

**Mid Essex Hospital Services NHS Trust, Broomfield Hospital**

**EMPLOYER'S REQUIREMENTS**

**For**

**PROPOSED UPS AND ELECTRICAL INFRASTRUCTURE UPGRADING PROJECT**

**Client:**

Mid Essex Hospital Services NHS Trust  
Broomfield Hospital  
Hospital Approach  
Broomfield  
Chelmsford  
CM1 7ET

**RHH Associates Limited**

Beech Tree Cottage  
10 Hildersham Road  
Little Abington  
Cambridge  
CB21 6BP  
Tel: 01223 890788  
Mob: 07711 160285

<b>Date:</b>	January 2017
<b>Status:</b>	Tender issue
<b>Issue:</b>	T1

These are the Employer's Requirements referred to in the Contract

between Mid Essex Hospital Service NHS Trust  
and [to be confirmed] (Contractor)

dated .....

Signed ..... (Employer)

Signed ..... (Contractor)

**CONFIDENTIALITY STATEMENT AND DISCLAIMER**

- i. These Employer's Requirements are being made available by Mid Essex Hospital Services NHS (hereafter "MEHT" or "the Employer") only to those persons (hereafter "the Contractor(s)") identified to tender for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services at Broomfield Hospital (hereafter "the project").
- ii. The information contained in these Employer's Requirements, and all other information made available at any time to the Contractor by or on behalf of MEHT in connection with the project, is supplied on the basis of the terms of these Employer's Requirements and on the basis that the Contractor will keep such information confidential at all times and that such information will be used only for the purpose of participating in the bidding process for the project. The Contractor agrees as the recipient of these Employer's Requirements to keep confidential the information supplied therein by MEHT and its advisers.
- iii. The information provided may be made available to a Contractor's employees and professional advisers (who must be made aware of, and the Contractor shall ensure that they shall be bound by, the obligation of confidentiality) but shall not, either in whole or in part, be copied, reproduced, distributed or otherwise made available to any other party in any circumstances without the prior written consent of MEHT. All information provided (including all copies) remains the property of MEHT and must be delivered to MEHT on demand.
- iv. Although every care has been taken in preparing these Employer's Requirements, no representation, warranty or undertaking, express or implied, in respect of any error, misstatement or representation is or will be made and no responsibility or liability is given and no responsibility or liability will be accepted by MEHT, its employees, servants, agents or advisers ("connected persons") as to the accuracy or completeness of the Employer's Requirements or any other written or oral information made available to any Contractor. Any liability howsoever arising is expressly disclaimed.
- v. Information provided by MEHT or connected persons to the Contractor will be given in good faith but the Contractor will have to make their own investigations and interpretations and no liability will be accepted by MEHT or any connected persons for the fairness, accuracy or completeness of that information.
- vi. No information contained in the Employer's Requirements or any other written, oral or other information made available to the Contractor or its advisers shall form the basis for any warranty, representation or term of any contract by MEHT with any third party.
- vii. Nothing in the Employer's Requirements is or should be relied on as a promise or representation as to the future. MEHT reserves the right to change the procurement process and/or to change the nature of the procurement process or any of the proposals or information in relation to the project.
- viii. MEHT reserves the right to withdraw from the procurement process at any stage and no expense incurred by any person in responding to the Employer's Requirements and/or preparing a bid or otherwise engaging in this procurement process will be reimbursed. MEHT reserves the right not to award a contract for any reason. MEHT is not bound to accept the lowest or any tender.
- ix. The Contractor must bear all their own costs and expenses relating to the submission of the Employer's Requirements, their bids, any subsequent negotiations and all contractual arrangements, and any other bid costs.

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**PART 1 - PRELIMINARY AND CONTRACTUAL MATTERS****A. INTRODUCTION****1. BRIEF DESCRIPTION OF THE PROJECT****Mid Essex Hospital Services NHS Trust (MEHT)**

Mid Essex Hospital Services NHS Trust was established as an NHS Trust in 1992.

The Trust provides local elective and emergency services to 380,000 people living in and around the districts of Chelmsford, Maldon and Braintree (including Witham). The Trust also provides a county-wide plastics, head and neck and upper gastrointestinal (GI) surgical centre to a population of 3.4 million and a world renowned supra regional burns service at the St Andrew's Centre that serves a population of 9.8 million. The Trust employs nearly 4,000 staff.

The Trust's five year organisational strategy was launched in 2011, and developed in consultation with staff, stakeholders and the public, signposting the way forward. This strategy was encapsulated in the strap line "Care, Excel, Innovate". We have made positive progress to deliver our strategy and to ensure that all staff within the Trust know what our vision is. A staff survey during 2012 demonstrated that 83% of respondents were familiar with the Trust's vision and values.

The Trust is focused on continuing its progress against this strategy and delivering the service developments identified in its operating plan. The Trust developed four strategic priorities, aligned to the strategy, of which each have specific strategic objectives and lead to the delivery of our vision. These are set out below:

- Strategic Priority 1 – Clinical and Service Excellence
- Strategic Priority 2 – Quality Leadership
- Strategic Priority 3 – Effective Relationships
- Strategic Priority 4 – Business Excellence

**Introduction**

MEHT wishes to receive tenders for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services at Broomfield Hospital. The scheme will include the replacement of critical UPS equipment, Low Voltage (LV) sub and main distribution cabling and new LV switch panels, complete with new High Voltage substation comprising of new RMU and Transformer.

The new equipment will be housed in two separate locations across the hospital site. The first location will be a purpose constructed two storey electrical plant space to house UPS equipment including large battery sets, LV & HV switch panels and intake transformer equipment.

The second location will be the refurbishment of an existing plant space in the basement of one of the Hospital buildings and will house UPS equipment, including large battery sets and LV switch panels.

The upgrading will provide continuity of supply and further improved resilience to serve the Hospitals operating theatre suites and intensive care facilities.

The scheme design will incorporate provision within the LV switch panel to improve future standby generator capacity as part of a further upgrading scheme in 2018/19.

MEHT has separately tendered, under OJEU, the contract for the design, manufacture, supply, delivery to site, off-loading, moving to place of work, protecting, assembly, installation, testing and commissioning of the UPS supplies. The successful UPS sub-contractor (BPC Energy Limited) will be required to enter into a domestic sub-contract with the successful Principal Contractor. See Appendix I for further information.

## CDM Competency

In accordance with CDM regulation 4 please provide the following information:-

### Stage 1 - Core Criteria

- Provide details of membership of independent H&S accreditation body e.g., CHAS, Constuctionline or similar
- Provide a clear explanation of the arrangements you have for discharging duties under CDM for PC and designer
- Details and qualifications including membership of professional bodies etc for designers to be used
- Accident records for the last 3 years and any subsequent action to remedy any identified occurrences
- Details of any HSE notifications in the last 3 years together with any subsequent actions to prevent re-occurrences

### Stage 2 – Project Specific details

- Details of working on active hospital sites with electrical and civil content in the role as PC
- Details of recent experience of designers on working on Hospital projects with electrical and civil engineering content
- Details of referees for projects as above
- Details of any specific achievements in respect of coordination of shut downs and change-overs in critical healthcare environments

Ability to satisfy an acceptable standard for the above will result in the need for further investigation and information to be provided and you should be aware that you may be precluded you from further consideration.

## Project Philosophy

MEHT requires this project to be undertaken in a spirit of mutual trust, respect and co-operation with good relationships prevailing throughout and that conflict is avoided.

The level of co-ordination and communication of all the parties involved will determine the success of the project.

The Project Team is encouraged to work together to deliver a high quality product, safely, on time and within budget with due regard for whole life cycle costs.

It is important from the outset that all the main parties involved understand the project as a whole, not just their part in it so that a spirit of ownership is developed, whereby, through helping to arrive at a solution and method of design, a shared responsibility and reward is generated.

The Key stakeholders in the project will form part of the Project Team and are encouraged to participate in a pro-active and open way that is synonymous with this Project Philosophy.

MEHT wish to develop and maintain excellent relationships with all those involved with, or affected by this project, including the general public and requires members of the team to act as Project Ambassadors in this regard.

## 2. CONCEPT DESIGN

The Employer has engaged the following Lead Consultant to provide a concept design.

Lead Consulant's Name: RHH Associates Limited  
Address: Beech Tree Cottage  
10 Hildersham Road  
Little Abington  
Cambridge, CB21 6BP

The Lead Consultant has employed sub-consultants to assist with preparation of the concept / scheme design and other duties required in accordance with his appointment with MEHT.

### 3. NOVATION

Novation of Design Consultants is not required by the Client.

### 4. PLANNING APPROVAL

Chelmsford City Council granted Planning Permission for the construction of a two storey plant room on 17 November 2016 (see Appendix K).

Any amendments to the Contractor's Proposals that become necessary to conform to the approval for any specified planning conditions imposed by the Planning Authority shall be notified to the Employer prior to implementation. Such amendments shall be regarded as a change to the Employer's Requirements.

### 5. ALTERNATIVE TENDERS

The Contractor is required to compile his tender on the basis of the stated programme but is also invited to provide an alternative tender.

The following is a schedule of tenders required (see Form of Tender in Appendix D);

- Tender No. 1 - Fixed price tender on stated programme.
- Tender No. 2 - Fixed price tender on Contractor's alternative programme, if applicable.

### 6. DOCUMENTS AND TERMS USED ON THIS PROJECT

The Form of Contract will be the JCT Design and Build Contract 2016 Edition.

In this Form of Contract the Employer states his requirements in a document entitled Employer's Requirements and the Contractor is required to respond to these Employer's Requirements with a further document entitled the Contractor's Proposals. The breakdown of the Contract Sum is to be given in a Contract Sum Analysis annexed to the Contractor's Proposals.

#### 6.1 Employer's Requirements

The Employer's Requirements are contained in this document entitled "Employer's Requirements for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services for Mid Essex Hospital Services NHS Trust at Broomfield Hospital | January 2017" which contains both text and drawings.

Certain drawings, specifications and other documents have been prepared by consultants employed by the Employer prior to the date of this tender. These are set out in Part 1 Section G – Particular Specification of the Employer's Requirements. It is intended that these drawings specifications and documents be included in the Contractor's Proposals as described in Article 4 of the JCT Design and Build contract.

Tenderers are required to check and satisfy themselves as to the adequacy and completeness of the information contained in Part 1 Section G – Particular Specification and to confirm that they are happy that it be included in the Contractor's Proposals. If any tenderer has any comments or queries or if he believes that it is appropriate to make any alterations to the drawings specifications and documents contained in Part 1 Section G – Particular Specification, he is required to do so with his tender.

Wherever in these Employer's Requirements reference is made to the Particular Specification such provisions shall not form part of the Employer's Requirements but shall be regarded only as an indication to tenderers of the Employer's preferences. Where the Contractor adopts such preferences or modifications thereto these shall be deemed to form part of the Contractor's Proposals and therefore to have been checked and approved by the Contractor who will have the same liability therefore as if he had prepared them, or caused them to be prepared himself. Tenders are to be based on the Employer's Requirements and Particular Specification so that bids can be compared on an equal basis.

Tenderers will be permitted to submit with their tender alternatives to the Particular Specifications, together with the effect upon their tender amounts, provided only that they have submitted a tender which wholly incorporates the Particular Specifications.

Any such alternative proposals to the Particular Specification shall be of no less a standard than is stated in or reasonably to be inferred from the relevant Particular Specifications and the remainder of the tender documents.

## 6.2 Contractor's Proposals

The Contractor's Proposals shall be deemed to have incorporated the provisions of the Particular Specification in accordance with the previous clause of these Employer's Requirements and shall incorporate such further specification or general matters and drawings as are necessary fully to describe the Works and the standards to which the same shall be designed and constructed. Where the Contractor has, in his Contractor's Proposals, either proposed alternatives to the Particular Specification (in accordance with the previous clause of these Employer's Requirements) or incorporated further provisions, such alternatives and further provisions shall be to no less a standard of design, workmanship and materials than is contained in the Employer's Requirements and the Particular Specification or reasonably to be inferred there from and the Contractor shall inform the Employer of these changes. Any discrepancy between the Employer's Requirements and the Contractor's Proposals shall be resolved as laid down in clause 2.14.1 of the Conditions of Contract.

## 6.3 Contract Sum Analysis

The Contract Sum Analysis is to be appended to the Contractor's Proposals in the format laid out in Appendix A to these Employer's Requirements. Within one week of a request so to do and, in any event, prior to taking possession of the site, the Contractor shall furnish the Employer with a detailed and quantified Schedule of Rates in support of the Contract Sum Analysis and shall provide such further details or analyses as the Employer shall in his absolute discretion direct. Notwithstanding the quantities, descriptions and computations contained in either the Contract Sum Analysis or the Schedule of Rates, the Contract Sum shall be deemed fully to cover the carrying out and completion of both the design and construction of the Works.

## 6.4 Provisional Sums

The works that are the subject of Provisional Sums given in the Contract Sum Analysis supplied with the tender documents are listed in Appendix A and form part of these Employer's Requirements and such sums shall be deemed to be included in the Contract Sum. The Contractor is not permitted to use any other Provisional Sums in the formulation of his tender.

The Contractor is deemed to have allowed elsewhere in the Contract Sum for all other costs arising from incorporating the design and construction of work which is the subject of such Provisional Sums.

## 7. PERFORMANCE BOND

Within 7 days after being given instructions by the Employer to proceed with the Works, the Contractor shall procure that a surety which is a major insurance company or clearing bank approved by the Employer enters into a Bond. The Bond shall be for an amount equal to 10% of the amount of the Contract Sum. The Contractor shall pay all fees, premiums and stamp duty due in connection with the Bond.

## 8. PARENT COMPANY GUARANTEE

A Parent Company Guarantee is not required.

## 9. SUB-CONTRACTOR WARRANTIES

The Contractor will be required to secure sub-contractor warranties as set out in Schedule 14 of the Contract Particulars.

**B. CONTRACTUAL MATTERS****1. FORM OF CONTRACT**

The Contractor shall enter into a Contract with the Employer; the Form of Contract will be the JCT Design and Build Contract 2016 Edition.

The Contractor shall allow for the obligations, liabilities and services described therein.

First Recital: The Employer wishes to have the design and construction of the following work carried out:

Proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services for Mid Essex Hospital Services NHS Trust at Broomfield Hospital, Hospital Approach, Broomfield, Chelmsford, CM1 7ET.

Article 3: The Employer's Agent - see Section C. Preliminary Matters item 1.

Article 5: The Principal Designer - see Section C. Preliminary Matters item 1.

Article 6: The Principal Contractor – See Section C. Preliminary Matters item 1

**2. SCHEDULE OF CONTRACT CONDITIONS**

The following is a schedule of the Contract Conditions.

**Section 1: Definitions and Interpretation**

Definitions

Interpretation

**Section 2: Carrying out the Works**

Contractor's Obligations

Possession

Supply of Documents, Setting Out etc.

Discrepancies and Divergences

Design Work – liabilities and limitation

Fees, Royalties and Patent Rights

Unfixed Materials and Goods – property, risk etc

Adjustment of Completion Date

Practical Completion, Lateness and Liquidated Damages

Partial Possession by Employer

Defects

Contractor's Design Documents

**Section 3: Control of the Works**

Access and Representatives

Sub-Contracting

Employer's Instructions

CDM Regulations

**Section 4: Payment**

Contract Sum and Adjustments

Taxes

Payments and Notices – general provisions

Interim Payments – calculation of sums due

Listed Items

Retention

Loss and Expense

Final Statement and Final Payment

**Section 5: Changes**

General

The Valuation Rules

**Section 6: Injury, Damage and Insurance**

Personal Injury and Property Damage

Insurance against Personal Injury and Property Damage

Insurance of the Works and Existing Structures

Professional Indemnity Insurance

Joint Fire Code – compliance

**Section 7: Assignment, Performance Bonds and Guarantees, Third Party Rights and Collateral Warranties**

Assignment

Performance Bonds and Guarantees

Clauses 7A to 7E – Preliminary

Third Party Rights from Contractor

Collateral Warranties from Contractor

**Section 8: Termination**

General

Termination by Employer

Termination by Contractor

Termination by either Party and regulations 73(1)(a) and 73 (1)(c) of the PC Regulations

Consequences of Termination under Clauses 8.9 to 8.11, etc.

**Section 9: Settlement of Disputes**

Mediation

Adjudication

Arbitration

**3. CONTRACT PARTICULARS**

The Contract Documents referred to in Article 4 will comprise the documents identified as follows:-

The Employer's Requirements:

" Employer's Requirements for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services for Mid Essex Hospital Services NHS Trust at Broomfield Hospital | January 2017"

The Contractor's Proposals: [To be confirmed]

The Contract Sum Analysis: [To be confirmed]

**Attestation**

The Contract will be executed as a deed.

The contract conditions will be completed as follows:

Clause etc.	Subject	
Fourth Recital and clause 4.5	Construction Industry Scheme (CIS)	Employer at the Base Date is not a 'contractor' for the purposes of the CIS
Fifth Recital	Description of Sections (if any) (If not shown or described in the Employer's Requirements, state the reference numbers and dates or other identifiers of documents in which they are shown.)	Not applicable
Sixth Recital	Framework Agreement (if applicable) (State date, title and parties.)	Not applicable
Seventh Recital and Part 1 of Schedule 2	Supplemental Provisions – Part 1	
	Named Sub-Contractors	Supplemental Provision 1 applies
	Valuation of Changes – Contractor's estimates	Supplemental Provision 2 applies
	Loss and expense – Contractor's estimates	Supplemental Provision 3 applies
Seventh Recital and Part 2 of Schedule 2	Supplemental Provisions – Part 2	
	Acceleration Quotation	Supplemental Provision 4 applies
	Collaborative working	Supplemental Provision 5 does not apply
	Health and safety	Supplemental Provision 6 applies
	Cost savings and value improvements	Supplemental Provision 7 applies
	Sustainable development and environmental considerations	Supplemental Provision 8 applies
	Performance Indicators and monitoring	Supplemental Provision 9 does not apply
	Notification and negotiation of disputes	Supplemental Provision 10 applies
Where Supplemental Provision 10 applies, the respective nominees of the Parties are	Employer's nominee To be confirmed  Contractor's nominee To be confirmed or such replacement as each Party may notify to the other from time to time	

Article 4	Employer's Requirements <i>(State reference numbers and dates or other identifiers of documents in which these are contained.)</i>	"Employer's Requirements for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services for Mid Essex Hospital Services NHS Trust at Broomfield Hospital  January 2017"
Article 4	Contractor's Proposals <i>(State reference numbers and dates or other identifiers of documents in which these are contained.)</i>	To be confirmed
Article 4	Contract Sum Analysis <i>(State reference numbers and dates or other identifiers of documents in which these are contained.)</i>	To be confirmed
Article 8	Arbitration <i>(If neither entry is deleted, Article 8 and clauses 9.3 to 9. 8 do not apply. If disputes and differences are to be determined by arbitration and not by legal proceedings, it <u>must</u> be stated that Article 8 and clauses 9.3 to 9. 8 apply.)</i>	Article 8 and clauses 9.3 to 9. 8 (Arbitration) do not apply
1.1	Base Date	6 January 2017
1.1	BIM Protocol (where applicable) <i>(State title, edition, date or other identifies of the relevant documents.)</i>	Not applicable
1.1	Date for Completion of the Works <i>(where completion by Sections does not apply)</i>	13 October 2017
	Sections: Dates for Completion of Sections	Section : N/A Section : N/A Section : N/A
1.7	Addresses for service of notices by the Parties <i>(If none is stated, the address in each case, unless and until otherwise agreed and subject to clause 1.7.3, shall be that shown at the commencement of the Agreement.)</i>	Employer [to be confirmed] Contractor [to be confirmed]
2.3	Date of Possession of the site <i>(where possession by Sections does not apply)</i>	3 April 2017
	Sections: Dates of Possession of Sections	Section : N/A Section : N/A Section : N/A
2.4	Deferment of possession of the site <i>(where possession by Sections does not apply)</i>	Clause 2.4 does not apply
		Maximum period of deferment (if less than 6 weeks) is N/A
2.4	Sections: deferment of possession of Sections	Clause 2.4 does not apply

		Maximum period of deferment (if less than 6 weeks) is
		Section : N/A
		Section : N/A
		Section : N/A
2.17.3	Limit of Contractor's liability for loss of use etc. (if any)	£5,000,000
2.29.2	Liquidated damages (where completion by Sections does not apply)	At the rate of £0 per calendar week or pro rata thereto
	Sections: rate of liquidated damages for each Section	Section : N/A Section : N/A Section : N/A
2.34	Sections: Section Sums	Section : N/A Section : N/A Section : N/A
2.35	Rectification Period (where completion by Sections does not apply)	12 months from the date of practical completion of the Works
	Sections: Rectification Periods	Section : N/A Section : N/A Section : N/A from the date of practical completion of each Section
4.2, 4.12 and 4.13	Fluctuations Provision (Unless another option or entry is selected, JCT Fluctuations Option A applies.)	no Fluctuations Provision applies
4.6	Advance payment	Clause 4.6 does not apply
		If applicable: the advance payment will be N/A
4.6	Advance Payment Bond	An advance payment bond is not required
4.7.1	Method of payment – alternatives	periodically in accordance with Alternative B (clause 4.13)
4.7.2	Interim Payments – Interim Valuation Dates (The dates apply for each alternative; if no date is stated, the first Interim Valuation Date is one month after the Date of Possession.)	The first date is: [to be confirmed] and thereafter the same date in each month or the nearest Business Day in that month
4.15.4	Listed Items – uniquely identified	For uniquely identified Listed Items a bond in respect of payment for such items is required for
		N/A

