replacement **now**.

The above stated tables show that a further 41,000 M2 of building space requires replacement than allowed for under Option 1. This effectively makes up the whole balance of the buildings on the estate.

For St Albans, with the emphasis under Option 1 to concentrate on improving the emergency care facilities at Watford, the essential renewal position is worse. Gloucester Block requires major investment or replacement within 5 years. Moynihan Block, that also has structural defects, Runcie Block and a further 3,500 M2 of clinical and non-clinical space are all stated in the Six Facet Survey as requiring major investment or replacement **now**.

The above blocks effectively constitute the whole of the facilities on the St Albans estate and as none of the existing buildings have been scheduled for replacement in Option 1 with very little refurbishment this leaves the whole 19,000 M2 requiring action.

As Option 1 only provides for retaining 8,000 M2 of the Verulam Block at Hemel Hempstead, leaving it otherwise untouched, and all other buildings to be cleared for land sale, the requirement would be less extensive but Table 5 still states that Verulam Block will require major investment or replacement within 5 years.

Irrespective the physical condition of all the buildings over the three estates considered above, nearly all have been found to be unsatisfactory or unacceptable in respect of functional suitability and graded as condition C or D.

Given the above, contrary to WHHT's and HVCCG's declaration during their public presentations that the 'New SOC' proposals must be considered to be a lasting solution and not part of a longer and more substantial redevelopment scheme, **Option 1 clearly cannot deliver this objective and comply with the most basic acceptable NHS standards. Given the conditions of the buildings not forming part of the proposed works under Option 1 and in particular the Watford estate as a whole, continuity of safe and effective healthcare services cannot be assured without additional investment.**

In the event that Option 1 is proceeded with, it would be the responsibility of WHHT, HVCCG and the NHS to address the essential remaining requirements identified through a subsequent redevelopment programme within a very short period of time. In reality any timescale for the delivery of Option 1 will far exceed the maximum five year period stated as required in Table 3 for replacing those buildings that would be retained. These buildings will deteriorate further and continue to leave the Trust failing to provide compliant facilities. It is therefore clearly the case that a total solution needs to be found now and the Clear Site New Build Options reconsidered. An extended or two part redevelopment programme would cause many more years of disruption to patients, staff and visitors to the hospital estates.

Irrespective of whether the cost estimate for Option 1 in Table 71 is used or the corrected version in this analysis it is self-evident that redevelopment of the Trust's existing estates incorporating all of the essential works will cost over £1 billion. Option 1 in itself only provides for replacing approximately 50% of the building space at Watford and little of the services infrastructure, and at St Albans and Hemel Hempstead none of the buildings needing to be replaced have been scheduled for replacement. Only 33,000 M2 of new build has been allowed for and a further 68,000 M2 has been identified as in need of replacement or major investment. The Trust's estimate for Option 1 in Table 71 that covers less than a third of the total works required amounts to over £400 million in itself.

The 'New SOC' cost estimates for Clear Site New Build are reviewed below. In each instance the estimates are based upon there being no derogation and this means that the hospital space, facilities and standards are superior to that provided for the new blocks and refurbished areas included in Option 1. Tables 10 and 11 on page 40 of the 'New SOC' shows that the space and facility requirements are based upon achieving 100% success in reaching their operational efficiency and demand management targets. This appears to be an unrealistic basis to use for the purposes of setting the capacity requirements for future hospital facilities and presents a significant risk of expansion being required. Clear Site New Build based upon fully compliant NHS current standards would reduce this risk and should the facilities need to be extended it could be achieved on a far more practical and cost effective basis. Furthermore, the Trust will have a greater opportunity of achieving efficiency improvements from new 'state of the art' facilities.

7. Single Clear Site Option Analysis

It is evident that inadequate research and work has been carried out by the Trust to reach a reliable basis for estimating and comparing the costs of the Clear Site New Build Options with the proposed Redevelopment Option. Whilst the Trust and HVCCG have inferred in their 'Responses to frequently asked questions' information sheet that their rejected Clear Site New Build option capital cost estimates have been based upon building on the Crown Estates development site near Junction 8 of the M1 no site or development specific information is contained within the 'New SOC' that provides any basis for arriving at a representative proposal and cost estimate for evaluation. Furthermore, there is no evidence that a meaningful and competent research into suitable sites has been carried out. It is rather more apparent that the Trust has simply dismissed all clear site new build options on the basis that they would all breach the capital spend limit set and decided to simply not bother. Whereas, notwithstanding any other considerations, with reasonable initiative it is wholly feasible to arrive a capital spent commitments that fall considerably lower than total the development costs.