4.15.5	Listed Items – not uniquely identified <i>(Delete the entry if clause 4.15.5 does not apply.)</i>	For Listed Items that are not uniquely identified a bond in respect of payment for such items is required for  N/A
4.17	Contractor's Retention Bond	Clause 4.17 does not apply  If clause 4.17 applies, the maximum aggregate sum for the purpose of clause 2 of the bond is  £ N/A  For the purpose of clause 6.3 of the bond, the expiry date shall be  N/A
4.18.1	Retention Percentage	3 per cent
5.5	Daywork	The Percentage Additions to each section of the prime cost or, if they apply in respect of labour, the All-Inclusive Rates, are set out in the following document  [to be confirmed]
6.4.1	Contractor's Public Liability insurance: injury to persons or property – the required level of cover is not less than	£5,000,000 for any one occurrence or series of occurrences arising out of one event
6.5.1	Insurance – liability of Employer	Minimum amount of indemnity for any one occurrence or series of occurrences arising out of one event  £ 5,000,000
6.7 and Schedule 3	Works insurance – Insurance Option applicable  Percentage to cover professional fees <i>(If no other percentage is stated, it shall be 15 percent.)</i>  Where Insurance Option C applies, paragraph C.1	Schedule 3: Insurance Option C applies  15 per cent  applies
6.10 and Schedule 3	Terrorism Cover – details of the required cover <i>(Unless otherwise stated, Pool Re Cover is required.)</i>	[to be confirmed]
6.15	Professional Indemnity insurance  Level of cover <i>(If an alternative is not selected the amount shall be the aggregate amount for any one period of insurance. A period of insurance for these</i>	Amount of indemnity required relates to claims or series of claims arising out of one event

	<i>purposes shall be one year unless otherwise stated.)</i>	and is
	<i>(If no amount is stated, insurance under clause 6.15 shall not be required.)</i>	£1,000,000
	Expiry of required period of Professional Indemnity insurance is	12 years
6.17	Joint Fire Code	The Joint Fire Code applies
	If the Joint Fire Code applies, state whether the insurer under Insurance Option A, B or C (paragraph C.2) has specified that the Works are a 'Large Project':	Yes
6.20	Joint Fire Code – amendments/revisions	The cost, if any, of compliance with amendment(s) or revision(s) to the Joint Fire Code shall be borne by the Contractor
7.2	Assignment/grant by Employer of rights under clause 7.2 <i>(If neither entry is deleted, clause 7.2 applies.)</i>	Clause 7.2 applies
	Sections: rights under clause 7.2 <i>(If clause 7.2 applies, amend the entry if rights under that clause are to apply to certain Sections only.)</i>	N/A
7.3	Performance bond or guarantee from bank or other approved surety <i>(If this entry is not completed or the required form is not specified, a performance bond or guarantee is not required.)</i>	is required
	The required form of the bond or guarantee is set out in	[to be confirmed]
	Initial value	[to be confirmed] per cent of the Contract Sum
	Period of validity – if not specified in the required form, the expiry date of the performance bond or guarantee is to be	the date of practical completion of the Works
	Reduction in value – if not specified in the required form and if expiring later than the date of practical completion of the Works, the percentage reduction in the initial value on that date is	50 per cent
7.3.2	Guarantee from the Contractor's parent company	Is not required
	Parent company's name and registration number	N/A
	The required form of the guarantee is set out in	N/A

7.4	Third Party Rights and Collateral Warranties – details of the requirements for the grant by the Contractor and sub-contractors of P&T Rights, Funder Rights and/or (in the case of sub-contractors) Employer Rights in respect of the Works, either as third party rights or by collateral warranties ('Rights Particulars') are set out in the following document <i>(State reference number and date or other identifier of the relevant document)</i>	“Employer's Requirements for the proposed upgrading of major UPS and electrical infrastructure systems that support essential clinical services for Mid Essex Hospital Services NHS Trust at Broomfield Hospital  January 2017”
8.9.2	Period of suspension <i>(If none is stated, the period is 2 months.)</i>	2 months
8.11.1.1 to 8.11.1.6	Period of suspension <i>(If none is stated, the period is 2 months.)</i>	2 months
9.2.1	Adjudication  Nominating body – where no Adjudicator is named or where the named Adjudicator is unwilling or unable to act (whenever that is established) <i>(Where an Adjudicator is not named and a nominating body has not been selected, the nominating body shall be one of the bodies listed opposite selected by the Party requiring the reference to adjudication.)</i>	The Adjudicator is [to be confirmed]  The Royal Institution of Chartered Surveyors
9.4.1	Arbitration - appointor of Arbitrator (and of any replacement)	Delete and insert “Not Used”

### Third Party Rights and Collateral Warranties

#### 4. PRELIMINARIES IN INTERIM APPLICATIONS

Preliminaries will be valued for the purpose of inclusion in Interim Applications on the following basis:

1. Fixed charge items will be valued as and when the charge is properly incurred.
2. Time related charge items will be expressed as a percentage of the Contract Sum excluding the value of all preliminaries items and provisional sums. This percentage will be added to the value of work properly executed and referred to in Contract clause 4.13 or 4.14 as applicable excluding the value of Changes. This method of valuing preliminary items is for the purposes of Interim Applications only and shall not be construed as setting a precedent for adoption in the valuation of Changes.

**C. PRELIMINARY MATTERS****1. NAMES OF PARTIES**

The names of the parties to be inserted in the Articles of Agreement are as follows:-

Employer:	<p>Mid Essex Hospital Services NHS Trust Broomfield Hospital Hospital Approach Broomfield Chelmsford, CM1 7ET</p> <p>Contact: Anthony Doyle (Project Manager) Mbl: 07990 570407 E-mail: <a href="mailto:tony.doyle@meht.nhs.uk">tony.doyle@meht.nhs.uk</a></p> <p>Contact: Phil Robson (Capital Projects Manager) Mbl: 07789 512416 E-mail: <a href="mailto:phil.robson@meht.nhs.uk">phil.robson@meht.nhs.uk</a></p> <p>Contact: Ashley John (Capital Procurement Manager) Mbl: 07709 571331 E-mail: <a href="mailto:ashley.john@meht.nhs.uk">ashley.john@meht.nhs.uk</a></p>
Employer's Agent & Cost Consultant:	<p>RHH Associates Limited Beech Tree Cottage 10 Hildersham Road Little Abington Cambridge, CB21 6BP</p> <p>Contact: Richard Howe Mbl: 07983 506130 Email: <a href="mailto:richard@rhassociates.com">richard@rhassociates.com</a></p> <p>Contact: Freya Halls Mbl: 07919 366735 Email: <a href="mailto:freya@rhassociates.co.uk">freya@rhassociates.co.uk</a></p>
Principle Designer:	The Contractor [To be confirmed]
Principal Contractor:	The Contractor [To be confirmed]

**1.1 Employer's Consultant**

The Employer has engaged for the preparation of tender documentation, final statement and assistance in carrying out his duties under the Contract:-

RHH Associates Limited  
Beech Tree Cottage  
10 Hildersham Road  
Little Abington  
Cambridge, CB21 6BP

Tel: 01223 890788  
Mob: 07983 506130

Contact: Richard Howe  
Email: [richard@rhassociates.com](mailto:richard@rhassociates.com)

## 2. SITE REQUIREMENTS

### 2.1 The Site

The site is located at:

Broomfield Hospital  
Hospital Approach  
Broomfield  
Chelmsford  
CM1 7ET

The boundaries of the site are as indicated on the drawing(s) included in Appendix B.

Access to the site is indicated on the drawing(s) included in Appendix B.

All buildings adjacent to the site will be in operation during the works.

The approximate boundaries of the site, the means of access and the position of the works are as indicated on the drawings listed in Appendix B.

The site may be visited by appointment with Freya Halls ([freya@rhassociates.co.uk](mailto:freya@rhassociates.co.uk)).

Before tendering the Contractor is strongly advised to visit the site, ascertain the nature of the site, access thereto and all local existing conditions and restrictions likely to affect the execution of the Works. The Contractor shall be deemed to have visited the site, to have inspected the trial holes, to have taken into consideration all local and existing conditions and to have become thoroughly acquainted with the position and accessibility of the proposed works and the conditions under which they will have to be carried out.

The Contractor shall note the site entrances and all access routes will remain in use throughout the contract period.

Contractor shall ascertain the required vehicular and pedestrian access route(s), both generally and adjacent to the site, and ensure they remain open and accessible to the public and MEHT staff at all times during the Contract. A restricted amount of passes may be issued to the Contractor by the Employer for the duration of the contract.

Parking of the Contractor's and employee's vehicles will be restricted to within the site compound area. The number and location of parking spaces within this compound will need to be agreed with the Employer. No other specific parking provision will be made available by the Employer. The Contractor shall therefore make alternative arrangements for parking of vehicles and transport to the site.

Attention is drawn to the services and installations known to exist on and adjacent to the site and within the adjacent existing buildings affected by the works, shown on drawings listed in Appendix B and those held by MEHT. Although the Employer's Requirements contain drawings indicating the possible location and extent of existing services to the affected area, the Contractor shall be deemed to have fully liaised with the relevant authorities and fully acquainted himself with the positions and details of such services and installations and the need to keep existing parking/ turning areas, roads, footpaths and fire escape routes clear at all times.

### 2.2 Availability of the Site

The site will be made available on the Date of Possession of the site.

Disturbed areas are to be fully reinstated at the end of the Contract when vacated by the Contractor.

Any land contamination or archaeology will be the responsibility of the Contractor and will form part of the normal legal searches.

### 2.3 Sectional Completion

The Contractor shall ensure that each part of the Works (including work located elsewhere on the site to permit the part of the building handed over to function properly) is completed as stated in the Contract Particulars (including testing and commissioning) and provide, maintain, adapt and clear away on completion all additional temporary works, including temporary service supplies, drain runs and the like and provide all facilities necessary to enable each part of the Works to be occupied and/or used as intended to the entire satisfaction of the Employer and of Statutory Authorities.

The Contractor shall ensure that the remaining parts of the Works are executed and completed with the minimum of noise and without interfering in any way with that part of the Works given over to the possession of the Employer.

The Contractor shall alter, adapt, move and replace all temporary works and all water and electricity supplies necessary for the phased possession of the site and for the phased execution and phased completion of the Works.

### 2.4 Adjacent Works by Other Contractors

The Contractor shall liaise closely with any other Contractors undertaking work adjacent to the site to ensure there is no conflict between them and in particular their use of and access to their respective sites. The success of this project will therefore be determined by the level of co-ordination and communication of all the parties involved. The Contractor is also referred to Section C.8 - Works not forming part of this contract.

### 2.5 Existing Trees and Shrubs

Existing trees and shrubs within the site boundary are to be retained and protected unless identified by the Employer for removal.

### 2.6 Materials Excavated from the Site

Any sand and gravel discovered on the site during excavation shall be the property of the Employer and shall not be removed from the site without the prior approval of the Employer. Such materials shall not be used in the Works except under the express instructions of the Employer, in which case the quantity used shall be measured and valued and such value deducted from the monies due or which may become due to the Contractor. Excavation shall not be made or enlarged for the recovery of such material.

### 2.7 Giving Notice

Give the Employer adequate notice of the following:-

1. Starting and completion dates of critical activities
2. Dates when work is due to be covered up
3. Overtime (for reasons of supervision and/or security)
4. Claims for extension of time or progress disturbed etc
5. Defects or extra works etc.
6. Disconnection or diversion of existing services

## 3. TEMPORARY FACILITIES

### 3.1 Site Security and Temporary Works

The Contractor shall erect Fencing and Viewing Platforms and take all measures necessary to ensure the security of the site and be responsible for the safety of the public. Pay particular attention to the need to provide safety for blind and disabled persons.

Where necessary, the Contractor shall erect external fencing and/or hoardings to the perimeter of the site and/or Contractor's compound. Such provision to be 2.40m high (minimum) and decorated to a scheme agreed with the Employer prior to commencing works on site. The Contractor shall ensure adequate security measures, including lockable gates, are provided at access points through the fencing/hoarding to prevent unauthorised entry/exit by members of the public or MEHT staff. The Contractor shall pay particular attention to the need to maintain privacy for

staff using the adjacent buildings and to minimise any possible disruption to the activities of the MEHT which may result from noise emanating from the site.

The Contractor shall erect temporary screens around areas of work within the existing buildings and/or where the new works interface with existing internal areas. Such screens to be full height and provide the necessary security requirements and be of suitable construction to prevent the ingress of dust/dirt to areas not affected by the Works (for example polythene sheeting on timber framework with timber boarding one side). Access points through the screens should be lockable.

Should the (temporary) use of existing corridors/internal areas be necessary to gain access to certain parts of the Works, the Contractor shall seek the Employer's permission prior to utilising any such facility. Where permission is granted the Contractor shall ensure all floor, wall and ceiling finishes and other affected areas are adequately protected to prevent damage.

In addition the Contractor shall take all further measures as necessary (including warning notices, lighting and the like) to ensure the security of the site (including works undertaken beyond the boundary of the site) and be responsible for the safety of the public.

The Contractor shall provide and maintain all necessary temporary shoring, strutting, needling and other supports/protective measures as may be necessary to preserve the stability and/or integrity of any existing structures and/or buildings that may be endangered or affected by the Works.

The Contractor shall notify the Employer of any relocation of equipment/furniture necessary as a result of carrying out the Works.

The Contractor will be required to submit method statements and design information for the proposed temporary screens/hoardings as part of his Contractor's Proposals.

### 3.2 Site Compound and Temporary Buildings

The Contractor shall provide space within his temporary site offices for the use of persons acting on behalf of the Employer and for the purpose of meetings. The Contractor shall ensure the offices are suitably furnished with chairs, tables and the like and provide all lighting, heating, water, sanitary accommodation and attendance.

### 3.3 Existing Accommodation

Any decoration and/or temporary adaptations must be approved by or on behalf of the Employer before being carried out.

At the end of the Contract the condition of the accommodation must be at least equivalent to its condition at the start of the Contract.

### 3.4 Temporary Services

The Contractor shall arrange with the Employer for the provision of clean water for the Works via agreed connection points to the existing system. Include for the provision of all temporary plumbing work and storage of water and reinstating all work disturbed on completion.

Where appropriate, provide all necessary temporary electrical circuit distribution wiring throughout the Works to facilitate power and lighting to all parts of the project for use by Contractor and Sub-Contractors. The temporary electrical system is to be connected to the permanent system at agreed locations and separately metered.

Include for all charges involved in obtaining a service, arranging for a service to be connected, installing meters, current consumed and disconnection of service. All electrical installations are to comply with the latest IEE Regulations.

### 3.5 Telephone

The Contractor shall provide as soon as practicable after the Date of Possession a temporary on-site telephone installation for use by the Contractor, Sub-Contractors, Consultants and those acting for or on behalf of the Employer; and pay all charges (installation costs, rental costs, cost of calls and disconnection charges). Make arrangements (e.g. an external bell if necessary) to ensure that incoming calls are answered reasonably promptly.

### 3.6 E-mail

The Contractor shall provide as soon as practicable after the Date of Possession a dedicated telephone line to be used for e-mail for the use of the Contractor, Sub-Contractors, Consultants and those acting for or on behalf of the Employer and pay all charges (installation costs, rental costs, cost of calls and disconnection charges).

### 3.7 Photocopier

The Contractor shall provide reasonably unrestricted access to and free reasonable use of an on-site photocopier, which may be located in the Contractor's own site offices, together with a free reasonable supply of photocopying paper.

### 3.8 Protective Clothing

The Contractor shall provide all safety and protective clothing for those acting for or on behalf of the Employer, as required under Health and Safety Legislation or may be deemed necessary on a project/site of this nature.

## 4. LOCAL AUTHORITIES AND STATUTORY UNDERTAKERS

The Contractor shall liaise with all Local Authorities and Statutory Undertakers which have any jurisdiction with regard to the works or with whose systems the same are or will be connected and obtain from them the location of all existing services and their requirements in relation to the Works.

The Contractor shall obtain the provision of all services to and from the Works by such bodies, co-ordinate the same with each other and the remainder of the Works, provide all necessary attendance, setting out and the like, and pay all fees and charges including prescribed fees payable under the Building (Amendment of Prescribed Fees) Regulations ruling at the Base Date.

## 5. EXISTING SERVICES

Notwithstanding any information which the Employer may make available regarding the position of existing services etc., it shall be the responsibility of the Contractor to satisfy himself as to the accurate locations and conditions of any and all such services.

The Contractor shall uphold and protect all pipes, ducts, sewers, service mains, overhead cables, and statutory undertakers' apparatus and make good at own expense any damage caused thereto.

The Contractor shall make all necessary arrangements with the Authorities concerned for the diversion, if necessary, of any existing services as required for the purposes of this Contract.

## 6. MATERIALS AND WORKMANSHIP

### 6.1 Definitions and Interpretations

The meaning of terms, derived terms and synonyms used in the Employer's Requirements/Contractor's Proposals are as defined below or in the appropriate British Standard or British Standard glossary.

**In writing:** When required to notify, inform, instruct, agree, confirm, obtain information, obtain approval or obtain instructions, do so in writing.

**Approval** (and words derived there from) means the approval in writing of the Employer or Employer's Agent unless specified otherwise.

**Product** means materials (including naturally occurring materials) and goods (including components, equipment and accessories) intended for permanent incorporation in the Works.

Where any product is specified to comply with a British Standard for which there is no equivalent European Standard it may be substituted by a product complying with a grade or category within a national standard of another Member State of the European Community or an international standard recognised in the UK specifying equivalent requirements and assurances in respect of material, safety, reliability, function, compatibility with adjacent construction, availability of compatible accessories and, where relevant, appearance.

In advance of ordering, notify the Contractor's Consultants and Employer's Agent of all such substitutions and, when requested, submit for verification documentary evidence confirming that the products comply with the specified requirements. Submit certified English translations of foreign language documents.

References to BSI Documents are to the versions and amendments listed in the BSI Standards Catalogue current at the Base Date.

Unless otherwise stated products are specified by their co-ordinating sizes.

Where **Manufacturer and Reference** is used in this combination:

'**Manufacturer**' means the firm under whose name the particular product is marketed.

'**Reference**' means the proprietary brand name and/or reference by which the particular product is identified.

**Fix only** means all labours in unloading, handling, storing and fixing in position, including use of all plant.

**Supply and fix:** Unless stated otherwise all items given in the Pricing Schedules and/or on the drawings are to be supplied and fixed complete.

## 6.2 Generally

All materials, goods and workmanship shall be the best available of their respective kinds and shall be:-

(i) in accordance with good building practice and of no less a standard than the British Standard Specification and Codes of Practice referred to in the Employer's Requirements and Contractor's Proposals, or where none is specified, in accordance with the latest relevant British Standard Specifications or Codes of Practice.

(ii) suitable for the purposes for which they are intended.

All materials, components and equipment shall be selected with careful regard for their fitness for purpose, appearance, long anticipated life, cost-in-use, and ease of maintenance and/or replacement or repair.

Where and to the extent that materials, goods and workmanship are stated to be subject to the consent or approval of the Employer they shall comply with all other requirements of the Contract and shall either have the written consent of the Employer or match, with the consent of the Employer, a sample expressly accepted by him as a standard for that purpose.

Where and to the extent, that any materials and workmanship necessary for completion of the Works contribute to the finished internal or external appearance of the Works the quality of materials and standards of workmanship whether specifically so described or not are to be subject to the consent of the Employer. In all such cases and also where the quality of materials or standards of workmanship are required by the Employer's Requirements or Contractor's Proposals to be subject to the consent of the Employer the same shall be to the reasonable satisfaction of the Employer.

Mock-ups and samples of materials shall be provided by the Contractor to demonstrate the standards of workmanship or materials, or the co-ordination or functioning of the various elements, including such samples as are specifically referred to elsewhere in these Employer's Requirements. The Contractor shall obtain the written consent of the Employer to each such sample or mock-up before ordering such materials or commencing such work.

The degree to which the standard of workmanship in the finished work can be determined from and compared with those to be found in such samples is to be a matter for the opinion of the Employer.

Such samples and mock-ups when consented to by the Employer shall be retained on site for comparison purposes and protected as necessary. Those not forming part of the finished works shall be removed on completion of the Works.

No inspection, action or statement is to be taken as consent by the Employer unless confirmed by the Employer in writing in express terms referring to the date and circumstances of inspection and the extent and purpose of the approval.

The combination or juxtaposition of any materials, components or equipment, as are necessary to form part of the proposed construction assembly of a building element, shall also fall within the scope of this clause.

### 6.3 Contracts for Supply of Materials

The Contractor shall ensure that all Contracts for the supply or the supply and fixing of materials or goods provide for the property in such materials or goods upon delivery to site to pass unconditionally to the Contractor.

### 6.4 Proprietary Products

The Contractor shall handle, store, prepare and use or fix each product in accordance with its manufacturer's current printed or written recommendations/instructions. The Contractor shall inform the Contractor's Consultants and Employer's Agent if these conflict with any other specified requirement. Submit copies to the Contractor's Consultants and Employer's Agent when requested.

The tender will be deemed to be based on the products as marketed and recommendations on their use current at a date ten days before the date for delivery of the tender.

The Contractor shall obtain confirmation from manufacturers that the products specified and recommendations on their use have not been changed since that time. Where such change has occurred, inform the Contractor's Consultants and Employer's Agent and do not place orders for or use the affected products without further instructions.

Where British Board of Agreement certified products are used, the Contractor shall comply with the limitations, recommendations and requirements of the relevant valid certificates.

### 6.5 Checking Compliance of Products

The Contractor shall check all delivery tickets, labels, identification marks and, where appropriate, the products themselves to ensure that all products comply with the project documents. Where different types of any product are specified, the Contractor shall check to ensure that the correct type is being used in each location. In particular, the Contractor shall check that:

The sources, types, qualities, finishes and colours are correct, and match any approved samples.

All accessories and fixings which should be supplied with the goods have been supplied.

Sizes and dimensions are correct. Where tolerances of components are critical, measure a sufficient quantity to ensure compliance.

The delivered quantities are correct, to ensure that shortages do not cause delays in the work.

The products are clean, undamaged and otherwise in good condition.

Products which have a limited shelf life are not out of date.

### 6.6 Water for the Works

The Contractor shall use only clean and uncontaminated water. If other than mains supply is proposed the Contractor shall provide evidence of suitability and test to BS 3148 if instructed.

### 6.7 Cutting Holes, etc.

Unless otherwise described all holes through concrete walls, floors, beams, columns and the like and through hollow block floors shall be formed with formwork when the concrete is poured. No such holes may be cut through the completed concrete members or hollow block floors without the Contractor's Consultants' or Employer's Agent's

permission. All holes through block and brick partitions and the like shall be cut or formed before the plaster, wall tiles or other finish is applied.

The extra cost of cutting holes through concrete partitions and the like after the finish has been applied will not be reimbursed unless the work is carried out on the instructions of the Employer's Agent which will only be given when he is satisfied that every endeavour has been used to comply with these conditions. Permission to cut holes which could have been formed during construction will not be deemed to be Changes.

#### 6.8 Protection of Products

The Contractor shall:-

Prevent over-stressing, distortion and any other type of physical damage.

Keep clean and free from contamination. Prevent staining, chipping, scratching or other disfigurement, particularly of products exposed to view in the finished work.

Keep dry and in a suitably low humidity atmosphere to prevent premature setting, moisture movement and similar defects. Where appropriate store off the ground and allow free air movement around and between stored products.

Prevent excessively high or low temperatures and rapid changes of temperature in the products.

Protect adequately from rain, damp, frost, sun and other elements as appropriate. Ensure that products are at a suitable temperature and moisture content at time of use.

Ensure that sheds and covers are of ample size, in good weatherproof condition and well secured.

Keep different types and grades of products separately and adequately identified.

So far as possible keep products in their original wrappings, packings or containers, until immediately before they are used.

Whenever possible retain protective wrappings after fixing and until shortly before Practical Completion.

Ensure that protective measures are fully compatible with and not prejudicial to the products/materials.

#### 6.9 Suitability of Related Work and Conditions

The Contractor shall ensure that all trades are provided with necessary details of related types of work. Before starting each new type or section of work, the Contractor shall ensure that:

Previous, related work is appropriately complete, in accordance with the project documents, to a suitable standard and in a suitable condition to receive the new work.

All necessary preparatory work has been carried out, including provision for services, openings, supports, fixings, damp proofing, priming and sealing.

The environmental conditions are suitable, particularly that the building is suitably weathertight when internal components, services and finishes are installed.

#### 6.10 Inspection

The Contractor shall permit and attend upon the inspection of the Works and of the manufacture and fabrication of materials therefore both on the site and in workshops and obtain the same facility from Sub-Contractors and suppliers. The Contractor shall give 7 days' notice to the Employer of his intention to commence testing or commissioning any part of the Works.

### 6.11 Testing

The Contractor shall provide for the opening up for inspection and the carrying out of such tests as are stated elsewhere in these Employer's Requirements and also such as are, in the opinion of the Employer, reasonably necessary to demonstrate that materials and workmanship are in accordance with these Employer's Requirements and the Contractor's Proposals, or such further data as has been endorsed in accordance with clause 2.8 of the Conditions of Contract.

The Contractor shall provide all necessary information, test data, reports and certificates, carry out tests and arrange demonstrations, as necessary to satisfy the Employer with regard to any material component or equipment which is proposed for incorporation in the Works.

Such tests shall be undertaken in a testing laboratory acceptable to the Employer. The Employer's decision on the acceptability or otherwise of materials based on the results of each test properly carried out shall be binding.

### 6.12 Notice Prior to Cover

Notice prior to cover is to be given in reasonable time (and in no case less than 24 hours) by the Contractor to the Employer and to any relevant Sub-Contractor whenever any works or materials are intended to be covered by earth, lagging, structural duct covers, walls, floors, ceilings or otherwise built in.

## 7. PROGRAMME

The Contractor shall submit with the tender, for comment by the Employer, the programme for the execution of the Works which shall show:-

- (a) A detailed analysis of the drawings and other data necessary to achieve a full scale start on site and the proposed timing for the production of the drawings and data
- (b) The dates for possession and completion referred to in the Contract Conditions
- (c) The periods included to obtain statutory approvals and the like.
- (d) The dates determined or proposed for commencement and completion of all trades, including those Sub-Contracted or to be Sub-Contracted and including the work and approvals of statutory bodies.
- (e) Such dates as can be made available or the commencement and completion of all Contracts for works not forming part of this Contract which the Employer has placed or intends to place direct and the existence of which have been made known to the Contractor.
- (f) The detailed co-ordination of all of the elements of the Works.
- (g) The detailed commissioning programme for all services.
- (h) The dates for holidays proposed to be taken.
- (i) All matters relating to Party Wall and Boundary Wall Awards.

The programme will be a linked bar chart programme and will be plotted from the computer software intended for the project. The critical paths must be clearly shown on the linked bar chart.

In preparing and in updating his programme the Contractor shall take account of the periods stated in clause 2.8 of the Conditions of Contract.

The Contractor shall also show on this programme each stage of both the design and construction of the various elements of the works so as to illustrate the latest dates by which instructions requiring changes can be accommodated in each part of the Works without affecting the completion (of any Section) thereof. Thereafter, the Contractor shall amend and revise the programme as required by the Conditions of Contract and as required by the Employer. In so doing, the Contractor shall obtain from all Sub-Contractors and statutory bodies and use his best endeavours to obtain

from all Contractors referred to in (e) above (including those made known to him during the course of the Contract) any updating in their progress or programme which has occurred or is likely to occur and incorporate this in the revised master programme.

The Contractor shall record progress on a copy of the programme kept on site. If any circumstances arise which may affect the progress of the Works, he shall put forward proposals or take other action as appropriate to minimise any delay and to recover any lost time.

#### 7.1 Progress Reporting

- (a) A detailed progress report is required every month from commencement of the project. In this report the Contractor will provide a scheduled report against all individual activities that should have started as at the date of the progress report. A numeric plus or minus statement for each activity is required along with a summary statement where appropriate.
- (b) In addition to the detailed report against the individual activities an overall statement report against the project's critical path status must be submitted.
- (c) This percentage and synopsis report must be prepared against the master programme at all times, unless the Employer's Agent agrees otherwise.
- (d) The Employer's Agent should be invited to site meetings and where necessary be permitted to witness commissioning.

#### 7.2 Drawings Issue and Approvals Register

The Contractor will be required to produce a Drawings Issue and Approvals Register and update this every month from commencement on site for issue to the Employer's Agent for information only.

### 8. WORKS NOT FORMING PART OF THIS CONTRACT

The Employer reserves the right to enter into separate Contracts for work requisite to the completion of the development which may proceed concurrently with, but not as part of, this Contract. Such separate Contracts will include:

- (a) To be confirmed

The Contractor shall provide access for persons carrying out any such separate Contracts and for any other persons engaged to execute work not forming part of this Contract, and permit the use of roads constructed under this Contract and provide such other facilities as are reasonably necessary to enable them to proceed expeditiously with their work.

### 9. SITE CONDITIONS

Upon taking possession of the site inspect, establish and record with the Employer the condition of the existing roads, street furniture etc., and make good all damage thereto arising from or caused by the execution of the Works to the satisfaction of the Employer.

The arrangement for delivery of materials is to be agreed with the Employer before commencement of the works. The arrangements for on-site parking (and the siting and construction of temporary parks) is to be agreed with the Employer before commencement of the Works.

### 10. OBLIGATIONS AND RESTRICTIONS

#### 10.1 Use of the Site

The site shall not be used for any purpose other than the carrying out of the Works.

The Contractor shall give written notice to the Employer at least 48 hours before the day on which any work outside normal working hours is proposed. In an emergency it is the Contractor's primary responsibility to make arrangements

to deal with the emergency and then to telephone and advise the Employer of his action. In any event the Contractor is to ensure that constant and proper supervision is provided for all work undertaken, including that undertaken by Sub-Contractors and suppliers outside normal working hours.

The Contractor shall inform the Employer's Agent in advance of all safety provisions and procedures (including those relating to materials which may be deleterious) which will require the compliance of the Employer or his representatives when visiting the site. Provide protective clothing and/or equipment for the Employer and his representatives as appropriate.

The Contractor shall provide all necessary facilities for the Employer or those authorised by him when visiting the site and give him such directions as shall be necessary to ensure their safety during such visits.

#### 10.2 Control of Noise, Nuisance and the Like

The Contractor shall:

Comply generally with BS 5228.

Fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.

Not use or permit employees to use radios or other audio equipment in ways or at times which may cause nuisance.

The Contractor shall take all necessary measures to minimise noise, vibration and all other nuisance to the occupiers or users of adjoining properties in accordance with current environmental legislation.

The Contractor shall make allowance in his tender for the effect on his programme and the cost of any disturbance to his progress of the works due to any dispute related to his noisy working.

#### 10.3 Site Access and Employment Security Arrangements

The Contractor shall ascertain the means of access to the site necessary for the execution of the Works and allow for all restrictions and costs that may be incurred through the requirements of any Statutory Undertaking or Police Regulations. The Contractor shall provide, maintain and alter from time to time as may be required all necessary temporary roadways, crossings, gantries, etc., for access to the site and for the works, and shall clear away when no longer required and make good all works disturbed and pay all charges.

HSE Approved Codes of Practice: Comply with the following:-

Management of health and safety at work

Managing construction for health and safety

The Contractor shall adequately safeguard the site, the Works, products, materials, plant and the new building from damage and theft. Take all reasonable precautions to prevent unauthorised access to the site, the Works and adjoining property.

The Contractor shall accept responsibility for the stability and structural integrity of the works during the Contract, and support as necessary.

#### 10.4 Maintenance of Adjoining Buildings, Roads, Footpaths, etc.

The Contractor shall be responsible, and include in his Tender for the upholding of the adjoining buildings, roads and footpaths, etc. together with the mains and services there under from the moment he takes possession of the site. The Contractor shall hold the Employer indemnified against all and every claim which may be brought against him for loss and/or damage of any description which may be caused to the adjoining building and adjacent roads and footpaths with the mains and services there under by reason of the carrying out of the works or by reason of insufficiency of shoring and strutting.

The Contractor shall be responsible for carrying out his own condition survey of the surrounding roads and footpaths and for agreeing it with the Employer prior to commencement of the works.

The Contractor shall ensure that all gutters, down pipes, roofs, etc., on adjoining buildings are kept clean and free from blockage and that periodic cleaning of dust and debris on adjoining buildings is carried out as required or upon reasonable request.

#### 10.5 Access to Adjoining Buildings and Property

The Contractor shall so arrange and carry out the Works so as to cause no interference or interruption to the use of the adjoining buildings or services nor of the roads, footpaths and other means of access to these buildings and services.

#### 10.6 Protection of Streams, Waterways, Drains and Sewers and the Like

The Contractor shall take all precautions to ensure the protection of all streams and waterways against pollution caused by carrying out the Works and shall carry out any necessary diversions to the satisfaction of the Employer and all relevant statutory authorities so as not to reduce the capacity of the streams or waterways.

Existing sewers and drains displaced or blocked during the course of the Works shall be immediately reinstated in working order including any necessary diversions to the satisfaction of the Employer and all relevant statutory authorities.

#### 10.7 Public Safety

The Contractor shall assume responsibility for complying with statutory requirements with respect to Public Safety for all works in connection with this Contract.

The Contractor shall safeguard public road users from site traffic including supervising all site related plant and goods vehicles entering and exiting site and/or when carrying out manoeuvres.

The Contractor shall submit to the Employer for his comment, proposals for complying with these requirements.

The Contractor's attention is drawn to the public footpaths adjacent to the site.

#### 10.8 Safety, Health and Welfare of Workpeople

Where an accident occurs on site which is notifiable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 and the Employment Act 1988, Section 24(3), a copy shall be sent to the Employer.

#### 10.9 Control of Hazardous Substances

The Contractor shall comply with the requirements of the Control of Substances Hazardous to Health Regulations (issued under the Health and Safety at Work, etc Act), the Environmental Protection Act 1990 and all other Statutory Requirements relating to the control of hazardous substances and the like.

In addition to complying with the above, the Contractor shall give advance notice in writing to the Employer's Agent warning him of any "substance hazardous to health", provide him with a copy of the "assessment of health risks" as defined in the Regulations, specify the hazardous substances, their location and the dates when they could be encountered before Practical Completion by any employees or representatives of the Employer. The Contractor shall provide a similar notice to the Employer (with a copy to the Employer's Agent) about any hazardous substances to be used in work carried out after Practical Completion of any part of the Works.

Copies of all notices given under this clause shall be provided by the Contractor to all Consultants involved in this project.

#### 10.10 Maintenance of Public and Private Roads

Damage to any highways caused by vehicles used in connection with works shall be made good at the expense of the Contractor. The Contractor shall indemnify the Employer against any liability, loss, claim or proceedings whatsoever arising under any statute or at common law in respect of any such damage. No materials shall be stored on the highway.

For the purpose of this clause the term "Highway" shall be deemed to include any road, footpath or bridleway on or off the site, used by the public, together with any verges, gullies, sewers, street lighting, public utility services or tree planting associated therewith.

#### 10.11 Removal of Rubbish and Cleaning the Works

The Contractor shall remove all rubbish and debris (including the protective casings and coverings) from the whole of the site from time to time during the execution of and at the completion of the Works to a tip provided by the Contractor.

The Contractor shall clean the buildings inside and out, remove stains and touch up decorations and leave the whole of the Works to the satisfaction of the Employer on completion.

The Contractor shall clean out and flush all sewers, drains, manholes and gullies within the site area and connections to the main sewers on completion of the Works.

#### 10.12 Drying the Works

The Contractor shall provide all temporary equipment, fuel and attendance for drying out the Works and controlling the humidity as necessary; the use of the permanent heating installation for this purpose will not be permitted unless previously agreed by the Employer in writing.

#### 10.13 Restriction of Publicity

No information either written or verbal, nor photographs or drawings concerning this Contract shall be supplied by the Contractor to any person without the written authority of the Employer.

#### 10.14 Advertising

All rights of advertising on the site are reserved by the Employer and the Contractor shall take all necessary measures to ensure that no unauthorised advertising takes place.

#### 10.15 Prohibited Products

The Contractor shall not employ on or incorporate in the Works any of the following products and shall impose a like obligation upon all Sub-Contractors:-

- (i) high alumina cement in structural elements;
- (ii) woodwool slabs in permanent formwork to concrete or in structural elements;
- (iii) calcium chloride in admixtures for use in reinforced concrete;
- (iv) asbestos as described in the Asbestos Prohibitions Regulations 1985 and the Asbestos Products (Safety) Regulations 1985;
- (v) aggregates for use in reinforced concrete which do not comply with BS EN 12620 and aggregates for use in concrete which do not comply with the provisions of BS EN 1992;
- (vi) calcium silicate bricks or tiles;
- (vii) lead or any products containing lead for use in connection with drinking water;
- (viii) urea formaldehyde foam in materials which contain formaldehyde in quantities which may be hazardous with reference to the limits set out at the time of use by the Health and Safety Executive;
- (ix) products which are generally composed of mineral fibres either manmade or naturally occurring which have a diameter of 3 microns or less and a length of 200 microns or less or which contain any fibres not sealed or otherwise stabilised to ensure that fibre migration is prevented;
- (x) other products or substances generally known to be deleterious to health and safety at the time of use or to the durability of the property in the particular circumstances in which they are being used;
- (xi) provided that the Contractor shall not be under any liability under this clause should any substance referred to herein be incorporated into the works by virtue of an Employer's instruction under the Building Contract. For the avoidance of doubt, nothing contained in the Employer's Requirements shall override or modify the application of this clause. Any requirement within these Employer's Requirements for the use of the prohibited products, whether express or implied, shall be of no effect and the Contractor shall be deemed to have included in his Contractor's Proposals for a suitable alternative.

In the event of any such products being specified by or on behalf of the Employer, the Contractor shall immediately draw the attention of the Employer to this fact and require him to issue alternative instructions in regard thereto.

#### 10.16 Fire

The Contractor shall take all necessary precautions to prevent personal injury, death and damage to the Works or other property from fire, and shall comply with 'Fire Prevention on Construction Sites' 1992, The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation published by The Building Employers Confederation, The Loss Prevention Council and The National Contractors' Group. The Contractor shall provide reasonable facilities and access to the Employers' Insurers Surveyors to enable them to check compliance with the Code.

#### 10.17 Insurance Matters

Before starting work on site submit to the Employer's Agent documentary evidence and/or policies and receipts for the insurance required by the Conditions of Contract.

The Contractor shall give notice in writing to the Employer if any event occurs which may give rise to any claim or proceeding in respect of loss or damage to the Works or injury or damage to persons or property arising out of the Works, the Contractor shall indemnify the Employer against any loss which may be caused by failure to give such notice.

#### 10.18 Limitations of Working Hours

The Contractor shall give the Employer's Agent at least 48 hours written notice of his intention to carry out work at nights, at weekends or at any other time outside normal working hours. The Employer's Agent does not warrant that any such approvals/agreements will be forthcoming and shall not rely on the relaxation of these restrictions.

Any costs arising from working outside of normal working hours which are not already detailed and agreed within the Contract Sum Analysis shall be borne by the Contractor.

The Contractor must comply with any restrictions imposed by the conditions of any planning consents associate with the development.

#### 10.19 Confinement of Employees to Site

The Contractor shall keep all persons under his control, including those employed by Sub-Contractors, merchants and hauliers, to the site of the Works and shall keep unauthorised persons off the site.

#### 10.20 CDM Regulations 2015

Accept the appointment as Principal Contractor for the project and assume the responsibilities of the plan referred to in regulation 2 of the CDM Regulations, including any updates and revisions.

#### 10.21 Name Board

The Contractor shall obtain approval from the Employer and provide a suitable temporary name board and display the title of the project, the name of Employer and his consultants and if the Contractor wishes, the name of the Contractor and his consultants. The Contractor shall remove the name board on completion.

#### 10.22 Occupied Premises

All adjacent buildings will be occupied and/or used during the whole Contract.  
Comply with Occupiers' rules and regulations affecting the site.

The Contractor shall carry out the Works without undue inconvenience and nuisance and without danger to occupants and users.

#### 10.23 Passes

Passes will be required for access to the site. Submit to the Employer a list of the names of all persons requiring passes together with any other related information the Employer may reasonably require. Passes must be returned to the

Employer when required and in any case on completion of the work to which the pass relates.

#### 10.24 Considerate Constructors Scheme

Before starting work register the site and pay the appropriate fee

Address: Considerate Constructors Scheme Office  
PO Box 75, Great Amwell, Ware, Hertfordshire  
SG12 9UY.  
Tel. 01992 550050  
Fax. 01992 550041

#### 10.25 Employers Agent's Meetings.

The EA will hold regular meetings to review progress and other matters arising from the administration of the Contract. Meetings will normally be held on site. Ensure the availability of accommodation at the time of such meetings. Attend all meetings and inform other parties when their presence is required. The Employer's Agent will chair the meetings and take and distribute minutes.

#### 10.26 Training of Employer's Staff.

Before completion, explain and demonstrate to the Employer's maintenance staff the purpose, function and operation of the installations including all items and procedures listed in the Building Manual. Allow a minimum of two days for training.

#### 10.27 Tools

Provide two sets of tools and portable indicating instruments for the operation and maintenance of all services plant and equipment.

### 11. CASH FLOW FORECAST

As soon as possible and before starting work on site submit to the Employer a forecast showing the gross valuation of the Works at the date of each Interim Payment throughout the Contract period, based upon the programme for the Works.

### 12. PROGRESS PHOTOGRAPHS

Allow for taking 24 colour photographs per month up to practical completion at locations to be agreed with the Employer and hand 3nr copies size 200 x 250mm each month to the Employer.

## **D. DATA AND SAMPLES TO BE PROVIDED BY THE CONTRACTOR**

### 1. GENERAL

The Contractor shall assume responsibility for the preparation of all design and shop drawings and for ascertaining the correct information for the preparation of such drawings.

All drawings prepared by the Contractor are to co-ordinate with the Employer's Requirements, drawings and details and shall be coded with reference to those drawings.

### 2. DATA/ INFORMATION TO BE SUPPLIED WITH THE TENDER

The Contractor shall supply the information with the tender as set out in the invitation to tender or in these Employer's Requirements.

The Contractor shall also supply as part of the Contractor's Proposals three copies of such drawings, specifications and the like as are necessary fully to describe the design proposals, constructional details, (including full size details) co-ordination and integration of every element of the Works and include the specific data referred to under this heading

in the various sections of these Employer's Requirements. The Contractor should also be able to provide all information in an electronic format.

3. DATA/ CONSTRUCTION INFORMATION AND SAMPLES TO BE SUBMITTED FROM TIME TO TIME IN ACCORDANCE WITH CLAUSE 2.8 OF THE CONDITIONS OF CONTRACT

3.1 The Contractor shall prepare and submit to the Employer in electronic format together with three copies of all drawings, specifications, details, levels and setting out dimensions in accordance with the Contractor's Design Submission Procedure set out in Schedule 1 of the Contract and which are either:-

- .1 reasonably necessary from time to time to explain and amplify the Employer's Requirements, Contractor's Proposals and any Changes; or
- .2 reasonably necessary to enable the Contractor to execute and complete the design and construction of the Works and any Changes; or
- .3 stated in the following item 3.3 to be prepared by the Contractor;

on a date which will enable the Employer and Contractor to comply with the procedures set out in Schedule 1 without delaying the progress of the Works.

3.2 On a date which will enable the Employer and Contractor to comply with all the foregoing provisions, the Contractor shall provide:-

- .1 Final versions of specifications
- .2 Amplification of proposals made with the tender
- .3 General arrangement drawings
- .4 Any necessary calculations
- .5 Detailed working drawings.

3.3 During the course of the work the Contractor shall provide:-

- .1 Any necessary certificates to demonstrate compliance with these requirements.
- .2 Such samples of materials and workmanship as are necessary to enable the Employer to make a choice on finishes and colours.

4. DESIGN DOCUMENTS AND RELATED INFORMATION TO BE SUBMITTED BEFORE PRACTICAL COMPLETION IN ACCORDANCE WITH CLAUSE 2.37 OF THE CONDITIONS OF CONTRACT

4.1 'As built' drawings

At the time of handover the Contractor shall supply [negative/electronic] drawings illustrating the Works as built together with specification notes sufficient to describe the construction.

4.2 Building Manual

At the time of practical completion the Contractor shall supply two copies of a comprehensive building manual in the form of a series of A4 size, plastic covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover titled. Selected drawings needed to illustrate or locate items mentioned in the Manual, where larger than A4, are to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings. The main set(s) of as-built drawings will form annex(es) to the Manual.

The Building Manual (incorporating the Health and Safety File) is to be a comprehensive information source and guide for the Employer and end users providing a complete understanding of the building and its systems and enabling it to be operated and maintained efficiently and safely. The Contractor is required to obtain or prepare all the information to be included in the Manual, produce the required number of copies of the Manual and submit them to the Employer.

The Manual is to consist of the following parts, sub-sectioned as appropriate:

## PART 1: GENERAL

## PART 2: BUILDING FABRIC

## PART 3: BUILDING SERVICES

## PART 4: HEALTH AND SAFETY

A complete draft of the Manual must be submitted not less than 4 weeks before the date for submission of the final copies of the Manual. Amend the draft Manual in the light of any comments and resubmit to the Employer. Do not proceed with production of the final copies of the Manual until authorised to do so by the Employer.