The Capital Cost Estimate shown in Table 63 of the 'New SOC' that summarises Arcadis Business Case Cost Form Option ID M8 therefore achieves little more than providing a rough guide using very questionable database statistics. The Trust and HVCCG's 'Responses to frequently asked questions' information sheet' state comparators used that are broad based, including redevelopments, rather than properly representative of similar sized clear site schemes. If the Capital Cost Estimates are to be based solely upon such rudimentary methods then the Analysis Table 5 included later in this Financial Analysis section provides a more representative and reliable basis for arriving at comparable Capital Cost Estimates for Clear Site New Build options and this is considered later in this Report and Analysis.

8. Basis used for Recalculating Capital Cost Estimate for Single Clear Site Option Estimate

In general terms Arcadis Cost Forms for Option ID M8 have been used for the purpose of arriving at the recalculated Capital Cost Estimate for this Option in Analysis Table 2 with the adjustments described within it.

Omissions have been made to On-Costs for Site Specific Adnormals as there is no basis provided for the assumptions made and there is reasonable expectations that advantageous terms could be achievable for land on the Crown Estates development.

Optimism Bias has been reduced from 21.75% to 15% in line with Green Book Guidance for standard construction and would benefit from the low risks of building on a clear site with few constraints.

Inflation, land sales receipts and acquisition costs have been treated in the same manner as described for Option 1

9. Recalculated Single Clear Site Option based upon Table 63 – No Derogation

Analysis Table 2

Cost Headings		Adjustments	Cost £M	Total £M	Reasons for Adjustments
Departmental Costs		As Table 63 (Incl VAT)	321.55	321.55	
On-Costs		As Table 63 (Incl VAT)	114.74		
	1	Omission of site specific abnormal costs	12.35		There are multiple site options on the Crown Estate development and there is therefore no basis for assuming that abnormal costs will apply. Given the nature of the development there is reasonable expectations that the Trust could secure the land with full infrastructure and other benefits without charge This addition is not consistent with the treatment of Option 1 and is relevant to land disposal rather than the provision of new hospital facilities As comments against 1 above
	2	Omission of demolition at WGH, HHH & SACH	6.34		
	3	Omission of diversion/reinforcement costs	3.80		
	4	VAT on the above	4.50	77.75	
Works Cost Total				399.30	
Project Fees		14.09% (unchanged percentage)	48.06		
Non Work Costs		As Cost Form SOC1	13.09		Whilst this sum has not been changed it is questionable as it incorrectly states that it includes for decanting into the refurbished facility
Equipment Costs		As Cost Form SOC1	64.61		
Planning Contingency		5% of £399.30	19.96		Included as Table 62 as represents a low risk
Sub Total			145.72	545.02	
Optimism Bias		15%	81.75		Reduced to align with HM Treasury Green Book guidance for standard buildings as Table 1 page 2/15
				626.77	
Inflation Adjustment		Based upon 3.5% construction tender price inflation to completion of works		105.05	Based upon commencement April 2022 and completion April 2025
				731.82	
Land Sales Revenue		Watford St Albans Hemel Hempstead Land Purchase	34.50 38.00 17.50 10.00	80.00	Amounts approximately in line with Deloites 2015 valuations commissioned by WHHT
				651.82	

**10. Two Site based upon Table 63 – No Derogation
(Assumed Emergency Hospital on Clear Site and Planned Care at existing Watford site)**

The NHC previously proposed that the Trust should investigate the viability of the option of two new hospitals with emergency services on a clear site such as the Crown Estates development near Junction 8 of the M1 and Planned Care on the site of the existing WACS building on the Watford estate. It was understood that this proposal would be pursued by the Trust but it has not featured in the 'New SOC' or the various Arcadis Strategic Outline Case – Business Case Cost Forms provided. The Forms for Option ID M6 do however provide costings for a Clear Site New Build Emergency Hospital and Refurbished Planned Care Facilities at Watford and this has been used as the main basis for arriving at the Two Site New Build Option in Table 3 below. In all other respects the same principles for costing have been followed as described for the preceding options.

11. Analysis Table 3

Cost Headings		Adjustments	Cost £M	Total £M	Reasons for Adjustments
Departmental Costs		Single Site Costs Forms for Option ID M6 - Updated for New SOA Increase from circa 91,000M2 to 96,000M2 in accordance with 'New SOC' Table 17	321.55 17.67	339.22	Cost built up from Arcadis Forms covering alternative options as no specific Cost Forms have been provided for this Option
On-Costs		As Cost Form SOC3 for Option ID M6 plus VAT	116.32		
	1	Omission of greenfield site specific costs	7.31		See notes in Analysis Table 2
	2	Omission of demolition at Watford other than WACS	5.82		Ditto
	3	Omission of additional prelims for phasing	3.80		Only single phase for each of the two sites
	4	Add for site preparation works at Watford VAT on the above	7.00 3.45	102.94	
Works Cost Total				442.16	
Project Fees		15.04%	55.27		Should be no higher than Option 1
Non Work Costs		As Cost as Option ID M6 SOC4	13.02		
Equipment Costs		As Cost as Option ID M6 SOC1	63.82		
Planning Contingency		5% of 442.16	22.11		Should be low risk and similar to Option ID M4
Sub Total				596.38	
Optimism Bias		15%		89.46	Reduced to align with HM Treasury Green Book guidance for standard buildings as Table 1 page 2/15
				685.84	
Inflation Adjustment		Based upon 3.5% construction tender price inflation to completion of works		133.63	Based upon commencement April 2022 and completion April 2025 for Emergency Hospital and commencement July 2025 and completion July 2027 for Planned Care Hospital
				819.47	
Land Sales Revenue		Watford St Albans Hemel Hempstead Land Purchase	24.50 38.00 17.50 8.00	72.00	Amounts approximately in line with Deloites 2015 valuations commissioned by WHHT
				747.47	

**12. Clear Site Emergency Hospital Only – Part One of Two Stage Development - No Derogation
(Assumed Planned Care Services at existing St Albans estate as interim measure)**

This option has been included within the Financial Analysis on the basis that it would provide a permanent solution for Emergency Care and limit expenditure by providing Planned Care from St Albans upon an economical interim basis as it would require less work and immediate investment than providing Planned Care facilities at Watford or Hemel Hempstead. The costings in Table 4 have been based upon Arcadis Strategic Outline Case – Business Case Cost Forms for the Two Site Option and Option ID M8 and the same principles as used for the preceding Options.

Analysis Table 4

Cost Headings		Adjustments	Cost £M	Total £M	Reasons for Adjustments
Departmental Costs		Greenfield Emergency Hospital 74,000M2 apportioned to Analysis Table 3 costs SACH Planned Care as 2 Site Option	261.48 20.80	282.28	
On-Costs		As Cost Form SOC3 for Option ID M2 plus VAT	116.32		
	1	Omission of Greenfield Site Abnormals	9.83		
	2	Omission of Watford demolition	7.25		
	3	Add Allowance for constraints as in Option 2	3.00		
	4	VAT on above	2.81	99.43	
Works Cost Total				381.71	
Project Fees		15.04%	47.84		Percentage increased to cover phasing and two sites
Non Work Costs		As Option ID 6 plus VAT	12.46		
Equipment Costs		AS Option ID 6 plus VAT	46.65		Reduced from ID 6 as assumed SACH equipment retained
Planning Contingency		5% on £381.71	19.09		
Sub Total				507.75	
Optimism Bias		18%		91.40	Reduced to align with HM Treasury Green Book guidance for standard buildings as Table 1 page 2/15
				599.15	
Inflation Adjustment		Based upon 3.5% construction tender price inflation to completion of works		76.76	Based upon commencement April 2022 and completion April 2025 for both Hospitals
				675.91	
Land Sales Revenue		Watford St Albans Hemel Hempstead Land Purchase	24.50 0.00 17.50 8.00	34.00	Amounts approximately in line with Deloitte's 2015 valuations commissioned by WHHT
				641.91	

13. Establishing Recent New Build NHS Hospital OBC or FBC Cost Levels for benchmarking purposes

Analysis Table 5 below provides information gathered from recent Outline Business Case and Final Business Case Documents that show the capital cost based upon fully committed tenders and where available confirmation through published outturn costs. This table has been provided for comparison purposes to establish whether or not the capital cost estimates included in the 'New SOC' are representative of recent and current market levels.