THE BUILDING MANUAL PART 1: GENERAL must include:

A description of the building.

Copies of all consents and approvals obtained.

A copy of the accredited Energy Performance Certificate (EPC) secured by the contractor and as handed to the Building Owner prior to Practical together with notification issued to Building Control prior to Practical Completion confirming that the accredited EPC and recommendations issued to the building owner is in accordance with the Energy Performance of Buildings (Certificates and Inspections Regulations 2007).

Drawings showing emergency escape routes, location of emergency and fire fighting systems, services shut-off valves, switches, etc.

THE BUILDING MANUAL PART 2: BUILDING FABRIC must include:

Design criteria including floor loadings, insulation values and other performance requirements.

As-built drawings recording details of construction, together with an index.

Details of all materials, components and equipment including copies of manufacturers current literature, COSHH dated data sheets and manufacturers' recommendations for cleaning and maintenance.

Names, addresses, telephone and fax numbers of all suppliers and manufacturers.

Copies of all guarantees, warranties and maintenance agreements offered by subcontractors, suppliers and manufacturers.

Copies of all test certificates and reports required in the specification.

THE BUILDING MANUAL PART 3: BUILDING SERVICES must include:

A full description of each of the systems installed, written to ensure that the Employer's staff fully understand the scope and facilities provided.

A description of the mode of operation of all systems.

Diagrammatic drawings of each system indicating principal items of plant, equipment, valves etc.

A photo-reduction of all record drawings to A1 size together with an index.

Legend for all colour-coded services.

Schedules (system by system) of plant, equipment, valves, etc, stating their locations, duties and performance figures. Each item must have a unique number cross-referenced to the record and diagrammatic drawings and schedules.

The name, address and telephone number of the manufacturer of every item of plant and equipment together with catalogue list numbers.

Manufacturers' technical literature for all items of plant and equipment, assembled specifically for the project, excluding

irrelevant matter and including detailed drawings, electrical circuit details and operating and maintenance instructions.

A copy of all Test Certificates (including but not limited to electrical circuit tests, corrosion tests, type tests, works tests, start and commissioning tests) for the installations and plant, equipment, valves, etc, used in the installations.

A copy of all manufacturers' guarantees, warranties and maintenance agreements offered by subcontractors, suppliers and manufacturers.

Starting up, operating and shutting down instructions for all equipment and systems installed.

Control sequences for all systems installed.

Schedules of all fixed and variable equipment settings established during commissioning.

Procedures for seasonal changeovers.

Recommendations as to the preventive maintenance frequency and procedures to be adopted to ensure the most efficient operation of the systems.

Lubrication schedules for all lubricated items.

A list of normal consumable items.

A list of recommended spares to be kept in stock by the Employer, being those items subject to wear or deterioration and which may involve the Employer in extended deliveries when replacements are required at some future date.

Procedures for fault finding.

Emergency procedures, including telephone numbers for emergency services.

#### PART 4

##### HEALTH AND SAFETY FILE

The Contractor, in addition to his obligations under the CDM Regulations in relation to information for the health and safety file, shall, before practical completion of the Works or relevant Section and without further charge to the Employer, supply for retention and use by the Employer such Contractor's Design Documents and related information as may be specified in the Contract Documents or as the Employer may reasonably require that show or describe the Works as built or relate to the maintenance and operation of them or their installations.

#### **E. PLANNING AND ACCOMMODATION REQUIREMENTS**

The Planning and Accommodation Requirements are contained in Part 2 of this document.

#### **F. BUILDING DESIGN REQUIREMENTS**

The Building Design Requirements are contained in Part 2 of this document.

**G. PARTICULAR SPECIFICATION**

## INTRODUCTION

The Contractor's attention is drawn to the following:

1. The provisions of this Particular Specification shall not form part of the Employer's Requirements but shall be regarded only as an indication of the Employer's preferences. Where the Contractor adopts such preferences or modifications thereto these shall be deemed to form part of the Contractor's Proposals and therefore to have been checked and approved by the Contractor who will have the same liability therefore as if he had prepared them, or caused them to be prepared himself. Tenders are to be based on the Employer's Requirements and Particular Specification so that bids can be compared on an equal basis.
2. Tenderers will be permitted to submit with their tenders alternatives to this Particular Specification, together with the effect upon their tender amounts, provided only that they have submitted a tender which wholly incorporates the Particular Specification.
3. Any such alternative proposals to the Particular Specification shall be of no less a standard than is stated in or reasonably to be inferred from the relevant Particular Specification and the remainder of the tender documents.
4. The Contractor's Proposals shall be deemed to have incorporated the provisions of the Particular Specification and the Contractor's Proposals shall incorporate such further specification or general matters and drawings as are necessary fully to describe the Works and the standards to which the same shall be designed and constructed.

**APPENDIX A**

**CONTRACT SUM ANALYSIS**

Element of Works	Total
<b>ELECTRICAL PLANT AND INSTALLATIONS</b>	
<b>HIGH VOLTAGE (HV) EQUIPMENT AND INSTALLATION</b>	
Supply and installation of the HV RMU ringmaster unit	
Interconnecting HV cabling for HV and LV tails	
1600kVA HV transformer	
HV/ LV earthing	
<b>LOW VOLTAGE MAIN INTAKE SWITCHBOARD (ALPHA BLOCK)</b>	
Supply and install main LV Switchboard	
Individual 24v DC power supply / charger unit	
<b>LV MAIN SUPPLY CONNECTION ( ZONE B)</b>	
Dual MCCB panel, tails to busbar in local Main LV switchroom	
<b>MAIN &amp; CONTROL CABLING</b>	
Supply all cabling and containment, install, terminate, test and commission all cabling as per the cable schedule	
<b>UPS MAIN DISTRIBUTION (CLINICAL AREA)</b>	
Supply , install, test and commission Schneider Isobar sub distribution boards in local switchrooms	
<b>UPR ROOM LOCAL CIRCUIT WIRING</b>	
Supply, install, test and commission local Distribution board in Zone B UPS room	
Supply, install, test and commission all sub-circuits (general lighting, outside lighting, emergency lighting, small power) in both Alpha & Zone B UPS rooms	
Install two remote indicator Alarm Panels within clinical areas one from each UPS system (Alarm Panel by others)	
Supply, install test and commission Data cabling from both Alpha & Zone B UPS systems to nearest BMS interface panel	
Supply, install test and commission TPN power supplies to 4x Air Conditioning units 2 x in each Alpha & Zone B UPS systems from new local Schneider Isobar distribution boards	
<b>FIRE ALARM SYSTEM</b>	
Supply, install, test and commission all components and interface panels to nearest hospital fire alarm panel in both Alpha & Zone B UPS rooms	
<b>REMOVAL OF EXISTING UPS UNITS AND ELECTRICAL SERVICES</b>	
Strip out all redundant main and sub main cables and distribution boards, local UPS and associated batteries made dead and safely removed	
<b>SEQUENCE OF WORKS</b>	
Transfer essential clinical sub circuits from existing localised UPS systems and reconnect to new centralised system under controlled conditions	
<b>SPECIALIST UPS PACKAGE (Named Subcontractor)</b>	
BPC Energy Limited tender return sum	238,135.17
Profit & attendance / coordination of names subcontractor works - UPS Supplier	

Element of Works	Total
<b>EARTHING</b>	
Supply, install and commission a main earthing bar and associated CPC conductors	
<b>LABELLING</b>	
<b>TESTING AND COMMISSIONING</b>	
<b>ELECTRICAL PLANT AND INSTALLATIONS - SUB-TOTAL £</b>	
<b>MECHANICAL PLANT AND INSTALLATIONS</b>	
<b>DIRECT EXPANSION (DX) UPS COOLING SYSTEMS</b>	
Supply, install, test and commission 4x complete DX split air conditioning system to serve both Alpha and Zone B UPS rooms	
Supply, install, test and commission Hydrogen extract ventilation systems in both Alpha and Zone B UPS battery rooms	
<b>MECHANICAL PLANT AND INSTALLATIONS - SUB-TOTAL £</b>	
<b>BUILDING / CIVIL WORKS</b>	
<b>CONSTRUCTION OF TWO STOREY PLANT ROOM - ALPHA BLOCK</b>	
Demolitions & Alterations	
Substructure	
Frame	
Upper Floors	
Roof	
Stairs	
External Walls	
Windows & External Walls	
Internal Walls & Partitions	
Internal Doors	
Finishes	
Fixtures & Fittings	
Site Works	
<b>WORKS TO EXISTING - ZONE D</b>	
Builders/ demolition works to remodel the room within the existing building	
<b>EXTERNAL CABLE DUCTING INSTALLATION</b>	
Supply and install trenching and making good	
Crossings and other hard surfaces and services bridging works	
<b>BUILDERS WORK IN CONNECTION WITH M&amp;E SERVICES</b>	
Cutting cable holes, making good, etc	
<b>BUILDING / CIVIL WORKS - SUB-TOTAL £</b>	

Element of Works	Total
<b>PRELIMINARIES, CONTINGENCY &amp; PROVISIONAL SUMS</b>	
<b>PRELIMINARIES</b>	
<b>CONTINGENCY</b>	
Unforeseen additional works required	20,000.00
<b>PROVISIONAL SUMS</b>	
High voltage ring feeder supply connections to the Schneider RMU to form the new HV supply	5,000.00
Main connections to main busbars in Zone B to provide main UPS supplies in DSS2 main switch room - labour and materials	5,000.00
Main connections to main busbars in Alpha Block to feed existing switchboard room panel - labour and materials	4,000.00
Existing generator main connections and control circuit modifications in Alpha Block - labour and material	5,000.00
Alpha Block- connections of clinical sub circuits to new UPS distribution boards which includes tracing and checking each circuit to be transferred – labour and material	12,000.00
Zone D - connections of clinical sub circuits to new UPS distribution boards which includes tracing and checking each circuit to be transferred – labour and material	12,000.00
Removal and disposal of all existing local UPS units and redundant electrical distribution equipment and cabling – labour and waste disposal costs	7,000.00
<b>PRELIMINARIES, CONTINGENCY &amp; PROVISIONAL SUMS - SUB-TOTAL £</b>	
<b>OTHER</b>	
<b>ANY OTHER EXPENDITURE, NOT ALLOWED FOR IN THE 'PRELIMINARIES' OR IN THE PRICES</b>	
Insert below	
<b>OTHER - SUB-TOTAL £</b>	
<b>CONTRACT SUM (excluding VAT) £</b>	

**APPENDIX B****LIST OF TENDER DRAWINGS**

These are the Drawings referred to in the Employer's Requirements and which accompany the tender documents.

**Drawings****Mechanical & Electrical**

<u>Drawing No's</u>	<u>Drawing Title</u>	
BH/01/10/011/AB	UPS System ALPHA BLOCK	UPS – Distribution Arrangements
BH/01/10/012/AB	UPS System ALPHA BLOCK	Proposed Cable Schedule
BH/01/10/013/AB	UPS System ZONE D	UPS – Distribution Arrangements
BH/01/10/014/AB	UPS System ZONE D	Proposed Cable Schedule
BH/01/10/015/AB	UPS System	Proposed Earthing Arrangements
BH/01/10/017/AB	UPS Zone D System	Proposed Room Layout
BH/01/10/018/A	Main Substation ALPHA BLOCK	HV/LV Distribution Arrangements
BH 020 - DICI870X2A	Uniflair Installation Drawing	Mechanical AC Schematic Internal
BH 021 - DIUI044X2X (1/2)	Uniflair Aircooled Condenser	Mechanical AC Schematic External
BH 021 - DIUI044X2X (2/2)	Uniflair Aircooled Condenser	Mechanical AC Schematic External
BH 022 - DICI896X2A	Uniflair Installation Drawing	Mechanical AC Schematic Internal

**Architecture**

<u>Drawing No's</u>	<u>Drawing Title</u>
(0-) 103 Rev 9	Proposed Plans and Elevations
(0-) 3000 Rev 6	Proposed Site & Location Plans
(2-) 101 Rev 6	Proposed Set Out Plans
(2-) 102 Rev 5	Foundation and Roof Layouts
(2-) 500 Rev 3	Proposed Elevations – Set Out
(2-) 1000 Rev 4	Section A-A
(2-) 1001 Rev 5	Section B-B
(63) 101 Rev 4	Electrical Layouts

**Civil Performance**

<u>Drawing No's</u>	<u>Drawing Title</u>
216/1227/01 Rev P3	Foundation Arrangement
216/1227/02 Rev P3	Ground Floor Arrangement Showing Structure Over
216/1227/03 Rev P2	First Floor Arrangement Showing Structure Over
216/1227/04 Rev P3	Elevations Showing Structural Arrangement
216/1227/05 Rev P2	First Floor Sections
MJG/216/1227	Structural Calculations

**APPENDIX C****INSTRUCTIONS RELATING TO PREPARATION AND SUBMISSION OF TENDERS****INSTRUCTIONS RELATING TO PREPARATION AND SUBMISSION OF TENDERS FOR THE PROPOSED UPGRADING OF MAJOR UPS AND ELECTRICAL INFRASTRUCTURE SYSTEMS THAT SUPPORT ESSENTIAL CLINICAL SERVICES AT BROOMFIELD HOSPITAL**

[1.] DATE AND TIME FOR RECEIPT OF TENDERS - The completed Form of Tender and other relevant information as detailed below shall be completed in full and submitted electronically using the e-Tendering Portal (<https://eoecph.bravosolution.co.uk>), not later than 12:00 (noon) on Friday 24 February 2017.

Tenderers should ensure that they allow plenty of time to upload the Tender response, particularly where there are large documents. If Tenderers have any problems with the e-Tendering Portal, they should contact the helpdesk on 0800 368 4850. The helpline is open Monday to Friday between 9am and 6pm excluding public and bank holidays.

The maximum file size for uploading documents is 50 MB per individual file. You should split your Tender into small enough file sizes to upload. Note: the Authority does not guarantee that you will be able to upload files up to the maximum size, particularly at busy times. For this reason it is recommended that tenderers ensure files are well below the maximum stated and allow plenty of time to upload, so they have enough time to resolve any technical difficulties before the deadline.

[2] TENDER INFORMATION - Certain drawings, specifications and other documents have been prepared by consultants employed by the Employer prior to the date of this tender. These are set out in Part 1 Section G – Particular Specification of the Employer's Requirements. It is intended that these drawings specifications and documents be included in the Contractor's Proposals as described in Clause B.3 of the Employer's Requirements and Article 4 of the JCT Design and Build Contract 2016 Edition.

Tenderers are required to check and satisfy themselves as to the adequacy and completeness of the information contained in Part 1 Section G – Particular Specification and to confirm that they are happy that it be included in the Contractor's Proposals. If any tenderer has any comments or queries or if he believes that it is appropriate to make any alterations to the drawings specifications and documents contained in Part 1 Section G – Particular Specification, he is required to do so with his tender.

[3.] INFORMATION TO BE SUBMITTED -

- (i) The completed Form of Tender, the completed Certificate of Bona Fide Tender, the completed Contract Sum Analysis (Appendix A of the Employer's Requirements).
- (ii) All other information detailed hereunder.

Tenders received after the due time and date, but prior to the opening of the other tenders, may be considered only if the Employer decides that there are exceptional circumstances.

[4.] ACCEPTANCE OF TENDERS - The Employer and his representatives offer no guarantee that the lowest or any tender will be recommended for acceptance or accepted, nor will they be responsible for any costs incurred in the preparation of any tenders.

[5.] ALTERNATIVE TENDERS - The following alternative tenders are required:

**Fully Compliant Tender (Tender Nr 1)** - Fixed Price Tender on Stated Programme.

**Alternative Tender (Tender Nr 2)** - Fixed Price Tender on Contractor's Programme.

[6.] TENDERING PROCEDURE - This will be in accordance with the principles of the JCT 2012 Practice Note- Tendering.

**APPENDIX C (CONTINUED)****INSTRUCTIONS RELATING TO PREPARATION AND SUBMISSION OF TENDERS (CONTINUED)**

[7.] INABILITY TO TENDER - If the Contractor cannot tender for any parts of the work as defined in the tender documents he must inform the Employer's Agent as soon as possible during the tender period defining the relevant parts and stating the reason for his inability to tender.

[8.] TENDER SUBMISSION - The Contractor's Proposals, in addition to anything else submitted, must contain the following:-

- (i) A comprehensive method statement.
- (ii) A master programme including all the information required under C.7 of the Employer's Requirements and incorporating the UPS sub-contractor/ supplier's works as detailed elsewhere in these Employer's Requirements.
- (iii) Such drawings, specifications and the like as requested and as may be necessary to fully expand upon the Employer's Requirements.
- (iv) Technical proposals in response to the specification and drawings included in the Employer's Requirements (evaluated in accordance with Section B of the Tender Evaluation Scoring Matrix and Criteria identified in Appendix M).
- (v) The above should be read in conjunction with the deliverables identified in Appendix M which are to be responded to, clearly set out in the order they appear in Section A of the Tender Evaluation Scoring Matrix and Criteria identified in Appendix L).

[9.] SUBMISSION OF A DETAILED AND QUANTIFIED SCHEDULE OF RATES - Within one week of the Employer's Agent's request to do so and, in any event, prior to taking possession of the site, the Contractor shall submit a detailed and quantified Schedule of Rates to support his submitted Contract Sum Analysis fully priced and monied out to agree with the total of his tender. The request shall not constitute or imply acceptance of the tender.

[10.] PRICING OF THE TENDER DOCUMENTS - Alterations and qualifications to the Employer's Requirements and Particular Specification must not be made without the written consent of the Quantity Surveyor. Costs relating to items in the Employer's Requirements and Particular Specification which are not priced in the Contractor's detailed and quantified Schedule of Rates will be deemed to have been included elsewhere in the said Schedule of Rates.

[11.] PRICING PRELIMINARIES - The Contractor must submit a detailed build-up of his pricing of the Preliminaries before his tender is accepted. "Fixed charges" (charges for work the cost of which is to be considered independent of duration) and "time related charges" (charges for work the cost of which is to be considered as dependent on duration) must be shown separately.

[12.] ERRORS IN PRICING DOCUMENTS - Will be dealt with in accordance with the JCT 2012 Practice Note – Tendering.

[13.] PERIOD OF VALIDITY - Tenders must remain open for consideration (unless previously withdrawn) for not less than 8 weeks from the date fixed for the submission or lodgement of tenders. Information on the date for possession is given in Section B Contractual Matters Clause 2.3

[14.] MID-TENDER INTERVIEWS – It is likely these will not be required.

[15.] QUALITY CONTROL RESOURCES - A statement must be submitted with the tender describing the organisation and resources which the Contractor proposes and undertakes to provide to control the quality of the Works, including the work of Sub-Contractors. The statement must include the number and type of staff responsible for quality control, with details of their qualifications and duties.

**APPENDIX C (CONTINUED)****INSTRUCTIONS RELATING TO PREPARATION AND SUBMISSION OF TENDERS (CONTINUED)**

[16.] HEALTH AND SAFETY INFORMATION - A statement must be submitted with the tender describing the organisation and resources which the Contractor proposes and undertakes to provide to safeguard the health and safety of operatives, including those of Sub-Contractors and of any person who may be affected by the Works including:

- (i) A copy of the Contractors health and safety policy document, including risk assessment procedures.
- (ii) Accident and illness records for the past five years.
- (iii) Records of previous Health and Safety Executive enforcement actions.
- (iv) Records of training and training policy.
- (v) The number and type of staff responsible for health and safety on this project with details of their qualifications and duties.

[17.] AN OUTLINE CONSTRUCTION STAGE HEALTH AND SAFETY PLAN must be submitted within 3 days of request and is to include the following:

- (i) Method statement related to the hazards identified in the pre-tender health and safety plan and/or statements on how the hazards will be addressed and other significant hazards identified by the Contractor.
- (ii) Details of the management structure and responsibilities.
- (iii) Arrangements for issuing health and safety directions.
- (iv) Procedures for informing other contractors and employees of health and safety hazards.
- (v) Selection procedures for ensuring competency of other contractors, the self-employed and designers.
- (vi) Procedures for communications between the project team, other contractors and site operatives.
- (vii) Procedures for checking that all haulage and freight operators comply with a recognised operator scheme (such as FORS) or have effective systems in place in order to ensure drivers are properly qualified and competent to drive and are aware of vulnerable road drivers together with specific project hazards and logistics.
- (viii) Arrangements for co-operation and co-ordination between contractors.
- (ix) Procedures for carrying out risk assessment and for managing and controlling the risk.
- (x) Emergency procedures including those for fire prevention and escape.
- (xi) Arrangements for ensuring that all accidents, illness and dangerous occurrences are recorded.
- (xii) Arrangements for welfare facilities.
- (xiii) Procedures for ensuring that all persons on site have received relevant health and safety information and any training.
- (xiv) Arrangements for consulting with and taking the views of people on site.
- (xv) Arrangements for preparing site rules and drawing them to the attention of those affected and ensuring their compliance.
- (xvi) Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements.
- (xvii) Review procedures to obtain feedback.

[18.] SITE VISIT - Before tendering the Contractor is advised to visit the site to ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the works.

The site may be visited by appointment with Freya Halls via email ([freya@rhassociates.co.uk](mailto:freya@rhassociates.co.uk)).

**APPENDIX D**

**STANDARD FORM OF TENDER**

TENDER FOR THE PROPOSED UPGRADING OF MAJOR UPS AND ELECTRICAL INFRASTRUCTURE SYSTEMS THAT SUPPORT ESSENTIAL CLINICAL SERVICES AT BROOMFIELD HOSPITAL

To Mid Essex Hospital Services NHS Trust

Sirs,

We, having read the Conditions of Contract and Employer's Requirements delivered to us and having examined the information referred to therein, do hereby offer to carry out and complete the whole of the Works described for the sum of

**TENDER NR 1 (STATED PROGRAMME)**

.....(£ .....) )

and within ..... weeks from the Date of Possession.

**TENDER NR 2 (ALTERNATIVE TENDER – CONTRACTOR'S ALTERNATIVE PROGRAMME)**

.....(£ .....) )

and within ..... weeks from the Date of Possession.

We undertake in the event of your acceptance to execute with you a Form of Contract embodying all the conditions and terms contained in this offer.

We agree that should obvious errors in pricing or significant errors in arithmetic be discovered in the priced Contract Sum Analysis submitted by us before acceptance of this offer, these errors will be dealt with in accordance with [Alternative 1] of the 'JCT Code of Procedure for Main Contract Tendering (Practice Note 6 – Series 2)' current at the Date of Tender.