Whilst the Trust's estimates are now significantly lower than in the original SOC they still stand at higher levels than has been achieved in the market.

Analysis Table 5

NHS Hospital	Internal Area M2	Total Cost £M	Cost per M2	Year Started	RPI Inflation Increase	Current Day Cost per M2	Features
Midland Metropolitan	79,828	337	4,222	2016	13.2%	4,779	Brownfield site, the development includes multi storey car park
Royal Papworth	43,000	165	3,837	2015	14.7%	4,401	Beds nearly 100% in single rooms
Northumbria SMC	30,000	119	3,570	2013	15.1%	4,109	Including new road infrastructures
Southmead, North Bristol	105,000	430	4,095	2011	23.6%	5,061	Small part overbuild/redevelopment
WHHT New Build (as recalculated)	91,289	547	5,992	n/a	n/a	5,992	Based upon Analysis Table 2
WHHT New Build as 'New SOC'	91,289	733	8,029	n/a	n/a	8,029	Based upon Arcadis Option ID M8

The Southmead shows the best comparison in size with WHHT's stated requirements. The figures have been taken from North Bristol NHS Hospitals Trust's FBC. Whilst the development does include an element of overbuilding on the existing site and it is therefore a brownfield rather than a clear site development requiring phasing it does represent, at the highest price level a reasonably safe comparison against WHHT's estimates. Construction costs will be a little lower for Bristol than west Hertfordshire but that would easily be balanced out by the increased complexity compared with the advantages of a clear site, of pre-provided highway and main access infrastructures plus utility services, thereby providing significant cost savings. **In real terms the above comparison shows that recent market 'clear site', or even brownfield site, new build construction cost levels are at least approximately 40% lower than reflected in the 'New SOC' and still over 18% below the cost estimate recalculated in Analysis Table 2. It would therefore be reasonable to set targets for Clear Site New Build costs at a minimum of 15% below the sums shown in this analysis and expect them to be achieved**

14. Comparison of Options

Analysis Table 6 below summarises and compares the options covered in Analysis Tables 1 to 4 for evaluation purposes. The table shows costs at current day levels in order to provide a direct comparison with the stated £350 million expenditure limit originally set for the 'New SOC'. As Option 1 has been shown to only be an interim solution requiring further substantial investment in order bring the Trust's hospitals up to minimum acceptable standards it is shown as an Interim Option alongside the alternative of proceeding only with a Clear Site Emergency Hospital. This option is included in the recognition of the objective to limit immediate expenditure to the practical minimum. The Estimated costs include credits for land sales. The OBC (Outline Business Case) Target column shows costs covering all of the Clear Site New Build Options at 15% below the 'New SOC' estimates following the findings from Table 5.

Analysis Table 6

Option	Analysis Table Ref	Estimated Cost £	Target OBC Cost £	Benefits and Disadvantages
<u>Interim Options</u>				
Redevelopment Option 1	1	530	530	50% of Emergency Hospital facilities and whole of Planned Care facilities would remain below NHS minimum standards. Continual high maintenance burden and risks of breakdowns and disruption to healthcare services. Very little investment in St Albans and Hemel Hempstead estates.
New clear site Emergency Hospital	4	565	487	New 'state of the art' Emergency Hospital on a more accessible central site and Planned Care at St Albans (redeveloped as provided for under Two Site Option)
<u>Full Options</u>				
Redevelopment Option 1 plus subsequent scheme	n/a	1,000 +	1,000	Many design limitations leading to sub optimal facilities and many years of disruption during demolition and construction works. Significant health and safety risks.
Single Clear Site New Build	2	547	465	New 'state of the art' Emergency and Planned Care on a more accessible central site in the most cost efficient format.
Two Site New Build (Clear Site and Watford)	3	614	522	New 'state of the art' facilities as for Single Site Option above. Planned Care Hospital could be sited on the level part of the Watford estate where the WACS block currently stands served by a surface car park.