We declare that our tender is based on a total of ..... working hours per week with the site being open for ..... days per week.

This tender remains open for acceptance for 8 weeks.

**APPENDIX D**

**CERTIFICATE OF BONA FIDE TENDER**

TENDER FOR THE PROPOSED UPGRADING OF MAJOR UPS AND ELECTRICAL INFRASTRUCTURE SYSTEMS THAT SUPPORT ESSENTIAL CLINICAL SERVICES AT BROOMFIELD HOSPITAL

To Mid Essex Hospital Services NHS Trust

Sir/s,

The essence of selective tendering is that the Employer shall receive bona fide competitive tenders from all those tendering. In recognition of this principle, we certify that this is a bona fide tender intended to be competitive, and that we have not fixed or adjusted the amount of the tender by, or under, or in accordance with, any agreement or arrangement with any other person. We also certify that we have not done, and we undertake that we will not do at any time before the latest hour and date specified for the return of this tender, any of the following acts:

- (i) communicating to a person other than the person calling for those tenders the amount or approximate amount of the proposed tender, except where the disclosure, in confidence, of the approximate amount of the tender was necessary to obtain insurance premium quotations required for the preparation of the tender.
- (ii) entering into any agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any tender to be submitted.
- (iii) offering, or paying, or giving, or agreeing to pay or give any sum of money or valuable consideration directly or indirectly to any person for doing, or having done, or causing or having caused to be done in relation to any other tender or proposed tender for the said work any act or thing of the sort described above.

In this certificate, the word "person" includes any persons and anybody or association, corporate or non-corporate, and "any agreement or arrangement" includes any such transaction, formal or informal and whether legally binding or not.

Date .....

Signed (as in Form of Tender) .....

For and on behalf of .....

**APPENDIX E****ELECTRICAL SPECIFICATION AND SEQUENCE OF WORKS****CONTENTS**

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**APPENDIX 1 – CABLE SCHEDULE**

## **1.0**     **SCOPE OF WORKS**

### **1.1**     **Extent and Nature of Associated Electrical Works**

The works covered by this specification comprises the supply, delivery, erection, connecting, testing and commissioning of all equipment and materials necessary for the complete installation detailed below for the hospitals new UPS centralisation system. The UPS system comprises of two new UPS rooms in two separate locations serving different sections of the hospital operating theatres, HDU and ICU critical care units.

The Alpha Block - UPS system will be located in a new purpose constructed two storey electrical switch room. The new building will also contain a new High Voltage substation and a new Low Voltage Main Intake Switch panel.

The Zone B - UPS system will be located in an existing basement plant room. The plant room will require some upgrading and modification to accommodate the new UPS units, battery racks and LV bypass panel.

The two centralised UPS system installations will form the first of a two stage upgrading programme, that will be followed in due course by the installation of individual IPS systems to each of the areas covered by the these new UPS supplies.

The electrical installation shall comply with the 17th Edition of the IEE Wiring Regulations BS 7671:2008 incorporating Amendment 3: 2015, IEE special regulations, IEC 60364-7-710 and HTM 06-01.

This associated electrical work generally consists of the following:-

1. Alpha Block - The creation of a new High Voltage (HV) substation DS/S No. 6 (sited on the ground floor of a newly constructed two storey electrical plant room) and comprising of the following new HV equipment. 1 x Schneider Ring Main Unit (RMU), 1 x 1600KVA Transformer and associated HV interconnecting links, LV interconnecting tails to a new LV main intake switch panel, and all earthing arrangements, earth cabling and main earthing bar located in the new substation.
2. The installation of the new High Voltage supply consisting 2 x 185mm XLPE ring feeder cables feeding the new Schneider RMU will be **by others**. However a specific PC sum is to be included as part of this tender to terminate the new HV supply cables into the RMU.
3. The supply and installation of a new Low Voltage (LV) Main Intake Switchboard. The LV Switchboard will incorporate a non-essential and essential section. The essential section will be supported by a set of automatic changeover circuit breakers, controlled to operate in the event of a loss of essential supply via a mains failure detection control device to signal to an existing hospital standby generator set. The system will also incorporate a facility to allow parallel connection of the existing standby generator set to the grid supply for the purposes of load testing the standby generator from time to time. The new LV switchboard is detailed below in section 4.
4. Installation of new LV supplies - Alpha Block from the new LV Main Switchboard, and Zone B from the hospitals existing main intake switch room. These new LV supplies will terminate into the two new UPS LV Bypass Switchboards sited in each of the UPS rooms (Alpha Block and Zone B)
5. The installation of **two sets** of UPS equipment, one set in each location (Alpha Block and Zone B) **each set** comprising of 2 x UPS units, 2 x DZZ transformers, 2 x battery units, 1 x LV Bypass panel , 2 x sets air conditioning units. The systems are designed to provide N+1 resilience insofar as economically practical.
6. Supply and install sub main circuits fed from the new UPS Bypass panels, in particular the supply and installation of remote sub main distribution boards, located adjacent to clinical areas supplying Operating Theatres and Intensive Care facilities.
7. Supply and installation of all cabling, containment, terminations and all earthing and associated installations in accordance with the cable schedule - Appendix 1. Complete all main and ancillary interconnections of all new UPS LV bypass panels and UPS equipment (supplied by named UPS supplier)
8. Supply and install all UPS system control cabling from the UPS units to the UPS LV Bypass Switchboards.

9. Supply and installation a fire alarm system in the two UPS room locations (Alpha Block and Zone B) and interface at each location with the existing Hospital system.
10. Supply and installation of all local sub circuit wiring for lighting, general power and a/c supplies in and adjacent to each UPS room (Alpha Block and Zone B).
11. Affix two remote alarm panels (alarm panels supplied by UPS supplier) and supply, install and terminate all interconnecting control cabling and, one from each UPS room (Alpha Block and Zone B) to a location to be confirmed in each of the clinical areas served by the UPS system.
12. Supply and installation of all control and data monitoring alarm cabling for the UPS alarm systems.
13. Testing and commissioning of all new systems including full load testing of each individual UPS unit and battery system.
14. The disconnection of existing sub circuit supplies to each clinical area, and the diversion and reconnections of these supplies to the new centralised UPS installation. This element of the work will require "out of hours working" and will form part of a specific PC sum in the tender.
15. Remove existing localised UPS units and safely dispose of batteries and equipment. These works will be undertaken as part of a specific PC sum agreed as part of the tender.
16. Supply of all as fitted drawings and Operation and Maintenance manuals for all plant and equipment.

## **1.2 Co-ordination of Services**

The contractor shall at an early stage of the contract co-ordinate with the other sub-contractors to agree:

Position of all holes required cutting or forming by the main contractor and any areas of conflict shall be brought to the Supervising Officer's attention immediately.

The contractor shall note that the electrical services drawings are diagrammatic and should not be scaled to determine exact positions and lengths of cable runs. The cable lengths stated in the cable schedule in Appendix 1 of this specification are indicative and for pricing purposes only. Actual cable lengths will be measured by contractor once the equipment has been sited and containment routes have been agreed and installed.

## **1.3 Identification of Cable Cores**

The contractor shall identify and number every core of twin and multicore cables at their terminations with tapes, sleeves or discs to the approval of the Supervising Officer. Cables installed for this scheme shall comply with the new harmonised cable colours. Where these cables are installed alongside or in the same enclosure as non-harmonised cables, cable identification and caution notices shall be installed in accordance with BS 7671:2008 incorporating Amendment 3: 2015

## **1.4 Delivery of Materials**

Where long delivery periods are experienced with equipment the main contractor shall order all equipment at an early stage of the contract in order to prevent contractual delays due to late delivery of equipment.

## **1.5 Manufacturer's Quotations**

Where in the Specification reference is made to a quotation for further specification details, the main contractor's attention is particularly drawn to the fact that this reference is solely for the technical details contained in the relevant quotation.

It remains the sole responsibility of the main contractor for ensuring that he obtains his own quotation for the same technical details, and that he is satisfied with any conditions of tender put forward by the manufacturer.

### **1.6 Ordering of Materials and Alternatives**

The main contractor shall place orders for materials and equipment immediately instructions have been received to proceed with the work.

Delays in the delivery of materials will not be accepted as a valid reason for extending the completion date of the works. The main contractor shall be responsible for accepting delivery, unloading and ensuring safe storage of all materials and equipment required on site.

Where materials are not specified, then they shall be the best of their respective kind and full details shall be submitted to the Supervising Officer for approval before use. All plant, equipment and materials shall be new and not damaged in any way.

### **1.7 Setting out of Work**

The position of all points, cable ways and equipment unless otherwise stated in this specification are shown on the drawings but these positions must be considered as approximate only and the drawings must not be scaled for the purpose of actually fixing the points and equipment.

No installation work shall be put in hand and no holes cut or formed until the site marked points and routes have been approved by the Supervising Officer.

The contractor shall allow for any reasonable deviation to routes and the main contractor shall make due allowances in his/her tender accordingly.

### **1.8 Electrical Main and Temporary Supplies**

The electrical supply for main plant and equipment installed for this contract shall be 240 volts, single phase, 50Hz, AC and 400 volts, three phase, 50 Hz, AC.

The contractor shall provide and wire temporary lighting and power to enable the works to be carried out. Temporary lighting and power shall be installed in accordance with construction site regulations.

### **1.9 Visits to Site**

The main contractor is advised to visit the site of the proposed works before tendering and to acquaint themselves with the site conditions, transport facilities for materials and equipment to and from the site and all other matters that may affect his tender as no claims arising out of neglect to do so in any misunderstanding will be entertained.

### **1.10 Foreman and Site Reports**

The main contractor shall employ a foreman on site for the duration of the installation. The main contractor shall arrange for his foreman/person in charge to keep a comprehensive diary as to progress to works and details of all instructions received in writing and verbally on site with dates, times and names of persons giving such instructions. This diary is to be available to the Supervising Officer as and when required by him.

### **1.11 Builders' Work, Cutting Away and Making Good etc.**

All necessary builders' work in connection with the installation of the engineering services will be undertaken by the main contractor or a sub-contractor working under the full supervision of the main contractor.

Any damage to the fabric of the existing building caused by main contractor or their sub-contractors during drilling, plugging or other operations undertaken shall be repaired at the main contractor's expense to the standard of the existing containment.

### **1.12 Existing Services**

During the works the surrounding areas will be in use and the main contractor must bear in mind that services associated with these must be kept running and allowances shall be made within the tender for carrying out the agreed programme

of works to ensure that the occupants are caused the absolute minimum of disturbance and inconvenience.

The main contractor shall include for all necessary labour and materials for providing temporary connections to maintain full services to the occupied areas/ sections of the surrounding areas of the hospital throughout the period of the works.

**ALL** shut down or interruptions of existing services or supplies, however minor, shall be expressly authorised by and agreed in advance with the Supervising Officer.

### 1.13 Works Standards

Any work which the Supervising Officer decides is below standard or installed in an untidy fashion will be removed and reinstated free of charge.

### 1.14 Drawings and Specifications

The drawings included within the Employer's Requirements (Appendix B) constitute part of the specification and must be read in conjunction with each other and the written specification. Items detailed in the written specification and not on the drawings or vice versa shall be deemed to be included in both.

## 2.0 POWER DISTRIBUTION

### 2.1 Main Supply to new Alpha Block electrical plant room

The new Alpha Block electrical plantroom will include the followings and separate sections within the new building.

#### Ground Floor

High Voltage (HV) substation (DSS No.6) complete with RMU and Transformer  
UPS battery room complete with two sets of UPS battery racks, each with a DC isolator.

#### First Floor

UPS inverter room complete with two 200A UPS inverter units, two DZZ earthing transformers and two A/C cooling units.

Low Voltage (LV) switch room complete with an LV Main Intake switchboard and UPS bypass switchboard.

High Voltage – Equipment and Installation

The incoming supply will be via 2 x 185mm XLPE HV ring feeders serving the new HV substation and terminating into the RMU ringmaster switchgear. The HV feeder cabling will be installed by others. The termination and testing of the two ring feeders into the RMU will form part of this tender for which a PC sum has been allocated.

Thereafter the supply and installation of the HV RMU ringmaster unit, the interconnecting HV cable to and supply of 1600KVA HV transformer and all HV /LV earthing will be undertaken by the contractor and form part of these tendered works.

RMU Schneider Ringmaster C, 630A, 13.8KV, gas insulated, TLF / VIP protection, IP54 rated.

Transformer Schneider Minera, 1600KVA, DY11, 11KV/400v, 36KV rated, mineral oil insulated, ONAN, OCTC.

Low Voltage – Equipment and Installation

The new LV Main Intake Switchboard (Appendix G) will be supplied and installed on the first floor of the new building and will be fed from the HV/LV transformer via 11no. single core copper x 400mm XLPE, LSF LV tails and 2x 320mm CPC to the incoming NW 25 ACB (2500A)

The new UPS Bypass Switchboard intake section (supplied **by others**) will be fed via 2 x 150mm 3 core XLPA SWA LSF (Cu) cable with 240mm separate CPC installed from the adjacent LV Main Intake Switchboard. The supply will originate from the Schneider NS630BN MCCB.

The new UPS Bypass Switchboard output section (supplied by others) will be fed via 2 x 95mm 4 core XLPA SWA LSF (Cu) cable with 185mm separate CPC installed from adjacent LV Main Intake Switchboard. The supply will originate from the Schneider NSX400AN MCCB.

## 2.2 Works to Alpha Block UPS Invertor Room.

The supply and installation of all equipment, containment, cables and accessories to and within the UPS room will be as follows.

### By named UPS supplier

To manufacture, supply, deliver, position, install, commission and load test 2x UPS units, 2x DZZ transformers, 2x battery units, 2x DC isolation switches, 1x LV Bypass Switchboard complete with intake and output sections, and all DC cabling and DC connections.

### By Electrical Contractor

To supply, install, commission and test all AC main HV equipment and cabling, all LV Main Intake Switchboard and main LV cabling.

To supply, install, commission and test all AC main, sub main, sub circuit and control cabling to and from the 2x UPS rooms and UPS units, 2x DZZ transformers, 1x LV Bypass Switchboard with intake and output sections.

To supply, install and commission a main earthing bar and associated CPC conductors to all HV and LV equipment.

To supply, install and commission, fire alarm, data, general room lighting and small power within the UPS room

To supply, install and commission all control cabling within the UPS room between UPS equipment and LV switchboards and externally to the remote indicator panels, air conditioning units and fire and data connections within the hospital.

To supply, install and commission two outgoing supply from the LV Bypass Switchboard output section to two separately located new UPS 6 way MCCB distribution board located within local switch rooms adjacent to clinical areas within the hospital complex.

The UPS distribution boards to be supplied and installed will be type Schneider MCCB (part no MG2C7 -7 way) fitted with NSX100N TM D (63A) SPN MCB to each way.

The disconnection of existing sub circuit supplies to each clinical area, and the diversion and reconnections of these supplies to the two new UPS distribution boards will require "out of hours working" and will form part of a specific PC sum in the tender

To install all local distribution from the internal distribution board fitted in the LV Main Intake Switchboard type Schneider Isobar (part no SEA9N4 – TPN 6 way) with 125A mains switch and fitted with the following type C circuit breakers - TP 2x 32amp, SP 2x 32amp, SP 2x 16amp for all ancillary equipment within the UPS room and the two air conditioning units.

To supply and install **all** DC and AC cable containment tray throughout the installation.

Remove existing localised UPS units and safely dispose of batteries and equipment. These works will be undertaken as part of a specific PC sum agreed as part of the tender.

## 2.3 Main Supply to Zone D UPS Room

The UPS incoming supply from the main distribution switch room (level 1 – DSS2) to the main UPS LV Bypass Switchboard incoming section shall be a 2 x 150mm 3 core XLPA SWA LSF (Cu) cable with 240mm separate CPC installed. The supply will originate from a new Schneider NS630BN MCCB.

The UPS incoming bypass supply from the main distribution switch room (level 1 - DSS4) to the main UPS LV Bypass Switchboard output section shall be a 2 x 95mm 4 core XLPA SWA LSF (Cu) cable with 185mm separate CPC installed. The supply will originate from a new Schneider NSX400AN MCCB.

These two main MCCB's will be supplied and fitted in a purpose made panel (to be supplied by contractor) with tails connected to the existing main panel bus bars within the existing main switch room. The connection to the main panel busbars will form part of an organised "out of hours working" shutdown of supplies which will form part of a specific PC sum in the tender.

## **2.4 Works to Zone D UPS Room**

The supply and installation of all equipment, containment, cables and accessories to and within the UPS room will be as follows.

### By named UPS supplier

To manufacture, supply, deliver, position, install, commission and load test 2x UPS units, 2x DZZ transformers, 2x battery units, 2x DC isolation switches, 1x LV Bypass panel and all DC cabling and DC connections.

### By Electrical Contractor

To supply, install, commission and test all AC main, sub main, sub circuit and control cabling to and from the 2x UPS units, 2x DZZ transformers, 1x LV Bypass panel intake and output sections.

To supply, install and commission a main earthing bar and associated CPC conductors to all equipment in accordance with drawing BH/01/10/15/A.

To supply, install and commission, fire alarm, data, general room lighting and small power within the UPS room

To supply, install and commission all control cabling within the UPS room between UPS equipment and LV panel and externally to the remote indicator panels, air conditioning units and fire and data connections within the hospital.

To supply, install and commission two outgoing supply from the LV bypass panel output section to two separately located new UPS 7 way MCCB distribution board located within local switch rooms adjacent to clinical areas within the hospital complex.

The UPS distribution boards to be supplied and installed will be type Schneider MCCB (part no MG2C7 -7 way) fitted with NSX100N TM D (63A) SPN MCB to each way.

The disconnection of existing sub circuit supplies to each clinical area, and the diversion and reconnections of these supplies to the two new UPS distribution boards will require "out of hours working" and will form part of a specific PC sum in the tender

To supply and install a local main supply and local distribution board type Schneider Isobar (part no SEA9N4 – 4 way) with 125A mains switch and fitted with the following type C circuit breakers - TP 2x 32amp, SP 1x 32amp RCBO, SP 2x 16amp for all ancillary equipment within the UPS room and the two air conditioning units.

To supply and install all DC and AC cable containment tray throughout the installation.

Remove existing localised UPS units and safely dispose of batteries and equipment. These works will be undertaken as part of a specific PC sum agreed as part of the tender.

## **3.0 LOW VOLTAGE MAIN INTAKE SWITCHBOARD (ALPHA BLOCK ONLY)**

The specification of the Switchboard is provided in Appendix G.

## **4.0 SEQUENCE OF WORKS**

The sequence of works is to be agreed with the Broomfield hospital operational staff, the Supervising Office (SO) and in conjunction with the main contractor. It is recognised that during the works there will be a requirement to disconnect certain electrical equipment and apparatus.

These works will be scheduled carefully to minimise disrupt and provide a secure supply wherever possible. However there will be occasions when supplies are not available particularly during disconnections and reconnections to local clinical sub circuits.

***The following is a DRAFT indicative sequence of work and is provided for tendering purposes only!***

1. Alpha Block - construct the new two storey electrical plant room.
2. Alpha Block - Supply, install all HV and LV equipment, commission and test.
3. Zone B - Builders / demolition works to remodel the room within the existing building.
4. Install commission and load test all UPS equipment to both the Alpha block and Zone D UPS rooms.
5. Install and commission two remote indicator panels in clinical areas and all air conditioning, fire, and data links.
6. Install new outgoing supplies and four remote UPS distribution boards in clinical area switch rooms.
7. Transfer essential clinical sub circuits from existing localised UPS systems and reconnect to new centralised system under controlled conditions.
8. Remove existing localised redundant UPS units and safety dispose of battery equipment.

**5.0 UPS SYSTEMS**

The supply and installation of the UPS equipment has already been tendered by Mid Essex Hospital Trust (MEHT) and the project Lead Consultant will advise the contractor the appointed named specialist sub-contractor for the UPS package.

The named specialist UPS sub-contractor will be expected to enter into a domestic sub-contract with the contractor. The contractor will include within the contractor tender return all works associated with the UPS package supplier.

The specification for the supply and installation of UPS system is provided for information in Appendix I.

These works will form an integral part of the responsibilities the contractor is required to provide as part of the contractors works.

**6.0 LOCAL CIRCUIT WIRING****6.1 Supply to Local Distribution Board in UPS rooms**

The main contractor will supply and install a 4 core 35mm XLPE SWA LSF cable (Cu) 125amp TPN supply to a new local distribution board (Schneider Isobar with 125amp isolator) mounted in or adjacent to each UPS room, both supplied from local main switch panels in close proximity to the UPS room.

**6.2 Local UPS Room sub-circuits**

The contractor shall allow for wiring in galvanised conduit from the above distribution board the following:-

1. General lighting - the lighting shall be IP 45 polycarbonate 5ft HF surface single fittings (TPA rated) to provide a lighting level of 300 lux at the floor within the UPS room and wired in 1.5mm PVC LSF singles.
2. Emergency Lighting – 2 x non- maintained emergency ceiling mounted lights with integral batteries shall be wired through a key switch for test purposes and shall be wired from the local lighting circuit.
3. Small Power – 2x 13amp twin socket (fed from a 30 mA RCBO) to be wired in 4mm PVC LSF single cables within each room.
4. Air Conditioning Units – 2x 32amp TP & N 4 core 16mm XLPE SWA LSF (Cu) cables to the external AC condensing units (1&2) located adjacent to UPS room. The cable shall be terminated into an IP 55 rated TPN isolator mounted adjacent to each AC unit. The cables to be installed on medium gauge tray.

### 6.3 Supplies to Clinical UPS distribution boards

To supply, install and commission 2x outgoing 160A XLPE/SWA-LSF TPN supply's from the LV Bypass Switchboard output section to two separately located new UPS 7 way MCCB UPS distribution boards located within local switch rooms adjacent to clinical areas within the hospital complex.

The UPS distribution boards to be supplied and installed will be type Schneider MCCB (part no MG2C7 -7 way) fitted with NSX100N TM D (63A) SPN MCB to each way.

The disconnection of existing sub circuit supplies to each clinical area, and the diversion and reconnections of these supplies to the two new UPS distribution boards will require "out of hours working" and will form part of a specific PC sum in the tender.

The new UPS distribution boards will be mounted in or adjacent to existing sub main switch rooms. Final position to be agreed.