The above table provides directly comparable recalculated capital cost estimates covering each option at current day prices on the basis used in the original SOC and modified in the 'New SOC'. It also allows the estimates to be directly compared with the original £350 million expenditure cap. On this basis the full Clear Site New Build Options show costs ranging from £547 million to £614 million compared with what can only be regarded as an interim solution that resolves less than 50% of the problems by opting for Option 1 at £530 million. There is also further potential for savings to the Clear Site New Build Options given the evidence of current market cost levels provided in Table 5 and through lease and partnering options to reduce capital expenditure (see also Section 5, Findings from Analysis item 9).

When applying the OBC targets that have been based on appropriate benchmarking from Analysis Table 5 it demonstrates that both the total new build solutions 2 and 3 provide the opportunity to achieve savings against the partial redevelopment Option 1. The total new build solutions also provide a solid basis for reducing capital expenditure through leasing and partnering agreements.

It should also be appreciated that the above estimates are based upon costs as at the dates of the Arcadis costings between Dec 2018 and May 2019. These are approximately 2 years after the preparation of the original SOC in which time construction tender prices have risen 5.8%. As the proposed expenditure cap was set following scrutiny of the original SOC there is a case that it should now be increased from the £350 million to reflect current day prices irrespective of any other considerations.

5. Findings from Analysis

1. Deliverability and Unfounded Proposals

There is no prospect of constructing a credible redevelopment or new build plan that can be contained within £350 million expenditure. Any redevelopment plan that is constrained by this limit will not provide a solution to the current critical functionality needs and effectively rectify the backlog maintenance and the essential replacements set out in the last Six Facet Survey. This is self-evident from the Figure 1 on page 3 of the 'New SOC' itself that provides headline findings taken from the survey that cites the basic costs of rectification to be £198 million which when, on costs are added, will be double this amount, £386 million, before any real improvements are taken into consideration. This major problem is as a result of years of neglect and underfunding that can no longer be viably resolved by normal maintenance arrangements.

The 'New SOC' arrives at a short list consisting only of redevelopment options and proposes Option 1 for adoption and progression to OBC stage without showing any basic plans or proposed solutions as to how this could be achieved while providing continuity of hospital healthcare services during the process.

Ensuring that the continuity of safe and effective hospital healthcare services are deliverable is fundamental and a pre-requisite for any redevelopment scheme. The Trust's plans include demolition and construction works adjacent to the principal block at Watford that contains the main theatres, clinical facilities and wards. This building (Princess Michael of Kent - PMoK) largely relies on natural ventilation with failing fenestration and many other serious defects. The proposals are to leave most of this block untouched. There is no solution provided as to how the Trust would ensure that patients would be fully protected from contamination and infections from the building works, particularly those most vulnerable.

All of the Trust's redevelopment options are complex and cannot be assumed to be deliverable and left on the basis that solutions can be found at Outline Business Case (OBC) stage. The Trust are seeking approval to embark on redeveloping its estates and rejecting the alternative Clear Site New Build options. They have a fundamental Duty of Care obligation that is not being given proper consideration. The whole feasibility of the Trust's redevelopment proposals are unproven and the subject of major doubt.

2. Flawed Basis and Inadequacies of Proposals

The 'New SOC' fails to show how the Trust proposes to deal with the buildings and infrastructure elements of their estates that require further investment but are not included within the redevelopment options. This requires the proposed timescales and cost estimates to be provided in order to properly assess the viability of the current proposals.

The 'New SOC' fails to provide even the most basic of diagrams showing the positions of the proposed new buildings for Option 1 and merely shows an Architect's images 'for what WGH could look like following redevelopment'. The images are not properly representative of the proposed works for Option 1 as included in the Summary of Works (Table 66) and the proposed works are at variance with those presented by WHHT and HVCCG at the preceding public engagement meetings.

The cost estimates in many of the Arcadis Strategic Outline Case – Business Case Cost Forms listed under 2 of this Financial Analysis, that were provided after the 'New SOC' was published following legal intervention by the NHC, do not reconcile with those contained in the 'New SOC' itself and there

are either two or three versions of the forms covering the Long List rejected options with little or no explanation for the changes made.

3. Inappropriate Rejection of Clear Site New Build Options

This analysis has demonstrated that there are many flaws in the assumptions on which the estimated costs of the options were based. The long list Clear Site New Build options were rejected on the basis that they could not be delivered within £350 million without any substantiation that the proposed redevelopment options can be contained within this sum, nor longer term affordability, value for money and functionality comparisons. This has resulted in the investigations into suitable new sites being inappropriately terminated and development of the options shelved.

While the 'New SOC' was progressed through 'evaluation' and board approval processes on the ground that 'if we do not take the opportunity of £350 million funding now we don't know when we will have the chance to improve our estates again' the 'New SOC' does not provide a basis for sound consideration and credible decision making. It is understandable that under the current national funding limitations that NHS should seek to spread expenditure as evenly as possible over the country and provide budget guidance to trusts to follow for SOC submissions. However, such guidelines are given without the NHS's full understanding of the implications in respect of providing acceptable facilities and hospital services to the population that the trust serves and further financial consequences. It is WHHT's and HVCCG's responsibilities to the population of west Hertfordshire and to the NHS/DHSC to provide a comprehensive account of the implications of working within £350 million. This information is essential to allow proper evaluation of the viability of Option 1 and review of the appropriate expenditure constraints.

Given that this analysis has demonstrated that the cost impact of Option 1 is far greater than the Clear Site New Build options it is clearly the case that the latter should be re-evaluated to arrive at the most beneficial result.

4. Interim Solution to Minimize Initial Capital Spend

In the event that initial expenditure is the biggest priority then the Clear Site New Build Emergency Hospital Option, leaving Planned Care in the current facilities at St Albans before later replacement, would be the most appropriate, although the relatively small additional investment required for the single site combined emergency and planned care hospital makes this questionable. It should be understood that this option would provide a completely new Emergency Hospital as opposed to the partial redevelopment of the existing hospital. It otherwise only provides for very limited investment for Planned Care facilities at St Albans but would release a significant amount of land from the Trust's existing estates for sale to help fund the construction of new permanent replacement facilities thereafter.

5. Best Value for Money and Effective Solution

The best value for money and overall cost effective solution is the Single Site Clear Site New Build Option. As with all the Clear Site New Build options, it currently appears that the Crown Estate development land close to Junction 8 of the M1 would provide the most beneficial site. Planning for the first phase of this development as a whole is at an advanced stage and is fully supported by St Albans City and Dacorum Borough Councils, and central government has recently agreed for it to be extended to form one of the Country's new garden communities that will include the construction of 11,000 new homes. The main road and utility services infrastructures will be provided as part of this

major development meaning that the Trust would not have to bear the costs specifically dedicated to support the hospital development. Additionally with planning gains and Crown Estate's commitment to provide amenities and support the communities where it develops it is likely that the acquisition costs of the land will be low. Furthermore with the scale of the development as a whole it can be expected to be well served by public transport to provide good accessibility. Notwithstanding the potential benefits of this site the Trust should recommence their search for other suitable sites that they terminated prematurely.

6. Two Site New Build Alternative

The alternative two site new build option with the emergency hospital on a clear site and planned care on the existing Watford site in the current location of the WACS and adjacent blocks would still allow the design and construction of 'state of the art' facilities. However, for the benefit of achieving WHHT and HVCCG objectives of separating emergency and planned care services plus widening the spread of services over west Hertfordshire there will be a cost penalty. This is mainly as a result of providing for the additional floor space requirements, from 91,000 M2 to 96,000 M2.

The decision as to what is the most appropriate variant of the above new build options is not one of major concern with regard to 'buildability' but it is clear that basing all facilities on a single site would be easier for the Trust to manage and cheaper to operate from.

7. Cost Analysis

In current cost terms comparing the original £350 million expenditure cap with the Clear Site New Build variants based upon the recalculated estimates from the 'New SOC', it shows costs ranging from £547 million to £614 million compared with recalculated Option 1 costs of £530 million for not solving even half of the problems faced.