The cabling shall be routed through existing cable ways and vertical ducts, and mounted on a combination of existing and new heavy duty galvanised cable tray.

This work will be carefully scheduled and approved by the Supervising Officer.

### 6.4 Remote Alarm Panel

It is essential in group 2 clinical locations to know the status of the UPS system supplying the area.

The contractor shall therefore supply and install a remote alarm indicator panel from each UPS room which will include:-

1. A 10c 1.5mm XLPE SWA LSF (Cu) cable for control and to incorporate a UPS supply to power the panel.
2. Lamp test facility.
3. A buzzer to sound if an alarm status is activate with appropriate indicator lights. The buzzer will be capable of being muted – however if the alarm state has not been resolved within [30] mins the buzzer will re-sound and require further attention/re-muting.
4. The panel will indicate "Ready /Normal" and "Fault" when the following conditions occurs- Loss of Mains, Bypass Operation, Battery low.

### 6.5 Fire Alarm System

#### 6.5.1 General

The contractor shall install and commission a fire alarm system which shall be linked to the existing building fire alarm system, and be incorporated into an existing fire loop circuit.

It will be the responsibility of the contractor to allow in his tender to connect into an existing circuit loop.

The fire alarm system to be extended is an open protocol addressable detector system (Details to be advised).

The work comprises of the supply and fit of all detectors, call points, sounders and all necessary interconnecting wiring within both UPS rooms.

The main contractor shall be responsible for obtaining the necessary quotations from the hospitals existing supplier (TBA) based on this specification and tender drawings, which should include connections into the existing loop circuits within the existing building.

#### 6.5.2 System of Operation

The system of operation shall be generally as follows:-

On operation of any break glass or automatic detector in the UPS room the sounders shall sound within the zone and

shall sound in an alert mode. The UPS units will not shut down on a fire alarm detector or manual call-point activation in accordance with the hospital services current fire alarm cause and effects strategy.

### **6.5.3 Cabling**

The fire alarm loop cabling shall be Draka Firetuf plus soft skinned fire rated cable to BS5839/1/2002 enhanced rating with red LSF sheath.

Joints are only permitted at equipment positions. All cable shall run straight and be installed to the satisfaction of the Supervising Officer.

Firetuf cable shall be clipped at intervals of no greater than 300mm apart using round headed screws or cable tied to new tray.

All cabling to devices shall be suitably labelled, with all cable cores identified with numbering sleeves.

### **6.5.4 Labelling**

The contractor shall allow for the Supervising Officer to provide names for each room and for these names to be incorporated into the fire alarm system to identify the location of any fire within the fire alarm software.

### **6.5.5 Mounting Heights**

All sounders shall be mounted at a height of 2000mm from the floor.

All call points shall be at a height of 1200mm from the floor.

### **6.5.6 Commissioning**

The main contractor will allow for the current fire alarm maintainer (TBA) to commission the system.

## **6.6 Data Cabling Alarm Monitoring**

The data cabling to be installed is to provide the following alarm signalling as follows:-

- UPS no.1 common fault
- UPS no.2 common fault
- UPS no.1 High room temperature alert
- UPS no.2 High room temperature alert

In order to provide this service, the main contractor shall provide the following CAT 6 UTP cabling installed in green or purple on suitable medium gauge basket within the UPS rooms. Terminations shall via RJ45 outlets and terminated in an IT hub station. All terminations shall be tested and supervised by others. The contractor will supply and install a suitable room thermostat mounted within each UPS room to detect a raise in room temperature.

These terminations will form part of the contingency allowed for within the tender.

The cabling will be supplied and installed as per cable schedule Appendix 1 and detailed in this specification

## **7.0 REMOVAL OF EXISTING UPS UNITS AND ELECTRICAL SERVICES**

The contractor shall ensure that all redundant main and sub main cables and distribution boards and local UPS units and associated batteries are made dead and safely removed where possible, and where applicable clearly labelled.

## **8.0 CIVIL WORKS**

The civil works specifications required to form the new internal UPS rooms are detailed on drawings as a separate section of the tender information.

## **9.0 LABELLING**

### **9.1 General**

Labels fitted to UPS units, D/ZZ Transformers, LV Panels, MCCB, MCB distribution boards, fuse switches, fused spur units etc. shall be:-

- Off white Ivorine or "Traffolyte" laminate with black lettering and securely fastened to the satisfaction of the Supervising Officer.
- All 13A sockets and light switches shall be labelled using a suitable label to the satisfaction of the Supervising Officer.

Labels on switch gear shall indicate:-

- Reference number on the switch
- The specified current rating
- The part of the distribution controlled.

Labels on MCB's shall indicate:-

- The reference number as indicated on the drawings and in this specification
- The service e.g. lighting, sockets, small power etc.
- The lettering of all labels shall not be less than 5mm (3/16"). The schedule and details of the labels shall be submitted to the Supervising Officer for approval to suit the programme of works.
- Labels on switch plates, fused spur units and 13A sockets shall indicate the reference No on the plate.

All main cables shall indicate:-

- At either end a cable reference number using suitable cable markers.

## **10.0 EARTHING**

### **10.1 General**

The contractor in conjunction with UPS specialist contractor will supply and install a complete earthing system. The earthing arrangements will be in accordance with schematic drawing BH/01/10/15/A.

The main earth bar will be 50mm x 12mm solid copper bar, suitably mounted and fixed to a wall with 12mm dia. fixing holes drilled central in the copper bar to provide for the main CPC equipotential earth bonding, and main earth points to principal equipment earth terminals. These will be fastened using 12mm brass nuts and bolts.

All earth cables shall have copper conductors with LSF green/ yellow stripped insulation.

All earth components will be installed to the satisfaction of the supervising officer.

## **11.0 COMMISSIONING**

### **11.1 General**

This section of the specification sets out the requirements and procedures to be adopted by the contractor in commissioning the engineering works.

Testing requirements are covered by The Record of Inspection and Testing sheet as shown below.

The contractor's attention is particularly drawn to the need to allow sufficient time and specialist labour to fully commission, document and personally prove to the Supervising Officer that every electrical system specified is operating in accordance with the design intent and to instruct all those concerned in their use and maintenance.

## 11.2 Commissioning Manuals

Commissioning shall generally follow the requirements of Hospital Technical Memorandum HTM06-01 and the current IEE wiring Regulations.

With respect to the arrangements for commissioning and associated activities completion of the documentation included in the commissioning manuals, the contractor will note that the envisaged division of responsibility is as follows:

- a) Pre-commissioning examinations and tests  
The contractor shall allow for attendance by the contractor who will be required (a) to present work as ready for examination to the Supervising Officer and (b) to be present during examination.
- b) Commissioning examination and tests  
This work will be the responsibility of the contractor and will be witnessed by the Supervising Officer. Witnessed and approved test results will then be recorded by the contractor.
- c) Completion and handing over  
This section will generally be completed by the contractor. The data recorded shall be fully comprehensive for all systems, subject to discussions between the contractor and Supervising Officer. The data shall be recorded on test sheets and schedules prepared by the contractor. It is anticipated that the test sheets and schedules will cover the following systems:
  - o Inspection and Tests as required.
  - o Illumination levels in all areas/rooms.
  - o Fire Alarm System.
  - o LV panel tests on site
  - o All cabling tests inc. earthing tests
  - o All UPS load tests

## 11.3 Time for Commissioning

The attention of the contractor is particularly drawn to the need to allow sufficient time and specialist labour to fully commission, document and demonstrate to the Supervising Officer that all electrical systems specified operate in accordance with design intent.

The main contractor will allow as a commissioning task for the instruction and training of personnel in the use, operation and maintenance of the electrical and mechanical works. Personnel will be designated by the Lead Consultant in conjunction with hospital maintenance staff.

## 11.4 Handover Documents

Two copies of a comprehensive set of handover manuals shall be provided by the contractor who will obtain all the necessary elements from the appropriate sources and provide to Supervising Officer.

The manuals shall be contained in an A4 ring size type, hard backed, loose leaf binder, with suitable separation of sections and sub-sections.

The documents listed below are to be obtained from the appropriate source and provided in the manual.

Two copies of a service manual to cover all items of plant and equipment in the installation are to include:

- 1 Index of Contents
- 2 Description of Design Intent
- 3 Commissioning Information, Tests and Reports
- 4 Manufacturer's Service Manuals
- 5 Manufacturer's Spare List and Ordering Procedure
- 6 Operational and Maintenance Routines
- 7 Line Diagram for Electrical Equipment

8	Schedule of Electrical Equipment and Fittings
9	Circuit Diagram for Electrical Equipment
10	"As fitted" Drawings, Electrical
11	Test Certificates and Reports including commissioning report
12	Insurance and Inspection Authority Certificates and Reports
13	Guaranteed Certificates
14	General Working Drawings for each main item of plant/ equipment supplied
15	List of Tools and Keys and Special Requirements to be handed to Client
16	Copies of all charts posted elsewhere in the building
17	Copy of Specification

## **12.0    CONTINGENCY**

The main contractor will allow the following contingency sum for an unforeseen additional works required within the tender **£20,000**

## **13.0    PROVISINAL SUMS**

Due to the clinical nature of the environment involved and the need to maintain essential electrical supplies during the installations, the main contractor will allow for the following provisional sums for identified sections of electrical works within the tender.

- High voltage ring feeder supply connections to the Schneider RMU to form the new HV supply **£5,000**
- Main connections to main busbars in Zone B to provide main UPS supplies in DSS2 main switch room - labour and materials **£5,000**
- Main connections to main busbars in Alpha Block to feed existing switchboard room panel - labour and materials - **£4,000**
- Existing generator main connections and control circuit modifications in Alpha Block - labour and material **£5,000**
- Alpha Block- connections of clinical sub circuits to new UPS distribution boards which includes tracing and checking each circuit to be transferred – labour and materials **£12,000**
- Zone D - connection of clinical sub circuits to new UPS distribution boards which includes tracing and checking each circuit to be transferred – labour and materials **£12,000**
- Removal and disposal of all existing local UPS units and redundant electrical distribution equipment and cabling – labour and waste disposal costs **£7,000**

**PC sum total allowances **£50,000****

**APPENDIX 1****CABLE SCHEDULE**

Cable ID	Cores	Size (mm)	CPC	Approx. Length (TBM)	Specification	From	Fixing	To	Comments
<b>ALPHA</b>									
A1	3	185	2*240	10m	XLPE/SWA- LSF Copper	RMU Terminals	New tray	HV Transformer HV terminals	HV Main Supply
A2	11 Single cores	400	2*320	15m	XLPE/SWA- LSF Copper	HV Transformer LV terminals	New tray	LV Main Intake Switchboard Incoming MCCB	LV Main Supply to Switchboard
A3	3	2x 150	240	15m	XLPE/SWA- LSF Copper	LV Main Intake Switchboard	New tray	UPS LV Bypass Switchboard Intake section	Main Supply UPS units
B	4	2x 95	185	15m	XLPE/SWA- LSF Copper	LV Main Intake Switchboard	New tray	UPS LV Bypass Switchboard Output section	External bypass supply
C1	3	2x 95	185	10m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	Transformer 1 D/ZZ	Transformer 1 supply
C2	3	2x 95	185	10m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	Transformer 2 D/ZZ	Transformer 2 supply
D1	3	2x 95	150	12m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	UPS 1 unit main supply	UPS 1 supply
D2	3	2x 95	150	12m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	UPS 2 unit main supply	UPS 2 supply
E1	4	2x 95	185	10m	638TQ-non armoured 90c rubber singles	Transformer 1 D/ZZ output	New tray	UPS 1 unit static bypass supply	UPS 1 static bypass
E2	4	2x 95	185	10m	638TQ-non armoured 90c rubber singles	Transformer 2 D/ZZ output	New tray	UPS 2 unit static bypass supply	UPS 2 static bypass
F1	4	2x 95	150	14m	638TQ-non armoured 90c rubber singles	UPS 1 output supply	New tray	UPS LV Main Panel output section	UPS 1 output supply
F2	4	2x 95	150	14m	638TQ-non armoured 90c rubber singles	UPS 2 output supply	New tray	UPS LV Main Panel output section	UPS 2 output supply
G	4	95	95	70m	XLPE/SWA- LSF Copper	UPS LV Bypass Switchboard Output section	50% new tray 50% existing tray	Sub main Dist. Board No 1 100A TPN 6 way	Located in Level 3 server room
H	4	95	95	55m	XLPE/SWA- LSF Copper	UPS LV Bypass Switchboard Output section	50% new tray 50% existing tray	Sub main Dist. Board No 2 100A TPN 6 way	Located in Level 3 switch room BH-020
W1	4	2x 95	95	8m	638TQ-non armoured 90c rubber singles	UPS unit No. 1	New tray	UPS 1 battery DC isolated	UPS Rm internal connections
W2	4	2x 95	95	8m	638TQ-non armoured 90c rubber singles	UPS unit No. 2	New tray	UPS 2 battery DC isolated	UPS Rm internal connections
CC1/2	10c	1.5	NA	100m	PVC/SWA/PVC LSF	UPS units 1&2	50% new tray 50% existing tray	TBA	Remote alarm panel in clinical area
CD1/2		N/A	N/A	100m	Data cable CAT 6 UTP	UPS units 1&2	50% new tray 50% existing tray	Patch panel network system	2 No. cables CAT 6
CA	10c	1.5	N/A	20m	PVC/SWA/PVC LSF	UPS units 1&2	New tray	UPS LV Main Panel output section	Static bypass interlock circuit
Y1	4	16	SWA		PVC/SWA/PVC - copper	UPS ALPHA Rm New local dist. board	New tray	No 1 DX Air conditioning within 15m	UPS ALPHA room cooling system
Y2	4	16	SWA		PVC/SWA/PVC - copper	UPS ALPHA Rm New local dist. board	New tray	No 2 DX Air conditioning within 15m	UPS ALPHA room cooling system
Y3	3	4	SWA		PVC/SWA/PVC - copper	UPS ALPHA Rm New local dist. board	New tray	UPS Rm Small power 3x twin sockets	

Y4	3	1.5	N/A		PVC/SWA/PVC - copper	UPS ALPHA Rm New local dist. board	New tray	UPS Rm room Lighting 6 x fittings	
Y5	4	2.5	N/A	75m	Fire tuff	Existing Hospital fire alarm system	New Tray	UPS Rm Fire alarm	Smoke/break glass/ siren
Y6	4	35	35	25m	PVC/SWA/PVC - copper	Existing Hospital local switch panel	New Tray	UPS ALPHA Rm New local dist. board	New local supply
<b>ZONE D</b>									
J	3	2x 150	240	35m	XLPE/SWA- LSF Copper	Main Intake switch room panel	New tray	UPS LV Bypass Switchboard Intake section	Main Supply UPS units
K	4	2x 95	185	35m	XLPE/SWA- LSF Copper	Main Intake switch room panel	New tray	UPS LV Bypass Switchboard Output section	External bypass supply
L1	3	2x 95	185	10m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	Transformer 1 D/ZZ	Transformer 1 supply
L2	3	2x 95	185	10m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	Transformer 2 D/ZZ	Transformer 2 supply
M1	3	2x 95	150	12m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	UPS 1 unit main supply	UPS 1 supply
M2	3	2x 95	150	12m	638TQ-non armoured 90c rubber singles	UPS LV Bypass Switchboard Intake section	New tray	UPS 2 unit main supply	UPS 2 supply
N1	4	2x 95	185	8m	638TQ-non armoured 90c rubber singles	Transformer 1 D/ZZ output	New tray	UPS 1 unit static bypass supply	UPS 1 static bypass
N2	4	2x 95	185	8m	638TQ-non armoured 90c rubber singles	Transformer 2 D/ZZ output	New tray	UPS 2 unit static bypass supply	UPS 2 static bypass
O1	4	2x 95	150	14m	638TQ-non armoured 90c rubber singles	UPS 1 output supply	New tray	UPS LV Bypass Switchboard Output section	UPS 1 output supply
O2	4	2x 95	150	14m	638TQ-non armoured 90c rubber singles	UPS 2 output supply	New tray	UPS LV Bypass Switchboard Output section	UPS 2 output supply
P	4	95	95	45m	XLPE/SWA- LSF Copper	UPS LV Bypass Switchboard Output section	50% new tray 50% existing tray	Sub main Dist. Board No 2 100A TPN 3way	Located in Level 2 switch room BH60-18
Q	4	95	95	45m	XLPE/SWA- LSF Copper	UPS LV Main Panel output section	50% new tray 50% existing tray	Sub main Dist. Board No 3 100A TPN 3way	Located in Level 2 Th5/6 /12/14 Switch room
X1	4	2x 95	95	8m	638TQ-non armoured 90c rubber singles	UPS unit No. 2	New tray	UPS 2 battery DC isolated	UPS Rm internal connections
X2	4	2x 95	95	8m	638TQ-non armoured 90c rubber singles	UPS unit No. 1	New tray	UPS 1 battery DC isolated	UPS Rm internal connections
CC3/4	10c	1.5	NA	80m	PVC/SWA/PVC LSF	UPS units 1&2	50% new tray 50% existing tray	TBA	Remote alarm panel in clinical area
CD3/4		N/A	N/A	100m	Data cable CAT 6 UTP	UPS units 1&2	50% new tray 50% existing tray	Patch panel network system	2 No. cables CAT 6
CT	10c	1.5	N/A	20m	PVC/SWA/PVC LSF	UPS units 1&2	New tray	UPS LV Bypass Switchboard Output section	Static bypass interlock circuit
Z1	4	16	SWA		PVC/SWA/PVC - copper	UPS ZONE D Rm New local dist. board	New tray	No 1 DX Air conditioning within 15m	UPS ZONE D room cooling system

Z2	4	6	SWA		PVC/SWA/PVC - copper	UPS ZONE D Rm New local dist. board	New tray	No 2 Chilled water Air conditioning within 15m	UPS ZONE D room cooling system
Z3	3	4	SWA		PVC/SWA/PVC - copper	UPS ZONE D Rm New local dist. board	New tray	UPS Rm Small power 3x twin sockets	
Z4	3	1.5	N/A		PVC/SWA/PVC - copper	UPS ZONE D Rm New local dist. board	New tray	UPS Rm room Lighting 6x fittings	
Z5	4	2.5	N/A	75m	Fire tuff	Existing Hospital fire alarm system	New Tray	UPS Rm Fire alarm	Smoke/break glass/ siren
Z6	4	35	35	25m	PVC/SWA/PVC - copper	Existing Hospital local switch panel	New Tray	UPS ZONE D Rm New local dist. board	New local supply

**APPENDIX F****MECHANICAL UPS COOLING SYSTEM PARTICULAR SPECIFICATION****CONTENTS**

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  - 1.3 Co-ordination of Services
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**APPENDIX 1 – MECHANICAL EQUIPMENT SCHEDULES**

## **1.0 INTRODUCTION**

This particular specification is for the Mechanical Services relating to the UPS cooling systems at Broomfield Hospital.

This specification should be read in conjunction with the following documents:-

- Equipment manufacturer installation requirements.
- Service Drawings.
- Equipment Schedules.

### **1.1 Acronyms and References**

The acronyms and references used within this particular specification are as detailed below:-

- BMS – Building management system
- COND – Condenser
- DX – Direct expansion
- DFU – Down flow unit
- EXF – Exhaust fan

### **1.2 Contractor's Responsibility**

The following items are deemed the responsibility of the tender awarded Contractor and his sub-contractors:-

- Full compliance with the requirements of this specification.
- Full on-site coordination of existing and proposed services.
- Make good any damage caused to existing systems and services.
- Any penetrations through fire compartments shall be sealed and made good.
- Raise any requests for information (RFIs) to the Consultant.
- Provide technical submittals of selected equipment to the Consultant for approval prior to procurement.
- Coordination with other disciplines including fire alarm interface, power requirements and builders work penetrations.
- Validation of existing systems including available power system capacities including distribution boards and control panels.

### **1.3 Co-ordination of Services**

The Contractor shall at an early stage of the contract co-ordinate with the other subcontractors to agree:-

- Positions of all trenches/holes to be cut/formed by the main contractor.
- Any areas of conflict shall be brought to the Supervising Officer's attention immediately.

The contractor shall note that the electrical services drawings are diagrammatic and should not be scaled to determine exact positions and lengths of cable runs.

### **1.4 Delivery of Materials**

Where extended lead times are expected the main contractor shall order all equipment at an early stage of the contract in order to prevent contractual delays due to late delivery of equipment.

### **1.5 Manufacturer's Quotations**

Where in the Specification reference is made to a quotation for further specification details, the main contractor's attention is particularly drawn to the fact that this reference is solely for the technical details contained in the relevant quotation.

It remains the sole responsibility of the main contractor for ensuring that he obtains his own quotation for the same technical details, and that he is satisfied with any conditions of tender put forward by the manufacturer.

### **1.6 Ordering of Materials and Alternatives**

The main contractor shall place orders for materials and equipment immediately instructions have been received to proceed with the work.

Delays in the delivery of materials will not be accepted as a valid reason for extending the completion date of the works.

The main contractor shall be responsible for accepting delivery, unloading and ensuring safe storage of all materials and equipment required on site.

Where materials are not specified, then they shall be the best of their respective kind and full details shall be submitted to the Supervising Officer for approval before use. All plant, equipment and materials shall be new and not damaged in any way.

### **1.7 Setting out of Work**

The position of all points, cable ways and equipment unless otherwise stated in this specification are shown on the drawings but these positions must be considered as approximate only and the drawings must not be scaled for the purpose of actually fixing the points and equipment.

No installation work shall be put in hand and no holes cut or formed until the site marked points and routes have been approved by the Supervising Officer.

The contractor shall allow for any reasonable deviation to routes and the main contractor shall make due allowances in his/her tender accordingly.

### **1.8 Visits to Site**

The main contractor is advised to visit the site of the proposed works before tendering and to acquaint himself with the site conditions, transport facilities for materials and equipment to and from the site and all other matters that may affect his tender as no claims arising out of neglect to do so in any misunderstanding will be entertained.

### **1.9 Foreman and Site Reports**

The main contractor shall employ a foreman on site for the duration of the installation. The main contractor shall arrange for his foreman/person in charge to keep a comprehensive diary as to progress to works and details of all instructions received in writing and verbally on site with dates, times and names of persons giving such instructions. This diary is to be available to the Supervising Officer as and when required by him.

### **1.10 Builders' Work, Cutting Away and Making Good etc.**

All necessary builders' work in connection with the installation of the engineering services will be undertaken by the main contractor or a sub-contractor working under the full supervision of the main contractor.