The above new build estimates are still 20% above the comparable costs recently achieved by other trusts and this must give some confidence that there is scope to establish lower figures with much more cost certainty at OBC stage. It would therefore be reasonable to target and expect 15% OBC reductions. The same degree of cost certainty can never be achieved for redevelopment schemes as it is not possible to establish the hidden conditions of the existing buildings to be demolished in order to clear areas for new build or stripped out for refurbishment until they are vacated and intrusive investigations are carried out. Similarly any decontamination needs, the ground loading capacities and the foundation and the main structure design cannot be established until after demolition. This means that these work elements will not form part of contractors' fixed contract prices and any consequential delays would give rise to extensions to the contract periods with the costs to the Trust's account. Even more uncertainty would apply to the site wide services infrastructures in constant use and running in underground ducts that the Six Facet Survey has found are no longer safely accessible or simply buried in the ground. There can therefore be no confidence that savings can similarly be targeted and achieved to the 'New SOC' redevelopment options estimates as is possible with Clear Site New Build solutions.

The capital cost summaries for each of the shortlisted options in Table 71 show an adjustment for inflation. This has not been included for the Clear Site New Build options in Tables 62 and 63, simply stating 'current prices'. The main focus of this analysis for comparison purposes has been on current prices. However, the percentages and amounts for the shortlisted redevelopment options in Table 71 are wrongly based and misleading as they are only based on forecasted increases up to projected tender dates before the start of works. As the full requirements of the redevelopment works will not

be determinable from initial commencement it is likely that contracts will need to be let in phases, but in any event the prices will obviously reflect the duration of the works and not just the start dates.

The duration of the redevelopment works (shown in Figure 38 on page 78 as less than 3 years) is unrealistic and will more than likely be double this time and will certainly be significantly longer than can be achieved for the Clear Site New Build options.

8. Savings to Operating Costs and Increased Revenue

Appropriate account has not been taken of the substantial savings that would be made on running costs through operating from completely new 'state of the art' efficient hospital buildings as against retaining most of the existing buildings and their infrastructures on what will still largely be dysfunctional and dilapidated estates. **While there will undoubtedly be many efficiency savings, from a facilities perspective, large savings would be gained in respect of facilities management and energy costs alone. New buildings can be expected to be virtually maintenance free for 7 to 10 years whereas the (partially redeveloped) existing estates will continue to require on-going programmed remedial works and emergency actions through numerous failures and breakdowns.**

The proposed redevelopment would also have a negative impact on elective surgery and treatment bookings together with staff retention and recruitment due to the poor environment and disruption during the works. As Option 1 is only a partial solution the environmental conditions after redevelopment would not be totally conducive towards redressing this impact. The reverse would be the case for the Clear Site New Build options and further operational savings are likely to be made through reductions in agency staff and higher revenue from elective surgery and treatment bookings.

9. Potential Capital Cost Savings

The Clear Site New Build options provide much greater scope for partnership capital investments in exchange for service contracts in order to reduce the Trust's own capital outlays and provide another way to achieve or better the OBC savings targets. These can include leases on space for food and retail outlets within the hospital(s), lease contracts for the provision of an energy centre and major equipment, and far more adventurous private partnerships with companies that provide allied healthcare services or healthcare support. There is no necessity for the Trust's offices to be part of the hospital buildings or estates and could be provided separately under a lease (this could potentially work well with the Crown Estate development where commercial buildings are already included within the plans). These opportunities should be fully explored.

10. Research and Decisions of other NHS Hospital Trusts

There is no credible basis to have excluded the Clear Site New Build options and no case for continuing to pursue the Trust's proposed redevelopment of the Watford estate. Many trusts, including those cited in this analysis have very carefully examined the option of redeveloping their existing estates with their professional advisers and established that such a course would be too disruptive and financially unviable, opting for new build developments on alternative land. Other trusts, including the PAH in Harlow, that is in the same STP group as WHHT, are pursuing the same course. It is very rare that a redevelopment scheme will prove more viable than clear site new build but the existing conditions at Watford and St Albans are such that they entirely preclude any plausible case for proceeding with redevelopment plans.