Any damage to the fabric of the building caused by main contractor or their sub-contractors during drilling, plugging or other operations undertaken shall be repaired at the main contractor's expense.

### **1.11 Existing Services**

During the works the surrounding areas will be in use and the main contractor must bear in mind that services associated therewith must be kept running and allowances shall be made within the tender for carrying out the agreed programme of works to ensure that the occupants are caused the absolute minimum of disturbance and inconvenience.

The main contractor shall include for all necessary labour and materials for providing temporary connections to maintain full services to the occupied areas/ sections of the surrounding areas of Broomfield Hospital throughout the period of the works.

**ALL** shut down or interruptions of existing services, however minor, shall be expressly authorised by and agreed with the Supervising Officer.

## 1.12 Works Standards

Any work which the Supervising Officer decides is below standard or installed in an untidy fashion will be removed and reinstated free of charge.

## 2.0 PARTICULAR SCOPE OF WORKS

### 2.1 Direct Expansion (DX) UPS Cooling Systems

A direct expansion split air conditioning system shall be installed to serve the 2 No. UPS rooms at Broomfield Hospital. An N+1 resilient DX system is to be installed.

Each DX cooling system shall operate with a 7 day change over period to ensure the design criteria is achieved.

The DX system shall be capable of 100% of the required cooling load within the UPS plant room.

A DX down flow unit (DFU) shall be positioned within the UPS plantroom, mounted on concrete up stands. The DFU shall provide conditioned air at low level to the UPS plant room. Return air shall be ducted at high level to the DFU.

An external condenser shall be located externally local to the UPS room with refrigeration pipework runs limited to 30m. Each external unit shall be referenced to its corresponding internal unit. Referencing shall follow the procedure UPS Station 1: UPS01/DX/01 (Internal unit), UPS01/COND/01 (external unit).

External condensers shall be installed with the manufacturer required installation requirements including air flow and maintenance access requirements.

Refrigerant pipework and power supplies shall be independent for each DX circuit.

All refrigerant pipework sub-contractors must be approved by manufacturers.

Refer to equipment schedules for further details.

Design, install and commission the complete refrigerant cooling systems as identified on the drawings and stated in the schedules.

All refrigerant pipework installations shall be designated, tested and commissioned by the installer in accordance with all relevant British Standards, Codes of Practice and f-gas Regulations.

Undertake site investigations prior to the installation to identify the minimum liquid line length, number of bends, vertical lift and horizontal runs. Agree final routes of refrigerant lines and positioning of components with the CA prior to commencing the works.

No space temperature sensors shall be placed outside of the space they control. Remote sensors shall be provided to the indoor units to allow temperature sensing of the room conditions.

Each evaporator unit shall be connected to an intelligent outstation which shall be incorporated within the building management system. Refer to BMS option below.

Condensing units shall be located externally to minimise air recirculation, solar gain and noise nuisance. Their performance shall be unaffected by local constraints and be positioned with full access for safe maintenance.

Take precautions to prevent the discharge of refrigerant gases to atmosphere

All electrical works shall be in accordance with BS 7671.

Electromagnetic compatibility shielding must be applied where appropriate to ensure the security of the system electronic communications.

Ensure that power lines and communication cables are correctly installed, labelled connected and tested prior to commissioning.

On completion of commissioning provide all necessary documentation as stated elsewhere. Record all additional refrigerant charge, cable connections and selection (DIP) switch settings to facilitate future maintenance and fault finding.

## **2.2 Condensate Pipework**

DFUs shall be complete with condensate lift pumps. Condensate pumps shall serve 22 Ø mm copper condensate pipework with a minimum fall of 1:80. Condensate pipework within the UPS room shall be kept to a minimum. The Contractor shall survey the availability of local waste stacks are available for termination of condensate pipework.

Condensate pipework shall be insulated for at least the first 1m length of pipework from the internal unit. Any condensate pipework to be located externally shall be insulated with mineral wool, 25 mm thickness, and finished in aluminium cladding.

Volt free contacts shall be provided from each condensate lift pump. Should a condensate lift pump fail, the corresponding DFU shall be isolated and a BMS alarm received.

## **2.3 Power Supplies**

The Contractor shall allow for a power supplies to be made to each cooling system. Separate supplies (A+B) are to be installed. Cooling systems cannot be fed from the same supply.

The Contractor shall validate that the existing local distribution boards are suitable for serving the above.

## **2.4 BMS (Option)**

The following items described below are to be highlighted within the tender return as a separate line item by the Contractor.

The Contractor shall provide a quote for interface of the above systems with the existing BMS on site. This would be limited to alarm interface and appropriate graphics only.

## **2.5 Extract Ventilation**

An extract ventilation system shall be installed in accordance with BS EN 50272 'Safety requirements for secondary batteries and battery installations'.

An exhaust fan shall discharge the UPS air to atmosphere when the UPS is in charging mode only. The UPS system shall provide volt free contacts for fan operation and interface. In normal operation the fan shall not operate.

Make-up ductwork shall connect directly to atmosphere. All ductwork shall be suitably fire rated with external walls complete with weather louvre with 50% free area.

The exhaust fan shall provide a volt free contact for BMS alarm.

The fan and associated ductwork shall be fire rated to ensure local fire compartment integrity is maintained.

Refer to equipment schedules for further details.

Fans shall be resiliently mounted with anti-vibration springs to ensure vibration transfer is mitigated.

Axial fan motors shall have non-overloading characteristics within the normal working range.

Rotors shall be statically and dynamically balanced. They shall be subject to X-ray tests and documented results shall be submitted to the CA. Impellers for variable pitch fans shall in addition be checked over the full blade angle range for vibration in accordance with BS ISO 10816.

Safety guards shall be provided on air inlet and air outlet connections where these are freely accessible to personnel.

### **3.0 DESIGN CRITERIA**

The following criteria must be adhered to:

UPS internal design condition:	Temperature: 22°C + 1°C Humidity: 60% + 10%
External Temperature:	Winter: - 4°C sat Summer: 30°C db / 20°C wb
Heat Rejection Plant:	Operating Temperature: 35°C
Fresh Air Ventilation Rate:	Infiltration leakage.
Extract Air Ventilation Rate:	Infiltration leakage.
Noise Levels:	NR45
Internal Heat Gains:	UPS load 22.4 kW (total) Transformer 7.9 kW (total) Switchgear 1.0 kW (total) LV panel 0.5 kW (total) Battery load 1.0 kW (total) Outside air load provision Fabric gain provision Lighting gain: 10 W/m <sup>2</sup>

### **4.0 GENERAL INSTALLATION REQUIREMENTS**

The general installation requirements relating to materials used and quality of work shall be in accordance with the requirements below.

#### **4.1 Refrigerant Pipework Installation Requirements**

All refrigerant installations shall be in accordance with all relevant British Standards, Codes of Practice and the f-gas Regulations.

Copper tubes for refrigerant pipework shall comply with BS EN 12735-1 and shall be suitable for the refrigerant used. Tubes shall be dry and absolutely free from scale. Where the refrigerant is above the limits for copper pipe then heavy grade mild steel tube shall be used instead.

Pipework shall be adequately supported every 1 m. The Contractor shall ensure that earth continuity is maintained throughout all installations.

Identification of services shall comply with BS 1710 and BS 4800. This consists of refrigerant lines labelled in a 150 mm 'green' label. Space of labelling shall not exceed 4 m.

Refrigerant pipework jointing can be brazed, pulled bends and flanged only. Compression and capillary jointing are not acceptable.

Refrigerant pipework installation to comply with manufacturer's specification. The Contractor shall be approved by the manufacturer.

Refrigerant pipework shall be insulated with closed cell nitrile rubber. External pipework shall be mounted on tray and sufficiently protected. The minimum thickness of thermal insulation must be determined using the methodology defined in the 2006 Edition of the Building Regulations 2000 Part L and BS5422: 2009

Under no circumstances shall any insulation material requiring the use of CFC's or HCFC's in its manufacture or containing asbestos be used. Thermal conductivity values shall be determined in accordance with BS EN 12667, BS 2972, BS EN 13467-13472.

Pipework shall be run in a neat manner and installed plumb, straight, symmetrical and at right angles to or parallel to adjacent walls.

The installation shall be executed by competent qualified/certified refrigerant operators fully experienced in the type of work being carried out.

Copper tube shall be suitable for the operating pressures that will occur throughout the system.

Pipework shall be dry, completely free from scale and internally degreased.

The number of joints shall be kept to a minimum and the longest possible lengths of copper pipe shall be utilized where possible.

Brazing and bronze welding shall be executed by competent qualified/certified operators fully experienced in the type and size of work being carried out. Brazers shall hold a valid certificate of competency issued by an approved body.

Copper joints shall be silver soldered, brazed or bronze welded to suit the operating temperature and pressure and shall comply with BS EN 14324. In addition the recommendations of the HVAC and Copper Development Association shall be adhered to.

Appropriate refrigeration installation tools must be utilised.

The ends of the pipework shall be cleaned and reamed out to the original internal diameter before brazing.

After completion, the refrigerant pipework shall be subjected to pressure and leakage testing as BS EN 378.

The installation shall be executed by competent qualified/certified refrigerant operators fully experienced in the type of work being carried out.

The ends of the pipework shall be cleaned and reamed out to the original internal diameter before brazing.

Dry nitrogen shall be passed continuously through the pipework at minimal pressure and at an adequate velocity during brazing or soldering to eliminate internal oxidation. All excess solder and flux shall be removed on completion of joints.

Piping and other components which have been prepared and are not to be used immediately shall be capped and sealed. During installation no component or length of tubing shall be left un-blanked longer than necessary for installation.

The ingress of moisture, dirt and any other contaminants to the interior of pipework and other components shall be prevented during storage.

Arrange all exposed pipe runs to present neat appearance, parallel with other pipe or service runs and building structure. Ensure all vertical pipes are plumb or follow building line.

Space pipe runs in relation to one another, other services runs and building structure, allow for specified thickness of thermal insulation and ensure adequate space for access to pipe joints, etc.

On completion of all site joints but immediately before connecting to the system components high pressure nitrogen shall be flushed through the pipe,

Provision should be made for the Employers maintenance technicians to be able to conduct thorough leak tests so joints in void spaces should be avoided.

Insulate the entire length of pipework and to avoid contact between copper and galvanising of support tray.

Pipework insulation shall be closed cell nitrile rubber preformed flexible sections and shall be CFC free with a fire performance rating of Class 0. The thickness of insulation shall be to BS 5422. Where the indicated thickness in BS 5422 is not a commercial size, the nearest larger commercially available thickness shall be provided. Wrap fittings and valves with same insulation as pipework.

External refrigerant pipes subject to solar radiation shall either be shielded or have weatherproofed closed-cell insulation applied, of the correct thickness, with a reflective or of a light coloured finish.

Include expansion joints if required to accommodate expansion and contraction. Cold bridging is to be prevented.

Discharge pipes likely to cause burns to personnel shall be shielded.

After installation of pipework and prior to sealing of insulation joints and starting of equipment, pipework should be pressure tested, held for 24 hours and checked for leaks, vacuumed/dehydrated and held for 12 hours (minimum).

Refrigerant charge weight shall be calculated, to the actual installed length of pipework in accordance with the manufacturer's recommendations. The charging shall be carried out with an appropriate charging station.

Refrigerant pipework shall be adequately supported with maximum support spacing as follows:

1. Pipe nominal bore 15 to 20 (mm) - Spacing 1.0 (m)
2. Pipe nominal bore 22 to 54 (mm) - Spacing 2.0 (m)
3. Pipe nominal bore 54 to 67 (mm) - Spacing 3.0 (m)

Where the pipework cannot be adequately supported at the spacing indicated directly from the building structure, continuous proprietary channel, angle or tray support systems shall be provided. Pipework shall be supported using sherardized steel clips with a rubber or plastic sleeve to prevent chafing or vibration.

For refrigeration copper pipework 15 to 28 mm diameter support on continuous plastic coated cable tray.

The arrangement of pipework and support shall be agreed with the EA before commencement of the Works.

The fixing and/or supports shall not allow any vibration to be transmitted to the structure.

All pipework shall be labelled with a reference number or other identification relating to the respective condensing unit served. Identification shall be at 3m intervals and be clearly visible.

Insulate entire length of pipework for thermal insulation and to avoid contact between copper and galvanising of support tray.

Electrical cables shall not be fixed to refrigerant pipework.

#### **4.2 Condensate Pipework Installation Requirements**

Condensate pipework shall be copper tube in accordance with BS EN 1057.

Pipework shall be adequately supported every 1 m. The Contractor shall ensure that earth continuity is maintained throughout all installations.

Any condensate drains from mechanical plant shall each have a connection from their drip tray to a common drainage run discharging onto roof areas of gutters, or floor gullies. The system shall be installed in copper tube to BS EN 1057: Part 1.

A permanent connection shall be made to each drip tray and a rodding eye shall be provided at the heads of risers and the ends of each run.

The float shall be labelled and shall fall to the main riser where a union shall connect to the main riser. The Contractor shall use laser beams to provide the fall to the float.

### **4.3 Thermal Insulation Requirements**

Ensure that all thermal insulation is made from materials with zero ozone depletion potential (CFC and HCFC free).

All insulation products shall maintain their thermal performance for a minimum of the plant design life.

All insulating material and associated products shall be applied in accordance with the manufacturer's recommendations and instructions.

All insulating materials, associated products and the completed works shall be in accordance with the relevant British Standards and the Building Regulations.

Thermal insulation materials shall be in accordance with BS EN ISO 1224.

Thermal insulation shall not be applied to pipework and ductwork services until:

1. The installation, or sections of the installation have been fully pressure tested and all joints proved sound
2. The surface to be insulated has been cleaned, dried and is free of rust, scale and other foreign matter
3. All painting of paintwork has been completed and is dry. Damage caused to pre-painted surfaces during installation shall be repaired at no additional cost
4. Copper pipework has been cleaned thoroughly to remove all traces of surplus jointing flux, building materials and debris, dust and moisture.

Where services pass through a fire compartment wall or floor the space between the pipework and the sleeve shall be completely filled with a certified fire resisting material having a performance equal to the fire rating of the structure. In this instance the thermal insulation shall not pass through the sleeve.

Vapour barriers shall be continuous and the integrity maintained. Where this is not possible, the vapour barrier shall be effectively sealed to the pipe to prevent any ingress of moisture or water vapour.

Thickness of insulation shall be in accordance with BS 5422

The insulation thicknesses stated in the following tables are given for thermal conductivities appropriate to the usual materials used for the application. The thickness for intermediate thermal conductivities and pipe sizes shall be deduced by calculation or interpolation in accordance with the relevant British Standards.

Pipe nominal diameters stated in insulation thickness tables are based upon steel pipework. Where copper or plastic pipework is used the equivalent outside diameter of the pipe shall be used. Reference should be made to BS EN 10255 and BS EN 10220.

### **4.4 Identification of Services Requirements**

Identification of services shall comply with BS1710 and BS 4800.

### **5.0 TESTING AND COMMISSIONING**

Before any project can be handed over it is essential that all systems and equipment installed are tested and commissioned to ensure that they are safe, working at optimum efficiency and meet the design requirements stated above.

Prior to any testing or commissioning process the Contractor shall submit, for approval, a Method Statement for the proposed work. Sufficient time shall be allowed for the Engineer to comment on these and any rectifications to be implemented.

The Engineer, or his representative and, if necessary, the Insurance Company, shall be invited to witness all testing and commissioning and shall have access at all reasonable times to such parts of the Contract Works and of any Contractors' and Suppliers' Works, as may be necessary for the purpose of inspecting, examining and testing the materials, workmanship and performance of plant.

Tests/Witnessing of the handed over systems are required to be carried out during the snagging period of the works. This shall be done out of hours.

All test certification shall be included within the O&M manuals.

Testing of refrigerant pipework shall generally be carried out in accordance with HVCA Guide RAC/70 "Commercial and Light Industrial Refrigeration and BS EN 378.

On successful completion of the pressure tests a copy of the results shall be handed to the Engineer duly signed on behalf of the Contractor.

Whether witnessed or not, certificates of individual test results shall be issued to the Engineer for approval.

The certificates shall incorporate the following information:

1. Identification of the specific plant including all serial numbers.
2. Parameters being tested and noted performance.
3. Method of testing including any standard method such as BS or EN.
4. Test conditions and variable performance factors used to calculate duty.

The Contractor shall produce all 'as built' drawings for the works. These shall be issued to the Engineer for comment and the final copy included within the O&M manuals.

#### **APPENDIX 1**

#### **MECHANICAL EQUIPMENT SCHEDULES**

##### **EXHAUST FANS**

Revision:

T2

<b>Fan reference</b>		<b>UPS/EXF/01 &amp; 02</b>	
Model		Vent Axia – ACP12512	
Number of	No	2	
Location		Local to UPS room	
System		Exhaust	
<b>Construction/material</b>			
Fan type		In-line	
Fire rating		To match fire integrity of UPS room	
Casing material		ABS Thermoplastic	
Impeller material		Backward curved	
Size (diameter)	mm	250	
Duct connection	mm	125	
Max fan speed	rpm	2410	
<b>Performance</b>			
Air flow rate	l/s	40	
System resistance	Pa	150 (estimated)	
<b>Motor</b>			
Motor rating	W	83	
Full load current	amps	0.34	
Starting current	amps	0.85	
Speed control		Yes	
<b>Electrical</b>			
Supply	Voltage	volts	240
	Phase	ph	1

	Hz	Hz	50
<b>Other</b>			
AV mounts			Yes
Flexible connections			Yes
Drive guard			No
Inlet guard			Yes

**Notes**

1. The schedule shall be read in conjunction with the service drawings.
2. The Contractor shall survey the proposed fan location prior to procurement.
3. All fans shall be tested to the relevant standards and test certificates provided
4. All fans and systems shall comply with the requirements of the Building Regulations
5. Fans shall be adequately supported independent of ductwork.
6. Fans shall be complete with flexible connections to ductwork.
7. Refer to typical fan detail for further information.
8. Contractor to provide technical submittal for equal or approved unit.

**DOWN FLOW UNITS (DFU)**

Revision:

T2

<b>Unit reference</b>			<b>DX/DFU/01-4</b>
<b>Unit Type</b>			<b>DX Unit</b>
Model			Uniflair – TDAV 1321
Cooling total	kW		42.4
Refrigerant			R410A
CHW Flow temp	°C		N/A
CHW Flow return	°C		N/A
External summer heat rejection temp	°C		35
<b>Indoor unit</b>			
Location			Within UPS room
Noise level		NR	45
Filter			Yes – EU4
Condensate			Pumped
Width		mm	1720
Depth		mm	865
Height		mm	1960
CHW Flow Rate		l/s	N/A
Pressure drop		kPa	N/A
Supply	Voltage	volts	400
	Phase	ph	3
	Hz	Hz	50
Total Power		kW	15.5
Weight		kg	575

<b>External unit</b>			
<b>Unit reference</b>		<b>DX/COND/01-4</b>	
<b>Unit Type</b>		<b>DX Unit</b>	
<b>Model</b>		Uniflair – CAP 1321	
<b>Location</b>		Local to UPS room	
<b>Noise level</b>	<b>db A</b>	52.7 @ 5 m (horizontal) 50.9 @ 5 m (vertical)	
<b>Width</b>	<b>mm</b>	2280	
<b>Depth</b>	<b>mm</b>	520	
<b>Height</b>	<b>mm</b>	720	
<b>Supply</b>	<b>Voltage</b>	<b>volts</b>	230
	<b>Phase</b>	<b>ph</b>	1
	<b>Hz</b>	<b>Hz</b>	50
<b>Running current</b>	<b>amps</b>	3.2	

**Notes**

1. The schedule shall be read in conjunction with the Architects drawings.
2. The Contractor shall survey the proposed DFU cooling corridor location prior to procurement.
3. All units shall be tested to the relevant standards and test certificates provided
4. Refer to typical DFU detail for further information.
5. Isolators to both power and control shall be provided to both indoor and outdoor units.
6. Condensate shall be pumped to a local waste stack.
7. Contractor to provide technical submittal for equal or approved unit.

**APPENDIX G**

**SPECIFICATION - LV MAIN INTAKE SWITCHBOARD**

**CONTENTS**

- 1.0 LV MAIN INTAKE SWITCHBOARD**
- 2.0 CONTROL STRATEGY**
- 3.0 GENERATOR SET – CONNECTION ARRANGEMENTS**
- 4.0 SWITCHBOARD 24V DC POWER SUPPLY / CHARGER**

**SPECIFICATION - LV MAIN INTAKE SWITCHBOARD****1.0 LV MAIN INTAKE SWITCHBOARD**

The LV Main Switchboard is to be manufactured, supplied and commissioned by a specialist electrical panel manufacturer. The new LV Switchboard will be provided and fitted within the new Alpha Block electrical plant room.

The switchboard should be either a Schneider range "Okken" or equivalent standard.

The switchboard shall be constructed of minimum 2mm steel profile with all external cladding and doors to have sealed gaskets ensuring a standard IP44 rating and form 4 type 2 panel construction.

The LV Switchboard will be front access, with plug in Circuit Breakers (CB's) to allow for minimum downtime in case of future alterations.

All CB's will be Schneider range and all incoming and outgoing CB's will allow for a fault level of 50KA.

The panel will be manufactured to include all circuit breakers and standby changeover arrangements indicated on schematic drawing BH/01/10/018A.

The switchboard will allow for all outgoing/incoming meters of the Schneider type PM 710 or PM 750.

The PM710 meters will be wired together (daisy chained) through a 2 – wire RS 485 port and the final connection shall be left in din rail connectors for future connection to a client Lan network server point for energy monitoring.

The LV cableways shall be capable of both bottom and top cable access.

The top access cables will be via heavy duty ladder rack cable tray. The panel manufacturer shall allow for these cables to be glanded at least 400mm from the ceiling with a suitably sized gland plate with a cable way spanning the whole length of the upper part of the panel. The upper and lower cable box sections of the switchboard will provide for access from any section of the cable entry boxes to any section of the LV circuit breaker section to provide complete entry flexibility.

All circuit breakers both incoming and outgoing shall be connected to the main busbars using copper busbar not cable. The busbars shall be accessible for thermal imaging for maintenance purposes.

The switchboard manufacturer shall allow in their quotation for all small control wiring within the switchboard to deliver the control strategy as specified in the control section below.

The LV Switchboard provider shall provide:-

1. All cabling for the closing coil and tripping coils of the main busbar and generator breakers including status of the breakers to be wired to a location in the switchboard to a fixed connector block. The control circuit to power the closing coil and tripping coils and indicator signalling shall be 24v DC supplied via a dedicated 24v DC battery supply / charger unit.
2. The 24 v DC battery / charger unit will be located adjacent to the new switchboard and will be supplied and installed solely for the purposes of controlling and operating switchboard devices, changeover / generator signalling and controller.
3. All cabling for voltage references and CT's will be organised for ease of access and presented on terminal rails accordingly.
4. The Deep Sea generator controller shall be fixed into a front door of the switchboard and presented at a convenient height for ease of operation.
5. The switchboard manufacturer shall include for surge protection using the Furse ESP415MI unit. The surge protection device will be connected to the main busbars within 300mm of the incoming feeder.

6. The switchboard manufacturer will include as part of the switchboard a local 6 way TPN Schneider Isobar distribution board including all outgoing MCBs and RCBOs.
7. The switchboard manufacturer will allow for future CT's for PF correction on incoming supplies. The CT's will be short circuited until required.

### Summary of switchboard devices

1. Incoming NW25ACB (2500A)

#### Non Essential section

2. Outgoing 1250A
3. Outgoing 400A

#### Essential section

4. Main busbar NW1600N 1600A Automatic remote control M/E interlocked
5. Generator NW1250N 1250A Automatic remote control M/E interlocked
6. Generator NS1250N 1250A A key (A) interlocked
7. Generator NS1250N 1250A A key (B) interlocked
8. Outgoing 1250A
9. Outgoing 630A
10. Outgoing 400A
11. Outgoing 250A
12. Outgoing 250A
13. Outgoing 63A (Internal Distribution Board)
14. Internal Distribution Board 125A TPN

## **2.0 CONTROL STRATEGY**

The switchboard manufacture shall incorporate all control devices and signalling devices to provide the following control requirement.

The switchboard will include non-essential and essential sections.

The essential section will be configured to provide automatic changeover MCCB's to supply the essential busbar section with either primary (grid supply) or standby supply (from an existing standby generator plant).

The essential section will incorporate a 1600A motorised Main MCCB (set at 1250A) which will be mechanically and electrically interlocked with a 1250A motorised Generator MCCB.

The switchboard will incorporate a Deep Sea DSE 7410 Mk2 controller or equivalent to manage the automatic changeover arrangements when the essential supply is interrupted or the generator is under test.

The controller will include automatic, manual, test on load and off functionality. Status information will be displayed on an LCD screen at all times.

The control strategy will be as follows: -

In **"automatic" mode** - once the controller senses a reduction or loss of voltage / frequency of minimum 0.5 sec. duration in the essential main supply, the controller will remotely switch the Main MCCB off and signal the existing standby generator set to start.

Once an acceptable generator voltage / frequency is detected on the incoming side of the Generator MCCB, the controller will recheck the Main MCCB is in the off position, and signal the Generator MCCB to close. The essential section of the switchboard will be supplied via the generator standby supply.

Once the controller senses the main essential supply has been re-established and has remained stable for 15 sec. the controller will remotely switch the Generator MCCB to off position and when satisfied the Generator MCCB is in the off

position remotely close the Main MCCB to restore essential supply. The essential section of the switchboard will be supplied via the main supply.

The controller will retain the generator run signal for a further 15 minutes to allow the existing generator set to warm down and thereafter signal the set to stop.

In **“test on load” mode** the controller will signal the Main MCCB feeding the essential bus bars to open (even though the main supply is stable and available) and at the same time signal the generator set to start.

Once an acceptable generator voltage / frequency is detected on the incoming side of the Generator MCCB, the controller will recheck the Main MCCB is in the off position, and signal the Generator MCCB to close. The essential section of the switchboard will be supplied via the generator standby supply.

Should the generator fail to supply the correct supply at the Generator MCCB incoming terminals within approx. 20sec. the controller will immediately re-establish the main supply by remotely reclosing the Main MCCB. The essential section of the switchboard will be supplied via the main supply.

If at any time during the generator on load testing procedure the controller senses a reduction or loss of voltage / frequency of minimum 0.5 sec. duration in the generator supply, the controller will remotely switch the Generator MCCB to off position, and when satisfied the Generator MCCB is in the off position remotely close the Main MCCB to restore essential supply. The essential section of the switchboard will be supplied via the main supply.

The controller will retain the generator run signal for a further 15 minutes to allow the existing generator set to warm down and thereafter signal the set to stop. However the generator may have already stopped due to a fault condition.

In **“manual” mode** (test off load) - the controller will signal the generator to start and within approx. 20sec. verify the generator supply is available. The off load test run will continue until an alternative control mode is selected. During the off load test should the main supply fail, the controller will revert to **“automatic mode”** and providing the generator supply is within tolerance and available the controller will instigate a changeover to generator supply and thereafter follow the automatic mode sequence once the main supply is re-established.

The controller will retain the generator run signal whilst the controller is in **“manual mode”**.

In **“off” mode** - the controller will assume the generator is not available. Should the main supply fail whilst **“off” mode** is selected, the controller will ensure the Generator MCCB remains in the off position and the Main MCCB remaining in the on position waiting for the main supply to be re-established.

In the **“off” mode** position the controller will indicate an alert signal and sound an alert buzzer. The buzzer will require manually muting periodically unless the controller is instructed via an authorised signal to permanently mute the alert buzzer. The alert indicator will remain until an alternative mode is selected.

### **3.0 GENERATOR SET – CONNECTION ARRANGEMENTS**

The Switchboard will provide for 1no. automatic remote controlled Generator MCCB which will be controlled by the Deep Sea or equivalent controller. However the switchboard will also make provision for 2 x NS1250A manual MCCB incoming generator supplies upstream of the automatic Generator MCCB.

The existing hospital generator will be connected to one of the NS 1250N MCCB. The other NS1250N MCCB will be available for an alternative emergency generator set to be connected to the system should the existing generator not be available.

The castelle key interlock mechanism will prevent both NS1250N MCCB, from being closed at the same time.

The generator signalling will be presented within the switchboard as a common set of volt free signalling connections, such that they can be connected to either of the two generator sets.

Typically the signalling communication between the Deep Sea controller and each Generator controller will be configured as follows: -

1. Start signal
2. Stop signal
3. Receive a common generator fault signal (to be presented on the Deep Sea controller)

**Existing Hospital Generator Set**

The existing generator set is located remotely from the new Alpha Block electrical plant room.

The main cables from the existing set to the new Switchboard will be by others. However the termination of these main generator supply cables will be undertaken within this contract.

A new 12 core 2.5mm PVC-SWA-PVC multicore cable will be supplied and installed in an existing underground duct between the new switchboard and existing generator controller and the contractor should allow for these works with the tender.

A PC sum of £3000 has been allowed in the tender to termination the main generator cables into the switchboard and for any alterations required to the control circuitry of the existing generator controller to accommodate the start, stop and common fault signalling.

**4.0 SWITCHBOARD 24V DC POWER SUPPLY / CHARGER**

The contractor will supply and install a suitable 24v DC battery supply and charger unit that will serve the switchboard controls and operate the automatic remote control MCCB equipment. The battery / charger unit will be located within the new electrical plant room in close proximity to the switchboard.

**APPENDIX H**

**TRANSFORMER & UPS PLANTROOM SPECIFICATION – SISCO ARCHITECTURE LTD**

Please refer to the attached separate document.

**APPENDIX I**

**UPS PERFORMANCE SPECIFICATION (TENDERED)**

**CONTENTS**

- 1.0 INTRODUCTION**
- 2.0 GENERAL**
- 3.0 UPS SYSTEMS**
  - 3.1 UPS Systems – Alpha Block and Zone D
- 4.0 REMOTE COMMUNICATIONS**
- 5.0 LV BYPASS SWITCHBOARD ARRANGEMENTS**
  - 5.1 Main LV Distribution and Bypass
  - 5.2 Intake Section
  - 5.3 Output Section
  - 5.4 Interlocking Arrangements
- 6.0 DELIVERY**
- 7.0 COMMISSIONING**
- 8.0 REMOTE MONITORING (24/7)**
- 9.0 ACCESSORIES**
- 10.0 MAINTENANCE CONTRACT**

## **1.0 INTRODUCTION**

The UPS (N+1) project consists of creating two new centralised UPS systems to increase capacity and provide N+1resilience. The upgrading will provide continuity of supply and further improved resilience to serve the Hospitals operating theatre suites and intensive care facilities.

The centralised UPS system installation will form the first stage of a two stage upgrading programme that will be followed in due course by the installation of individual IPS systems to each of the areas covered by the new UPS supplies.

This performance specification is to be tendered by specialist UPS suppliers who are invited to tender for the works as detailed below and return their quotation as per instructions provided within the tender information section.

The successful quotation based on cost, maintenance and quality of information received will be appointed, and will work in conjunction with the Main Contractor.

The Main Contractor will carry out the general "associated electrical and other works" as part of a consolidated contract with UPS supplier. The UPS supplier once selected and nominated will be form part of the main contractors supply.

## **2.0 GENERAL**

The specialist UPS supplier is required to supply, deliver to site, off-load, position, install, test and commission the following UPS systems as shown on the following drawings in Appendix B of the Employer's Requirements:-

BH/01/10/011/AB	UPS System ALPHA BLOCK	UPS – Distribution Arrangements
BH/01/10/013/AB	UPS System ZONE D	UPS – Distribution Arrangements
BH/01/10/015/AB	UPS System	Proposed Earthing Arrangements
BH/01/10/017/AB	UPS Zone D System	Proposed Room Layout
(2-) 101 Rev 6	Proposed Set Out Plans	

## **3.0 UPS SYSTEMS**

### **3.1 UPS System - Alpha Block and Zone D**

Currently there are a number of small individual UPS units serving a mixture of different areas. These will be removed once the new centralised systems are installed and commissioned.

There will be two centralised systems installed each in a dedicated purposed built UPS room. The new UPS rooms will house all the UPS system equipment which will consist of the following:

200 KVA UPS units configured to run in parallel mode with each UPS configured to accept no more than 50% load capacity.

In the event of a power failure the two UPS units will maintain downstream supply to the load in parallel operational mode.

Should one of the parallel UPS units fail for any reason, the downstream load will be seamlessly maintained by the alternative UPS acting autonomously and at maximum 100% load. This configuration is an essential aspect of the upgrading requirement and must be incorporated within the UPS operational system specification.

The new 200 KVA UPS units will have the following specification: -

1 x 200 KVA UPS

Input 400volts 50Hz

Output 400 volts 50Hz

Battery type VRLA, 10 year

Autonomy: 60 minutes @ 200KVA @0.8PF

UPS: dual input (incoming supply & static bypass supply)

UPS: parallel and synchronised mode (50/50 maximum load share)

UPS: Inbuilt isolation transformer between the inverter and static switch to provide galvanic isolation of the UPS from the output load.

Standard: IEC 60364-7-710, HTM06-01and IEE special locations

The battery sets will be provide on an open rack type stand complete with DC battery isolators mounted adjacent to each battery set.

The UPS units will provide a voltage free contact (10 Amp rated) to signal when the batteries are in charging mode. The signal will operate an extractor fan to ensure a minimum air change rate occurs within the room during charging cycle.

The UPS units will each be supplied with a separate external delta zigzag transformer to provide a reference neutral and earth connection adjacent to the UPS equipment.

Both transformer PEN and PE earths will be bonded to a common earth bar provided in each UPS room.

The transformers will be a matched pair and have the following specification:-

200 KVA DznO 400v/400v  
 Cooling: ANAN  
 Insulation: Class F - 155°C up to 20kVA. Class H - 180°C as from 30kVA  
 Windings: Class HC - 200°C  
 Protection: Safety class I  
 Standard: IEC/EN/UNE-EN 60076, CE

#### **4.0 REMOTE COMMUNICATIONS**

The UPS specialist will allow for a remote alarm panel to be supplied with each UPS unit.

The alarm will provide the following remote indications Mains fail, UPS in bypass, Battery on and Battery low. The remote alarm panel will be wired by others, and be suitable for mounting in an operating theatre environment.

The alarm status should also be relayed to the Trust's local server network such that a common UPS alarm fault will appear as a message on the Trust's mobile phone devices.

The UPS specialist will also allow for a communications card to be able to monitor the status of all UPS units via remote dial-in facility for operational and maintenance purposes.

The specialist will detail in his quotation how the alarm system will be achieved.

#### **5.0 LV BYPASS SWITCHBOARD ARRANGEMENTS**

##### **5.1 Main LV Distribution and Bypass Panel**

These two main switch panels are located within each of the dedicated UPS system rooms and will be utilised to serve the new UPS units.

The main panel will have two sections intake and output sections

##### **5.2 Intake Section**

To provide the UPS units with a dedicated main supply as follows:-

UPS System 1 supply	1x 400A MCCB 3P (Schneider NXS400N)
UPS System 1 static bypass	1x 400A MCCB 3P (Schneider NXS400N)
UPS System 2 supply	1x 400A MCCB 3P (Schneider NXS400N)
UPS System 2 static bypass	1x 400A MCCB 3P (Schneider NXS400N)

##### **5.3 Output Section**

Output section will allow for the following configuration: -

UPS System 1	1x 400A MCCB 3P+N (Schneider NXS400N)
UPS System 2	1x 400A MCCB 3P+N (Schneider NXS400N)
Service Bus Coupler	1x 400A Switch 3P+N (Schneider device with interlock)
Manual Bypass	1x 400A Switch 3P+N (Schneider device with interlock)

Load Bank Test	1x 400A Switch 3P+N (Schneider device)
#Load supplies ZONE D	3x 250A MCCB 3P+N (Schneider NXS250N)
#Load supplies ALPHA	3x 250A MCCB 3P+N (Schneider NXS250N)

The UPS supplier will be responsible for the manufacturer, design, supply and commissioning of a Form 4 type 2, LV panels.

The new output LV panels will be constructed of 2mm steel profile with all external cladding and doors to have sealed gaskets ensuring a standard IP44 rating.

All circuit breakers will be of the **Schneider NXS "Micro logic" 5 range** front access, plug in breakers, with allowance for a fault level of 50KA.

The LV cableways will be capable of bottom, rear and top cable access. The majority of cables will be rear access via suitable wall mounted cable tray.

The panel manufacturer will allow for supply cable to be glanded at least 400mm from the suitably sized gland plate. The panel manufacturer must accommodate 2x150mm 4 core SWA XLPE cables for the incoming supply, 2x95mm 4core SWA XLPE manual bypass and 2x95mm 638TQ flexible for outgoing load terminations.

The cables from the UPS units will be 2x95mm 4 core 638TQ flexible cable.

#### **5.4 Interlocking Arrangements**

The LV output panels will be supplied with a suitable interlocking device (castelle key) located on the LV output panel.

The interlocking device will be interlinked between the manual bypass isolator and the bus section service switch and the static bypass of both parallel UPS units.

The interlocking device will be designed to prevent the manual bypass supply from being connected to the outgoing load when the parallel UPS units are connected to the outgoing load and vice versa unless the both units are in static bypass position or alternatively the busbar mounted service switch is in the open position. The interlock will therefore be connected to the service switch, external manual bypass switch and static bypass of both UPS units.

Each "key" will be a different suite to any other "key" on the Broomfield site.

The front of the panel will have a black line indication of the power distribution layout of the panel.

All panel circuit breakers both incoming and outgoing will be connected to the main busbars using copper bar not cable. The busbars will be accessible for thermal imaging for maintenance purposes.

#### **6.0 DELIVERY**

The UPS contractor will provide in his quotation for an anticipated delivery times for the equipment assuming a start on site date of January 2016.

#### **7.0 COMMISSIONING**

The UPS specialist will allow for commissioning of both UPS systems on different days (due to the programme of works).

The specialist will also allow for an on-site battery discharge test before the actual load is connected using a full load dummy resistive load bank. The UPS contractor will allow for temporary cabling (cables less than 25 metres) from the UPS systems to the load bank.

#### **8.0 REMOTE MONITORING (24/7)**

The UPS specialist will also provide a separate quotation for remote monitoring (24 hours 7 days a week) of both UPS's to the UPS specialist own call-out centre. Should an alarm state occur the UPS supplier will be required to inform the NHS client promptly of a fault/alarm with the UPS equipment a telephone/data cable will be provided to the UPS as part of the works.

**9.0**     **ACCESSORIES**

The UPS specialist will provide a full set of maintenance tools and battery temperature probe for each UPS room.

**10.0**     **MAINTENANCE CONTRACT**

The tenderer will also include within the tender return a firm offer for an annual fully comprehensive maintenance contract of the UPS system based on five year contract period. The annual maintenance contract will be included as part of the tender return and will form part of the overall evaluated process.

**APPENDIX J**

**BPC ENERGY LIMITED QUOTATION**

**BPC Energy Limited documents: -**

- Compliance against Performance Specification
- UPS Proposal Summary
- Formal Quotation

**APPENDIX K**

**PLANNING PERMISSION**

Please refer to the attached separate document.

**APPENDIX L**

**MASTER PROJECT PROGRAMME**

Please refer to the attached gantt chart.

The Employer reserves the right to amend the programme at any time.

The attached programme shall include all necessary design approval periods and construction testing, technical commissioning and snagging.

**APPENDIX M**

**TENDER EVALUATION SCORING MATRIX AND CRITERIA**

Please refer to the attached separate document.

Tender Deliverable(s)		Weighting	[Bidder A]	[Bidder B]	[Bidder C]	[Bidder D]	Bidder E]
<b>A Experience and Capacity (20%)</b>							
1	Programme & delivery strategy (to achieve the programme identified in the Employer's Requirements)	10.00					
2	Direct and relevant experience of designing and constructing similar works including, but not limited to construction works including generators and UPS systems. Complete with details of how restrictions on delivery and noise have been dealt with.	10.00					
3	To enable the client to consider you for the role of Principal Contractor (PC) and designer on the above project you are required to provide evidence of competence in accordance with the CDM regulation 4 and therefore please can you provide the information set out in (A) below.	Pass / Fail					
4	Provide any further information that you consider demonstrative to your successful track record for health and safety in this type of environment (For Information Only).	0.00					
<b>Experience and Capacity Sub-Total</b>		<b>20.00</b>					
<b>B Technical Proposals (30%)</b>							
1	Compliance with the Specification and Drawings included in Appendices B, E, F, G, H, I and J of these Employer's Requirements.	30.00					
<b>Technical Proposals Sub-Total</b>		<b>30.00</b>					
<b>C Commercial Proposals (50%)</b>							
1	Contractor's Tendered Price (on Employer's Stated Programme) and presented in accordance with the Contract Sum Analysis in Appendix A.	50.00					
2	Robustness of Contractor's current financial trading position (i.e. via credit checks) (Pass = minimum 40% credit worthiness on <a href="http://www.creditsafe.com">www.creditsafe.com</a> , Fail = below 40% credit worthiness on <a href="http://www.creditsafe.com">www.creditsafe.com</a> . The Employer reserves the right to evaluate the Contractor's current financial trading position using equivalent Dunn & Bradstreet or Experian Risk Reports if no rating is available on <a href="http://www.creditsafe.com">www.creditsafe.com</a> ).	Pass / Fail					
<b>Commercial Proposals Sub-Total</b>		<b>50.00</b>					
<b>TOTAL WEIGHTING</b>		<b>100.00</b>					
<b>Rank based on weighting score</b>							

**RATIONALE FOR ASSESSMENT / EVALUATION**

**Section A - Experience and capacity**

Assessment	Score
Very poor - completely fails to demonstrate required capacity and capability.	0
Poor - limited evidence of required capacity and capability.	1 to 4
Satisfactory - provides sufficient evidence of required capacity and capability.	5 to 6
Good - shows considerable evidence of required capacity and capability in some areas and some innovation in excess of project requirements.	7 to 8
Very good - shows considerable evidence of required capacity and capability in all areas and innovation in most areas in excess of project requirements.	9 to 10

**Section B - Technical proposals**

Assessment	Score
Non-compliant - The Bidder does not demonstrate any understanding of the Employer's expectations.	0
Unacceptable - The Bidder meets only a few of the Employer's expectations.	1
Acceptable - The Bidder meets the Employer's expectations in most respects.	3
More than Acceptable - The Bidder meets or exceeds the Employer's expectations in all respects.	5

**Section C - Commercial proposals**

The best sum will score 10 and other sums will be indexed accordingly. For example, the lowest tender at £1,000 would score 10, £2,000 would score 5, £4,000 2.5 etc.

(A) To enable the Employer to consider you for the role of Principal Contractor (PC) and designer on the above project you are required to provide evidence of competence in accordance with the CDM regulation 4 and are therefore required to provide the following information:-

**Stage 1 - Core Criteria (as Appendix 4 of the ACOP)**

- Provide details of membership of independent H & S accreditation body e.g., CHAS, Constructionline or similar
- Provide a clear explanation of the arrangements you have for discharging duties under CDM for PC and designer
- Details and qualifications including membership of professional bodies etc for designers to be used
- Accident records for the last 3 years and any subsequent action to remedy any identified occurrences
- Details of any HSE notifications in the last 3 years together with any subsequent actions to prevent re-occurrences

**Stage 2 – Project Specific details**

- Details of working on active hospital sites with electrical and civil content in the role as PC
- Details of recent experience of designers on working on Hospital projects with electrical and civil engineering content
- Details of referees for projects as above
- Details of any specific achievements in respect of coordination of shut downs and change-overs in critical healthcare environments

Ability to satisfy an acceptable standard for the above will result in the need for further investigation and information to be provided and you should be aware that you may be precluded you from further consideration.

**PART 2 - PLANNING AND DESIGN REQUIREMENTS****Soil Conditions**

The Contractor shall carry out any necessary research, examination or tests of soil conditions to obtain the information required for the proper formulation of his tender. Such tests must be carried out by prior arrangement with the Employer.

To assist in the formulation of the tender, a Site Investigation Report is included with these tender documents. The report is for assistance purposes only and no endorsement of its accuracy is given or implied. Where such information is provided and adopted by the Contractor then the Contractor shall have the same liability therefore as if he had prepared and researched the information himself.

**Building Requirements**

The general requirements as regards location, size and form of the building is shown on the drawings listed in Appendix B.

**Disabled Persons**

The building shall include provision for and access facilities for disabled persons in accordance with the requirements of the Disabled Persons Act 1981.